



CITY COUNCIL Study Session

December 9, 2024

6:00 PM, Council Chambers - 111 E. Maple Ave.

To view a Council meeting agenda, visit <https://independencemo.portal.civicclerk.com/> and select 'Most Recent Council Agenda'.

PRESENTATIONS

1. Canterbury Trails HOA Sewer Discussion
2. Traffic Study Presentation for the Noland Road Multimodal Corridor Project (No. 112402)
3. Rental Ready and Landlord Tenant Updates

INFORMATION ONLY

1. Boards and Commissions Report
2. **Please Note:** *In accordance with RSMo. 610.021, the City Council may convene in an Executive Session during or after the meeting, in the Council Chambers and move to Conference Room D for the closed meeting, on matters of litigation, legal action, and/or attorney client communications, as permitted by Sec. 610.021(1), on matters of personnel, as permitted by Sec. 610.021(3) and personnel records, as permitted by 610.021(13), on matters of contracts, as permitted by 610.021(12), on matters of real estate, as permitted by 610.021(2) and/or matters of labor negotiations, as permitted by 610.021(9).*

Canterbury Trails Homes Association

(CTHA)

Why we are here

- Background
- Discuss Canterbury Trails Homes Association (CTHA) sewer system
- Discuss funding to improve the sewer system
- Why proposed funding is fair

Canterbury Trails Subdivision

- Started development in early 1980s
- 91 homes
- Streets are private and maintained by Canterbury Trails Homes Association (CTHA)
- Sewer system is private and maintained by homeowners and CTHA

Canterbury Trails Sewer System

- Homeowners have a septic tank
- Septic tanks are connected to the main line
- Main line is connected to Little Blue Valley Sewer District

Issues with Canterbury Trails Sewer System

- Repairs on the main line are few but increasing
- Anticipate more repairs needed in the future
- No dedicated funding source for future repairs

Two Alternatives to Address Sewer System Issues

- Have the City take over the Canterbury Trails Sewer System
- Develop standards, upgrade and maintain the current system

How to improve the current system

- Develop septic tank standards
- Clean out septic tanks on a three-year cycle
- During clean outs assess compliance with Covenants and Restrictions standards
- Contract with a firm to receive recommendations on the lines
- Install new cleanouts

How to finance improvement of the current system

- Raise dues so CTHA can contract with a firm to pump out septic tanks routinely and assess the tanks
- Ask the City to waive some sewer fees

Current Independence Sewer Charges

- Fee based on water usage
- Monthly base charge
- Regulatory Compliance Charge
- State sewer connection fee

Monthly Base Charge

- History of changes in base charge
- Base charge for CTHA is treated differently than other City residents

Regulatory Compliance Fee

- History of Regulatory Compliance Fee
- CTHA is not subject to the Consent Decree but is being charged for it

Water Pollution Department Expenses

- Department expenses for Independence non CTHA residents
- Department expenses for CTHA residents

Financial Proposal

- Waive monthly base charge
- Waive Regulatory Compliance charge

Current and Proposed Bill

	Current Bill	Proposed Bill
Sewer Service	\$28.84	\$28.84
Base Charge	\$16.59	\$0
Regulatory Compliance Charge	\$12.00	\$0
Total	\$57.43	\$28.84

Water Pollution Department Finances

- Reserve target
- Amount of reserves

Accountably

- Increase CTHA dues to pay for sewer system improvements
- Place dues in dedicated Sewer Fund
- Provide annual report to the city

Fairness

- CTHA is being charged for services not provided by the City
- City Charter Fairness doctrine

Conclusion

- Need for a well-functioning sewer system
- CTHA is willing to improve their system
- Need for the City and CTHA to partner to improve the sewer system



Engineering Possibilities.



Noland Road Multimodal Corridor Improvements

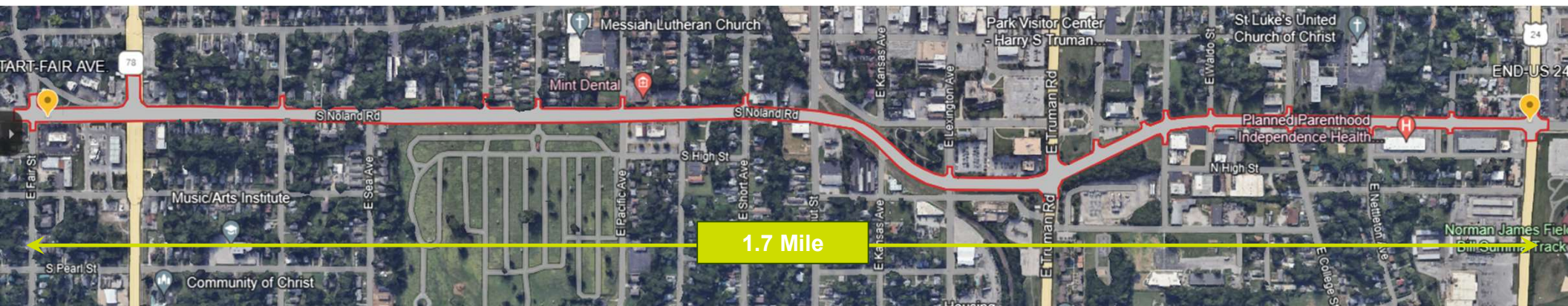
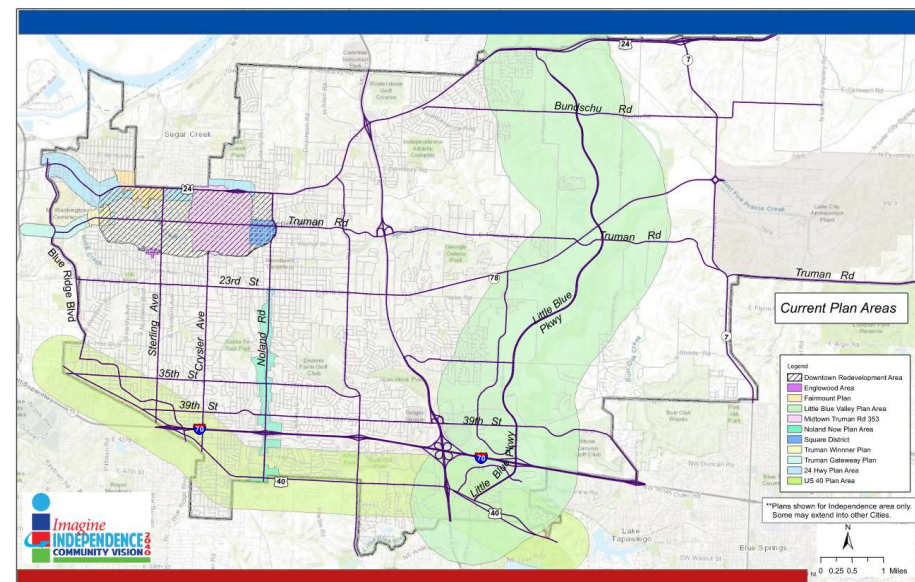
HIGHWAY 24 TO FAIR STREET

Overview

LOCATION & VISION

GOALS:

- Improve safety and accessibility
- Multimodal transportation modes



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Overview

RESOURCES



PLANNED TIMELINE

- Duration: 2,395 Days
- Start Date: 08/12/22
- End Date: 09/05/28



BUDGET SUMMARY

- PE: \$1.3M (80:20)
- ROW: \$0.8M (50:50)
- CO: \$11.4M (76:24)



FUND SOURCES

- FHWA: \$10.16M (RAISE GRANT)
- COI: \$3.34M (Streets Sales Tax)



BRIAN NEVINS, PE FHWA PROJECT LEAD

Our Team of Outstanding Professionals

We have carefully selected an outstanding group of professionals who bring the skills, knowledge, and experience necessary to ensure the success of the Noland Road Multimodal Corridor project. *Below are some of our key team members. For more detailed resumes, please see the appendix.*

CITY OF INDEPENDENCE, MISSOURI



BRYAN BLIZZARD, PE
Project Manager



REID CATT, PE
Quality Control



ANTONIO SAAVEDRA, EI
Roadway



KURT ROTERING, PE, PTOE
Lead Traffic



KEN BOONE
Public Involvement



BRAD SCHLEEETER, PE, CFM, ENV SP
Stormwater



BRANDON MCBRIDE
Landscape Architecture



JACOB BERRY, PE
Traffic



PAT WARD, PLS
Survey



IAN DILLON, PE
Geotech



KYLEEN KELLY
Environmental



DENNY BLIND, PLA
Multimodal Transportation



Traffic Study

STUDY OVERVIEW/CONSIDERATIONS

- Existing Plans / Conditions
- Best Practices
- Alternatives Analysis
- Traffic Conditions
 - Existing
 - Existing Build
 - Future 2035 & 2045
 - Future 2035 & 2045



Traffic Study

DATA COLLECTION

- Historical Crash Data
 - (5-year period, 2019-2023)
- Existing Roadway Configuration
- Existing User Data
 - Traffic Volumes
 - Pedestrians
 - Cyclists
- Existing Transit Center



Traffic Study

CRASH PATTERNS DATA



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INTERSECTION WITH NOLAND ROAD	VOLUME (AVERAGE DAILY TRAFFIC)	CRASHES BY CONTROL		CRASH RATE (CRASHES / MILLION VEHICLES ENTERING)		CRITICAL CRASH RATE**
	ADT	SIGNAL CTRL	STOP CTRL	SIGNAL CTRL	STOP CTRL	
HIGHWAY 24	32,725	22		0.35		0.54
ST CHARLES STREET	13,661		5		0.19	0.62
NETTLETON AVENUE	13,974		2		0.07	0.62
COLLEGE STREET	15,942	15		0.49		0.60
WALDO STREET	14,598		2		0.07	0.61
FARMER AVENUE	14,886		3		0.11	0.61
MEMORIAL DRIVE	-		0			
WHITE OAK STREET	15,186		2		0.07	0.61
TRUMAN ROAD	28,752	21		0.38		0.55
LEXINGTON AVENUE	16,567		4		0.13	0.60
KANSAS AVENUE	-		0			
WALNUT STREET	20,048	12		0.31		0.58
SHORT AVENUE	18,331		4		0.11	0.59
ELM STREET	18,403		1		0.03	0.59
PACIFIC AVENUE	19,148		5		0.14	0.59
RUBY AVENUE	19,124		1		0.03	0.59
LINDEN AVENUE	19,424		1		0.03	0.58
SEA AVENUE	19,580		4		0.11	0.58
SOUTH AVENUE	20,072		4		0.10	0.58
23RD STREET	49,028	42		0.45		0.51
FAIR STREET	24,202	35		0.75		0.56
TOTAL		147	38	-	-	-

*Represents full year of 2019 through 2023 with 3 months of 2024 data provided by the City.

**Critical Crash Rate for similar facilities statewide was referenced as 0.40 based on prior data.

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Traffic Study

TRAFFIC DATA

- 24-Hr data collected May 7 -13th
- Signal Timings from maintaining agency
- Selected Peak Periods of highest day
- ADT Data

CORRIDOR SEGMENT	SPEED LIMIT	AVERAGE DAILY TRAFFIC VOLUME	SEGMENT LENGTH	DRIVEWAY DENSITY
HIGHWAY 24 TO COLLEGE STREET	40 mph	~12,000 Veh per Day	0.26 Miles	84 Drives/Mile
COLLEGE STREET TO TRUMAN ROAD	40 mph	~12,000 Veh per Day	0.27 Miles	44 Drives/Mile
TRUMAN ROAD TO WALNUT STREET	40 mph	~15,000 Veh per Day	0.28 Miles	21 Drives/Mile
WALNUT STREET TO 23RD STREET	40 mph	~18,000 Veh per Day	0.75 Miles	85 Drives/Mile
23RD STREET TO FAIR STREET	40 mph	~18,000 Veh per Day	0.11 Miles	45 Drives/Mile

Traffic Study

ADJACENT PLANS REVIEWED

- Comprehensive Plan 2040
- Imagine Independence
- Downtown Redevelopment Coordinating Committee Report
- Link Independence
- Noland Now Revitalization Plan
- Truman Connected Plan
- National Historic Retracement Plan



Traffic Study

BEST PRACTICES

- Facility Types
 - Shared Roadway
 - On-Street Bike Lane
 - Separated Bikeway
 - Shared-Use Path
- Design Guidelines
 - 5' Minimum Bicycle Lanes if on-street
 - Buffer Space Recommended where speed differentials are high

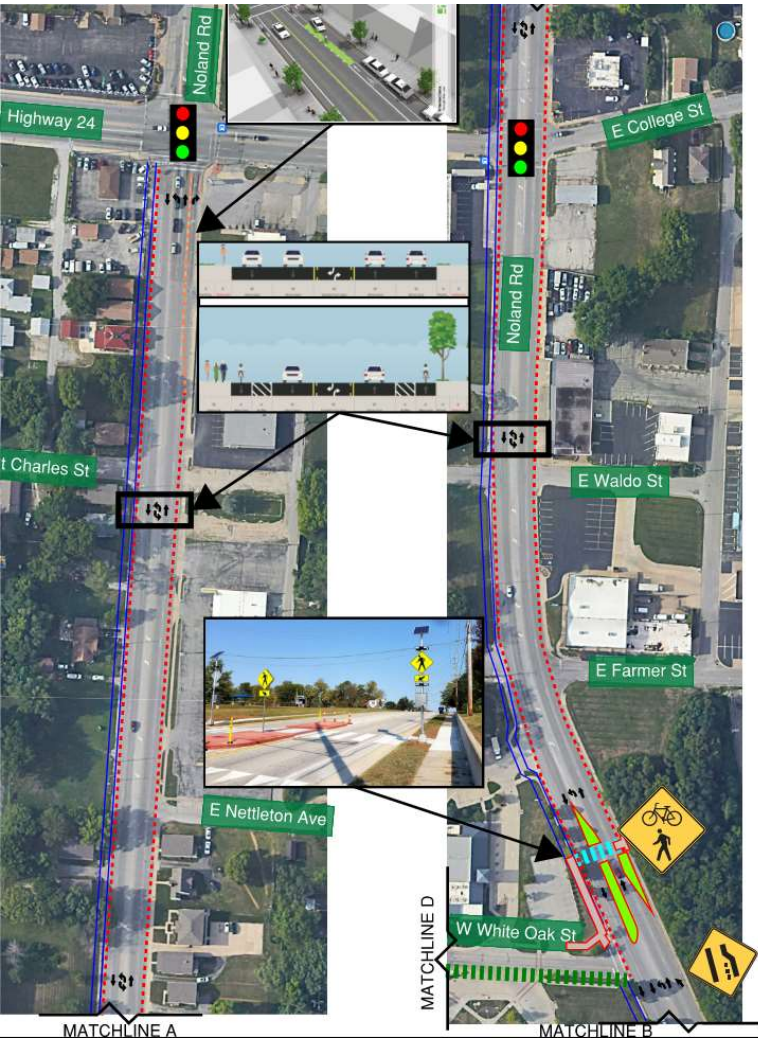


Table 7: Bicycle Facility by Type

SHARED ROADWAY	ON-STREET BIKE LANE	SEPARATED BIKEWAY	SHARED-USE PATH
• Streets are designed to mix bicycle travel with other vehicles. • Recommended to use traffic calming measures to achieve low speeds on low volume facilities (>20mph and >2,000 vehicles per day desirable).	• Dedicated lane on roadway reserved for bicycle use only. • Recommended to provide buffer space and/or separation between bicycle lane and traffic on roadway where higher speed or volumes are present.	• One or Two-way facilities reserved for bicycle use and physically separated from roadway and sidewalk. • Recommended to provide tighter radii at intersections to encourage yielding and improve visibility.	• Travelway that excludes motorized vehicles. • Recommended to provide raised medians, curb extensions, warning beacons, or other means to assist with major roadway crossings.
			

Noland Road Multimodal Study / Multimodal Corridor Study / Olsson Project No. 023-00893 / September 2024 / 13





Traffic Study

ALTERNATIVES ANALYSIS

- Adjacent Plans
- Corridor Make-up
- Facility Demand

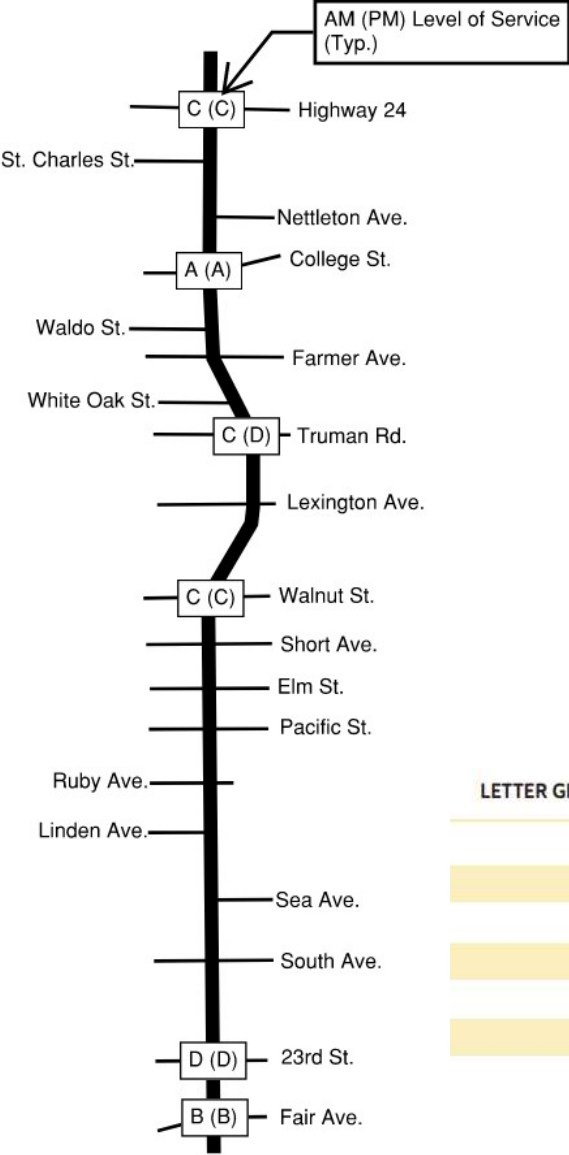
RECOMMENDATIONS

- Multi-Use Trail - Entire Corridor
- On-Street Buffered Bike Lanes – Northern Segment (US-24 to White Oak Street)
- Installation of Pedestrian Hybrid Beacon north of White Oak Street
- Replacement of Existing Sidewalk

Traffic Study

CAPACITY ANALYSIS

- Level of service (LOS) is a way to measure how well a transportation facility is operating from a traveler's perspective. It's based on factors like speed, travel time, maneuverability, delay, and safety.
- LOS is typically measured on a scale of A to F, with A being the best operating conditions and F being the worst.
- The proposed multimodal enhancements maintain Level of Service across the corridor with few exceptions, even with traffic increases through 2045.



	EX AM	2045 AM	EX PM	2045 PM
	OVERALL	OVERALL	OVERALL	OVERALL
HIGHWAY 24	C	C	C	C
St Charles Street				
Nettleton Avenue				
College Street	A	A	A	A
Waldo Street				
Farmer Avenue				
White Oak Street				
Truman Road	C	C	C	D
Lexington Avenue				
Kansas Avenue				
Walnut Street	B	B	C	C
Short Avenue				
Elm Street				
Pacific Avenue				
Ruby Avenue				
Linden Avenue				
Sea Avenue				
South Avenue				
23rd Street	D	D	D	D
Fair Avenue	B	B	B	B

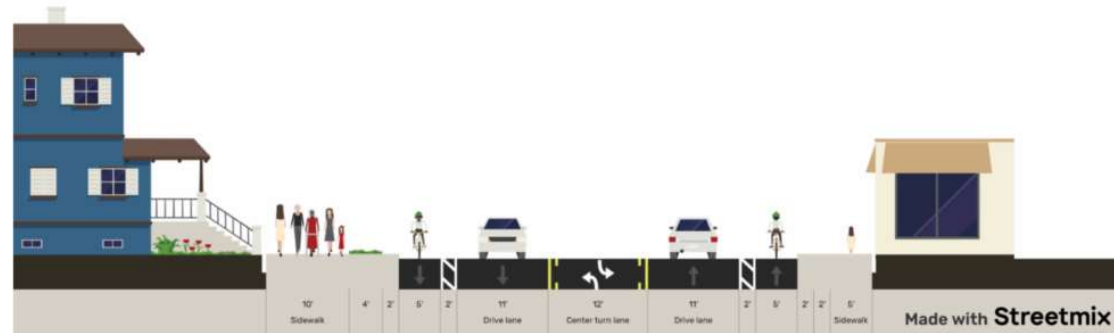
LETTER GRADE LEVEL-OF-SERVICE	DESCRIPTION
A	Free-Flow Traffic Conditions
B	Reasonably Free Flow Conditions
C	Stable Flow Conditions
D	Approaching Unstable Flow Conditions
E	Unstable Flow Conditions
F	Forced or Breakdown Flow Conditions

Traffic Study

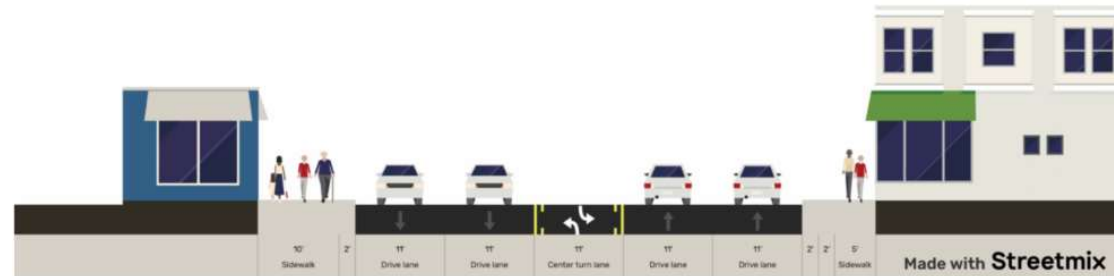
CONCLUSION

Overall, this project is expected to:

- Improve Safety,
- Provide Equitable Access and Improve Quality of Life,
- Promote Environmental Sustainability,
- Improve Existing Facilities,
- And provide Economic Benefits.

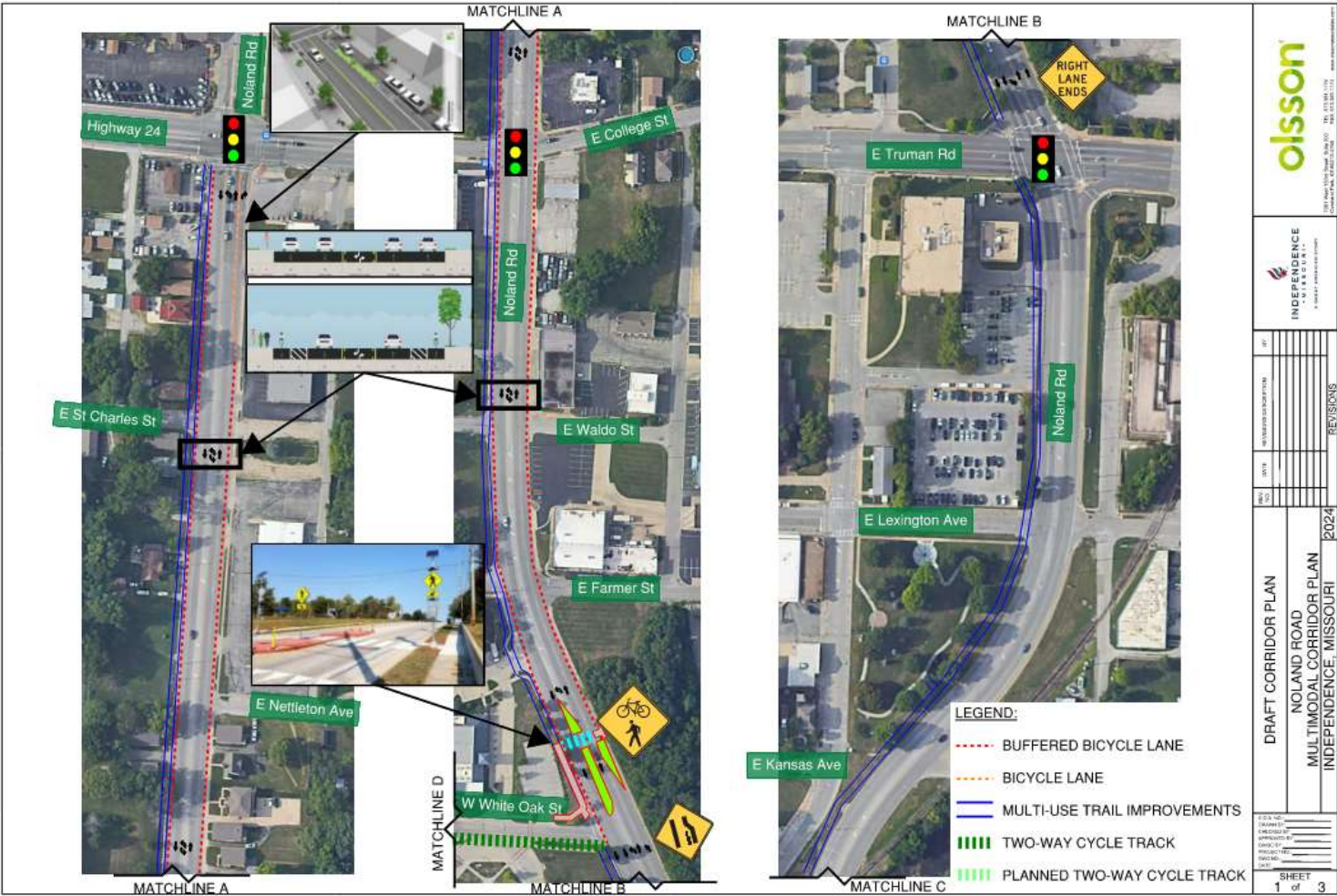


NOLAND ROAD
Highway 24 to East White Oak Street



NOLAND ROAD
East White Oak Street to East Pacific Avenue

Cross Sections & Traffic Operational Analysis





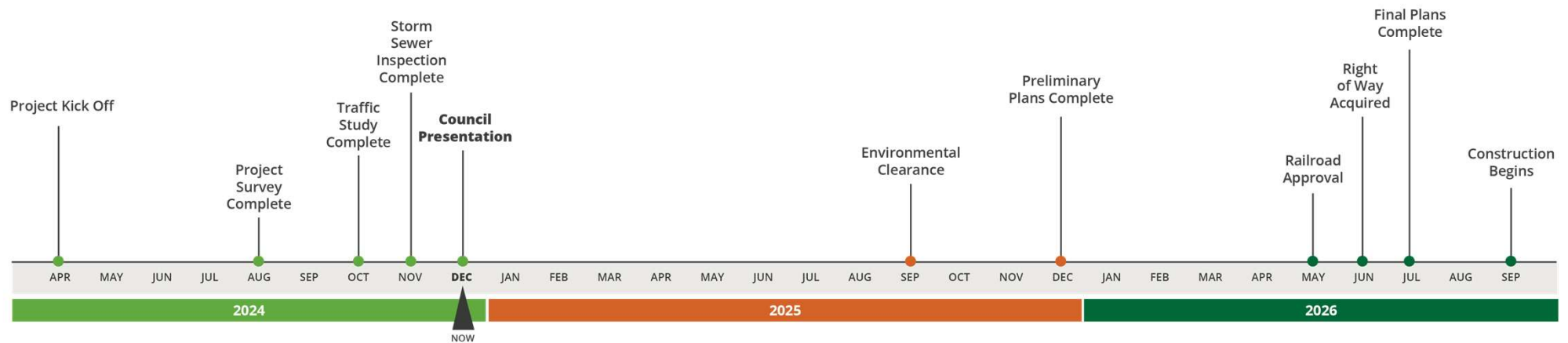






Next Steps

- Coordination:
 - Railroad
 - Utilities
 - Property Owners
 - Traveling Public
 - Council & Public
 - US-24 Project

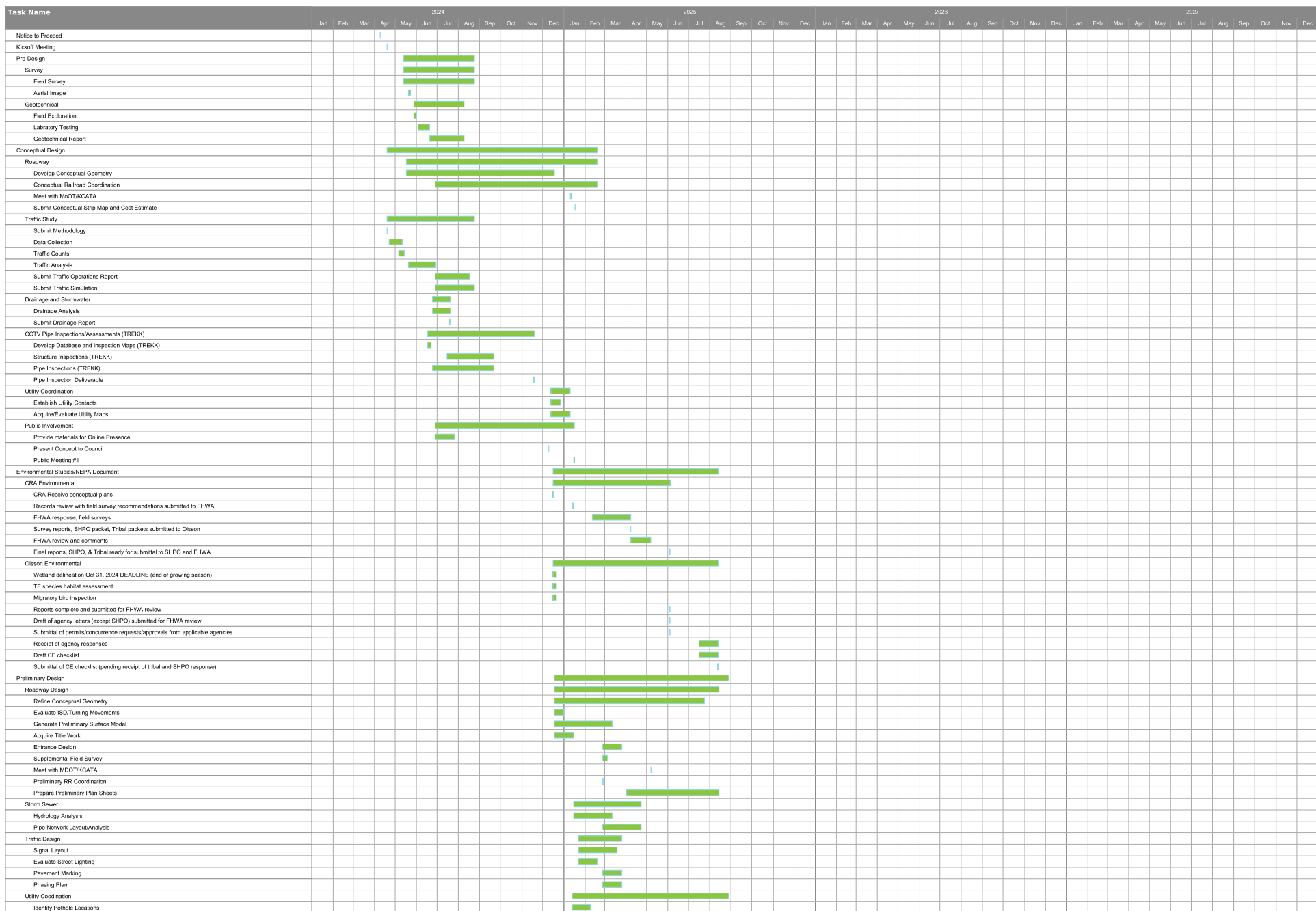


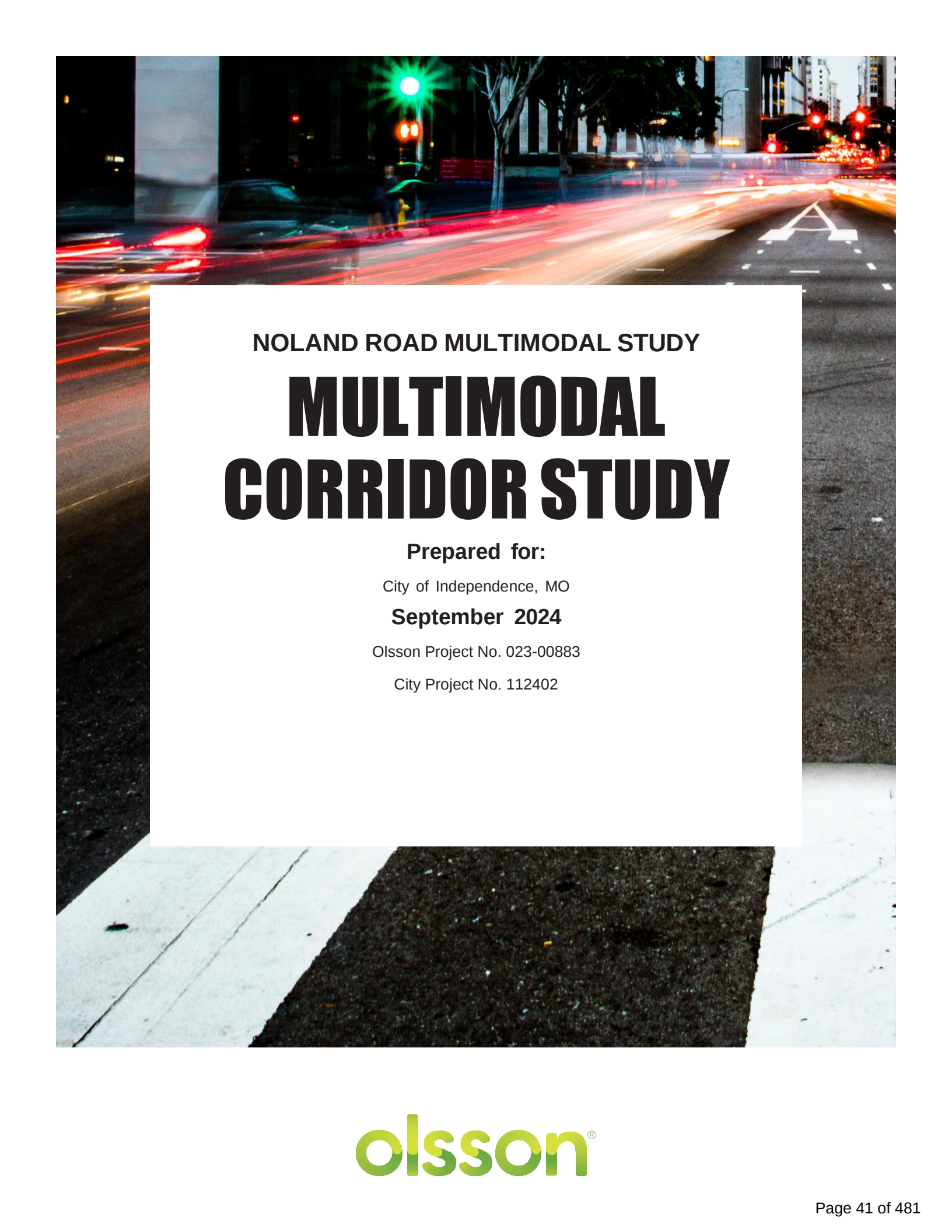


Engineering Possibilities.

Thank you!

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NOLAND ROAD MULTIMODAL STUDY

MULTIMODAL CORRIDOR STUDY

Prepared for:

City of Independence, MO

September 2024

Olsson Project No. 023-00883

City Project No. 112402



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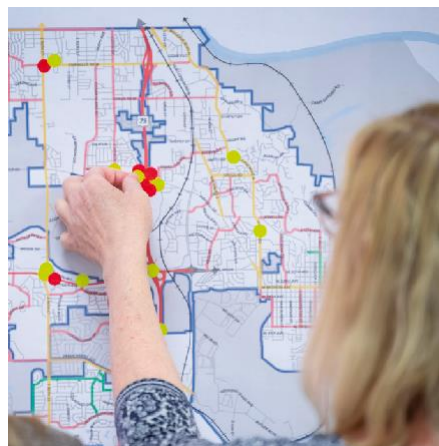
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Appendix B: Existing Conditions
Appendix C: Existing With Bike Lanes Conditions
Appendix D: Year 2035 No Build Conditions
Appendix E: Year 2035 With Bike Lanes Conditions
Appendix F: Future Year 2045 No Build Conditions

1. INTRODUCTION

This report studies the opportunity to improve the Noland Road corridor with regards to the existing transportation infrastructure, including facilities for vehicles, transit services, bicycles, and pedestrians traveling along the corridor. The City of Independence received RAISE Grant funding to provide these improvements, specifically to explore opportunities to improve the multimodal transportation infrastructure along the corridor by adding dedicated facilities to support these modes of travel.

The study area includes Noland Road and its surrounding street network between State Highway 24 to the north and Fair Street to the south. This area encompasses much of the City's vibrant downtown square, which supports a variety of government, retail, and residential land uses near the Truman Road intersection with Noland Road. The corridor area is also surrounded by predominantly single-family residential land uses to the east and west, with main east/west thoroughfares providing abundant retail centers at the intersections with State Highway 24 and Route 78 (referred to locally as West 23rd Street). The approximate study area is located on the Vicinity Map in **Figure 1**.



This report reviews the following elements to develop recommendations for an improved transportation network which addresses all modes of transportation in alignment with City goals to support the local and regional needs:

- Existing Plans
- Existing Conditions
- Industry Recommended Practices
- Development of Scenarios
- Traffic Analysis and Results
- Public Involvement (*Appendix*)
- Typical Sections, with Conceptual Layouts and Estimate (*Appendix*)

The following scenarios were analyzed considering weekday AM and PM peak hour periods for traffic operations:

- Existing Conditions
- Existing Build Conditions
- Year 2035 No Build Conditions
- Year 2035 Build Conditions
- Future Year 2045 No Build Conditions
- Future Year 2045 Build Conditions

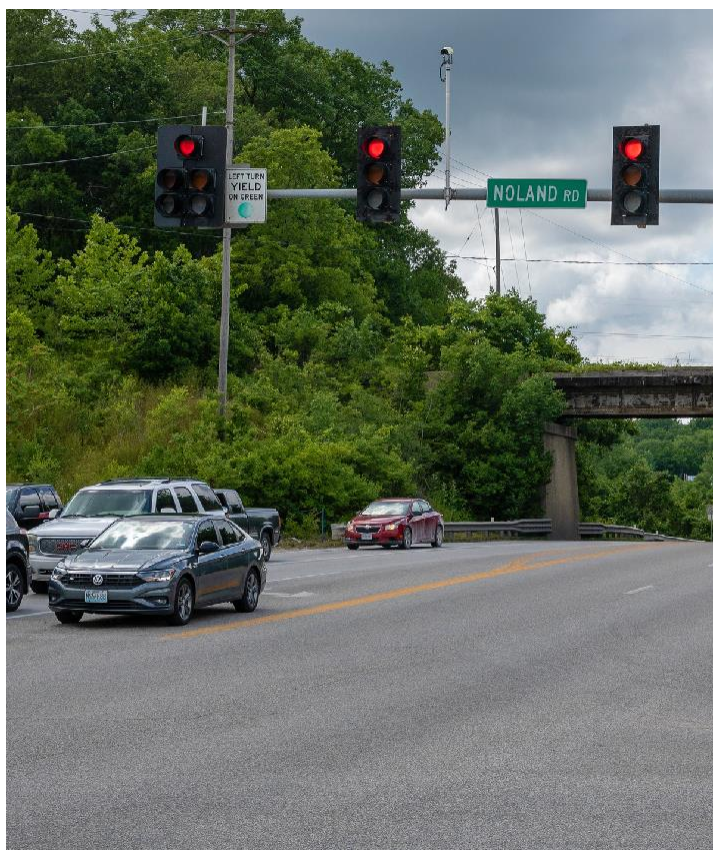


Figure 1. Vicinity Map - Independence, MO.



2. DATA COLLECTION

The data collection effort included acquiring Average Daily Traffic (ADT) volumes, peak period turning movement counts, existing intersection signal timings, crash data, and relevant comprehensive plans.

24-hour turning movement traffic counts were collected at the study intersections from Tuesday, May 7 to Monday, May 13, 2024. The peak weekday volumes were observed to occur on Thursday, May 9, 2024. Peak hours occurred between 7:00-9:00 AM and 3:30-5:30 PM and varied by intersection. Individual peaks were used at each intersection to reflect the maximum volumes along the corridor, and volumes were not balanced along Noland Road. Traffic count data is provided in **Appendix A**.

Signal timings for all signalized intersections were provided by Operation Green Light. These signal timings were used for peak hour period analysis.

Crash data from January 2019 to March 2024 was obtained from the City. Crash data was reviewed for all intersections on Noland Road, from Highway 24 to Fair Street, as well as crashes between the intersections. Crash data summary statistics collected for this study are provided in **Appendix A**.

2.1 Comprehensive Plans

The City provided several comprehensive plan documents that reference plans for multimodal expansion throughout the City to ensure the Noland Road corridor improvements align with the existing plans' goals and facility improvements. A summary of relevant information from each plan is provided.

CITYWIDE PLANS CONSIDERED:

- **Comprehensive Plan 2040 Imagine Independence**
- **Downtown Redevelopment Coordinating Committee Report**
- Independence Square Revitalization Plan
- **Link Independence**
- **Noland Now Revitalization Plan**
- **Truman Connected Plan**
- Truman Road Green Gateway Plan
- Truman Winner Road Plan
- US 24 Highway Strategic Plan
- Independence Transportation for All Plan (in development)

REGIONWIDE PLANS CONSIDERED:

- Greater Kansas City Regional Bikeway Plan (2015)
- Smart Moves 3.0 (2017)
- **National Historic Retracement Plan (2018)**

After reviewing the above plans, the bolded plan titles provided the most critical information relative to the areas surrounding the Noland Road corridor where bicycle facilities are planned. Relevant materials were found in documents such as area plans, and multiple plans geared towards the future development of specific modes of transportation, either specifically within Independence, or relative to the nine-county Mid-America Regional Council (MARC) region.

A SUMMARY OF KEY ELEMENTS INCLUDED WITHIN EACH OF THESE IS PROVIDED BELOW:

Comprehensive Plan 2040

Imagine Independence

This document provides a comprehensive look at how to best serve the communities for future years and outlines the need to maintain existing public facilities and amenities, while also considering expanding and/or improving them to ensure Independence is a truly livable and thriving community. This plan includes specific references to community studies expressing desires for more livable areas, including complete streets and other transportation options for non-drivers as well as providing improved connections to parks and special interest areas. One piece of this plan outlines a desire to connect the City's bike/trail system together and to extend it to regional systems like Little Blue Trace and the Rock Island Trail.

OTHER IMPORTANT THEMES OUTLINED IN THIS DOCUMENT INCLUDE THE FOLLOWING:

- New neighborhoods should implement safe passage for pedestrian and bike crossing.
- Neighborhood commercial areas, community commercial areas, and regional commercial areas should provide pedestrian and bicycle connections.
- Civic/Public land use areas, when located in commercial centers, should design with regards to pedestrian and bicycle modes of transit and similar facilities should be located within or adjacent to residential areas with multimodal access.



Downtown Redevelopment Coordinating Committee Report

This document outlines specific plans to implement a north/south cycle track on Liberty Street for 14 blocks, beginning at Highway 24 and continuing south to Pacific Avenue. This project would include pedestrian enhancements on W. Maple, N. Osage, Liberty, W. Lexington, N. Delaware and N. Main Streets for a total of 25 blocks.

The report also recommends specific projects which should consider bicycle/pedestrian infrastructure improvements, including the Truman Connected Project (referenced later), Highway 24 improvements east of the Truman Library, and the US-24 Bridge replacement project.

Committee members mentioned as a part of this report that they would like bike paths to have a different color to the street.

Link Independence

This document provides a framework for development of long-term vision for the design and implementation for a physical connection or pathway between the Courthouse Square and the National Frontier Trails Museum and discusses how to increase the residential population in the city center area of the community. General principles for street modifications to include traffic calming, narrower roadways, wider sidewalks, vegetated buffer zones, bus shelters, improvements to lighting, and the addition of well thought out bicycle lanes. This report reiterates the idea that bicycle lanes need to be marked and have different color from the roadway. The study also recommends bicycle lanes to be continuous and to include buffer zones.

Noland Now Revitalization Plan

The study thoroughly documents conditions along the stretch of Noland Road corridor beginning at 23rd Street and continuing south to US-40 Highway. This study included analysis of crash data, operational conditions, and transportation methods. The study also recognizes the importance of developing a citywide bike plan within public streetscape and considering this as development/redevelopment continues along the corridor. Among several key issues to be addressed are the following items:

- There are significant gaps in the sidewalk network that diminish the walkability of the corridor.
- Public transit stops along the corridor are difficult to locate and lack the typical amenities expected by transit users.
- There are currently no dedicated bike lanes or multi-use trails along the corridor, and the vehicular lanes feel unsafe for bike users.

Truman Connected Plan & National Historic Trail Retracement Plan

The Truman Connected Plan and National Historic Trail Retracement Plan are in alignment on routing of trail alignment recommendation, which recommend that a new bike trail network should run along Bess Truman Parkway from Highway 24 south to White Oak Street. The two studies vary in recommendations on where to continue south, either Liberty Street or Main Street.

The Truman Connected Plan recommends

Main Street, while the National Historic Trail Retracement Plan recommends Liberty Street, as that is the main alignment from which the Santa Fe, California, trail ran. The Truman Connected Plan further outlines that bike lane and pedestrian pathways should be separated, and the bike alignment should be a cycle track along the proposed route which continues down Main Street to Lexington Avenue (with future extension of the plan down Main Street to Pacific Avenue).

For segments outside the scope of our study area, proposed bike lanes are recommended to be 5-feet wide with a 2.5-foot buffer to the street. The pedestrian sidewalk will be 6-feet wide with a 2-foot safety buffer from the bike lane. The plan further recommends that landscaped areas be provided, however they should not obstruct bicycle sight distance. The National Association of City Transportation Officials (NACTO) Urban Street Design Guide and Urban Bikeway Design Guide should be consulted for pedestrian and bicycle infrastructure.

3. EXISTING CONDITIONS

Existing traffic conditions were evaluated to identify any existing deficiencies and to provide a baseline for comparison purposes.

3.1 Network Characteristics

Within the study area there are 21 intersections with Noland Road that were considered during analysis, intersections with Noland Road are listed in **Table 1** along with their associated method of control.

Table 1: Noland Road Study Intersections

CROSS STREET	CONTROL METHOD
Highway 24	Signalized Intersection
St Charles Street	Two-way Stop Controlled
Nettleton Avenue	Two-way Stop Controlled
College Street	Two-way Stop Controlled
Waldo Street	Two-way Stop Controlled
Farmer Avenue	Two-way Stop Controlled
Memorial Drive	Two-way Stop Controlled
White Oak Street	Two-way Stop Controlled
Truman Road	Signalized Intersection
Lexington Avenue	Two-way Stop Controlled
Kansas Avenue	Two-way Stop Controlled
Walnut Street	Signalized Intersection
Short Avenue	Two-way Stop Controlled
Elm Street	Two-way Stop Controlled
Pacific Avenue	Two-way Stop Controlled
Ruby Avenue	Two-way Stop Controlled
Linden Avenue	Two-way Stop Controlled
Sea Avenue	Two-way Stop Controlled
South Avenue	Two-way Stop Controlled
23rd Street South	Signalized Intersection
Fair Street	Signalized Intersection

Functional classification for roadways maintained by the City of Independence was acquired referencing the Mid-America Regional Council's (MARC) Functional Classification Map. Current network characteristics were determined and are summarized in **Table 2**.

Table 2. Existing Network Summary.

ROADWAY	FUNCTIONAL CLASSIFICATION	MAINTAINING JURISDICTION	TYPICAL SECTION	MEDIAN TYPE	POSTED SPEED
Noland Road	Principal Arterial	City of Independence	Four-lane Five-lane	Raised N/A	40 mph

3.1.1 Multimodal Review

A review of existing multimodal facilities was conducted.

3.1.1.1 Pedestrian

Sidewalk is currently provided along the following study area roadways:

- The west side of Noland Road from Highway 24 to Lexington Avenue and from Elm Street to Fair Avenue.
- The east side of Noland Road from Highway 24 to Kansas Avenue and from Walnut Street to Fair Avenue.

Table 3 summarizes existing pedestrian infrastructure were identified along Noland Road within the study limits.

Table 3: Noland Road Pedestrian Infrastructure

INTERSECTION WITH NOLAND ROAD	CHARACTERISTICS NOTED
Highway 24	Pedestrian infrastructure including pavement marking, signing, ramps, truncated domes, pedestrian push buttons, and pedestrian indications are provided at the signalized intersection for the east and south legs of the intersection.
St Charles Street	Ramps and truncated domes are provided on the west leg of the intersection.
Nettleton Avenue	Ramps are provided on the east leg of the intersection.
College Street	Pedestrian infrastructure including pavement marking, ramps, truncated domes, pedestrian push buttons, and pedestrian indications are provided at the signalized intersection for the north leg of the intersection. Other legs of the intersection feature pavement marking, ramps, and truncated domes.
Waldo Street	Ramps and truncated domes are provided on the east and west legs of the intersection.

INTERSECTION WITH NOLAND ROAD	CHARACTERISTICS NOTED
Farmer Avenue	Ramps and truncated domes are provided on the east and west legs of the intersection.
Memorial Drive	Ramps and truncated domes are provided on the west leg of the intersection.
White Oak Street	Ramps, truncated domes, and pavement marking are provided on the west leg of the intersection.
Truman Road	Pedestrian infrastructure including pavement marking, signing, ramps, truncated domes, pedestrian push buttons, and pedestrian indications are provided at the signalized intersection for all legs of the intersection.
Lexington Avenue	Ramps and truncated domes are provided on the east and west legs of the intersection. Pavement marking is also provided on the west leg.
Kansas Avenue	Ramps, truncated domes, and pavement marking are provided on the south leg of the intersection.
Walnut Street	Ramps, truncated domes, and pavement marking are provided on the south leg of the intersection.
Short Avenue	Ramps and truncated domes are provided on the east leg of the intersection.
Elm Street	Ramps and truncated domes are provided on the east and west legs of the intersection.
Pacific Avenue	Ramps and truncated domes are provided on the east and west legs of the intersection.
Ruby Avenue	Ramps and truncated domes are provided on the west leg of the intersection.
Linden Avenue	Ramps and truncated domes are provided on the west leg of the intersection.
Sea Avenue	Ramps and truncated domes are provided on the east leg of the intersection.
South Avenue	Ramps and truncated domes are provided on the east and west legs of the intersection.
23rd Street South	Pedestrian infrastructure including pavement marking, ramps, truncated domes, pedestrian push buttons, and pedestrian indications are provided at the signalized intersection for all legs of the intersection.
Fair Street	Pedestrian infrastructure including pavement marking, ramps, truncated domes, pedestrian push buttons, and pedestrian indications are provided at the signalized intersection for all legs of the intersection.

3.1.1.2 Bicycle

No existing marked or signed bicycle infrastructure was found along Noland Road.

3.1.1.3 Transit

The City's bus system, IndeBus, has six (6) lines that serve the Independence community. All six begin and end their routes at the Metro Transit Center (MTC), which is located just to the west of Noland Road between White Oak Street and Truman Road. The Purple Line is the most relevant line to Noland Road, but the Blue and Green Lines also serve the corridor. The following summarizes of each of the noted routes and highlighted in **Figure 2**:

- The Purple Line briefly heads west and then south before looping back to Noland Road at Pacific Avenue and heading south. It then follows Noland Road all the way to 45th Street. It circles around Noland South Shopping Center before finally stopping at HyVee (Noland Road and 40 Hwy) and looping back to the north and repeating its route in reverse. The route includes multiple stops in both directions along Noland Road, though none of these stops include a dedicated bus shelter.



- The Blue Line, which mainly travels along Sterling Avenue and 40 Highway to the west, can be accessed at the north and south ends of the corridor.
- The Green Line travels south along Noland Road from Truman Road to 23rd Street, then heads east along 23rd Street before turning south at Lee's Summit Road, and then east at 39th Street.
- The Red Line heads east from the MTC along Truman Road.
- The Yellow Line heads northeast from the MTC via Main Street to College Street.
- The Orange Line heads northwest from the MTC via Truman Road to Spring Street.



Figure 2: City of Independence Transit Map



3.1.1.4 Other Travel Modes

A rail line crosses Noland Road north of Walnut Street at a skew which also crosses Walnut Street west of Noland Road. Hiram Young Park is located in the southwest corner of Noland Road and Lexington Avenue.

3.2 Existing Capacity Analysis

Capacity analysis was performed for the study intersections using the existing lane configurations and traffic control. Analysis was conducted using Synchro, Version 11, based on the Highway Capacity Manual (HCM) delay methodologies. For simplicity, the amount of control delay is equated to a grade or Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 4** shows the delays associated with each LOS grade for signalized and unsignalized intersections, respectively. Queuing analysis was conducted referencing the 95th percentile queue length. This represents the queue length that has a 5 percent probability of being exceeded during the peak hour period.



Table 4. Intersection Level of Service Criteria.

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	< 10	< 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Highway Capacity Manual (6th Edition)



Analysis was conducted referencing the existing peak hour factors as obtained from data collection. Heavy vehicle percentages were based on existing conditions.

The signalized intersection of 23rd Street South and Noland Road is operating at an overall LOS D during the AM peak hour period and the PM peak hour period. Other signalized intersections operate at LOS C or better during both peak hours.

Most unsignalized movements are operating at LOS D or better during the AM and PM peak hour periods. The Existing capacity analysis summary is illustrated in **Table 5**. Detailed results are provided in **Appendix B**.

Table 5. Existing Conditions - Capacity Analysis.

	AM LOS					PM LOS				
	OVERALL	EB	WB	NB	SB	OVERALL	EB	WB	NB	SB
HIGHWAY 24	C	B	B	D	D	C	C	B	D	D
St Charles Street		A					B			
Nettleton Avenue			B					C		
College Street	A	D	D	A	A	A	D	D	A	A
Waldo Street		B	B				C	C		
Farmer Avenue		B	C				C	C		
White Oak Street		B					B			
Truman Road	C	C	C	B	B	C	D	C	C	C
Lexington Avenue		B	C				C	C		
Kansas Avenue			B					C		
Walnut Street	B	C	D	B	A	C	D	D	B	B
Short Avenue		A	C				A	D		
Elm Street		B	B				B	D		
Pacific Avenue		B	C				C	E		
Ruby Avenue		B					B			
Linden Avenue		B					B			
Sea Avenue			C					C		
South Avenue		B	C				C	C		
23rd Street	D	D	C	D	E	D	D	D	E	E
Fair Avenue	B	D	E	B	A	B	D	E	A	A

3.3 Existing Crash Analysis

The total number of crashes at each intersection were obtained during the 5-year period; 2019-2023. Some data from 2024 was also available and was included in the analysis data. Crash rates for each intersection were determined by dividing the total crashes at each intersection by the number of million entering vehicles (MEV). The intersection crash rate equation is as follows:

$$CR = \frac{1,000,000 * C}{365 * N * V}$$

WHERE:

CR = Crash rate for the intersection as crashes per million entering vehicles (MEV)

C = Total number of reported crashes at the intersection for the study period

N = Number of years of data

V = Entering traffic volumes for the intersection, daily

An average crash rate for each of the intersections located on the corridor was determined over the years 2019 to 2023 based on the count data provided. A factor was applied to the hourly volumes to generated total number of daily entering vehicles. In general, a crash rate above 1.0 crashes per MEV should be considered for safety countermeasures. Another important threshold is the critical crash rate, which is calculated based on the specific characteristics of each intersection. The critical crash rate is calculated as follows:

$$CCR = CR_{Avg} + Z \sqrt{\left(\frac{CR_{Avg}}{E} + \frac{1}{2E}\right)}$$

WHERE:

CCR = Critical crash rate

CR_{Avg} = Average Crash Rate for similar facilities

Z = Z-value corresponding to the desired confidence level (95% used)

E = Traffic Exposure (million entering vehicles)

Intersection crash rates were then reviewed to determine if crash history on this facility is higher than facilities statewide of similar type. The three highest intersections with the greatest number of crashes occurred at Noland Road with 23rd Street (42), Fair Street (35), and Highway 24 (22). Once adjusted by the number of vehicles traveling through each intersection, intersections with the highest crash rates were shown to occurred at signalized intersections along Noland Road with Fair Street (0.75), College Street (0.49), and 23rd Street (0.45) which represents the crash rate per MEV. Of these locations, the Noland Road and Fair Street intersection crash rate represents a value greater than the statewide average for similar facilities and a rate higher than the critical crash rate. **The factors suggest that the intersection configuration should be evaluated for potential countermeasure solutions to improve conditions.** A contributing factor could be the proximity to the 23rd Street intersection, and the Southside Boulevard intersection to the west. **Table 6** represents the crash data for intersections along Noland Road.

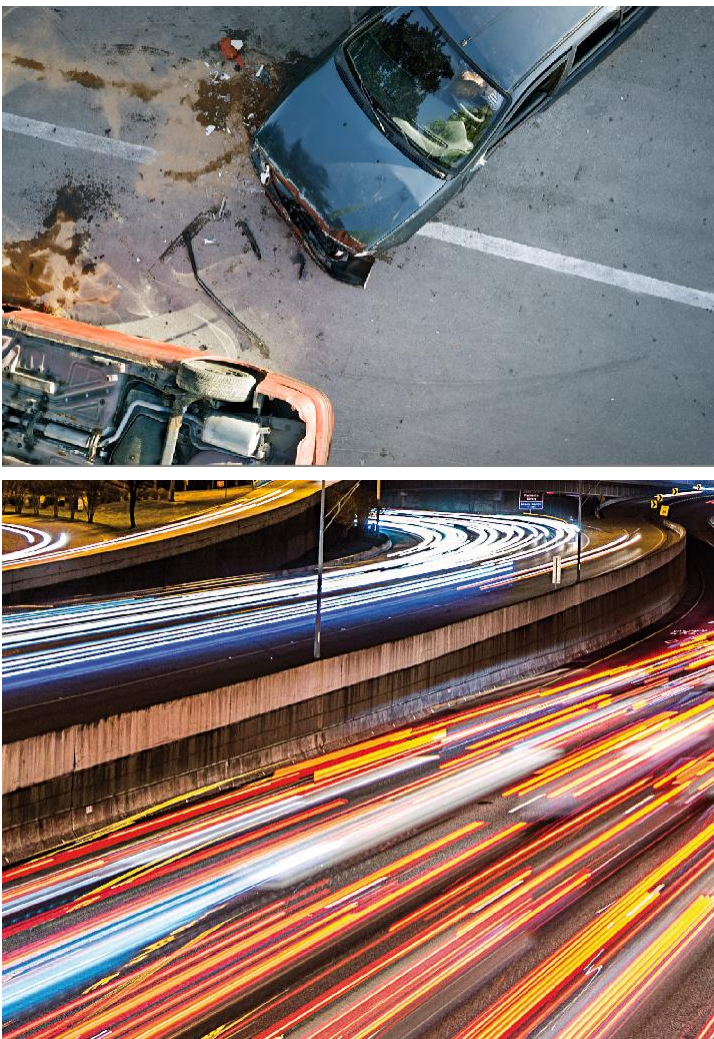


Table 6: Crash Rates (2019-2024*) by Intersection

INTERSECTION WITH NOLAND ROAD	VOLUME (AVERAGE DAILY TRAFFIC)	CRASHES BY CONTROL		CRASH RATE (CRASHES / MILLION VEHICLES ENTERING)		CRITICAL CRASH RATE**
	ADT	SIGNAL CTRL	STOP CTRL	SIGNAL CTRL	STOP CTRL	
HIGHWAY 24	32,725	22		0.35		0.54
ST CHARLES STREET	13,661		5		0.19	0.62
NETTLETON AVENUE	13,974		2		0.07	0.62
COLLEGE STREET	15,942	15		0.49		0.60
WALDO STREET	14,598		2		0.07	0.61
FARMER AVENUE	14,886		3		0.11	0.61
MEMORIAL DRIVE	-		0			
WHITE OAK STREET	15,186		2		0.07	0.61
TRUMAN ROAD	28,752	21		0.38		0.55
LEXINGTON AVENUE	16,567		4		0.13	0.60
KANSAS AVENUE	-		0			
WALNUT STREET	20,048	12		0.31		0.58
SHORT AVENUE	18,331		4		0.11	0.59
ELM STREET	18,403		1		0.03	0.59
PACIFIC AVENUE	19,148		5		0.14	0.59
RUBY AVENUE	19,124		1		0.03	0.59
LINDEN AVENUE	19,424		1		0.03	0.58
SEA AVENUE	19,580		4		0.11	0.58
SOUTH AVENUE	20,072		4		0.10	0.58
23RD STREET	49,028	42		0.45		0.51
FAIR STREET	24,202	35		0.75		0.56
TOTAL		147	38	-	-	-

*Represents full year of 2019 through 2023 with 3 months of 2024 data provided by the City.

**Critical Crash Rate for similar facilities statewide was referenced as 0.40 based on prior data.

Of the total 198 crashes recorded along the corridor, all but 5 were attributed to an intersection as they occurred in the vicinity of an intersection. Of the segment crashes, 3 occurred between Truman Road and Walnut Street with 1 involving a serious injury to a pedestrian after the pedestrian crossed the street at an uncontrolled location due to lack of facilities.

There were three fatal injury accidents which occurred along Noland Road during the period analyzed. Two of the three were located at the Noland Road intersection with Fair Street. The third occurred at the Noland Road intersection with 23rd Street.

Each of the three crashes resulting in fatality exhibited extenuating circumstances such as medical emergencies, substance abuse, or excessive speed.

There were also 2 crashes involving a train at the Walnut Street intersection with Noland Road, one occurring along Noland Road while another occurred along Walnut Street. These crashes, along with the proposed facility improvements along Noland Road warrant additional crossing safety measures to be strongly considered at the signalized intersection.

4. ALTERNATIVE DEVELOPMENT

The Noland Road corridor is a diverse area with varying adjacent land uses and travel patterns. The area studied includes the Noland Road corridor and its adjacent roadway network. The following best practices related to bicycle facility design for consideration of the Noland Road bike facility.

4.1 Facility Options

Accommodations for bicycle transportation vary widely in form and function and have evolved significantly over the past decade. There is not one facility type that is considered best. The most appropriate type of facility for a corridor segment depends on constraints, corridor characteristics, and the role of the bikeway within the broader bicycle transportation network. Just as streets and highways are assigned functional classifications based on their role within the roadway network, bikeways exist on a

similar continuum of function, from local access to higher speed throughput. For example, a trail loop within a park or a signed bike route through a residential subdivision may serve mainly to provide access to recreation or connect homes to the bicycle transportation network. Meanwhile, a trail alongside a freeway or a trunk route connecting between neighborhoods may place a greater emphasis on reducing delays at roadway crossings and minimizing conflicts with driveways and turning vehicles.

To more deliberately consider the role of a bicycle facility within the broader network, planners and designers sometimes refer to different categories of bicycle riders, ranging from those that are “interested but concerned” to those riders that are “experienced and confident”. To create a low-stress network for bicycling, facilities should be designed to appeal to the broadest range of users. The Noland Road bicycle facilities will likely take the form of some combination of on-street bicycle lanes and separated bikeways. The design considerations presented in this section have been tailored to this understanding. Other design considerations should be considered for other bicycle facility types. **Table 7** illustrate aspects of the different types of bicycle facilities.

Table 7: Bicycle Facility by Type

SHARED ROADWAY	ON-STREET BIKE LANE	SEPARATED BIKEWAY	SHARED-USE PATH
- Streets are designed to mix bicycle travel with other vehicles. - Recommended to use traffic calming measures to achieve low speeds on low volume facilities (>20mph and >2,000 vehicles per day desirable).	- Dedicated lane on roadway reserved for bicycle use only. - Recommended to provide buffer space and/or separation between bicycle lane and traffic on roadway where higher speed or volumes are present.	- One or Two-way facilities reserved for bicycle use and physically separated from roadway and sidewalk. - Recommended to provide tighter radii at intersections to encourage yielding and improve visibility.	- Travelway that excludes motorized vehicles. - Recommended to provide raised medians, curb extensions, warning beacons, or other means to assist with major roadway crossings.
			

4.1.1 Design Considerations

This section outlines the different aspects that were kept in mind as the project team moved forward in designing the appropriate bicycle infrastructure for the Noland corridor.

4.1.1.1 General Guidance

Signs, markings, and signals should conform to those published in the Manual on Uniform Traffic Control Devices (MUTCD) and Federal Highway Administration (FHWA) Interim Approvals. To use traffic control devices with Interim Approval status, jurisdictions must file a letter with FHWA confirming that their use will conform to the conditions of interim approval.

Standard and guidance presented here is drawn primarily from the resources listed at the end of this best practices review, as noted in parenthetical references.

4.1.1.2 Separation of Traffic

Bicycle and automobile traffic can be separated by having each mode use the same space at different times, such as in shared lanes or in mixing zones near intersections; or each mode can use a different part of the roadway at the same time, such as a bike lane or separated bike lanes running parallel to automobile lanes.

4.1.1.2.1 SHARED LANE/MIXING ZONE

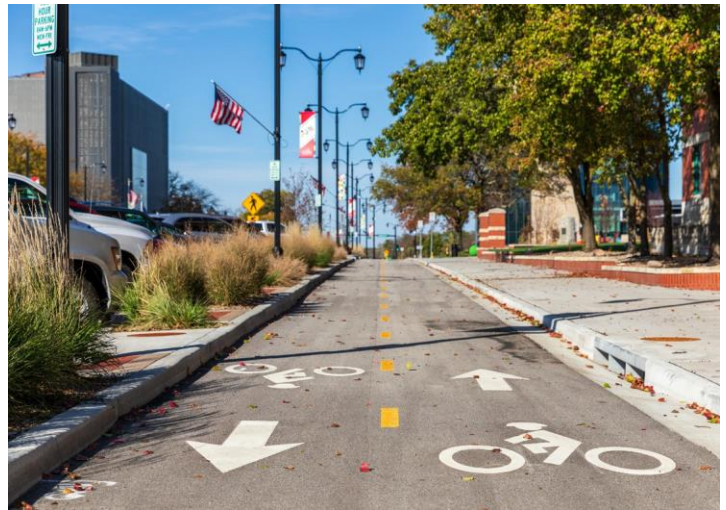
Shared lanes are streets designed to mix both automobile traffic and people biking. A variant of this is mixing zones. Mixing zones typically occur at intersections or at transit stops where automobile traffic crosses over a separated bike facility such as a bike lane, to access a right-turn lane or transit stop.

STANDARDS:

Motor vehicle traffic may only merge into bikeways that are one way in the same direction of travel as motor vehicle traffic (per state law).

GUIDANCE:

Transitions to shared lanes may be accompanied by shared lane markings and/or MUTCD R4-11 (bicycles may use full lane) signs (MUTCD). Mixing zones may be used to facilitate cross-over movements for buses or turning vehicles (see following sections).



4.1.1.2.2 BIKE LANE ADJACENT TO TRAFFIC

A bike lane is a lane on the roadway reserved for people biking.

STANDARDS:

Minimum bike lane width adjacent to curb is 4 feet (not including gutter pan) (AASHTO). Recommended minimum width is 5 to 7 feet. Minimum bike lane width is 5 feet when used between travel lanes and on-street parking (AASHTO).

GUIDANCE:

Greater widths are recommended in locations with high volumes of bicyclists, parking turnover, vehicle speeds, traffic volumes, or heavy trucks or buses. Painted buffer areas are recommended where space permits and may expand the appeal of bike lanes to additional users. Buffers also help distinguish wide bike lanes from general travel lanes.

4.1.1.2.3 PHYSICAL SEPARATION

Physically separated bikeways, such as cycle tracks or raised bicycle lanes, run parallel to a roadway and are separated from automobile traffic by either a curbed buffer or vertical delineator. A wide range of options are available to separate bikeways from other users. Most are not considered traffic control devices. Guidance is instead based primarily on practical considerations of constructability, maintenance, and aesthetics. In surveys and other outreach, the project team has conducted in other communities, users tend to prefer separation that is both substantial and aesthetically pleasing, such as raised curb, vertical delineators, or modular planter boxes. Other options include parking wheel stops, rigid bollards, or concrete barriers.

STANDARDS:

The color and reflectivity of channelizing markers shall comply with Section 3H.01 of the MUTCD. If used on high-speed roadways, policies and standards for roadside fixed objects must be observed.

GUIDANCE:

Signing and marking may be used to encourage driver yielding at intersections and driveway crossings (MassDOT). If parking is located adjacent to separated bikeways, at least 3 feet of separation is recommended to accommodate people exiting vehicles (MassDOT and FHWA). A detectable edge – either planted buffer, street furnishings, or curb – should be present between the sidewalk and bikeway (MassDOT and FHWA). Bikeways bordered by curbs or other vertical elements on both sides are usually 7 to 10 feet in width for one-way and 10 to 14 feet in width for two-way facilities to accommodate bicycle passing movements and street sweeping or snow plowing equipment. Constrained bike lanes that are not immediately bordered by vertical elements may be as narrow as 4 feet (one-way) or 8 feet (two-way) (MassDOT).

