

# CITY PLAN COMMISSION STAFF REPORT

CD-CPC-2025-00169

KCI 29 Logistics Park

January 21, 2026

## Docket #3

### Request

Major Amendment

### Applicant

Jabob Hodson  
Olsson

### Owner

Aaron Schimdt  
Hunt Midwest

### Site Information

Location	13651 N Bethel Ave
Area	2,500 Acres
Zoning	MPD
Council District	1st
County	Platte
School District	Platte County

### Surrounding Land Uses

North: Residential, AG-R/M1-1  
South: Airport, KCIA  
East: Residential/Undeveloped, AG-R  
West: Undeveloped, KCIA/M2-2

### KC Spirit Playbook Alignment

CD-CPC-2025-00169: **High**

### Land Use Plan

The KCI Area Plan recommends Industrial Uses for this location. The proposed plan has a high alignment with this designation. See Criteria A for more information.

### Major Street Plan

There are also multiple streets within the MPD that are identified on the Major Street Plan.

## Approval Process



### Overview

The applicant seeks a major amendment to an approved development plan which also serves as the preliminary plan, in District MPD (Master Planned Development) to expand the district boundary by approximately 167 acres and allow for 20 million square feet of commercial, office, and warehousing development on 32 lots and about 2,500 acres at the northwest corner of North Bethel Avenue and I-435.

### Existing Conditions

The project site is approximately 2,500 acres. Multiple parcels have been developed with industrial and commercial uses. The rest of the parcels are undeveloped.

### Neighborhood(s)

This site is not located within a registered neighborhood or homes association.

### Required Public Engagement

Section 88-505-12, Public Engagement does apply to this request. The applicant hosted a meeting on January 7, 2026. A meeting summary is attached; see Attachment #3.

### Controlling Case

CD-CPC-2024-00138 - Ordinance 250084, approved by City Council on August 23, 2024 approved a major amendment to an approved development plan for the purpose of expanding the district, and allowing for 20 million square foot of commercial office and warehouse development on 32 lots, on about 2,143 acres, generally located on the north side of I-29/I-435 and Northwest 128<sup>th</sup> Street, specifically at the southeast corner of MO Route 92 and North Bethel Avenue at the terminus of Mexico City Avenue.

### Project Timeline

The application was filed on October 27, 2025. Scheduling deviations have occurred due to requests by the applicant to continue the case.

### Professional Staff Recommendation

Docket #3      Approval, Subject to Conditions



will be subject to the MPD standards and subject to the specific uses within that controlling plan. All plans and conditions for ordinance No. 220883 passed by City Council on October 6, 2022, will remain in full force and effect.

**PLAN ANALYSIS**

Standards	Meets	Notes
Use-Specific Standards (88-280)	Yes	
Parking & Loading (88-420)	Yes, Subject to Conditions	
Landscaping & Screening (88-425)	Yes, Subject to Conditions	
Outdoor Lighting (88-430)	Yes, Subject to Conditions	
Pedestrian Standards (88-450)	Yes, Subject to Conditions	

**SPECIFIC REVIEW CRITERIA**

**Master Planned Developments (88-520-03-G)**

In reviewing and making decisions on proposed MPD rezonings and preliminary development plans, review and decision-making bodies must consider at least the following factors:

**A. The preliminary development plan’s consistency with any adopted land use plans for the area.**

The major amendment complies with applicable sections of the Zoning and Development Code and the recommended land use of KCI Area Plan.

“This project supports a few goals in the KCI Area Plan and KC Spirit Playbook. The proposed major amendment to rezone the property to MPD is consistent with the future land use designation of industrial, as the MPD district is oriented toward industrial development. The KCI Area Plan supports industrials uses north of the airport due to the area’s remoteness and its significant separation from residential neighborhoods. While the proposed major amendment does not include specific design guidelines relating to landscaping, each project will be subject to an administrative review.” – Alexis Berra, 1<sup>st</sup> District Planner, Community Planning Division

**B. The preliminary development plan’s consistency with the MPD district provisions of 88-280.**

The major amendment request is to bring an additional 168 acres into the existing MPD District. The new land will be subject to the current MPD conditions and standards. There are eleven specific objectives staff reviews for MPD plans, of the eleven, this MPD plan meets four of them. The MPD plan meets the following criteria:

1. flexibility and creativity in responding to changing social, economic, and market conditions and that results in greater public benefits than could be achieved using conventional zoning and development regulations;
3. efficient and economical provision of public facilities and services;
7. a coordinated transportation systems that includes a inter-connected hierarchy of appropriately designed improvements for pedestrians, bicycles, and vehicles;
8. compatibility of buildings and other improvements as determined by their arrangement, massing, form, character, and landscaping to establish a high-quality livable environment;

This MPD Plan allows for flexibility and creativity in responding to changing economic and market conditions by allowing flexibility of each lot to be reviewed on a case-by-case basis. Public and private facilities will be extended to the boundaries of each lot when developed in an efficient and economical way. The MPD plan shows efficient connectivity for vehicular and non-vehicular users. The compatibility and other improvements will be determined through MPD Final Plans, the design standards set by this MPD Plan, staff is expecting high-quality development.

**C. The sufficiency of the terms and conditions proposes to protect the interest of the public and the residents of the MPD in the case of a plan that proposes development over a long period of time.**

The subject area is limited to the uses listed on the plan which are primarily industrial uses with the exception of some industrial uses such as junk yards, intensive manufacturing and demolition debris landfill, which removes some level of unknown to the public about how this area will be developed. Additionally, there are design standards with the controlling MPD Plan to encourage a consistent level of design on the remaining undeveloped lots.

#### ATTACHMENTS

1. Conditions Report
2. Applicant's Submittal
3. Public Engagement Materials
4. KC Spirit Alignment

#### PROFESSIONAL STAFF RECOMMENDATION

**City staff recommends APPROVAL SUBJECT TO CONDITIONS as stated in the conditions report.**

Respectfully submitted,



Justin Smith

Planner



## Plan Conditions

Report Date: January 15, 2026

Case Number: CD-CPC-2025-00169

Project: KCI 29 Logistics Park

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*Condition(s) by City Planning and Development Department. Contact Justin Smith at (816) 513-8823 / justin.smith@kcmo.org with questions.*

1. That Ordinance No. 220883, including all conditions provided therein, shall remain in full force and effect.
2. That the applicant gains approval of a major street plan amendment or revise the alignment accordingly.

*Condition(s) by Fire Department. Contact Michael Schroeder at (816) 513-4604 / michael.schroeder@kcmo.org with questions.*

3. Controlling plan conditions shall still be in effect.

*Condition(s) by Parks & Recreation. Contact Virginia Tharpe at / virginia.tharpe@kcmo.org with questions.*

4. The developer shall be responsible for tree preservation in an easement or platted tract, mitigation planting, or payment of cash-in-lieu of preservation or mitigation planting, or any combination thereof in accordance with 88-424. Should the developer choose to pay cash-in-lieu of preservation or mitigation