Both one-way and two-way operations are possible, with each having advantages and disadvantages as shown in **Table 8**.

Table 8: Comparison of Separated Bicycle Facilities

ONE-WAY SEPARATED BICYCLE FACILITY	TWO-WAY SEPARATED BICYCLE FACILITY
Provides greater range of options for mitigating conflicts at intersections and bus stops.	Can save space by making a greater proportion of width usable by requiring only one buffer to separate from motor vehicle traffic instead of two.
Better conforms to driver expectations.	Can provide bicycle riders with more direct routes to destinations on one side of a street.
Legible route for bicycle rider expectations and access to destinations.	Typically requires a greater level of intervention to mitigate conflicts at intersections and bus stops.

4.1.1.3 Mitigating Conflicts with Turning Vehicles and Transit Stops

Intersections increase the exposure of people biking to vehicle collisions. Right-turning cars must cross over the space used by people biking through the intersection. Intersections and mixing zones can be designed to have turning vehicles cross over well before the intersection or delay the vehicle's crossing of the bike facility until it has already slowed down to make the turn. These mitigation efforts increase the visibility of people biking to the vehicle driver.

Similarly, people biking often ride in the same area of the roadway (outside lane/shoulder) used by transit vehicles to pick up or drop off passengers. Special consideration should be made in corridors where a high level of transit usage (typically more than four buses per hour) may conflict with bicycle traffic.

Recommendations for creating shared or separate spaces for each of these two conflict types are similar and include reviewing opportunities for turning lanes or transit vehicles to be crossed over before an intersection or stop. Alternatively, a shared "mixing zone" can be used in locations where right-of-way is limited.



4.1.2 Summary

The process of planning and designing bicycle facilities begins with consideration of the intended range of users. Increasingly, agencies and jurisdictions seek to implement facilities designed to serve users of all ages and abilities, particularly the interested but concerned bicyclist. Such facilities may employ a range of methods to manage conflicts at intersections, driveways, and bus stops and separate users from busy roadways. The most appropriate form of the bikeway depends on a range of factors and may vary between corridor segments. While some of the terminology and details of bikeway infrastructure implementation are new and evolving, the underlying design and engineering principles are rooted in longstanding practices for designing travelways for any other type of vehicle. Many guidance documents have reached completion and publication in recent years to synthesize these underlying principles and standards in detailed elements of design, with the most recent version of the MUTCD incorporating many of these into the latest version.

4.2 Selection of Preferred Alternative

The following section outlines the considerations used for selection of the preferred alternative for the addition of bicycle facilities along Noland Road within the study limits.

4.2.1 Facility Type Considerations

Selecting a facility type was largely driven by two factors, the number of driveways along the corridor and the speeds and volumes of traffic along the corridor. Some of the corridor characteristics used for selection of facility are shown in **Table 9**.

Based on the above conditions, bicycle facilities along Noland Road were not considered to be viable south of the Noland Road intersection with Truman Road, as vehicle demand produces unfavorable conditions to cyclists traveling along the corridor. Additionally, adding a two-way facility such as a cycle-track north of Truman Road would require significant infrastructure improvements due to the presence of signalized intersections and the quantity of driveways along the corridor segments.

Table 9: Corridor Considerations

CORRIDOR SEGMENT	SPEED LIMIT	AVERAGE DAILY TRAFFIC VOLUME	SEGMENT LENGTH	DRIVEWAY DENSITY
HIGHWAY 24 TO COLLEGE STREET	35 mph	Traffic Volume	0.26 Miles	84 Drives/Mile (~22)
COLLEGE STREET TO TRUMAN ROAD	40 mph	~12,000 Veh per Day	0.27 Miles	44 Drives/Mile (~12)
TRUMAN ROAD TO WALNUT STREET	40 mph	~12,000 Veh per Day	0.28 Miles	21 Drives/Mile (~6)
WALNUT STREET TO 23RD STREET	40 mph	~15,000 Veh per Day	0.75 Miles	85 Drives/Mile (~64)
23RD STREET TO FAIR STREET	40 mph	~18,000 Veh per Day	0.11 Miles	45 Drives/Mile (~5)

In addition to the above considerations, the findings of the Truman Connected study provided valuable insight which was considered when reviewing alternative facility types. There is heavy overlap between study areas, and the findings from survey data were directly applicable to this study. The findings of that study had identified a segment of Noland Road considered as bicycle route alternative. This route was ultimately determined to be less desirable than the Bess Truman Parkway Route to connect the area north of the Independence Square to the Rock Island Connector corridor at US-40 Highway and the Truman Sports Complex.

4.2.2 Recommendations

The selected facility type is comprised of buffered bicycle lanes from the segment Highway 24 intersection to White Oak Street with the **bicycle facility transitioning to a two-way cycle track along White Oak Street to Main Street**. The cycle track will turn south along Main Street to run adjacent to Noland Road (in alignment with the *Truman Connected* Phase 1 plans) to Lexington Avenue. These facilities should ultimately continue along Main Street between Lexington Avenue to at least Pacific Avenue before turning west on Pacific Avenue in alignment with a Future Phase 1 connection also outlined in the *Truman Connected* study. **In the interim, these facilities can be transitioned into a shared-use lane facility along Main Street to the 23rd Street intersection.** At the 23rd Street intersection, a multi-use trail should be provided along the north side of 23rd Street to the east side of Noland Road to facilitate bicycle connections back to Noland Road.

It is recommended to provide a multi-use trail along the west side of Noland Road through the entire project limits of Highway 24 to Fair Street to provide pedestrians and more casual bicyclists the with improved facilities to connect residential and commercial areas with vital public transportation stops along Noland Road.

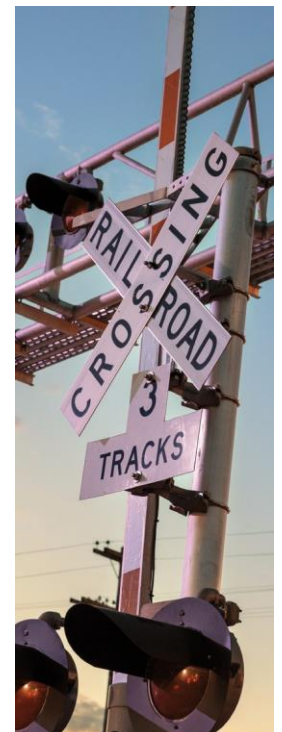
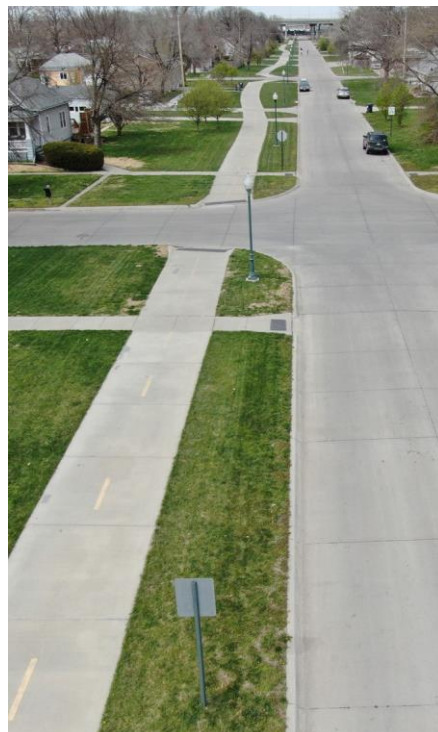
The largest barrier to providing these facilities is the railroad crossing north of Walnut Street, which will require special permits and track crossing improvements to ensure safety at the intersection.

The speed limit from College Street to Truman Road is currently 40 mph and should be reduced to 35 mph along this section, in proximity to the bike lanes. Improvements to existing sidewalks along Noland Road are recommended along the east side of the corridor and at intersections along Noland Road.

4.3 Analysis Scenarios

Following selection of the preferred alternative, a variety of scenarios were reviewed considering the selected alternative conditions and comparing that with the “no-build” existing and future year conditions to see how the corridor could be expected to perform with new facilities in place. The following conditions were reviewed:

- Existing Build Conditions
- Year 2035 No Build Conditions
- Year 2035 Build Conditions
- Year 2045 No Build Conditions
- Year 2045 Build Conditions



5. ALTERNATIVE ANALYSIS

5.1 Existing With Bike Lanes Conditions

The Existing Build Conditions represent analysis of the Noland Road corridor in place with those conditions listed under **Section 4.2.2** in place.

5.1.1 Existing With Bike Lanes Capacity Analysis

Capacity analysis was performed for Existing With Bike Lanes conditions using the methodologies described in **Section 3.2**. The peak hour factors observed under existing conditions were used for existing build conditions at study intersections. Truck percentages were also maintained at existing conditions throughout the study area.

All signalized intersections are expected to operate at an overall LOS D or better during the AM and PM peak hour periods.

Unsignalized movements are expected to operate at LOS D or better during the AM and PM peak hour periods, **except at Pacific Avenue westbound in the PM peak period, which operates at LOS E**. This is not unusual for sign-controlled side streets. The Existing With Bike Lanes capacity analysis summary is illustrated in **Table 10**.

Detailed results are provided in **Appendix C**.

Table 10. Existing with Bike Lanes Conditions - Capacity Analysis.

	AM LOS					PM LOS				
	OVERALL	EB	WB	NB	SB	OVERALL	EB	WB	NB	SB
HIGHWAY 24	C	B	B	D	D	C	C	B	D	D
St Charles Street		B					B			
Nettleton Avenue			B					C		
College Street	A	D	D	A	A	A	D	D	A	A
Waldo Street		B	B				C	D		
Farmer Avenue		B	C				C	D		
White Oak Street		B					C			
Truman Road	C	C	C	B	B	C	D	C	D	C
Lexington Avenue		B	C				C	D		
Kansas Avenue			B					C		
Walnut Street	B	C	D	B	B	C	D	D	B	B
Short Avenue		A	C				A	D		
Elm Street		B	B				B	D		
Pacific Avenue		B	C				C	E		
Ruby Avenue		B					B			
Linden Avenue		B					B			
Sea Avenue			C					C		
South Avenue		B	C				C	C		
23rd Street	D	D	C	D	E	D	D	D	E	E
Fair Avenue	B	D	E	B	A	B	D	E	A	A

5.2 Year 2035 No Build Conditions

This scenario considers operations of the future roadway network considering background traffic growth. Historical traffic count data was reviewed along Noland Road from the years 2013 through 2023. Traffic along Noland Road was to grow at an annual growth rate of 1 percent.

The growth rate was applied to existing volumes for through movements along Noland Road. A growth rate was not applied to side streets. Background traffic growth volumes were added to existing volumes to obtain future year 2035 volumes. Additional information for the calculation of future year background traffic volumes is provided in **Appendix D**.

5.2.1 Year 2035 No Build Capacity Analysis

Capacity analysis was performed for Year 2035 No Build conditions using the methodologies presented in **Section 3.2**. The peak hour factors at all intersections were adjusted to 0.92 for the build year scenarios. Truck percentages were not updated to reflect changed truck percentages throughout the study area.

The signalized intersections are expected to operate at an overall LOS D during the peak hour periods.

Unsignalized movements are expected to operate at LOS D or better during the AM and PM peak hour periods, with the exception of Pacific Avenue westbound, which operates at LOS E. The Year 2035 No Build capacity analysis summary is illustrated in **Table 11**. Detailed results are provided in **Appendix D**.

Table 11. Year 2035 No Build Conditions - Capacity Analysis.

	AM LOS					PM LOS				
	OVERALL	EB	WB	NB	SB	OVERALL	EB	WB	NB	SB
HIGHWAY 24	C	B	B	D	D	C	C	B	D	D
St Charles Street		A					B			
Nettleton Avenue			B					C		
College Street	A	D	D	A	A	A	D	D	A	A
Waldo Street		B	B				C	D		
Farmer Avenue		B	C				C	C		
White Oak Street		B					B			
Truman Road	C	C	C	B	C	C	D	C	C	C
Lexington Avenue		B	C				C	D		
Kansas Avenue			B					C		
Walnut Street	B	C	D	B	A	C	D	D	B	B
Short Avenue		A	C				A	D		
Elm Street		B	B				B	D		
Pacific Avenue		B	C				C	E		
Ruby Avenue		B					B			
Linden Avenue		B					B			
Sea Avenue			C					C		
South Avenue		B	C				C	C		
23rd Street	D	D	C	D	E	D	D	D	E	E
Fair Avenue	B	D	E	B	A	B	D	E	A	A

5.3 Year 2035 With Bike Lanes Conditions

This scenario considers the Build Year 2035 conditions with some lanes repurposed into bike lanes as noted in **Section 4.2.2**, as in the Existing Build scenario.



5.3.1 Year 2035 With Bike Lanes Capacity Analysis

Capacity analysis was performed for Year 2035 With Bike Lanes conditions using the methodologies presented in **Section 3.2**. The peak hour factors at study intersections were adjusted to 0.92. Truck percentages were not changed from existing.

All signalized intersections are expected to operate at an overall LOS D or better during the AM and PM peak hour periods.

Unsignalized movements are expected to operate at LOS D or better during the AM and PM peak hour periods, except at Pacific Avenue westbound, Farmer Avenue westbound, and Waldo Street westbound. The Year 2035 With Bike Lanes capacity analysis summary is illustrated in **Table 12**. Detailed results are provided in **Appendix E**.

Table 12. Year 2035 Build Conditions - Capacity Analysis.

	AM LOS					PM LOS				
	OVERALL	EB	WB	NB	SB	OVERALL	EB	WB	NB	SB
HIGHWAY 24	C	B	B	D	D	C	C	B	D	D
St Charles Street		B					B			
Nettleton Avenue			B					C		
College Street	A	D	D	A	A	A	D	D	A	A
Waldo Street		C	C				C	E		
Farmer Avenue		B	C				D	D		
White Oak Street		B					C			
Truman Road	C	C	C	B	B	C	D	C	D	C
Lexington Avenue		B	C				C	D		
Kansas Avenue			B					C		
Walnut Street	B	C	D	B	A	C	D	D	B	B
Short Avenue		A	C				A	D		
Elm Street		B	B				B	D		
Pacific Avenue		B	C				C	E		
Ruby Avenue		B					B			
Linden Avenue		B					B			
Sea Avenue			C					C		
South Avenue		B	C				C	C		
23rd Street	D	D	C	D	E	D	D	D	E	E
Fair Avenue	B	D	E	B	A	B	D	E	A	A

5.4 Future Year 2045 No Build Conditions

As with the 2035 conditions, growth rate of 1 percent annually was applied to existing volumes for through movements along Noland Road. A growth rate was not applied to side streets. Background traffic growth volumes were added to existing volumes to obtain future year 2045 volumes. Additional information for the calculation of future year background traffic volumes is discussed in **Section 5.2** and provided in **Appendix E**.



5.4.1 Future Year 2045 No Build Capacity Analysis

Capacity analysis was performed for Future Year 2045 No Build conditions using the methodologies presented in **Section 3.2**. Peak hour factors were set at 0.92 for the Future Year scenario, and truck percentages were not changed from existing.

No significant changes are expected at signalized intersection along Noland Road as all overall LOS is expected to continue to operate at LOS D or better during both peak hour periods.

Unsignalized movements are expected to operate at LOS D or better during the AM and PM peak hour periods, except at Pacific Avenue westbound and Lexington Avenue westbound in the PM peak period. The Future Year 2045 No Build capacity analysis summary is illustrated in **Table 13**. Detailed results are provided in **Appendix F**.

Table 13. Future Year 2045 No Build Conditions - Capacity Analysis.

	AM LOS					PM LOS				
	OVERALL	EB	WB	NB	SB	OVERALL	EB	WB	NB	SB
HIGHWAY 24	C	B	B	D	D	C	C	B	D	D
St Charles Street		B					B			
Nettleton Avenue			B					C		
College Street	A	D	D	A	A	A	D	D	A	A
Waldo Street		C	B				C	D		
Farmer Avenue		B	C				C	D		
White Oak Street		B					C			
Truman Road	C	C	C	B	C	C	D	C	D	C
Lexington Avenue		C	C				D	E		
Kansas Avenue			B					C		
Walnut Street	B	C	D	B	A	C	D	D	B	B
Short Avenue		A	C				A	D		
Elm Street		B	B				B	D		
Pacific Avenue		B	C				C	E		
Ruby Avenue		B					B			
Linden Avenue		B					B			
Sea Avenue			C					C		
South Avenue		B	C				C	C		
23rd Street	D	D	C	D	E	D	D	D	E	E
Fair Avenue	B	D	E	B	A	B	D	E	A	A

5.5 Future Year 2045 With Bike Lanes Conditions

This scenario considers operations of the future roadway network considering background traffic growth and the Build conditions noted in **Section 4.2.2**.



5.5.1 Future Year 2045 With Bike Lanes Capacity Analysis

Capacity analysis was performed for Future Year 2045 With Bike Lanes conditions using the methodologies presented in **Section 3.2**. Peak hour factors were set at 0.92, and truck percentages were unchanged from existing.

No significant changes are expected at signalized intersection along Noland Road as all overall LOS is expected to continue to operate at LOS D or better during both peak hour periods.

Unsignalized movements are expected to operate at LOS D or better during the AM and PM peak hour periods, except at Pacific Avenue westbound, Lexington Avenue westbound, Farmer Avenue westbound, and Waldo Street westbound in the PM peak period. The Future Year 2045 With Bike Lanes capacity analysis summary is illustrated in **Table 14**. Detailed results are provided in **Appendix E**.

Table 14. Future Year 2045 Build Conditions - Capacity Analysis.

	AM LOS					PM LOS				
	OVERALL	EB	WB	NB	SB	OVERALL	EB	WB	NB	SB
HIGHWAY 24	C	B	B	D	D	C	C	B	D	D
St Charles Street		B					C			
Nettleton Avenue			B					D		
College Street	A	D	D	A	A	A	D	D	A	A
Waldo Street		C	C				D	F		
Farmer Avenue		B	C				D	E		
White Oak Street		B					C			
Truman Road	C	C	C	B	C	D	D	C	D	C
Lexington Avenue		C	C				D	E		
Kansas Avenue			B					C		
Walnut Street	B	C	D	B	A	C	D	D	B	B
Short Avenue		A	C				A	D		
Elm Street		B	B				B	D		
Pacific Avenue		B	C				C	E		
Ruby Avenue		B					B			
Linden Avenue		B					B			
Sea Avenue			C					C		
South Avenue		B	C				C	C		
23rd Street	D	D	C	D	E	D	D	D	E	E
Fair Avenue	B	D	E	B	A	B	D	E	A	A

6. SUMMARY

This report summarizes analysis conducted for the Noland Road Multimodal Study located along Noland Road between Highway 24 and Fair Street in Independence, Missouri.

6.1 Conclusions

The general findings for this Noland Road Multimodal Study include the following:

1. Crash analysis was conducted at the intersections and segments in the study area. The crash rate at Fair Street exceeds the critical crash rate for comparable roads. Three fatal crashes occurred on Noland Road from 2019-early 2024, all of which were due to extenuating circumstances, not roadway conditions. Two crashes occurred at the railroad crossing at Walnut Street, which may warrant additional signal modifications at that intersection.
2. Reviewing overall operations under existing and existing plus build conditions, the proposed multimodal improvements are expected to have a minimal impact on overall operations of the study area network. The roadway system currently services a high volume of traffic, resulting in existing deficiencies at stop-controlled side streets.
3. The selected bike lane alternative should be comprised of buffered bicycle lanes from the Highway 24 intersection to White Oak Street with the bicycle facility transitioning to a two-way cycle track along White Oak Street to Main Street. The facilities should then turn south along Main Street to run adjacent to Noland Road to Lexington Avenue, and eventually onward to Pacific Avenue through a separate project outlined in the Truman Connected plan. The facilities could be extended further south along Main Street to 23rd Street with future phases, interim improvements could be comprised of “share the road” signing and markings along Main Street. At the 23rd Street intersection with Main Street, a multi-use trail should be provided along the north side of 23rd Street running between Main Street and the east side of Noland Road to facilitate bicycle connections back to Noland Road.
4. It is recommended to provide a multi-use trail along the west side of Noland Road through the entire project limits of Highway 24 to Fair Street to provide pedestrians and more casual bicyclists

the with improved facilities to connect residential and commercial areas with vital public transportation stops along Noland Road. The railroad crossing at Walnut Street will require special permits and track crossing improvements to ensure safety at the intersection.

5. Improvements to existing sidewalks along Noland Road are recommended along the east side of the corridor and at intersections along Noland Road.

6.2 Recommendations

Recommended multimodal improvements are as follows:

1. Add buffered bike lanes along Noland Road from Highway 24 to White Oak Street.
2. Provide RRFB or a Pedestrian Hybrid Beacon for cyclist to enter the network at White Oak Street and Noland Road.
3. Add two-way cycle track along White Oak Street from Noland Road to Main Street, tying to the existing Truman Connected planned network. Ultimately, this system is planned to extend south along Main Street from White Oak Street to Lexington Avenue. Future phases show that this system could be further extended to Pacific Avenue. **Additional planning would be needed to determine if this same facility type can be extended further south to 23rd Street and beyond.** Interim improvements along Main Street are recommended to install “share the road” signing and marking between Lexington Avenue and 23rd Street.
4. Reduce speed limit between College Street and Truman Road from 40 mph to 35 mph.
5. Provide a multi-use trail along the west side of Noland Road.
6. Improve sidewalks along the Noland Road corridor.
7. Coordinate with the railroad to provide additional protection at the at-grade rail crossing at Walnut Street.
8. Consider restriping the westbound approach of Pacific Avenue at Noland Road to provide a separate left-turn and thru/right-turn lane to reduce delay of side-street traffic.

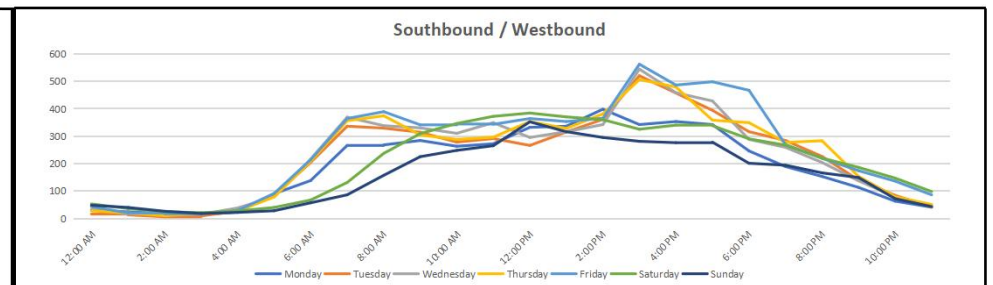
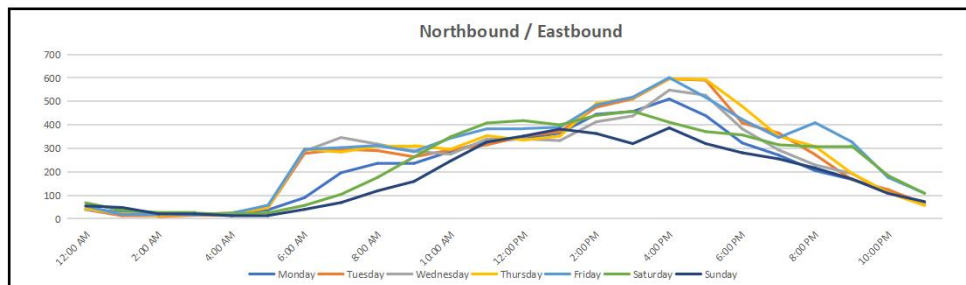
APPENDIX A

Data Collection

Vehicle Volume Report - Hourly

Site Description: Noland Rd N.O. St Charles St
 Site Number: 22
 Start Date: 05/07/2024
 End Date: 05/13/2024

Time	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			3 Day Avg		5 Day Avg		7 Day Avg	
	5/13/24			5/7/24			5/8/24			5/9/24			5/10/24			5/11/24			5/12/24			Tue-Thu		Mon-Fri		Mon-Sun	
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	NB	SB	NB	SB
12:00 AM	44	30	74	39	16	55	39	33	72	44	28	72	54	43	97	68	53	121	55	48	103	41	26	44	30	49	36
1:00 AM	27	24	51	13	13	26	21	16	37	21	20	41	18	20	38	36	36	72	48	40	88	18	16	20	19	26	24
2:00 AM	19	18	37	10	6	16	19	15	34	15	10	25	21	17	38	27	25	52	21	26	47	15	10	17	13	19	17
3:00 AM	16	14	30	15	9	24	17	15	32	19	18	37	17	16	33	24	21	45	21	18	39	17	14	17	14	18	16
4:00 AM	23	23	46	14	27	41	26	38	64	24	27	51	23	29	52	20	27	47	13	22	35	21	31	22	29	20	28
5:00 AM	38	90	128	47	84	131	51	79	130	47	78	125	58	91	149	25	40	65	14	28	42	48	80	48	84	40	70
6:00 AM	90	138	228	278	204	482	288	216	504	297	208	505	296	214	510	57	67	124	40	57	97	288	209	250	196	192	158
7:00 AM	196	266	462	296	336	632	346	369	715	284	356	640	303	364	667	104	131	235	69	86	155	309	354	285	338	228	273
8:00 AM	236	268	504	290	329	619	318	338	656	309	374	683	312	389	701	176	237	413	119	157	276	306	347	293	340	251	299
9:00 AM	236	284	520	264	314	578	288	330	618	311	304	615	286	341	627	263	309	572	159	225	384	288	316	277	315	258	301
10:00 AM	287	263	550	293	278	571	275	310	585	296	288	584	343	344	687	349	346	695	246	248	494	288	292	299	297	298	297
11:00 AM	330	272	602	315	291	606	340	349	689	354	296	650	383	343	726	408	372	780	327	265	592	336	312	344	310	351	313
12:00 PM	341	332	673	351	266	617	340	295	635	335	353	688	384	364	748	418	384	802	352	352	704	342	305	350	322	360	335
1:00 PM	365	336	701	371	315	686	333	316	649	352	328	680	390	353	743	400	370	770	382	316	698	352	320	362	330	370	333
2:00 PM	445	398	843	475	361	836	413	342	755	491	381	872	484	365	849	440	360	800	363	295	658	460	361	462	369	444	357
3:00 PM	457	342	799	511	520	1031	438	544	982	516	506	1022	518	562	1080	458	325	783	320	281	601	488	523	488	495	460	440
4:00 PM	510	353	863	596	457	1053	548	458	1006	597	479	1076	601	486	1087	411	340	751	387	276	663	580	465	570	447	521	407
5:00 PM	439	342	781	590	394	984	526	428	954	593	358	951	517	498	1015	371	338	709	320	278	598	570	393	533	404	479	377
6:00 PM	323	246	569	408	316	724	383	288	671	479	349	828	423	467	890	357	290	647	281	201	482	423	318	403	333	379	308
7:00 PM	271	189	460	365	284	649	293	259	552	351	277	628	346	269	615	315	267	582	255	194	449	336	273	325	256	314	248
8:00 PM	205	153	358	273	226	499	229	204	433	308	283	591	409	219	628	307	220	527	216	166	382	270	238	285	217	278	210
9:00 PM	168	113	281	167	140	307	193	137	330	194	153	347	328	174	502	310	186	496	170	149	319	185	143	210	143	219	150
10:00 PM	115	63	178	124	84	208	111	79	190	111	79	190	176	136	312	184	147	331	108	72	180	115	81	127	88	133	94
11:00 PM	67	41	108	64	41	105	59	47	106	57	51	108	109	86	195	108	98	206	73	43	116	60	46	71	53	77	58
6:00 AM - 9:00 AM	522	672	1194	864	869	1733	952	923	1875	890	938	1828	911	967	1878	337	435	772	228	300	528	902	910	828	874	672	729
3:00 PM - 6:00 PM	1406	1037	2443	1697	1371	3068	1512	1430	2942	1706	1343	3049	1636	1546	3182	1240	1003	2243	1027	835	1862	1638	1381	1591	1345	1461	1224
6:00 AM - 7:00 PM	4255	3840	8095	5038	4381	9419	4836	4583	9419	5214	4580	9794	5240	5090	10330	4212	3869	8081	3365	3037	6402	5029	4515	4917	4495	4594	4197
12:00 AM - 12:00 AM	5248	4598	9846	6169	5311	11480	5894	5505	11399	6405	5604	12009	6799	6190	12989	5636	4989	10625	4359	3843	8202	6156	5473	6103	5442	5787	5149
Percent	53.3%	46.7%	100.0%	53.7%	46.3%	100.0%	51.7%	48.3%	100.0%	53.3%	46.7%	100.0%	52.3%	47.7%	100.0%	53.0%	47.0%	100.0%	53.1%	46.9%	100.0%	52.9%	47.1%	52.9%	47.1%	52.9%	47.1%
AM Peak	11:00 AM	12:00 PM		7:00 AM	8:00 AM		7:00 AM	8:00 AM		8:00 AM	9:00 AM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM							
PM Peak	4:00 PM	5:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		12:00 PM	1:00 PM		12:00 PM	1:00 PM							



Vehicle Classification Report - Hourly

Site Description: Noland Rd N.O. St Charles St

Site Number: 22

Start Date: 05/07/2024

End Date: 05/13/2024

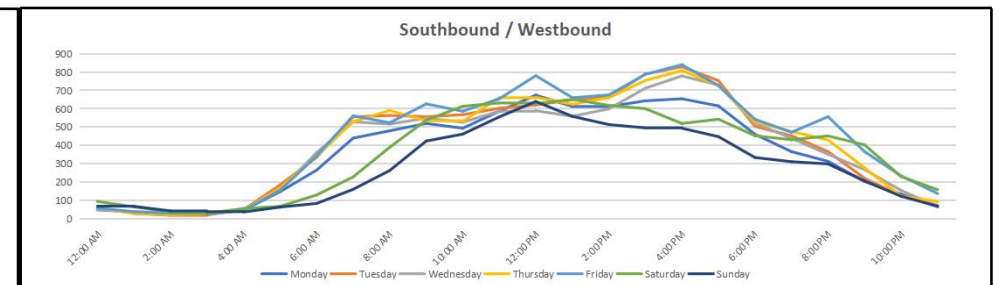
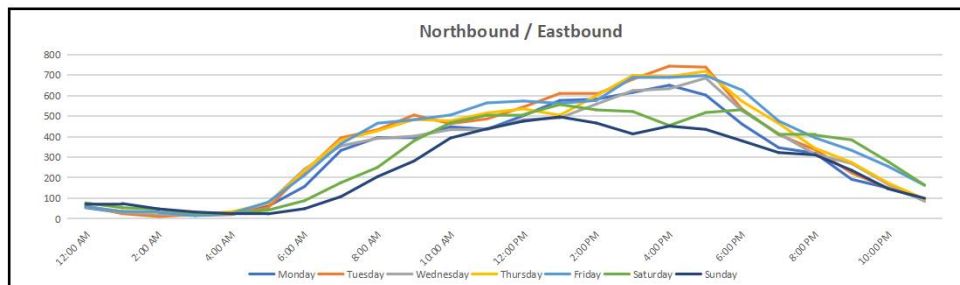
FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

		FHWA Vehicle Classification - Total Study												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
Northbound	40510	371	29402	8580	367	1384	141	133	107	9	4	3	0	9
Percent	100.0%	0.9%	72.6%	21.2%	0.9%	3.4%	0.3%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Southbound	36040	228	26396	7918	313	947	71	68	54	26	4	4	0	11
Percent	100.0%	0.6%	73.2%	22.0%	0.9%	2.6%	0.2%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	76550	599	55798	16498	680	2331	212	201	161	35	8	7	0	20
Percent	100.0%	0.8%	72.9%	21.6%	0.9%	3.0%	0.3%	0.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%

Vehicle Volume Report - Hourly

Site Description: Noland Rd S.O. South Ave
Site Number: 23
Start Date: 05/07/2024
End Date: 05/13/2024

Time	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			3 Day Avg		5 Day Avg		7 Day Avg	
	5/13/24			5/7/24			5/8/24			5/9/24			5/10/24			5/11/24			5/12/24			Tue-Thu		Mon-Fri		Mon-Sun	
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	NB	SB	NB	SB
12:00 AM	54	47	101	64	58	122	58	50	108	59	55	114	59	56	115	77	93	170	71	67	138	60	54	59	53	63	61
1:00 AM	29	35	64	25	27	52	32	36	68	37	29	66	35	37	72	54	63	117	74	66	140	31	31	32	33	41	42
2:00 AM	23	25	48	11	17	28	22	30	52	31	20	51	31	28	59	47	35	82	48	41	89	21	22	24	24	30	28
3:00 AM	16	23	39	21	19	40	22	25	47	22	26	48	16	24	40	26	28	54	33	37	70	22	23	19	23	22	26
4:00 AM	21	46	67	22	48	70	28	50	78	34	45	79	26	44	70	26	54	80	25	35	60	28	48	26	47	26	46
5:00 AM	61	146	207	54	183	237	75	155	230	75	166	241	81	154	235	42	66	108	24	62	86	68	168	69	161	59	133
6:00 AM	157	264	421	229	334	563	242	360	602	234	341	575	212	342	554	88	128	216	49	82	131	235	345	215	328	173	264
7:00 AM	333	439	772	394	555	949	355	528	883	383	529	912	365	561	926	176	227	403	108	159	267	377	537	366	522	302	428
8:00 AM	395	479	874	433	563	996	391	516	907	428	590	1018	465	523	988	250	389	639	205	262	467	417	556	422	534	367	475
9:00 AM	394	519	913	505	556	1061	402	548	950	483	534	1017	482	626	1108	379	537	916	281	423	704	463	546	453	557	418	535
10:00 AM	448	493	941	463	567	1030	434	526	960	477	530	1007	505	586	1091	467	613	1080	393	461	854	458	541	465	540	455	539
11:00 AM	435	586	1021	486	602	1088	434	586	1020	515	660	1175	564	654	1218	504	631	1135	438	555	993	478	616	487	618	482	611
12:00 PM	502	674	1176	544	620	1164	482	589	1071	535	662	1197	573	780	1353	507	627	1134	475	639	1114	520	624	527	665	517	656
1:00 PM	576	612	1188	610	648	1258	491	558	1049	504	624	1128	562	660	1222	556	651	1207	496	558	1054	535	610	549	620	542	616
2:00 PM	582	611	1193	606	664	1270	558	599	1157	599	660	1259	576	675	1251	530	618	1148	466	513	979	588	641	584	642	560	620
3:00 PM	615	643	1258	679	789	1468	624	712	1336	698	754	1452	688	788	1476	522	600	1122	413	495	908	667	752	661	737	606	683
4:00 PM	650	654	1304	743	829	1572	633	779	1412	692	808	1500	688	840	1528	454	519	973	451	493	944	689	805	681	782	616	703
5:00 PM	602	615	1217	738	753	1491	685	729	1414	718	727	1445	697	726	1423	517	542	1059	435	447	882	714	736	688	710	627	648
6:00 PM	460	460	920	533	503	1036	525	521	1046	571	529	1100	626	542	1168	531	452	983	379	333	712	543	518	543	511	518	477
7:00 PM	346	365	711	409	452	861	414	438	852	464	475	939	476	471	947	411	430	841	322	310	632	429	455	422	440	406	420
8:00 PM	319	312	631	336	365	701	314	351	665	343	429	772	394	556	950	407	451	858	311	298	609	331	382	341	403	346	395
9:00 PM	192	202	394	223	219	442	269	267	536	274	277	551	333	365	698	384	402	786	236	205	441	255	254	258	266	273	277
10:00 PM	150	133	283	150	125	275	168	153	321	174	121	295	255	233	488	278	229	507	146	121	267	164	133	179	153	189	159
11:00 PM	94	63	157	95	72	167	85	66	151	96	93	189	163	136	299	164	157	321	100	67	167	92	77	107	86	114	93
6:00 AM - 9:00 AM	885	1182	2067	1056	1452	2508	988	1404	2392	1045	1460	2505	1042	1426	2468	514	744	1258	362	503	865	1030	1439	1003	1385	842	1167
3:00 PM - 6:00 PM	1867	1912	3779	2160	2371	4531	1942	2220	4162	2108	2289	4397	2073	2354	4427	1493	1661	3154	1299	1435	2734	2070	2293	2030	2229	1849	2035
6:00 AM - 7:00 PM	6149	7049	13198	6963	7983	14946	6256	7551	13807	6837	7948	14785	7003	8303	15306	5481	6534	12015	4589	5420	10009	6685	7827	6642	7767	6183	7255
12:00 AM - 12:00 AM	7454	8446	15900	8373	9568	17941	7743	9172	16915	8446	9684	18130	8872	10407	19279	7397	8542	15939	5979	6729	12708	8187	9475	8178	9455	7752	8935
Percent	46.9%	53.1%	100.0%	46.7%	53.3%	100.0%	45.8%	54.2%	100.0%	46.6%	53.4%	100.0%	46.0%	54.0%	100.0%	46.4%	53.6%	100.0%	47.0%	53.0%	100.0%	46.4%	53.6%	46.4%	53.6%	46.5%	53.5%
AM Peak	11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM							
PM Peak	4:00 PM	5:00 PM		4:00 PM	5:00 PM		5:00 PM	6:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		1:00 PM	2:00 PM		12:00 PM	1:00 PM							



Vehicle Classification Report - Hourly

Site Description: Noland Rd S.O. South Ave

Site Number: 23

Start Date: 05/07/2024

End Date: 05/13/2024

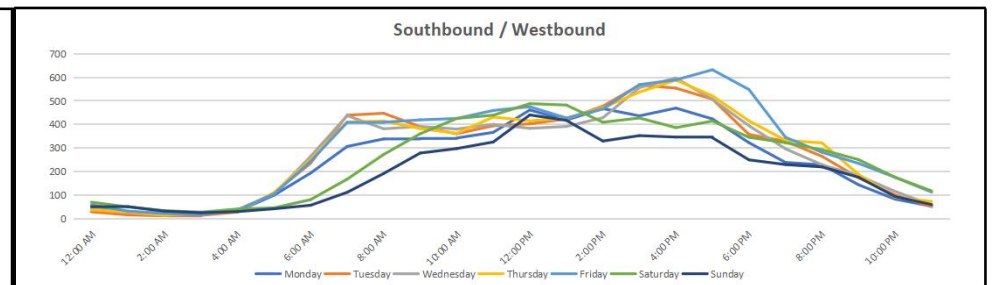
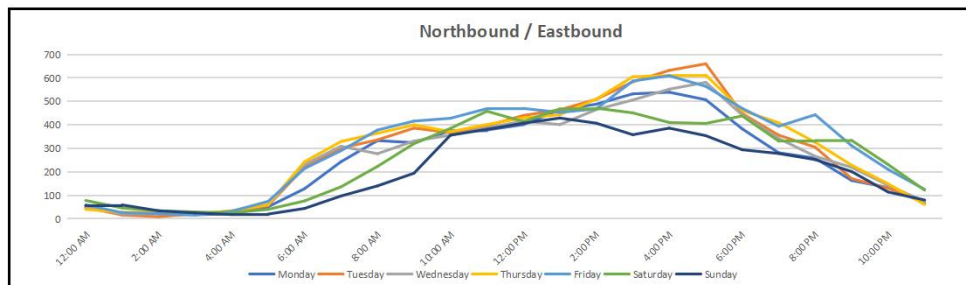
FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

		FHWA Vehicle Classification - Total Study												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
Northbound	54264	259	43626	8442	418	612	136	427	263	53	7	7	0	14
Percent	100.0%	0.5%	80.4%	15.6%	0.8%	1.1%	0.3%	0.8%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%
Southbound	62548	303	44887	14253	388	1783	356	257	237	55	10	4	1	14
Percent	100.0%	0.5%	71.8%	22.8%	0.6%	2.9%	0.6%	0.4%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	116812	562	88513	22695	806	2395	492	684	500	108	17	11	1	28
Percent	100.0%	0.5%	75.8%	19.4%	0.7%	2.1%	0.4%	0.6%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%

Vehicle Volume Report - Hourly

Site Description: Noland Rd S.O. Lexington Ave
Site Number: 24
Start Date: 05/07/2024
End Date: 05/13/2024

Time	Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			3 Day Avg		5 Day Avg		7 Day Avg	
	5/13/24			5/7/24			5/8/24			5/9/24			5/10/24			5/11/24			5/12/24			Tue-Thu		Mon-Fri		Mon-Sun	
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	NB	SB	NB	SB
12:00 AM	47	42	89	48	28	76	50	41	91	40	37	77	59	58	117	78	69	147	56	50	106	46	35	49	41	54	46
1:00 AM	22	29	51	16	15	31	21	25	46	28	27	55	26	31	57	46	49	95	59	50	109	22	22	23	25	31	32
2:00 AM	21	19	40	9	11	20	22	29	51	26	13	39	22	21	43	34	33	67	34	31	65	19	18	20	19	24	22
3:00 AM	17	16	33	21	13	34	21	23	44	20	22	42	16	16	32	29	27	56	25	24	49	21	19	19	18	21	20
4:00 AM	21	30	51	26	27	53	33	38	71	34	29	63	32	35	67	25	40	65	18	29	47	31	31	29	32	27	33
5:00 AM	51	99	150	56	109	165	59	104	163	60	110	170	74	104	178	40	45	85	20	41	61	58	108	60	105	51	87
6:00 AM	128	193	321	220	235	455	231	264	495	243	251	494	214	243	457	76	80	156	44	56	100	231	250	207	237	165	189
7:00 AM	243	306	549	301	439	740	309	437	746	329	410	739	290	408	698	136	167	303	97	111	208	313	429	294	400	244	325
8:00 AM	333	338	671	336	447	783	277	381	658	364	414	778	378	409	787	223	272	495	140	191	331	326	414	338	398	293	350
9:00 AM	324	340	664	386	390	776	331	391	722	400	382	782	416	419	835	320	360	680	194	278	472	372	388	371	384	339	366
10:00 AM	375	342	717	367	360	727	356	380	736	371	362	733	428	425	853	385	425	810	356	297	653	365	367	379	374	377	370
11:00 AM	378	366	744	396	394	790	387	400	787	401	431	832	469	459	928	458	439	897	381	325	706	395	408	406	410	410	402
12:00 PM	401	461	862	440	402	842	416	383	799	430	415	845	470	475	945	414	488	902	407	440	847	429	400	431	427	425	438
1:00 PM	464	418	882	464	423	887	401	391	792	443	426	869	453	427	880	468	482	950	429	417	846	436	413	445	417	446	426
2:00 PM	488	467	955	509	477	986	465	428	893	510	470	980	468	465	933	471	409	880	407	329	736	495	458	488	461	474	435
3:00 PM	532	436	968	583	567	1150	506	556	1062	605	537	1142	587	569	1156	451	427	878	358	352	710	565	553	563	533	517	492
4:00 PM	539	469	1008	632	554	1186	552	597	1149	610	588	1198	609	589	1198	410	386	796	386	346	732	598	580	588	559	534	504
5:00 PM	507	423	930	660	507	1167	581	506	1087	612	521	1133	564	632	1196	406	414	820	354	343	697	618	511	585	518	526	478
6:00 PM	383	322	705	448	357	805	442	394	836	461	415	876	470	548	1018	438	345	783	294	249	543	450	389	441	407	419	376
7:00 PM	281	238	519	356	328	684	342	296	638	409	332	741	394	345	739	331	322	653	278	229	507	369	319	356	308	342	299
8:00 PM	258	228	486	305	264	569	266	228	494	326	321	647	443	281	724	333	292	625	252	219	471	299	271	320	264	312	262
9:00 PM	163	143	306	171	173	344	219	182	401	228	187	415	311	234	545	334	250	584	201	175	376	206	181	218	184	232	192
10:00 PM	133	82	215	130	100	230	143	115	258	149	90	239	210	175	385	231	175	406	114	93	207	141	102	153	112	159	119
11:00 PM	68	52	120	76	50	126	73	57	130	61	72	133	125	112	237	122	117	239	80	59	139	70	60	81	69	86	74
6:00 AM - 9:00 AM	704	837	1541	857	1121	1978	817	1082	1899	936	1075	2011	882	1060	1942	435	519	954	281	358	639	870	1093	839	1035	702	865
3:00 PM - 6:00 PM	1578	1328	2906	1875	1628	3503	1639	1659	3298	1827	1646	3473	1760	1790	3550	1267	1227	2494	1098	1041	2139	1780	1644	1736	1610	1578	1474
6:00 AM - 7:00 PM	5095	4881	9976	5742	5552	11294	5254	5508	10762	5779	5622	11401	5816	6068	11884	4656	4694	9350	3847	3734	7581	5592	5561	5537	5526	5170	5151
12:00 AM - 12:00 AM	6177	5859	12036	6956	6670	13626	6503	6646	13149	7160	6862	14022	7528	7480	15008	6259	6113	12372	4984	4734	9718	6873	6726	6865	6703	6510	6338
Percent	51.3%	48.7%	100.0%	51.0%	49.0%	100.0%	49.5%	50.5%	100.0%	51.1%	48.9%	100.0%	50.2%	49.8%	100.0%	50.6%	49.4%	100.0%	51.3%	48.7%	100.0%	50.5%	49.5%	50.6%	49.4%	50.7%	49.3%
AM Peak	11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM		11:00 AM	12:00 PM							
PM Peak	4:00 PM	5:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		4:00 PM	5:00 PM		1:00 PM	2:00 PM		12:00 PM	1:00 PM							



Vehicle Classification Report - Hourly

Site Description: Noland Rd S.O. Lexington Ave

Site Number: 24

Start Date: 05/07/2024

End Date: 05/13/2024

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

		FHWA Vehicle Classification - Total Study												
	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
Northbound	45567	276	35659	7534	313	988	168	268	206	61	17	10	1	66
Percent	100.0%	0.6%	78.3%	16.5%	0.7%	2.2%	0.4%	0.6%	0.5%	0.1%	0.0%	0.0%	0.0%	0.1%
Southbound	44364	135	31875	10265	282	1297	120	159	174	33	4	5	0	15
Percent	100.0%	0.3%	71.8%	23.1%	0.6%	2.9%	0.3%	0.4%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	89931	411	67534	17799	595	2285	288	427	380	94	21	15	1	81
Percent	100.0%	0.5%	75.1%	19.8%	0.7%	2.5%	0.3%	0.5%	0.4%	0.1%	0.0%	0.0%	0.0%	0.1%



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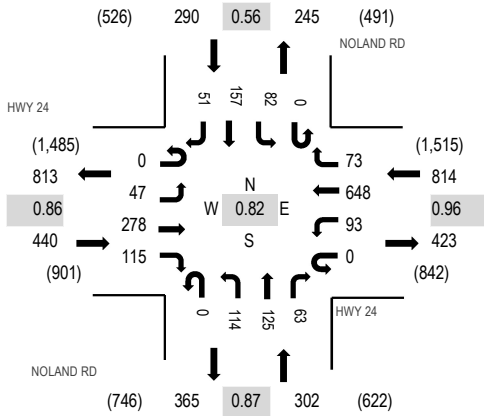
Location: 1 NOLAND RD & HWY 24 AM

Date: Thursday, May 9, 2024

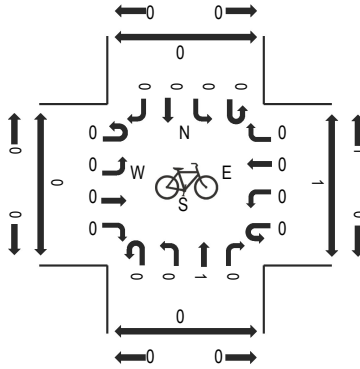
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:00 AM - 07:15 AM

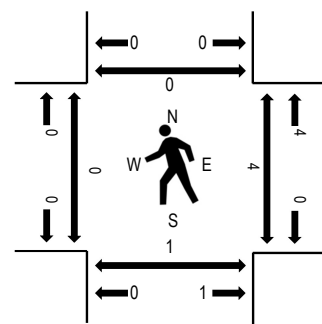
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 24 Eastbound				HWY 24 Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	31	65	26	0	11	140	47	0	30	76	9	0	36	71	23	565	1,846	0	2	0	0
7:15 AM	0	7	70	28	0	28	177	8	0	30	15	17	0	11	28	5	424	1,643	0	0	1	0
7:30 AM	0	5	69	36	0	22	160	11	0	22	16	12	0	23	36	13	425	1,629	0	2	0	0
7:45 AM	0	4	74	25	0	32	171	7	0	32	18	25	0	12	22	10	432	1,662	0	0	0	0
8:00 AM	0	5	60	31	0	19	121	7	0	25	28	13	0	14	24	15	362	1,718	0	1	0	0
8:15 AM	0	3	78	29	0	26	142	19	0	39	23	17	0	14	16	4	410		0	0	0	0
8:30 AM	0	14	71	36	0	39	128	32	0	20	45	18	0	13	33	9	458		0	0	0	0
8:45 AM	0	14	65	55	0	24	121	23	0	32	33	27	0	29	49	16	488		0	0	0	0
Count Total	0	83	552	266	0	201	1,160	154	0	230	254	138	0	152	279	95	3,564		0	5	1	0
Peak Hour	0	47	278	115	0	93	648	73	0	114	125	63	0	82	157	51	1,846		0	4	1	0



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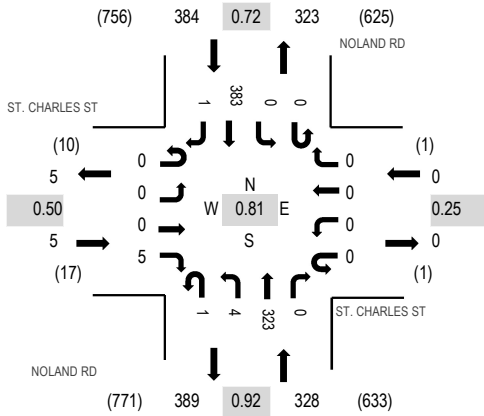
Location: 2 NOLAND RD & ST. CHARLES ST AM

Date: Thursday, May 9, 2024

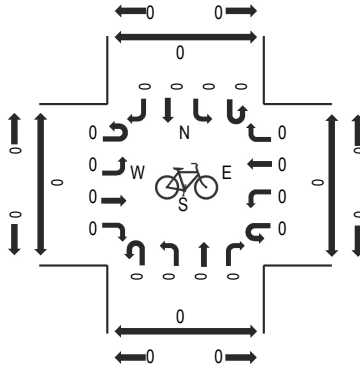
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

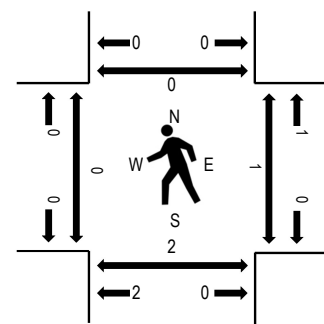
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ST. CHARLES ST Eastbound				ST. CHARLES ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	1	2	0	0	0	0	0	0	104	0	0	0	106	0	213	690	0	1	0	0
7:15 AM	0	0	0	1	0	0	0	0	0	2	67	0	0	0	88	0	158	619	0	2	0	0
7:30 AM	0	1	0	1	0	0	0	1	0	3	48	0	0	0	95	0	149	623	0	2	0	0
7:45 AM	0	0	0	6	0	0	0	0	0	0	81	0	0	0	83	0	170	665	0	2	0	0
8:00 AM	0	0	0	3	0	0	0	0	0	2	65	0	0	0	72	0	142	717	0	1	1	0
8:15 AM	0	0	0	0	0	0	0	0	1	1	82	0	0	0	78	0	162		0	0	1	0
8:30 AM	0	0	0	2	0	0	0	0	0	1	87	0	0	0	101	0	191		0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	89	0	0	0	132	1	222		0	0	0	0
Count Total	0	1	1	15	0	0	0	1	1	9	623	0	0	0	755	1	1,407		0	8	2	0
Peak Hour	0	0	0	5	0	0	0	0	1	4	323	0	0	0	383	1	717		0	1	2	0



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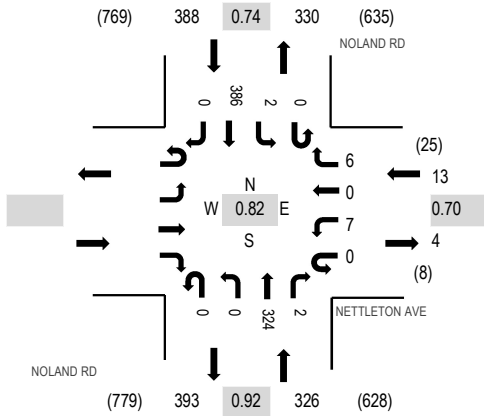
Location: 3 NOLAND RD & NETTLETON AVE AM

Date: Thursday, May 9, 2024

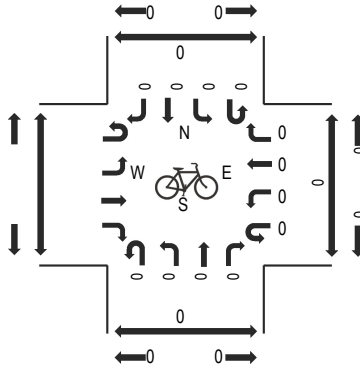
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

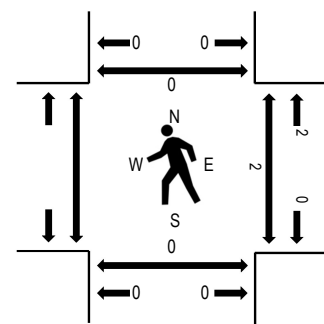
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NETTLETON AVE								NOLAND RD				NOLAND RD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
7:00 AM					0	1	0	2	0	0	103	0	0	2	107	0	215	695	1	0	0	
7:15 AM					0	2	0	0	0	0	68	0	0	1	86	0	157	619	0	0	0	
7:30 AM					0	1	0	1	0	0	51	0	0	0	97	0	150	631	2	0	0	
7:45 AM					0	5	0	0	0	0	80	0	0	1	87	0	173	678	2	0	0	
8:00 AM					0	1	0	1	0	0	65	1	0	0	71	0	139	727	1	0	0	
8:15 AM					0	2	0	0	0	0	84	0	0	0	83	0	169		1	0	0	
8:30 AM					0	2	0	3	0	0	89	0	0	0	103	0	197		0	0	0	
8:45 AM					0	2	0	2	0	0	86	1	0	2	129	0	222		0	0	0	
Count Total					0	16	0	9	0	0	626	2	0	6	763	0	1,422		7	0	0	
Peak Hour					0	7	0	6	0	0	324	2	0	2	386	0	727		2	0	0	



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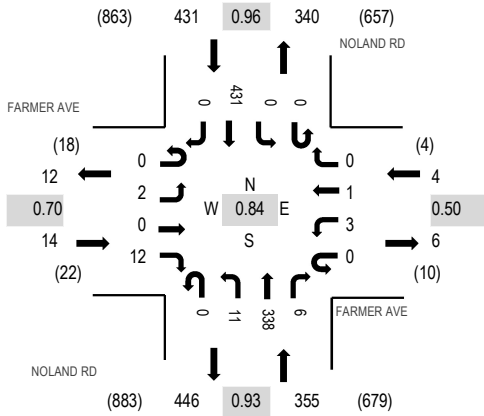
Location: 4 NOLAND RD & FARMER AVE AM

Date: Thursday, May 9, 2024

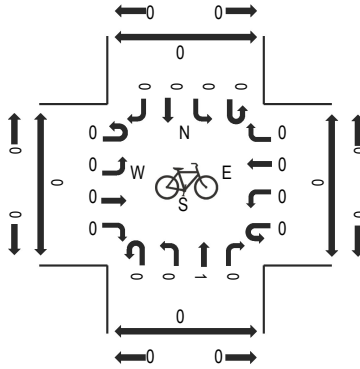
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

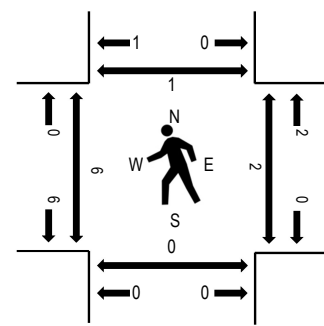
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FARMER AVE Eastbound				FARMER AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	2	0	0	0	0	0	2	94	1	0	0	111	1	212	764	1	0	0	0
7:15 AM	0	0	0	3	0	0	0	0	0	0	77	1	0	0	96	0	177	715	0	1	0	0
7:30 AM	0	0	0	1	0	0	0	0	0	2	53	0	0	0	111	0	167	730	0	0	0	0
7:45 AM	0	1	0	0	0	0	0	0	0	1	91	2	0	0	113	0	208	772	1	1	0	0
8:00 AM	0	0	0	3	0	1	1	0	0	3	75	0	0	0	80	0	163	804	2	1	0	0
8:15 AM	0	1	0	4	0	1	0	0	0	2	84	3	0	0	97	0	192		0	1	0	0
8:30 AM	0	1	0	2	0	0	0	0	0	4	89	0	0	0	113	0	209		1	0	0	1
8:45 AM	0	0	0	3	0	1	0	0	0	2	90	3	0	0	141	0	240		3	0	0	0
Count Total	0	4	0	18	0	3	1	0	0	16	653	10	0	0	862	1	1,568		8	4	0	1
Peak Hour	0	2	0	12	0	3	1	0	0	11	338	6	0	0	431	0	804		6	2	0	1



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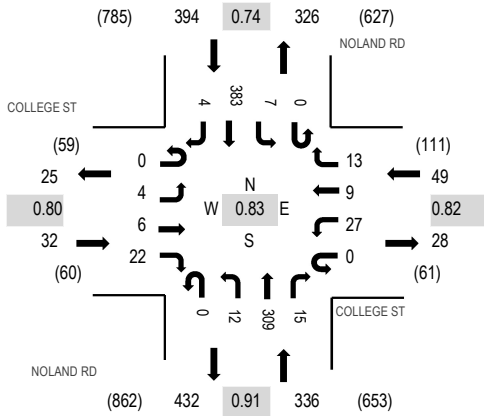
Location: 5 NOLAND RD & COLLEGE ST AM

Date: Thursday, May 9, 2024

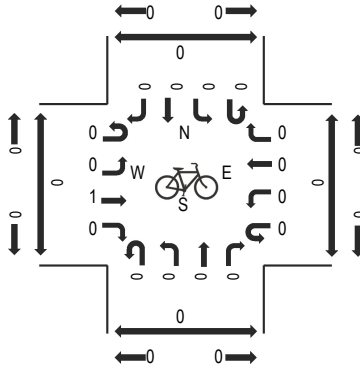
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

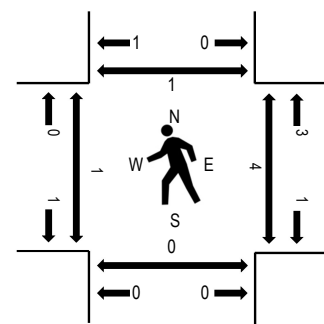
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	COLLEGE ST Eastbound				COLLEGE ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	2	1	5	0	4	3	11	0	5	89	4	0	7	103	1	235	798	1	1	0	0
7:15 AM	0	0	1	7	0	6	4	3	0	4	67	5	0	2	87	0	186	722	0	0	0	0
7:30 AM	0	1	5	1	0	6	5	1	0	4	46	3	0	0	98	0	170	727	0	1	0	0
7:45 AM	0	0	0	5	0	15	2	2	0	6	79	5	0	0	93	0	207	775	0	2	0	1
8:00 AM	0	1	2	4	0	10	1	2	0	6	61	5	0	1	65	1	159	811	0	1	0	0
8:15 AM	0	2	2	6	0	4	1	1	0	2	81	4	0	2	86	0	191		0	1	0	0
8:30 AM	0	1	1	6	0	7	4	8	0	2	81	2	0	1	105	0	218		0	1	0	0
8:45 AM	0	0	1	6	0	6	3	2	0	2	86	4	0	3	127	3	243		1	1	0	1
Count Total	0	7	13	40	0	58	23	30	0	31	590	32	0	16	764	5	1,609		2	8	0	2
Peak Hour	0	4	6	22	0	27	9	13	0	12	309	15	0	7	383	4	811		1	4	0	1



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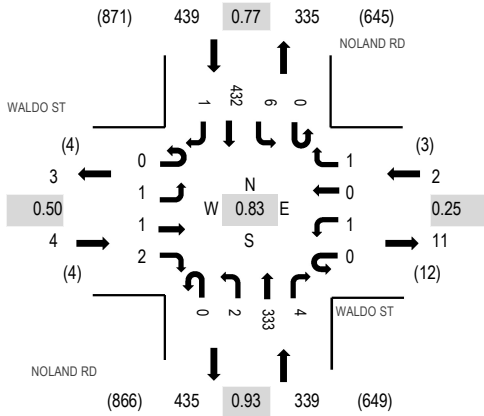
Location: 6 NOLAND RD & WALDO ST AM

Date: Thursday, May 9, 2024

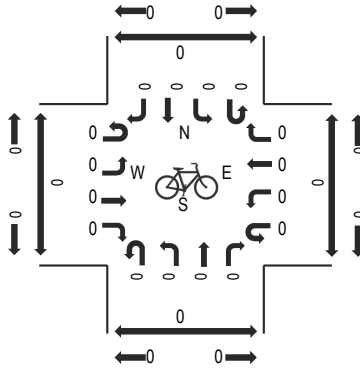
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

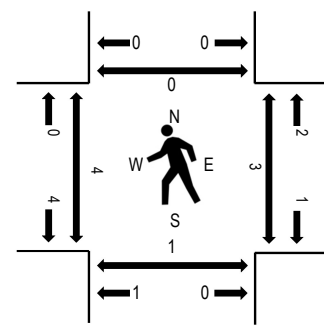
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WALDO ST Eastbound				WALDO ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	0	0	0	0	1	91	0	0	0	112	0	204	743	1	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	77	0	0	0	96	0	174	695	0	1	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	52	0	0	1	110	0	163	709	0	1	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	89	0	0	0	113	0	202	750	0	2	0	0
8:00 AM	0	0	0	2	0	0	0	0	0	0	72	3	0	1	78	0	156	784	1	1	1	0
8:15 AM	0	1	0	0	0	0	0	0	0	1	86	0	0	2	98	0	188		0	1	0	0
8:30 AM	0	0	1	0	0	0	0	0	0	1	85	0	0	1	115	1	204		0	1	0	0
8:45 AM	0	0	0	0	0	1	0	1	0	0	90	1	0	2	141	0	236		3	0	0	0
Count Total	0	1	1	2	0	1	0	2	0	3	642	4	0	7	863	1	1,527		5	7	1	0
Peak Hour	0	1	1	2	0	1	0	1	0	2	333	4	0	6	432	1	784		4	3	1	0



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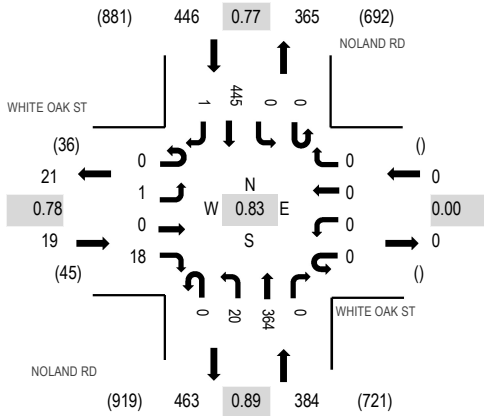
Location: 7 NOLAND RD & WHITE OAK ST AM

Date: Thursday, May 9, 2024

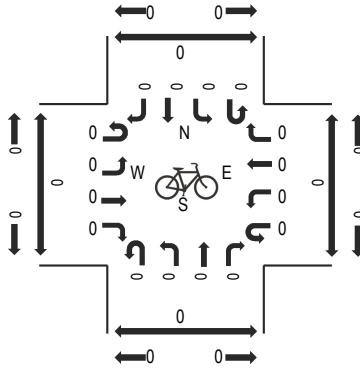
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

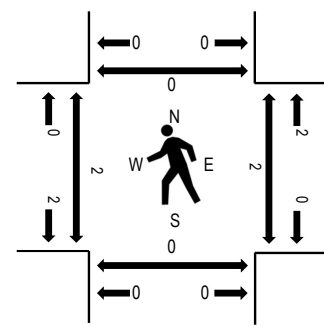
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WHITE OAK ST Eastbound				WHITE OAK ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	3	0	0	0	0	0	1	97	0	0	0	117	1	220	798	1	0	0	0
7:15 AM	0	1	0	6	0	0	0	0	0	5	78	0	0	0	97	0	187	757	0	1	0	0
7:30 AM	0	0	0	9	0	0	0	0	0	2	54	0	0	0	113	0	178	771	0	0	0	0
7:45 AM	0	1	0	5	0	0	0	0	0	5	95	0	0	0	106	1	213	806	0	1	0	0
8:00 AM	0	0	0	6	0	0	0	0	0	6	79	0	0	0	88	0	179	849	0	1	0	0
8:15 AM	0	0	0	5	0	0	0	0	0	4	89	0	0	0	103	0	201		0	1	0	0
8:30 AM	0	0	0	4	0	0	0	0	0	2	96	0	0	0	111	0	213		0	0	0	0
8:45 AM	0	1	0	3	0	0	0	0	0	8	100	0	0	0	143	1	256		2	0	0	0
Count Total	0	4	0	41	0	0	0	0	0	33	688	0	0	0	878	3	1,647		3	4	0	0
Peak Hour	0	1	0	18	0	0	0	0	0	20	364	0	0	0	445	1	849		2	2	0	0



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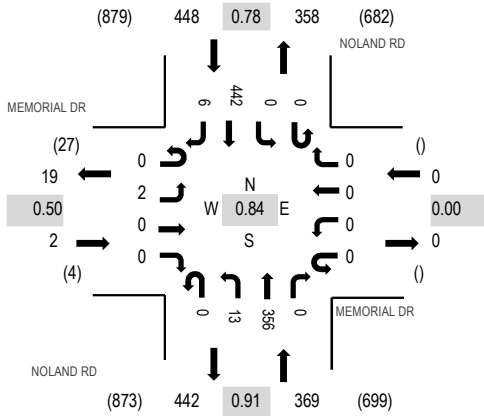
Location: 8 NOLAND RD & MEMORIAL DR AM

Date: Thursday, May 9, 2024

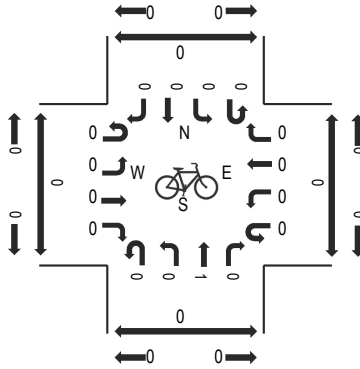
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

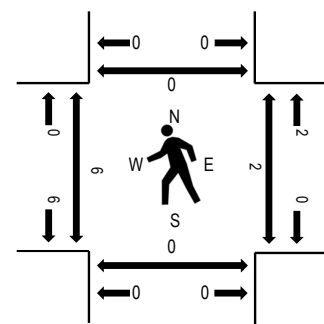
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MEMORIAL DR Eastbound				MEMORIAL DR Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	0	0	0	0	1	98	0	0	0	112	0	211	763	1	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	78	0	0	0	98	1	178	717	1	1	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	1	55	0	0	0	111	0	167	739	2	0	0	0
7:45 AM	0	0	0	2	0	0	0	0	0	3	93	0	0	0	108	1	207	781	1	1	0	0
8:00 AM	0	2	0	0	0	0	0	0	0	0	77	0	0	0	84	2	165	819	2	1	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	5	91	0	0	0	104	0	200		0	1	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	3	92	0	0	0	113	1	209		1	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	5	96	0	0	0	141	3	245		3	0	0	0
Count Total	0	2	0	2	0	0	0	0	0	19	680	0	0	0	871	8	1,582		11	4	0	0
Peak Hour	0	2	0	0	0	0	0	0	0	13	356	0	0	0	442	6	819		6	2	0	0



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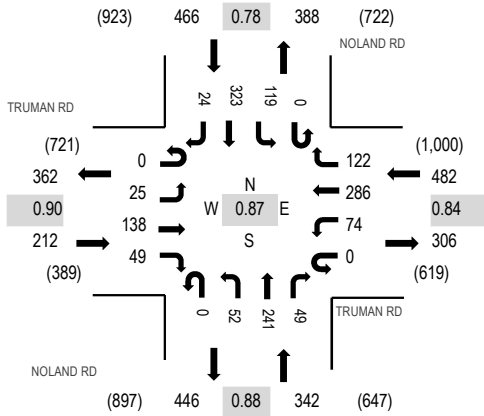
Location: 9 NOLAND RD & TRUMAN RD AM

Date: Thursday, May 9, 2024

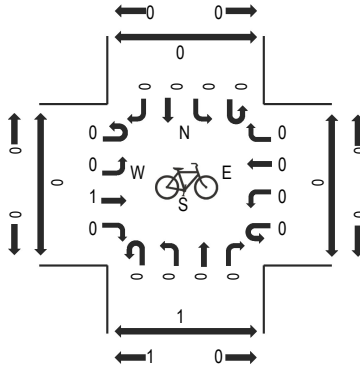
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

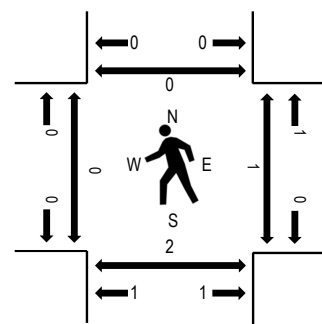
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	TRUMAN RD Eastbound				TRUMAN RD Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	4	29	6	0	35	63	34	0	13	56	17	0	35	80	8	380	1,457	1	0	0	0
7:15 AM	0	4	29	7	0	16	60	22	0	10	57	13	0	27	68	6	319	1,413	0	1	0	1
7:30 AM	0	4	39	10	0	37	70	26	0	8	30	16	0	29	90	5	364	1,448	0	0	0	1
7:45 AM	0	4	27	14	1	17	95	42	0	9	51	25	0	26	71	12	394	1,465	0	1	0	1
8:00 AM	0	4	26	8	0	12	83	30	0	16	53	10	0	30	58	6	336	1,502	0	1	0	0
8:15 AM	0	8	40	11	0	15	64	24	0	8	63	14	0	29	71	7	354		0	0	1	0
8:30 AM	0	7	36	13	0	26	63	40	0	15	53	13	0	24	84	7	381		0	0	1	0
8:45 AM	0	6	36	17	0	21	76	28	0	13	72	12	0	36	110	4	431		0	0	0	0
Count Total	0	41	262	86	1	179	574	246	0	92	435	120	0	236	632	55	2,959		1	3	2	3
Peak Hour	0	25	138	49	0	74	286	122	0	52	241	49	0	119	323	24	1,502		0	1	2	0



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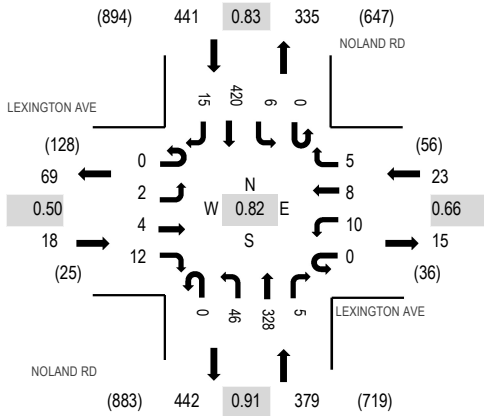
Location: 10 NOLAND RD & LEXINGTON AVE AM

Date: Thursday, May 9, 2024

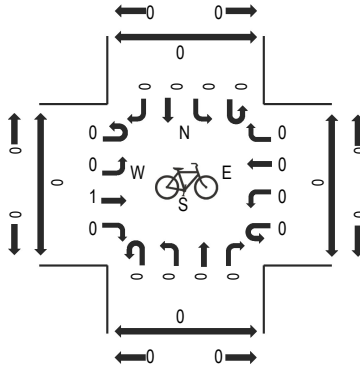
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

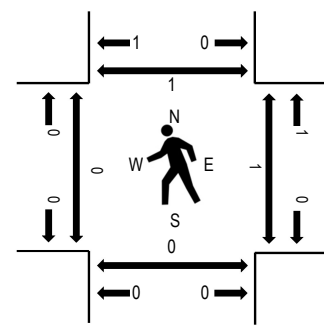
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LEXINGTON AVE Eastbound				LEXINGTON AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	0	0	3	1	4	0	8	81	3	0	5	108	3	217	833	1	0	0	0
7:15 AM	0	1	1	0	0	7	3	4	0	2	77	1	0	2	91	2	191	795	0	1	0	0
7:30 AM	0	1	0	2	0	0	1	2	0	14	49	2	0	3	130	4	208	793	0	0	0	0
7:45 AM	0	1	0	0	0	2	3	3	0	13	88	2	0	2	98	5	217	817	0	2	0	1
8:00 AM	0	0	2	1	0	5	4	3	0	10	75	2	0	1	73	3	179	861	0	0	0	0
8:15 AM	0	1	1	1	0	1	2	1	0	9	78	1	0	1	91	2	189		0	0	0	0
8:30 AM	0	0	0	3	0	4	0	0	0	16	82	2	0	2	116	7	232		0	0	0	1
8:45 AM	0	1	1	7	0	0	2	1	0	11	93	0	0	2	140	3	261		0	1	0	0
Count Total	0	6	5	14	0	22	16	18	0	83	623	13	0	18	847	29	1,694		1	4	0	2
Peak Hour	0	2	4	12	0	10	8	5	0	46	328	5	0	6	420	15	861		0	1	0	1



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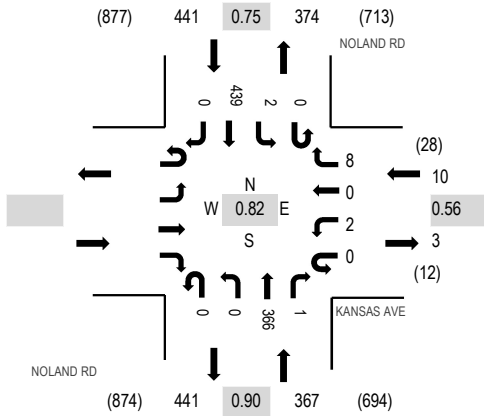
Location: 11 NOLAND RD & KANSAS AVE AM

Date: Thursday, May 9, 2024

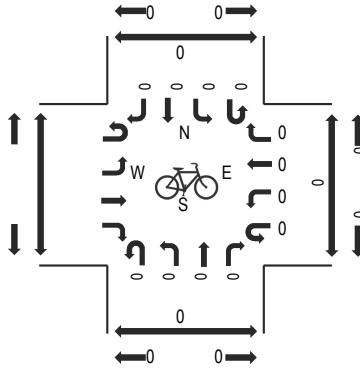
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

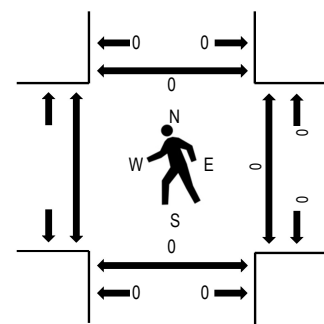
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	KANSAS AVE Eastbound				KANSAS AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM					0	1	0	7	0	0	84	2	0	5	105	0	204	781	0	0	0	0
7:15 AM					0	3	0	1	0	0	80	0	0	2	96	0	182	745	1	0	0	0
7:30 AM					0	0	0	3	0	0	63	0	0	0	125	0	191	747	0	1	0	0
7:45 AM					0	0	0	3	0	0	98	0	0	0	103	0	204	773	0	0	0	0
8:00 AM					0	2	0	3	0	0	82	1	0	0	80	0	168	818	0	0	0	0
8:15 AM					0	0	0	1	0	0	89	0	0	1	93	0	184		0	0	0	0
8:30 AM					0	0	0	4	0	0	93	0	0	0	120	0	217		0	0	0	0
8:45 AM					0	0	0	0	0	0	102	0	0	1	146	0	249		0	0	0	0
Count Total					0	6	0	22	0	0	691	3	0	9	868	0	1,599		1	1	0	0
Peak Hour					0	2	0	8	0	0	366	1	0	2	439	0	818		0	0	0	0



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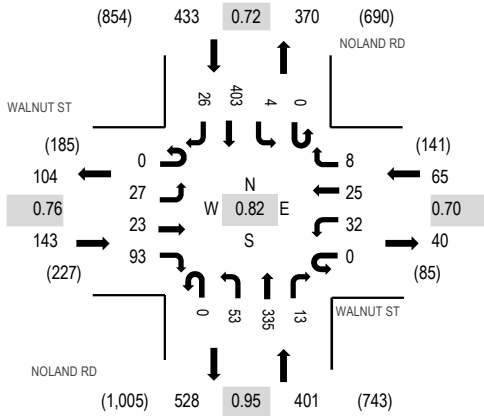
Location: 12 NOLAND RD & WALNUT ST AM

Date: Thursday, May 9, 2024

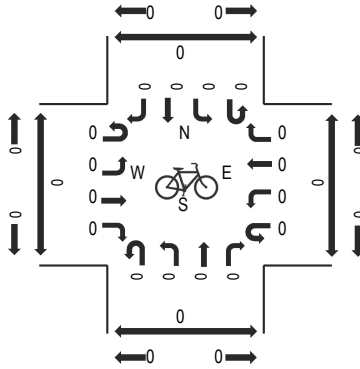
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

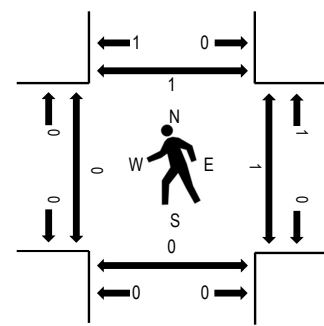
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WALNUT ST Eastbound				WALNUT ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	5	4	8	0	15	7	5	0	9	71	4	0	1	92	4	225	923	0	0	0	0
7:15 AM	0	3	6	12	0	8	3	0	0	8	71	7	0	3	90	7	218	914	0	2	2	0
7:30 AM	0	8	3	8	0	12	6	1	0	9	55	5	0	0	118	7	232	943	0	0	0	0
7:45 AM	0	12	2	13	0	8	9	2	0	10	87	6	0	4	93	2	248	972	0	0	0	0
8:00 AM	0	2	5	18	0	11	6	3	0	7	79	3	0	0	77	5	216	1,042	0	0	0	1
8:15 AM	0	8	6	26	0	8	5	1	0	18	84	3	0	0	81	7	247		0	0	0	0
8:30 AM	0	8	3	20	0	8	6	2	0	16	83	2	0	2	107	4	261		0	0	0	0
8:45 AM	0	9	9	29	0	5	8	2	0	12	89	5	0	2	138	10	318		0	1	0	0
Count Total	0	55	38	134	0	75	50	16	0	89	619	35	0	12	796	46	1,965		0	3	2	1
Peak Hour	0	27	23	93	0	32	25	8	0	53	335	13	0	4	403	26	1,042		0	1	0	1



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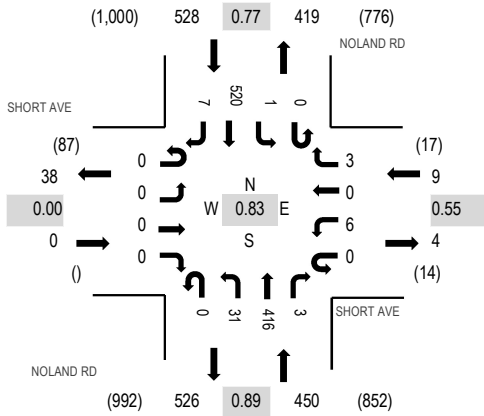
Location: 13 NOLAND RD & SHORT AVE AM

Date: Thursday, May 9, 2024

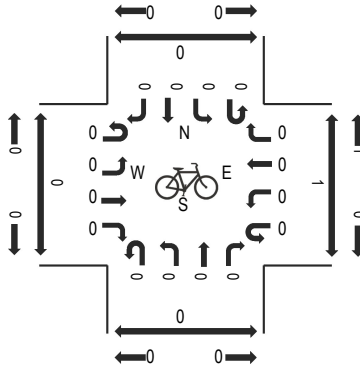
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

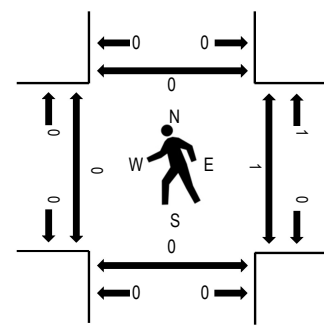
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SHORT AVE Eastbound				SHORT AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	0	1	1	0	3	83	1	0	1	114	0	204	882	0	1	0	0
7:15 AM	0	0	0	0	0	0	1	0	0	11	94	1	0	2	108	0	217	885	0	2	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	10	69	2	0	2	131	1	216	897	0	0	0	0
7:45 AM	0	0	0	0	0	3	0	1	0	19	109	0	0	1	109	3	245	934	0	1	0	0
8:00 AM	0	0	0	0	0	4	0	1	0	10	86	1	0	0	104	1	207	987	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	5	107	1	0	1	114	1	229		0	0	0	0
8:30 AM	0	0	0	0	0	0	0	2	0	8	108	0	0	0	133	2	253		0	0	0	0
8:45 AM	0	0	0	0	0	2	0	0	0	8	115	1	0	0	169	3	298		0	1	0	0
Count Total	0	0	0	0	0	10	2	5	0	74	771	7	0	7	982	11	1,869		0	5	0	0
Peak Hour	0	0	0	0	0	6	0	3	0	31	416	3	0	1	520	7	987		0	1	0	0



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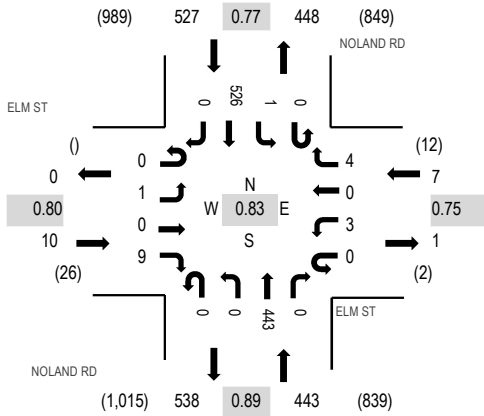
Location: 14 NOLAND RD & ELM ST AM

Date: Thursday, May 9, 2024

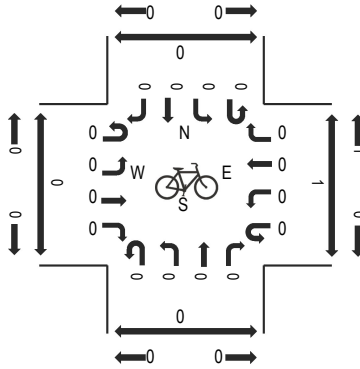
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

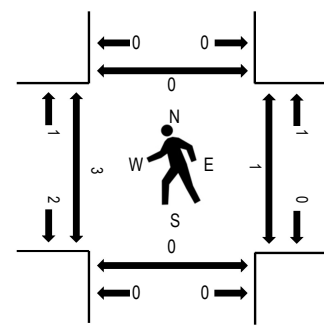
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ELM ST Eastbound				ELM ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	3	0	1	0	2	0	0	0	0	85	1	0	0	112	0	204	879	0	0	0	0
7:15 AM	0	0	0	5	0	0	0	0	0	0	105	0	0	0	107	0	217	875	0	2	0	0
7:30 AM	0	1	0	2	0	0	0	0	0	0	79	0	0	0	133	0	215	896	0	0	0	0
7:45 AM	0	0	0	4	0	1	0	2	0	0	126	0	0	0	110	0	243	931	1	0	0	0
8:00 AM	0	0	0	0	0	1	0	1	0	0	96	0	0	1	101	0	200	987	0	0	0	0
8:15 AM	0	0	0	2	0	0	0	2	0	0	112	0	0	0	122	0	238		0	0	0	0
8:30 AM	0	0	0	2	0	2	0	0	0	0	114	0	0	0	132	0	250		2	0	0	0
8:45 AM	0	1	0	5	0	0	0	1	0	0	121	0	0	0	171	0	299		1	1	0	0
Count Total	0	5	0	21	0	6	0	6	0	0	838	1	0	1	988	0	1,866		4	3	0	0
Peak Hour	0	1	0	9	0	3	0	4	0	0	443	0	0	1	526	0	987		3	1	0	0



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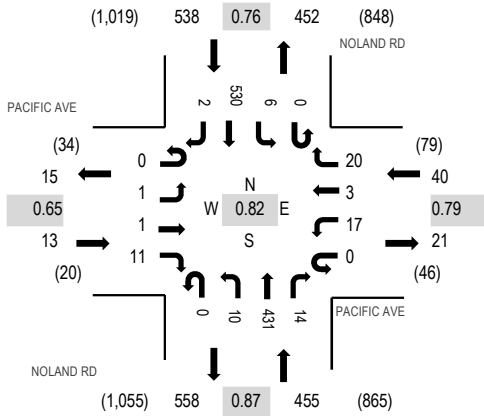
Location: 15 NOLAND RD & PACIFIC AVE AM

Date: Thursday, May 9, 2024

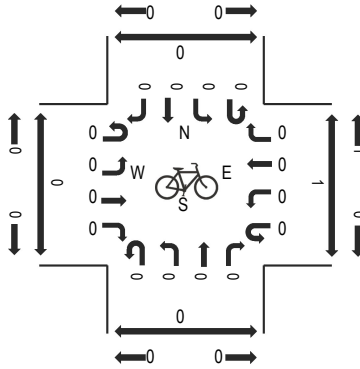
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

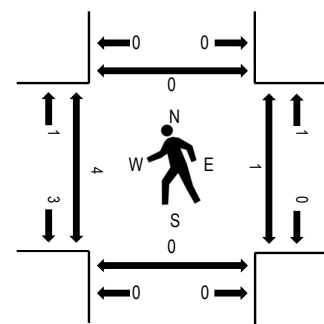
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	PACIFIC AVE Eastbound				PACIFIC AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	2	0	7	1	0	0	3	85	5	0	3	110	1	217	937	0	0	0	0
7:15 AM	0	1	0	1	0	8	0	2	0	2	103	2	0	2	109	1	231	934	0	3	0	0
7:30 AM	0	1	0	1	0	4	3	0	0	0	78	0	0	0	133	2	222	956	0	0	0	0
7:45 AM	0	1	0	0	0	6	1	7	0	5	118	9	0	4	116	0	267	996	0	0	0	0
8:00 AM	0	0	1	1	0	5	0	6	0	0	90	7	0	1	103	0	214	1,046	1	0	0	0
8:15 AM	0	0	0	5	0	3	2	5	0	4	108	3	0	2	121	0	253		0	0	0	0
8:30 AM	0	1	0	3	0	4	1	4	0	2	112	1	0	1	132	1	262		2	0	0	0
8:45 AM	0	0	0	2	0	5	0	5	0	4	121	3	0	2	174	1	317		1	1	0	0
Count Total	0	4	1	15	0	42	8	29	0	20	815	30	0	15	998	6	1,983		4	4	0	0
Peak Hour	0	1	1	11	0	17	3	20	0	10	431	14	0	6	530	2	1,046		4	1	0	0



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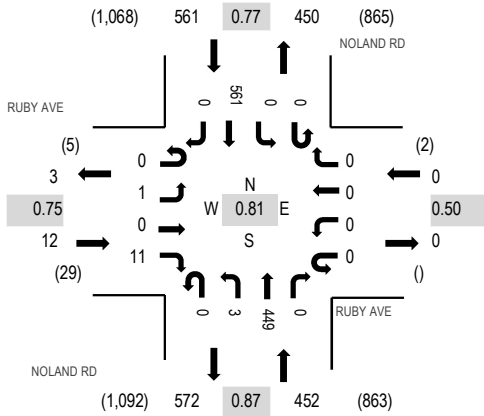
Location: 16 NOLAND RD & RUBY AVE AM

Date: Thursday, May 9, 2024

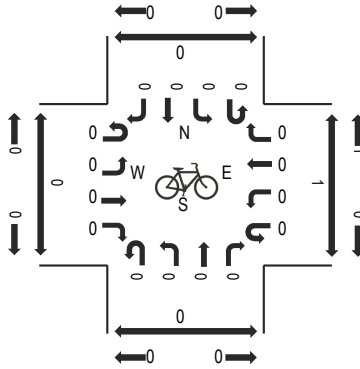
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

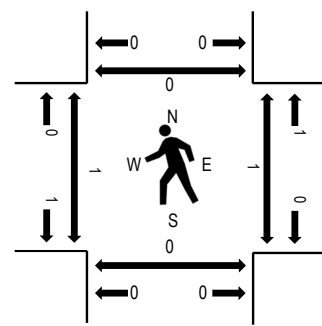
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	RUBY AVE Eastbound				RUBY AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	1	0	0	0	1	0	0	96	0	0	0	124	0	222	937	0	2	0	0
7:15 AM	0	0	0	2	0	0	0	1	0	0	105	0	0	0	118	0	226	926	0	2	0	0
7:30 AM	0	0	0	7	0	0	0	0	0	0	80	0	0	0	140	0	227	944	0	0	0	0
7:45 AM	0	2	0	5	0	0	0	0	0	1	129	0	1	0	123	1	262	972	0	0	0	0
8:00 AM	0	0	0	3	0	0	0	0	0	1	95	0	0	0	112	0	211	1,025	1	0	0	0
8:15 AM	0	1	0	3	0	0	0	0	0	1	112	0	0	0	127	0	244		0	0	0	0
8:30 AM	0	0	0	1	0	0	0	0	0	0	115	0	0	0	139	0	255		0	1	0	0
8:45 AM	0	0	0	4	0	0	0	0	0	1	127	0	0	0	183	0	315		0	0	0	0
Count Total	0	3	0	26	0	0	0	2	0	4	859	0	1	0	1,066	1	1,962		1	5	0	0
Peak Hour	0	1	0	11	0	0	0	0	0	3	449	0	0	0	561	0	1,025		1	1	0	0



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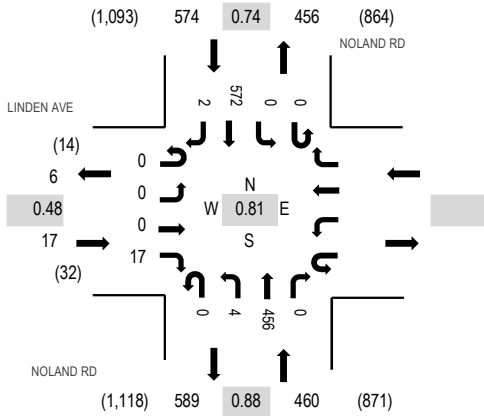
Location: 17 NOLAND RD & LINDEN AVE AM

Date: Thursday, May 9, 2024

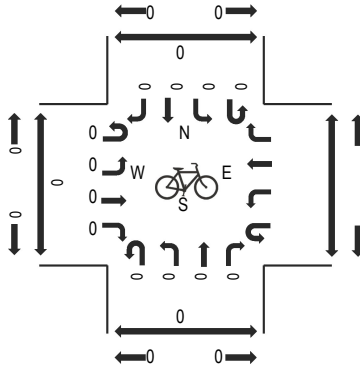
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

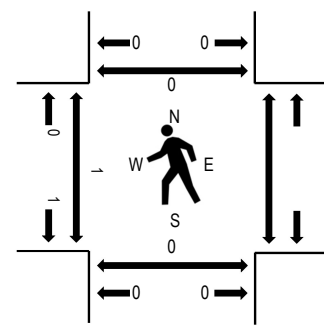
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LINDEN AVE Eastbound				Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	2	0	4					0	1	93	0	0	0	122	1	223	945	0		0	0
7:15 AM	0	0	0	3					0	0	104	0	0	0	124	0	231	948	0		0	0
7:30 AM	0	0	0	4					0	1	81	0	0	0	147	2	235	962	0		0	0
7:45 AM	0	0	0	2					0	3	128	0	0	0	123	0	256	983	0		0	0
8:00 AM	0	0	0	10					0	0	101	0	0	0	115	0	226	1,051	1		0	0
8:15 AM	0	0	0	3					0	0	111	0	0	0	131	0	245		0		0	0
8:30 AM	0	0	0	3					0	2	118	0	0	0	133	0	256		0		0	0
8:45 AM	0	0	0	1					0	2	126	0	0	0	193	2	324		0		0	0
Count Total	0	2	0	30					0	9	862	0	0	0	1,088	5	1,996		1		0	0
Peak Hour	0	0	0	17					0	4	456	0	0	0	572	2	1,051		1		0	0



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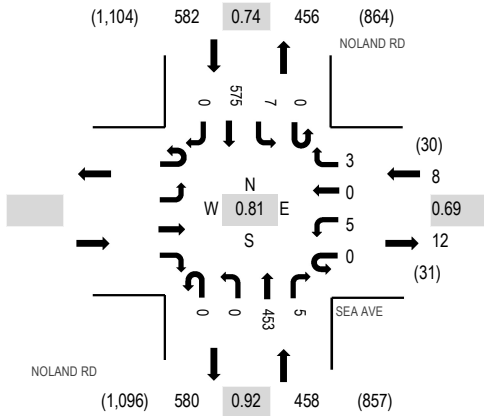
Location: 18 NOLAND RD & SEA AVE AM

Date: Thursday, May 9, 2024

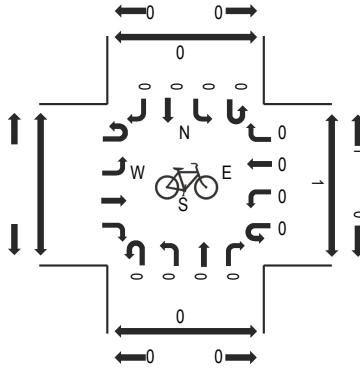
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

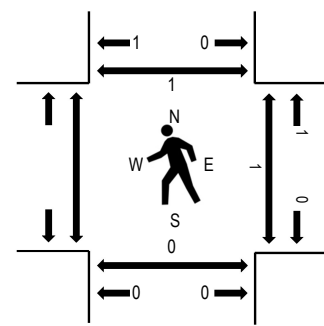
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SEA AVE Eastbound				SEA AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM					0	0	0	4	0	0	97	1	0	3	125	0	230	943	2	0	0	0
7:15 AM					0	1	0	4	0	0	94	1	0	3	121	0	224	941	3	0	0	0
7:30 AM					0	2	0	6	0	0	77	4	0	5	143	0	237	958	0	0	0	0
7:45 AM					0	2	0	3	0	0	123	2	0	0	122	0	252	978	0	0	0	0
8:00 AM					0	2	0	1	0	0	101	1	0	1	122	0	228	1,048	0	0	0	0
8:15 AM					0	1	0	0	0	0	106	2	0	1	131	0	241		0	0	0	0
8:30 AM					0	0	0	1	0	0	124	1	0	3	128	0	257		1	0	1	1
8:45 AM					0	2	0	1	0	0	122	1	0	2	194	0	322		0	0	0	0
Count Total					0	10	0	20	0	0	844	13	0	18	1,086	0	1,991		6	0	1	1
Peak Hour					0	5	0	3	0	0	453	5	0	7	575	0	1,048		1	0	1	1



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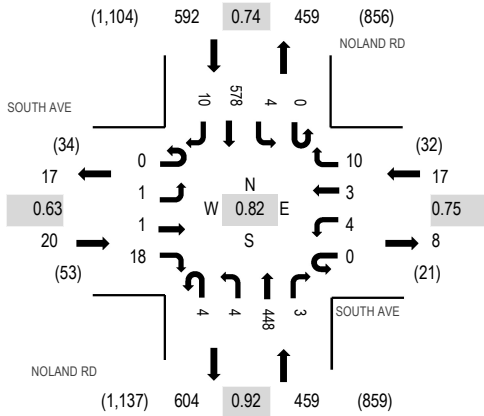
Location: 19 NOLAND RD & SOUTH AVE AM

Date: Thursday, May 9, 2024

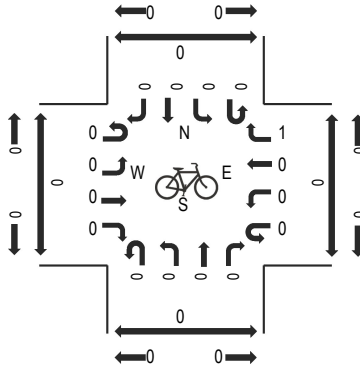
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

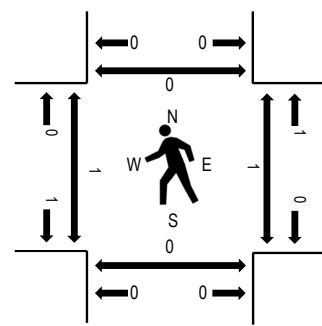
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTH AVE Eastbound				SOUTH AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	1	8	0	0	0	0	1	1	100	1	0	2	120	3	238	960	0	2	0	0
7:15 AM	0	0	0	2	0	2	0	2	0	2	91	1	0	2	118	4	224	967	0	2	0	0
7:30 AM	0	1	0	12	0	0	2	3	0	0	78	2	0	1	140	3	242	983	0	1	0	0
7:45 AM	0	0	1	7	0	3	0	3	2	1	118	2	0	0	118	1	256	1,012	1	0	0	0
8:00 AM	0	1	0	3	0	1	0	1	2	0	105	0	0	0	128	4	245	1,088	0	0	0	0
8:15 AM	0	0	0	1	0	0	1	3	0	1	104	1	0	1	124	4	240		1	0	0	0
8:30 AM	0	0	1	8	0	2	1	3	1	3	120	1	0	0	130	1	271		0	1	0	0
8:45 AM	0	0	0	6	0	1	1	3	1	0	119	1	0	3	196	1	332		0	0	0	0
Count Total	0	3	3	47	0	9	5	18	7	8	835	9	0	9	1,074	21	2,048		2	6	0	0
Peak Hour	0	1	1	18	0	4	3	10	4	4	448	3	0	4	578	10	1,088		1	1	0	0



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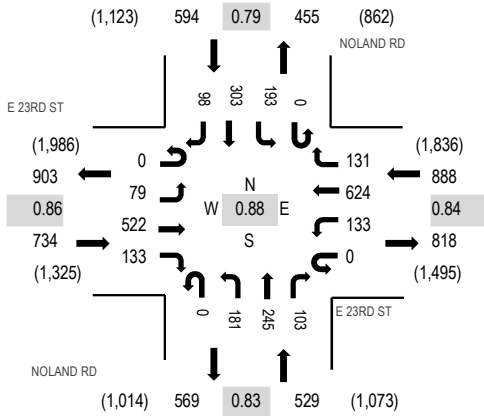
Location: 20 NOLAND RD & E 23RD ST AM

Date: Thursday, May 9, 2024

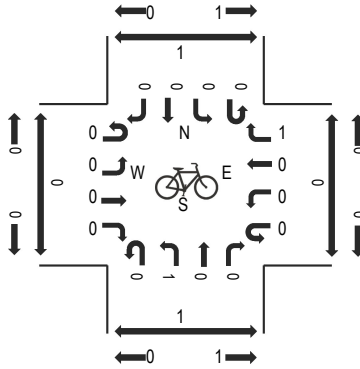
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

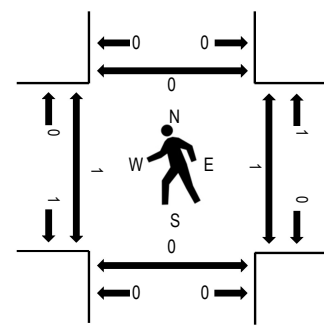
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	E 23RD ST Eastbound				E 23RD ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	21	70	14	0	35	161	23	0	66	60	38	0	37	55	41	621	2,612	0	0	0	0
7:15 AM	0	20	111	22	0	16	173	26	0	41	49	22	0	33	53	32	598	2,648	0	0	0	0
7:30 AM	0	10	111	28	0	21	194	18	0	51	53	31	0	47	72	39	675	2,673	0	0	0	0
7:45 AM	0	27	130	27	0	35	212	34	0	48	66	19	0	28	67	25	718	2,685	0	0	0	0
8:00 AM	0	19	126	33	0	27	152	29	0	46	56	25	0	48	67	29	657	2,745	0	0	0	0
8:15 AM	0	18	130	35	0	37	138	27	0	51	58	26	0	29	56	18	623		0	0	0	0
8:30 AM	0	16	112	31	0	35	159	39	0	41	68	28	0	46	87	25	687		1	1	0	0
8:45 AM	0	26	154	34	0	34	175	36	0	43	63	24	0	70	93	26	778		0	0	0	0
Count Total	0	157	944	224	0	240	1,364	232	0	387	473	213	0	338	550	235	5,357		1	1	0	0
Peak Hour	0	79	522	133	0	133	624	131	0	181	245	103	0	193	303	98	2,745		1	1	0	0



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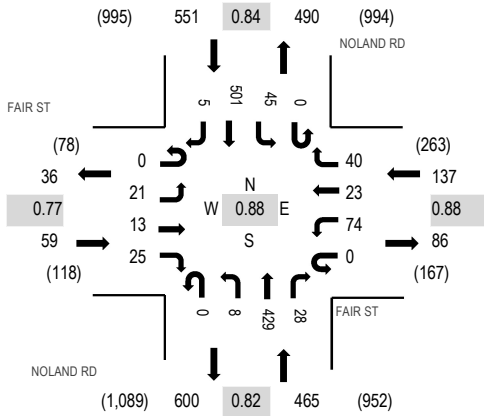
Location: 21 NOLAND RD & FAIR ST AM

Date: Thursday, May 9, 2024

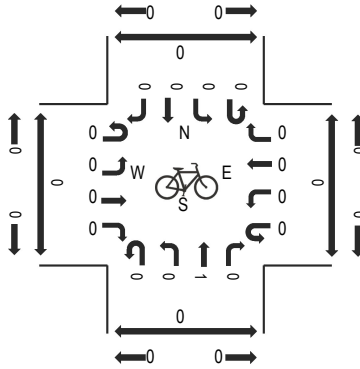
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

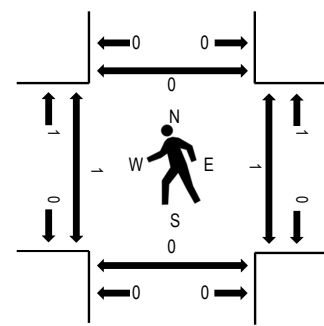
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FAIR ST Eastbound				FAIR ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	5	3	6	0	12	5	8	0	7	133	9	0	4	106	0	298	1,116	0	0	0	0
7:15 AM	0	4	5	3	0	15	3	14	0	1	92	7	0	8	80	0	232	1,082	0	0	0	0
7:30 AM	0	7	3	7	0	11	7	11	0	3	95	11	0	10	105	2	272	1,151	0	0	0	0
7:45 AM	0	7	6	3	0	19	4	17	0	9	111	9	0	6	122	1	314	1,180	0	0	0	0
8:00 AM	0	4	0	7	0	14	8	13	0	2	96	4	0	10	106	0	264	1,212	0	0	0	0
8:15 AM	0	8	4	9	0	24	7	10	0	2	110	3	0	13	109	2	301		1	0	0	0
8:30 AM	0	6	4	3	0	10	5	8	0	2	105	11	0	13	131	3	301		0	1	0	0
8:45 AM	0	3	5	6	0	26	3	9	0	2	118	10	0	9	155	0	346		0	0	0	0
Count Total	0	44	30	44	0	131	42	90	0	28	860	64	0	73	914	8	2,328		1	1	0	0
Peak Hour	0	21	13	25	0	74	23	40	0	8	429	28	0	45	501	5	1,212		1	1	0	0



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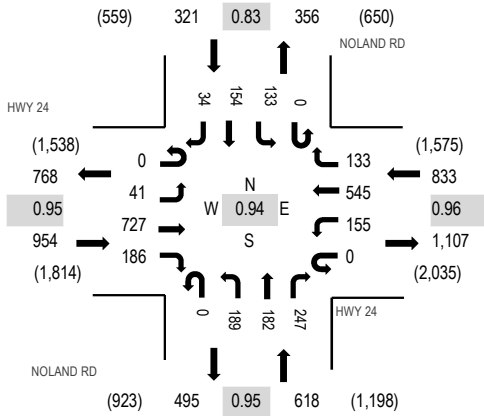
Location: 1 NOLAND RD & HWY 24 PM

Date: Thursday, May 9, 2024

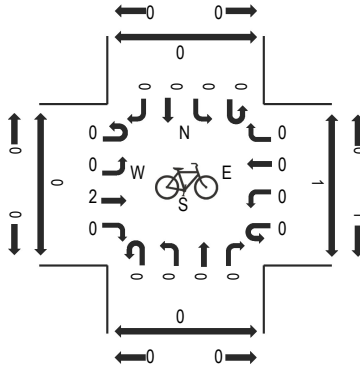
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

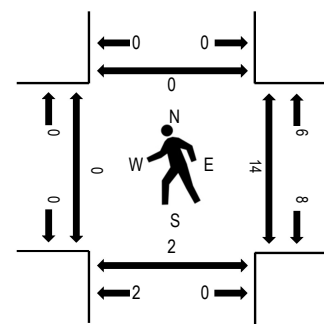
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 24 Eastbound				HWY 24 Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	5	139	46	0	29	112	15	0	58	47	42	0	24	41	2	560	2,450	0	3	0	0
3:45 PM	0	17	154	44	0	29	139	20	0	41	41	42	0	18	39	7	591	2,579	0	8	1	0
4:00 PM	0	6	185	39	0	40	138	19	0	56	50	56	0	21	25	9	644	2,715	0	2	2	0
4:15 PM	0	17	161	44	0	35	143	32	0	37	52	67	0	28	33	6	655	2,726	0	1	0	0
4:30 PM	0	9	179	49	0	43	125	37	0	50	47	53	0	39	45	13	689	2,696	0	3	0	0
4:45 PM	0	5	194	53	0	42	141	35	0	55	41	71	0	44	38	8	727		0	10	2	0
5:00 PM	0	10	193	40	0	35	136	29	0	47	42	56	0	22	38	7	655		0	0	0	0
5:15 PM	0	13	170	42	0	31	147	23	0	54	38	55	0	22	23	7	625		0	6	0	0
Count Total	0	82	1,375	357	0	284	1,081	210	0	398	358	442	0	218	282	59	5,146		0	33	5	0
Peak Hour	0	41	727	186	0	155	545	133	0	189	182	247	0	133	154	34	2,726		0	14	2	0



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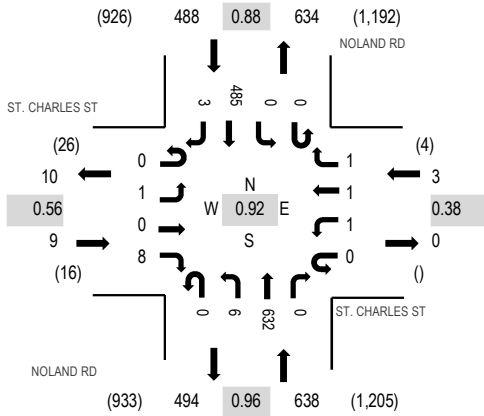
Location: 2 NOLAND RD & ST. CHARLES ST PM

Date: Thursday, May 9, 2024

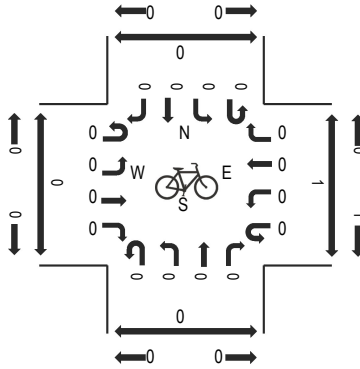
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

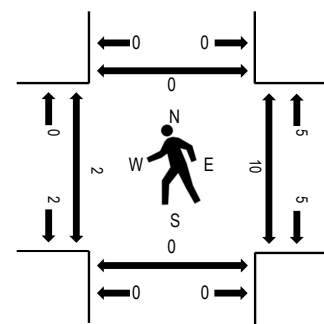
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ST. CHARLES ST Eastbound				ST. CHARLES ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	2	0	0	0	0	0	3	142	0	0	0	117	0	264	1,043	0	1	0	0
3:45 PM	0	2	0	1	0	0	0	0	0	3	121	0	0	0	109	1	237	1,087	1	5	1	0
4:00 PM	0	0	0	1	0	0	0	0	0	1	166	0	0	0	100	0	268	1,138	0	0	0	0
4:15 PM	0	0	0	2	0	0	1	1	0	2	154	0	0	0	113	1	274	1,125	0	4	0	0
4:30 PM	0	0	0	2	0	1	0	0	0	3	161	0	0	0	141	0	308	1,108	2	1	0	0
4:45 PM	0	1	0	3	0	0	0	0	0	0	151	0	0	0	131	2	288		0	5	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	1	145	0	0	0	108	1	255		0	0	0	0
5:15 PM	0	2	0	0	0	0	1	0	0	6	146	0	0	0	102	0	257		0	0	0	0
Count Total	0	5	0	11	0	1	2	1	0	19	1,186	0	0	0	921	5	2,151		3	16	1	0
Peak Hour	0	1	0	8	0	1	1	1	0	6	632	0	0	0	485	3	1,138		2	10	0	0



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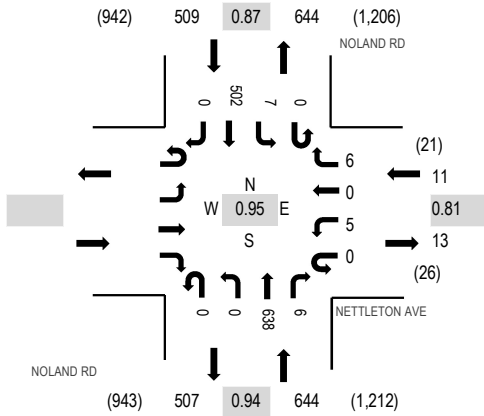
Location: 3 NOLAND RD & NETTLETON AVE PM

Date: Thursday, May 9, 2024

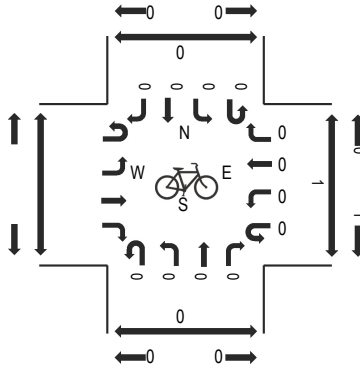
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

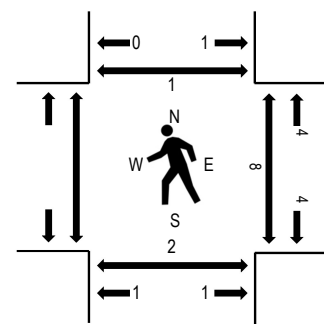
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NETTLETON AVE Eastbound				NETTLETON AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM					0	2	0	1	0	0	143	3	0	1	119	0	269	1,058	1	1	0	0
3:45 PM					0	1	0	0	0	0	123	2	0	0	109	0	235	1,094	1	1	0	0
4:00 PM					0	1	0	1	0	0	170	1	0	1	99	0	273	1,164	0	0	0	0
4:15 PM					0	1	0	2	0	0	155	3	0	0	120	0	281	1,150	2	0	1	0
4:30 PM					0	1	0	2	0	0	161	1	0	2	138	0	305	1,117	2	0	0	0
4:45 PM					0	2	0	1	0	0	152	1	0	4	145	0	305		4	2	0	0
5:00 PM					0	4	0	0	0	0	144	3	0	1	107	0	259		0	0	0	0
5:15 PM					0	1	0	1	0	0	150	0	0	3	93	0	248		0	0	0	0
Count Total					0	13	0	8	0	0	1,198	14	0	12	930	0	2,175		10	4	1	1
Peak Hour					0	5	0	6	0	0	638	6	0	7	502	0	1,164		8	2	1	1



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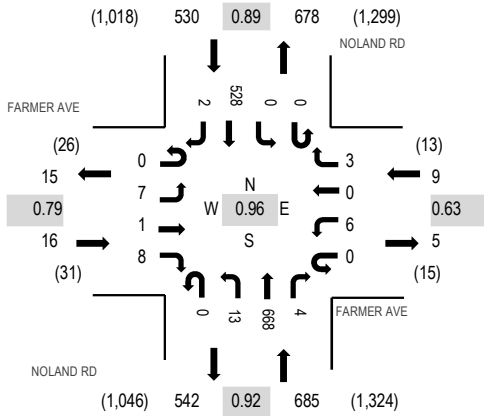
Location: 4 NOLAND RD & FARMER AVE PM

Date: Thursday, May 9, 2024

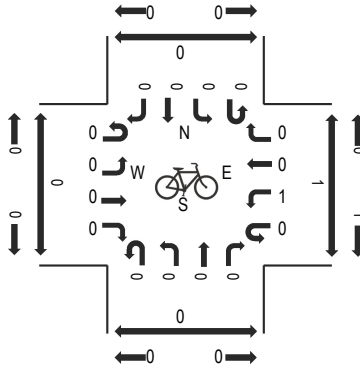
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

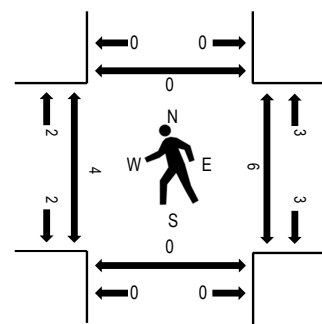
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FARMER AVE Eastbound				FARMER AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	2	0	2	0	0	0	1	158	2	0	0	133	0	298	1,170	1	0	0	0
3:45 PM	0	0	0	4	0	0	0	1	0	4	136	4	0	0	122	0	271	1,194	1	0	0	0
4:00 PM	0	1	0	2	0	1	0	0	0	2	183	2	0	0	113	0	304	1,240	0	2	0	0
4:15 PM	0	3	0	0	0	2	0	2	0	4	166	0	0	0	120	0	297	1,232	1	1	0	0
4:30 PM	0	2	1	3	0	3	0	1	0	3	164	1	0	0	143	1	322	1,216	1	2	0	0
4:45 PM	0	1	0	3	0	0	0	0	0	4	155	1	0	0	152	1	317		2	1	0	0
5:00 PM	0	0	0	4	0	1	0	0	0	3	159	1	0	0	128	0	296		0	0	0	0
5:15 PM	0	1	1	3	0	0	0	0	0	3	166	2	0	0	105	0	281		0	0	0	0
Count Total	0	8	2	21	0	9	0	4	0	24	1,287	13	0	0	1,016	2	2,386		6	6	0	0
Peak Hour	0	7	1	8	0	6	0	3	0	13	668	4	0	0	528	2	1,240		4	6	0	0



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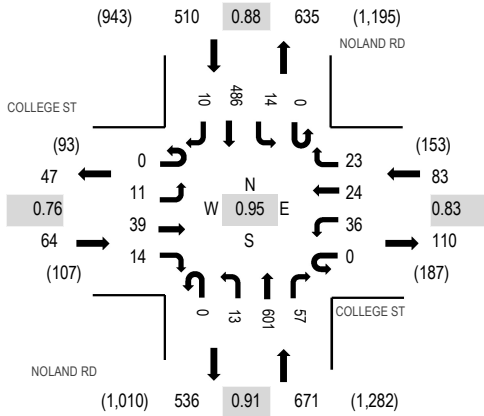
Location: 5 NOLAND RD & COLLEGE ST PM

Date: Thursday, May 9, 2024

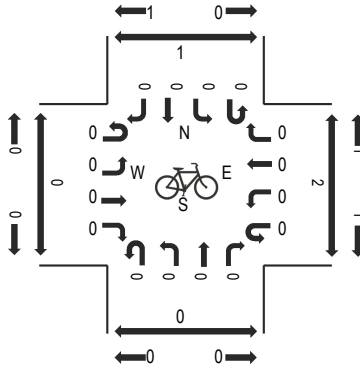
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

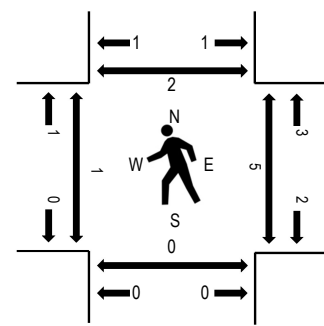
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	COLLEGE ST Eastbound				COLLEGE ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	1	6	7	0	10	3	5	0	5	139	10	0	1	111	5	303	1,215	1	0	0	0
3:45 PM	0	0	5	7	0	12	3	2	0	1	118	12	0	4	103	4	271	1,260	1	1	0	1
4:00 PM	0	6	9	2	0	10	5	6	0	1	165	19	0	2	100	1	326	1,328	0	1	0	0
4:15 PM	0	2	6	0	0	9	4	5	0	5	147	16	0	2	117	2	315	1,299	1	1	0	1
4:30 PM	0	3	10	8	0	8	9	8	0	4	150	10	0	7	127	4	348	1,270	0	1	0	1
4:45 PM	0	0	14	4	0	9	6	4	0	3	139	12	0	3	142	3	339		0	2	0	0
5:00 PM	0	1	7	2	0	9	5	3	0	5	142	12	0	3	106	2	297		0	0	0	6
5:15 PM	0	0	5	2	0	12	5	1	0	7	148	12	0	0	93	1	286		0	0	0	2
Count Total	0	13	62	32	0	79	40	34	0	31	1,148	103	0	22	899	22	2,485		3	6	0	11
Peak Hour	0	11	39	14	0	36	24	23	0	13	601	57	0	14	486	10	1,328		1	5	0	2



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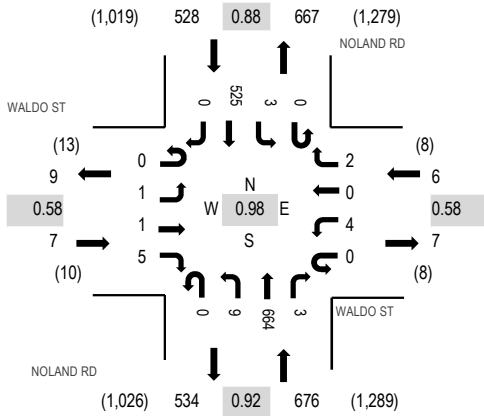
Location: 6 NOLAND RD & WALDO ST PM

Date: Thursday, May 9, 2024

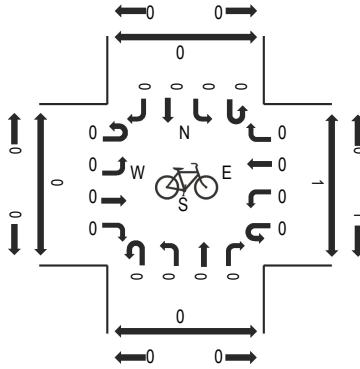
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

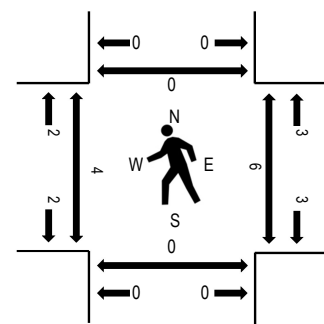
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WALDO ST Eastbound				WALDO ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	1	0	1	0	0	0	3	154	0	0	0	131	0	290	1,138	1	1	0	0
3:45 PM	0	0	0	0	0	0	0	1	0	0	131	0	0	1	121	0	254	1,160	1	5	0	0
4:00 PM	0	0	0	3	0	1	0	2	0	2	179	2	0	2	110	0	301	1,217	0	2	0	0
4:15 PM	0	0	1	1	0	1	0	0	0	2	170	0	0	1	117	0	293	1,200	1	1	0	0
4:30 PM	0	0	0	0	0	2	0	0	0	3	163	0	0	0	144	0	312	1,188	2	1	0	0
4:45 PM	0	1	0	1	0	0	0	0	0	2	152	1	0	0	154	0	311		1	2	0	0
5:00 PM	0	0	0	1	0	0	0	0	0	0	159	0	0	0	124	0	284		0	1	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	166	0	0	0	113	1	281		0	0	0	0
Count Total	0	2	1	7	0	5	0	3	0	12	1,274	3	0	4	1,014	1	2,326		6	13	0	0
Peak Hour	0	1	1	5	0	4	0	2	0	9	664	3	0	3	525	0	1,217		4	6	0	0



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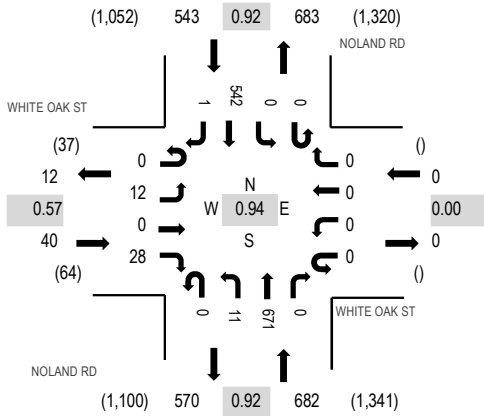
Location: 7 NOLAND RD & WHITE OAK ST PM

Date: Thursday, May 9, 2024

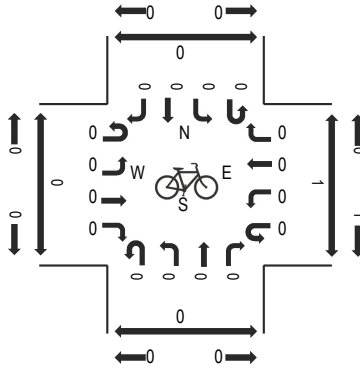
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

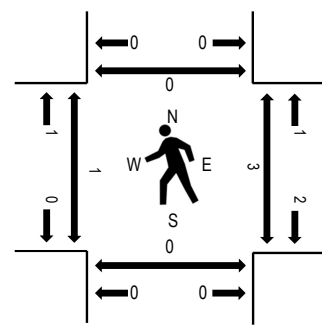
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WHITE OAK ST Eastbound				WHITE OAK ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	3	0	0	0	0	0	6	161	0	0	0	138	1	309	1,203	0	0	0	0
3:45 PM	0	0	0	7	0	0	0	0	0	8	141	0	0	0	127	0	283	1,229	0	0	0	0
4:00 PM	0	3	0	8	0	0	0	0	0	1	185	0	0	0	115	0	312	1,265	0	0	0	0
4:15 PM	0	2	0	3	0	0	0	0	0	3	168	0	0	0	122	1	299	1,264	1	0	0	0
4:30 PM	0	5	0	13	0	0	0	0	0	4	161	0	0	0	152	0	335	1,254	0	2	0	0
4:45 PM	0	2	0	4	0	0	0	0	0	3	157	0	0	0	153	0	319		0	1	0	0
5:00 PM	0	0	0	6	0	0	0	0	0	4	165	0	0	0	136	0	311		0	0	0	0
5:15 PM	0	2	0	6	0	0	0	0	0	6	168	0	0	0	107	0	289		0	0	0	0
Count Total	0	14	0	50	0	0	0	0	0	35	1,306	0	0	0	1,050	2	2,457		1	3	0	0
Peak Hour	0	12	0	28	0	0	0	0	0	11	671	0	0	0	542	1	1,265		1	3	0	0



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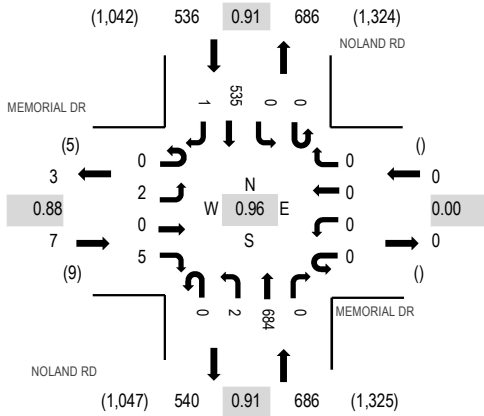
Location: 8 NOLAND RD & MEMORIAL DR PM

Date: Thursday, May 9, 2024

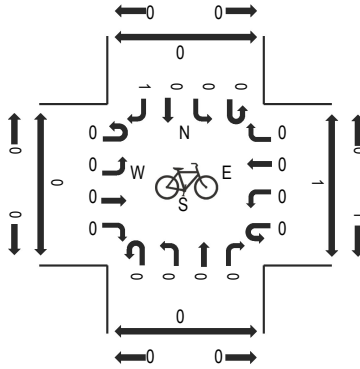
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

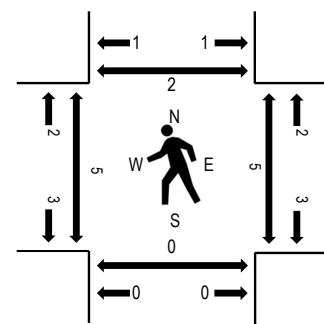
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MEMORIAL DR Eastbound				MEMORIAL DR Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	0	0	0	0	0	0	0	161	0	0	0	138	1	300	1,169	1	0	0	0
3:45 PM	0	0	0	1	0	0	0	0	0	0	143	0	0	0	127	0	271	1,188	1	0	0	0
4:00 PM	0	1	0	1	0	0	0	0	0	2	187	0	0	0	114	1	306	1,229	1	1	0	2
4:15 PM	0	0	0	2	0	0	0	0	0	0	171	0	0	0	119	0	292	1,222	1	1	0	0
4:30 PM	0	0	0	2	0	0	0	0	0	0	167	0	0	0	150	0	319	1,207	1	2	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	159	0	0	0	152	0	312		2	1	0	0
5:00 PM	0	0	0	1	0	0	0	0	1	0	163	0	0	0	133	1	299		0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	171	0	0	0	106	0	277		0	0	0	0
Count Total	0	2	0	7	0	0	0	0	1	2	1,322	0	0	0	1,039	3	2,376		7	5	0	2
Peak Hour	0	2	0	5	0	0	0	0	0	2	684	0	0	0	535	1	1,229		5	5	0	2



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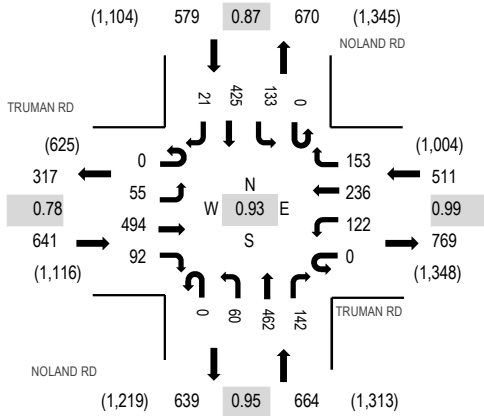
Location: 9 NOLAND RD & TRUMAN RD PM

Date: Thursday, May 9, 2024

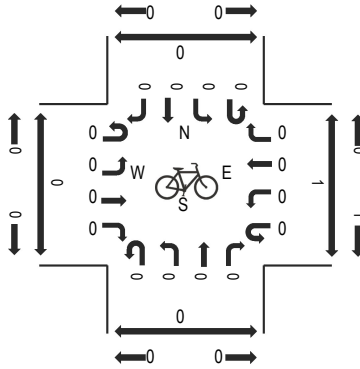
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

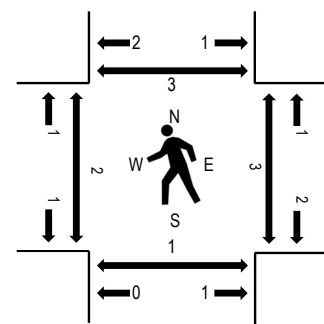
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	TRUMAN RD Eastbound				TRUMAN RD Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	9	71	23	0	19	58	36	0	13	124	38	0	29	113	7	540	2,142	0	0	0	0
3:45 PM	0	8	65	24	0	35	60	36	0	13	107	25	0	26	93	5	497	2,214	0	0	2	1
4:00 PM	0	19	91	24	0	21	59	39	0	10	126	31	0	38	87	4	549	2,297	0	0	1	0
4:15 PM	0	14	99	28	0	30	54	46	0	15	111	36	0	30	83	10	556	2,389	0	0	0	0
4:30 PM	0	10	126	16	0	25	53	49	0	19	108	39	0	36	126	5	612	2,395	0	2	0	0
4:45 PM	0	13	108	22	0	40	56	34	0	12	114	25	0	31	119	6	580		0	1	0	2
5:00 PM	0	18	157	31	0	34	59	33	0	14	117	41	0	37	93	7	641		2	0	0	1
5:15 PM	0	14	103	23	0	23	68	37	0	15	123	37	0	29	87	3	562		0	0	1	0
Count Total	0	105	820	191	0	227	467	310	0	111	930	272	0	256	801	47	4,537		2	3	4	4
Peak Hour	0	55	494	92	0	122	236	153	0	60	462	142	0	133	425	21	2,395		2	3	1	3



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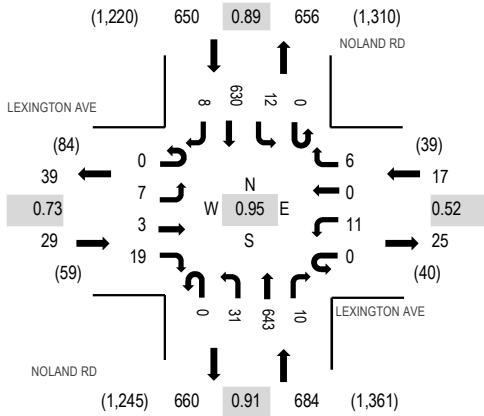
Location: 10 NOLAND RD & LEXINGTON AVE PM

Date: Thursday, May 9, 2024

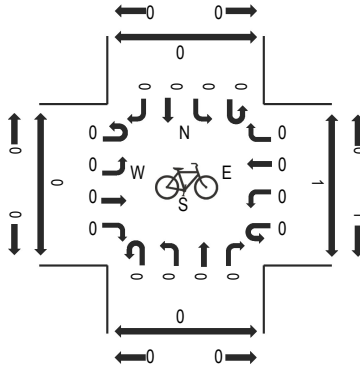
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

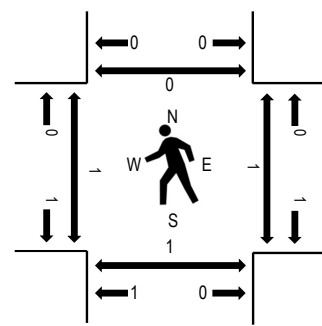
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LEXINGTON AVE Eastbound				LEXINGTON AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	4	0	5	1	5	0	12	158	1	0	4	135	3	328	1,303	0	0	0	0
3:45 PM	0	3	0	9	0	3	0	1	0	10	150	0	0	6	152	2	336	1,332	0	1	0	0
4:00 PM	0	1	0	9	0	0	0	3	0	7	167	1	0	1	134	1	324	1,341	0	2	1	0
4:15 PM	0	2	1	4	0	4	0	1	0	6	153	1	0	3	140	0	315	1,380	0	0	1	0
4:30 PM	0	1	2	3	0	2	0	1	0	7	172	2	0	1	162	4	357	1,376	0	1	0	0
4:45 PM	0	0	0	5	0	3	0	2	0	8	142	2	0	3	177	3	345		0	0	0	0
5:00 PM	0	4	0	7	0	2	0	2	0	10	176	5	0	5	151	1	363		1	0	0	0
5:15 PM	0	1	0	3	0	2	0	2	0	8	163	0	0	2	129	1	311		0	0	0	0
Count Total	0	12	3	44	0	21	1	17	0	68	1,281	12	0	25	1,180	15	2,679		1	4	2	0
Peak Hour	0	7	3	19	0	11	0	6	0	31	643	10	0	12	630	8	1,380		1	1	1	0



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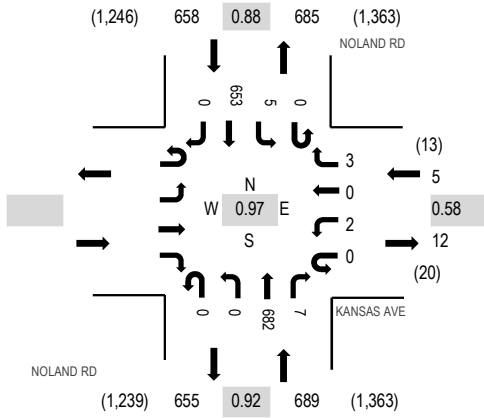
Location: 11 NOLAND RD & KANSAS AVE PM

Date: Thursday, May 9, 2024

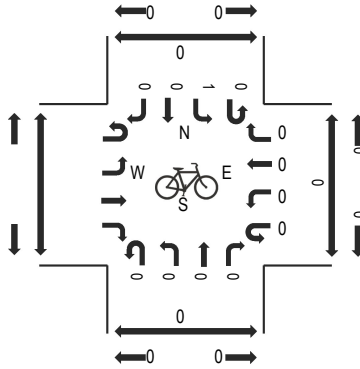
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

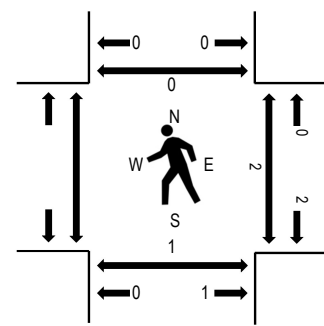
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound				KANSAS AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM					0	0	0	3	0	0	168	0	0	1	144	0	316	1,274	0	0	0	0
3:45 PM					0	0	0	2	0	0	162	2	0	1	167	0	334	1,308	0	1	0	0
4:00 PM					0	0	0	0	0	0	172	1	0	0	141	0	314	1,317	0	0	0	0
4:15 PM					0	2	0	0	0	0	160	4	0	0	144	0	310	1,352	0	0	0	0
4:30 PM					0	0	0	0	0	0	182	1	0	3	164	0	350	1,348	1	0	0	0
4:45 PM					0	0	0	2	0	0	153	1	0	0	187	0	343		0	0	0	0
5:00 PM					0	0	0	1	0	0	187	1	0	2	158	0	349		1	1	0	0
5:15 PM					0	0	0	3	0	0	168	1	0	2	132	0	306		0	0	0	0
Count Total					0	2	0	11	0	0	1,352	11	0	9	1,237	0	2,622		2	2	0	0
Peak Hour					0	2	0	3	0	0	682	7	0	5	653	0	1,352		2	1	0	0



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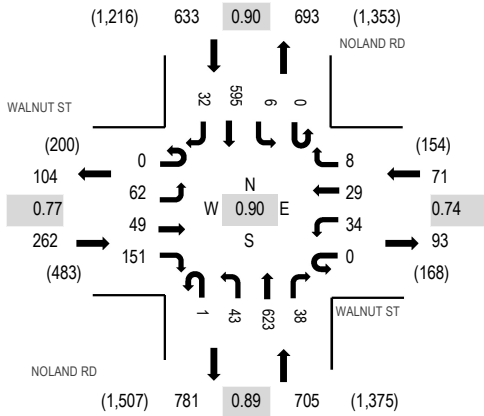
Location: 12 NOLAND RD & WALNUT ST PM

Date: Thursday, May 9, 2024

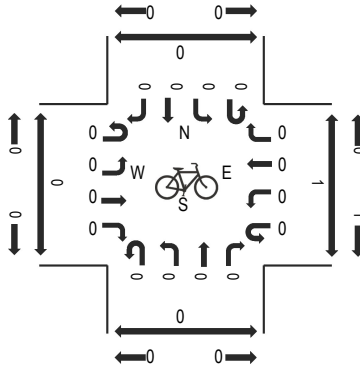
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

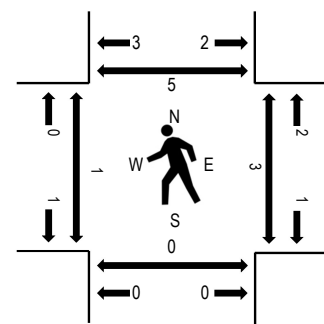
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WALNUT ST Eastbound				WALNUT ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	14	11	37	0	12	11	5	0	10	146	9	0	3	128	4	390	1,557	0	0	0	1
3:45 PM	0	7	12	39	0	5	11	5	0	9	146	11	0	2	160	4	411	1,593	0	1	0	1
4:00 PM	0	12	7	38	0	8	8	0	0	13	160	7	0	1	130	7	391	1,585	0	0	0	0
4:15 PM	0	15	6	23	0	6	7	5	0	8	145	6	0	0	140	4	365	1,657	0	0	0	0
4:30 PM	0	23	11	38	0	11	4	2	0	12	154	8	0	2	155	6	426	1,671	1	1	0	2
4:45 PM	0	13	9	33	0	3	7	1	0	10	139	8	0	3	168	9	403		0	0	0	0
5:00 PM	0	15	16	54	0	11	8	3	0	15	170	13	0	0	149	9	463		0	0	0	1
5:15 PM	0	11	13	26	0	9	10	2	1	6	160	9	0	1	123	8	379		0	2	0	2
Count Total	0	110	85	288	0	65	66	23	1	83	1,220	71	0	12	1,153	51	3,228		1	4	0	7
Peak Hour	0	62	49	151	0	34	29	8	1	43	623	38	0	6	595	32	1,671		1	3	0	5



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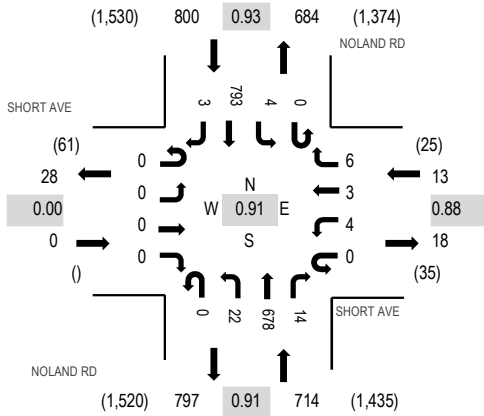
Location: 13 NOLAND RD & SHORT AVE PM

Date: Thursday, May 9, 2024

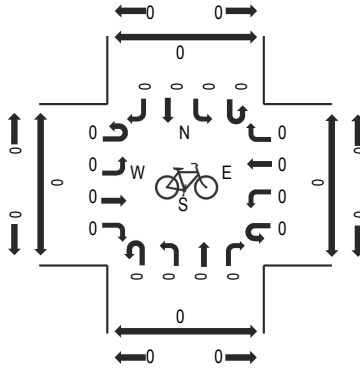
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

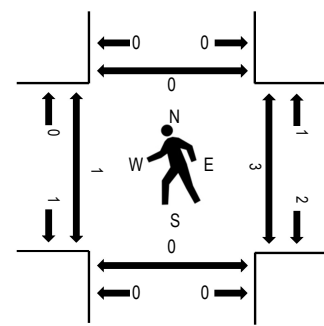
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SHORT AVE Eastbound				SHORT AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	0	0	1	0	1	0	6	165	3	0	3	176	1	356	1,466	0	0	0	1
3:45 PM	0	0	0	0	0	2	1	0	0	6	165	2	0	1	202	4	383	1,498	0	1	0	1
4:00 PM	0	0	0	0	0	3	1	0	0	5	183	5	0	0	180	3	380	1,489	0	1	0	0
4:15 PM	0	0	0	0	0	1	1	1	0	6	158	6	0	0	174	0	347	1,527	0	1	0	0
4:30 PM	0	0	0	0	0	2	0	2	0	8	169	2	0	1	203	1	388	1,524	1	2	0	0
4:45 PM	0	0	0	0	0	1	2	0	0	4	158	4	0	3	200	2	374		0	0	0	0
5:00 PM	0	0	0	0	0	0	0	3	0	4	193	2	0	0	216	0	418		0	0	0	0
5:15 PM	0	0	0	0	0	2	0	1	0	4	175	2	0	1	157	2	344		0	1	0	0
Count Total	0	0	0	0	0	12	5	8	0	43	1,366	26	0	9	1,508	13	2,990		1	6	0	2
Peak Hour	0	0	0	0	0	4	3	6	0	22	678	14	0	4	793	3	1,527		1	3	0	0



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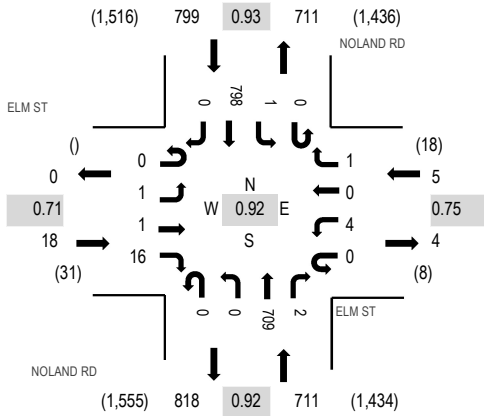
Location: 14 NOLAND RD & ELM ST PM

Date: Thursday, May 9, 2024

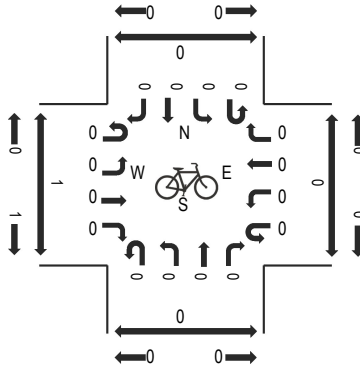
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

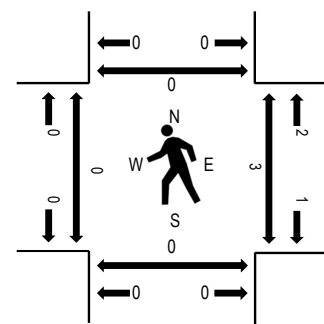
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ELM ST Eastbound				ELM ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	2	0	2	0	1	0	0	174	1	0	0	177	0	357	1,473	0	0	0	0
3:45 PM	0	0	1	2	0	1	0	1	0	0	175	1	0	0	204	0	385	1,504	0	1	0	0
4:00 PM	0	0	0	5	0	3	0	1	0	0	192	1	0	0	178	0	380	1,495	0	1	0	0
4:15 PM	0	0	0	1	0	2	0	1	0	0	170	0	0	0	177	0	351	1,533	0	1	0	0
4:30 PM	0	0	0	5	0	0	0	0	0	0	178	1	0	0	204	0	388	1,526	0	0	0	0
4:45 PM	0	0	0	7	0	0	0	0	0	0	166	0	0	0	203	0	376		0	2	0	0
5:00 PM	0	1	1	3	0	2	0	0	0	0	195	1	0	1	214	0	418		0	0	0	0
5:15 PM	0	0	0	3	0	2	0	2	0	0	179	0	0	0	158	0	344		0	1	0	0
Count Total	0	1	2	28	0	12	0	6	0	0	1,429	5	0	1	1,515	0	2,999		0	6	0	0
Peak Hour	0	1	1	16	0	4	0	1	0	0	709	2	0	1	798	0	1,533		0	3	0	0



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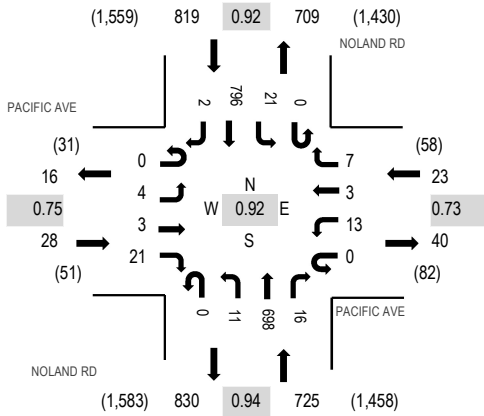
Location: 15 NOLAND RD & PACIFIC AVE PM

Date: Thursday, May 9, 2024

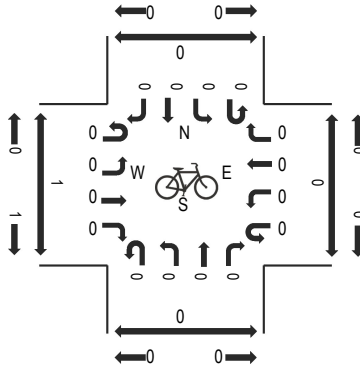
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

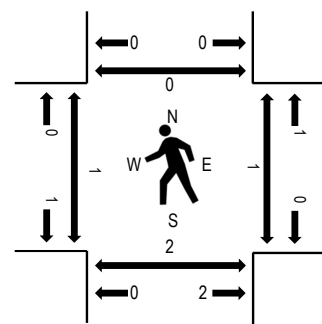
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	PACIFIC AVE Eastbound				PACIFIC AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	1	2	2	0	3	4	4	0	2	166	7	0	0	181	0	372	1,536	0	0	0	0
3:45 PM	0	1	0	2	0	3	1	7	0	3	170	7	0	2	207	0	403	1,570	0	1	0	0
4:00 PM	0	2	0	8	0	3	0	1	0	2	189	5	0	4	183	1	398	1,561	0	1	0	0
4:15 PM	0	1	1	2	0	3	1	2	0	0	170	5	0	5	172	1	363	1,595	0	1	2	0
4:30 PM	0	2	0	5	0	4	0	1	0	5	175	3	0	5	205	1	406	1,590	1	0	0	0
4:45 PM	0	0	0	9	0	3	2	3	0	2	163	5	0	3	204	0	394		0	0	0	0
5:00 PM	0	1	2	5	0	3	0	1	0	4	190	3	0	8	215	0	432		0	0	0	0
5:15 PM	0	1	1	3	0	4	1	4	0	0	175	7	0	7	154	1	358		0	1	0	0
Count Total	0	9	6	36	0	26	9	23	0	18	1,398	42	0	34	1,521	4	3,126		1	4	2	0
Peak Hour	0	4	3	21	0	13	3	7	0	11	698	16	0	21	796	2	1,595		1	1	2	0



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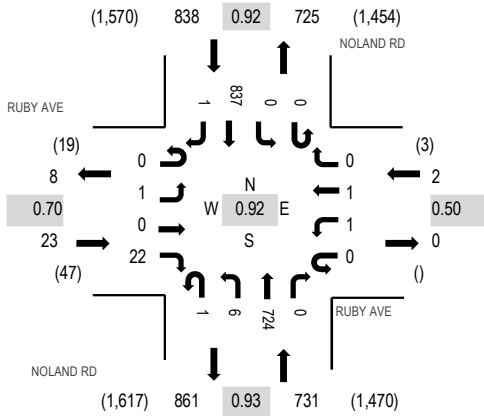
Location: 16 NOLAND RD & RUBY AVE PM

Date: Thursday, May 9, 2024

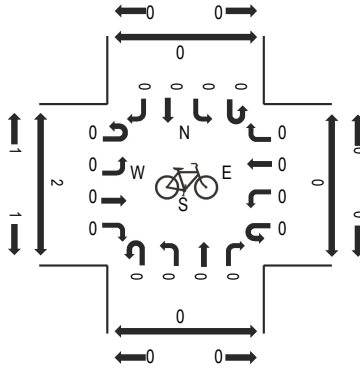
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

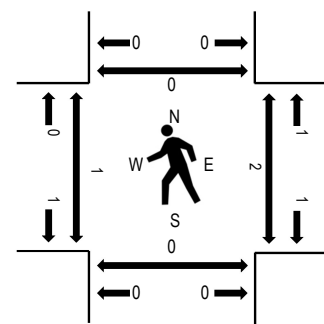
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	RUBY AVE Eastbound				RUBY AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	6	0	0	0	0	0	0	169	0	0	0	187	0	362	1,511	0	0	0	0
3:45 PM	0	1	0	3	0	0	0	0	0	1	184	0	0	0	205	0	394	1,548	0	2	0	0
4:00 PM	0	0	0	11	0	1	0	0	0	2	189	0	0	0	191	0	394	1,554	0	1	0	0
4:15 PM	0	0	0	3	0	0	1	0	0	2	172	0	0	0	183	0	361	1,594	0	1	0	0
4:30 PM	0	0	0	8	0	0	0	0	0	1	183	0	0	0	206	1	399	1,579	1	0	0	0
4:45 PM	0	0	0	9	0	0	0	0	0	0	171	0	0	0	220	0	400		0	1	0	0
5:00 PM	0	1	0	2	0	1	0	0	1	3	198	0	0	0	228	0	434		0	0	0	0
5:15 PM	0	0	0	3	0	0	0	0	1	7	186	0	0	0	148	1	346		0	1	0	0
Count Total	0	2	0	45	0	2	1	0	2	16	1,452	0	0	0	1,568	2	3,090		1	6	0	0
Peak Hour	0	1	0	22	0	1	1	0	1	6	724	0	0	0	837	1	1,594		1	2	0	0



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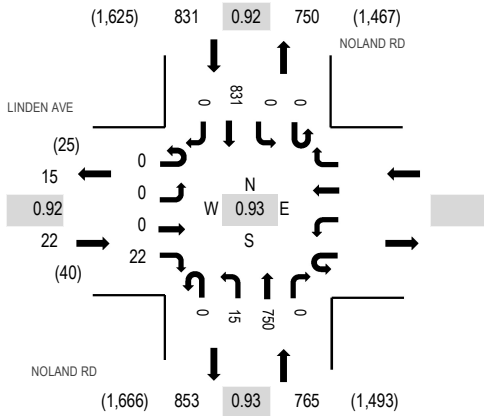
Location: 17 NOLAND RD & LINDEN AVE PM

Date: Thursday, May 9, 2024

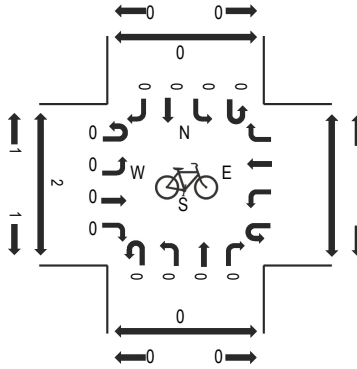
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

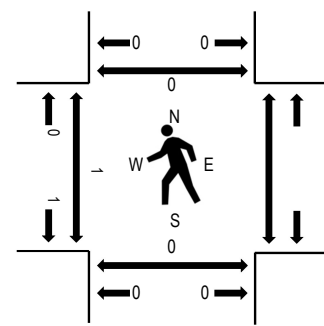
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LINDEN AVE Eastbound				Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	0	6					1	5	166	0	0	0	196	0	374	1,540	0	0	0	0
3:45 PM	0	0	0	5					0	2	186	0	0	0	207	0	400	1,559	0	0	0	0
4:00 PM	0	0	0	2					0	0	190	0	0	0	204	0	396	1,577	0	0	0	0
4:15 PM	0	1	0	4					1	3	174	0	0	0	187	0	370	1,616	0	0	0	0
4:30 PM	0	0	0	6					0	0	179	0	0	0	208	0	393	1,618	0	0	0	0
4:45 PM	0	0	0	6					0	4	176	0	0	0	232	0	418		1	0	0	0
5:00 PM	0	0	0	5					0	3	198	0	0	0	229	0	435		0	0	0	0
5:15 PM	0	0	0	5					0	8	197	0	0	0	162	0	372		0	0	0	0
Count Total	0	1	0	39					2	25	1,466	0	0	0	1,625	0	3,158		1	0	0	0
Peak Hour	0	0	0	22					0	15	750	0	0	0	831	0	1,618		1	0	0	0



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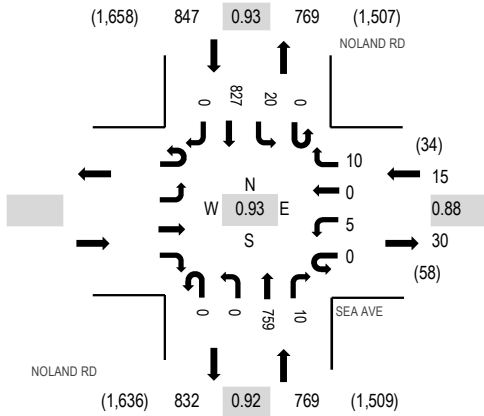
Location: 18 NOLAND RD & SEA AVE PM

Date: Thursday, May 9, 2024

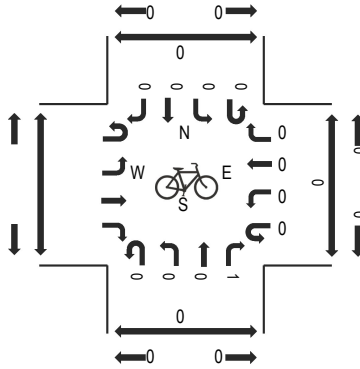
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

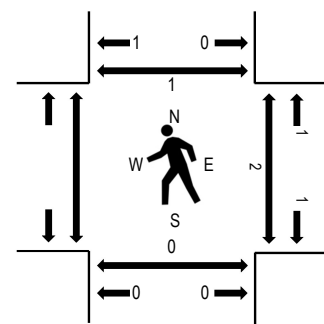
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SEA AVE Eastbound				SEA AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM					0	4	0	3	0	0	177	6	0	3	192	0	385	1,570	0	0	0	0
3:45 PM					0	1	0	0	0	0	190	2	0	4	211	0	408	1,579	2	0	0	0
4:00 PM					0	1	0	4	0	0	187	0	0	5	205	0	402	1,593	1	0	1	1
4:15 PM					0	1	0	5	2	0	172	4	0	4	187	0	375	1,629	0	0	0	0
4:30 PM					0	1	0	3	0	0	173	1	0	6	210	0	394	1,631	0	0	0	0
4:45 PM					0	2	0	4	0	0	180	4	0	5	227	0	422		1	0	0	0
5:00 PM					0	1	0	1	0	0	199	2	0	2	233	0	438		0	0	1	1
5:15 PM					0	1	0	2	0	0	207	3	0	7	157	0	377		1	0	0	0
Count Total					0	12	0	22	2	0	1,485	22	0	36	1,622	0	3,201		5	0	2	2
Peak Hour					0	5	0	10	0	0	759	10	0	20	827	0	1,631		2	0	1	1



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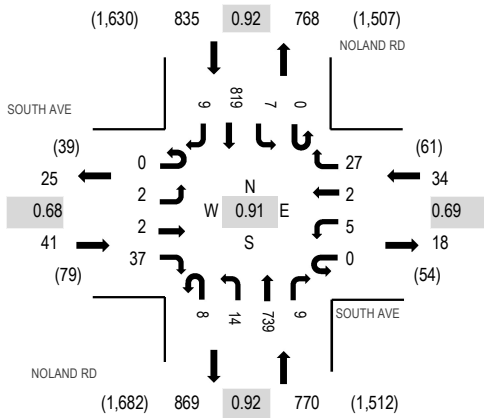
Location: 19 NOLAND RD & SOUTH AVE PM

Date: Thursday, May 9, 2024

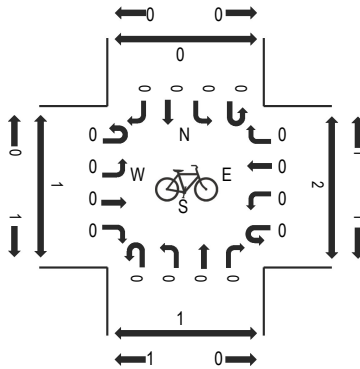
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

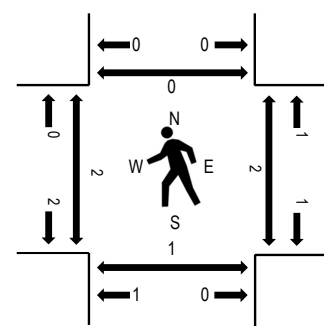
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTH AVE Eastbound				SOUTH AVE Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	0	1	11	0	1	0	3	1	1	176	5	0	2	193	2	396	1,602	0	0	0	0
3:45 PM	0	2	0	7	0	0	2	6	0	4	181	2	0	6	199	0	409	1,599	0	1	0	1
4:00 PM	0	0	0	10	0	1	1	7	0	1	179	4	0	5	195	1	404	1,620	0	2	0	0
4:15 PM	0	0	0	7	0	1	0	5	1	1	179	7	1	4	186	1	393	1,679	1	1	0	0
4:30 PM	0	0	0	15	0	1	0	12	0	2	155	0	0	2	204	2	393	1,680	0	0	0	0
4:45 PM	0	1	1	3	0	0	0	2	3	3	185	3	0	1	227	1	430		1	1	0	0
5:00 PM	0	0	1	9	0	2	1	7	2	4	199	4	0	0	231	3	463		1	0	0	0
5:15 PM	0	1	0	10	0	2	1	6	3	5	200	2	0	4	157	3	394		0	1	1	0
Count Total	0	4	3	72	0	8	5	48	10	21	1,454	27	1	24	1,592	13	3,282		3	6	1	1
Peak Hour	0	2	2	37	0	5	2	27	8	14	739	9	0	7	819	9	1,680		2	2	1	0



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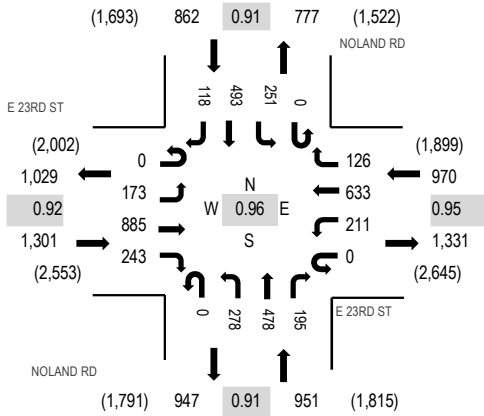
Location: 20 NOLAND RD & E 23RD ST PM

Date: Thursday, May 9, 2024

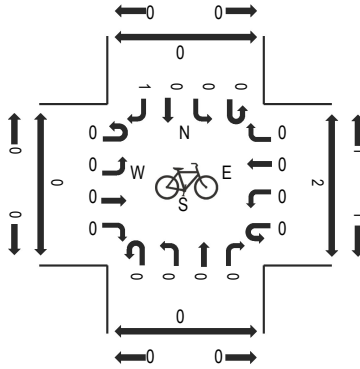
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

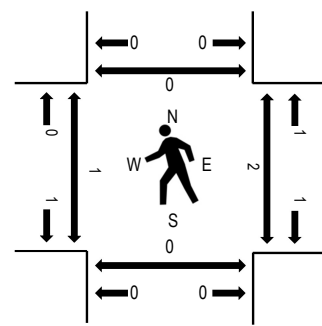
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	E 23RD ST Eastbound				E 23RD ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	43	207	58	0	42	135	38	1	46	103	42	0	75	111	29	930	3,876	0	0	0	1
3:45 PM	0	44	211	45	0	51	145	40	1	71	108	57	0	64	110	33	980	3,925	0	2	1	0
4:00 PM	0	49	226	59	0	53	164	31	0	70	102	43	0	69	119	32	1,017	4,000	0	1	1	0
4:15 PM	0	54	214	42	0	48	153	29	0	60	104	56	0	50	104	35	949	4,052	0	0	0	0
4:30 PM	0	34	224	63	0	41	161	35	0	66	91	48	0	65	124	27	979	4,084	0	0	0	0
4:45 PM	0	47	200	74	0	65	164	27	0	78	126	47	0	57	133	37	1,055		0	1	0	0
5:00 PM	0	53	250	52	0	46	160	32	0	62	122	51	0	79	137	25	1,069		0	0	0	0
5:15 PM	0	39	211	54	0	59	148	32	0	72	139	49	0	50	99	29	981		1	1	0	0
Count Total	0	363	1,743	447	0	405	1,230	264	2	525	895	393	0	509	937	247	7,960		1	5	2	1
Peak Hour	0	173	885	243	0	211	633	126	0	278	478	195	0	251	493	118	4,084		1	2	0	0



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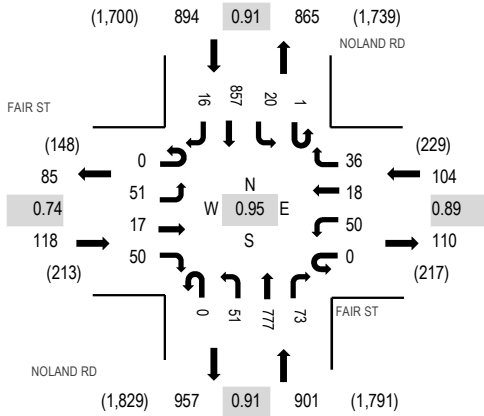
Location: 21 NOLAND RD & FAIR ST PM

Date: Thursday, May 9, 2024

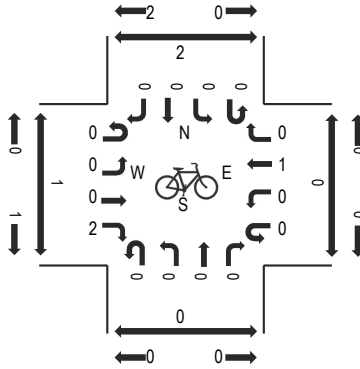
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

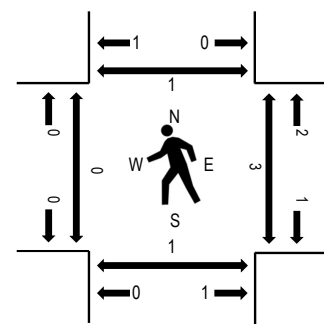
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

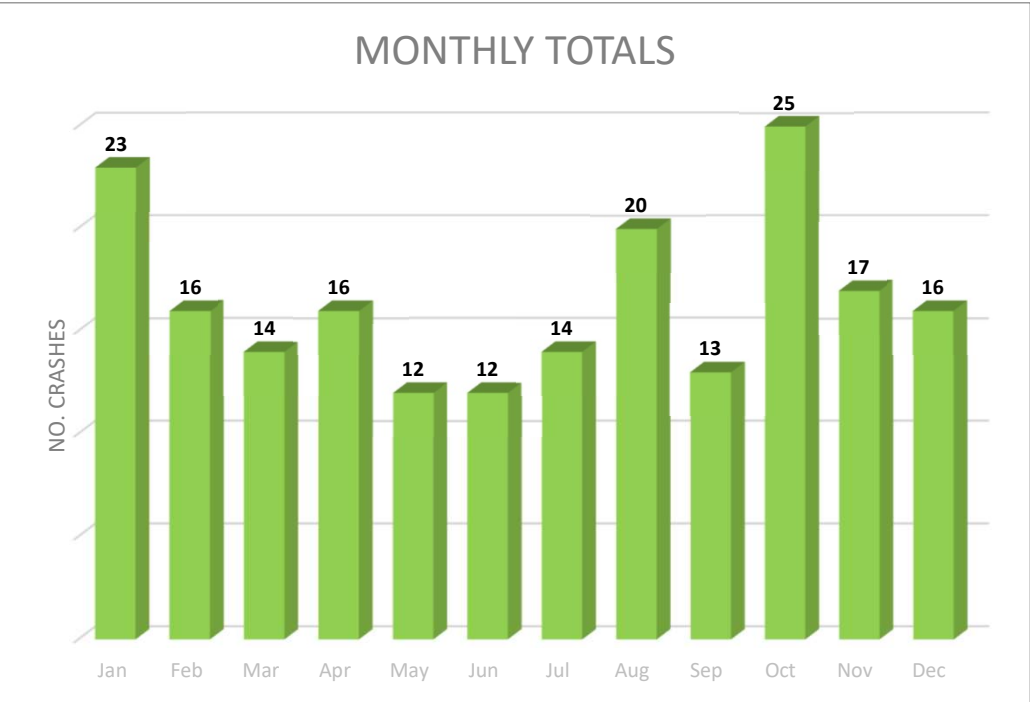
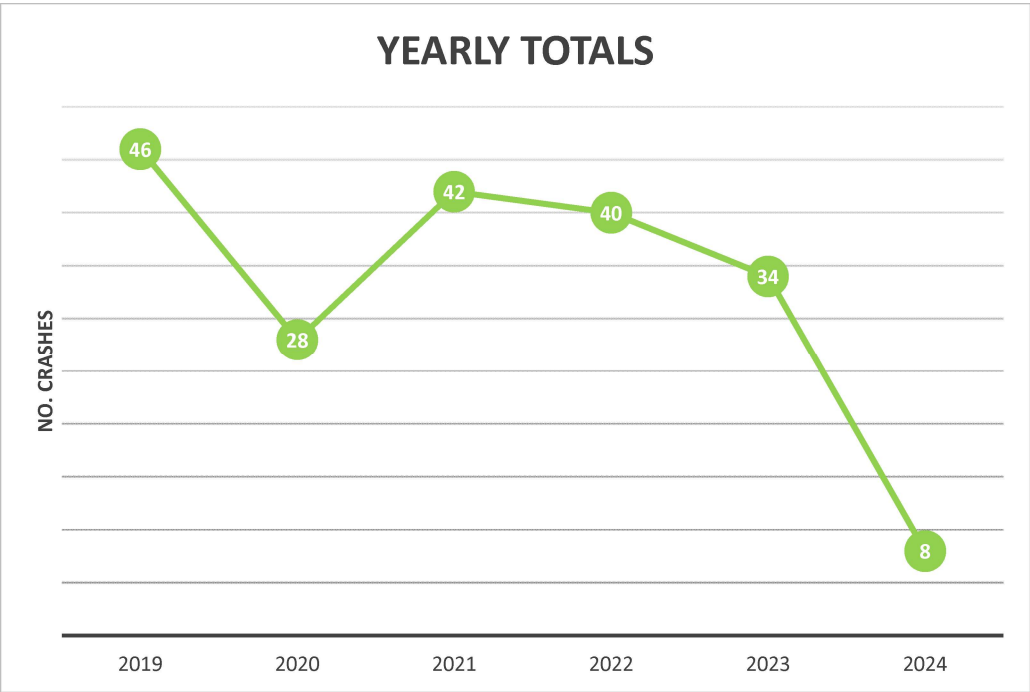
Traffic Counts - Motorized Vehicles

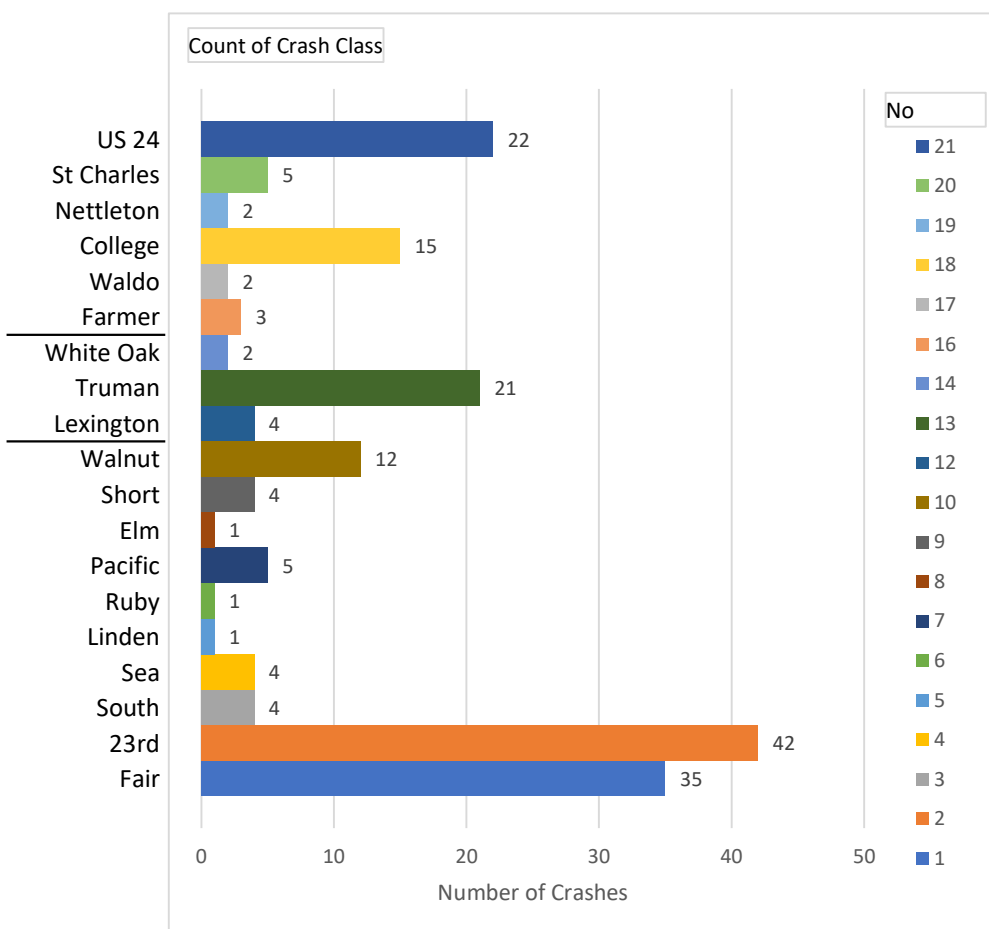
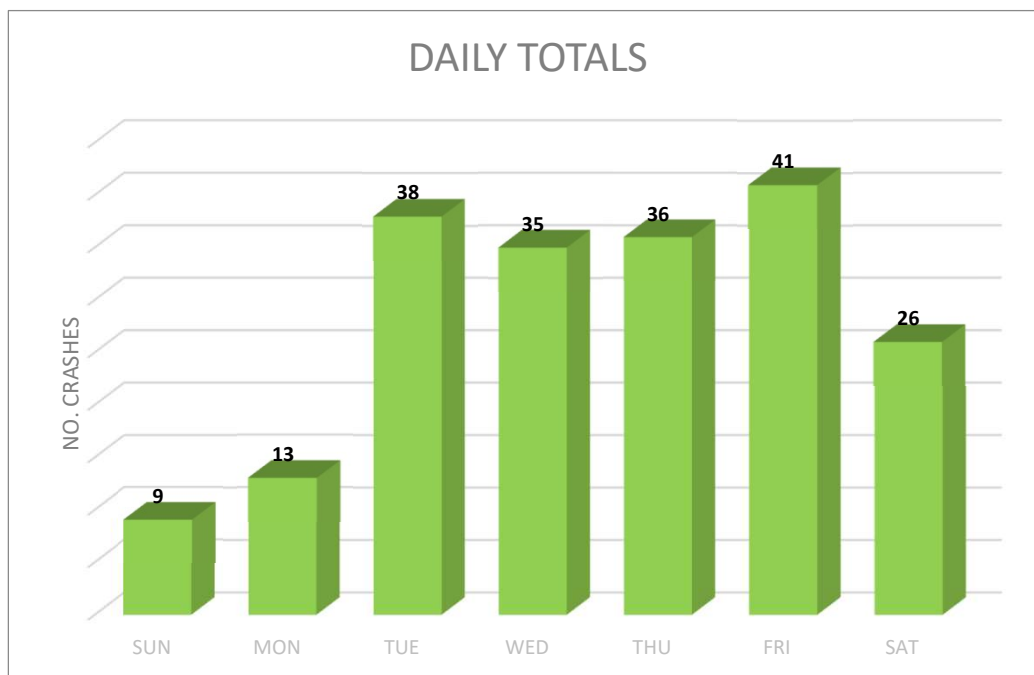
Interval Start Time	FAIR ST Eastbound				FAIR ST Westbound				NOLAND RD Northbound				NOLAND RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30 PM	0	5	5	8	0	11	5	11	0	4	209	17	2	6	193	1	477	1,916	0	1	0	0
3:45 PM	0	7	5	15	0	14	3	14	0	9	195	20	0	7	199	3	491	1,940	0	6	0	0
4:00 PM	0	11	2	14	0	8	10	14	0	8	205	16	0	4	208	1	501	1,982	0	0	0	0
4:15 PM	0	8	3	12	0	22	7	6	0	11	186	10	1	12	168	1	447	1,981	1	0	4	0
4:30 PM	0	5	2	8	0	11	3	9	0	11	215	23	0	3	206	5	501	2,017	0	0	0	0
4:45 PM	0	10	11	16	0	13	7	8	0	9	203	11	1	6	234	4	533		0	0	0	0
5:00 PM	0	22	1	17	0	8	3	8	0	18	169	23	0	7	219	5	500		0	1	0	0
5:15 PM	0	14	3	9	0	18	5	11	0	13	190	16	0	4	198	2	483		0	2	1	1
Count Total	0	82	32	99	0	105	43	81	0	83	1,572	136	4	49	1,625	22	3,933		1	10	5	1
Peak Hour	0	51	17	50	0	50	18	36	0	51	777	73	1	20	857	16	2,017		0	3	1	1

CST NOLAND f LEFT TURN	12/4/2019 0:00	PROPERTY DAMAGE ONLY	2190085269	DAYLIGHT	DRY	CLEAR	1328	39.09518	-94.41284	2 CST FARMER ST	17310 Straight	No	1	0	0	0	16 Intersection
CST NOLAND f BACKING	4/19/2022 0:00	PROPERTY DAMAGE ONLY	2220028478	DARK W/ STRE	DRY	CLEAR	2159	39.09519	-94.41285	2 CST FARMER ST	14123 Straight	No	1	0	0	0	16 Intersection
CST NOLAND f REAR END	10/7/2020 0:00	PROPERTY DAMAGE ONLY	2200077412	DAYLIGHT	DRY	CLEAR	1425	39.09627	-94.41303	2 CST WALDO AVE	16824 Straight	No	1	0	0	0	17 Intersection
CST NOLAND f CHANGING LANE	5/31/2019 0:00	SUSPECTED SERIOUS INJURY	2190031930	DAYLIGHT	DRY	CLEAR	1553	39.09654	-94.41305	2 CST WALDO AVE	17310 Straight	No	0	0	1	0	17 Intersection
CST NOLAND f RIGHT TURN	4/23/2021 0:00	PROPERTY DAMAGE ONLY	2210031113	DAYLIGHT	WET	RAIN	1536	39.09707	-94.41303	2 CST COLLEGE ST	14451 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f REAR END	11/25/2022 0:00	PROPERTY DAMAGE ONLY	2220101274	DAYLIGHT	DRY	CLEAR	1443	39.09738	-94.41299	2 CST COLLEGE ST	14123 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f OUT OF CONTROL	7/4/2023 0:00	PROPERTY DAMAGE ONLY	2230052885	DARK W/ STRE	DRY	CLEAR	2224	39.09738	-94.41299	1 CST COLLEGE ST	13910 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f PASSING	11/29/2021 0:00	PROPERTY DAMAGE ONLY	2210110772	DARK W/ STRE	DRY	CLEAR	1759	39.09743	-94.41299	2 CST COLLEGE ST	14451 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f RIGHT ANGLE	2/1/2019 0:00	MINOR INJURY	2190006164	DAYLIGHT	DRY	CLEAR	1400	39.09745	-94.41299	2 CST COLLEGE ST	17310 Straight	No	0	1	0	0	18 Intersection
CST NOLAND f PASSING	7/14/2020 0:00	PROPERTY DAMAGE ONLY	2200049291	DAYLIGHT	DRY	CLEAR	1955	39.09745	-94.41299	2 CST COLLEGE ST	16824 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f LEFT TURN RIGHT ANGLE C	1/30/2021 0:00	PROPERTY DAMAGE ONLY	2210009011	DAYLIGHT	WET	CLOUDY	1550	39.09745	-94.41299	2 CST COLLEGE ST	14451 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f LEFT TURN	10/2/2021 0:00	MINOR INJURY	2210084870	DAYLIGHT	DRY	CLOUDY	1211	39.09745	-94.41299	2 CST COLLEGE ST	14451 Straight	No	0	1	0	0	18 Intersection
CST NOLAND f RIGHT ANGLE	12/10/2022 0:00	PROPERTY DAMAGE ONLY	2220110203	DAYLIGHT	DRY	CLEAR	1338	39.09745	-94.41299	2 CST COLLEGE ST	14123 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f PEDALCYCLE	4/21/2023 0:00	MINOR INJURY	2230034481	DAYLIGHT	DRY	CLEAR	1643	39.09745	-94.41299	2 CST COLLEGE ST	13910 Straight	No	0	1	0	0	18 Intersection
CST NOLAND f OUT OF CONTROL	9/23/2019 0:00	PROPERTY DAMAGE ONLY	2190060824	DARK W/ STRE	DRY	CLEAR	0	39.09757	-94.41299	1 CST COLLEGE ST	17310 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f LEFT TURN	12/7/2023 0:00	PROPERTY DAMAGE ONLY	2230103805	DAYLIGHT	DRY	CLEAR	1624	39.09761	-94.41299	2 CST COLLEGE ST	13910 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f REAR END	6/21/2019 0:00	MINOR INJURY	2190041171	DAYLIGHT	DRY	CLEAR	1549	39.09764	-94.41298	3 CST COLLEGE ST	17310 Straight	No	0	1	0	0	18 Intersection
CST NOLAND f RIGHT TURN RIGHT ANGLE	4/23/2020 0:00	PROPERTY DAMAGE ONLY	2200028181	DAYLIGHT	DRY	CLEAR	1820	39.09773	-94.41298	2 CST COLLEGE ST	16824 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f LEFT TURN RIGHT ANGLE C	2/14/2021 0:00	PROPERTY DAMAGE ONLY	2210011390	DAYLIGHT	SNOW	CLOUDY	1640	39.09776	-94.41298	2 CST COLLEGE ST	14451 Straight	No	1	0	0	0	18 Intersection
CST NOLAND f PEDALCYCLE	12/25/2019 0:00	MINOR INJURY	2190092975	DARK W/ STRE	DRY	CLEAR	1709	39.09839	-94.41298	2 CST NETTLETON AVE	17310 Straight	No	0	1	0	0	19 Intersection
CST NOLAND f HEAD ON	10/26/2023 0:00	MINOR INJURY	2230092838	DARK W/ STRE	WET	RAIN	658	39.09871	-94.41298	2 CST NETTLETON AVE	13910 Straight	No	0	1	0	0	19 Intersection
CST NOLAND f REAR END	4/10/2019 0:00	PROPERTY DAMAGE ONLY	2190021243	DAYLIGHT	DRY	CLEAR	711	39.09998	-94.41289	3 CST CHARLES ST	17310 Straight	No	1	0	0	0	20 Intersection
CST NOLAND f LEFT TURN	5/22/2019 0:00	MINOR INJURY	2190030150	DAYLIGHT	DRY	CLOUDY	1451	39.09998	-94.41289	2 CST CHARLES ST	17310 Straight	No	0	1	0	0	20 Intersection
CST NOLAND f RIGHT TURN	7/6/2021 0:00	MINOR INJURY	2210056460	DAYLIGHT	DRY	CLEAR	1128	39.09998	-94.41289	2 CST CHARLES ST	14451 Straight	No	0	1	0	0	20 Intersection
CST NOLAND f LEFT TURN	1/31/2023 0:00	MINOR INJURY	2230008762	DAYLIGHT	DRY	CLEAR	710	39.10011	-94.41288	2 CST CHARLES ST	13910 Straight	No	0	1	0	0	20 Intersection
CST NOLAND f REAR END	12/5/2023 0:00	PROPERTY DAMAGE ONLY	2230101414	DAYLIGHT	DRY	CLEAR	703	39.10014	-94.41287	3 CST CHARLES ST	13910 Straight	No	1	0	0	0	20 Intersection
CST NOLAND f REAR END	1/28/2022 0:00	MINOR INJURY	2220006571	DARK W/ STRE	DRY	CLEAR	711	39.10083	-94.41282	4 US 24	14123 Straight	No	0	1	0	0	21 Intersection
CST NOLAND f REAR END	2/23/2019 0:00	MINOR INJURY	2190010914	DARK W/ STRE	WET	RAIN	1820	39.10084	-94.41282	2 CST INDEPENDENCE AVE	17310 Straight	No	0	1	0	0	21 Intersection
CST NOLAND f REAR END	10/13/2022 0:00	PROPERTY DAMAGE ONLY	2220089738	DARK W/ STRE	DRY	CLEAR	700	39.10084	-94.41282	2 CST INDEPENDENCE AVE	14123 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f REAR END	4/7/2021 0:00	PROPERTY DAMAGE ONLY	2210027526	DAYLIGHT	WET	RAIN	1530	39.10093	-94.41281	2 CST INDEPENDENCE AVE	14451 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f REAR END	4/3/2019 0:00	PROPERTY DAMAGE ONLY	2190019531	DAYLIGHT	DRY	CLOUDY	1502	39.10096	-94.41281	2 CST INDEPENDENCE AVE	17310 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f LEFT TURN RIGHT ANGLE C	11/2/2019 0:00	MINOR INJURY	2190073947	DAYLIGHT	DRY	CLEAR	1305	39.10097	-94.41281	2 CST INDEPENDENCE AVE	17310 Straight	No	0	1	0	0	21 Intersection
CST NOLAND f PASSING	1/25/2024 0:00	PROPERTY DAMAGE ONLY	2240003918	DAYLIGHT	WET	CLOUDY	800	39.10097	-94.41281	2 CST INDEPENDENCE AVE	13910 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f REAR END	3/23/2019 0:00	PROPERTY DAMAGE ONLY	2190025816	DAYLIGHT	DRY	CLOUDY	1551	39.101	-94.41281	2 CST INDEPENDENCE AVE	17310 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f LEFT TURN RIGHT ANGLE C	10/12/2022 0:00	PROPERTY DAMAGE ONLY	2220082277	DAYLIGHT	WET	RAIN	752	39.101	-94.41281	2 US 24	14123 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f CHANGING LANE	8/31/2021 0:00	PROPERTY DAMAGE ONLY	2210073809	DAYLIGHT	DRY	CLOUDY	832	39.10104	-94.41281	2 US 24	14451 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f RIGHT TURN RIGHT ANGLE	1/31/2020 0:00	PROPERTY DAMAGE ONLY	2200011370	DAYLIGHT	DRY	CLOUDY	1602	39.10112	-94.4128	2 CST INDEPENDENCE AVE	16824 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f LEFT TURN RIGHT ANGLE C	2/1/2019 0:00	PROPERTY DAMAGE ONLY	2190006543	DAYLIGHT	DRY	CLEAR	1710	39.10116	-94.4128	3 US 24	17310 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f REAR END	5/21/2020 0:00	PROPERTY DAMAGE ONLY	2200048823	DAYLIGHT	DRY	CLEAR	1639	39.10122	-94.41279	2 CST INDEPENDENCE AVE	16824 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f LEFT TURN	7/25/2021 0:00	PROPERTY DAMAGE ONLY	2210065396	DARK W/ STRE	DRY	CLEAR	2250	39.10123	-94.41279	2 CST INDEPENDENCE AVE	14451 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f REAR END	7/31/2022 0:00	PROPERTY DAMAGE ONLY	2220060677	DAYLIGHT	DRY	CLEAR	1646	39.10123	-94.41279	2 US 24	14123 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f PASSING	12/15/2023 0:00	PROPERTY DAMAGE ONLY	2230109932	DARK W/ STRE	WET	RAIN	2208	39.10123	-94.41279	2 CST INDEPENDENCE AVE	13910 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f RIGHT TURN RIGHT ANGLE	10/24/2021 0:00	PROPERTY DAMAGE ONLY	2210097658	DARK W/ STRE	DRY	CLOUDY	2220	39.10125	-94.41279	2 US 24	14451 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f HEAD ON	3/11/2022 0:00	MINOR INJURY	2220024473	DARK W/ STRE	DRY	CLEAR	1959	39.10125	-94.41279	2 CST INDEPENDENCE AVE	14123 Straight	No	0	1	0	0	21 Intersection
CST NOLAND f RIGHT ANGLE	5/27/2022 0:00	PROPERTY DAMAGE ONLY	2220041391	DARK W/ STRE	DRY	CLEAR	2209	39.10125	-94.41279	2 CST INDEPENDENCE AVE	14123 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f PEDALCYCLE	4/14/2023 0:00	MINOR INJURY	2230027269	DAYLIGHT	DRY	CLEAR	1048	39.10125	-94.41279	2 US 24	13910 Straight	No	0	1	0	0	21 Intersection
CST NOLAND f REAR END	3/12/2022 0:00	PROPERTY DAMAGE ONLY	2220024474	DARK W/ STRE	DRY	CLEAR	2117	39.10127	-94.41279	2 US 24	13363 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f SIDESWIPE	1/10/2019 0:00	PROPERTY DAMAGE ONLY	2190001999	DAYLIGHT	DRY	CLOUDY	659	39.10135	-94.41279	2 CST INDEPENDENCE AVE	15512 Straight	No	1	0	0	0	21 Intersection
CST NOLAND f REAR END	2/14/2019 0:00	PROPERTY DAMAGE ONLY	2190009713	DAYLIGHT	DRY	CLEAR	1400	39.07926	-94.41386	2 MO 78	17310 Straight	No	1	0	0	0	Intersection

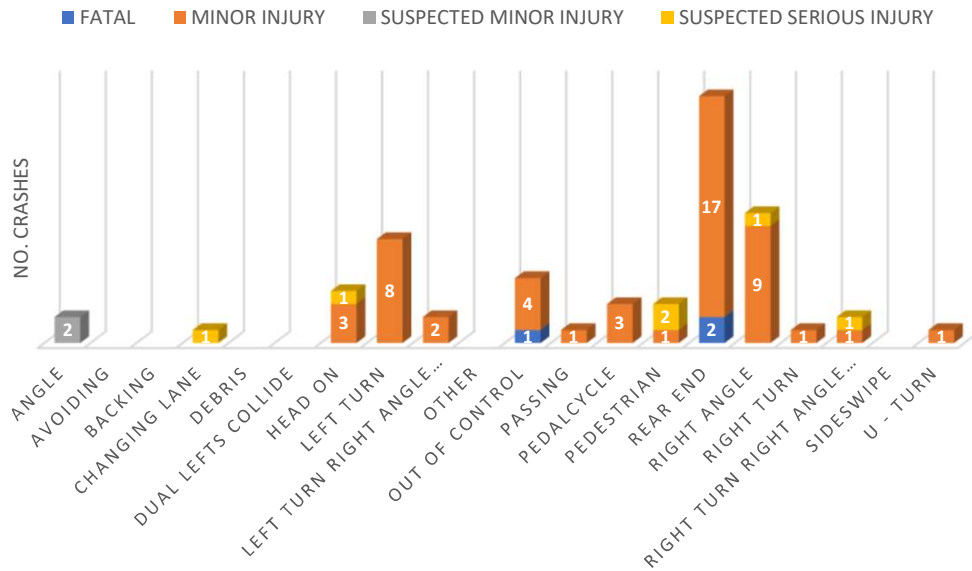
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195
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Severity	
PROPERTY DAMAGE ONLY	136
MINOR INJURY	51
SUSPECTED MINOR INJURY	2
SUSPECTED SERIOUS INJURY	6
FATAL	3
Grand Total	198



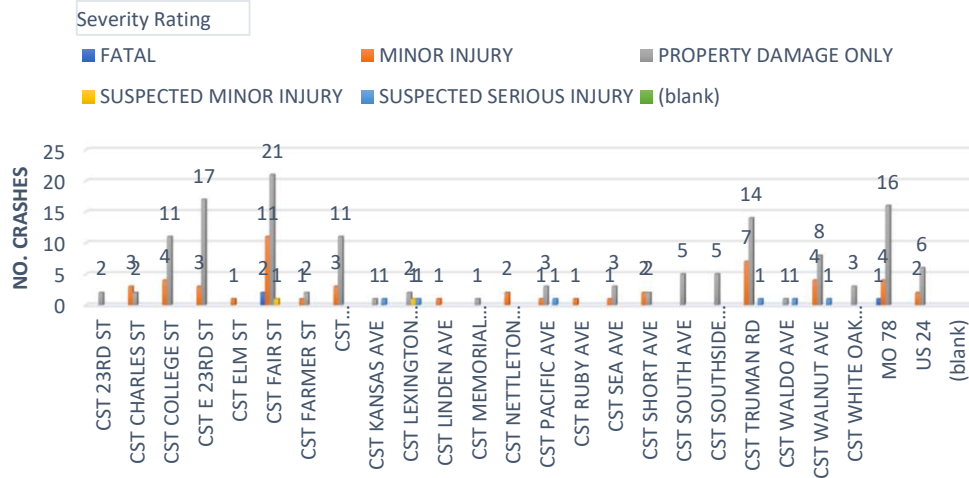


CRASH TYPE VS. SEVERITY

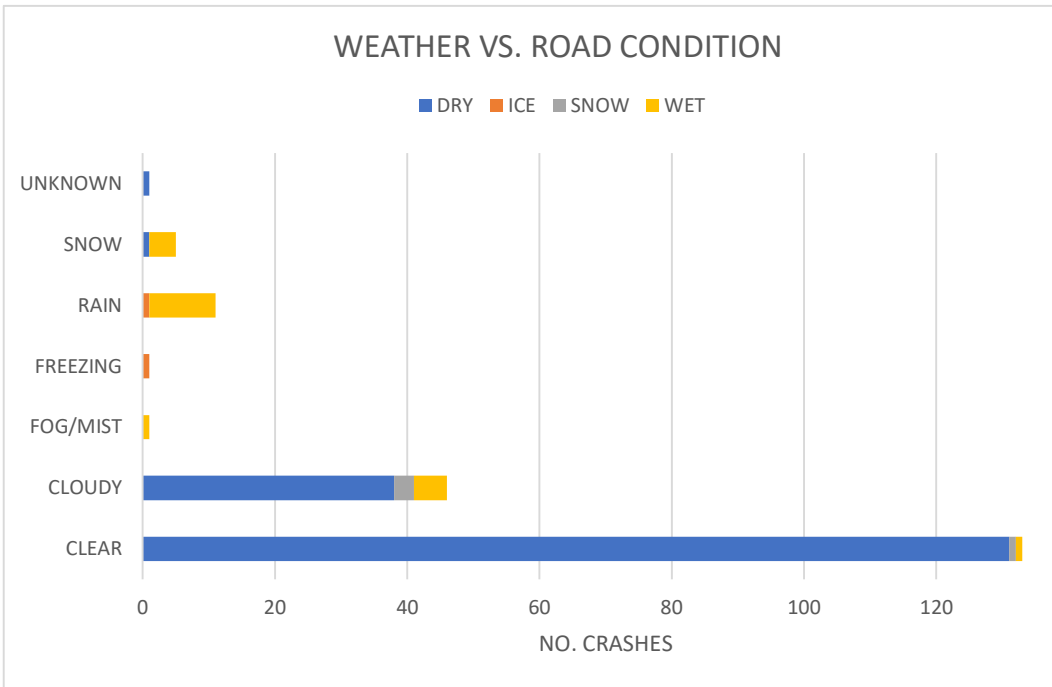
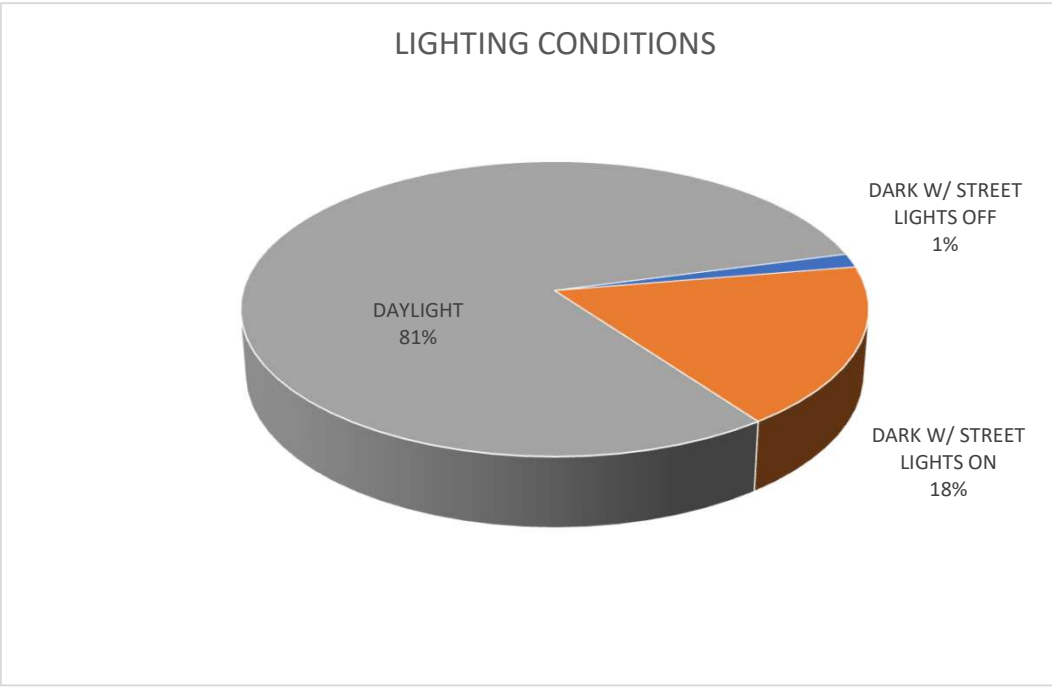


Count of Severity Rating

CRASH TYPE VS. SEVERITY by Intersection



Near Street Location Crash Class



APPENDIX B

Existing Conditions

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	462	117	645	126	140	82	76	181
v/c Ratio	0.09	0.30	0.22	0.36	0.40	0.48	0.21	0.25	0.41
Control Delay	10.3	14.3	10.4	16.0	30.4	44.3	1.3	27.7	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	14.3	10.4	16.0	30.4	44.3	1.3	27.7	32.0
Queue Length 50th (ft)	9	67	29	126	59	81	0	35	41
Queue Length 95th (ft)	26	119	60	195	107	146	0	70	75
Internal Link Dist (ft)		612		1268		380			1054
Turn Bay Length (ft)	100		180		200			140	
Base Capacity (vph)	500	1517	625	1781	320	347	427	337	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.30	0.19	0.36	0.39	0.40	0.19	0.23	0.28
Intersection Summary									

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	274	151	108	512	81	116	129	75	70	122	44
Future Volume (vph)	36	274	151	108	512	81	116	129	75	70	122	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3351		1770	3467		1770	1863	1583	1770	3398	
Flt Permitted	0.39	1.00		0.42	1.00		0.54	1.00	1.00	0.67	1.00	
Satd. Flow (perm)	725	3351		787	3467		1003	1863	1583	1244	3398	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	298	164	117	557	88	126	140	82	76	133	48
RTOR Reduction (vph)	0	63	0	0	11	0	0	0	70	0	37	0
Lane Group Flow (vph)	39	399	0	117	634	0	126	140	12	76	144	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	47.5	43.5		56.5	48.0		23.9	14.8	14.8	19.5	12.6	
Effective Green, g (s)	47.5	43.5		56.5	48.0		23.9	14.8	14.8	19.5	12.6	
Actuated g/C Ratio	0.49	0.44		0.58	0.49		0.24	0.15	0.15	0.20	0.13	
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	394	1488		539	1699		316	281	239	284	437	
v/s Ratio Prot	0.00	0.12		c0.02	c0.18		c0.04	c0.08		0.02	0.04	
v/s Ratio Perm	0.04			0.11			0.06		0.01	0.03		
v/c Ratio	0.10	0.27		0.22	0.37		0.40	0.50	0.05	0.27	0.33	
Uniform Delay, d1	13.3	17.2		9.6	15.6		30.1	38.1	35.5	32.8	38.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.2	0.6		0.8	1.4	0.1	0.5	0.4	
Delay (s)	13.4	17.6		9.8	16.2		31.0	39.5	35.6	33.3	39.3	
Level of Service	B	B		A	B		C	D	D	C	D	
Approach Delay (s)		17.3			15.2			35.5			37.5	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			22.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			97.9			Sum of lost time (s)			24.2			
Intersection Capacity Utilization			53.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	4	323	383	1
Future Vol, veh/h	0	5	4	323	383	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	4	351	416	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	601	209	417	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	184	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	432	797	1138	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	430	797	1138	-	-	-
Mov Cap-2 Maneuver	430	-	-	-	-	-
Stage 1	630	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.5	0.1		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1138	-	797	-	-	
HCM Lane V/C Ratio	0.004	-	0.007	-	-	
HCM Control Delay (s)	8.2	-	9.5	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	324	2	2	386
Future Vol, veh/h	7	6	324	2	2	386
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	352	2	2	420
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	567	177	0	0	354	0
Stage 1	353	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	454	835	-	-	1201	-
Stage 1	682	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	453	835	-	-	1201	-
Mov Cap-2 Maneuver	453	-	-	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	574	1201	-	
HCM Lane V/C Ratio	-	-	0.025	0.002	-	
HCM Control Delay (s)	-	-	11.4	8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	53	13	352	8	420
v/c Ratio	0.19	0.28	0.02	0.12	0.01	0.14
Control Delay	20.5	31.2	1.2	1.2	2.9	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	31.2	1.2	1.2	2.9	2.4
Queue Length 50th (ft)	5	19	2	26	1	26
Queue Length 95th (ft)	32	53	m0	2	4	40
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	657	590	800	2985	854	2995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.09	0.02	0.12	0.01	0.14

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	6	22	27	9	13	12	309	15	7	383	4
Future Volume (vph)	4	6	22	27	9	13	12	309	15	7	383	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1681			1748		1770	3515		1770	3534	
Flt Permitted		0.95			0.81		0.51	1.00		0.54	1.00	
Satd. Flow (perm)		1607			1456		943	3515		1008	3534	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	7	24	29	10	14	13	336	16	8	416	4
RTOR Reduction (vph)	0	22	0	0	13	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	40	0	13	350	0	8	420	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Effective Green, g (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Actuated g/C Ratio		0.07			0.07		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		117			106		751	2799		799	2802	
v/s Ratio Prot								0.10			c0.12	
v/s Ratio Perm		0.01			c0.03		0.01			0.01		
v/c Ratio		0.11			0.38		0.02	0.13		0.01	0.15	
Uniform Delay, d1		36.8			37.6		1.8	2.0		1.8	2.1	
Progression Factor		1.00			1.00		0.44	0.53		1.00	1.00	
Incremental Delay, d2		0.4			2.2		0.0	0.1		0.0	0.1	
Delay (s)		37.2			39.8		0.8	1.1		1.9	2.2	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		37.2			39.8			1.1			2.2	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.17										
Actuated Cycle Length (s)		85.0			Sum of lost time (s)			11.4				
Intersection Capacity Utilization		28.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↕↵		↵	↕↵	
Traffic Vol, veh/h	1	1	2	1	0	1	2	333	4	6	432	1
Future Vol, veh/h	1	1	2	1	0	1	2	333	4	6	432	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	1	0	1	2	362	4	7	470	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	670	855	236	618	853	183	471	0	0	366	0	0
Stage 1	485	485	-	368	368	-	-	-	-	-	-	-
Stage 2	185	370	-	250	485	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	343	294	766	373	295	828	1087	-	-	1189	-	-
Stage 1	532	550	-	624	620	-	-	-	-	-	-	-
Stage 2	799	619	-	732	550	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	341	292	766	369	293	828	1087	-	-	1189	-	-
Mov Cap-2 Maneuver	341	292	-	369	293	-	-	-	-	-	-	-
Stage 1	531	547	-	623	619	-	-	-	-	-	-	-
Stage 2	796	618	-	724	547	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	13.2		12.1		0		0.1					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1087	-	-	446	510	1189	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.01	0.004	0.005	-	-				
HCM Control Delay (s)	8.3	-	-	13.2	12.1	8	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	2	0	12	3	1	0	11	338	6	0	431	0
Future Vol, veh/h	2	0	12	3	1	0	11	338	6	0	431	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	13	3	1	0	12	367	7	0	468	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	676	866	234	629	863	187	468	0	0	374	0	0
Stage 1	468	468	-	395	395	-	-	-	-	-	-	-
Stage 2	208	398	-	234	468	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	339	290	768	367	291	823	1090	-	-	1181	-	-
Stage 1	545	560	-	602	603	-	-	-	-	-	-	-
Stage 2	775	601	-	748	560	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	335	287	768	358	288	823	1090	-	-	1181	-	-
Mov Cap-2 Maneuver	335	287	-	358	288	-	-	-	-	-	-	-
Stage 1	539	560	-	595	596	-	-	-	-	-	-	-
Stage 2	765	594	-	735	560	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.7		15.8		0.3		0					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1090	-	-	648	337	1181	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.023	0.013	-	-	-				
HCM Control Delay (s)	8.3	-	-	10.7	15.8	0	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-				

HCM 6th TWSC
8: Noland Road & White Oak Street

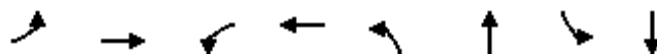
09/30/2024

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	20	364	445	1
Future Vol, veh/h	1	18	20	364	445	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	20	22	396	484	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	727	243	485	0	-	0
Stage 1	485	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	359	758	1074	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	352	758	1074	-	-	-
Mov Cap-2 Maneuver	352	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.2	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1074	-	715	-	-	
HCM Lane V/C Ratio	0.02	-	0.029	-	-	
HCM Control Delay (s)	8.4	-	10.2	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	203	80	444	57	315	129	377
v/c Ratio	0.14	0.32	0.22	0.49	0.13	0.25	0.30	0.25
Control Delay	31.3	23.9	28.1	24.4	15.1	13.0	19.1	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	23.9	28.1	24.4	15.1	13.0	19.1	17.0
Queue Length 50th (ft)	12	36	30	76	13	33	49	76
Queue Length 95th (ft)	35	67	72	137	22	36	99	123
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	188	805	452	1082	435	1254	446	1535
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.18	0.41	0.13	0.25	0.29	0.25
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	138	49	74	286	122	52	241	49	119	323	24
Future Volume (vph)	25	138	49	74	286	122	52	241	49	119	323	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3380		1770	3450		1770	3503	
Flt Permitted	0.32	1.00		0.62	1.00		0.53	1.00		0.39	1.00	
Satd. Flow (perm)	591	3401		1163	3380		984	3450		723	3503	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	150	53	80	311	133	57	262	53	129	351	26
RTOR Reduction (vph)	0	44	0	0	58	0	0	18	0	0	5	0
Lane Group Flow (vph)	27	159	0	80	386	0	57	297	0	129	372	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.0	15.0		21.6	21.6		26.3	26.3		30.6	30.6	
Effective Green, g (s)	15.0	15.0		21.6	21.6		26.3	26.3		30.6	30.6	
Actuated g/C Ratio	0.18	0.18		0.25	0.25		0.31	0.31		0.36	0.36	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	600		359	858		353	1067		380	1261	
v/s Ratio Prot	0.01	c0.05		0.02	c0.11		0.01	c0.09		0.04	c0.11	
v/s Ratio Perm	0.03			0.03			0.04			c0.08		
v/c Ratio	0.20	0.27		0.22	0.45		0.16	0.28		0.34	0.29	
Uniform Delay, d1	29.7	30.2		25.4	26.7		21.5	22.2		19.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		0.62	0.63		0.92	0.93	
Incremental Delay, d2	0.7	0.2		0.3	0.4		0.2	0.6		0.5	0.6	
Delay (s)	30.4	30.5		25.7	27.1		13.6	14.6		18.0	18.6	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s)		30.5			26.9			14.4			18.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			85.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			57.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↱	↕↱		↱	↕↱	
Traffic Vol, veh/h	2	4	12	10	8	5	46	328	5	6	420	15
Future Vol, veh/h	2	4	12	10	8	5	46	328	5	6	420	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	13	11	9	5	50	357	5	7	457	16
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	762	941	237	705	947	181	473	0	0	362	0	0
Stage 1	479	479	-	460	460	-	-	-	-	-	-	-
Stage 2	283	462	-	245	487	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	294	262	764	323	260	831	1085	-	-	1193	-	-
Stage 1	537	553	-	551	564	-	-	-	-	-	-	-
Stage 2	700	563	-	737	549	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	273	248	764	301	246	831	1085	-	-	1193	-	-
Mov Cap-2 Maneuver	273	248	-	301	246	-	-	-	-	-	-	-
Stage 1	512	550	-	526	538	-	-	-	-	-	-	-
Stage 2	653	537	-	714	546	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	13.2		17.2		1		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1085	-	-	460	321	1193	-	-				
HCM Lane V/C Ratio	0.046	-	-	0.043	0.078	0.005	-	-				
HCM Control Delay (s)	8.5	-	-	13.2	17.2	8	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.3	0	-	-				

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	366	1	2	439
Future Vol, veh/h	2	8	366	1	2	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	10	446	1	2	535
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	719	224	0	0	447	0
Stage 1	447	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	363	779	-	-	1110	-
Stage 1	611	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	779	-	-	1110	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	633	1110	-	
HCM Lane V/C Ratio	-	-	0.019	0.002	-	
HCM Control Delay (s)	-	-	10.8	8.2	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	113	79	65	425	5	523
v/c Ratio	0.24	0.25	0.31	0.36	0.21	0.04	0.32
Control Delay	35.2	1.3	33.5	40.6	13.6	24.2	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	1.3	33.5	40.6	13.6	24.2	11.1
Queue Length 50th (ft)	29	0	35	33	64	3	59
Queue Length 95th (ft)	59	0	68	63	111	m10	73
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	273	471	291	324	1995	141	1612
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.27	0.20	0.21	0.04	0.32

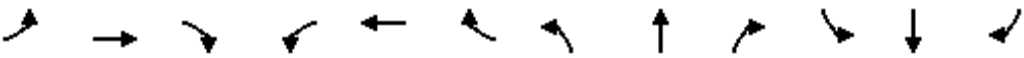
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱		↰	↱	
Traffic Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Future Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1583		1787		1770	3519		1770	3507	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1814	1583		1787		1770	3519		1770	3507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	33	28	113	39	30	10	65	409	16	5	491	32
RTOR Reduction (vph)	0	0	100	0	6	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	13	0	73	0	65	422	0	5	519	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Effective Green, g (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Actuated g/C Ratio		0.11	0.11		0.11		0.09	0.47		0.02	0.40	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		204	178		201		154	1664		29	1411	
v/s Ratio Prot		c0.03			c0.04		c0.04	0.12		0.00	c0.15	
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.07		0.36		0.42	0.25		0.17	0.37	
Uniform Delay, d1		34.6	33.7		34.9		36.8	13.4		41.2	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.65	0.52	
Incremental Delay, d2		0.8	0.2		1.1		1.9	0.4		2.8	0.7	
Delay (s)		35.4	33.9		36.0		38.6	13.8		29.6	10.0	
Level of Service		D	C		D		D	B		C	A	
Approach Delay (s)		34.4			36.0			17.1			10.1	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.7									
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			85.0									
Intersection Capacity Utilization			48.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Future Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	37	501	4	1	627	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	958	1212	318	893	1214	253	635	0	0	505	0	0
Stage 1	633	633	-	577	577	-	-	-	-	-	-	-
Stage 2	325	579	-	316	637	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	212	181	678	236	180	746	944	-	-	1056	-	-
Stage 1	434	472	-	469	500	-	-	-	-	-	-	-
Stage 2	661	499	-	670	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	205	174	678	229	173	746	944	-	-	1056	-	-
Mov Cap-2 Maneuver	205	174	-	229	173	-	-	-	-	-	-	-
Stage 1	417	472	-	451	481	-	-	-	-	-	-	-
Stage 2	632	480	-	669	470	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		17.5		0.6		0	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	-	298	1056	-
HCM Lane V/C Ratio	0.04	-	-	-	0.036	0.001	-
HCM Control Delay (s)	9	-	-	0	17.5	8.4	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0	-

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↙	↕	
Traffic Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Future Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	4	0	5	0	534	0	1	634	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	903	1170	317	853	1170	267	-	0	0	534	0	0
Stage 1	636	636	-	534	534	-	-	-	-	-	-	-
Stage 2	267	534	-	319	636	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	232	192	679	253	192	731	0	-	-	1030	-	-
Stage 1	433	470	-	498	523	-	0	-	-	-	-	-
Stage 2	715	523	-	667	470	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	192	679	249	192	731	-	-	-	1030	-	-
Mov Cap-2 Maneuver	230	192	-	249	192	-	-	-	-	-	-	-
Stage 1	433	470	-	498	523	-	-	-	-	-	-	-
Stage 2	710	523	-	656	470	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		14.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		568 400		1030	-	-			
HCM Lane V/C Ratio	-		-		0.021 0.021		0.001	-	-			
HCM Control Delay (s)	-		-		11.5 14.2		8.5	-	-			
HCM Lane LOS	-		-		B B		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.1 0.1		0	-	-			

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Future Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	13	21	4	24	12	526	17	7	646	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	950	1228	324	897	1221	272	648	0	0	543	0	0
Stage 1	661	661	-	559	559	-	-	-	-	-	-	-
Stage 2	289	567	-	338	662	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	215	177	672	235	179	726	934	-	-	1022	-	-
Stage 1	418	458	-	481	509	-	-	-	-	-	-	-
Stage 2	694	505	-	650	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	201	173	672	226	175	726	934	-	-	1022	-	-
Mov Cap-2 Maneuver	201	173	-	226	175	-	-	-	-	-	-	-
Stage 1	413	455	-	475	502	-	-	-	-	-	-	-
Stage 2	657	498	-	631	454	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.8		17.6		0.2		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	934	-	-	479	334	1022	-	-				
HCM Lane V/C Ratio	0.013	-	-	0.033	0.146	0.007	-	-				
HCM Control Delay (s)	8.9	-	-	12.8	17.6	8.5	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-	-				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	3	449	561	0
Future Vol, veh/h	1	11	3	449	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	4	554	693	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	978	347	693	0	-	0
Stage 1	693	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	248	649	898	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	649	898	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	571	-	-	
HCM Lane V/C Ratio	0.004	-	0.026	-	-	
HCM Control Delay (s)	9	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	4	456	572	2
Future Vol, veh/h	0	17	4	456	572	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	5	563	706	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	999	354	708	0	-	0
Stage 1	707	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	240	642	887	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	239	642	887	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	887	-	642	-	-	
HCM Lane V/C Ratio	0.006	-	0.033	-	-	
HCM Control Delay (s)	9.1	-	10.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	3	453	5	7	575
Future Vol, veh/h	5	3	453	5	7	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	559	6	9	710
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	935	283	0	0	565	0
Stage 1	562	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	264	714	-	-	1003	-
Stage 1	534	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	262	714	-	-	1003	-
Mov Cap-2 Maneuver	262	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15.8	0	0.1			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	344	1003	-	
HCM Lane V/C Ratio	-	-	0.029	0.009	-	
HCM Control Delay (s)	-	-	15.8	8.6	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Future Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	22	5	4	12	5	546	4	1	705	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	998	1273	359	913	1277	275	717	0	0	550	0	0
Stage 1	713	713	-	558	558	-	-	-	-	-	-	-
Stage 2	285	560	-	355	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	198	166	638	228	165	722	880	-	-	1016	-	-
Stage 1	389	434	-	482	510	-	-	-	-	-	-	-
Stage 2	698	509	-	635	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	190	165	638	218	164	722	880	-	-	1016	-	-
Mov Cap-2 Maneuver	190	165	-	218	164	-	-	-	-	-	-	-
Stage 1	387	434	-	479	507	-	-	-	-	-	-	-
Stage 2	677	506	-	611	431	-	-	-	-	-	-	-

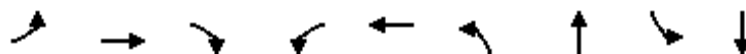
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		16.4		0.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	880	-	-	506	337	1016	-
HCM Lane V/C Ratio	0.006	-	-	0.048	0.062	0.001	-
HCM Control Delay (s)	9.1	-	-	12.5	16.4	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	593	151	151	858	206	395	219	455
v/c Ratio	0.93	0.43	0.21	0.71	0.54	0.57	0.69	0.67	0.90
Control Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Length 50th (ft)	71	176	0	113	237	80	138	85	173
Queue Length 95th (ft)	#170	237	35	181	311	114	182	124	#255
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	97	1391	722	234	1597	503	692	346	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.43	0.21	0.65	0.54	0.41	0.57	0.63	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Future Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	593	151	151	709	149	206	278	117	219	344	111
RTOR Reduction (vph)	0	0	92	0	14	0	0	40	0	0	26	0
Lane Group Flow (vph)	90	593	59	151	844	0	206	355	0	219	429	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Effective Green, g (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Actuated g/C Ratio	0.06	0.39	0.39	0.12	0.46		0.11	0.16		0.10	0.14	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	1392	622	215	1582		363	529		326	480	
v/s Ratio Prot	c0.05	0.17		c0.09	c0.24		0.06	c0.10		0.06	c0.13	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.43	0.10	0.70	0.53		0.57	0.67		0.67	0.89	
Uniform Delay, d1	56.4	26.5	22.9	50.6	23.2		51.0	47.7		52.5	50.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.79		1.00	1.00	
Incremental Delay, d2	64.3	1.0	0.3	9.9	1.3		2.0	3.3		5.4	18.7	
Delay (s)	120.7	27.5	23.2	60.5	24.5		43.8	41.0		57.9	69.4	
Level of Service	F	C	C	E	C		D	D		E	E	
Approach Delay (s)		36.8			29.9			41.9			65.7	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			28.6			
Intersection Capacity Utilization			66.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	28	155	9	520	51	575
v/c Ratio	0.20	0.09	0.71	0.02	0.23	0.07	0.22
Control Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Length 50th (ft)	27	0	102	3	88	2	13
Queue Length 95th (ft)	56	0	160	11	134	m8	m42
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	480	631	517	594	2256	731	2624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.30	0.02	0.23	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Future Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1583		1743		1770	3507		1770	3534	
Flt Permitted		0.74	1.00		0.81		0.39	1.00		0.46	1.00	
Satd. Flow (perm)		1380	1583		1449		730	3507		856	3534	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	24	15	28	84	26	45	9	488	32	51	569	6
RTOR Reduction (vph)	0	0	24	0	16	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	39	4	0	139	0	9	517	0	51	575	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Effective Green, g (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Actuated g/C Ratio		0.14	0.14		0.14		0.60	0.60		0.71	0.71	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		193	221		202		452	2121		706	2494	
v/s Ratio Prot							0.00	c0.15		0.01	c0.16	
v/s Ratio Perm		0.03	0.00		c0.10		0.01			0.04		
v/c Ratio		0.20	0.02		0.69		0.02	0.24		0.07	0.23	
Uniform Delay, d1		45.7	44.5		49.1		9.6	11.0		5.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.40	0.34	
Incremental Delay, d2		0.5	0.0		9.3		0.0	0.3		0.0	0.2	
Delay (s)		46.2	44.5		58.4		9.6	11.3		2.2	2.3	
Level of Service		D	D		E		A	B		A	A	
Approach Delay (s)		45.5			58.4			11.2			2.3	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.1										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		120.0								17.2		
Intersection Capacity Utilization		47.8%								A		
Analysis Period (min)		15										
c Critical Lane Group												

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	45	992	168	737	205	198	268	145	204
v/c Ratio	0.12	0.71	0.53	0.43	0.60	0.73	0.58	0.50	0.40
Control Delay	11.4	27.9	16.7	17.7	36.6	56.7	10.5	33.0	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	27.9	16.7	17.7	36.6	56.7	10.5	33.0	36.6
Queue Length 50th (ft)	12	266	49	164	101	122	0	69	55
Queue Length 95th (ft)	29	375	84	225	172	#207	72	124	93
Internal Link Dist (ft)		612		1268		380			1054
Turn Bay Length (ft)	100		180		200			140	
Base Capacity (vph)	438	1401	393	1718	342	319	493	299	612
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.71	0.43	0.43	0.60	0.62	0.54	0.48	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	727	186	155	545	133	189	182	247	133	154	34
Future Volume (vph)	41	727	186	155	545	133	189	182	247	133	154	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3435		1770	1863	1583	1770	3443	
Flt Permitted	0.35	1.00		0.15	1.00		0.61	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	648	3431		278	3435		1130	1863	1583	837	3443	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	790	202	168	592	145	205	198	268	145	167	37
RTOR Reduction (vph)	0	20	0	0	18	0	0	0	230	0	19	0
Lane Group Flow (vph)	45	972	0	168	719	0	205	198	38	145	185	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	46.5	42.3		59.1	48.7		24.1	14.4	14.4	23.5	14.1	
Effective Green, g (s)	46.5	42.3		59.1	48.7		24.1	14.4	14.4	23.5	14.1	
Actuated g/C Ratio	0.46	0.42		0.59	0.48		0.24	0.14	0.14	0.23	0.14	
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	345	1438		319	1657		331	265	225	281	481	
v/s Ratio Prot	0.01	c0.28		c0.06	0.21		c0.06	c0.11		0.05	0.05	
v/s Ratio Perm	0.05			0.25			0.09		0.02	0.07		
v/c Ratio	0.13	0.68		0.53	0.43		0.62	0.75	0.17	0.52	0.38	
Uniform Delay, d1	15.1	23.7		13.5	17.1		33.1	41.5	38.0	32.4	39.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	2.6		1.6	0.8		3.4	10.9	0.4	1.6	0.5	
Delay (s)	15.3	26.3		15.1	17.9		36.5	52.4	38.4	34.0	40.0	
Level of Service	B	C		B	B		D	D	D	C	D	
Approach Delay (s)		25.8			17.4			41.9			37.5	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	28.3			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	100.9			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	71.7%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	8	6	632	485	3
Future Vol, veh/h	1	8	6	632	485	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	7	687	527	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	887	265	530	0	-	0
Stage 1	529	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	284	733	1033	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	282	733	1033	-	-	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	551	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.9	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1033	-	622	-	-	
HCM Lane V/C Ratio	0.006	-	0.016	-	-	
HCM Control Delay (s)	8.5	-	10.9	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	612	8	7	510
Future Vol, veh/h	8	5	612	8	7	510
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	665	9	8	554
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	963	337	0	0	674	0
Stage 1	670	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	253	659	-	-	913	-
Stage 1	470	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	251	659	-	-	913	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	724	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	16.4	0	0.1			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	329	913	-	
HCM Lane V/C Ratio	-	-	0.043	0.008	-	
HCM Control Delay (s)	-	-	16.4	9	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	86	18	682	16	547
v/c Ratio	0.32	0.45	0.03	0.24	0.03	0.19
Control Delay	36.7	39.5	1.2	1.2	3.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.5	1.2	1.2	3.1	3.0
Queue Length 50th (ft)	28	40	1	22	2	36
Queue Length 95th (ft)	66	85	m2	25	7	62
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	650	592	684	2868	596	2884
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.03	0.24	0.03	0.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	6	37	14	35	24	20	17	578	50	15	492	11
Future Volume (vph)	6	37	14	35	24	20	17	578	50	15	492	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792			1760		1770	3497		1770	3528	
Flt Permitted		0.96			0.87		0.45	1.00		0.39	1.00	
Satd. Flow (perm)		1734			1569		834	3497		731	3528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	40	15	38	26	22	18	628	54	16	535	12
RTOR Reduction (vph)	0	14	0	0	18	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	48	0	0	68	0	18	679	0	16	546	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Effective Green, g (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Actuated g/C Ratio		0.09			0.09		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			144		664	2787		580	2801	
v/s Ratio Prot								0.19			0.15	
v/s Ratio Perm		0.03			0.04		0.02			0.02		
v/c Ratio		0.30			0.47		0.03	0.24		0.03	0.20	
Uniform Delay, d1		42.4			43.1		2.1	2.6		2.2	2.5	
Progression Factor		1.00			1.00		0.40	0.35		1.00	1.00	
Incremental Delay, d2		1.1			2.4		0.1	0.2		0.1	0.2	
Delay (s)		43.5			45.5		0.9	1.1		2.3	2.7	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		43.5			45.5			1.1			2.7	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.3										
HCM 2000 Volume to Capacity ratio		0.27										
Actuated Cycle Length (s)		100.0								11.4		
Intersection Capacity Utilization		37.9%								A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	1	1	3	3	0	0	7	644	1	1	539	0
Future Vol, veh/h	1	1	3	3	0	0	7	644	1	1	539	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	3	3	0	0	8	700	1	1	586	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	954	1305	293	1013	1305	351	586	0	0	701	0	0
Stage 1	588	588	-	717	717	-	-	-	-	-	-	-
Stage 2	366	717	-	296	588	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	213	159	703	193	159	645	985	-	-	892	-	-
Stage 1	462	494	-	387	432	-	-	-	-	-	-	-
Stage 2	626	432	-	688	494	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	212	158	703	190	158	645	985	-	-	892	-	-
Mov Cap-2 Maneuver	212	158	-	190	158	-	-	-	-	-	-	-
Stage 1	458	494	-	384	429	-	-	-	-	-	-	-
Stage 2	621	429	-	683	494	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.2		24.3		0.1		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	985	-	-	327	190	892	-
HCM Lane V/C Ratio	0.008	-	-	0.017	0.017	0.001	-
HCM Control Delay (s)	8.7	-	-	16.2	24.3	9	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	6	1	10	6	0	3	14	644	3	0	543	2
Future Vol, veh/h	6	1	10	6	0	3	14	644	3	0	543	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	11	7	0	3	15	700	3	0	590	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	971	1324	296	1028	1324	352	592	0	0	703	0	0
Stage 1	591	591	-	732	732	-	-	-	-	-	-	-
Stage 2	380	733	-	296	592	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	207	155	700	188	155	644	980	-	-	890	-	-
Stage 1	460	493	-	379	425	-	-	-	-	-	-	-
Stage 2	614	424	-	688	492	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	203	153	700	182	153	644	980	-	-	890	-	-
Mov Cap-2 Maneuver	203	153	-	182	153	-	-	-	-	-	-	-
Stage 1	453	493	-	373	419	-	-	-	-	-	-	-
Stage 2	602	418	-	676	492	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.3		20.7		0.2		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	980	-	-	337 239	890	-	-
HCM Lane V/C Ratio	0.016	-	-	0.055 0.041	-	-	-
HCM Control Delay (s)	8.7	-	-	16.3 20.7	0	-	-
HCM Lane LOS	A	-	-	C C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2 0.1	0	-	-

HCM 6th TWSC
8: Noland Road & White Oak Street

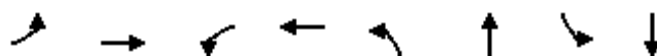
09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	26	14	651	563	1
Future Vol, veh/h	9	26	14	651	563	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	15	708	612	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	997	307	613	0	-	0
Stage 1	613	-	-	-	-	-
Stage 2	384	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	241	689	962	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	237	689	962	-	-	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.5	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	962	-	462	-	-	
HCM Lane V/C Ratio	0.016	-	0.082	-	-	
HCM Control Delay (s)	8.8	-	13.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	638	140	417	65	642	146	488
v/c Ratio	0.20	0.78	0.57	0.41	0.15	0.51	0.42	0.35
Control Delay	21.6	41.6	30.4	18.1	17.8	32.3	17.6	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	41.6	30.4	18.1	17.8	32.3	17.6	21.0
Queue Length 50th (ft)	25	195	60	65	30	195	42	87
Queue Length 95th (ft)	48	242	95	103	68	267	78	156
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	296	986	245	1118	437	1268	344	1396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.57	0.37	0.15	0.51	0.42	0.35
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	490	97	129	222	162	60	450	141	134	421	28
Future Volume (vph)	55	490	97	129	222	162	60	450	141	134	421	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3452		1770	3315		1770	3413		1770	3507	
Flt Permitted	0.44	1.00		0.24	1.00		0.46	1.00		0.28	1.00	
Satd. Flow (perm)	815	3452		438	3315		851	3413		523	3507	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	533	105	140	241	176	65	489	153	146	458	30
RTOR Reduction (vph)	0	17	0	0	128	0	0	29	0	0	4	0
Lane Group Flow (vph)	60	621	0	140	289	0	65	613	0	146	484	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.5	24.6		34.7	27.2		40.7	34.9		45.1	37.0	
Effective Green, g (s)	29.5	24.6		34.7	27.2		40.7	34.9		45.1	37.0	
Actuated g/C Ratio	0.29	0.25		0.35	0.27		0.41	0.35		0.45	0.37	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	849		251	901		399	1191		336	1297	
v/s Ratio Prot	0.01	c0.18		c0.04	0.09		0.01	c0.18		c0.04	0.14	
v/s Ratio Perm	0.05			0.15			0.06			c0.16		
v/c Ratio	0.21	0.73		0.56	0.32		0.16	0.51		0.43	0.37	
Uniform Delay, d1	25.8	34.7		24.0	29.0		18.3	25.8		17.3	23.0	
Progression Factor	1.00	1.00		1.00	1.00		1.19	1.29		0.89	0.89	
Incremental Delay, d2	0.4	3.3		2.7	0.2		0.2	1.5		0.9	0.8	
Delay (s)	26.1	37.9		26.7	29.2		21.9	34.8		16.3	21.3	
Level of Service	C	D		C	C		C	C		B	C	
Approach Delay (s)		36.9			28.6			33.6			20.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			68.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	3	19	11	0	6	31	643	10	12	630	8
Future Vol, veh/h	7	3	19	11	0	6	31	643	10	12	630	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	3	21	12	0	7	34	699	11	13	685	9
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1134	1494	347	1143	1493	355	694	0	0	710	0	0
Stage 1	716	716	-	773	773	-	-	-	-	-	-	-
Stage 2	418	778	-	370	720	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	157	122	649	155	122	641	897	-	-	885	-	-
Stage 1	387	432	-	358	407	-	-	-	-	-	-	-
Stage 2	583	405	-	622	430	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	149	116	649	141	116	641	897	-	-	885	-	-
Mov Cap-2 Maneuver	149	116	-	141	116	-	-	-	-	-	-	-
Stage 1	372	426	-	344	392	-	-	-	-	-	-	-
Stage 2	555	390	-	589	424	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	19.3		25.4		0.4		0.2					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	897	-	-	284	195	885	-	-				
HCM Lane V/C Ratio	0.038	-	-	0.111	0.095	0.015	-	-				
HCM Control Delay (s)	9.2	-	-	19.3	25.4	9.1	-	-				
HCM Lane LOS	A	-	-	C	D	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.3	0	-	-				

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	682	7	5	653
Future Vol, veh/h	2	3	682	7	5	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	703	7	5	673

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1054	355	0
Stage 1	707	-	-
Stage 2	347	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	221	641	885
Stage 1	450	-	-
Stage 2	687	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	220	641	885
Mov Cap-2 Maneuver	220	-	-
Stage 1	450	-	-
Stage 2	683	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	363	885
HCM Lane V/C Ratio	-	-	0.014	0.006
HCM Control Delay (s)	-	-	15.1	9.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	164	75	50	715	6	711
v/c Ratio	0.51	0.40	0.34	0.34	0.36	0.06	0.42
Control Delay	48.1	4.2	40.4	48.8	14.3	55.8	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	4.2	40.4	48.8	14.3	55.8	19.7
Queue Length 50th (ft)	73	0	40	31	120	3	194
Queue Length 95th (ft)	126	15	83	66	228	m9	277
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	285	446	284	276	2004	138	1700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.37	0.26	0.18	0.36	0.04	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Future Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1583		1782		1770	3510		1770	3516	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1583		1782		1770	3510		1770	3516	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	47	164	34	29	12	50	676	39	6	680	31
RTOR Reduction (vph)	0	0	143	0	7	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	120	21	0	68	0	50	712	0	6	708	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Effective Green, g (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Actuated g/C Ratio		0.13	0.13		0.10		0.07	0.52		0.01	0.46	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236	207		174		127	1807		24	1606	
v/s Ratio Prot		c0.07			c0.04		c0.03	c0.20		0.00	c0.20	
v/s Ratio Perm			0.01									
v/c Ratio		0.51	0.10		0.39		0.39	0.39		0.25	0.44	
Uniform Delay, d1		40.5	38.3		42.3		44.3	14.8		48.8	18.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.24	0.96	
Incremental Delay, d2		1.7	0.2		1.4		2.0	0.6		5.1	0.8	
Delay (s)		42.2	38.5		43.7		46.3	15.4		65.6	18.6	
Level of Service		D	D		D		D	B		E	B	
Approach Delay (s)		40.1			43.7			17.4			19.0	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.6									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			52.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Future Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	3	7	24	745	15	4	871	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1303	1689	437	1245	1683	380	874	0	0	760	0	0
Stage 1	881	881	-	801	801	-	-	-	-	-	-	-
Stage 2	422	808	-	444	882	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	118	93	567	130	93	618	768	-	-	848	-	-
Stage 1	308	363	-	344	395	-	-	-	-	-	-	-
Stage 2	580	392	-	563	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	110	90	567	126	90	618	768	-	-	848	-	-
Mov Cap-2 Maneuver	110	90	-	126	90	-	-	-	-	-	-	-
Stage 1	298	361	-	333	383	-	-	-	-	-	-	-
Stage 2	551	380	-	560	360	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		27.5		0.3		0	
HCM LOS	A		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	-	174	848	-
HCM Lane V/C Ratio	0.031	-	-	-	0.082	0.005	-
HCM Control Delay (s)	9.8	-	-	0	27.5	9.3	-
HCM Lane LOS	A	-	-	A	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0	-

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Future Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	17	4	0	1	0	771	2	1	867	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1255	1642	434	1208	1641	387	-	0	0	773	0	0
Stage 1	869	869	-	772	772	-	-	-	-	-	-	-
Stage 2	386	773	-	436	869	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	128	99	570	139	99	611	0	-	-	838	-	-
Stage 1	313	367	-	358	407	-	0	-	-	-	-	-
Stage 2	609	407	-	569	367	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	99	570	133	99	611	-	-	-	838	-	-
Mov Cap-2 Maneuver	128	99	-	133	99	-	-	-	-	-	-	-
Stage 1	313	367	-	358	407	-	-	-	-	-	-	-
Stage 2	608	407	-	549	367	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.7		28.6		0		0					
HCM LOS	B		D									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		391 158		838	-	-			
HCM Lane V/C Ratio	-		-		0.05 0.034		0.001	-	-			
HCM Control Delay (s)	-		-		14.7 28.6		9.3	-	-			
HCM Lane LOS	-		-		B D		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.2 0.1		0	-	-			

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Future Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	23	14	3	8	12	759	17	23	865	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1317	1712	434	1272	1705	388	867	0	0	776	0	0
Stage 1	912	912	-	792	792	-	-	-	-	-	-	-
Stage 2	405	800	-	480	913	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	115	90	570	125	90	611	772	-	-	836	-	-
Stage 1	295	351	-	349	399	-	-	-	-	-	-	-
Stage 2	593	395	-	536	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	86	570	113	86	611	772	-	-	836	-	-
Mov Cap-2 Maneuver	107	86	-	113	86	-	-	-	-	-	-	-
Stage 1	290	341	-	343	393	-	-	-	-	-	-	-
Stage 2	572	389	-	496	340	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20.9		35.4		0.1		0.2					
HCM LOS	C		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	772	-	-	257	143	836	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.118	0.175	0.027	-	-				
HCM Control Delay (s)	9.7	-	-	20.9	35.4	9.4	-	-				
HCM Lane LOS	A	-	-	C	E	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-	-				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	22	6	724	837	1
Future Vol, veh/h	1	22	6	724	837	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	24	7	787	910	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1319	456	911	0	-	0
Stage 1	911	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	149	551	743	-	-	-
Stage 1	352	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	148	551	743	-	-	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.7	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	743	-	493	-	-	
HCM Lane V/C Ratio	0.009	-	0.051	-	-	
HCM Control Delay (s)	9.9	-	12.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	10	727	856	0
Future Vol, veh/h	1	21	10	727	856	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	23	11	782	920	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1333	460	920
Stage 1	920	-	-
Stage 2	413	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	145	548	738
Stage 1	349	-	-
Stage 2	636	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	143	548	738
Mov Cap-2 Maneuver	143	-	-
Stage 1	344	-	-
Stage 2	636	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	738	-	485	-	-
HCM Lane V/C Ratio	0.015	-	0.049	-	-
HCM Control Delay (s)	9.9	-	12.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	724	11	17	857
Future Vol, veh/h	5	13	724	11	17	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	14	778	12	18	922
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1281	395	0	0	790	0
Stage 1	784	-	-	-	-	-
Stage 2	497	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	157	604	-	-	826	-
Stage 1	410	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	154	604	-	-	826	-
Mov Cap-2 Maneuver	154	-	-	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	16.5	0	0.2			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	333	826	-	
HCM Lane V/C Ratio	-	-	0.058	0.022	-	
HCM Control Delay (s)	-	-	16.5	9.5	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Future Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	37	4	1	29	11	789	15	8	932	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1369	1778	470	1302	1775	402	940	0	0	804	0	0
Stage 1	952	952	-	819	819	-	-	-	-	-	-	-
Stage 2	417	826	-	483	956	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	105	82	540	118	82	598	725	-	-	816	-	-
Stage 1	279	336	-	336	388	-	-	-	-	-	-	-
Stage 2	584	385	-	534	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	97	80	540	105	80	598	725	-	-	816	-	-
Mov Cap-2 Maneuver	97	80	-	105	80	-	-	-	-	-	-	-
Stage 1	275	333	-	331	382	-	-	-	-	-	-	-
Stage 2	546	379	-	489	332	-	-	-	-	-	-	-

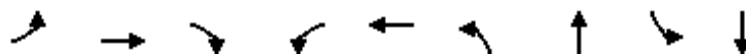
Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		17.2		0.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	725	-	-	377 330	816	-	-
HCM Lane V/C Ratio	0.015	-	-	0.108 0.103	0.009	-	-
HCM Control Delay (s)	10	-	-	15.7 17.2	9.5	-	-
HCM Lane LOS	B	-	-	C C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4 0.3	0	-	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	925	241	208	793	277	671	261	648
v/c Ratio	0.91	0.85	0.37	0.84	0.69	0.74	0.90	0.70	0.90
Control Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Length 50th (ft)	152	363	7	157	278	109	250	101	249
Queue Length 95th (ft)	#294	#482	69	#275	351	156	#353	146	#350
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	215	1091	645	266	1145	389	758	403	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.37	0.78	0.69	0.71	0.89	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Future Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	196	925	241	208	665	128	277	461	210	261	519	129
RTOR Reduction (vph)	0	0	158	0	13	0	0	44	0	0	18	0
Lane Group Flow (vph)	196	925	83	208	780	0	277	627	0	261	630	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Effective Green, g (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Actuated g/C Ratio	0.12	0.31	0.31	0.14	0.33		0.11	0.21		0.11	0.20	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1091	488	250	1134		371	699		374	698	
v/s Ratio Prot	0.11	c0.26		0.12	c0.23		0.08	c0.19		0.08	c0.18	
v/s Ratio Perm			0.05									
v/c Ratio	0.91	0.85	0.17	0.83	0.69		0.75	0.90		0.70	0.90	
Uniform Delay, d1	52.1	38.9	30.3	50.1	35.0		51.9	46.3		51.5	46.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Incremental Delay, d2	37.9	8.2	0.8	20.4	3.4		7.7	13.7		5.6	14.9	
Delay (s)	89.9	47.1	31.1	70.5	38.4		57.0	57.5		57.1	61.5	
Level of Service	F	D	C	E	D		E	E		E	E	
Approach Delay (s)		50.4			45.1			57.4			60.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			28.6			
Intersection Capacity Utilization			84.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	56	111	52	885	29	887
v/c Ratio	0.46	0.24	0.64	0.11	0.34	0.06	0.35
Control Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Length 50th (ft)	48	0	69	7	128	1	115
Queue Length 95th (ft)	90	26	125	19	197	m3	m134
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	451	598	513	575	2568	571	2514
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.22	0.09	0.34	0.05	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Future Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1743		1770	3497		1770	3530	
Flt Permitted		0.70	1.00		0.80		0.29	1.00		0.30	1.00	
Satd. Flow (perm)		1295	1583		1438		539	3497		563	3530	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	18	56	57	21	33	52	814	71	29	871	16
RTOR Reduction (vph)	0	0	50	0	17	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	65	6	0	94	0	52	882	0	29	886	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Effective Green, g (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Actuated g/C Ratio		0.11	0.11		0.11		0.76	0.71		0.74	0.70	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	174		158		462	2500		452	2482	
v/s Ratio Prot							c0.00	c0.25		0.00	0.25	
v/s Ratio Perm		0.05	0.00		c0.07		0.08			0.05		
v/c Ratio		0.46	0.04		0.60		0.11	0.35		0.06	0.36	
Uniform Delay, d1		50.0	47.7		50.9		3.9	6.5		4.4	7.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.36	0.58	
Incremental Delay, d2		2.3	0.1		5.9		0.1	0.4		0.0	0.3	
Delay (s)		52.4	47.8		56.8		4.0	6.9		1.6	4.3	
Level of Service		D	D		E		A	A		A	A	
Approach Delay (s)		50.3			56.8			6.8			4.3	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		10.8										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		55.4%										
Analysis Period (min)		15										
c Critical Lane Group												

APPENDIX C

Existing With Bike Lanes Conditions

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	462	117	645	126	140	82	76	133	48
v/c Ratio	0.09	0.31	0.22	0.37	0.39	0.46	0.21	0.24	0.56	0.21
Control Delay	10.4	14.5	10.6	16.3	30.1	43.5	1.2	27.5	48.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	14.5	10.6	16.3	30.1	43.5	1.2	27.5	48.9	2.1
Queue Length 50th (ft)	10	68	30	130	59	81	0	35	78	0
Queue Length 95th (ft)	26	119	60	195	107	146	0	70	139	0
Internal Link Dist (ft)		612		1268		380			1054	
Turn Bay Length (ft)	100		180		200		300	140		280
Base Capacity (vph)	494	1506	619	1766	327	348	428	344	334	226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.31	0.19	0.37	0.39	0.40	0.19	0.22	0.40	0.21
Intersection Summary										

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	274	151	108	512	81	116	129	75	70	122	44
Future Volume (vph)	36	274	151	108	512	81	116	129	75	70	122	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3351		1770	3467		1770	1863	1583	1770	1863	1583
Flt Permitted	0.39	1.00		0.42	1.00		0.54	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	721	3351		784	3467		1011	1863	1583	1244	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	298	164	117	557	88	126	140	82	76	133	48
RTOR Reduction (vph)	0	63	0	0	11	0	0	0	69	0	0	48
Lane Group Flow (vph)	39	399	0	117	634	0	126	140	13	76	133	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	47.4	43.4		56.4	47.9		24.7	15.6	15.6	20.3	13.4	0.0
Effective Green, g (s)	47.4	43.4		56.4	47.9		24.7	15.6	15.6	20.3	13.4	0.0
Actuated g/C Ratio	0.48	0.44		0.57	0.49		0.25	0.16	0.16	0.21	0.14	0.00
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	389	1474		533	1684		323	294	250	292	253	0
v/s Ratio Prot	0.00	0.12		c0.02	c0.18		c0.04	c0.08		0.02	0.07	
v/s Ratio Perm	0.04			0.11			0.06		0.01	0.04		
v/c Ratio	0.10	0.27		0.22	0.38		0.39	0.48	0.05	0.26	0.53	0.00
Uniform Delay, d1	13.6	17.5		9.9	16.0		29.9	37.8	35.2	32.5	39.6	49.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.5		0.2	0.6		0.8	1.2	0.1	0.5	2.0	0.0
Delay (s)	13.7	18.0		10.1	16.6		30.6	39.0	35.3	33.0	41.6	49.3
Level of Service	B	B		B	B		C	D	D	C	D	D
Approach Delay (s)		17.7			15.6			35.1			40.5	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	23.2			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.41											
Actuated Cycle Length (s)	98.6			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	54.7%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	4	323	383	1
Future Vol, veh/h	0	5	4	323	383	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	4	351	416	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	776	417	417	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	366	636	1142	-	-	-
Stage 1	665	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	636	1142	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	662	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1142	-	636	-	-	
HCM Lane V/C Ratio	0.004	-	0.009	-	-	
HCM Control Delay (s)	8.2	-	10.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	324	2	2	386
Future Vol, veh/h	7	6	324	2	2	386
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	352	2	2	420
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	777	353	0	0	354	0
Stage 1	353	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	365	691	-	-	1205	-
Stage 1	711	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	364	691	-	-	1205	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	466	1205	-	
HCM Lane V/C Ratio	-	-	0.03	0.002	-	
HCM Control Delay (s)	-	-	13	8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	53	13	352	8	420
v/c Ratio	0.19	0.28	0.02	0.22	0.01	0.27
Control Delay	20.5	31.2	0.7	1.1	2.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	31.2	0.7	1.1	2.9	3.2
Queue Length 50th (ft)	5	19	1	52	1	58
Queue Length 95th (ft)	32	53	m1	5	4	94
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	657	590	817	1571	868	1576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.09	0.02	0.22	0.01	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	6	22	27	9	13	12	309	15	7	383	4
Future Volume (vph)	4	6	22	27	9	13	12	309	15	7	383	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1681			1748		1770	1850		1770	1860	
Flt Permitted		0.95			0.81		0.52	1.00		0.55	1.00	
Satd. Flow (perm)		1607			1456		963	1850		1025	1860	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	7	24	29	10	14	13	336	16	8	416	4
RTOR Reduction (vph)	0	22	0	0	13	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	40	0	13	351	0	8	420	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Effective Green, g (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Actuated g/C Ratio		0.07			0.07		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		117			106		767	1473		812	1474	
v/s Ratio Prot								0.19			c0.23	
v/s Ratio Perm		0.01			c0.03		0.01			0.01		
v/c Ratio		0.11			0.38		0.02	0.24		0.01	0.28	
Uniform Delay, d1		36.8			37.6		1.8	2.2		1.8	2.4	
Progression Factor		1.00			1.00		0.22	0.31		1.00	1.00	
Incremental Delay, d2		0.4			2.2		0.0	0.4		0.0	0.5	
Delay (s)		37.2			39.8		0.4	1.0		1.9	2.8	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		37.2			39.8			1.0			2.8	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.7									
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			85.0									
Intersection Capacity Utilization			38.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	2	1	0	1	2	333	4	6	432	1
Future Vol, veh/h	1	1	2	1	0	1	2	333	4	6	432	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	1	0	1	2	362	4	7	470	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	854	855	471	854	853	364	471	0	0	366	0	0
Stage 1	485	485	-	368	368	-	-	-	-	-	-	-
Stage 2	369	370	-	486	485	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	279	296	593	279	296	681	1091	-	-	1193	-	-
Stage 1	563	552	-	652	621	-	-	-	-	-	-	-
Stage 2	651	620	-	563	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	277	294	593	276	294	681	1091	-	-	1193	-	-
Mov Cap-2 Maneuver	277	294	-	276	294	-	-	-	-	-	-	-
Stage 1	562	549	-	651	620	-	-	-	-	-	-	-
Stage 2	649	619	-	557	549	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.5		14.2		0		0.1	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1091	-	-	385	393	1193	-
HCM Lane V/C Ratio	0.002	-	-	0.011	0.006	0.005	-
HCM Control Delay (s)	8.3	-	-	14.5	14.2	8	-
HCM Lane LOS	A	-	-	B	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	0	12	3	1	0	11	338	6	0	431	0
Future Vol, veh/h	2	0	12	3	1	0	11	338	6	0	431	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	13	3	1	0	12	367	7	0	468	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	863	866	468	870	863	371	468	0	0	374	0	0
Stage 1	468	468	-	395	395	-	-	-	-	-	-	-
Stage 2	395	398	-	475	468	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	275	291	595	272	292	675	1094	-	-	1184	-	-
Stage 1	575	561	-	630	605	-	-	-	-	-	-	-
Stage 2	630	603	-	570	561	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	272	288	595	264	289	675	1094	-	-	1184	-	-
Mov Cap-2 Maneuver	272	288	-	264	289	-	-	-	-	-	-	-
Stage 1	569	561	-	623	598	-	-	-	-	-	-	-
Stage 2	622	596	-	558	561	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.3		18.6		0.3		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	509	270	1184	-
HCM Lane V/C Ratio	0.011	-	-	0.03	0.016	-	-
HCM Control Delay (s)	8.3	-	-	12.3	18.6	0	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	20	364	445	1
Future Vol, veh/h	1	18	20	364	445	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	20	22	396	484	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	727	485	485
Stage 1	485	-	-
Stage 2	242	-	-
Critical Hdwy	6.63	6.23	4.13
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.83	-	-
Follow-up Hdwy	3.519	3.319	2.219
Pot Cap-1 Maneuver	375	581	1076
Stage 1	618	-	-
Stage 2	776	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	368	581	1076
Mov Cap-2 Maneuver	368	-	-
Stage 1	606	-	-
Stage 2	776	-	-

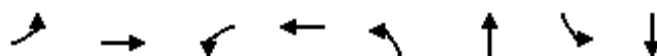
Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1076	-	564	-	-
HCM Lane V/C Ratio	0.02	-	0.037	-	-
HCM Control Delay (s)	8.4	-	11.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	203	80	444	57	315	129	377
v/c Ratio	0.14	0.32	0.22	0.49	0.13	0.32	0.33	0.25
Control Delay	31.3	23.9	28.1	24.4	15.1	13.9	19.0	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	23.9	28.1	24.4	15.1	13.9	19.0	16.4
Queue Length 50th (ft)	12	36	30	76	13	44	39	70
Queue Length 95th (ft)	35	67	72	137	22	48	99	123
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	188	805	452	1082	435	989	404	1535
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.18	0.41	0.13	0.32	0.32	0.25
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	138	49	74	286	122	52	241	49	119	323	24
Future Volume (vph)	25	138	49	74	286	122	52	241	49	119	323	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	*0.75		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3380		1770	2724		1770	3503	
Flt Permitted	0.32	1.00		0.62	1.00		0.53	1.00		0.32	1.00	
Satd. Flow (perm)	591	3401		1163	3380		984	2724		590	3503	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	150	53	80	311	133	57	262	53	129	351	26
RTOR Reduction (vph)	0	44	0	0	58	0	0	13	0	0	5	0
Lane Group Flow (vph)	27	159	0	80	386	0	57	302	0	129	372	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.0	15.0		21.6	21.6		26.3	26.3		30.6	30.6	
Effective Green, g (s)	15.0	15.0		21.6	21.6		26.3	26.3		30.6	30.6	
Actuated g/C Ratio	0.18	0.18		0.25	0.25		0.31	0.31		0.36	0.36	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	600		359	858		353	842		348	1261	
v/s Ratio Prot	0.01	c0.05		0.02	c0.11		0.01	c0.11		c0.04	0.11	
v/s Ratio Perm	0.03			0.03			0.04			0.09		
v/c Ratio	0.20	0.27		0.22	0.45		0.16	0.36		0.37	0.29	
Uniform Delay, d1	29.7	30.2		25.4	26.7		21.5	22.8		19.2	19.5	
Progression Factor	1.00	1.00		1.00	1.00		0.62	0.62		0.89	0.90	
Incremental Delay, d2	0.7	0.2		0.3	0.4		0.2	1.2		0.7	0.6	
Delay (s)	30.4	30.5		25.7	27.1		13.6	15.4		17.7	18.0	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s)		30.5			26.9			15.1			18.0	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			85.0			Sum of lost time (s)				25.1		
Intersection Capacity Utilization			57.3%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	2	4	12	10	8	5	46	328	5	6	420	15
Future Vol, veh/h	2	4	12	10	8	5	46	328	5	6	420	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	13	11	9	5	50	357	5	7	457	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	762	941	237	705	947	181	473	0	0	362	0	0
Stage 1	479	479	-	460	460	-	-	-	-	-	-	-
Stage 2	283	462	-	245	487	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	294	262	764	323	260	831	1085	-	-	1193	-	-
Stage 1	537	553	-	551	564	-	-	-	-	-	-	-
Stage 2	700	563	-	737	549	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	273	248	764	301	246	831	1085	-	-	1193	-	-
Mov Cap-2 Maneuver	273	248	-	301	246	-	-	-	-	-	-	-
Stage 1	512	550	-	526	538	-	-	-	-	-	-	-
Stage 2	653	537	-	714	546	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.2		17.2		1		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1085	-	-	460	321	1193	-
HCM Lane V/C Ratio	0.046	-	-	0.043	0.078	0.005	-
HCM Control Delay (s)	8.5	-	-	13.2	17.2	8	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.3	0	-

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	366	1	2	439
Future Vol, veh/h	2	8	366	1	2	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	10	446	1	2	535
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	719	224	0	0	447	0
Stage 1	447	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	363	779	-	-	1110	-
Stage 1	611	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	779	-	-	1110	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	633	1110	-	-
HCM Lane V/C Ratio	-	-	0.019	0.002	-	-
HCM Control Delay (s)	-	-	10.8	8.2	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-	-

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	113	79	65	425	5	523
v/c Ratio	0.24	0.25	0.31	0.36	0.21	0.04	0.32
Control Delay	35.2	1.3	33.5	40.6	13.6	24.2	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	1.3	33.5	40.6	13.6	24.2	11.1
Queue Length 50th (ft)	29	0	35	33	64	3	59
Queue Length 95th (ft)	59	0	68	63	111	m10	73
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	273	471	291	324	1995	141	1612
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.27	0.20	0.21	0.04	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Future Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1583		1787		1770	3519		1770	3507	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1814	1583		1787		1770	3519		1770	3507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	33	28	113	39	30	10	65	409	16	5	491	32
RTOR Reduction (vph)	0	0	100	0	6	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	13	0	73	0	65	422	0	5	519	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Effective Green, g (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Actuated g/C Ratio		0.11	0.11		0.11		0.09	0.47		0.02	0.40	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		204	178		201		154	1664		29	1411	
v/s Ratio Prot		c0.03			c0.04		c0.04	0.12		0.00	c0.15	
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.07		0.36		0.42	0.25		0.17	0.37	
Uniform Delay, d1		34.6	33.7		34.9		36.8	13.4		41.2	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.65	0.52	
Incremental Delay, d2		0.8	0.2		1.1		1.9	0.4		2.8	0.7	
Delay (s)		35.4	33.9		36.0		38.6	13.8		29.6	10.0	
Level of Service		D	C		D		D	B		C	A	
Approach Delay (s)		34.4			36.0			17.1			10.1	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.7									
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			85.0									
Intersection Capacity Utilization			48.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Future Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	37	501	4	1	627	8
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	958	1212	318	893	1214	253	635	0	0	505	0	0
Stage 1	633	633	-	577	577	-	-	-	-	-	-	-
Stage 2	325	579	-	316	637	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	212	181	678	236	180	746	944	-	-	1056	-	-
Stage 1	434	472	-	469	500	-	-	-	-	-	-	-
Stage 2	661	499	-	670	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	205	174	678	229	173	746	944	-	-	1056	-	-
Mov Cap-2 Maneuver	205	174	-	229	173	-	-	-	-	-	-	-
Stage 1	417	472	-	451	481	-	-	-	-	-	-	-
Stage 2	632	480	-	669	470	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0		17.5			0.6			0			
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	944	-	-	-	298	1056	-	-				
HCM Lane V/C Ratio	0.04	-	-	-	0.036	0.001	-	-				
HCM Control Delay (s)	9	-	-	0	17.5	8.4	-	-				
HCM Lane LOS	A	-	-	A	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0	-	-				

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↙	↕	
Traffic Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Future Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	4	0	5	0	534	0	1	634	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	903	1170	317	853	1170	267	-	0	0	534	0	0
Stage 1	636	636	-	534	534	-	-	-	-	-	-	-
Stage 2	267	534	-	319	636	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	232	192	679	253	192	731	0	-	-	1030	-	-
Stage 1	433	470	-	498	523	-	0	-	-	-	-	-
Stage 2	715	523	-	667	470	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	192	679	249	192	731	-	-	-	1030	-	-
Mov Cap-2 Maneuver	230	192	-	249	192	-	-	-	-	-	-	-
Stage 1	433	470	-	498	523	-	-	-	-	-	-	-
Stage 2	710	523	-	656	470	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		14.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		568 400		1030	-	-			
HCM Lane V/C Ratio	-		-		0.021 0.021		0.001	-	-			
HCM Control Delay (s)	-		-		11.5 14.2		8.5	-	-			
HCM Lane LOS	-		-		B B		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.1 0.1		0	-	-			

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Future Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	13	21	4	24	12	526	17	7	646	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	950	1228	324	897	1221	272	648	0	0	543	0	0
Stage 1	661	661	-	559	559	-	-	-	-	-	-	-
Stage 2	289	567	-	338	662	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	215	177	672	235	179	726	934	-	-	1022	-	-
Stage 1	418	458	-	481	509	-	-	-	-	-	-	-
Stage 2	694	505	-	650	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	201	173	672	226	175	726	934	-	-	1022	-	-
Mov Cap-2 Maneuver	201	173	-	226	175	-	-	-	-	-	-	-
Stage 1	413	455	-	475	502	-	-	-	-	-	-	-
Stage 2	657	498	-	631	454	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.8		17.6		0.2		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	934	-	-	479	334	1022	-	-				
HCM Lane V/C Ratio	0.013	-	-	0.033	0.146	0.007	-	-				
HCM Control Delay (s)	8.9	-	-	12.8	17.6	8.5	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-	-				

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	3	449	561	0
Future Vol, veh/h	1	11	3	449	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	4	554	693	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	978	347	693	0	-	0
Stage 1	693	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	248	649	898	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	649	898	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	738	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	898	-	571	-	-
HCM Lane V/C Ratio	0.004	-	0.026	-	-
HCM Control Delay (s)	9	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	4	456	572	2
Future Vol, veh/h	0	17	4	456	572	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	5	563	706	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	999	354	708	0	-	0
Stage 1	707	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	240	642	887	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	239	642	887	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	732	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	887	-	642	-	-
HCM Lane V/C Ratio	0.006	-	0.033	-	-
HCM Control Delay (s)	9.1	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	3	453	5	7	575
Future Vol, veh/h	5	3	453	5	7	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	559	6	9	710

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	935	283	0
Stage 1	562	-	-
Stage 2	373	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	264	714	-
Stage 1	534	-	-
Stage 2	666	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	262	714	-
Mov Cap-2 Maneuver	262	-	-
Stage 1	534	-	-
Stage 2	660	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	344	1003
HCM Lane V/C Ratio	-	-	0.029	0.009
HCM Control Delay (s)	-	-	15.8	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Future Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	22	5	4	12	5	546	4	1	705	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	998	1273	359	913	1277	275	717	0	0	550	0	0
Stage 1	713	713	-	558	558	-	-	-	-	-	-	-
Stage 2	285	560	-	355	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	198	166	638	228	165	722	880	-	-	1016	-	-
Stage 1	389	434	-	482	510	-	-	-	-	-	-	-
Stage 2	698	509	-	635	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	190	165	638	218	164	722	880	-	-	1016	-	-
Mov Cap-2 Maneuver	190	165	-	218	164	-	-	-	-	-	-	-
Stage 1	387	434	-	479	507	-	-	-	-	-	-	-
Stage 2	677	506	-	611	431	-	-	-	-	-	-	-

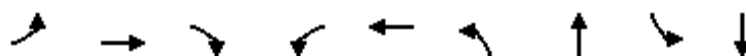
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		16.4		0.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	880	-	-	506	337	1016	-
HCM Lane V/C Ratio	0.006	-	-	0.048	0.062	0.001	-
HCM Control Delay (s)	9.1	-	-	12.5	16.4	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	593	151	151	858	206	395	219	455
v/c Ratio	0.93	0.43	0.21	0.71	0.54	0.57	0.69	0.67	0.90
Control Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Length 50th (ft)	71	176	0	113	237	80	138	85	173
Queue Length 95th (ft)	#170	237	35	181	311	114	182	124	#255
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	97	1391	722	234	1597	503	692	346	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.43	0.21	0.65	0.54	0.41	0.57	0.63	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Future Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	593	151	151	709	149	206	278	117	219	344	111
RTOR Reduction (vph)	0	0	92	0	14	0	0	40	0	0	26	0
Lane Group Flow (vph)	90	593	59	151	844	0	206	355	0	219	429	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Effective Green, g (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Actuated g/C Ratio	0.06	0.39	0.39	0.12	0.46		0.11	0.16		0.10	0.14	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	1392	622	215	1582		363	529		326	480	
v/s Ratio Prot	c0.05	0.17		c0.09	c0.24		0.06	c0.10		0.06	c0.13	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.43	0.10	0.70	0.53		0.57	0.67		0.67	0.89	
Uniform Delay, d1	56.4	26.5	22.9	50.6	23.2		51.0	47.7		52.5	50.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.79		1.00	1.00	
Incremental Delay, d2	64.3	1.0	0.3	9.9	1.3		2.0	3.3		5.4	18.7	
Delay (s)	120.7	27.5	23.2	60.5	24.5		43.8	41.0		57.9	69.4	
Level of Service	F	C	C	E	C		D	D		E	E	
Approach Delay (s)		36.8			29.9			41.9			65.7	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			28.6			
Intersection Capacity Utilization			66.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	28	155	9	520	51	575
v/c Ratio	0.20	0.09	0.71	0.02	0.23	0.07	0.22
Control Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Length 50th (ft)	27	0	102	3	88	2	13
Queue Length 95th (ft)	56	0	160	11	134	m8	m42
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	480	631	517	594	2256	731	2624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.30	0.02	0.23	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Future Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1583		1743		1770	3507		1770	3534	
Flt Permitted		0.74	1.00		0.81		0.39	1.00		0.46	1.00	
Satd. Flow (perm)		1380	1583		1449		730	3507		856	3534	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	24	15	28	84	26	45	9	488	32	51	569	6
RTOR Reduction (vph)	0	0	24	0	16	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	39	4	0	139	0	9	517	0	51	575	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Effective Green, g (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Actuated g/C Ratio		0.14	0.14		0.14		0.60	0.60		0.71	0.71	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		193	221		202		452	2121		706	2494	
v/s Ratio Prot							0.00	c0.15		0.01	c0.16	
v/s Ratio Perm		0.03	0.00		c0.10		0.01			0.04		
v/c Ratio		0.20	0.02		0.69		0.02	0.24		0.07	0.23	
Uniform Delay, d1		45.7	44.5		49.1		9.6	11.0		5.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.40	0.34	
Incremental Delay, d2		0.5	0.0		9.3		0.0	0.3		0.0	0.2	
Delay (s)		46.2	44.5		58.4		9.6	11.3		2.2	2.3	
Level of Service		D	D		E		A	B		A	A	
Approach Delay (s)		45.5			58.4			11.2			2.3	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.1										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		47.8%										
Analysis Period (min)		15										
c Critical Lane Group												

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	45	992	168	737	205	198	268	145	167	37
v/c Ratio	0.12	0.71	0.53	0.43	0.65	0.72	0.58	0.50	0.62	0.16
Control Delay	11.4	27.9	16.8	17.7	39.1	56.1	10.4	32.9	50.6	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	27.9	16.8	17.7	39.1	56.1	10.4	32.9	50.6	1.6
Queue Length 50th (ft)	12	266	49	164	101	122	0	69	101	0
Queue Length 95th (ft)	29	375	84	225	172	#207	72	124	174	0
Internal Link Dist (ft)		612		1268		380			1054	
Turn Bay Length (ft)	100		180		200		300	140		280
Base Capacity (vph)	436	1399	392	1714	316	319	493	300	321	226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.71	0.43	0.43	0.65	0.62	0.54	0.48	0.52	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	727	186	155	545	133	189	182	247	133	154	34
Future Volume (vph)	41	727	186	155	545	133	189	182	247	133	154	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3431		1770	3435		1770	1863	1583	1770	1863	1583
Flt Permitted	0.35	1.00		0.15	1.00		0.51	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	647	3431		277	3435		949	1863	1583	841	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	790	202	168	592	145	205	198	268	145	167	37
RTOR Reduction (vph)	0	20	0	0	18	0	0	0	229	0	0	37
Lane Group Flow (vph)	45	972	0	168	719	0	205	198	39	145	167	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	46.4	42.2		59.0	48.6		24.2	14.5	14.5	23.6	14.2	0.0
Effective Green, g (s)	46.4	42.2		59.0	48.6		24.2	14.5	14.5	23.6	14.2	0.0
Actuated g/C Ratio	0.46	0.42		0.58	0.48		0.24	0.14	0.14	0.23	0.14	0.00
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	344	1434		318	1654		306	267	227	283	262	0
v/s Ratio Prot	0.01	c0.28		c0.06	0.21		c0.06	c0.11		0.05	0.09	
v/s Ratio Perm	0.05			0.25			0.10		0.02	0.07		
v/c Ratio	0.13	0.68		0.53	0.43		0.67	0.74	0.17	0.51	0.64	0.00
Uniform Delay, d1	15.1	23.8		13.6	17.1		33.1	41.4	37.9	32.3	40.9	50.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.6		1.6	0.8		5.5	10.6	0.4	1.6	5.0	0.0
Delay (s)	15.3	26.4		15.2	18.0		38.6	52.0	38.3	33.9	45.9	50.5
Level of Service	B	C		B	B		D	D	D	C	D	D
Approach Delay (s)		25.9			17.5			42.4			41.4	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	28.9			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	100.9			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	73.4%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	8	6	632	485	3
Future Vol, veh/h	1	8	6	632	485	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	7	687	527	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1230	529	530	0	-	0
Stage 1	529	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	196	550	1037	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	195	550	1037	-	-	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	492	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1037	-	457	-	-
HCM Lane V/C Ratio	0.006	-	0.021	-	-
HCM Control Delay (s)	8.5	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	612	8	7	510
Future Vol, veh/h	8	5	612	8	7	510
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	665	9	8	554

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1240	670	0	0	674
Stage 1	670	-	-	-	-
Stage 2	570	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	193	457	-	-	917
Stage 1	509	-	-	-	-
Stage 2	566	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	191	457	-	-	917
Mov Cap-2 Maneuver	191	-	-	-	-
Stage 1	509	-	-	-	-
Stage 2	561	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	246	917
HCM Lane V/C Ratio	-	-	0.057	0.008
HCM Control Delay (s)	-	-	20.5	9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	86	18	682	16	547
v/c Ratio	0.32	0.45	0.03	0.45	0.03	0.36
Control Delay	36.7	39.5	2.8	4.3	3.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.5	2.8	4.3	3.1	4.2
Queue Length 50th (ft)	28	40	1	44	2	83
Queue Length 95th (ft)	66	85	m5	198	7	154
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	650	592	670	1509	559	1518
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.03	0.45	0.03	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	6	37	14	35	24	20	17	578	50	15	492	11
Future Volume (vph)	6	37	14	35	24	20	17	578	50	15	492	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792			1760		1770	1841		1770	1857	
Flt Permitted		0.96			0.87		0.44	1.00		0.37	1.00	
Satd. Flow (perm)		1734			1569		818	1841		686	1857	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	40	15	38	26	22	18	628	54	16	535	12
RTOR Reduction (vph)	0	14	0	0	18	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	48	0	0	68	0	18	681	0	16	547	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Effective Green, g (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Actuated g/C Ratio		0.09			0.09		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			144		651	1467		544	1474	
v/s Ratio Prot								c0.37			0.29	
v/s Ratio Perm		0.03			c0.04		0.02			0.02		
v/c Ratio		0.30			0.47		0.03	0.46		0.03	0.37	
Uniform Delay, d1		42.4			43.1		2.1	3.3		2.2	3.0	
Progression Factor		1.00			1.00		0.94	0.91		1.00	1.00	
Incremental Delay, d2		1.1			2.4		0.1	0.9		0.1	0.7	
Delay (s)		43.5			45.5		2.1	3.9		2.3	3.7	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		43.5			45.5			3.9			3.7	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.1			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			11.4				
Intersection Capacity Utilization		53.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↵	↵		↵	↵	
Traffic Vol, veh/h	1	1	3	3	0	0	7	644	1	1	539	0
Future Vol, veh/h	1	1	3	3	0	0	7	644	1	1	539	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	3	3	0	0	8	700	1	1	586	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1305	1305	586	1307	1305	701	586	0	0	701	0	0
Stage 1	588	588	-	717	717	-	-	-	-	-	-	-
Stage 2	717	717	-	590	588	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	137	160	510	137	160	439	989	-	-	896	-	-
Stage 1	495	496	-	421	434	-	-	-	-	-	-	-
Stage 2	421	434	-	494	496	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	159	510	135	159	439	989	-	-	896	-	-
Mov Cap-2 Maneuver	136	159	-	135	159	-	-	-	-	-	-	-
Stage 1	491	496	-	418	431	-	-	-	-	-	-	-
Stage 2	418	431	-	489	496	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	19.4		32.3			0.1			0			
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	989	-	-	256	135	896	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.021	0.024	0.001	-	-				
HCM Control Delay (s)	8.7	-	-	19.4	32.3	9	-	-				
HCM Lane LOS	A	-	-	C	D	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	6	1	10	6	0	3	14	644	3	0	543	2
Future Vol, veh/h	6	1	10	6	0	3	14	644	3	0	543	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	11	7	0	3	15	700	3	0	590	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1324	1324	591	1329	1324	702	592	0	0	703	0	0
Stage 1	591	591	-	732	732	-	-	-	-	-	-	-
Stage 2	733	733	-	597	592	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	133	156	507	132	156	438	984	-	-	895	-	-
Stage 1	493	494	-	413	427	-	-	-	-	-	-	-
Stage 2	412	426	-	490	494	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	130	154	507	127	154	438	984	-	-	895	-	-
Mov Cap-2 Maneuver	130	154	-	127	154	-	-	-	-	-	-	-
Stage 1	486	494	-	407	421	-	-	-	-	-	-	-
Stage 2	403	420	-	478	494	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	21.6		28		0.2		0	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	984	-	-	235	166	895	-
HCM Lane V/C Ratio	0.015	-	-	0.079	0.059	-	-
HCM Control Delay (s)	8.7	-	-	21.6	28	0	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	26	14	651	563	1
Future Vol, veh/h	9	26	14	651	563	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	15	708	612	1

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	997	613	613	0	-	0
Stage 1	613	-	-	-	-	-
Stage 2	384	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	255	492	964	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	251	492	964	-	-	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	659	-	-	-	-	-

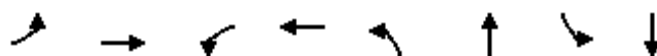
Approach	EB	NB	SB
HCM Control Delay, s	15.1	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	964	-	395	-	-
HCM Lane V/C Ratio	0.016	-	0.096	-	-
HCM Control Delay (s)	8.8	-	15.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	638	140	417	65	642	146	488
v/c Ratio	0.20	0.78	0.57	0.41	0.15	0.64	0.53	0.35
Control Delay	21.6	41.6	30.4	18.1	17.8	36.9	22.7	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	41.6	30.4	18.1	17.8	36.9	22.7	20.5
Queue Length 50th (ft)	25	195	60	65	30	278	45	92
Queue Length 95th (ft)	48	242	95	103	68	357	#97	123
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	296	986	245	1118	437	996	278	1396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.57	0.37	0.15	0.64	0.53	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	490	97	129	222	162	60	450	141	134	421	28
Future Volume (vph)	55	490	97	129	222	162	60	450	141	134	421	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	*0.75		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3452		1770	3315		1770	2694		1770	3507	
Flt Permitted	0.44	1.00		0.24	1.00		0.46	1.00		0.19	1.00	
Satd. Flow (perm)	815	3452		438	3315		853	2694		348	3507	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	533	105	140	241	176	65	489	153	146	458	30
RTOR Reduction (vph)	0	17	0	0	128	0	0	20	0	0	4	0
Lane Group Flow (vph)	60	621	0	140	289	0	65	622	0	146	484	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.5	24.6		34.7	27.2		40.6	34.8		45.2	37.0	
Effective Green, g (s)	29.5	24.6		34.7	27.2		40.6	34.8		45.2	37.0	
Actuated g/C Ratio	0.29	0.25		0.35	0.27		0.41	0.35		0.45	0.37	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	849		251	901		399	937		273	1297	
v/s Ratio Prot	0.01	c0.18		c0.04	0.09		0.01	c0.23		c0.04	0.14	
v/s Ratio Perm	0.05			0.15			0.06			c0.20		
v/c Ratio	0.21	0.73		0.56	0.32		0.16	0.66		0.53	0.37	
Uniform Delay, d1	25.8	34.7		24.0	29.0		18.3	27.6		18.2	23.0	
Progression Factor	1.00	1.00		1.00	1.00		1.19	1.28		0.98	0.87	
Incremental Delay, d2	0.4	3.3		2.7	0.2		0.2	3.6		1.9	0.8	
Delay (s)	26.1	37.9		26.7	29.2		22.0	38.9		19.8	20.8	
Level of Service	C	D		C	C		C	D		B	C	
Approach Delay (s)		36.9			28.6			37.4			20.6	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			31.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			68.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	3	19	11	0	6	31	643	10	12	630	8
Future Vol, veh/h	7	3	19	11	0	6	31	643	10	12	630	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	3	21	12	0	7	34	699	11	13	685	9
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1134	1494	347	1143	1493	355	694	0	0	710	0	0
Stage 1	716	716	-	773	773	-	-	-	-	-	-	-
Stage 2	418	778	-	370	720	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	157	122	649	155	122	641	897	-	-	885	-	-
Stage 1	387	432	-	358	407	-	-	-	-	-	-	-
Stage 2	583	405	-	622	430	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	149	116	649	141	116	641	897	-	-	885	-	-
Mov Cap-2 Maneuver	149	116	-	141	116	-	-	-	-	-	-	-
Stage 1	372	426	-	344	392	-	-	-	-	-	-	-
Stage 2	555	390	-	589	424	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	19.3		25.4		0.4		0.2					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	897	-	-	284	195	885	-	-				
HCM Lane V/C Ratio	0.038	-	-	0.111	0.095	0.015	-	-				
HCM Control Delay (s)	9.2	-	-	19.3	25.4	9.1	-	-				
HCM Lane LOS	A	-	-	C	D	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.3	0	-	-				

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	682	7	5	653
Future Vol, veh/h	2	3	682	7	5	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	703	7	5	673

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1054	355	0
Stage 1	707	-	-
Stage 2	347	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	221	641	-
Stage 1	450	-	-
Stage 2	687	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	220	641	-
Mov Cap-2 Maneuver	220	-	-
Stage 1	450	-	-
Stage 2	683	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	363	885
HCM Lane V/C Ratio	-	-	0.014	0.006
HCM Control Delay (s)	-	-	15.1	9.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	164	75	50	715	6	711
v/c Ratio	0.51	0.40	0.34	0.34	0.36	0.06	0.42
Control Delay	48.1	4.2	40.4	48.8	14.3	56.8	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	4.2	40.4	48.8	14.3	56.8	19.5
Queue Length 50th (ft)	73	0	40	31	120	3	194
Queue Length 95th (ft)	126	15	83	66	228	m9	277
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	285	446	284	276	2004	138	1700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.37	0.26	0.18	0.36	0.04	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Future Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1583		1782		1770	3510		1770	3516	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1583		1782		1770	3510		1770	3516	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	47	164	34	29	12	50	676	39	6	680	31
RTOR Reduction (vph)	0	0	143	0	7	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	120	21	0	68	0	50	712	0	6	708	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Effective Green, g (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Actuated g/C Ratio		0.13	0.13		0.10		0.07	0.52		0.01	0.46	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236	207		174		127	1807		24	1606	
v/s Ratio Prot		c0.07			c0.04		c0.03	c0.20		0.00	c0.20	
v/s Ratio Perm			0.01									
v/c Ratio		0.51	0.10		0.39		0.39	0.39		0.25	0.44	
Uniform Delay, d1		40.5	38.3		42.3		44.3	14.8		48.8	18.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.27	0.95	
Incremental Delay, d2		1.7	0.2		1.4		2.0	0.6		5.1	0.8	
Delay (s)		42.2	38.5		43.7		46.3	15.4		66.8	18.4	
Level of Service		D	D		D		D	B		E	B	
Approach Delay (s)		40.1			43.7			17.4			18.8	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.5									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			52.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Future Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	3	7	24	745	15	4	871	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1303	1689	437	1245	1683	380	874	0	0	760	0	0
Stage 1	881	881	-	801	801	-	-	-	-	-	-	-
Stage 2	422	808	-	444	882	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	118	93	567	130	93	618	768	-	-	848	-	-
Stage 1	308	363	-	344	395	-	-	-	-	-	-	-
Stage 2	580	392	-	563	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	110	90	567	126	90	618	768	-	-	848	-	-
Mov Cap-2 Maneuver	110	90	-	126	90	-	-	-	-	-	-	-
Stage 1	298	361	-	333	383	-	-	-	-	-	-	-
Stage 2	551	380	-	560	360	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		27.5		0.3		0	
HCM LOS	A		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	-	174	848	-
HCM Lane V/C Ratio	0.031	-	-	-	0.082	0.005	-
HCM Control Delay (s)	9.8	-	-	0	27.5	9.3	-
HCM Lane LOS	A	-	-	A	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0	-

HCM 6th TWSC
14: Noland Road & Elm Street

09/30/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Future Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	17	4	0	1	0	771	2	1	867	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1255	1642	434	1208	1641	387	-	0	0	773	0	0
Stage 1	869	869	-	772	772	-	-	-	-	-	-	-
Stage 2	386	773	-	436	869	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	128	99	570	139	99	611	0	-	-	838	-	-
Stage 1	313	367	-	358	407	-	0	-	-	-	-	-
Stage 2	609	407	-	569	367	-	0	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	99	570	133	99	611	-	-	-	838	-	-
Mov Cap-2 Maneuver	128	99	-	133	99	-	-	-	-	-	-	-
Stage 1	313	367	-	358	407	-	-	-	-	-	-	-
Stage 2	608	407	-	549	367	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.7		28.6		0		0	
HCM LOS	B		D					

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	391 158	838	-	-
HCM Lane V/C Ratio	-	-	0.05 0.034	0.001	-	-
HCM Control Delay (s)	-	-	14.7 28.6	9.3	-	-
HCM Lane LOS	-	-	B D	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2 0.1	0	-	-

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Future Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	23	14	3	8	12	759	17	23	865	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1317	1712	434	1272	1705	388	867	0	0	776	0	0
Stage 1	912	912	-	792	792	-	-	-	-	-	-	-
Stage 2	405	800	-	480	913	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	115	90	570	125	90	611	772	-	-	836	-	-
Stage 1	295	351	-	349	399	-	-	-	-	-	-	-
Stage 2	593	395	-	536	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	86	570	113	86	611	772	-	-	836	-	-
Mov Cap-2 Maneuver	107	86	-	113	86	-	-	-	-	-	-	-
Stage 1	290	341	-	343	393	-	-	-	-	-	-	-
Stage 2	572	389	-	496	340	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20.9		35.4		0.1		0.2					
HCM LOS	C		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	772	-	-	257	143	836	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.118	0.175	0.027	-	-				
HCM Control Delay (s)	9.7	-	-	20.9	35.4	9.4	-	-				
HCM Lane LOS	A	-	-	C	E	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-	-				

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	22	6	724	837	1
Future Vol, veh/h	1	22	6	724	837	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	24	7	787	910	1

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1319	456	911	0	-	0
Stage 1	911	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	149	551	743	-	-	-
Stage 1	352	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	148	551	743	-	-	-
Mov Cap-2 Maneuver	148	-	-	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	640	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	743	-	493	-	-
HCM Lane V/C Ratio	0.009	-	0.051	-	-
HCM Control Delay (s)	9.9	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	10	727	856	0
Future Vol, veh/h	1	21	10	727	856	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	23	11	782	920	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1333	460	920	0	-	0
Stage 1	920	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	145	548	738	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	143	548	738	-	-	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	738	-	485	-	-	
HCM Lane V/C Ratio	0.015	-	0.049	-	-	
HCM Control Delay (s)	9.9	-	12.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	724	11	17	857
Future Vol, veh/h	5	13	724	11	17	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	14	778	12	18	922

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1281	395	0
Stage 1	784	-	-
Stage 2	497	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	157	604	826
Stage 1	410	-	-
Stage 2	577	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	154	604	826
Mov Cap-2 Maneuver	154	-	-
Stage 1	410	-	-
Stage 2	564	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	826
HCM Lane V/C Ratio	-	-	0.058	0.022
HCM Control Delay (s)	-	-	16.5	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Future Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	37	4	1	29	11	789	15	8	932	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1369	1778	470	1302	1775	402	940	0	0	804	0	0
Stage 1	952	952	-	819	819	-	-	-	-	-	-	-
Stage 2	417	826	-	483	956	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	105	82	540	118	82	598	725	-	-	816	-	-
Stage 1	279	336	-	336	388	-	-	-	-	-	-	-
Stage 2	584	385	-	534	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	97	80	540	105	80	598	725	-	-	816	-	-
Mov Cap-2 Maneuver	97	80	-	105	80	-	-	-	-	-	-	-
Stage 1	275	333	-	331	382	-	-	-	-	-	-	-
Stage 2	546	379	-	489	332	-	-	-	-	-	-	-

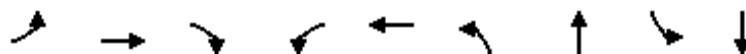
Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		17.2		0.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	725	-	-	377 330	816	-	-
HCM Lane V/C Ratio	0.015	-	-	0.108 0.103	0.009	-	-
HCM Control Delay (s)	10	-	-	15.7 17.2	9.5	-	-
HCM Lane LOS	B	-	-	C C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4 0.3	0	-	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	925	241	208	793	277	671	261	648
v/c Ratio	0.91	0.85	0.37	0.84	0.69	0.74	0.90	0.70	0.90
Control Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Length 50th (ft)	152	363	7	157	278	109	250	101	249
Queue Length 95th (ft)	#294	#482	69	#275	351	156	#353	146	#350
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	215	1091	645	266	1145	389	758	403	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.37	0.78	0.69	0.71	0.89	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Future Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	196	925	241	208	665	128	277	461	210	261	519	129
RTOR Reduction (vph)	0	0	158	0	13	0	0	44	0	0	18	0
Lane Group Flow (vph)	196	925	83	208	780	0	277	627	0	261	630	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Effective Green, g (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Actuated g/C Ratio	0.12	0.31	0.31	0.14	0.33		0.11	0.21		0.11	0.20	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1091	488	250	1134		371	699		374	698	
v/s Ratio Prot	0.11	c0.26		0.12	c0.23		0.08	c0.19		0.08	c0.18	
v/s Ratio Perm			0.05									
v/c Ratio	0.91	0.85	0.17	0.83	0.69		0.75	0.90		0.70	0.90	
Uniform Delay, d1	52.1	38.9	30.3	50.1	35.0		51.9	46.3		51.5	46.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Incremental Delay, d2	37.9	8.2	0.8	20.4	3.4		7.7	13.7		5.6	14.9	
Delay (s)	89.9	47.1	31.1	70.5	38.4		57.0	57.5		57.1	61.5	
Level of Service	F	D	C	E	D		E	E		E	E	
Approach Delay (s)		50.4			45.1			57.4			60.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			84.8%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	56	111	52	885	29	887
v/c Ratio	0.46	0.24	0.64	0.11	0.34	0.06	0.35
Control Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Length 50th (ft)	48	0	69	7	128	1	115
Queue Length 95th (ft)	90	26	125	19	197	m3	m134
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	451	598	513	575	2568	571	2514
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.22	0.09	0.34	0.05	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Future Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1743		1770	3497		1770	3530	
Flt Permitted		0.70	1.00		0.80		0.29	1.00		0.30	1.00	
Satd. Flow (perm)		1295	1583		1438		539	3497		563	3530	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	18	56	57	21	33	52	814	71	29	871	16
RTOR Reduction (vph)	0	0	50	0	17	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	65	6	0	94	0	52	882	0	29	886	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Effective Green, g (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Actuated g/C Ratio		0.11	0.11		0.11		0.76	0.71		0.74	0.70	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	174		158		462	2500		452	2482	
v/s Ratio Prot							c0.00	c0.25		0.00	0.25	
v/s Ratio Perm		0.05	0.00		c0.07		0.08			0.05		
v/c Ratio		0.46	0.04		0.60		0.11	0.35		0.06	0.36	
Uniform Delay, d1		50.0	47.7		50.9		3.9	6.5		4.4	7.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.36	0.58	
Incremental Delay, d2		2.3	0.1		5.9		0.1	0.4		0.0	0.3	
Delay (s)		52.4	47.8		56.8		4.0	6.9		1.6	4.3	
Level of Service		D	D		E		A	A		A	A	
Approach Delay (s)		50.3			56.8			6.8			4.3	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			17.2		
Intersection Capacity Utilization			55.4%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

APPENDIX D

Year 2035 No Build Conditions

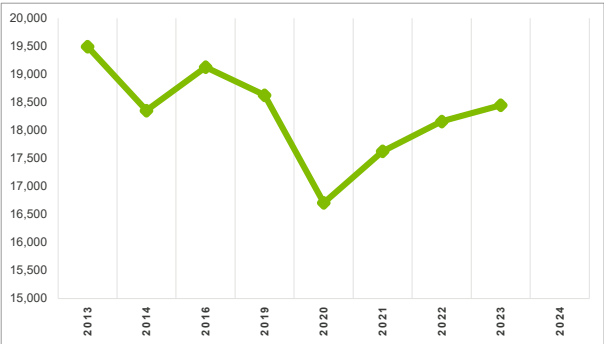
Growth Rate Calculations

Noland Road Multimodal



Station							
Route	Highway 24 @ Noland Road						
Location							
Count Type	Count Year	AADT	Annual Growth Rate	AM Peak Volume	AM Peak Growth	PM Peak Volume	PM Peak Growth
Actual	2013	19,493					
Actual	2014	18,353	-5.8%				
Actual	2016	19,127	2.1%				
Actual	2019	18,627	-0.9%				
Actual	2020	16,708	-10.3%				
Actual	2021	17,626	5.5%				
Actual	2022	18,158	3.0%				
Actual	2023	18,448	1.6%				
Actual	2024						

	AADT	AM	PM
5 Year Growth Rate	-0.2%		
Average 1 Year Growth Rate	-0.7%		
Most Recent Actual Count Growth Rate	1.6%		



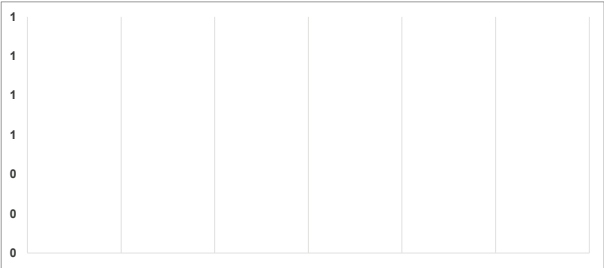
Station							
Route	Truman Road & Noland Road						
Location							
Count Type	Count Year	PM Peak Total Volume	Annual Growth Rate	AM Peak Volume	AM Peak Growth	PM Peak Volume	PM Peak Growth
Actual							
Actual							
Actual							
Actual							
Actual							
Actual							

	AADT	AM	PM
5 Year Growth Rate			
Average 1 Year Growth Rate	#DIV/0!		
Most Recent Actual Count Growth Rate	#NUM!		



Station							
Route	Walnut Street & Noland Road						
Location							
Count Type	Count Year	PM Peak Total Volume	Annual Growth Rate	AM Peak Volume	AM Peak Growth	PM Peak Volume	PM Peak Growth
Actual							
Actual							
Actual							
Actual							
Actual							
Actual							

	AADT	AM	PM
5 Year Growth Rate			
Average 1 Year Growth Rate	#DIV/0!		
Most Recent Actual Count Growth Rate	#NUM!		



Station							
Route	Highway 78/23rd Street & Noland Road						
Location							
Count Type	Count Year	PM Peak Total Volume	Annual Growth Rate	AM Peak Volume	AM Peak Growth	PM Peak Volume	PM Peak Growth
Actual							
Actual							
Actual							
Actual							
Actual							
Actual							

	AADT	AM	PM
5 Year Growth Rate			
Average 1 Year Growth Rate	#DIV/0!		
Most Recent Actual Count Growth Rate	#NUM!		



Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	462	117	645	140	157	91	85	201
v/c Ratio	0.09	0.31	0.22	0.37	0.44	0.51	0.23	0.27	0.43
Control Delay	10.5	14.6	10.7	16.4	31.1	45.1	1.4	27.9	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	14.6	10.7	16.4	31.1	45.1	1.4	27.9	33.3
Queue Length 50th (ft)	10	70	30	131	66	93	0	39	48
Queue Length 95th (ft)	26	119	60	195	118	162	2	77	83
Internal Link Dist (ft)		612		1268		380			1054
Turn Bay Length (ft)	100		180		200			140	
Base Capacity (vph)	493	1503	618	1764	324	346	426	340	643
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.31	0.19	0.37	0.43	0.45	0.21	0.25	0.31
Intersection Summary									

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	274	151	108	512	81	129	144	84	78	136	49
Future Volume (vph)	36	274	151	108	512	81	129	144	84	78	136	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3351		1770	3467		1770	1863	1583	1770	3399	
Flt Permitted	0.39	1.00		0.42	1.00		0.54	1.00	1.00	0.66	1.00	
Satd. Flow (perm)	721	3351		784	3467		1001	1863	1583	1225	3399	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	298	164	117	557	88	140	157	91	85	148	53
RTOR Reduction (vph)	0	63	0	0	11	0	0	0	77	0	35	0
Lane Group Flow (vph)	39	399	0	117	634	0	140	157	14	85	166	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	47.5	43.5		56.5	48.0		24.8	15.6	15.6	20.6	13.5	
Effective Green, g (s)	47.5	43.5		56.5	48.0		24.8	15.6	15.6	20.6	13.5	
Actuated g/C Ratio	0.48	0.44		0.57	0.49		0.25	0.16	0.16	0.21	0.14	
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	388	1473		532	1682		322	293	249	294	463	
v/s Ratio Prot	0.00	0.12		c0.02	c0.18		c0.04	c0.08		0.02	0.05	
v/s Ratio Perm	0.04			0.11			0.07		0.01	0.04		
v/c Ratio	0.10	0.27		0.22	0.38		0.43	0.54	0.06	0.29	0.36	
Uniform Delay, d1	13.7	17.6		10.0	16.0		30.2	38.3	35.4	32.6	38.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.5		0.2	0.6		0.9	1.9	0.1	0.5	0.5	
Delay (s)	13.8	18.1		10.2	16.7		31.1	40.2	35.5	33.1	39.2	
Level of Service	B	B		B	B		C	D	D	C	D	
Approach Delay (s)		17.7			15.7			35.8			37.4	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	23.5			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	98.9			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	54.5%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	4	360	427	1
Future Vol, veh/h	0	5	4	360	427	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	4	391	464	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	669	233	465
Stage 1	465	-	-
Stage 2	204	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	391	769	1093
Stage 1	599	-	-
Stage 2	810	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	389	769	1093
Mov Cap-2 Maneuver	389	-	-
Stage 1	597	-	-
Stage 2	810	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1093	-	769	-	-
HCM Lane V/C Ratio	0.004	-	0.007	-	-
HCM Control Delay (s)	8.3	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	362	2	2	431
Future Vol, veh/h	7	6	362	2	2	431
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	393	2	2	468

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	632	198	0
Stage 1	394	-	-
Stage 2	238	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	413	810	-
Stage 1	650	-	-
Stage 2	779	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	412	810	-
Mov Cap-2 Maneuver	412	-	-
Stage 1	650	-	-
Stage 2	777	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	533	1160
HCM Lane V/C Ratio	-	-	0.027	0.002
HCM Control Delay (s)	-	-	11.9	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	53	14	393	9	468
v/c Ratio	0.19	0.28	0.02	0.13	0.01	0.16
Control Delay	20.5	31.2	1.3	1.2	2.9	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	31.2	1.3	1.2	2.9	2.4
Queue Length 50th (ft)	5	19	2	30	1	30
Queue Length 95th (ft)	32	53	m1	3	4	45
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	657	590	764	2985	821	2995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.09	0.02	0.13	0.01	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	6	22	27	9	13	13	345	17	8	427	4
Future Volume (vph)	4	6	22	27	9	13	13	345	17	8	427	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1681			1748		1770	3515		1770	3535	
Flt Permitted		0.95			0.81		0.48	1.00		0.52	1.00	
Satd. Flow (perm)		1607			1456		901	3515		968	3535	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	7	24	29	10	14	14	375	18	9	464	4
RTOR Reduction (vph)	0	22	0	0	13	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	40	0	14	391	0	9	468	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Effective Green, g (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Actuated g/C Ratio		0.07			0.07		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		117			106		717	2799		767	2803	
v/s Ratio Prot								0.11			c0.13	
v/s Ratio Perm		0.01			c0.03		0.02			0.01		
v/c Ratio		0.11			0.38		0.02	0.14		0.01	0.17	
Uniform Delay, d1		36.8			37.6		1.8	2.0		1.8	2.1	
Progression Factor		1.00			1.00		0.45	0.53		1.00	1.00	
Incremental Delay, d2		0.4			2.2		0.0	0.1		0.0	0.1	
Delay (s)		37.2			39.8		0.9	1.1		1.9	2.2	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		37.2			39.8			1.1			2.2	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.1									
HCM 2000 Volume to Capacity ratio			0.18									
Actuated Cycle Length (s)			85.0									
Intersection Capacity Utilization			30.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕↕		↕	↕↕	
Traffic Vol, veh/h	1	1	2	1	0	1	2	372	4	7	482	1
Future Vol, veh/h	1	1	2	1	0	1	2	372	4	7	482	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	1	0	1	2	404	4	8	524	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	747	953	263	689	951	204	525	0	0	408	0	0
Stage 1	541	541	-	410	410	-	-	-	-	-	-	-
Stage 2	206	412	-	279	541	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	301	258	735	332	258	803	1038	-	-	1147	-	-
Stage 1	493	519	-	589	594	-	-	-	-	-	-	-
Stage 2	777	593	-	704	519	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	299	256	735	328	256	803	1038	-	-	1147	-	-
Mov Cap-2 Maneuver	299	256	-	328	256	-	-	-	-	-	-	-
Stage 1	492	515	-	588	593	-	-	-	-	-	-	-
Stage 2	774	592	-	696	515	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.1		12.8		0		0.1					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1038	-	-	401	466	1147	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.011	0.005	0.007	-	-				
HCM Control Delay (s)	8.5	-	-	14.1	12.8	8.2	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↕↵		↵	↕↵	
Traffic Vol, veh/h	2	0	12	3	1	0	12	377	7	0	481	0
Future Vol, veh/h	2	0	12	3	1	0	12	377	7	0	481	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	13	3	1	0	13	410	8	0	523	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	755	967	262	702	963	209	523	0	0	418	0	0
Stage 1	523	523	-	440	440	-	-	-	-	-	-	-
Stage 2	232	444	-	262	523	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	298	253	737	325	254	797	1040	-	-	1138	-	-
Stage 1	505	529	-	566	576	-	-	-	-	-	-	-
Stage 2	750	574	-	720	529	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	294	250	737	316	251	797	1040	-	-	1138	-	-
Mov Cap-2 Maneuver	294	250	-	316	251	-	-	-	-	-	-	-
Stage 1	499	529	-	559	569	-	-	-	-	-	-	-
Stage 2	739	567	-	707	529	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.1		17.3		0.3		0					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1040	-	-	606	297	1138	-	-				
HCM Lane V/C Ratio	0.013	-	-	0.025	0.015	-	-	-				
HCM Control Delay (s)	8.5	-	-	11.1	17.3	0	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-				

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	22	406	497	1
Future Vol, veh/h	1	18	22	406	497	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	20	24	441	540	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	810	271	541	0	-	0
Stage 1	541	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	318	727	1024	-	-	-
Stage 1	548	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	311	727	1024	-	-	-
Mov Cap-2 Maneuver	311	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	752	-	-	-	-	-

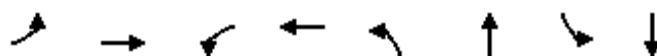
Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1024	-	679	-	-
HCM Lane V/C Ratio	0.023	-	0.03	-	-
HCM Control Delay (s)	8.6	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	203	80	444	63	352	145	420
v/c Ratio	0.14	0.32	0.22	0.49	0.15	0.29	0.37	0.30
Control Delay	31.3	23.9	28.1	24.4	15.5	13.5	21.4	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	23.9	28.1	24.4	15.5	13.5	21.4	18.8
Queue Length 50th (ft)	12	36	30	76	14	38	55	86
Queue Length 95th (ft)	35	67	72	137	24	41	109	135
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	188	805	452	1082	418	1231	397	1412
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.18	0.41	0.15	0.29	0.37	0.30
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	138	49	74	286	122	58	269	55	133	360	27
Future Volume (vph)	25	138	49	74	286	122	58	269	55	133	360	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3380		1770	3449		1770	3503	
Flt Permitted	0.32	1.00		0.62	1.00		0.51	1.00		0.33	1.00	
Satd. Flow (perm)	591	3401		1163	3380		943	3449		621	3503	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	150	53	80	311	133	63	292	60	145	391	29
RTOR Reduction (vph)	0	44	0	0	58	0	0	19	0	0	5	0
Lane Group Flow (vph)	27	159	0	80	386	0	63	333	0	145	415	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.0	15.0		21.6	21.6		25.8	25.8		28.8	28.8	
Effective Green, g (s)	15.0	15.0		21.6	21.6		25.8	25.8		28.8	28.8	
Actuated g/C Ratio	0.18	0.18		0.25	0.25		0.30	0.30		0.34	0.34	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	600		359	858		355	1046		349	1186	
v/s Ratio Prot	0.01	c0.05		0.02	c0.11		0.01	c0.10		0.05	c0.12	
v/s Ratio Perm	0.03			0.03			0.04			c0.09		
v/c Ratio	0.20	0.27		0.22	0.45		0.18	0.32		0.42	0.35	
Uniform Delay, d1	29.7	30.2		25.4	26.7		22.1	22.8		20.6	21.1	
Progression Factor	1.00	1.00		1.00	1.00		0.62	0.63		0.92	0.93	
Incremental Delay, d2	0.7	0.2		0.3	0.4		0.2	0.8		0.8	0.8	
Delay (s)	30.4	30.5		25.7	27.1		13.9	15.1		19.8	20.4	
Level of Service	C	C		C	C		B	B		B	C	
Approach Delay (s)		30.5			26.9			15.0			20.2	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay	22.3			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	85.0			Sum of lost time (s)			25.1					
Intersection Capacity Utilization	58.1%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	4	12	10	8	5	51	366	6	7	469	17
Future Vol, veh/h	2	4	12	10	8	5	51	366	6	7	469	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	13	11	9	5	55	398	7	8	510	18

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	849	1050	264	785	1056	203	528	0	0	405	0	0
Stage 1	535	535	-	512	512	-	-	-	-	-	-	-
Stage 2	314	515	-	273	544	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	254	226	734	283	224	804	1035	-	-	1150	-	-
Stage 1	497	522	-	513	535	-	-	-	-	-	-	-
Stage 2	671	533	-	710	517	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	233	212	734	261	211	804	1035	-	-	1150	-	-
Mov Cap-2 Maneuver	233	212	-	261	211	-	-	-	-	-	-	-
Stage 1	471	518	-	486	507	-	-	-	-	-	-	-
Stage 2	620	505	-	687	513	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.2		19.2		1		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1035	-	-	411	279	1150	-
HCM Lane V/C Ratio	0.054	-	-	0.048	0.09	0.007	-
HCM Control Delay (s)	8.7	-	-	14.2	19.2	8.2	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.3	0	-

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	366	1	2	439
Future Vol, veh/h	2	8	366	1	2	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	10	446	1	2	535
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	719	224	0	0	447	0
Stage 1	447	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	363	779	-	-	1110	-
Stage 1	611	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	779	-	-	1110	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	633	1110	-	-
HCM Lane V/C Ratio	-	-	0.019	0.002	-	-
HCM Control Delay (s)	-	-	10.8	8.2	-	-
HCM Lane LOS	-	-	B	A	-	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-	-

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	113	79	65	425	5	523
v/c Ratio	0.24	0.25	0.31	0.36	0.21	0.04	0.32
Control Delay	35.2	1.3	33.5	40.6	13.6	21.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	1.3	33.5	40.6	13.6	21.8	8.9
Queue Length 50th (ft)	29	0	35	33	64	2	52
Queue Length 95th (ft)	59	0	68	63	111	m8	63
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	273	471	291	324	1995	141	1612
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.27	0.20	0.21	0.04	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Future Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1583		1787		1770	3519		1770	3507	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1814	1583		1787		1770	3519		1770	3507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	33	28	113	39	30	10	65	409	16	5	491	32
RTOR Reduction (vph)	0	0	100	0	6	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	13	0	73	0	65	422	0	5	519	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Effective Green, g (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Actuated g/C Ratio		0.11	0.11		0.11		0.09	0.47		0.02	0.40	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		204	178		201		154	1664		29	1411	
v/s Ratio Prot		c0.03			c0.04		c0.04	0.12		0.00	c0.15	
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.07		0.36		0.42	0.25		0.17	0.37	
Uniform Delay, d1		34.6	33.7		34.9		36.8	13.4		41.2	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.58	0.41	
Incremental Delay, d2		0.8	0.2		1.1		1.9	0.4		2.8	0.7	
Delay (s)		35.4	33.9		36.0		38.6	13.8		26.8	8.0	
Level of Service		D	C		D		D	B		C	A	
Approach Delay (s)		34.4			36.0			17.1			8.2	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)			24.2		
Intersection Capacity Utilization			48.2%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Future Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	37	501	4	1	627	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	958	1212	318	893	1214	253	635	0	0	505	0	0
Stage 1	633	633	-	577	577	-	-	-	-	-	-	-
Stage 2	325	579	-	316	637	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	212	181	678	236	180	746	944	-	-	1056	-	-
Stage 1	434	472	-	469	500	-	-	-	-	-	-	-
Stage 2	661	499	-	670	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	205	174	678	229	173	746	944	-	-	1056	-	-
Mov Cap-2 Maneuver	205	174	-	229	173	-	-	-	-	-	-	-
Stage 1	417	472	-	451	481	-	-	-	-	-	-	-
Stage 2	632	480	-	669	470	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	17.5	0.6	0
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	-	298	1056	-
HCM Lane V/C Ratio	0.04	-	-	-	0.036	0.001	-
HCM Control Delay (s)	9	-	-	0	17.5	8.4	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0	-

HCM 6th TWSC
14: Noland Road & Elm Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Future Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	4	0	5	0	534	0	1	634	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	903	1170	317	853	1170	267	-	0	0	534	0	0
Stage 1	636	636	-	534	534	-	-	-	-	-	-	-
Stage 2	267	534	-	319	636	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	232	192	679	253	192	731	0	-	-	1030	-	-
Stage 1	433	470	-	498	523	-	0	-	-	-	-	-
Stage 2	715	523	-	667	470	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	192	679	249	192	731	-	-	-	1030	-	-
Mov Cap-2 Maneuver	230	192	-	249	192	-	-	-	-	-	-	-
Stage 1	433	470	-	498	523	-	-	-	-	-	-	-
Stage 2	710	523	-	656	470	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		14.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	-	-	568	400	1030	-	-					
HCM Lane V/C Ratio	-	-	0.021	0.021	0.001	-	-					
HCM Control Delay (s)	-	-	11.5	14.2	8.5	-	-					
HCM Lane LOS	-	-	B	B	A	-	-					
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-	-					

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Future Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	13	21	4	24	12	526	17	7	646	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	950	1228	324	897	1221	272	648	0	0	543	0	0
Stage 1	661	661	-	559	559	-	-	-	-	-	-	-
Stage 2	289	567	-	338	662	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	215	177	672	235	179	726	934	-	-	1022	-	-
Stage 1	418	458	-	481	509	-	-	-	-	-	-	-
Stage 2	694	505	-	650	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	201	173	672	226	175	726	934	-	-	1022	-	-
Mov Cap-2 Maneuver	201	173	-	226	175	-	-	-	-	-	-	-
Stage 1	413	455	-	475	502	-	-	-	-	-	-	-
Stage 2	657	498	-	631	454	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.8		17.6		0.2		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	934	-	-	479	334	1022	-
HCM Lane V/C Ratio	0.013	-	-	0.033	0.146	0.007	-
HCM Control Delay (s)	8.9	-	-	12.8	17.6	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	3	449	561	0
Future Vol, veh/h	1	11	3	449	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	4	554	693	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	978	347	693	0	-	0
Stage 1	693	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	248	649	898	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	649	898	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	571	-	-	
HCM Lane V/C Ratio	0.004	-	0.026	-	-	
HCM Control Delay (s)	9	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	4	456	572	2
Future Vol, veh/h	0	17	4	456	572	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	5	563	706	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	999	354	708	0	-	0
Stage 1	707	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	240	642	887	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	239	642	887	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	887	-	642	-	-	
HCM Lane V/C Ratio	0.006	-	0.033	-	-	
HCM Control Delay (s)	9.1	-	10.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	3	453	5	7	575
Future Vol, veh/h	5	3	453	5	7	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	559	6	9	710

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	935	283	0
Stage 1	562	-	-
Stage 2	373	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	264	714	-
Stage 1	534	-	-
Stage 2	666	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	262	714	-
Mov Cap-2 Maneuver	262	-	-
Stage 1	534	-	-
Stage 2	660	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	344	1003
HCM Lane V/C Ratio	-	-	0.029	0.009
HCM Control Delay (s)	-	-	15.8	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Future Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	22	5	4	12	5	546	4	1	705	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	998	1273	359	913	1277	275	717	0	0	550	0	0
Stage 1	713	713	-	558	558	-	-	-	-	-	-	-
Stage 2	285	560	-	355	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	198	166	638	228	165	722	880	-	-	1016	-	-
Stage 1	389	434	-	482	510	-	-	-	-	-	-	-
Stage 2	698	509	-	635	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	190	165	638	218	164	722	880	-	-	1016	-	-
Mov Cap-2 Maneuver	190	165	-	218	164	-	-	-	-	-	-	-
Stage 1	387	434	-	479	507	-	-	-	-	-	-	-
Stage 2	677	506	-	611	431	-	-	-	-	-	-	-

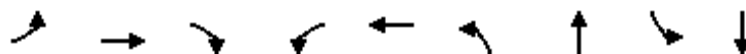
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		16.4		0.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	880	-	-	506	337	1016	-
HCM Lane V/C Ratio	0.006	-	-	0.048	0.062	0.001	-
HCM Control Delay (s)	9.1	-	-	12.5	16.4	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	593	151	151	858	206	395	219	455
v/c Ratio	0.93	0.43	0.21	0.71	0.54	0.57	0.69	0.67	0.90
Control Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Length 50th (ft)	71	176	0	113	237	80	138	85	173
Queue Length 95th (ft)	#170	237	35	181	311	114	182	124	#255
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	97	1391	722	234	1597	503	692	346	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.43	0.21	0.65	0.54	0.41	0.57	0.63	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Future Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	593	151	151	709	149	206	278	117	219	344	111
RTOR Reduction (vph)	0	0	92	0	14	0	0	40	0	0	26	0
Lane Group Flow (vph)	90	593	59	151	844	0	206	355	0	219	429	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Effective Green, g (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Actuated g/C Ratio	0.06	0.39	0.39	0.12	0.46		0.11	0.16		0.10	0.14	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	1392	622	215	1582		363	529		326	480	
v/s Ratio Prot	c0.05	0.17		c0.09	c0.24		0.06	c0.10		0.06	c0.13	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.43	0.10	0.70	0.53		0.57	0.67		0.67	0.89	
Uniform Delay, d1	56.4	26.5	22.9	50.6	23.2		51.0	47.7		52.5	50.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.79		1.00	1.00	
Incremental Delay, d2	64.3	1.0	0.3	9.9	1.3		2.0	3.3		5.4	18.7	
Delay (s)	120.7	27.5	23.2	60.5	24.5		43.8	41.0		57.9	69.4	
Level of Service	F	C	C	E	C		D	D		E	E	
Approach Delay (s)		36.8			29.9			41.9			65.7	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			66.3%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	28	155	9	520	51	575
v/c Ratio	0.20	0.09	0.71	0.02	0.23	0.07	0.22
Control Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Length 50th (ft)	27	0	102	3	88	2	13
Queue Length 95th (ft)	56	0	160	11	134	m8	m42
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	480	631	517	594	2256	731	2624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.30	0.02	0.23	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶	↷		↶		↷	↶	↷	↷	↶	↷
Traffic Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Future Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1583		1743		1770	3507		1770	3534	
Flt Permitted		0.74	1.00		0.81		0.39	1.00		0.46	1.00	
Satd. Flow (perm)		1380	1583		1449		730	3507		856	3534	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	24	15	28	84	26	45	9	488	32	51	569	6
RTOR Reduction (vph)	0	0	24	0	16	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	39	4	0	139	0	9	517	0	51	575	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Effective Green, g (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Actuated g/C Ratio		0.14	0.14		0.14		0.60	0.60		0.71	0.71	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		193	221		202		452	2121		706	2494	
v/s Ratio Prot							0.00	c0.15		0.01	c0.16	
v/s Ratio Perm		0.03	0.00		c0.10		0.01			0.04		
v/c Ratio		0.20	0.02		0.69		0.02	0.24		0.07	0.23	
Uniform Delay, d1		45.7	44.5		49.1		9.6	11.0		5.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.40	0.34	
Incremental Delay, d2		0.5	0.0		9.3		0.0	0.3		0.0	0.2	
Delay (s)		46.2	44.5		58.4		9.6	11.3		2.2	2.3	
Level of Service		D	D		E		A	B		A	A	
Approach Delay (s)		45.5			58.4			11.2			2.3	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.1										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		47.8%										
Analysis Period (min)		15										
c Critical Lane Group												

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	45	992	168	737	229	221	300	161	228
v/c Ratio	0.12	0.71	0.54	0.43	0.67	0.78	0.63	0.58	0.43
Control Delay	11.5	28.4	17.1	18.0	39.5	60.3	13.4	35.9	37.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	28.4	17.1	18.0	39.5	60.3	13.4	35.9	37.5
Queue Length 50th (ft)	13	270	50	167	115	138	15	77	63
Queue Length 95th (ft)	29	375	84	225	192	#250	98	136	104
Internal Link Dist (ft)		612		1268		380			1054
Turn Bay Length (ft)	100		180		200			140	
Base Capacity (vph)	432	1388	387	1702	343	316	496	285	606
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.71	0.43	0.43	0.67	0.70	0.60	0.56	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	727	186	155	545	133	211	203	276	148	172	38
Future Volume (vph)	41	727	186	155	545	133	211	203	276	148	172	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3435		1770	1863	1583	1770	3444	
Flt Permitted	0.35	1.00		0.15	1.00		0.59	1.00	1.00	0.39	1.00	
Satd. Flow (perm)	644	3431		274	3435		1098	1863	1583	725	3444	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	790	202	168	592	145	229	221	300	161	187	41
RTOR Reduction (vph)	0	20	0	0	18	0	0	0	233	0	18	0
Lane Group Flow (vph)	45	972	0	168	719	0	229	221	67	161	210	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	46.4	42.2		59.0	48.6		24.9	15.1	15.1	24.3	14.8	
Effective Green, g (s)	46.4	42.2		59.0	48.6		24.9	15.1	15.1	24.3	14.8	
Actuated g/C Ratio	0.46	0.42		0.58	0.48		0.25	0.15	0.15	0.24	0.15	
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	340	1425		315	1643		333	276	235	271	501	
v/s Ratio Prot	0.01	c0.28		c0.06	0.21		c0.07	c0.12		0.06	0.06	
v/s Ratio Perm	0.05			0.25			0.10		0.04	0.09		
v/c Ratio	0.13	0.68		0.53	0.44		0.69	0.80	0.28	0.59	0.42	
Uniform Delay, d1	15.4	24.2		13.9	17.5		33.4	41.8	38.4	32.5	39.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	2.7		1.7	0.8		5.8	15.2	0.7	3.5	0.6	
Delay (s)	15.6	26.9		15.6	18.3		39.2	57.0	39.1	36.0	40.1	
Level of Service	B	C		B	B		D	E	D	D	D	
Approach Delay (s)		26.4			17.8			44.4			38.4	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	29.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.69											
Actuated Cycle Length (s)	101.6			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	73.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	8	7	705	541	3
Future Vol, veh/h	1	8	7	705	541	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	8	766	588	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	989	296	591	0	-	0
Stage 1	590	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	244	700	981	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	242	700	981	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.3	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	981	-	578	-	-	
HCM Lane V/C Ratio	0.008	-	0.017	-	-	
HCM Control Delay (s)	8.7	-	11.3	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC 3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	683	9	8	569
Future Vol, veh/h	8	5	683	9	8	569
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	742	10	9	618

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1074	376	0
Stage 1	747	-	-
Stage 2	327	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	215	622	-
Stage 1	429	-	-
Stage 2	703	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	213	622	-
Mov Cap-2 Maneuver	213	-	-
Stage 1	429	-	-
Stage 2	695	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	285	853
HCM Lane V/C Ratio	-	-	0.05	0.01
HCM Control Delay (s)	-	-	18.3	9.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	86	21	762	18	610
v/c Ratio	0.32	0.45	0.03	0.27	0.03	0.21
Control Delay	36.7	39.5	1.3	1.2	3.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.5	1.3	1.2	3.2	3.0
Queue Length 50th (ft)	28	40	1	25	2	41
Queue Length 95th (ft)	66	85	m3	28	8	70
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	650	592	642	2868	546	2884
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.03	0.27	0.03	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	6	37	14	35	24	20	19	645	56	17	549	12
Future Volume (vph)	6	37	14	35	24	20	19	645	56	17	549	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792			1760		1770	3497		1770	3528	
Flt Permitted		0.96			0.87		0.42	1.00		0.36	1.00	
Satd. Flow (perm)		1734			1569		784	3497		669	3528	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	40	15	38	26	22	21	701	61	18	597	13
RTOR Reduction (vph)	0	14	0	0	18	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	48	0	0	68	0	21	759	0	18	609	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Effective Green, g (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Actuated g/C Ratio		0.09			0.09		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			144		624	2787		531	2801	
v/s Ratio Prot								0.22			0.17	
v/s Ratio Perm		0.03			0.04		0.03			0.03		
v/c Ratio		0.30			0.47		0.03	0.27		0.03	0.22	
Uniform Delay, d1		42.4			43.1		2.1	2.6		2.2	2.6	
Progression Factor		1.00			1.00		0.40	0.36		1.00	1.00	
Incremental Delay, d2		1.1			2.4		0.1	0.2		0.1	0.2	
Delay (s)		43.5			45.5		0.9	1.2		2.3	2.7	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		43.5			45.5			1.2			2.7	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.9									
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			39.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	3	3	0	0	8	719	1	1	602	0
Future Vol, veh/h	1	1	3	3	0	0	8	719	1	1	602	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	3	3	0	0	9	782	1	1	654	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1065	1457	327	1131	1457	392	654	0	0	783	0	0
Stage 1	656	656	-	801	801	-	-	-	-	-	-	-
Stage 2	409	801	-	330	656	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	177	129	669	158	129	607	929	-	-	831	-	-
Stage 1	421	460	-	344	395	-	-	-	-	-	-	-
Stage 2	590	395	-	657	460	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	176	128	669	155	128	607	929	-	-	831	-	-
Mov Cap-2 Maneuver	176	128	-	155	128	-	-	-	-	-	-	-
Stage 1	417	460	-	341	391	-	-	-	-	-	-	-
Stage 2	584	391	-	651	460	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	18.2		28.7		0.1		0	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	929	-	-	278	155	831	-
HCM Lane V/C Ratio	0.009	-	-	0.02	0.021	0.001	-
HCM Control Delay (s)	8.9	-	-	18.2	28.7	9.3	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	6	1	10	6	0	3	16	719	3	0	606	2
Future Vol, veh/h	6	1	10	6	0	3	16	719	3	0	606	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	11	7	0	3	17	782	3	0	659	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1085	1479	331	1148	1479	393	661	0	0	785	0	0
Stage 1	660	660	-	818	818	-	-	-	-	-	-	-
Stage 2	425	819	-	330	661	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	171	125	665	154	125	606	923	-	-	829	-	-
Stage 1	418	458	-	336	388	-	-	-	-	-	-	-
Stage 2	578	388	-	657	458	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	123	665	148	123	606	923	-	-	829	-	-
Mov Cap-2 Maneuver	168	123	-	148	123	-	-	-	-	-	-	-
Stage 1	410	458	-	330	381	-	-	-	-	-	-	-
Stage 2	564	381	-	645	458	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	18.3		24.1		0.2		0					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	923	-	-	289	198	829	-	-				
HCM Lane V/C Ratio	0.019	-	-	0.064	0.049	-	-	-				
HCM Control Delay (s)	9	-	-	18.3	24.1	0	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	0	-	-				

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	26	16	727	628	1
Future Vol, veh/h	9	26	16	727	628	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	17	790	683	1

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1113	342	684	0	-	0
Stage 1	684	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	203	654	905	-	-	-
Stage 1	462	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	654	905	-	-	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	624	-	-	-	-	-

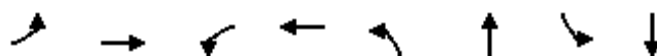
Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	905	-	412	-	-
HCM Lane V/C Ratio	0.019	-	0.092	-	-
HCM Control Delay (s)	9.1	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	638	140	417	73	717	163	545
v/c Ratio	0.20	0.78	0.57	0.41	0.18	0.57	0.52	0.39
Control Delay	21.6	41.6	30.4	18.1	17.9	33.2	20.8	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	41.6	30.4	18.1	17.9	33.2	20.8	21.6
Queue Length 50th (ft)	25	195	60	65	32	225	47	97
Queue Length 95th (ft)	48	242	95	103	71	297	85	198
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	296	986	245	1118	408	1259	315	1389
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.57	0.37	0.18	0.57	0.52	0.39
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	490	97	129	222	162	67	502	157	150	470	31
Future Volume (vph)	55	490	97	129	222	162	67	502	157	150	470	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3452		1770	3315		1770	3413		1770	3506	
Flt Permitted	0.44	1.00		0.24	1.00		0.41	1.00		0.24	1.00	
Satd. Flow (perm)	815	3452		438	3315		771	3413		438	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	533	105	140	241	176	73	546	171	163	511	34
RTOR Reduction (vph)	0	17	0	0	128	0	0	29	0	0	4	0
Lane Group Flow (vph)	60	621	0	140	289	0	73	688	0	163	541	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.5	24.6		34.7	27.2		40.6	34.6		45.2	36.8	
Effective Green, g (s)	29.5	24.6		34.7	27.2		40.6	34.6		45.2	36.8	
Actuated g/C Ratio	0.29	0.25		0.35	0.27		0.41	0.35		0.45	0.37	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	849		251	901		372	1180		309	1290	
v/s Ratio Prot	0.01	c0.18		c0.04	0.09		0.01	c0.20		c0.04	0.15	
v/s Ratio Perm	0.05			0.15			0.07			c0.19		
v/c Ratio	0.21	0.73		0.56	0.32		0.20	0.58		0.53	0.42	
Uniform Delay, d1	25.8	34.7		24.0	29.0		18.4	26.8		17.8	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.17	1.26		0.91	0.89	
Incremental Delay, d2	0.4	3.3		2.7	0.2		0.3	2.0		1.6	1.0	
Delay (s)	26.1	37.9		26.7	29.2		21.9	35.7		17.8	22.0	
Level of Service	C	D		C	C		C	D		B	C	
Approach Delay (s)		36.9			28.6			34.4			21.0	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.4			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			71.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	7	3	19	11	0	6	35	718	11	13	703	9
Future Vol, veh/h	7	3	19	11	0	6	35	718	11	13	703	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	3	21	12	0	7	38	780	12	14	764	10

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1263	1665	387	1274	1664	396	774	0	0	792	0	0
Stage 1	797	797	-	862	862	-	-	-	-	-	-	-
Stage 2	466	868	-	412	802	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	126	96	611	124	96	603	837	-	-	824	-	-
Stage 1	346	397	-	316	370	-	-	-	-	-	-	-
Stage 2	546	368	-	588	395	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	119	90	611	111	90	603	837	-	-	824	-	-
Mov Cap-2 Maneuver	119	90	-	111	90	-	-	-	-	-	-	-
Stage 1	330	390	-	302	353	-	-	-	-	-	-	-
Stage 2	516	351	-	554	388	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.7		31.2		0.4		0.2	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	837	-	-	235	156	824	-
HCM Lane V/C Ratio	0.045	-	-	0.134	0.118	0.017	-
HCM Control Delay (s)	9.5	-	-	22.7	31.2	9.4	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.4	0.1	-

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	682	7	5	653
Future Vol, veh/h	2	3	682	7	5	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	703	7	5	673

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1054	355	0
Stage 1	707	-	-
Stage 2	347	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	221	641	885
Stage 1	450	-	-
Stage 2	687	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	220	641	885
Mov Cap-2 Maneuver	220	-	-
Stage 1	450	-	-
Stage 2	683	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	363	885
HCM Lane V/C Ratio	-	-	0.014	0.006
HCM Control Delay (s)	-	-	15.1	9.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	164	75	50	715	6	711
v/c Ratio	0.51	0.40	0.34	0.34	0.36	0.06	0.42
Control Delay	48.1	4.2	40.4	48.8	14.3	57.8	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	4.2	40.4	48.8	14.3	57.8	19.0
Queue Length 50th (ft)	73	0	40	31	120	3	195
Queue Length 95th (ft)	126	15	83	66	228	m9	279
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	285	446	284	276	2004	138	1700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.37	0.26	0.18	0.36	0.04	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Future Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1583		1782		1770	3510		1770	3516	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1583		1782		1770	3510		1770	3516	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	47	164	34	29	12	50	676	39	6	680	31
RTOR Reduction (vph)	0	0	143	0	7	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	120	21	0	68	0	50	712	0	6	708	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Effective Green, g (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Actuated g/C Ratio		0.13	0.13		0.10		0.07	0.52		0.01	0.46	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236	207		174		127	1807		24	1606	
v/s Ratio Prot		c0.07			c0.04		c0.03	c0.20		0.00	c0.20	
v/s Ratio Perm			0.01									
v/c Ratio		0.51	0.10		0.39		0.39	0.39		0.25	0.44	
Uniform Delay, d1		40.5	38.3		42.3		44.3	14.8		48.8	18.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.29	0.92	
Incremental Delay, d2		1.7	0.2		1.4		2.0	0.6		5.1	0.8	
Delay (s)		42.2	38.5		43.7		46.3	15.4		67.9	17.9	
Level of Service		D	D		D		D	B		E	B	
Approach Delay (s)		40.1			43.7			17.4			18.3	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.3									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			52.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Future Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	3	7	24	745	15	4	871	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1303	1689	437	1245	1683	380	874	0	0	760	0	0
Stage 1	881	881	-	801	801	-	-	-	-	-	-	-
Stage 2	422	808	-	444	882	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	118	93	567	130	93	618	768	-	-	848	-	-
Stage 1	308	363	-	344	395	-	-	-	-	-	-	-
Stage 2	580	392	-	563	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	110	90	567	126	90	618	768	-	-	848	-	-
Mov Cap-2 Maneuver	110	90	-	126	90	-	-	-	-	-	-	-
Stage 1	298	361	-	333	383	-	-	-	-	-	-	-
Stage 2	551	380	-	560	360	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	27.5	0.3	0
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	-	174	848	-
HCM Lane V/C Ratio	0.031	-	-	-	0.082	0.005	-
HCM Control Delay (s)	9.8	-	-	0	27.5	9.3	-
HCM Lane LOS	A	-	-	A	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0	-

HCM 6th TWSC
14: Noland Road & Elm Street

09/30/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Future Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	17	4	0	1	0	771	2	1	867	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1255	1642	434	1208	1641	387	-	0	0	773	0	0
Stage 1	869	869	-	772	772	-	-	-	-	-	-	-
Stage 2	386	773	-	436	869	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	128	99	570	139	99	611	0	-	-	838	-	-
Stage 1	313	367	-	358	407	-	0	-	-	-	-	-
Stage 2	609	407	-	569	367	-	0	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	99	570	133	99	611	-	-	-	838	-	-
Mov Cap-2 Maneuver	128	99	-	133	99	-	-	-	-	-	-	-
Stage 1	313	367	-	358	407	-	-	-	-	-	-	-
Stage 2	608	407	-	549	367	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB				
HCM Control Delay, s	14.7		28.6		0			0				
HCM LOS	B		D									

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	391 158	838	-	-
HCM Lane V/C Ratio	-	-	0.05 0.034	0.001	-	-
HCM Control Delay (s)	-	-	14.7 28.6	9.3	-	-
HCM Lane LOS	-	-	B D	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2 0.1	0	-	-

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Future Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	23	14	3	8	12	759	17	23	865	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1317	1712	434	1272	1705	388	867	0	0	776	0	0
Stage 1	912	912	-	792	792	-	-	-	-	-	-	-
Stage 2	405	800	-	480	913	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	115	90	570	125	90	611	772	-	-	836	-	-
Stage 1	295	351	-	349	399	-	-	-	-	-	-	-
Stage 2	593	395	-	536	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	86	570	113	86	611	772	-	-	836	-	-
Mov Cap-2 Maneuver	107	86	-	113	86	-	-	-	-	-	-	-
Stage 1	290	341	-	343	393	-	-	-	-	-	-	-
Stage 2	572	389	-	496	340	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20.9		35.4		0.1		0.2					
HCM LOS	C		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	772	-	-	257	143	836	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.118	0.175	0.027	-	-				
HCM Control Delay (s)	9.7	-	-	20.9	35.4	9.4	-	-				
HCM Lane LOS	A	-	-	C	E	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-	-				

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	22	6	724	837	1
Future Vol, veh/h	1	22	6	724	837	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	24	7	787	910	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1319	456	911
Stage 1	911	-	-
Stage 2	408	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	149	551	743
Stage 1	352	-	-
Stage 2	640	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	148	551	743
Mov Cap-2 Maneuver	148	-	-
Stage 1	349	-	-
Stage 2	640	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	743	-	493	-	-
HCM Lane V/C Ratio	0.009	-	0.051	-	-
HCM Control Delay (s)	9.9	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	10	727	856	0
Future Vol, veh/h	1	21	10	727	856	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	23	11	782	920	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1333	460	920	0	-	0
Stage 1	920	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	145	548	738	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	143	548	738	-	-	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	738	-	485	-	-
HCM Lane V/C Ratio	0.015	-	0.049	-	-
HCM Control Delay (s)	9.9	-	12.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	724	11	17	857
Future Vol, veh/h	5	13	724	11	17	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	14	778	12	18	922

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1281	395	0
Stage 1	784	-	-
Stage 2	497	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	157	604	826
Stage 1	410	-	-
Stage 2	577	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	154	604	826
Mov Cap-2 Maneuver	154	-	-
Stage 1	410	-	-
Stage 2	564	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	826
HCM Lane V/C Ratio	-	-	0.058	0.022
HCM Control Delay (s)	-	-	16.5	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Future Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	37	4	1	29	11	789	15	8	932	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1369	1778	470	1302	1775	402	940	0	0	804	0	0
Stage 1	952	952	-	819	819	-	-	-	-	-	-	-
Stage 2	417	826	-	483	956	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	105	82	540	118	82	598	725	-	-	816	-	-
Stage 1	279	336	-	336	388	-	-	-	-	-	-	-
Stage 2	584	385	-	534	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	97	80	540	105	80	598	725	-	-	816	-	-
Mov Cap-2 Maneuver	97	80	-	105	80	-	-	-	-	-	-	-
Stage 1	275	333	-	331	382	-	-	-	-	-	-	-
Stage 2	546	379	-	489	332	-	-	-	-	-	-	-

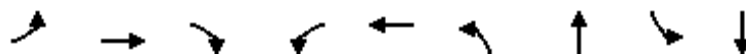
Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		17.2		0.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	725	-	-	377 330	816	-	-
HCM Lane V/C Ratio	0.015	-	-	0.108 0.103	0.009	-	-
HCM Control Delay (s)	10	-	-	15.7 17.2	9.5	-	-
HCM Lane LOS	B	-	-	C C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4 0.3	0	-	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	925	241	208	793	277	671	261	648
v/c Ratio	0.91	0.85	0.37	0.84	0.69	0.74	0.90	0.70	0.90
Control Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Length 50th (ft)	152	363	7	157	278	109	250	101	249
Queue Length 95th (ft)	#294	#482	69	#275	351	156	#353	146	#350
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	215	1091	645	266	1145	389	758	403	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.37	0.78	0.69	0.71	0.89	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Future Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	196	925	241	208	665	128	277	461	210	261	519	129
RTOR Reduction (vph)	0	0	158	0	13	0	0	44	0	0	18	0
Lane Group Flow (vph)	196	925	83	208	780	0	277	627	0	261	630	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Effective Green, g (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Actuated g/C Ratio	0.12	0.31	0.31	0.14	0.33		0.11	0.21		0.11	0.20	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1091	488	250	1134		371	699		374	698	
v/s Ratio Prot	0.11	c0.26		0.12	c0.23		0.08	c0.19		0.08	c0.18	
v/s Ratio Perm			0.05									
v/c Ratio	0.91	0.85	0.17	0.83	0.69		0.75	0.90		0.70	0.90	
Uniform Delay, d1	52.1	38.9	30.3	50.1	35.0		51.9	46.3		51.5	46.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Incremental Delay, d2	37.9	8.2	0.8	20.4	3.4		7.7	13.7		5.6	14.9	
Delay (s)	89.9	47.1	31.1	70.5	38.4		57.0	57.5		57.1	61.5	
Level of Service	F	D	C	E	D		E	E		E	E	
Approach Delay (s)		50.4			45.1			57.4			60.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			84.8%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	56	111	52	885	29	887
v/c Ratio	0.46	0.24	0.64	0.11	0.34	0.06	0.35
Control Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Length 50th (ft)	48	0	69	7	128	1	115
Queue Length 95th (ft)	90	26	125	19	197	m3	m134
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	451	598	513	575	2568	571	2514
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.22	0.09	0.34	0.05	0.35

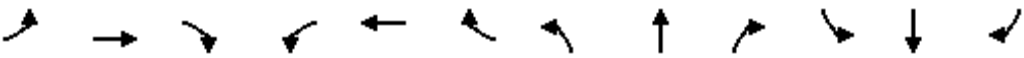
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↰	↱	↰	↰	↱
Traffic Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Future Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1743		1770	3497		1770	3530	
Flt Permitted		0.70	1.00		0.80		0.29	1.00		0.30	1.00	
Satd. Flow (perm)		1295	1583		1438		539	3497		563	3530	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	18	56	57	21	33	52	814	71	29	871	16
RTOR Reduction (vph)	0	0	50	0	17	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	65	6	0	94	0	52	882	0	29	886	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Effective Green, g (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Actuated g/C Ratio		0.11	0.11		0.11		0.76	0.71		0.74	0.70	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	174		158		462	2500		452	2482	
v/s Ratio Prot							c0.00	c0.25		0.00	0.25	
v/s Ratio Perm		0.05	0.00		c0.07		0.08			0.05		
v/c Ratio		0.46	0.04		0.60		0.11	0.35		0.06	0.36	
Uniform Delay, d1		50.0	47.7		50.9		3.9	6.5		4.4	7.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.36	0.58	
Incremental Delay, d2		2.3	0.1		5.9		0.1	0.4		0.0	0.3	
Delay (s)		52.4	47.8		56.8		4.0	6.9		1.6	4.3	
Level of Service		D	D		E		A	A		A	A	
Approach Delay (s)		50.3			56.8			6.8			4.3	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.8									
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			120.0									
Intersection Capacity Utilization			55.4%									
Analysis Period (min)			15									
c Critical Lane Group												

APPENDIX E

Year 2035 With Bike Lanes Conditions

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	462	117	645	140	157	91	85	148	53
v/c Ratio	0.09	0.31	0.22	0.37	0.44	0.50	0.23	0.27	0.60	0.23
Control Delay	10.6	14.8	10.9	16.6	31.1	44.3	1.4	27.7	50.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	14.8	10.9	16.6	31.1	44.3	1.4	27.7	50.0	2.4
Queue Length 50th (ft)	10	70	30	132	66	93	0	39	88	0
Queue Length 95th (ft)	26	119	60	195	118	162	2	77	152	0
Internal Link Dist (ft)		612		1268		380			1054	
Turn Bay Length (ft)	100		180		200		300	140		280
Base Capacity (vph)	488	1492	612	1750	321	349	428	347	331	226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.31	0.19	0.37	0.44	0.45	0.21	0.24	0.45	0.23
Intersection Summary										

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	274	151	108	512	81	129	144	84	78	136	49
Future Volume (vph)	36	274	151	108	512	81	129	144	84	78	136	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3351		1770	3467		1770	1863	1583	1770	1863	1583
Flt Permitted	0.39	1.00		0.42	1.00		0.51	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	720	3351		780	3467		944	1863	1583	1225	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	298	164	117	557	88	140	157	91	85	148	53
RTOR Reduction (vph)	0	64	0	0	11	0	0	0	76	0	0	53
Lane Group Flow (vph)	39	398	0	117	634	0	140	157	15	85	148	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	47.3	43.3		56.5	47.9		25.5	16.3	16.3	21.1	14.1	0.0
Effective Green, g (s)	47.3	43.3		56.5	47.9		25.5	16.3	16.3	21.1	14.1	0.0
Actuated g/C Ratio	0.48	0.44		0.57	0.48		0.26	0.16	0.16	0.21	0.14	0.00
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	384	1459		529	1670		318	305	259	298	264	0
v/s Ratio Prot	0.00	0.12		c0.02	c0.18		c0.04	c0.08		0.02	0.08	
v/s Ratio Perm	0.04			0.11			0.07		0.01	0.04		
v/c Ratio	0.10	0.27		0.22	0.38		0.44	0.51	0.06	0.29	0.56	0.00
Uniform Delay, d1	14.0	18.0		10.2	16.3		29.9	37.9	35.1	32.4	39.8	49.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.5		0.2	0.7		1.0	1.5	0.1	0.5	2.7	0.0
Delay (s)	14.1	18.4		10.4	17.0		30.9	39.4	35.2	32.9	42.5	49.7
Level of Service	B	B		B	B		C	D	D	C	D	D
Approach Delay (s)		18.1			16.0			35.3			41.0	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	24.1			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	99.4			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	56.2%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC
2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	4	360	427	1
Future Vol, veh/h	0	5	4	360	427	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	4	391	464	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	864	465	465	0	-	0
Stage 1	465	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	325	597	1096	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	324	597	1096	-	-	-
Mov Cap-2 Maneuver	324	-	-	-	-	-
Stage 1	629	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.1	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1096	-	597	-	-	
HCM Lane V/C Ratio	0.004	-	0.009	-	-	
HCM Control Delay (s)	8.3	-	11.1	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	362	2	2	431
Future Vol, veh/h	7	6	362	2	2	431
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	393	2	2	468
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	866	394	0	0	395	0
Stage 1	394	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	324	655	-	-	1164	-
Stage 1	681	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	323	655	-	-	1164	-
Mov Cap-2 Maneuver	323	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.8	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	422	1164	-	
HCM Lane V/C Ratio	-	-	0.033	0.002	-	
HCM Control Delay (s)	-	-	13.8	8.1	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	53	14	393	9	468
v/c Ratio	0.19	0.28	0.02	0.25	0.01	0.30
Control Delay	20.5	31.2	0.7	1.2	2.9	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	31.2	0.7	1.2	2.9	3.3
Queue Length 50th (ft)	5	19	1	61	1	67
Queue Length 95th (ft)	32	53	m1	7	4	107
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	657	590	773	1571	836	1576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.09	0.02	0.25	0.01	0.30

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	4	6	22	27	9	13	13	345	17	8	427	4
Future Volume (vph)	4	6	22	27	9	13	13	345	17	8	427	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1681			1748		1770	1850		1770	1860	
Flt Permitted		0.95			0.81		0.49	1.00		0.53	1.00	
Satd. Flow (perm)		1607			1456		911	1850		987	1860	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	7	24	29	10	14	14	375	18	9	464	4
RTOR Reduction (vph)	0	22	0	0	13	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	40	0	14	392	0	9	468	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Effective Green, g (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Actuated g/C Ratio		0.07			0.07		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		117			106		725	1473		782	1474	
v/s Ratio Prot								0.21			c0.25	
v/s Ratio Perm		0.01			c0.03		0.02			0.01		
v/c Ratio		0.11			0.38		0.02	0.27		0.01	0.32	
Uniform Delay, d1		36.8			37.6		1.8	2.2		1.8	2.4	
Progression Factor		1.00			1.00		0.23	0.31		1.00	1.00	
Incremental Delay, d2		0.4			2.2		0.0	0.4		0.0	0.6	
Delay (s)		37.2			39.8		0.5	1.1		1.9	3.0	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		37.2			39.8			1.1			3.0	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.4										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		85.0										
Intersection Capacity Utilization		40.8%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↵	↵		↵	↵	
Traffic Vol, veh/h	1	1	2	1	0	1	2	372	4	7	482	1
Future Vol, veh/h	1	1	2	1	0	1	2	372	4	7	482	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	1	0	1	2	404	4	8	524	1
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	952	953	525	952	951	406	525	0	0	408	0	0
Stage 1	541	541	-	410	410	-	-	-	-	-	-	-
Stage 2	411	412	-	542	541	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	239	259	552	239	260	645	1042	-	-	1151	-	-
Stage 1	525	521	-	619	595	-	-	-	-	-	-	-
Stage 2	618	594	-	525	521	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	237	257	552	236	258	645	1042	-	-	1151	-	-
Mov Cap-2 Maneuver	237	257	-	236	258	-	-	-	-	-	-	-
Stage 1	524	517	-	618	594	-	-	-	-	-	-	-
Stage 2	616	593	-	518	517	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	15.7		15.5			0			0.1			
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1042	-	-	341	346	1151	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.013	0.006	0.007	-	-				
HCM Control Delay (s)	8.5	-	-	15.7	15.5	8.1	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↵	↵		↵	↵	
Traffic Vol, veh/h	2	0	12	3	1	0	12	377	7	0	481	0
Future Vol, veh/h	2	0	12	3	1	0	12	377	7	0	481	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	13	3	1	0	13	410	8	0	523	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	964	967	523	970	963	414	523	0	0	418	0	0
Stage 1	523	523	-	440	440	-	-	-	-	-	-	-
Stage 2	441	444	-	530	523	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	235	254	554	233	256	638	1043	-	-	1141	-	-
Stage 1	537	530	-	596	578	-	-	-	-	-	-	-
Stage 2	595	575	-	533	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	232	251	554	225	253	638	1043	-	-	1141	-	-
Mov Cap-2 Maneuver	232	251	-	225	253	-	-	-	-	-	-	-
Stage 1	531	530	-	589	571	-	-	-	-	-	-	-
Stage 2	586	568	-	520	530	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	13.1		20.9			0.3			0			
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1043	-	-	462	231	1141	-	-				
HCM Lane V/C Ratio	0.013	-	-	0.033	0.019	-	-	-				
HCM Control Delay (s)	8.5	-	-	13.1	20.9	0	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	22	406	497	1
Future Vol, veh/h	1	18	22	406	497	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	20	24	441	540	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	810	541	541
Stage 1	541	-	-
Stage 2	269	-	-
Critical Hdwy	6.63	6.23	4.13
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.83	-	-
Follow-up Hdwy	3.519	3.319	2.219
Pot Cap-1 Maneuver	333	540	1026
Stage 1	582	-	-
Stage 2	753	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	325	540	1026
Mov Cap-2 Maneuver	325	-	-
Stage 1	569	-	-
Stage 2	753	-	-

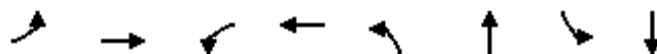
Approach	EB	NB	SB
HCM Control Delay, s	12.2	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1026	-	522	-	-
HCM Lane V/C Ratio	0.023	-	0.04	-	-
HCM Control Delay (s)	8.6	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	203	80	444	63	352	145	420
v/c Ratio	0.14	0.32	0.22	0.49	0.15	0.36	0.42	0.30
Control Delay	31.3	23.9	28.1	24.4	15.5	14.6	21.7	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	23.9	28.1	24.4	15.5	14.6	21.7	18.2
Queue Length 50th (ft)	12	36	30	76	14	52	44	79
Queue Length 95th (ft)	35	67	72	137	24	54	108	135
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	188	805	452	1082	418	970	353	1412
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.18	0.41	0.15	0.36	0.41	0.30
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	138	49	74	286	122	58	269	55	133	360	27
Future Volume (vph)	25	138	49	74	286	122	58	269	55	133	360	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	*0.75		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3380		1770	2723		1770	3503	
Flt Permitted	0.32	1.00		0.62	1.00		0.51	1.00		0.25	1.00	
Satd. Flow (perm)	591	3401		1163	3380		943	2723		464	3503	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	150	53	80	311	133	63	292	60	145	391	29
RTOR Reduction (vph)	0	44	0	0	58	0	0	13	0	0	5	0
Lane Group Flow (vph)	27	159	0	80	386	0	63	339	0	145	415	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.0	15.0		21.6	21.6		25.8	25.8		28.8	28.8	
Effective Green, g (s)	15.0	15.0		21.6	21.6		25.8	25.8		28.8	28.8	
Actuated g/C Ratio	0.18	0.18		0.25	0.25		0.30	0.30		0.34	0.34	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	600		359	858		355	826		315	1186	
v/s Ratio Prot	0.01	c0.05		0.02	c0.11		0.01	c0.12		c0.06	0.12	
v/s Ratio Perm	0.03			0.03			0.04			c0.10		
v/c Ratio	0.20	0.27		0.22	0.45		0.18	0.41		0.46	0.35	
Uniform Delay, d1	29.7	30.2		25.4	26.7		22.1	23.5		20.8	21.1	
Progression Factor	1.00	1.00		1.00	1.00		0.62	0.62		0.89	0.90	
Incremental Delay, d2	0.7	0.2		0.3	0.4		0.2	1.5		1.0	0.8	
Delay (s)	30.4	30.5		25.7	27.1		13.9	16.1		19.6	19.8	
Level of Service	C	C		C	C		B	B		B	B	
Approach Delay (s)		30.5			26.9			15.8			19.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay	22.4			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	85.0			Sum of lost time (s)			25.1					
Intersection Capacity Utilization	58.1%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	4	12	10	8	5	51	366	6	7	469	17
Future Vol, veh/h	2	4	12	10	8	5	51	366	6	7	469	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	13	11	9	5	55	398	7	8	510	18
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	849	1050	264	785	1056	203	528	0	0	405	0	0
Stage 1	535	535	-	512	512	-	-	-	-	-	-	-
Stage 2	314	515	-	273	544	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	254	226	734	283	224	804	1035	-	-	1150	-	-
Stage 1	497	522	-	513	535	-	-	-	-	-	-	-
Stage 2	671	533	-	710	517	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	233	212	734	261	211	804	1035	-	-	1150	-	-
Mov Cap-2 Maneuver	233	212	-	261	211	-	-	-	-	-	-	-
Stage 1	471	518	-	486	507	-	-	-	-	-	-	-
Stage 2	620	505	-	687	513	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.2		19.2		1		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1035	-	-	411	279	1150	-	-				
HCM Lane V/C Ratio	0.054	-	-	0.048	0.09	0.007	-	-				
HCM Control Delay (s)	8.7	-	-	14.2	19.2	8.2	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.3	0	-	-				

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	366	1	2	439
Future Vol, veh/h	2	8	366	1	2	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	10	446	1	2	535
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	719	224	0	0	447	0
Stage 1	447	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	363	779	-	-	1110	-
Stage 1	611	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	779	-	-	1110	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	633	1110	-	
HCM Lane V/C Ratio	-	-	0.019	0.002	-	
HCM Control Delay (s)	-	-	10.8	8.2	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	113	79	65	425	5	523
v/c Ratio	0.24	0.25	0.31	0.36	0.21	0.04	0.32
Control Delay	35.2	1.3	33.5	40.6	13.6	21.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	1.3	33.5	40.6	13.6	21.8	8.9
Queue Length 50th (ft)	29	0	35	33	64	2	52
Queue Length 95th (ft)	59	0	68	63	111	m8	63
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	273	471	291	324	1995	141	1612
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.27	0.20	0.21	0.04	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Future Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1583		1787		1770	3519		1770	3507	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1814	1583		1787		1770	3519		1770	3507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	33	28	113	39	30	10	65	409	16	5	491	32
RTOR Reduction (vph)	0	0	100	0	6	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	13	0	73	0	65	422	0	5	519	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Effective Green, g (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Actuated g/C Ratio		0.11	0.11		0.11		0.09	0.47		0.02	0.40	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		204	178		201		154	1664		29	1411	
v/s Ratio Prot		c0.03			c0.04		c0.04	0.12		0.00	c0.15	
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.07		0.36		0.42	0.25		0.17	0.37	
Uniform Delay, d1		34.6	33.7		34.9		36.8	13.4		41.2	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.58	0.41	
Incremental Delay, d2		0.8	0.2		1.1		1.9	0.4		2.8	0.7	
Delay (s)		35.4	33.9		36.0		38.6	13.8		26.8	8.0	
Level of Service		D	C		D		D	B		C	A	
Approach Delay (s)		34.4			36.0			17.1			8.2	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)			24.2		
Intersection Capacity Utilization			48.2%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Future Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	37	501	4	1	627	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	958	1212	318	893	1214	253	635	0	0	505	0	0
Stage 1	633	633	-	577	577	-	-	-	-	-	-	-
Stage 2	325	579	-	316	637	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	212	181	678	236	180	746	944	-	-	1056	-	-
Stage 1	434	472	-	469	500	-	-	-	-	-	-	-
Stage 2	661	499	-	670	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	205	174	678	229	173	746	944	-	-	1056	-	-
Mov Cap-2 Maneuver	205	174	-	229	173	-	-	-	-	-	-	-
Stage 1	417	472	-	451	481	-	-	-	-	-	-	-
Stage 2	632	480	-	669	470	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		17.5		0.6		0	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	-	298	1056	-
HCM Lane V/C Ratio	0.04	-	-	-	0.036	0.001	-
HCM Control Delay (s)	9	-	-	0	17.5	8.4	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0	-

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↙	↕	
Traffic Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Future Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	4	0	5	0	534	0	1	634	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	903	1170	317	853	1170	267	-	0	0	534	0	0
Stage 1	636	636	-	534	534	-	-	-	-	-	-	-
Stage 2	267	534	-	319	636	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	232	192	679	253	192	731	0	-	-	1030	-	-
Stage 1	433	470	-	498	523	-	0	-	-	-	-	-
Stage 2	715	523	-	667	470	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	192	679	249	192	731	-	-	-	1030	-	-
Mov Cap-2 Maneuver	230	192	-	249	192	-	-	-	-	-	-	-
Stage 1	433	470	-	498	523	-	-	-	-	-	-	-
Stage 2	710	523	-	656	470	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		14.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		568 400		1030	-	-			
HCM Lane V/C Ratio	-		-		0.021 0.021		0.001	-	-			
HCM Control Delay (s)	-		-		11.5 14.2		8.5	-	-			
HCM Lane LOS	-		-		B B		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.1 0.1		0	-	-			

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Future Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	13	21	4	24	12	526	17	7	646	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	950	1228	324	897	1221	272	648	0	0	543	0	0
Stage 1	661	661	-	559	559	-	-	-	-	-	-	-
Stage 2	289	567	-	338	662	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	215	177	672	235	179	726	934	-	-	1022	-	-
Stage 1	418	458	-	481	509	-	-	-	-	-	-	-
Stage 2	694	505	-	650	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	201	173	672	226	175	726	934	-	-	1022	-	-
Mov Cap-2 Maneuver	201	173	-	226	175	-	-	-	-	-	-	-
Stage 1	413	455	-	475	502	-	-	-	-	-	-	-
Stage 2	657	498	-	631	454	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.8		17.6		0.2		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	934	-	-	479	334	1022	-
HCM Lane V/C Ratio	0.013	-	-	0.033	0.146	0.007	-
HCM Control Delay (s)	8.9	-	-	12.8	17.6	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	3	449	561	0
Future Vol, veh/h	1	11	3	449	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	4	554	693	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	978	347	693	0	-	0
Stage 1	693	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	248	649	898	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	649	898	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	571	-	-	
HCM Lane V/C Ratio	0.004	-	0.026	-	-	
HCM Control Delay (s)	9	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC
17: Noland Road & Linden Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	4	456	572	2
Future Vol, veh/h	0	17	4	456	572	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	5	563	706	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	999	354	708	0	-	0
Stage 1	707	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	240	642	887	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	239	642	887	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	732	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	887	-	642	-	-
HCM Lane V/C Ratio	0.006	-	0.033	-	-
HCM Control Delay (s)	9.1	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	3	453	5	7	575
Future Vol, veh/h	5	3	453	5	7	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	559	6	9	710

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	935	283	0
Stage 1	562	-	-
Stage 2	373	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	264	714	1003
Stage 1	534	-	-
Stage 2	666	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	262	714	1003
Mov Cap-2 Maneuver	262	-	-
Stage 1	534	-	-
Stage 2	660	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	344	1003
HCM Lane V/C Ratio	-	-	0.029	0.009
HCM Control Delay (s)	-	-	15.8	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Future Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	22	5	4	12	5	546	4	1	705	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	998	1273	359	913	1277	275	717	0	0	550	0	0
Stage 1	713	713	-	558	558	-	-	-	-	-	-	-
Stage 2	285	560	-	355	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	198	166	638	228	165	722	880	-	-	1016	-	-
Stage 1	389	434	-	482	510	-	-	-	-	-	-	-
Stage 2	698	509	-	635	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	190	165	638	218	164	722	880	-	-	1016	-	-
Mov Cap-2 Maneuver	190	165	-	218	164	-	-	-	-	-	-	-
Stage 1	387	434	-	479	507	-	-	-	-	-	-	-
Stage 2	677	506	-	611	431	-	-	-	-	-	-	-

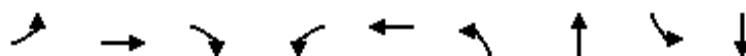
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		16.4		0.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	880	-	-	506	337	1016	-
HCM Lane V/C Ratio	0.006	-	-	0.048	0.062	0.001	-
HCM Control Delay (s)	9.1	-	-	12.5	16.4	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	593	151	151	858	206	395	219	455
v/c Ratio	0.93	0.43	0.21	0.71	0.54	0.57	0.69	0.67	0.90
Control Delay	130.2	28.8	3.9	68.2	24.6	47.4	39.5	63.0	69.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	28.8	3.9	68.2	24.6	47.4	39.5	63.0	69.1
Queue Length 50th (ft)	71	176	0	113	237	80	138	85	173
Queue Length 95th (ft)	#170	237	35	181	311	114	182	124	#255
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	97	1391	722	234	1597	503	692	346	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.43	0.21	0.65	0.54	0.41	0.57	0.63	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Future Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	593	151	151	709	149	206	278	117	219	344	111
RTOR Reduction (vph)	0	0	92	0	14	0	0	40	0	0	26	0
Lane Group Flow (vph)	90	593	59	151	844	0	206	355	0	219	429	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Effective Green, g (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Actuated g/C Ratio	0.06	0.39	0.39	0.12	0.46		0.11	0.16		0.10	0.14	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	1392	622	215	1582		363	529		326	480	
v/s Ratio Prot	c0.05	0.17		c0.09	c0.24		0.06	c0.10		0.06	c0.13	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.43	0.10	0.70	0.53		0.57	0.67		0.67	0.89	
Uniform Delay, d1	56.4	26.5	22.9	50.6	23.2		51.0	47.7		52.5	50.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.79		1.00	1.00	
Incremental Delay, d2	64.3	1.0	0.3	9.9	1.3		2.0	3.3		5.4	18.7	
Delay (s)	120.7	27.5	23.2	60.5	24.5		43.7	40.8		57.9	69.4	
Level of Service	F	C	C	E	C		D	D		E	E	
Approach Delay (s)		36.8			29.9			41.8			65.7	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			66.3%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	28	155	9	520	51	575
v/c Ratio	0.20	0.09	0.71	0.02	0.23	0.07	0.22
Control Delay	45.6	0.5	59.8	11.2	10.7	2.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.5	59.8	11.2	10.7	2.7	2.1
Queue Length 50th (ft)	27	0	102	3	88	2	13
Queue Length 95th (ft)	56	0	160	11	134	m8	m42
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	480	631	517	594	2256	731	2624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.30	0.02	0.23	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Future Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1583		1743		1770	3507		1770	3534	
Flt Permitted		0.74	1.00		0.81		0.39	1.00		0.46	1.00	
Satd. Flow (perm)		1380	1583		1449		730	3507		856	3534	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	24	15	28	84	26	45	9	488	32	51	569	6
RTOR Reduction (vph)	0	0	24	0	16	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	39	4	0	139	0	9	517	0	51	575	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Effective Green, g (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Actuated g/C Ratio		0.14	0.14		0.14		0.60	0.60		0.71	0.71	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		193	221		202		452	2121		706	2494	
v/s Ratio Prot							0.00	c0.15		0.01	c0.16	
v/s Ratio Perm		0.03	0.00		c0.10		0.01			0.04		
v/c Ratio		0.20	0.02		0.69		0.02	0.24		0.07	0.23	
Uniform Delay, d1		45.7	44.5		49.1		9.6	11.0		5.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.39	0.33	
Incremental Delay, d2		0.5	0.0		9.3		0.0	0.3		0.0	0.2	
Delay (s)		46.2	44.5		58.4		9.6	11.3		2.2	2.2	
Level of Service		D	D		E		A	B		A	A	
Approach Delay (s)		45.5			58.4			11.2			2.2	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.1										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		47.8%										
Analysis Period (min)		15										
c Critical Lane Group												

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	45	992	168	737	229	221	300	161	187	41
v/c Ratio	0.12	0.72	0.54	0.43	0.75	0.78	0.63	0.58	0.67	0.18
Control Delay	11.6	28.4	17.1	18.0	45.9	60.1	13.4	35.8	52.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	28.4	17.1	18.0	45.9	60.1	13.4	35.8	52.8	1.8
Queue Length 50th (ft)	13	270	50	167	115	138	15	77	114	0
Queue Length 95th (ft)	29	375	84	225	#222	#250	98	136	193	0
Internal Link Dist (ft)		612		1268		380			1054	
Turn Bay Length (ft)	100		180		200		300	140		280
Base Capacity (vph)	432	1387	387	1701	305	316	496	286	318	226
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.72	0.43	0.43	0.75	0.70	0.60	0.56	0.59	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	727	186	155	545	133	211	203	276	148	172	38
Future Volume (vph)	41	727	186	155	545	133	211	203	276	148	172	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3431		1770	3435		1770	1863	1583	1770	1863	1583
Flt Permitted	0.35	1.00		0.15	1.00		0.46	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	643	3431		273	3435		850	1863	1583	728	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	790	202	168	592	145	229	221	300	161	187	41
RTOR Reduction (vph)	0	20	0	0	18	0	0	0	233	0	0	41
Lane Group Flow (vph)	45	972	0	168	719	0	229	221	67	161	187	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	46.4	42.2		59.0	48.6		25.0	15.2	15.2	24.4	14.9	0.0
Effective Green, g (s)	46.4	42.2		59.0	48.6		25.0	15.2	15.2	24.4	14.9	0.0
Actuated g/C Ratio	0.46	0.41		0.58	0.48		0.25	0.15	0.15	0.24	0.15	0.00
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	339	1423		314	1641		297	278	236	271	272	0
v/s Ratio Prot	0.01	c0.28		c0.06	0.21		c0.07	c0.12		0.06	0.10	
v/s Ratio Perm	0.05			0.25			0.12		0.04	0.09		
v/c Ratio	0.13	0.68		0.54	0.44		0.77	0.79	0.28	0.59	0.69	0.00
Uniform Delay, d1	15.5	24.3		14.0	17.5		34.0	41.7	38.4	32.5	41.2	50.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.7		1.8	0.9		11.7	14.5	0.7	3.5	7.0	0.0
Delay (s)	15.7	27.0		15.7	18.4		45.7	56.2	39.1	36.0	48.2	50.9
Level of Service	B	C		B	B		D	E	D	D	D	D
Approach Delay (s)		26.5			17.9			46.1			43.4	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			30.9			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			101.7			Sum of lost time (s)			24.2			
Intersection Capacity Utilization			75.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	8	7	705	541	3
Future Vol, veh/h	1	8	7	705	541	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	8	766	588	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1372	590	591	0	-	0
Stage 1	590	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	161	508	985	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	160	508	985	-	-	-
Mov Cap-2 Maneuver	160	-	-	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	985	-	409	-	-	
HCM Lane V/C Ratio	0.008	-	0.024	-	-	
HCM Control Delay (s)	8.7	-	14	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	683	9	8	569
Future Vol, veh/h	8	5	683	9	8	569
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	742	10	9	618

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1383	747	0	0	752
Stage 1	747	-	-	-	-
Stage 2	636	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	158	413	-	-	858
Stage 1	468	-	-	-	-
Stage 2	527	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	156	413	-	-	858
Mov Cap-2 Maneuver	156	-	-	-	-
Stage 1	468	-	-	-	-
Stage 2	522	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	205	858
HCM Lane V/C Ratio	-	-	0.069	0.01
HCM Control Delay (s)	-	-	23.9	9.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	86	21	762	18	610
v/c Ratio	0.32	0.45	0.03	0.50	0.04	0.40
Control Delay	36.7	39.5	3.6	6.4	3.2	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.5	3.6	6.4	3.2	4.5
Queue Length 50th (ft)	28	40	1	102	2	97
Queue Length 95th (ft)	66	85	m7	290	8	179
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	650	592	619	1509	502	1518
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.03	0.50	0.04	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	6	37	14	35	24	20	19	645	56	17	549	12
Future Volume (vph)	6	37	14	35	24	20	19	645	56	17	549	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792			1760		1770	1840		1770	1857	
Flt Permitted		0.96			0.87		0.41	1.00		0.33	1.00	
Satd. Flow (perm)		1734			1569		756	1840		615	1857	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	40	15	38	26	22	21	701	61	18	597	13
RTOR Reduction (vph)	0	14	0	0	18	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	48	0	0	68	0	21	761	0	18	610	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Effective Green, g (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Actuated g/C Ratio		0.09			0.09		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			144		602	1466		488	1474	
v/s Ratio Prot								c0.41			0.33	
v/s Ratio Perm		0.03			c0.04		0.03			0.03		
v/c Ratio		0.30			0.47		0.03	0.52		0.04	0.41	
Uniform Delay, d1		42.4			43.1		2.1	3.5		2.2	3.2	
Progression Factor		1.00			1.00		1.21	1.31		1.00	1.00	
Incremental Delay, d2		1.1			2.4		0.1	1.1		0.1	0.9	
Delay (s)		43.5			45.5		2.6	5.7		2.3	4.0	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		43.5			45.5			5.6			4.0	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			11.4				
Intersection Capacity Utilization		57.7%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	1	1	3	3	0	0	8	719	1	1	602	0
Future Vol, veh/h	1	1	3	3	0	0	8	719	1	1	602	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	3	3	0	0	9	782	1	1	654	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1457	1457	654	1459	1457	783	654	0	0	783	0	0
Stage 1	656	656	-	801	801	-	-	-	-	-	-	-
Stage 2	801	801	-	658	656	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	108	130	467	107	130	394	933	-	-	835	-	-
Stage 1	454	462	-	378	397	-	-	-	-	-	-	-
Stage 2	378	397	-	453	462	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	107	129	467	105	129	394	933	-	-	835	-	-
Mov Cap-2 Maneuver	107	129	-	105	129	-	-	-	-	-	-	-
Stage 1	449	462	-	374	393	-	-	-	-	-	-	-
Stage 2	374	393	-	448	462	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.3		40.4		0.1		0	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	933	-	-	213	105	835	-
HCM Lane V/C Ratio	0.009	-	-	0.026	0.031	0.001	-
HCM Control Delay (s)	8.9	-	-	22.3	40.4	9.3	-
HCM Lane LOS	A	-	-	C	E	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	6	1	10	6	0	3	16	719	3	0	606	2
Future Vol, veh/h	6	1	10	6	0	3	16	719	3	0	606	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	11	7	0	3	17	782	3	0	659	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1479	1479	660	1484	1479	784	661	0	0	785	0	0
Stage 1	660	660	-	818	818	-	-	-	-	-	-	-
Stage 2	819	819	-	666	661	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	104	126	463	103	126	393	927	-	-	834	-	-
Stage 1	452	460	-	370	390	-	-	-	-	-	-	-
Stage 2	369	389	-	449	460	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	102	124	463	98	124	393	927	-	-	834	-	-
Mov Cap-2 Maneuver	102	124	-	98	124	-	-	-	-	-	-	-
Stage 1	444	460	-	363	383	-	-	-	-	-	-	-
Stage 2	359	382	-	437	460	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	25.7		34.7		0.2		0	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	927	-	-	192	131	834	-
HCM Lane V/C Ratio	0.019	-	-	0.096	0.075	-	-
HCM Control Delay (s)	9	-	-	25.7	34.7	0	-
HCM Lane LOS	A	-	-	D	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.2	0	-

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	26	16	727	628	1
Future Vol, veh/h	9	26	16	727	628	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	17	790	683	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1113	684	684	0	-	0
Stage 1	684	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	216	448	907	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	212	448	907	-	-	-
Mov Cap-2 Maneuver	212	-	-	-	-	-
Stage 1	491	-	-	-	-	-
Stage 2	625	-	-	-	-	-

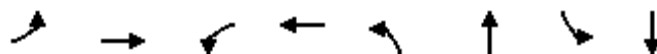
Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	907	-	348	-	-
HCM Lane V/C Ratio	0.019	-	0.109	-	-
HCM Control Delay (s)	9	-	16.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	638	140	417	73	717	163	545
v/c Ratio	0.20	0.78	0.57	0.41	0.18	0.74	0.64	0.39
Control Delay	21.6	41.6	30.4	18.1	17.9	39.9	33.6	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	41.6	30.4	18.1	17.9	39.9	33.6	21.0
Queue Length 50th (ft)	25	195	60	65	32	310	51	103
Queue Length 95th (ft)	48	242	95	103	71	392	#162	135
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	296	986	245	1118	408	971	255	1389
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.57	0.37	0.18	0.74	0.64	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	490	97	129	222	162	67	502	157	150	470	31
Future Volume (vph)	55	490	97	129	222	162	67	502	157	150	470	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	*0.75		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3452		1770	3315		1770	2694		1770	3506	
Flt Permitted	0.44	1.00		0.24	1.00		0.42	1.00		0.13	1.00	
Satd. Flow (perm)	815	3452		438	3315		787	2694		248	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	533	105	140	241	176	73	546	171	163	511	34
RTOR Reduction (vph)	0	17	0	0	128	0	0	20	0	0	4	0
Lane Group Flow (vph)	60	621	0	140	289	0	73	697	0	163	541	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.5	24.6		34.7	27.2		39.9	33.9		45.9	36.8	
Effective Green, g (s)	29.5	24.6		34.7	27.2		39.9	33.9		45.9	36.8	
Actuated g/C Ratio	0.29	0.25		0.35	0.27		0.40	0.34		0.46	0.37	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	849		251	901		372	913		252	1290	
v/s Ratio Prot	0.01	c0.18		c0.04	0.09		0.01	c0.26		c0.06	0.15	
v/s Ratio Perm	0.05			0.15			0.07			c0.24		
v/c Ratio	0.21	0.73		0.56	0.32		0.20	0.76		0.65	0.42	
Uniform Delay, d1	25.8	34.7		24.0	29.0		18.9	29.5		19.2	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.17	1.24		1.27	0.87	
Incremental Delay, d2	0.4	3.3		2.7	0.2		0.3	5.8		5.4	1.0	
Delay (s)	26.1	37.9		26.7	29.2		22.4	42.5		29.8	21.4	
Level of Service	C	D		C	C		C	D		C	C	
Approach Delay (s)		36.9			28.6			40.6			23.3	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			32.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			71.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	7	3	19	11	0	6	35	718	11	13	703	9
Future Vol, veh/h	7	3	19	11	0	6	35	718	11	13	703	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	3	21	12	0	7	38	780	12	14	764	10

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1263	1665	387	1274	1664	396	774	0	0	792	0	0
Stage 1	797	797	-	862	862	-	-	-	-	-	-	-
Stage 2	466	868	-	412	802	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	126	96	611	124	96	603	837	-	-	824	-	-
Stage 1	346	397	-	316	370	-	-	-	-	-	-	-
Stage 2	546	368	-	588	395	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	119	90	611	111	90	603	837	-	-	824	-	-
Mov Cap-2 Maneuver	119	90	-	111	90	-	-	-	-	-	-	-
Stage 1	330	390	-	302	353	-	-	-	-	-	-	-
Stage 2	516	351	-	554	388	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.7		31.2		0.4		0.2	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	837	-	-	235	156	824	-
HCM Lane V/C Ratio	0.045	-	-	0.134	0.118	0.017	-
HCM Control Delay (s)	9.5	-	-	22.7	31.2	9.4	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.4	0.1	-

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	682	7	5	653
Future Vol, veh/h	2	3	682	7	5	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	703	7	5	673

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1054	355	0
Stage 1	707	-	-
Stage 2	347	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	221	641	885
Stage 1	450	-	-
Stage 2	687	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	220	641	885
Mov Cap-2 Maneuver	220	-	-
Stage 1	450	-	-
Stage 2	683	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	363	885
HCM Lane V/C Ratio	-	-	0.014	0.006
HCM Control Delay (s)	-	-	15.1	9.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Queues

12: Noland Road & Walnut St

09/30/2024

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	164	75	50	715	6	711
v/c Ratio	0.51	0.40	0.34	0.34	0.36	0.06	0.42
Control Delay	48.1	4.2	40.4	48.8	14.3	58.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	4.2	40.4	48.8	14.3	58.8	18.8
Queue Length 50th (ft)	73	0	40	31	120	3	194
Queue Length 95th (ft)	126	15	83	66	228	m9	279
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	285	446	284	276	2004	138	1700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.37	0.26	0.18	0.36	0.04	0.42
Intersection Summary							
m Volume for 95th percentile queue is metered by upstream signal.							

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱		↰	↱	
Traffic Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Future Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1583		1782		1770	3510		1770	3516	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1583		1782		1770	3510		1770	3516	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	47	164	34	29	12	50	676	39	6	680	31
RTOR Reduction (vph)	0	0	143	0	7	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	120	21	0	68	0	50	712	0	6	708	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Effective Green, g (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Actuated g/C Ratio		0.13	0.13		0.10		0.07	0.52		0.01	0.46	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236	207		174		127	1807		24	1606	
v/s Ratio Prot		c0.07			c0.04		c0.03	c0.20		0.00	c0.20	
v/s Ratio Perm			0.01									
v/c Ratio		0.51	0.10		0.39		0.39	0.39		0.25	0.44	
Uniform Delay, d1		40.5	38.3		42.3		44.3	14.8		48.8	18.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.31	0.92	
Incremental Delay, d2		1.7	0.2		1.4		2.0	0.6		5.1	0.8	
Delay (s)		42.2	38.5		43.7		46.3	15.4		69.1	17.7	
Level of Service		D	D		D		D	B		E	B	
Approach Delay (s)		40.1			43.7			17.4			18.2	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay		22.3										
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		100.0								24.2		
Intersection Capacity Utilization		52.6%								A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Future Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	3	7	24	745	15	4	871	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1303	1689	437	1245	1683	380	874	0	0	760	0	0
Stage 1	881	881	-	801	801	-	-	-	-	-	-	-
Stage 2	422	808	-	444	882	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	118	93	567	130	93	618	768	-	-	848	-	-
Stage 1	308	363	-	344	395	-	-	-	-	-	-	-
Stage 2	580	392	-	563	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	110	90	567	126	90	618	768	-	-	848	-	-
Mov Cap-2 Maneuver	110	90	-	126	90	-	-	-	-	-	-	-
Stage 1	298	361	-	333	383	-	-	-	-	-	-	-
Stage 2	551	380	-	560	360	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		27.5		0.3		0	
HCM LOS	A		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	-	174	848	-
HCM Lane V/C Ratio	0.031	-	-	-	0.082	0.005	-
HCM Control Delay (s)	9.8	-	-	0	27.5	9.3	-
HCM Lane LOS	A	-	-	A	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0	-

HCM 6th TWSC
14: Noland Road & Elm Street

09/30/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Future Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	17	4	0	1	0	771	2	1	867	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1255	1642	434	1208	1641	387	-	0	0	773	0	0
Stage 1	869	869	-	772	772	-	-	-	-	-	-	-
Stage 2	386	773	-	436	869	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	128	99	570	139	99	611	0	-	-	838	-	-
Stage 1	313	367	-	358	407	-	0	-	-	-	-	-
Stage 2	609	407	-	569	367	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	99	570	133	99	611	-	-	-	838	-	-
Mov Cap-2 Maneuver	128	99	-	133	99	-	-	-	-	-	-	-
Stage 1	313	367	-	358	407	-	-	-	-	-	-	-
Stage 2	608	407	-	549	367	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.7		28.6		0		0					
HCM LOS	B		D									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		391 158		838	-	-			
HCM Lane V/C Ratio	-		-		0.05 0.034		0.001	-	-			
HCM Control Delay (s)	-		-		14.7 28.6		9.3	-	-			
HCM Lane LOS	-		-		B D		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.2 0.1		0	-	-			

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Future Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	23	14	3	8	12	759	17	23	865	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1317	1712	434	1272	1705	388	867	0	0	776	0	0
Stage 1	912	912	-	792	792	-	-	-	-	-	-	-
Stage 2	405	800	-	480	913	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	115	90	570	125	90	611	772	-	-	836	-	-
Stage 1	295	351	-	349	399	-	-	-	-	-	-	-
Stage 2	593	395	-	536	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	107	86	570	113	86	611	772	-	-	836	-	-
Mov Cap-2 Maneuver	107	86	-	113	86	-	-	-	-	-	-	-
Stage 1	290	341	-	343	393	-	-	-	-	-	-	-
Stage 2	572	389	-	496	340	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.9		35.4		0.1		0.2	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	772	-	-	257	143	836	-
HCM Lane V/C Ratio	0.015	-	-	0.118	0.175	0.027	-
HCM Control Delay (s)	9.7	-	-	20.9	35.4	9.4	-
HCM Lane LOS	A	-	-	C	E	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	22	6	724	837	1
Future Vol, veh/h	1	22	6	724	837	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	24	7	787	910	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1319	456	911
Stage 1	911	-	-
Stage 2	408	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	149	551	743
Stage 1	352	-	-
Stage 2	640	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	148	551	743
Mov Cap-2 Maneuver	148	-	-
Stage 1	349	-	-
Stage 2	640	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	743	-	493	-	-
HCM Lane V/C Ratio	0.009	-	0.051	-	-
HCM Control Delay (s)	9.9	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	10	727	856	0
Future Vol, veh/h	1	21	10	727	856	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	23	11	782	920	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1333	460	920
Stage 1	920	-	-
Stage 2	413	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	145	548	738
Stage 1	349	-	-
Stage 2	636	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	143	548	738
Mov Cap-2 Maneuver	143	-	-
Stage 1	344	-	-
Stage 2	636	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	738	-	485	-	-
HCM Lane V/C Ratio	0.015	-	0.049	-	-
HCM Control Delay (s)	9.9	-	12.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	724	11	17	857
Future Vol, veh/h	5	13	724	11	17	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	14	778	12	18	922

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1281	395	0
Stage 1	784	-	-
Stage 2	497	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	157	604	-
Stage 1	410	-	-
Stage 2	577	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	154	604	-
Mov Cap-2 Maneuver	154	-	-
Stage 1	410	-	-
Stage 2	564	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	826
HCM Lane V/C Ratio	-	-	0.058	0.022
HCM Control Delay (s)	-	-	16.5	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Future Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	37	4	1	29	11	789	15	8	932	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1369	1778	470	1302	1775	402	940	0	0	804	0	0
Stage 1	952	952	-	819	819	-	-	-	-	-	-	-
Stage 2	417	826	-	483	956	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	105	82	540	118	82	598	725	-	-	816	-	-
Stage 1	279	336	-	336	388	-	-	-	-	-	-	-
Stage 2	584	385	-	534	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	97	80	540	105	80	598	725	-	-	816	-	-
Mov Cap-2 Maneuver	97	80	-	105	80	-	-	-	-	-	-	-
Stage 1	275	333	-	331	382	-	-	-	-	-	-	-
Stage 2	546	379	-	489	332	-	-	-	-	-	-	-

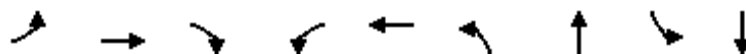
Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		17.2		0.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	725	-	-	377 330	816	-	-
HCM Lane V/C Ratio	0.015	-	-	0.108 0.103	0.009	-	-
HCM Control Delay (s)	10	-	-	15.7 17.2	9.5	-	-
HCM Lane LOS	B	-	-	C C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4 0.3	0	-	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	925	241	208	793	277	671	261	648
v/c Ratio	0.91	0.85	0.37	0.84	0.69	0.74	0.90	0.70	0.90
Control Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Length 50th (ft)	152	363	7	157	278	109	250	101	249
Queue Length 95th (ft)	#294	#482	69	#275	351	156	#353	146	#350
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	215	1091	645	266	1145	389	758	403	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.37	0.78	0.69	0.71	0.89	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Future Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	196	925	241	208	665	128	277	461	210	261	519	129
RTOR Reduction (vph)	0	0	158	0	13	0	0	44	0	0	18	0
Lane Group Flow (vph)	196	925	83	208	780	0	277	627	0	261	630	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Effective Green, g (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Actuated g/C Ratio	0.12	0.31	0.31	0.14	0.33		0.11	0.21		0.11	0.20	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1091	488	250	1134		371	699		374	698	
v/s Ratio Prot	0.11	c0.26		0.12	c0.23		0.08	c0.19		0.08	c0.18	
v/s Ratio Perm			0.05									
v/c Ratio	0.91	0.85	0.17	0.83	0.69		0.75	0.90		0.70	0.90	
Uniform Delay, d1	52.1	38.9	30.3	50.1	35.0		51.9	46.3		51.5	46.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Incremental Delay, d2	37.9	8.2	0.8	20.4	3.4		7.7	13.7		5.6	14.9	
Delay (s)	89.9	47.1	31.1	70.5	38.4		57.0	57.5		57.1	61.5	
Level of Service	F	D	C	E	D		E	E		E	E	
Approach Delay (s)		50.4			45.1			57.4			60.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			84.8%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	56	111	52	885	29	887
v/c Ratio	0.46	0.24	0.64	0.11	0.34	0.06	0.35
Control Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Length 50th (ft)	48	0	69	7	128	1	115
Queue Length 95th (ft)	90	26	125	19	197	m3	m134
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	451	598	513	575	2568	571	2514
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.22	0.09	0.34	0.05	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Future Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1743		1770	3497		1770	3530	
Flt Permitted		0.70	1.00		0.80		0.29	1.00		0.30	1.00	
Satd. Flow (perm)		1295	1583		1438		539	3497		563	3530	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	18	56	57	21	33	52	814	71	29	871	16
RTOR Reduction (vph)	0	0	50	0	17	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	65	6	0	94	0	52	882	0	29	886	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Effective Green, g (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Actuated g/C Ratio		0.11	0.11		0.11		0.76	0.71		0.74	0.70	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	174		158		462	2500		452	2482	
v/s Ratio Prot							c0.00	c0.25		0.00	0.25	
v/s Ratio Perm		0.05	0.00		c0.07		0.08			0.05		
v/c Ratio		0.46	0.04		0.60		0.11	0.35		0.06	0.36	
Uniform Delay, d1		50.0	47.7		50.9		3.9	6.5		4.4	7.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.36	0.58	
Incremental Delay, d2		2.3	0.1		5.9		0.1	0.4		0.0	0.3	
Delay (s)		52.4	47.8		56.8		4.0	6.9		1.6	4.3	
Level of Service		D	D		E		A	A		A	A	
Approach Delay (s)		50.3			56.8			6.8			4.3	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		10.8										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		55.4%										
Analysis Period (min)		15										
c Critical Lane Group												

APPENDIX F

Future Year 2045 No Build Conditions

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	462	117	645	155	173	100	93	222
v/c Ratio	0.09	0.31	0.22	0.37	0.48	0.55	0.25	0.30	0.46
Control Delay	10.8	14.9	11.0	16.8	32.0	45.8	2.5	28.0	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	14.9	11.0	16.8	32.0	45.8	2.5	28.0	34.1
Queue Length 50th (ft)	10	72	31	135	74	104	0	43	54
Queue Length 95th (ft)	26	119	60	195	129	177	8	83	92
Internal Link Dist (ft)		612		1268		380			1054
Turn Bay Length (ft)	100		180		200			140	
Base Capacity (vph)	487	1489	611	1749	326	347	426	340	638
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.31	0.19	0.37	0.48	0.50	0.23	0.27	0.35
Intersection Summary									

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	274	151	108	512	81	143	159	92	86	150	54
Future Volume (vph)	36	274	151	108	512	81	143	159	92	86	150	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3351		1770	3467		1770	1863	1583	1770	3398	
Flt Permitted	0.39	1.00		0.42	1.00		0.53	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	719	3351		779	3467		981	1863	1583	1175	3398	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	298	164	117	557	88	155	173	100	93	163	59
RTOR Reduction (vph)	0	64	0	0	11	0	0	0	84	0	36	0
Lane Group Flow (vph)	39	398	0	117	634	0	155	173	16	93	186	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	47.4	43.4		56.6	48.0		25.7	16.3	16.3	21.3	14.1	
Effective Green, g (s)	47.4	43.4		56.6	48.0		25.7	16.3	16.3	21.3	14.1	
Actuated g/C Ratio	0.48	0.44		0.57	0.48		0.26	0.16	0.16	0.21	0.14	
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	383	1458		527	1669		327	304	258	293	480	
v/s Ratio Prot	0.00	0.12		c0.02	c0.18		c0.04	c0.09		0.02	0.05	
v/s Ratio Perm	0.04			0.11			0.08		0.01	0.04		
v/c Ratio	0.10	0.27		0.22	0.38		0.47	0.57	0.06	0.32	0.39	
Uniform Delay, d1	14.1	18.0		10.2	16.4		30.1	38.5	35.2	32.5	38.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.5		0.2	0.7		1.1	2.4	0.1	0.6	0.5	
Delay (s)	14.2	18.5		10.4	17.1		31.2	40.9	35.4	33.2	39.4	
Level of Service	B	B		B	B		C	D	D	C	D	
Approach Delay (s)		18.2			16.0			36.1			37.6	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			24.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			99.7			Sum of lost time (s)			24.2			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	5	398	472	1
Future Vol, veh/h	0	5	5	398	472	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	5	433	513	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	741	257	514	0	-	0
Stage 1	514	-	-	-	-	-
Stage 2	227	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	352	742	1048	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	350	742	1048	-	-	-
Mov Cap-2 Maneuver	350	-	-	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.9	0.1		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1048	-	742	-	-	
HCM Lane V/C Ratio	0.005	-	0.007	-	-	
HCM Control Delay (s)	8.5	-	9.9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	399	2	2	476
Future Vol, veh/h	7	6	399	2	2	476
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	434	2	2	517

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	698	218	0
Stage 1	435	-	-
Stage 2	263	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	375	786	-
Stage 1	620	-	-
Stage 2	757	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	374	786	-
Mov Cap-2 Maneuver	374	-	-
Stage 1	620	-	-
Stage 2	755	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	493	1120
HCM Lane V/C Ratio	-	-	0.029	0.002
HCM Control Delay (s)	-	-	12.5	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	53	16	434	10	518
v/c Ratio	0.19	0.28	0.02	0.15	0.01	0.17
Control Delay	20.5	31.2	1.3	1.3	2.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	31.2	1.3	1.3	2.9	2.5
Queue Length 50th (ft)	5	19	3	37	1	34
Queue Length 95th (ft)	32	53	m1	4	5	50
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	657	590	729	2985	788	2995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.09	0.02	0.15	0.01	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	6	22	27	9	13	15	381	18	9	472	5
Future Volume (vph)	4	6	22	27	9	13	15	381	18	9	472	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1681			1748		1770	3515		1770	3534	
Flt Permitted		0.95			0.81		0.46	1.00		0.50	1.00	
Satd. Flow (perm)		1607			1456		858	3515		931	3534	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	7	24	29	10	14	16	414	20	10	513	5
RTOR Reduction (vph)	0	22	0	0	13	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	40	0	16	432	0	10	518	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Effective Green, g (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Actuated g/C Ratio		0.07			0.07		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		117			106		683	2799		738	2802	
v/s Ratio Prot								0.12			c0.15	
v/s Ratio Perm		0.01			c0.03		0.02			0.01		
v/c Ratio		0.11			0.38		0.02	0.15		0.01	0.18	
Uniform Delay, d1		36.8			37.6		1.8	2.0		1.8	2.1	
Progression Factor		1.00			1.00		0.45	0.56		1.00	1.00	
Incremental Delay, d2		0.4			2.2		0.1	0.1		0.0	0.1	
Delay (s)		37.2			39.8		0.9	1.2		1.9	2.3	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		37.2			39.8			1.2			2.3	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		4.8			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.20										
Actuated Cycle Length (s)		85.0			Sum of lost time (s)			11.4				
Intersection Capacity Utilization		31.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	2	1	0	1	2	410	5	7	532	1
Future Vol, veh/h	1	1	2	1	0	1	2	410	5	7	532	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	1	0	1	2	446	5	8	578	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	822	1050	290	759	1048	226	579	0	0	451	0	0
Stage 1	595	595	-	453	453	-	-	-	-	-	-	-
Stage 2	227	455	-	306	595	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	266	226	707	296	226	777	991	-	-	1106	-	-
Stage 1	458	491	-	556	568	-	-	-	-	-	-	-
Stage 2	755	567	-	679	491	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	264	224	707	292	224	777	991	-	-	1106	-	-
Mov Cap-2 Maneuver	264	224	-	292	224	-	-	-	-	-	-	-
Stage 1	457	488	-	555	567	-	-	-	-	-	-	-
Stage 2	752	566	-	671	488	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.1		13.5		0		0.1	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	991	-	-	361	424	1106	-
HCM Lane V/C Ratio	0.002	-	-	0.012	0.005	0.007	-
HCM Control Delay (s)	8.6	-	-	15.1	13.5	8.3	-
HCM Lane LOS	A	-	-	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↕↵		↵	↕↵	
Traffic Vol, veh/h	2	0	12	3	1	0	14	416	7	0	531	0
Future Vol, veh/h	2	0	12	3	1	0	14	416	7	0	531	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	13	3	1	0	15	452	8	0	577	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	834	1067	289	775	1063	230	577	0	0	460	0	0
Stage 1	577	577	-	486	486	-	-	-	-	-	-	-
Stage 2	257	490	-	289	577	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	261	221	708	288	222	772	993	-	-	1097	-	-
Stage 1	469	500	-	531	549	-	-	-	-	-	-	-
Stage 2	725	547	-	694	500	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	257	218	708	279	219	772	993	-	-	1097	-	-
Mov Cap-2 Maneuver	257	218	-	279	219	-	-	-	-	-	-	-
Stage 1	462	500	-	523	541	-	-	-	-	-	-	-
Stage 2	713	539	-	681	500	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		19		0.3		0					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	993	-	-	566	261	1097	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.027	0.017	-	-	-				
HCM Control Delay (s)	8.7	-	-	11.5	19	0	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	25	448	548	1
Future Vol, veh/h	1	18	25	448	548	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	20	27	487	596	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	895	299	597	0	-	0
Stage 1	597	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	280	697	976	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	272	697	976	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	727	-	-	-	-	-

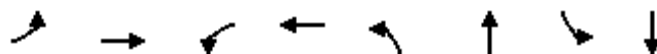
Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	976	-	644	-	-
HCM Lane V/C Ratio	0.028	-	0.032	-	-
HCM Control Delay (s)	8.8	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	203	80	444	70	388	160	466
v/c Ratio	0.14	0.32	0.22	0.49	0.18	0.32	0.43	0.33
Control Delay	31.3	23.9	28.1	24.4	16.8	14.6	22.2	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	23.9	28.1	24.4	16.8	14.6	22.2	19.0
Queue Length 50th (ft)	12	36	30	76	17	46	61	96
Queue Length 95th (ft)	35	67	72	137	29	51	118	150
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	188	805	452	1082	404	1218	381	1411
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.18	0.41	0.17	0.32	0.42	0.33
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	138	49	74	286	122	64	297	60	147	398	30
Future Volume (vph)	25	138	49	74	286	122	64	297	60	147	398	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3380		1770	3450		1770	3502	
Flt Permitted	0.32	1.00		0.62	1.00		0.48	1.00		0.29	1.00	
Satd. Flow (perm)	591	3401		1163	3380		902	3450		547	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	150	53	80	311	133	70	323	65	160	433	33
RTOR Reduction (vph)	0	44	0	0	58	0	0	18	0	0	6	0
Lane Group Flow (vph)	27	159	0	80	386	0	70	370	0	160	460	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.0	15.0		21.6	21.6		25.4	25.4		28.8	28.8	
Effective Green, g (s)	15.0	15.0		21.6	21.6		25.4	25.4		28.8	28.8	
Actuated g/C Ratio	0.18	0.18		0.25	0.25		0.30	0.30		0.34	0.34	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	600		359	858		342	1030		339	1186	
v/s Ratio Prot	0.01	c0.05		0.02	c0.11		0.02	c0.11		0.06	c0.13	
v/s Ratio Perm	0.03			0.03			0.04			c0.10		
v/c Ratio	0.20	0.27		0.22	0.45		0.20	0.36		0.47	0.39	
Uniform Delay, d1	29.7	30.2		25.4	26.7		22.7	23.4		20.9	21.4	
Progression Factor	1.00	1.00		1.00	1.00		0.65	0.66		0.92	0.93	
Incremental Delay, d2	0.7	0.2		0.3	0.4		0.3	1.0		1.0	1.0	
Delay (s)	30.4	30.5		25.7	27.1		14.9	16.4		20.2	20.7	
Level of Service	C	C		C	C		B	B		C	C	
Approach Delay (s)		30.5			26.9			16.2			20.6	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay	22.5			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.46											
Actuated Cycle Length (s)	85.0			Sum of lost time (s)			25.1					
Intersection Capacity Utilization	58.9%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	4	12	10	8	5	57	404	6	7	517	18
Future Vol, veh/h	2	4	12	10	8	5	57	404	6	7	517	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	13	11	9	5	62	439	7	8	562	20
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	936	1158	291	866	1165	223	582	0	0	446	0	0
Stage 1	588	588	-	567	567	-	-	-	-	-	-	-
Stage 2	348	570	-	299	598	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	220	195	706	247	193	780	988	-	-	1111	-	-
Stage 1	462	494	-	476	505	-	-	-	-	-	-	-
Stage 2	641	504	-	685	489	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	199	181	706	226	179	780	988	-	-	1111	-	-
Mov Cap-2 Maneuver	199	181	-	226	179	-	-	-	-	-	-	-
Stage 1	433	491	-	446	473	-	-	-	-	-	-	-
Stage 2	586	472	-	662	486	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.4		21.7		1.1		0.1					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	988	-	-	366	241	1111	-	-				
HCM Lane V/C Ratio	0.063	-	-	0.053	0.104	0.007	-	-				
HCM Control Delay (s)	8.9	-	-	15.4	21.7	8.3	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	0	-	-				

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	366	1	2	439
Future Vol, veh/h	2	8	366	1	2	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	10	446	1	2	535
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	719	224	0	0	447	0
Stage 1	447	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	363	779	-	-	1110	-
Stage 1	611	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	779	-	-	1110	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 633		1110	-	
HCM Lane V/C Ratio	-	- 0.019		0.002	-	
HCM Control Delay (s)	-	- 10.8		8.2	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	113	79	65	425	5	523
v/c Ratio	0.24	0.25	0.31	0.36	0.21	0.04	0.32
Control Delay	35.2	1.3	33.5	40.6	13.6	21.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	1.3	33.5	40.6	13.6	21.2	8.7
Queue Length 50th (ft)	29	0	35	33	64	2	50
Queue Length 95th (ft)	59	0	68	63	111	m7	61
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	273	471	291	324	1995	141	1612
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.27	0.20	0.21	0.04	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Future Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1583		1787		1770	3519		1770	3507	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1814	1583		1787		1770	3519		1770	3507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	33	28	113	39	30	10	65	409	16	5	491	32
RTOR Reduction (vph)	0	0	100	0	6	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	13	0	73	0	65	422	0	5	519	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Effective Green, g (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Actuated g/C Ratio		0.11	0.11		0.11		0.09	0.47		0.02	0.40	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		204	178		201		154	1664		29	1411	
v/s Ratio Prot		c0.03			c0.04		c0.04	0.12		0.00	c0.15	
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.07		0.36		0.42	0.25		0.17	0.37	
Uniform Delay, d1		34.6	33.7		34.9		36.8	13.4		41.2	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.57	0.40	
Incremental Delay, d2		0.8	0.2		1.1		1.9	0.4		2.8	0.7	
Delay (s)		35.4	33.9		36.0		38.6	13.8		26.1	7.8	
Level of Service		D	C		D		D	B		C	A	
Approach Delay (s)		34.4			36.0			17.1			8.0	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)			24.2		
Intersection Capacity Utilization			48.2%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Future Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	37	501	4	1	627	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	958	1212	318	893	1214	253	635	0	0	505	0	0
Stage 1	633	633	-	577	577	-	-	-	-	-	-	-
Stage 2	325	579	-	316	637	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	212	181	678	236	180	746	944	-	-	1056	-	-
Stage 1	434	472	-	469	500	-	-	-	-	-	-	-
Stage 2	661	499	-	670	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	205	174	678	229	173	746	944	-	-	1056	-	-
Mov Cap-2 Maneuver	205	174	-	229	173	-	-	-	-	-	-	-
Stage 1	417	472	-	451	481	-	-	-	-	-	-	-
Stage 2	632	480	-	669	470	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		17.5		0.6		0	
HCM LOS	A		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	-	298	1056	-
HCM Lane V/C Ratio	0.04	-	-	-	0.036	0.001	-
HCM Control Delay (s)	9	-	-	0	17.5	8.4	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0	-

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↙	↕	
Traffic Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Future Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	4	0	5	0	534	0	1	634	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	903	1170	317	853	1170	267	-	0	0	534	0	0
Stage 1	636	636	-	534	534	-	-	-	-	-	-	-
Stage 2	267	534	-	319	636	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	232	192	679	253	192	731	0	-	-	1030	-	-
Stage 1	433	470	-	498	523	-	0	-	-	-	-	-
Stage 2	715	523	-	667	470	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	192	679	249	192	731	-	-	-	1030	-	-
Mov Cap-2 Maneuver	230	192	-	249	192	-	-	-	-	-	-	-
Stage 1	433	470	-	498	523	-	-	-	-	-	-	-
Stage 2	710	523	-	656	470	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		14.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	-	-	568	400	1030	-	-					
HCM Lane V/C Ratio	-	-	0.021	0.021	0.001	-	-					
HCM Control Delay (s)	-	-	11.5	14.2	8.5	-	-					
HCM Lane LOS	-	-	B	B	A	-	-					
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-	-					

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Future Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	13	21	4	24	12	526	17	7	646	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	950	1228	324	897	1221	272	648	0	0	543	0	0
Stage 1	661	661	-	559	559	-	-	-	-	-	-	-
Stage 2	289	567	-	338	662	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	215	177	672	235	179	726	934	-	-	1022	-	-
Stage 1	418	458	-	481	509	-	-	-	-	-	-	-
Stage 2	694	505	-	650	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	201	173	672	226	175	726	934	-	-	1022	-	-
Mov Cap-2 Maneuver	201	173	-	226	175	-	-	-	-	-	-	-
Stage 1	413	455	-	475	502	-	-	-	-	-	-	-
Stage 2	657	498	-	631	454	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.8		17.6		0.2		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	934	-	-	479	334	1022	-	-				
HCM Lane V/C Ratio	0.013	-	-	0.033	0.146	0.007	-	-				
HCM Control Delay (s)	8.9	-	-	12.8	17.6	8.5	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-	-				

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	3	449	561	0
Future Vol, veh/h	1	11	3	449	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	4	554	693	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	978	347	693	0	-	0
Stage 1	693	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	248	649	898	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	649	898	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	571	-	-	
HCM Lane V/C Ratio	0.004	-	0.026	-	-	
HCM Control Delay (s)	9	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	4	456	572	2
Future Vol, veh/h	0	17	4	456	572	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	5	563	706	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	999	354	708
Stage 1	707	-	-
Stage 2	292	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	240	642	887
Stage 1	450	-	-
Stage 2	732	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	239	642	887
Mov Cap-2 Maneuver	239	-	-
Stage 1	447	-	-
Stage 2	732	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	887	-	642	-	-
HCM Lane V/C Ratio	0.006	-	0.033	-	-
HCM Control Delay (s)	9.1	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	3	453	5	7	575
Future Vol, veh/h	5	3	453	5	7	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	559	6	9	710
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	935	283	0	0	565	0
Stage 1	562	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	264	714	-	-	1003	-
Stage 1	534	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	262	714	-	-	1003	-
Mov Cap-2 Maneuver	262	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	660	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.8	0		0.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		344	1003	
HCM Lane V/C Ratio	-	-		0.029	0.009	
HCM Control Delay (s)	-	-		15.8	8.6	
HCM Lane LOS	-	-		C	A	
HCM 95th %tile Q(veh)	-	-		0.1	0	

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Future Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	22	5	4	12	5	546	4	1	705	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	998	1273	359	913	1277	275	717	0	0	550	0	0
Stage 1	713	713	-	558	558	-	-	-	-	-	-	-
Stage 2	285	560	-	355	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	198	166	638	228	165	722	880	-	-	1016	-	-
Stage 1	389	434	-	482	510	-	-	-	-	-	-	-
Stage 2	698	509	-	635	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	190	165	638	218	164	722	880	-	-	1016	-	-
Mov Cap-2 Maneuver	190	165	-	218	164	-	-	-	-	-	-	-
Stage 1	387	434	-	479	507	-	-	-	-	-	-	-
Stage 2	677	506	-	611	431	-	-	-	-	-	-	-

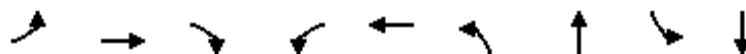
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		16.4		0.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	880	-	-	506	337	1016	-
HCM Lane V/C Ratio	0.006	-	-	0.048	0.062	0.001	-
HCM Control Delay (s)	9.1	-	-	12.5	16.4	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	593	151	151	858	206	395	219	455
v/c Ratio	0.93	0.43	0.21	0.71	0.54	0.57	0.69	0.67	0.90
Control Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Length 50th (ft)	71	176	0	113	237	80	138	85	173
Queue Length 95th (ft)	#170	237	35	181	311	114	182	124	#255
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	97	1391	722	234	1597	503	692	346	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.43	0.21	0.65	0.54	0.41	0.57	0.63	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Future Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	593	151	151	709	149	206	278	117	219	344	111
RTOR Reduction (vph)	0	0	92	0	14	0	0	40	0	0	26	0
Lane Group Flow (vph)	90	593	59	151	844	0	206	355	0	219	429	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Effective Green, g (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Actuated g/C Ratio	0.06	0.39	0.39	0.12	0.46		0.11	0.16		0.10	0.14	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	1392	622	215	1582		363	529		326	480	
v/s Ratio Prot	c0.05	0.17		c0.09	c0.24		0.06	c0.10		0.06	c0.13	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.43	0.10	0.70	0.53		0.57	0.67		0.67	0.89	
Uniform Delay, d1	56.4	26.5	22.9	50.6	23.2		51.0	47.7		52.5	50.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.79		1.00	1.00	
Incremental Delay, d2	64.3	1.0	0.3	9.9	1.3		2.0	3.3		5.4	18.7	
Delay (s)	120.7	27.5	23.2	60.5	24.5		43.8	41.0		57.9	69.4	
Level of Service	F	C	C	E	C		D	D		E	E	
Approach Delay (s)		36.8			29.9			41.9			65.7	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			28.6			
Intersection Capacity Utilization			66.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	28	155	9	520	51	575
v/c Ratio	0.20	0.09	0.71	0.02	0.23	0.07	0.22
Control Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Length 50th (ft)	27	0	102	3	88	2	13
Queue Length 95th (ft)	56	0	160	11	134	m8	m42
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	480	631	517	594	2256	731	2624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.30	0.02	0.23	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Future Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1583		1743		1770	3507		1770	3534	
Flt Permitted		0.74	1.00		0.81		0.39	1.00		0.46	1.00	
Satd. Flow (perm)		1380	1583		1449		730	3507		856	3534	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	24	15	28	84	26	45	9	488	32	51	569	6
RTOR Reduction (vph)	0	0	24	0	16	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	39	4	0	139	0	9	517	0	51	575	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Effective Green, g (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Actuated g/C Ratio		0.14	0.14		0.14		0.60	0.60		0.71	0.71	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		193	221		202		452	2121		706	2494	
v/s Ratio Prot							0.00	c0.15		0.01	c0.16	
v/s Ratio Perm		0.03	0.00		c0.10		0.01			0.04		
v/c Ratio		0.20	0.02		0.69		0.02	0.24		0.07	0.23	
Uniform Delay, d1		45.7	44.5		49.1		9.6	11.0		5.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.40	0.34	
Incremental Delay, d2		0.5	0.0		9.3		0.0	0.3		0.0	0.2	
Delay (s)		46.2	44.5		58.4		9.6	11.3		2.2	2.3	
Level of Service		D	D		E		A	B		A	A	
Approach Delay (s)		45.5			58.4			11.2			2.3	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.1										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		47.8%										
Analysis Period (min)		15										
c Critical Lane Group												

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	45	992	168	737	253	243	330	178	253
v/c Ratio	0.12	0.72	0.54	0.44	0.75	0.82	0.70	0.66	0.45
Control Delay	11.6	28.9	17.6	18.2	45.0	64.5	18.3	40.4	38.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	28.9	17.6	18.2	45.0	64.5	18.3	40.4	38.0
Queue Length 50th (ft)	13	270	50	167	129	153	38	86	71
Queue Length 95th (ft)	29	375	84	225	#239	#287	137	#157	114
Internal Link Dist (ft)		612		1268		380			1054
Turn Bay Length (ft)	100		180		200			140	
Base Capacity (vph)	427	1376	381	1686	338	313	486	272	601
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.72	0.44	0.44	0.75	0.78	0.68	0.65	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	727	186	155	545	133	233	224	304	164	190	42
Future Volume (vph)	41	727	186	155	545	133	233	224	304	164	190	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3431		1770	3435		1770	1863	1583	1770	3443	
Flt Permitted	0.34	1.00		0.14	1.00		0.56	1.00	1.00	0.33	1.00	
Satd. Flow (perm)	641	3431		269	3435		1036	1863	1583	618	3443	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	790	202	168	592	145	253	243	330	178	207	46
RTOR Reduction (vph)	0	20	0	0	18	0	0	0	223	0	19	0
Lane Group Flow (vph)	45	972	0	168	719	0	253	243	107	178	234	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		
Actuated Green, G (s)	46.3	42.1		59.0	48.6		25.6	15.8	15.8	25.4	15.7	
Effective Green, g (s)	46.3	42.1		59.0	48.6		25.6	15.8	15.8	25.4	15.7	
Actuated g/C Ratio	0.45	0.41		0.58	0.47		0.25	0.15	0.15	0.25	0.15	
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	335	1409		311	1628		328	287	244	262	527	
v/s Ratio Prot	0.01	c0.28		c0.06	0.21		c0.07	c0.13		0.06	0.07	
v/s Ratio Perm	0.06			0.25			0.12		0.07	0.10		
v/c Ratio	0.13	0.69		0.54	0.44		0.77	0.85	0.44	0.68	0.44	
Uniform Delay, d1	15.9	24.8		14.3	17.9		34.1	42.2	39.3	32.5	39.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	2.8		1.9	0.9		10.7	20.0	1.3	6.8	0.6	
Delay (s)	16.0	27.6		16.3	18.8		44.8	62.2	40.6	39.4	40.0	
Level of Service	B	C		B	B		D	E	D	D	D	
Approach Delay (s)		27.1			18.3			48.2			39.8	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			31.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			102.5			Sum of lost time (s)			24.2			
Intersection Capacity Utilization			75.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	8	7	779	598	4
Future Vol, veh/h	1	8	7	779	598	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	8	847	650	4

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1092	327	654	0	-	0
Stage 1	652	-	-	-	-	-
Stage 2	440	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	209	669	929	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	207	669	929	-	-	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	476	-	-	-	-	-
Stage 2	616	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	929	-	536	-	-
HCM Lane V/C Ratio	0.008	-	0.018	-	-
HCM Control Delay (s)	8.9	-	11.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	754	10	9	628
Future Vol, veh/h	8	5	754	10	9	628
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	820	11	10	683

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1188	416	0
Stage 1	826	-	-
Stage 2	362	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	181	585	-
Stage 1	390	-	-
Stage 2	675	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	179	585	-
Mov Cap-2 Maneuver	179	-	-
Stage 1	390	-	-
Stage 2	666	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	244	797
HCM Lane V/C Ratio	-	-	0.058	0.012
HCM Control Delay (s)	-	-	20.7	9.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	86	23	841	20	674
v/c Ratio	0.32	0.45	0.04	0.29	0.04	0.23
Control Delay	36.7	39.5	1.6	1.5	3.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.5	1.6	1.5	3.2	3.1
Queue Length 50th (ft)	28	40	1	28	2	46
Queue Length 95th (ft)	66	85	m3	41	9	78
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	650	592	603	2868	500	2884
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.04	0.29	0.04	0.23

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	37	14	35	24	20	21	712	62	18	606	14
Future Volume (vph)	6	37	14	35	24	20	21	712	62	18	606	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792			1760		1770	3497		1770	3527	
Flt Permitted		0.96			0.87		0.40	1.00		0.33	1.00	
Satd. Flow (perm)		1734			1569		737	3497		613	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	40	15	38	26	22	23	774	67	20	659	15
RTOR Reduction (vph)	0	14	0	0	18	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	48	0	0	68	0	23	838	0	20	673	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Effective Green, g (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Actuated g/C Ratio		0.09			0.09		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			144		587	2787		486	2800	
v/s Ratio Prot								c0.24			0.19	
v/s Ratio Perm		0.03			c0.04		0.03			0.03		
v/c Ratio		0.30			0.47		0.04	0.30		0.04	0.24	
Uniform Delay, d1		42.4			43.1		2.1	2.7		2.2	2.6	
Progression Factor		1.00			1.00		0.51	0.43		1.00	1.00	
Incremental Delay, d2		1.1			2.4		0.1	0.2		0.2	0.2	
Delay (s)		43.5			45.5		1.2	1.4		2.4	2.8	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		43.5			45.5			1.4			2.8	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.7				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			11.4		
Intersection Capacity Utilization			42.0%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↕↵		↵	↕↵	
Traffic Vol, veh/h	1	1	3	3	0	0	9	793	1	1	664	0
Future Vol, veh/h	1	1	3	3	0	0	9	793	1	1	664	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	3	3	0	0	10	862	1	1	722	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1175	1607	361	1247	1607	432	722	0	0	863	0	0
Stage 1	724	724	-	883	883	-	-	-	-	-	-	-
Stage 2	451	883	-	364	724	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	147	104	636	130	104	572	876	-	-	775	-	-
Stage 1	383	429	-	307	362	-	-	-	-	-	-	-
Stage 2	557	362	-	627	429	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	103	636	127	103	572	876	-	-	775	-	-
Mov Cap-2 Maneuver	146	103	-	127	103	-	-	-	-	-	-	-
Stage 1	379	429	-	304	358	-	-	-	-	-	-	-
Stage 2	551	358	-	621	429	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20.7		34.1		0.1		0					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	876	-	-	235	127	775	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.023	0.026	0.001	-	-				
HCM Control Delay (s)	9.2	-	-	20.7	34.1	9.7	-	-				
HCM Lane LOS	A	-	-	C	D	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	6	1	10	6	0	3	17	793	4	0	669	2
Future Vol, veh/h	6	1	10	6	0	3	17	793	4	0	669	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	11	7	0	3	18	862	4	0	727	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1195	1630	365	1264	1629	433	729	0	0	866	0	0
Stage 1	728	728	-	900	900	-	-	-	-	-	-	-
Stage 2	467	902	-	364	729	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	142	101	632	126	101	571	871	-	-	773	-	-
Stage 1	381	427	-	300	355	-	-	-	-	-	-	-
Stage 2	545	355	-	627	426	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	139	99	632	121	99	571	871	-	-	773	-	-
Mov Cap-2 Maneuver	139	99	-	121	99	-	-	-	-	-	-	-
Stage 1	373	427	-	294	348	-	-	-	-	-	-	-
Stage 2	531	348	-	615	426	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.8		28.3		0.2		0	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	871	-	-	246	164	773	-
HCM Lane V/C Ratio	0.021	-	-	0.075	0.06	-	-
HCM Control Delay (s)	9.2	-	-	20.8	28.3	0	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	0	-

HCM 6th TWSC
8: Noland Road & White Oak Street

09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	26	17	802	694	1
Future Vol, veh/h	9	26	17	802	694	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	18	872	754	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1227	378	755
Stage 1	755	-	-
Stage 2	472	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	171	620	851
Stage 1	425	-	-
Stage 2	594	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	167	620	851
Mov Cap-2 Maneuver	167	-	-
Stage 1	416	-	-
Stage 2	594	-	-

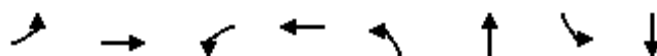
Approach	EB	NB	SB
HCM Control Delay, s	16	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	851	-	365	-	-
HCM Lane V/C Ratio	0.022	-	0.104	-	-
HCM Control Delay (s)	9.3	-	16	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	638	140	417	80	791	179	601
v/c Ratio	0.20	0.78	0.57	0.41	0.21	0.64	0.61	0.43
Control Delay	21.6	41.6	30.4	18.1	18.0	34.7	27.3	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	41.6	30.4	18.1	18.0	34.7	27.3	22.3
Queue Length 50th (ft)	25	195	60	65	35	261	53	133
Queue Length 95th (ft)	48	242	95	103	74	326	#145	220
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	296	986	245	1118	382	1238	293	1385
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.57	0.37	0.21	0.64	0.61	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	490	97	129	222	162	74	554	174	165	519	34
Future Volume (vph)	55	490	97	129	222	162	74	554	174	165	519	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3452		1770	3315		1770	3412		1770	3507	
Flt Permitted	0.44	1.00		0.24	1.00		0.38	1.00		0.19	1.00	
Satd. Flow (perm)	815	3452		438	3315		705	3412		353	3507	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	533	105	140	241	176	80	602	189	179	564	37
RTOR Reduction (vph)	0	17	0	0	128	0	0	30	0	0	4	0
Lane Group Flow (vph)	60	621	0	140	289	0	80	761	0	179	597	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.5	24.6		34.7	27.2		40.1	34.0		45.7	36.7	
Effective Green, g (s)	29.5	24.6		34.7	27.2		40.1	34.0		45.7	36.7	
Actuated g/C Ratio	0.29	0.25		0.35	0.27		0.40	0.34		0.46	0.37	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	849		251	901		347	1160		288	1287	
v/s Ratio Prot	0.01	c0.18		c0.04	0.09		0.01	c0.22		c0.06	0.17	
v/s Ratio Perm	0.05			0.15			0.08			c0.23		
v/c Ratio	0.21	0.73		0.56	0.32		0.23	0.66		0.62	0.46	
Uniform Delay, d1	25.8	34.7		24.0	29.0		18.9	28.0		18.4	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.16	1.23		1.00	0.89	
Incremental Delay, d2	0.4	3.3		2.7	0.2		0.3	2.8		4.1	1.2	
Delay (s)	26.1	37.9		26.7	29.2		22.3	37.3		22.6	22.7	
Level of Service	C	D		C	C		C	D		C	C	
Approach Delay (s)		36.9			28.6			35.9			22.7	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			31.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			74.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	7	3	19	11	0	6	38	792	12	15	776	10
Future Vol, veh/h	7	3	19	11	0	6	38	792	12	15	776	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	3	21	12	0	7	41	861	13	16	843	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1394	1837	427	1405	1836	437	854	0	0	874	0	0
Stage 1	881	881	-	950	950	-	-	-	-	-	-	-
Stage 2	513	956	-	455	886	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	101	75	576	99	75	567	781	-	-	768	-	-
Stage 1	308	363	-	280	337	-	-	-	-	-	-	-
Stage 2	512	335	-	554	361	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	94	70	576	87	70	567	781	-	-	768	-	-
Mov Cap-2 Maneuver	94	70	-	87	70	-	-	-	-	-	-	-
Stage 1	292	355	-	265	319	-	-	-	-	-	-	-
Stage 2	480	318	-	518	353	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	27.3		39.1		0.4		0.2	
HCM LOS	D		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	781	-	-	193	124	768	-
HCM Lane V/C Ratio	0.053	-	-	0.163	0.149	0.021	-
HCM Control Delay (s)	9.9	-	-	27.3	39.1	9.8	-
HCM Lane LOS	A	-	-	D	E	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	0.5	0.1	-

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	682	7	5	653
Future Vol, veh/h	2	3	682	7	5	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	703	7	5	673
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1054	355	0	0	710	0
Stage 1	707	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	221	641	-	-	885	-
Stage 1	450	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	220	641	-	-	885	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.1	0		0.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	363	885	-	
HCM Lane V/C Ratio	-	-	0.014	0.006	-	
HCM Control Delay (s)	-	-	15.1	9.1	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Queues

12: Noland Road & Walnut St

09/30/2024

							
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	164	75	50	715	6	711
v/c Ratio	0.51	0.40	0.34	0.34	0.36	0.06	0.42
Control Delay	48.1	4.2	40.4	48.8	14.3	59.8	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	4.2	40.4	48.8	14.3	59.8	18.4
Queue Length 50th (ft)	73	0	40	31	120	4	195
Queue Length 95th (ft)	126	15	83	66	228	m8	280
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	285	446	284	276	2004	138	1700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.37	0.26	0.18	0.36	0.04	0.42
Intersection Summary							
m Volume for 95th percentile queue is metered by upstream signal.							

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Future Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1583		1782		1770	3510		1770	3516	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1583		1782		1770	3510		1770	3516	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	47	164	34	29	12	50	676	39	6	680	31
RTOR Reduction (vph)	0	0	143	0	7	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	120	21	0	68	0	50	712	0	6	708	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Effective Green, g (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Actuated g/C Ratio		0.13	0.13		0.10		0.07	0.52		0.01	0.46	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236	207		174		127	1807		24	1606	
v/s Ratio Prot		c0.07			c0.04		c0.03	c0.20		0.00	c0.20	
v/s Ratio Perm			0.01									
v/c Ratio		0.51	0.10		0.39		0.39	0.39		0.25	0.44	
Uniform Delay, d1		40.5	38.3		42.3		44.3	14.8		48.8	18.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.34	0.89	
Incremental Delay, d2		1.7	0.2		1.4		2.0	0.6		5.0	0.8	
Delay (s)		42.2	38.5		43.7		46.3	15.4		70.2	17.3	
Level of Service		D	D		D		D	B		E	B	
Approach Delay (s)		40.1			43.7			17.4			17.8	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.1									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			52.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Future Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	3	7	24	745	15	4	871	3
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1303	1689	437	1245	1683	380	874	0	0	760	0	0
Stage 1	881	881	-	801	801	-	-	-	-	-	-	-
Stage 2	422	808	-	444	882	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	118	93	567	130	93	618	768	-	-	848	-	-
Stage 1	308	363	-	344	395	-	-	-	-	-	-	-
Stage 2	580	392	-	563	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	110	90	567	126	90	618	768	-	-	848	-	-
Mov Cap-2 Maneuver	110	90	-	126	90	-	-	-	-	-	-	-
Stage 1	298	361	-	333	383	-	-	-	-	-	-	-
Stage 2	551	380	-	560	360	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		27.5		0.3		0					
HCM LOS	A		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	768	-	-	-	174	848	-	-				
HCM Lane V/C Ratio	0.031	-	-	-	0.082	0.005	-	-				
HCM Control Delay (s)	9.8	-	-	0	27.5	9.3	-	-				
HCM Lane LOS	A	-	-	A	D	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0	-	-				

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Future Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	17	4	0	1	0	771	2	1	867	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1255	1642	434	1208	1641	387	-	0	0	773	0	0
Stage 1	869	869	-	772	772	-	-	-	-	-	-	-
Stage 2	386	773	-	436	869	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	128	99	570	139	99	611	0	-	-	838	-	-
Stage 1	313	367	-	358	407	-	0	-	-	-	-	-
Stage 2	609	407	-	569	367	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	99	570	133	99	611	-	-	-	838	-	-
Mov Cap-2 Maneuver	128	99	-	133	99	-	-	-	-	-	-	-
Stage 1	313	367	-	358	407	-	-	-	-	-	-	-
Stage 2	608	407	-	549	367	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14.7		28.6		0		0					
HCM LOS	B		D									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBL	SBT	SBR			
Capacity (veh/h)	-		-		391 158		838	-	-			
HCM Lane V/C Ratio	-		-		0.05 0.034		0.001	-	-			
HCM Control Delay (s)	-		-		14.7 28.6		9.3	-	-			
HCM Lane LOS	-		-		B D		A	-	-			
HCM 95th %tile Q(veh)	-		-		0.2 0.1		0	-	-			

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↱	↕↱		↱	↕↱	
Traffic Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Future Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	23	14	3	8	12	759	17	23	865	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1317	1712	434	1272	1705	388	867	0	0	776	0	0
Stage 1	912	912	-	792	792	-	-	-	-	-	-	-
Stage 2	405	800	-	480	913	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	115	90	570	125	90	611	772	-	-	836	-	-
Stage 1	295	351	-	349	399	-	-	-	-	-	-	-
Stage 2	593	395	-	536	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	86	570	113	86	611	772	-	-	836	-	-
Mov Cap-2 Maneuver	107	86	-	113	86	-	-	-	-	-	-	-
Stage 1	290	341	-	343	393	-	-	-	-	-	-	-
Stage 2	572	389	-	496	340	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20.9		35.4		0.1		0.2					
HCM LOS	C		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	772	-	-	257	143	836	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.118	0.175	0.027	-	-				
HCM Control Delay (s)	9.7	-	-	20.9	35.4	9.4	-	-				
HCM Lane LOS	A	-	-	C	E	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-	-				

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	22	6	724	837	1
Future Vol, veh/h	1	22	6	724	837	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	24	7	787	910	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1319	456	911
Stage 1	911	-	-
Stage 2	408	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	149	551	743
Stage 1	352	-	-
Stage 2	640	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	148	551	743
Mov Cap-2 Maneuver	148	-	-
Stage 1	349	-	-
Stage 2	640	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	743	-	493	-	-
HCM Lane V/C Ratio	0.009	-	0.051	-	-
HCM Control Delay (s)	9.9	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 6th TWSC
17: Noland Road & Linden Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	10	727	856	0
Future Vol, veh/h	1	21	10	727	856	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	23	11	782	920	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1333	460	920	0	-	0
Stage 1	920	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	145	548	738	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	143	548	738	-	-	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	738	-	485	-	-	
HCM Lane V/C Ratio	0.015	-	0.049	-	-	
HCM Control Delay (s)	9.9	-	12.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	724	11	17	857
Future Vol, veh/h	5	13	724	11	17	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	14	778	12	18	922

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1281	395	0
Stage 1	784	-	-
Stage 2	497	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	157	604	826
Stage 1	410	-	-
Stage 2	577	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	154	604	826
Mov Cap-2 Maneuver	154	-	-
Stage 1	410	-	-
Stage 2	564	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	826
HCM Lane V/C Ratio	-	-	0.058	0.022
HCM Control Delay (s)	-	-	16.5	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Future Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	37	4	1	29	11	789	15	8	932	8

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1369	1778	470	1302	1775	402	940	0	0	804	0	0
Stage 1	952	952	-	819	819	-	-	-	-	-	-	-
Stage 2	417	826	-	483	956	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	105	82	540	118	82	598	725	-	-	816	-	-
Stage 1	279	336	-	336	388	-	-	-	-	-	-	-
Stage 2	584	385	-	534	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	97	80	540	105	80	598	725	-	-	816	-	-
Mov Cap-2 Maneuver	97	80	-	105	80	-	-	-	-	-	-	-
Stage 1	275	333	-	331	382	-	-	-	-	-	-	-
Stage 2	546	379	-	489	332	-	-	-	-	-	-	-

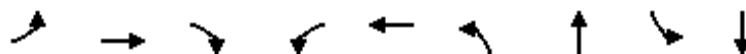
Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		17.2		0.1		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	725	-	-	377	330	816	-
HCM Lane V/C Ratio	0.015	-	-	0.108	0.103	0.009	-
HCM Control Delay (s)	10	-	-	15.7	17.2	9.5	-
HCM Lane LOS	B	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	925	241	208	793	277	671	261	648
v/c Ratio	0.91	0.85	0.37	0.84	0.69	0.74	0.90	0.70	0.90
Control Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Length 50th (ft)	152	363	7	157	278	109	250	101	249
Queue Length 95th (ft)	#294	#482	69	#275	351	156	#353	146	#350
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	215	1091	645	266	1145	389	758	403	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.37	0.78	0.69	0.71	0.89	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Future Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	196	925	241	208	665	128	277	461	210	261	519	129
RTOR Reduction (vph)	0	0	158	0	13	0	0	44	0	0	18	0
Lane Group Flow (vph)	196	925	83	208	780	0	277	627	0	261	630	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Effective Green, g (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Actuated g/C Ratio	0.12	0.31	0.31	0.14	0.33		0.11	0.21		0.11	0.20	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1091	488	250	1134		371	699		374	698	
v/s Ratio Prot	0.11	c0.26		0.12	c0.23		0.08	c0.19		0.08	c0.18	
v/s Ratio Perm			0.05									
v/c Ratio	0.91	0.85	0.17	0.83	0.69		0.75	0.90		0.70	0.90	
Uniform Delay, d1	52.1	38.9	30.3	50.1	35.0		51.9	46.3		51.5	46.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Incremental Delay, d2	37.9	8.2	0.8	20.4	3.4		7.7	13.7		5.6	14.9	
Delay (s)	89.9	47.1	31.1	70.5	38.4		57.0	57.5		57.1	61.5	
Level of Service	F	D	C	E	D		E	E		E	E	
Approach Delay (s)		50.4			45.1			57.4			60.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			28.6			
Intersection Capacity Utilization			84.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	56	111	52	885	29	887
v/c Ratio	0.46	0.24	0.64	0.11	0.34	0.06	0.35
Control Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Length 50th (ft)	48	0	69	7	128	1	115
Queue Length 95th (ft)	90	26	125	19	197	m3	m134
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	451	598	513	575	2568	571	2514
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.22	0.09	0.34	0.05	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Future Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1743		1770	3497		1770	3530	
Flt Permitted		0.70	1.00		0.80		0.29	1.00		0.30	1.00	
Satd. Flow (perm)		1295	1583		1438		539	3497		563	3530	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	18	56	57	21	33	52	814	71	29	871	16
RTOR Reduction (vph)	0	0	50	0	17	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	65	6	0	94	0	52	882	0	29	886	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Effective Green, g (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Actuated g/C Ratio		0.11	0.11		0.11		0.76	0.71		0.74	0.70	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	174		158		462	2500		452	2482	
v/s Ratio Prot							c0.00	c0.25		0.00	0.25	
v/s Ratio Perm		0.05	0.00		c0.07		0.08			0.05		
v/c Ratio		0.46	0.04		0.60		0.11	0.35		0.06	0.36	
Uniform Delay, d1		50.0	47.7		50.9		3.9	6.5		4.4	7.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.36	0.58	
Incremental Delay, d2		2.3	0.1		5.9		0.1	0.4		0.0	0.3	
Delay (s)		52.4	47.8		56.8		4.0	6.9		1.6	4.3	
Level of Service		D	D		E		A	A		A	A	
Approach Delay (s)		50.3			56.8			6.8			4.3	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		10.8										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		55.4%										
Analysis Period (min)		15										
c Critical Lane Group												

APPENDIX G

Future Year 2045 With Bike Lanes Conditions

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	462	117	645	155	173	100	93	163	59
v/c Ratio	0.09	0.31	0.23	0.37	0.50	0.53	0.24	0.29	0.63	0.16
Control Delay	10.8	15.0	11.1	16.9	32.6	45.0	2.4	27.9	51.2	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	15.0	11.1	16.9	32.6	45.0	2.4	27.9	51.2	1.0
Queue Length 50th (ft)	10	71	31	134	74	104	0	43	98	0
Queue Length 95th (ft)	26	119	60	195	129	177	8	83	167	0
Internal Link Dist (ft)		612		1268		380			1054	
Turn Bay Length (ft)	100		180		200		300	140		280
Base Capacity (vph)	483	1480	606	1736	315	350	429	345	328	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.31	0.19	0.37	0.49	0.49	0.23	0.27	0.50	0.14
Intersection Summary										

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	274	151	108	512	81	143	159	92	86	150	54
Future Volume (vph)	36	274	151	108	512	81	143	159	92	86	150	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3351		1770	3467		1770	1863	1583	1770	1863	1583
Flt Permitted	0.38	1.00		0.42	1.00		0.47	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	717	3351		777	3467		878	1863	1583	1178	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	298	164	117	557	88	155	173	100	93	163	59
RTOR Reduction (vph)	0	64	0	0	11	0	0	0	83	0	0	50
Lane Group Flow (vph)	39	398	0	117	634	0	155	173	17	93	163	9
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	47.3	43.3		56.5	47.9		26.3	16.9	16.9	21.9	14.7	14.7
Effective Green, g (s)	47.3	43.3		56.5	47.9		26.3	16.9	16.9	21.9	14.7	14.7
Actuated g/C Ratio	0.47	0.43		0.56	0.48		0.26	0.17	0.17	0.22	0.15	0.15
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	380	1448		523	1657		314	314	266	300	273	232
v/s Ratio Prot	0.00	0.12		c0.02	c0.18		c0.05	c0.09		0.02	0.09	
v/s Ratio Perm	0.04			0.11			0.08		0.01	0.05		0.01
v/c Ratio	0.10	0.27		0.22	0.38		0.49	0.55	0.06	0.31	0.60	0.04
Uniform Delay, d1	14.3	18.3		10.5	16.7		30.0	38.2	35.0	32.3	40.0	36.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.5		0.2	0.7		1.2	2.1	0.1	0.6	3.5	0.1
Delay (s)	14.4	18.8		10.7	17.4		31.2	40.3	35.1	32.9	43.5	36.7
Level of Service	B	B		B	B		C	D	D	C	D	D
Approach Delay (s)		18.5			16.3			35.8			39.1	
Approach LOS		B			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	24.6			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.45											
Actuated Cycle Length (s)	100.2			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	57.7%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	5	5	398	472	1
Future Vol, veh/h	0	5	5	398	472	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	5	433	513	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	957	514	514	0	-	0
Stage 1	514	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	286	560	1052	-	-	-
Stage 1	600	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	285	560	1052	-	-	-
Mov Cap-2 Maneuver	285	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	647	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1052	-	560	-	-
HCM Lane V/C Ratio	0.005	-	0.01	-	-
HCM Control Delay (s)	8.4	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	399	2	2	476
Future Vol, veh/h	7	6	399	2	2	476
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	434	2	2	517
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	956	435	0	0	436	0
Stage 1	435	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	286	621	-	-	1124	-
Stage 1	653	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	285	621	-	-	1124	-
Mov Cap-2 Maneuver	285	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 380		1124	-	
HCM Lane V/C Ratio	-	- 0.037		0.002	-	
HCM Control Delay (s)	-	- 14.8		8.2	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	53	16	434	10	518
v/c Ratio	0.19	0.28	0.02	0.28	0.01	0.33
Control Delay	20.5	31.2	0.7	1.3	2.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	31.2	0.7	1.3	2.9	3.5
Queue Length 50th (ft)	5	19	0	74	1	77
Queue Length 95th (ft)	32	53	m1	9	5	122
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	657	590	728	1571	799	1576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.09	0.02	0.28	0.01	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Volume (vph)	4	6	22	27	9	13	15	381	18	9	472	5
Future Volume (vph)	4	6	22	27	9	13	15	381	18	9	472	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1681			1748		1770	1850		1770	1860	
Flt Permitted		0.95			0.81		0.46	1.00		0.51	1.00	
Satd. Flow (perm)		1607			1456		857	1850		945	1860	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	7	24	29	10	14	16	414	20	10	513	5
RTOR Reduction (vph)	0	22	0	0	13	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	40	0	16	433	0	10	518	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Effective Green, g (s)		6.2			6.2		67.7	67.7		67.4	67.4	
Actuated g/C Ratio		0.07			0.07		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		117			106		682	1473		749	1474	
v/s Ratio Prot								0.23			c0.28	
v/s Ratio Perm		0.01			c0.03		0.02			0.01		
v/c Ratio		0.11			0.38		0.02	0.29		0.01	0.35	
Uniform Delay, d1		36.8			37.6		1.8	2.3		1.8	2.5	
Progression Factor		1.00			1.00		0.22	0.34		1.00	1.00	
Incremental Delay, d2		0.4			2.2		0.1	0.5		0.0	0.7	
Delay (s)		37.2			39.8		0.5	1.3		1.9	3.2	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		37.2			39.8			1.2			3.2	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.3			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			85.0			Sum of lost time (s)			11.4			
Intersection Capacity Utilization			43.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	2	1	0	1	2	410	5	7	532	1
Future Vol, veh/h	1	1	2	1	0	1	2	410	5	7	532	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	1	0	1	2	446	5	8	578	1
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1048	1050	579	1049	1048	449	579	0	0	451	0	0
Stage 1	595	595	-	453	453	-	-	-	-	-	-	-
Stage 2	453	455	-	596	595	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	206	227	515	205	228	610	995	-	-	1109	-	-
Stage 1	491	492	-	586	570	-	-	-	-	-	-	-
Stage 2	586	569	-	490	492	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	204	225	515	202	226	610	995	-	-	1109	-	-
Mov Cap-2 Maneuver	204	225	-	202	226	-	-	-	-	-	-	-
Stage 1	490	489	-	585	569	-	-	-	-	-	-	-
Stage 2	584	568	-	483	489	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	17.1		17			0			0.1			
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	995	-	-	302	303	1109	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.014	0.007	0.007	-	-				
HCM Control Delay (s)	8.6	-	-	17.1	17	8.3	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	2	0	12	3	1	0	14	416	7	0	531	0
Future Vol, veh/h	2	0	12	3	1	0	14	416	7	0	531	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	13	3	1	0	15	452	8	0	577	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1064	1067	577	1070	1063	456	577	0	0	460	0	0
Stage 1	577	577	-	486	486	-	-	-	-	-	-	-
Stage 2	487	490	-	584	577	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	201	222	516	199	223	604	996	-	-	1101	-	-
Stage 1	502	502	-	563	551	-	-	-	-	-	-	-
Stage 2	562	549	-	498	502	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	198	219	516	192	220	604	996	-	-	1101	-	-
Mov Cap-2 Maneuver	198	219	-	192	220	-	-	-	-	-	-	-
Stage 1	494	502	-	555	543	-	-	-	-	-	-	-
Stage 2	552	541	-	485	502	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.9		23.6		0.3		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	996	-	-	420	198	1101	-
HCM Lane V/C Ratio	0.015	-	-	0.036	0.022	-	-
HCM Control Delay (s)	8.7	-	-	13.9	23.6	0	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-

HCM 6th TWSC
8: Noland Road & White Oak Street

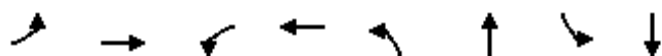
09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	18	25	448	548	1
Future Vol, veh/h	1	18	25	448	548	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	20	27	487	596	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	895	597	597	0	-	0
Stage 1	597	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	295	502	978	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	287	502	978	-	-	-
Mov Cap-2 Maneuver	287	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	978	-	483	-	-	
HCM Lane V/C Ratio	0.028	-	0.043	-	-	
HCM Control Delay (s)	8.8	-	12.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	27	203	80	444	70	388	160	466
v/c Ratio	0.14	0.32	0.22	0.49	0.18	0.40	0.48	0.33
Control Delay	31.3	23.9	28.1	24.4	16.8	15.8	22.7	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	23.9	28.1	24.4	16.8	15.8	22.7	18.4
Queue Length 50th (ft)	12	36	30	76	17	62	49	88
Queue Length 95th (ft)	35	67	72	137	29	68	113	150
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	188	805	452	1082	404	960	344	1411
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.25	0.18	0.41	0.17	0.40	0.47	0.33
Intersection Summary								

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	138	49	74	286	122	64	297	60	147	398	30
Future Volume (vph)	25	138	49	74	286	122	64	297	60	147	398	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	*0.75		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3401		1770	3380		1770	2724		1770	3502	
Flt Permitted	0.32	1.00		0.62	1.00		0.48	1.00		0.22	1.00	
Satd. Flow (perm)	591	3401		1163	3380		902	2724		412	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	150	53	80	311	133	70	323	65	160	433	33
RTOR Reduction (vph)	0	44	0	0	58	0	0	13	0	0	6	0
Lane Group Flow (vph)	27	159	0	80	386	0	70	375	0	160	460	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.0	15.0		21.6	21.6		25.4	25.4		28.8	28.8	
Effective Green, g (s)	15.0	15.0		21.6	21.6		25.4	25.4		28.8	28.8	
Actuated g/C Ratio	0.18	0.18		0.25	0.25		0.30	0.30		0.34	0.34	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	137	600		359	858		342	813		310	1186	
v/s Ratio Prot	0.01	c0.05		0.02	c0.11		0.02	c0.14		c0.06	0.13	
v/s Ratio Perm	0.03			0.03			0.04			c0.11		
v/c Ratio	0.20	0.27		0.22	0.45		0.20	0.46		0.52	0.39	
Uniform Delay, d1	29.7	30.2		25.4	26.7		22.7	24.2		21.2	21.4	
Progression Factor	1.00	1.00		1.00	1.00		0.65	0.65		0.88	0.89	
Incremental Delay, d2	0.7	0.2		0.3	0.4		0.3	1.9		1.4	0.9	
Delay (s)	30.4	30.5		25.7	27.1		14.9	17.6		20.2	20.1	
Level of Service	C	C		C	C		B	B		C	C	
Approach Delay (s)		30.5			26.9			17.2			20.1	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			85.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			58.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	2	4	12	10	8	5	57	404	6	7	517	18
Future Vol, veh/h	2	4	12	10	8	5	57	404	6	7	517	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	4	13	11	9	5	62	439	7	8	562	20
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	936	1158	291	866	1165	223	582	0	0	446	0	0
Stage 1	588	588	-	567	567	-	-	-	-	-	-	-
Stage 2	348	570	-	299	598	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	220	195	706	247	193	780	988	-	-	1111	-	-
Stage 1	462	494	-	476	505	-	-	-	-	-	-	-
Stage 2	641	504	-	685	489	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	199	181	706	226	179	780	988	-	-	1111	-	-
Mov Cap-2 Maneuver	199	181	-	226	179	-	-	-	-	-	-	-
Stage 1	433	491	-	446	473	-	-	-	-	-	-	-
Stage 2	586	472	-	662	486	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.4		21.7		1.1		0.1					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	988	-	-	366	241	1111	-	-				
HCM Lane V/C Ratio	0.063	-	-	0.053	0.104	0.007	-	-				
HCM Control Delay (s)	8.9	-	-	15.4	21.7	8.3	-	-				
HCM Lane LOS	A	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.3	0	-	-				

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	366	1	2	439
Future Vol, veh/h	2	8	366	1	2	439
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	10	446	1	2	535
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	719	224	0	0	447	0
Stage 1	447	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	363	779	-	-	1110	-
Stage 1	611	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	779	-	-	1110	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 633		1110	-	
HCM Lane V/C Ratio	-	- 0.019		0.002	-	
HCM Control Delay (s)	-	- 10.8		8.2	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Queues

12: Noland Road & Walnut St

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	61	113	79	65	425	5	523
v/c Ratio	0.24	0.25	0.31	0.36	0.21	0.04	0.32
Control Delay	35.2	1.3	33.5	40.6	13.6	21.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	1.3	33.5	40.6	13.6	21.2	8.7
Queue Length 50th (ft)	29	0	35	33	64	2	50
Queue Length 95th (ft)	59	0	68	63	111	m7	61
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	273	471	291	324	1995	141	1612
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.24	0.27	0.20	0.21	0.04	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Future Volume (vph)	27	23	93	32	25	8	53	335	13	4	403	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1814	1583		1787		1770	3519		1770	3507	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1814	1583		1787		1770	3519		1770	3507	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	33	28	113	39	30	10	65	409	16	5	491	32
RTOR Reduction (vph)	0	0	100	0	6	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	61	13	0	73	0	65	422	0	5	519	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Effective Green, g (s)		9.6	9.6		9.6		7.4	40.2		1.4	34.2	
Actuated g/C Ratio		0.11	0.11		0.11		0.09	0.47		0.02	0.40	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		204	178		201		154	1664		29	1411	
v/s Ratio Prot		c0.03			c0.04		c0.04	0.12		0.00	c0.15	
v/s Ratio Perm			0.01									
v/c Ratio		0.30	0.07		0.36		0.42	0.25		0.17	0.37	
Uniform Delay, d1		34.6	33.7		34.9		36.8	13.4		41.2	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.57	0.40	
Incremental Delay, d2		0.8	0.2		1.1		1.9	0.4		2.8	0.7	
Delay (s)		35.4	33.9		36.0		38.6	13.8		26.1	7.8	
Level of Service		D	C		D		D	B		C	A	
Approach Delay (s)		34.4			36.0			17.1			8.0	
Approach LOS		C			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)			24.2		
Intersection Capacity Utilization			48.2%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕		↗	↕↕	
Traffic Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Future Vol, veh/h	0	0	0	6	0	3	31	416	3	1	520	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	4	37	501	4	1	627	8
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	958	1212	318	893	1214	253	635	0	0	505	0	0
Stage 1	633	633	-	577	577	-	-	-	-	-	-	-
Stage 2	325	579	-	316	637	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	212	181	678	236	180	746	944	-	-	1056	-	-
Stage 1	434	472	-	469	500	-	-	-	-	-	-	-
Stage 2	661	499	-	670	470	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	205	174	678	229	173	746	944	-	-	1056	-	-
Mov Cap-2 Maneuver	205	174	-	229	173	-	-	-	-	-	-	-
Stage 1	417	472	-	451	481	-	-	-	-	-	-	-
Stage 2	632	480	-	669	470	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0		17.5			0.6			0			
HCM LOS	A		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	944	-	-	-	298	1056	-	-				
HCM Lane V/C Ratio	0.04	-	-	-	0.036	0.001	-	-				
HCM Control Delay (s)	9	-	-	0	17.5	8.4	-	-				
HCM Lane LOS	A	-	-	A	C	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0	-	-				

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↙	↕	
Traffic Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Future Vol, veh/h	1	0	9	3	0	4	0	443	0	1	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	11	4	0	5	0	534	0	1	634	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	903	1170	317	853	1170	267	-	0	0	534	0	0
Stage 1	636	636	-	534	534	-	-	-	-	-	-	-
Stage 2	267	534	-	319	636	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	232	192	679	253	192	731	0	-	-	1030	-	-
Stage 1	433	470	-	498	523	-	0	-	-	-	-	-
Stage 2	715	523	-	667	470	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	230	192	679	249	192	731	-	-	-	1030	-	-
Mov Cap-2 Maneuver	230	192	-	249	192	-	-	-	-	-	-	-
Stage 1	433	470	-	498	523	-	-	-	-	-	-	-
Stage 2	710	523	-	656	470	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		14.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	-	-	568	400	1030	-	-					
HCM Lane V/C Ratio	-	-	0.021	0.021	0.001	-	-					
HCM Control Delay (s)	-	-	11.5	14.2	8.5	-	-					
HCM Lane LOS	-	-	B	B	A	-	-					
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0	-	-					

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↱	↕↱		↱	↕↱	
Traffic Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Future Vol, veh/h	1	1	11	17	3	20	10	431	14	6	530	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	13	21	4	24	12	526	17	7	646	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	950	1228	324	897	1221	272	648	0	0	543	0	0
Stage 1	661	661	-	559	559	-	-	-	-	-	-	-
Stage 2	289	567	-	338	662	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	215	177	672	235	179	726	934	-	-	1022	-	-
Stage 1	418	458	-	481	509	-	-	-	-	-	-	-
Stage 2	694	505	-	650	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	201	173	672	226	175	726	934	-	-	1022	-	-
Mov Cap-2 Maneuver	201	173	-	226	175	-	-	-	-	-	-	-
Stage 1	413	455	-	475	502	-	-	-	-	-	-	-
Stage 2	657	498	-	631	454	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.8		17.6		0.2		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	934	-	-	479	334	1022	-	-				
HCM Lane V/C Ratio	0.013	-	-	0.033	0.146	0.007	-	-				
HCM Control Delay (s)	8.9	-	-	12.8	17.6	8.5	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-	-				

HCM 6th TWSC
16: Noland Road & Ruby Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	11	3	449	561	0
Future Vol, veh/h	1	11	3	449	561	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	4	554	693	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	978	347	693	0	-	0
Stage 1	693	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	248	649	898	-	-	-
Stage 1	457	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	247	649	898	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	571	-	-	
HCM Lane V/C Ratio	0.004	-	0.026	-	-	
HCM Control Delay (s)	9	-	11.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC
17: Noland Road & Linden Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	4	456	572	2
Future Vol, veh/h	0	17	4	456	572	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	5	563	706	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	999	354	708	0	-	0
Stage 1	707	-	-	-	-	-
Stage 2	292	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	240	642	887	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	239	642	887	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	887	-	642	-	-	
HCM Lane V/C Ratio	0.006	-	0.033	-	-	
HCM Control Delay (s)	9.1	-	10.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	3	453	5	7	575
Future Vol, veh/h	5	3	453	5	7	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	4	559	6	9	710

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	935	283	0	0	565
Stage 1	562	-	-	-	-
Stage 2	373	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	264	714	-	-	1003
Stage 1	534	-	-	-	-
Stage 2	666	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	262	714	-	-	1003
Mov Cap-2 Maneuver	262	-	-	-	-
Stage 1	534	-	-	-	-
Stage 2	660	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	344	1003
HCM Lane V/C Ratio	-	-	0.029	0.009
HCM Control Delay (s)	-	-	15.8	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
19: Noland Road & South Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Future Vol, veh/h	1	1	18	4	3	10	4	448	3	1	578	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	22	5	4	12	5	546	4	1	705	12

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	998	1273	359	913	1277	275	717	0	0	550	0	0
Stage 1	713	713	-	558	558	-	-	-	-	-	-	-
Stage 2	285	560	-	355	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	198	166	638	228	165	722	880	-	-	1016	-	-
Stage 1	389	434	-	482	510	-	-	-	-	-	-	-
Stage 2	698	509	-	635	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	190	165	638	218	164	722	880	-	-	1016	-	-
Mov Cap-2 Maneuver	190	165	-	218	164	-	-	-	-	-	-	-
Stage 1	387	434	-	479	507	-	-	-	-	-	-	-
Stage 2	677	506	-	611	431	-	-	-	-	-	-	-

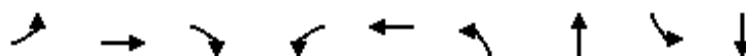
Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.5		16.4		0.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	880	-	-	506	337	1016	-
HCM Lane V/C Ratio	0.006	-	-	0.048	0.062	0.001	-
HCM Control Delay (s)	9.1	-	-	12.5	16.4	8.5	-
HCM Lane LOS	A	-	-	B	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	593	151	151	858	206	395	219	455
v/c Ratio	0.93	0.43	0.21	0.71	0.54	0.57	0.69	0.67	0.90
Control Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.2	28.8	3.9	68.2	24.6	47.6	39.6	63.0	69.1
Queue Length 50th (ft)	71	176	0	113	237	80	138	85	173
Queue Length 95th (ft)	#170	237	35	181	311	114	182	124	#255
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	97	1391	722	234	1597	503	692	346	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.43	0.21	0.65	0.54	0.41	0.57	0.63	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Future Volume (vph)	79	522	133	133	624	131	181	245	103	193	303	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3447		3433	3382		3433	3410	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	90	593	151	151	709	149	206	278	117	219	344	111
RTOR Reduction (vph)	0	0	92	0	14	0	0	40	0	0	26	0
Lane Group Flow (vph)	90	593	59	151	844	0	206	355	0	219	429	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Effective Green, g (s)	6.7	47.2	47.2	14.6	55.1		12.7	18.8		11.4	16.9	
Actuated g/C Ratio	0.06	0.39	0.39	0.12	0.46		0.11	0.16		0.10	0.14	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	98	1392	622	215	1582		363	529		326	480	
v/s Ratio Prot	c0.05	0.17		c0.09	c0.24		0.06	c0.10		0.06	c0.13	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.43	0.10	0.70	0.53		0.57	0.67		0.67	0.89	
Uniform Delay, d1	56.4	26.5	22.9	50.6	23.2		51.0	47.7		52.5	50.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.82	0.79		1.00	1.00	
Incremental Delay, d2	64.3	1.0	0.3	9.9	1.3		2.0	3.3		5.4	18.7	
Delay (s)	120.7	27.5	23.2	60.5	24.5		43.8	41.0		57.9	69.4	
Level of Service	F	C	C	E	C		D	D		E	E	
Approach Delay (s)		36.8			29.9			41.9			65.7	
Approach LOS		D			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			41.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			66.3%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	28	155	9	520	51	575
v/c Ratio	0.20	0.09	0.71	0.02	0.23	0.07	0.22
Control Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.5	59.8	11.2	10.7	2.8	2.2
Queue Length 50th (ft)	27	0	102	3	88	2	13
Queue Length 95th (ft)	56	0	160	11	134	m8	m42
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	480	631	517	594	2256	731	2624
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.30	0.02	0.23	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Future Volume (vph)	21	13	25	74	23	40	8	429	28	45	501	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1807	1583		1743		1770	3507		1770	3534	
Flt Permitted		0.74	1.00		0.81		0.39	1.00		0.46	1.00	
Satd. Flow (perm)		1380	1583		1449		730	3507		856	3534	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	24	15	28	84	26	45	9	488	32	51	569	6
RTOR Reduction (vph)	0	0	24	0	16	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	39	4	0	139	0	9	517	0	51	575	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Effective Green, g (s)		16.8	16.8		16.8		72.6	72.6		84.7	84.7	
Actuated g/C Ratio		0.14	0.14		0.14		0.60	0.60		0.71	0.71	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		193	221		202		452	2121		706	2494	
v/s Ratio Prot							0.00	c0.15		0.01	c0.16	
v/s Ratio Perm		0.03	0.00		c0.10		0.01			0.04		
v/c Ratio		0.20	0.02		0.69		0.02	0.24		0.07	0.23	
Uniform Delay, d1		45.7	44.5		49.1		9.6	11.0		5.5	6.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.40	0.34	
Incremental Delay, d2		0.5	0.0		9.3		0.0	0.3		0.0	0.2	
Delay (s)		46.2	44.5		58.4		9.6	11.3		2.2	2.3	
Level of Service		D	D		E		A	B		A	A	
Approach Delay (s)		45.5			58.4			11.2			2.3	
Approach LOS		D			E			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.1										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		120.0										
Intersection Capacity Utilization		47.8%										
Analysis Period (min)		15										
c Critical Lane Group												

Queues

1: Noland Road & Highway 24

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	45	992	168	737	253	243	330	178	207	46
v/c Ratio	0.12	0.72	0.54	0.44	0.86	0.82	0.70	0.66	0.71	0.12
Control Delay	11.6	28.9	17.6	18.2	57.8	64.5	18.3	40.3	54.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	28.9	17.6	18.2	57.8	64.5	18.3	40.3	54.7	0.6
Queue Length 50th (ft)	13	270	50	167	129	153	38	86	128	0
Queue Length 95th (ft)	29	375	84	225	#221	#287	137	#156	#225	0
Internal Link Dist (ft)		612		1268		380			1054	
Turn Bay Length (ft)	100		180		200		300	140		280
Base Capacity (vph)	427	1376	381	1686	295	313	486	273	315	402
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.72	0.44	0.44	0.86	0.78	0.68	0.65	0.66	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Noland Road & Highway 24

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	727	186	155	545	133	233	224	304	164	190	42
Future Volume (vph)	41	727	186	155	545	133	233	224	304	164	190	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3431		1770	3435		1770	1863	1583	1770	1863	1583
Flt Permitted	0.34	1.00		0.14	1.00		0.41	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	641	3431		269	3435		767	1863	1583	626	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	790	202	168	592	145	253	243	330	178	207	46
RTOR Reduction (vph)	0	20	0	0	18	0	0	0	223	0	0	39
Lane Group Flow (vph)	45	972	0	168	719	0	253	243	107	178	207	7
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8		8	4		4
Actuated Green, G (s)	46.3	42.1		59.0	48.6		25.7	15.9	15.9	25.3	15.7	15.7
Effective Green, g (s)	46.3	42.1		59.0	48.6		25.7	15.9	15.9	25.3	15.7	15.7
Actuated g/C Ratio	0.45	0.41		0.58	0.47		0.25	0.16	0.16	0.25	0.15	0.15
Clearance Time (s)	6.2	6.2		5.7	5.7		6.2	6.2	6.2	6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	335	1409		311	1628		288	288	245	261	285	242
v/s Ratio Prot	0.01	c0.28		c0.06	0.21		c0.08	0.13		0.06	0.11	
v/s Ratio Perm	0.06			0.25			c0.14		0.07	0.10		0.00
v/c Ratio	0.13	0.69		0.54	0.44		0.88	0.84	0.44	0.68	0.73	0.03
Uniform Delay, d1	15.9	24.8		14.3	17.9		35.2	42.1	39.2	32.6	41.4	36.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.8		1.9	0.9		24.7	19.6	1.2	7.2	8.9	0.0
Delay (s)	16.0	27.6		16.3	18.8		59.8	61.7	40.5	39.8	50.2	37.0
Level of Service	B	C		B	B		E	E	D	D	D	D
Approach Delay (s)		27.1			18.3			52.7			44.5	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM 2000 Control Delay	33.6			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	102.5			Sum of lost time (s)			24.2					
Intersection Capacity Utilization	77.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th TWSC

2: Noland Road & St Charles Street

09/30/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	8	7	779	598	4
Future Vol, veh/h	1	8	7	779	598	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	140	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	8	847	650	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1515	652	654	0	-	0
Stage 1	652	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	132	468	933	-	-	-
Stage 1	518	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	131	468	933	-	-	-
Mov Cap-2 Maneuver	131	-	-	-	-	-
Stage 1	513	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.2	0.1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	933	-	364	-	-	
HCM Lane V/C Ratio	0.008	-	0.027	-	-	
HCM Control Delay (s)	8.9	-	15.2	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC

3: Noland Road & Nettleton Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	5	754	10	9	628
Future Vol, veh/h	8	5	754	10	9	628
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	5	820	11	10	683
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1529	826	0	0	831	0
Stage 1	826	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	129	372	-	-	801	-
Stage 1	430	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	127	372	-	-	801	-
Mov Cap-2 Maneuver	127	-	-	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	28.1	0		0.1		
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 170		801	-	
HCM Lane V/C Ratio	-	- 0.083		0.012	-	
HCM Control Delay (s)	-	- 28.1		9.6	-	
HCM Lane LOS	-	- D		A	-	
HCM 95th %tile Q(veh)	-	- 0.3		0	-	

Queues

4: Noland Road & College St

09/30/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	86	23	841	20	674
v/c Ratio	0.32	0.45	0.04	0.56	0.04	0.44
Control Delay	36.7	39.5	4.1	8.7	3.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.5	4.1	8.7	3.3	4.8
Queue Length 50th (ft)	28	40	2	151	2	113
Queue Length 95th (ft)	66	85	m7	m348	9	209
Internal Link Dist (ft)	607	1056		375		381
Turn Bay Length (ft)			200		300	
Base Capacity (vph)	650	592	569	1509	447	1518
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.15	0.04	0.56	0.04	0.44

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

4: Noland Road & College St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	6	37	14	35	24	20	21	712	62	18	606	14
Future Volume (vph)	6	37	14	35	24	20	21	712	62	18	606	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792			1760		1770	1840		1770	1857	
Flt Permitted		0.96			0.87		0.37	1.00		0.29	1.00	
Satd. Flow (perm)		1734			1569		695	1840		547	1857	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	40	15	38	26	22	23	774	67	20	659	15
RTOR Reduction (vph)	0	14	0	0	18	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	48	0	0	68	0	23	840	0	20	674	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Effective Green, g (s)		9.2			9.2		79.7	79.7		79.4	79.4	
Actuated g/C Ratio		0.09			0.09		0.80	0.80		0.79	0.79	
Clearance Time (s)		6.0			6.0		5.1	5.1		5.4	5.4	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			144		553	1466		434	1474	
v/s Ratio Prot								c0.46			0.36	
v/s Ratio Perm		0.03			c0.04		0.03			0.04		
v/c Ratio		0.30			0.47		0.04	0.57		0.05	0.46	
Uniform Delay, d1		42.4			43.1		2.1	3.8		2.2	3.3	
Progression Factor		1.00			1.00		1.34	1.67		1.00	1.00	
Incremental Delay, d2		1.1			2.4		0.1	1.3		0.2	1.0	
Delay (s)		43.5			45.5		3.0	7.6		2.4	4.4	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		43.5			45.5			7.5			4.3	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		9.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			11.4				
Intersection Capacity Utilization		61.6%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th TWSC
5: Noland Road & Waldo Street

09/30/2024

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	3	3	0	0	9	793	1	1	664	0
Future Vol, veh/h	1	1	3	3	0	0	9	793	1	1	664	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	3	3	0	0	10	862	1	1	722	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1607	1607	722	1609	1607	863	722	0	0	863	0	0
Stage 1	724	724	-	883	883	-	-	-	-	-	-	-
Stage 2	883	883	-	726	724	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	85	105	427	84	105	354	880	-	-	779	-	-
Stage 1	417	430	-	340	364	-	-	-	-	-	-	-
Stage 2	340	364	-	416	430	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	84	104	427	82	104	354	880	-	-	779	-	-
Mov Cap-2 Maneuver	84	104	-	82	104	-	-	-	-	-	-	-
Stage 1	412	430	-	336	360	-	-	-	-	-	-	-
Stage 2	336	360	-	411	430	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	26.2		50.7		0.1		0					
HCM LOS	D		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	880	-	-	175	82	779	-	-				
HCM Lane V/C Ratio	0.011	-	-	0.031	0.04	0.001	-	-				
HCM Control Delay (s)	9.1	-	-	26.2	50.7	9.6	-	-				
HCM Lane LOS	A	-	-	D	F	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th TWSC
6: Noland Road & Farmer Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↖		↗	↖	
Traffic Vol, veh/h	6	1	10	6	0	3	17	793	4	0	669	2
Future Vol, veh/h	6	1	10	6	0	3	17	793	4	0	669	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	11	7	0	3	18	862	4	0	727	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1630	1630	728	1634	1629	864	729	0	0	866	0	0
Stage 1	728	728	-	900	900	-	-	-	-	-	-	-
Stage 2	902	902	-	734	729	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	81	102	423	81	102	354	875	-	-	777	-	-
Stage 1	415	429	-	333	357	-	-	-	-	-	-	-
Stage 2	332	356	-	412	428	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	79	100	423	77	100	354	875	-	-	777	-	-
Mov Cap-2 Maneuver	79	100	-	77	100	-	-	-	-	-	-	-
Stage 1	406	429	-	326	350	-	-	-	-	-	-	-
Stage 2	322	349	-	400	428	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	31.3		43.2		0.2		0					
HCM LOS	D		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	875	-	-	155	104	777	-	-				
HCM Lane V/C Ratio	0.021	-	-	0.119	0.094	-	-	-				
HCM Control Delay (s)	9.2	-	-	31.3	43.2	0	-	-				
HCM Lane LOS	A	-	-	D	E	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.3	0	-	-				

HCM 6th TWSC
8: Noland Road & White Oak Street

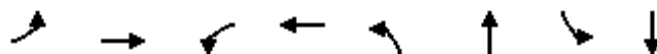
09/30/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	26	17	802	694	1
Future Vol, veh/h	9	26	17	802	694	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	28	18	872	754	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1227	755	755	0	-	0
Stage 1	755	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	183	408	853	-	-	-
Stage 1	463	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	179	408	853	-	-	-
Mov Cap-2 Maneuver	179	-	-	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18.4	0.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	853	-	307	-	-	
HCM Lane V/C Ratio	0.022	-	0.124	-	-	
HCM Control Delay (s)	9.3	-	18.4	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-	

Queues

9: Noland Road & Truman Rd

09/30/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	638	140	417	80	791	179	601
v/c Ratio	0.20	0.78	0.57	0.41	0.21	0.84	0.71	0.43
Control Delay	21.6	41.6	30.4	18.1	18.1	45.0	42.4	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	41.6	30.4	18.1	18.1	45.0	42.4	21.6
Queue Length 50th (ft)	25	195	60	65	35	343	72	113
Queue Length 95th (ft)	48	242	95	103	74	#455	#209	146
Internal Link Dist (ft)		721		705		500		225
Turn Bay Length (ft)	120		85		90		70	
Base Capacity (vph)	296	986	245	1118	381	946	253	1385
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	0.57	0.37	0.21	0.84	0.71	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

9: Noland Road & Truman Rd

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	490	97	129	222	162	74	554	174	165	519	34
Future Volume (vph)	55	490	97	129	222	162	74	554	174	165	519	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	*0.75		1.00	0.95	
Frt	1.00	0.98		1.00	0.94		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3452		1770	3315		1770	2694		1770	3507	
Flt Permitted	0.44	1.00		0.24	1.00		0.39	1.00		0.11	1.00	
Satd. Flow (perm)	815	3452		438	3315		726	2694		203	3507	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	533	105	140	241	176	80	602	189	179	564	37
RTOR Reduction (vph)	0	17	0	0	128	0	0	20	0	0	4	0
Lane Group Flow (vph)	60	621	0	140	289	0	80	771	0	179	597	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.5	24.6		34.7	27.2		39.1	33.0		46.7	36.7	
Effective Green, g (s)	29.5	24.6		34.7	27.2		39.1	33.0		46.7	36.7	
Actuated g/C Ratio	0.29	0.25		0.35	0.27		0.39	0.33		0.47	0.37	
Clearance Time (s)	6.9	6.9		5.5	5.5		6.1	6.1		6.4	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	849		251	901		347	889		251	1287	
v/s Ratio Prot	0.01	c0.18		c0.04	0.09		0.01	c0.29		c0.07	c0.17	
v/s Ratio Perm	0.05			0.15			0.08			0.26		
v/c Ratio	0.21	0.73		0.56	0.32		0.23	0.87		0.71	0.46	
Uniform Delay, d1	25.8	34.7		24.0	29.0		19.5	31.4		20.3	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.16	1.22		1.37	0.86	
Incremental Delay, d2	0.4	3.3		2.7	0.2		0.3	10.9		8.7	1.1	
Delay (s)	26.1	37.9		26.7	29.2		23.0	49.1		36.6	22.0	
Level of Service	C	D		C	C		C	D		D	C	
Approach Delay (s)		36.9			28.6			46.7			25.3	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			35.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			25.1			
Intersection Capacity Utilization			74.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
10: Noland Road & Lexington Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	7	3	19	11	0	6	38	792	12	15	776	10
Future Vol, veh/h	7	3	19	11	0	6	38	792	12	15	776	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	3	21	12	0	7	41	861	13	16	843	11

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1394	1837	427	1405	1836	437	854	0	0	874	0	0
Stage 1	881	881	-	950	950	-	-	-	-	-	-	-
Stage 2	513	956	-	455	886	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	101	75	576	99	75	567	781	-	-	768	-	-
Stage 1	308	363	-	280	337	-	-	-	-	-	-	-
Stage 2	512	335	-	554	361	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	94	70	576	87	70	567	781	-	-	768	-	-
Mov Cap-2 Maneuver	94	70	-	87	70	-	-	-	-	-	-	-
Stage 1	292	355	-	265	319	-	-	-	-	-	-	-
Stage 2	480	318	-	518	353	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	27.3		39.1		0.4		0.2	
HCM LOS	D		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	781	-	-	193	124	768	-
HCM Lane V/C Ratio	0.053	-	-	0.163	0.149	0.021	-
HCM Control Delay (s)	9.9	-	-	27.3	39.1	9.8	-
HCM Lane LOS	A	-	-	D	E	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	0.5	0.1	-

HCM 6th TWSC
11: Noland Road & Kansas Avenue

09/30/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	682	7	5	653
Future Vol, veh/h	2	3	682	7	5	653
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	85	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	703	7	5	673
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1054	355	0	0	710	0
Stage 1	707	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	221	641	-	-	885	-
Stage 1	450	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	220	641	-	-	885	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	450	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.1	0		0.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	363	885	-	
HCM Lane V/C Ratio	-	-	0.014	0.006	-	
HCM Control Delay (s)	-	-	15.1	9.1	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Queues

12: Noland Road & Walnut St

09/30/2024

	→	↘	←	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	164	75	50	715	6	711
v/c Ratio	0.51	0.40	0.34	0.34	0.36	0.06	0.42
Control Delay	48.1	4.2	40.4	48.8	14.3	61.0	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	4.2	40.4	48.8	14.3	61.0	18.2
Queue Length 50th (ft)	73	0	40	31	120	3	195
Queue Length 95th (ft)	126	15	83	66	228	m8	280
Internal Link Dist (ft)	588		824		322		375
Turn Bay Length (ft)				120		115	
Base Capacity (vph)	285	446	284	276	2004	138	1700
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.37	0.26	0.18	0.36	0.04	0.42

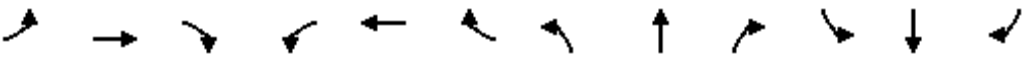
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

12: Noland Road & Walnut St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱		↰	↱	
Traffic Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Future Volume (vph)	66	42	148	31	26	11	45	608	35	5	612	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1808	1583		1782		1770	3510		1770	3516	
Flt Permitted		0.97	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1583		1782		1770	3510		1770	3516	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	47	164	34	29	12	50	676	39	6	680	31
RTOR Reduction (vph)	0	0	143	0	7	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	120	21	0	68	0	50	712	0	6	708	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Effective Green, g (s)		13.1	13.1		9.8		7.2	51.5		1.4	45.7	
Actuated g/C Ratio		0.13	0.13		0.10		0.07	0.52		0.01	0.46	
Clearance Time (s)		6.2	6.2		6.4		6.4	6.4		5.2	5.2	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		236	207		174		127	1807		24	1606	
v/s Ratio Prot		c0.07			c0.04		c0.03	c0.20		0.00	c0.20	
v/s Ratio Perm			0.01									
v/c Ratio		0.51	0.10		0.39		0.39	0.39		0.25	0.44	
Uniform Delay, d1		40.5	38.3		42.3		44.3	14.8		48.8	18.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.36	0.88	
Incremental Delay, d2		1.7	0.2		1.4		2.0	0.6		5.0	0.8	
Delay (s)		42.2	38.5		43.7		46.3	15.4		71.5	17.1	
Level of Service		D	D		D		D	B		E	B	
Approach Delay (s)		40.1			43.7			17.4			17.6	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.1									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			52.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
13: Noland Road & Short Avenue

09/30/2024

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Future Vol, veh/h	0	0	0	4	3	6	22	678	14	4	793	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	4	3	7	24	745	15	4	871	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1303	1689	437	1245	1683	380	874	0	0	760	0	0
Stage 1	881	881	-	801	801	-	-	-	-	-	-	-
Stage 2	422	808	-	444	882	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	118	93	567	130	93	618	768	-	-	848	-	-
Stage 1	308	363	-	344	395	-	-	-	-	-	-	-
Stage 2	580	392	-	563	362	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	110	90	567	126	90	618	768	-	-	848	-	-
Mov Cap-2 Maneuver	110	90	-	126	90	-	-	-	-	-	-	-
Stage 1	298	361	-	333	383	-	-	-	-	-	-	-
Stage 2	551	380	-	560	360	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	27.5	0.3	0
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	-	174	848	-
HCM Lane V/C Ratio	0.031	-	-	-	0.082	0.005	-
HCM Control Delay (s)	9.8	-	-	0	27.5	9.3	-
HCM Lane LOS	A	-	-	A	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0	-

HCM 6th TWSC
14: Noland Road & Elm Street

09/30/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Future Vol, veh/h	1	1	16	4	0	1	0	709	2	1	798	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	17	4	0	1	0	771	2	1	867	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1255	1642	434	1208	1641	387	-	0	0	773	0	0
Stage 1	869	869	-	772	772	-	-	-	-	-	-	-
Stage 2	386	773	-	436	869	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	128	99	570	139	99	611	0	-	-	838	-	-
Stage 1	313	367	-	358	407	-	0	-	-	-	-	-
Stage 2	609	407	-	569	367	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	99	570	133	99	611	-	-	-	838	-	-
Mov Cap-2 Maneuver	128	99	-	133	99	-	-	-	-	-	-	-
Stage 1	313	367	-	358	407	-	-	-	-	-	-	-
Stage 2	608	407	-	549	367	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.7		28.6		0		0	
HCM LOS	B		D					

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	391	158	838	-	-
HCM Lane V/C Ratio	-	-	0.05	0.034	0.001	-	-
HCM Control Delay (s)	-	-	14.7	28.6	9.3	-	-
HCM Lane LOS	-	-	B	D	A	-	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0	-	-

HCM 6th TWSC
15: Noland Road & Pacific Avenue

09/30/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕↗		↙	↕↗	
Traffic Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Future Vol, veh/h	4	3	21	13	3	7	11	698	16	21	796	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	90	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	3	23	14	3	8	12	759	17	23	865	2
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1317	1712	434	1272	1705	388	867	0	0	776	0	0
Stage 1	912	912	-	792	792	-	-	-	-	-	-	-
Stage 2	405	800	-	480	913	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	115	90	570	125	90	611	772	-	-	836	-	-
Stage 1	295	351	-	349	399	-	-	-	-	-	-	-
Stage 2	593	395	-	536	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	107	86	570	113	86	611	772	-	-	836	-	-
Mov Cap-2 Maneuver	107	86	-	113	86	-	-	-	-	-	-	-
Stage 1	290	341	-	343	393	-	-	-	-	-	-	-
Stage 2	572	389	-	496	340	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	20.9		35.4		0.1		0.2					
HCM LOS	C		E									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	772	-	-	257	143	836	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.118	0.175	0.027	-	-				
HCM Control Delay (s)	9.7	-	-	20.9	35.4	9.4	-	-				
HCM Lane LOS	A	-	-	C	E	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.1	-	-				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	22	6	724	837	1
Future Vol, veh/h	1	22	6	724	837	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	24	7	787	910	1

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1319	456	911
Stage 1	911	-	-
Stage 2	408	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	149	551	743
Stage 1	352	-	-
Stage 2	640	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	148	551	743
Mov Cap-2 Maneuver	148	-	-
Stage 1	349	-	-
Stage 2	640	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	743	-	493	-	-
HCM Lane V/C Ratio	0.009	-	0.051	-	-
HCM Control Delay (s)	9.9	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	21	10	727	856	0
Future Vol, veh/h	1	21	10	727	856	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	90	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	23	11	782	920	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1333	460	920	0	-	0
Stage 1	920	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	145	548	738	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	143	548	738	-	-	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	738	-	485	-	-	
HCM Lane V/C Ratio	0.015	-	0.049	-	-	
HCM Control Delay (s)	9.9	-	12.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	724	11	17	857
Future Vol, veh/h	5	13	724	11	17	857
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	14	778	12	18	922

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1281	395	0
Stage 1	784	-	-
Stage 2	497	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	157	604	-
Stage 1	410	-	-
Stage 2	577	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	154	604	-
Mov Cap-2 Maneuver	154	-	-
Stage 1	410	-	-
Stage 2	564	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	333	826
HCM Lane V/C Ratio	-	-	0.058	0.022
HCM Control Delay (s)	-	-	16.5	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC
19: Noland Road & South Avenue

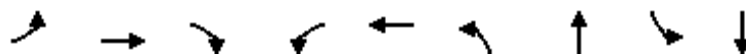
09/30/2024

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Future Vol, veh/h	1	2	34	4	1	26	10	718	14	7	848	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	90	-	-	135	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	37	4	1	29	11	789	15	8	932	8
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1369	1778	470	1302	1775	402	940	0	0	804	0	0
Stage 1	952	952	-	819	819	-	-	-	-	-	-	-
Stage 2	417	826	-	483	956	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	105	82	540	118	82	598	725	-	-	816	-	-
Stage 1	279	336	-	336	388	-	-	-	-	-	-	-
Stage 2	584	385	-	534	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	97	80	540	105	80	598	725	-	-	816	-	-
Mov Cap-2 Maneuver	97	80	-	105	80	-	-	-	-	-	-	-
Stage 1	275	333	-	331	382	-	-	-	-	-	-	-
Stage 2	546	379	-	489	332	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.7		17.2		0.1		0.1					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	725	-	-	377	330	816	-	-				
HCM Lane V/C Ratio	0.015	-	-	0.108	0.103	0.009	-	-				
HCM Control Delay (s)	10	-	-	15.7	17.2	9.5	-	-				
HCM Lane LOS	B	-	-	C	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0	-	-				

Queues

20: Noland Road & 23rd St

09/30/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	925	241	208	793	277	671	261	648
v/c Ratio	0.91	0.85	0.37	0.84	0.69	0.74	0.90	0.70	0.90
Control Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	48.2	6.9	77.1	38.3	61.7	56.2	61.8	62.1
Queue Length 50th (ft)	152	363	7	157	278	109	250	101	249
Queue Length 95th (ft)	#294	#482	69	#275	351	156	#353	146	#350
Internal Link Dist (ft)		482			377		503		765
Turn Bay Length (ft)	475		200	280		280		440	
Base Capacity (vph)	215	1091	645	266	1145	389	758	403	736
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.37	0.78	0.69	0.71	0.89	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

20: Noland Road & 23rd St

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Future Volume (vph)	188	888	231	200	638	123	266	443	202	251	498	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		0.97	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3454		3433	3373		3433	3434	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	196	925	241	208	665	128	277	461	210	261	519	129
RTOR Reduction (vph)	0	0	158	0	13	0	0	44	0	0	18	0
Lane Group Flow (vph)	196	925	83	208	780	0	277	627	0	261	630	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Effective Green, g (s)	14.6	37.0	37.0	17.0	39.4		13.0	24.9		13.1	24.4	
Actuated g/C Ratio	0.12	0.31	0.31	0.14	0.33		0.11	0.21		0.11	0.20	
Clearance Time (s)	7.4	7.4	7.4	6.9	6.9		7.4	6.8		6.9	6.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1091	488	250	1134		371	699		374	698	
v/s Ratio Prot	0.11	c0.26		0.12	c0.23		0.08	c0.19		0.08	c0.18	
v/s Ratio Perm			0.05									
v/c Ratio	0.91	0.85	0.17	0.83	0.69		0.75	0.90		0.70	0.90	
Uniform Delay, d1	52.1	38.9	30.3	50.1	35.0		51.9	46.3		51.5	46.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.95	0.95		1.00	1.00	
Incremental Delay, d2	37.9	8.2	0.8	20.4	3.4		7.7	13.7		5.6	14.9	
Delay (s)	89.9	47.1	31.1	70.5	38.4		57.0	57.5		57.1	61.5	
Level of Service	F	D	C	E	D		E	E		E	E	
Approach Delay (s)		50.4			45.1			57.4			60.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			52.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				28.6		
Intersection Capacity Utilization			84.8%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

Queues

21: Noland Road & Fair Ave

09/30/2024



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	56	111	52	885	29	887
v/c Ratio	0.46	0.24	0.64	0.11	0.34	0.06	0.35
Control Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	8.7	57.8	3.9	7.2	1.4	4.7
Queue Length 50th (ft)	48	0	69	7	128	1	115
Queue Length 95th (ft)	90	26	125	19	197	m3	m134
Internal Link Dist (ft)	179		381		434		503
Turn Bay Length (ft)				660		70	
Base Capacity (vph)	451	598	513	575	2568	571	2514
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.09	0.22	0.09	0.34	0.05	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

21: Noland Road & Fair Ave

09/30/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Future Volume (vph)	45	17	53	54	20	31	49	773	67	28	827	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1743		1770	3497		1770	3530	
Flt Permitted		0.70	1.00		0.80		0.29	1.00		0.30	1.00	
Satd. Flow (perm)		1295	1583		1438		539	3497		563	3530	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	18	56	57	21	33	52	814	71	29	871	16
RTOR Reduction (vph)	0	0	50	0	17	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	65	6	0	94	0	52	882	0	29	886	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Effective Green, g (s)		13.2	13.2		13.2		91.0	85.8		88.2	84.4	
Actuated g/C Ratio		0.11	0.11		0.11		0.76	0.71		0.74	0.70	
Clearance Time (s)		6.2	6.2		6.2		5.5	5.5		5.5	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	174		158		462	2500		452	2482	
v/s Ratio Prot							c0.00	c0.25		0.00	0.25	
v/s Ratio Perm		0.05	0.00		c0.07		0.08			0.05		
v/c Ratio		0.46	0.04		0.60		0.11	0.35		0.06	0.36	
Uniform Delay, d1		50.0	47.7		50.9		3.9	6.5		4.4	7.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		0.36	0.58	
Incremental Delay, d2		2.3	0.1		5.9		0.1	0.4		0.0	0.3	
Delay (s)		52.4	47.8		56.8		4.0	6.9		1.6	4.3	
Level of Service		D	D		E		A	A		A	A	
Approach Delay (s)		50.3			56.8			6.8			4.3	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay		10.8										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		120.0								17.2		
Intersection Capacity Utilization		55.4%										
Analysis Period (min)		15										
c Critical Lane Group												

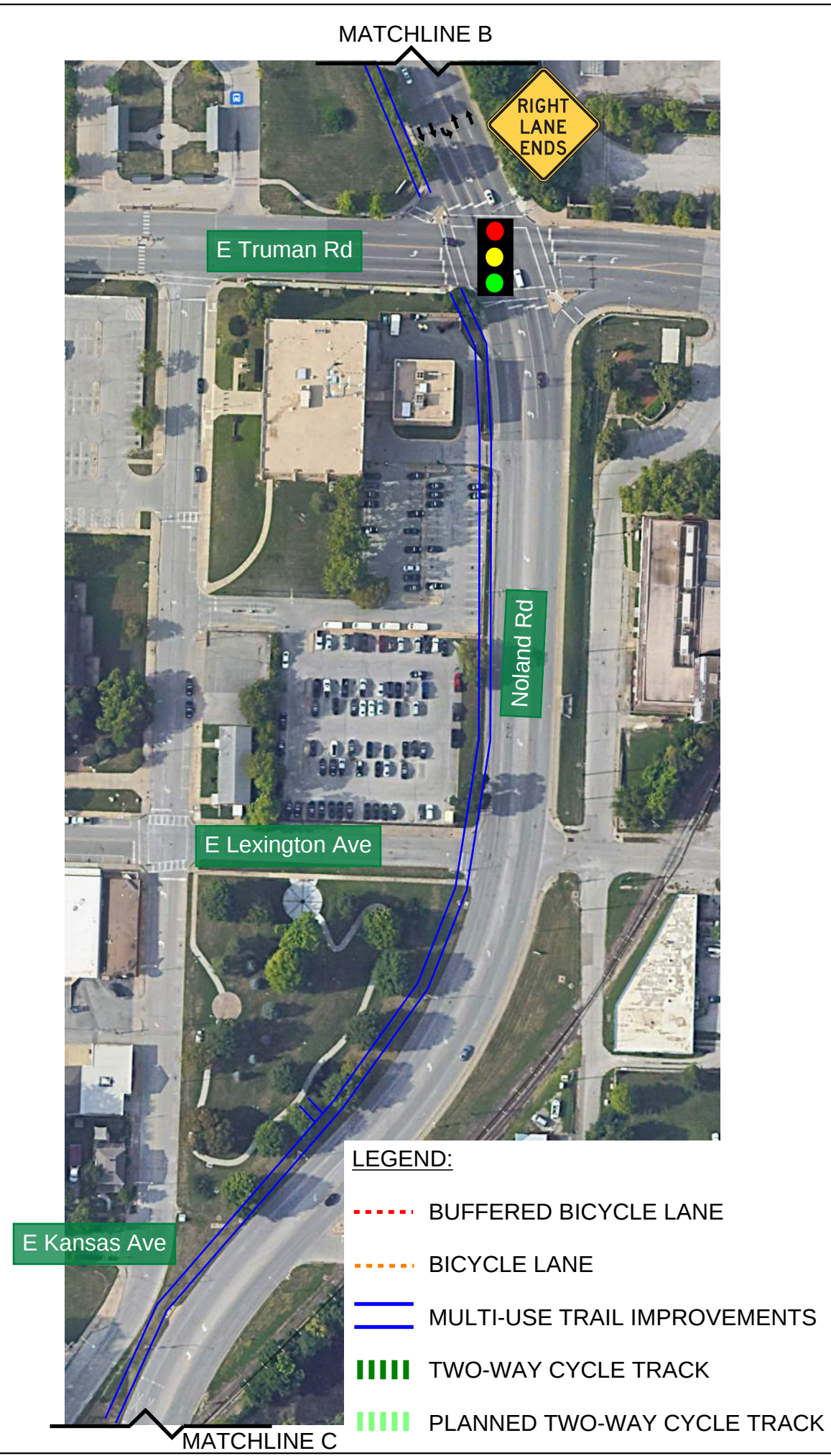
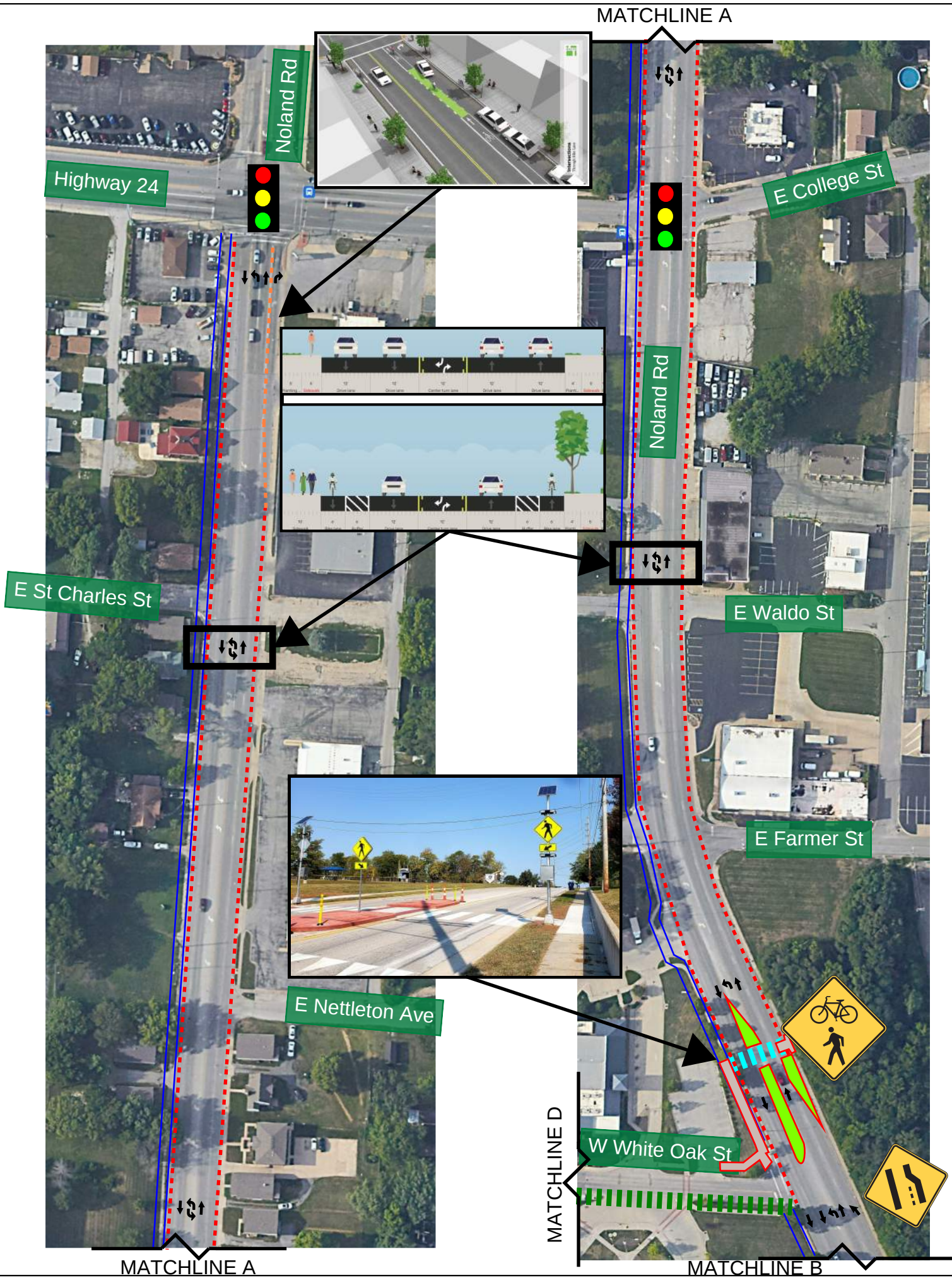


10/3/2024

NOLAND ROAD MULTIMODAL STUDY

Independence, MO

Olsson Project No. 023-00883



Rental Ready & Landlord Tenant Updates

December 9, 2024



★ A GREAT AMERICAN STORY ★

Overview

- Rental Ready Program
 - Background of the program
 - Proposed inspection item changes
 - Other ordinance changes
 - Website enhancements
- Landlord Tenant
 - Background
 - Proposed ordinance changes
 - Other enhancements

Rental Ready Background

- Rental Ready Program went into effect June 1, 2017
- Requires rental units to be inspected and pass a basic health/safety inspection every two (2) years.
- Landlords are required to have a valid business license and list all units on the license.
- Purpose of the Program:
 - Protect health, safety and welfare
 - Maintain attractive neighborhoods
 - Ensure interior standards are met

Current Inspection Requirements

The rental unit inspection include:

- No exposed electrical wire.
- All smoke detectors are in proper working order.
- All handrails are secure and functional.
- Property address street number shall be visible.
- All units shall have a working sanitary sewer system.
- At least one carbon monoxide detector be installed in all residential rental units.

Current Inspection Requirements (cont)

- A safe, continuous, and unobstructed means of egress shall be provided from the interior of a structure to a public way.
- Ground fault circuit-interceptors are required to be placed within six feet of any water source; including but not limited to bathrooms, garages, crawl space, unfinished basements, and kitchens.
- All furnaces, water heaters, and corresponding accessories shall be properly installed and maintained in a safe working condition and shall be capable of performing the intended function.

Inspection Process

- The landlord hires a qualified housing inspector from the City's approved list.
- The inspector inspects each unit for the nine (9) basic health and safety items
- If a unit fails an inspection, the landlord is required to resolve any deficiencies and have the unit reinspected.
- All units get inspected except for multi-family; only 10% get inspected
- Inspector uploads through the City portal the passing inspection.

Why are we making changes?

- First building code adoption since the Rental Ready program fully implemented
 - Current building codes – 2018 I-Series Codes – adopted December 2017
 - Proposed building codes – 2024 I-Series Codes – scheduled for December 2024
- Both codes are integral to protect the public health, safety and general welfare of the residents of Independence in rental dwellings

Proposed Rental Ready Changes

- Expanded and clarified current inspection requirements for:
 - Handrails
 - Property address
 - Smoke and carbon monoxide detectors
 - Safe and unobstructed means of egress
 - Ground fault circuit interrupters

Proposed Rental Ready Changes – Electrical

- Clarified requirements for electrical
 - Current requirement: No exposed electrical wires, as specified in Section 4.01.02.A. of the City Code
 - Proposed requirement: **Each rental dwelling unit shall have a properly maintained electrical system, which shall be in a safe working condition and capable of performing its intended function. Electrical panels shall have a cover per the manufacturer's direction, or as directed by the currently adopted National Electrical Code.**

Proposed Rental Ready Changes – Sanitary Sewer

- Expanded and clarified requirements for sanitary sewer system
 - Current requirement: all units must be connected to a working sanitary sewer system
 - Proposed requirement: **All such plumbing fixtures shall be maintained in a sanitary and good working condition and shall be properly connected to the public sewer system or to an approved private system if the public system is not available.**
 - Proposed requirement: **All kitchen sinks, lavatories, bathtubs and showers shall be supplied with hot and cold running water and shall be otherwise operable.**

Proposed Rental Ready Changes – Water Heater

- Expanded and clarified requirements for water heater.
 - Current requirement: All furnaces, water heaters, and corresponding accessories shall be properly installed and maintained in a safe working condition, and shall be capable of performing the intended function
 - Proposed requirement: **Water heating facilities shall be in good working condition, and capable of providing an adequate amount of water to be drawn at every required sink, lavatory, bathtub, and shower at a minimum temperature of 110 degrees Fahrenheit. Proper exhaust systems must be attached, sealed to prevent leaks and fully operational;**

Proposed Rental Ready Changes – Furnace

- Expanded and clarified requirements for furnace.
 - Current requirement: All furnaces, water heaters, and corresponding accessories shall be properly installed and maintained in a safe working condition, and shall be capable of performing the intended function
 - Proposed requirement: **Each rental housing unit shall have heating facilities in good working order that can safely maintain a minimum room temperature of 68 degrees Fahrenheit in all habitable rooms, bathrooms, and toilet rooms, measured at a point three feet above the floor and two feet from exterior walls. Cooking appliances and space heaters shall not be used to provide space heating to meet the requirements of this section. Proper exhaust systems must be attached, sealed to prevent leaks and fully operational;**

Proposed Rental Ready Changes – AC

- New requirements for air conditioning units, if provided by the landlord
 - Current requirement: None
 - Proposed requirement: **If provided by the lessor, the cooling system shall be in good working order that can safely maintain a maximum temperature of 80 degrees Fahrenheit in all bedrooms, measured at a point three feet above the floor and two feet from exterior walls;**

Proposed Rental Ready Changes – Appliances

- New requirements for appliances, if provided by the landlord,
 - Current requirement: None
 - Proposed requirement: **If provided by the lessor, all mechanical appliances, operative fireplaces, solid-fuel-burning appliances and cooking appliances shall be properly installed and maintained in a safe working condition, and shall be capable of performing the intended function;**

Proposed Rental Ready Changes – Exterior

- New requirements for roofs, windows and, exterior doors
 - Current requirement: None
 - Proposed requirement: **Roofs, windows, and exterior doors must be adequate to prevent dampness or deterioration in the walls or interior portions of the rental housing unit. No evidence of mold shall be present on the interior of the unit. The roof and flashing shall be sound, tight and free of defects that admit rain;**

Proposed Rental Ready Changes – Interior

- New requirements for holes in ceilings, walls and floors
 - Current requirement: None
 - Proposed requirement: **All holes and/or missing drywall/subfloor in interior walls, ceilings and floors shall be sealed as necessary.**

Proposed Rental Ready Changes – Window Fall Protection

- New requirements for window fall protection
 - Current requirement: None
 - Proposed requirement: **All rental dwelling units where the bottom of an operable window is located less than 36 inches (914 mm) above the finished floor and more than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, shall have window fall protection installed per the City's current adopted building code.**

Proposed Rental Ready Changes – Miscellaneous

- Amends the requirement to allow for an inspection to occur upon the change of tenant or 2 years, whichever occurs later.
- Require 50% of multi-family units to get inspected. Specify that same units cannot be inspected back-to-back
- Require the inspector to maintain inspections records for 2 years and must produce the report if requested by City.
- Requires a landlord to have a business license prior to customers obtaining utility service
 - This would be effective January 1, 2026

Other Rental Ready Changes

- Increase the fee the inspectors can charge
 - From \$50 per unit to \$100 for initial inspection – index to CPI
 - From \$30 per unit to \$60 for reinspection
- Website enhancements
 - More resources and information for both landlords and tenants

Landlord Tenant Code

- Landlord Tenant code was enacted in 1989
 - Minor updates occurred in 1990s
- Very few complaints received
- No clear process for handling complaints

Landlord Tenant Complaints Updates

- Introduces deficient landlord concept
 - This is a landlord who has 3 or more valid landlord tenant complaints in a 12-month period.
 - Deficient landlord must have all dwelling units inspected by City on periodic basis – once a month – for 6 months.
 - If violation(s) are found, the landlord is given reasonable time to cure the violation(s). Failure to cure the violation(s) result in one (1) additional month.
 - Outlines notification process for landlord and tenant
 - To be removed as deficient landlord, all dwelling unit(s) must be violation free or violation resolved for 6 consecutive months.

Landlord Tenant Complaint Process

- Non-critical health or life-safety issues
 - Notify owner, provide 7 days to address the issue
 - If the complaint is not remedied within the timeframe identified, the City will schedule an inspection an inspection of the unit.
 - If owner fails to correct cited issue(s), the City, at the discretion of the Director, may do one (1) or more of the following:
 - Allow additional time to correct the cited issue(s)
 - Initiate license suspension or revocation proceedings in accordance with Chapter 5
 - Write a ticket for municipal court

Landlord Tenant Complaint Process (cont)

- Critical health or life-safety issues
 - Notify the owner in writing of the complaint.
 - Allow the landlord to immediately correct cited violation(s). Considering the nature of the issue and the complexity of the corrective action needed, the Director may allow a longer time frame to correct.
 - If landlord fails to correct cited issue(s), the City, at the discretion of the Director, may do one (1) or more of the following:
 - Require the property to be vacated in accordance, if determined necessary;
 - Re-inspect the rental property, if necessary, to determine if the violation still exists;
 - Initiate license suspension or revocation proceedings in accordance with Chapter 5;
 - Write a ticket for municipal court.

Landlord Tenant Complaints Updates

- Prohibits retaliation by landlord
 - Eviction
 - Cause any service, facility, equipment or utility required under this ordinance to be removed, shut off or discontinued
 - Charge or demand reimbursement of any fees arising from this Article, including late fees, annual permit review fees and re-inspection fees, to a tenant
- Added penalty for making false complaints
 - Unlawful for any person to knowingly make a false complaint against an owner
 - Knowingly make three or more false complaints made with respect to any structure or landlord in any twelve-month period

Landlord Tenant Complaints Updates

- Removes the requirement to give tenant the landlord tenant guide.
- Updated code references
- Website enhancements
 - Includes portal where tenant can make online complaint
 - More tenant resources and information
 - More resources and information for landlords
- Revised paper complaint form
- Complaints can be made via the IndepNow app

Resources Needed

- During Implementation Phase, City utilized 1 staff member.
 - Served as central point of contact
- Over the years, migrated to sharing those duties
- Staff recommends adding 1 staff member
 - Central point for rental ready and landlord tenant complaints
 - Staff anticipates receiving more complaints
 - Would be involved in the inspection of those complaints

Questions...

INDEPENDENCE
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MEMORANDUM

DATE: December 9, 2024

TO: Mayor and Members of the City Council

FROM: Susanne Holland, City Clerk

SUBJECT: Boards and Commissions Report

Independence Park Commission

- A recommendation has been made to appoint Kevin Baird to the Independence Park Commission.
- Staff requests direction to add a resolution to the next regular meeting for the appointment of this individual to the above board.

Sustainability Commission

- A recommendation has been made to appoint Cassandra Krul to the Sustainability Commission.
- Staff requests direction to add a resolution to the next regular meeting for the appointment of this individual to the above board.

Street Improvement Sales Tax Oversight Committee

- A recommendation has been made to appoint John Powell and reappoint Dennis Tharp to the Street Improvement Sales Tax Oversight Committee.
- Staff requests direction to add a resolution to the next regular meeting for the appointments of these individuals to the above board.



Public Safety Tax Oversight Committee

- A recommendation has been made to reappoint Bruce Frakes to the Public Safety Tax Oversight Committee.
- Staff requests direction to add a resolution to the next regular meeting for the appointment of this individual to the above board.

Public Utility Advisory Board

- A recommendation has been made to appoint Teri Mertel to the Public Utility Advisory Board.
- Staff requests direction to add a resolution to the next regular meeting for the appointment of this individual to the above board.

Board of Adjustment

- A recommendation has been made to appoint Cindy McClain to the Board of Adjustment.
- Staff requests direction to add a resolution to the next regular meeting for the appointment of this individual to the above board.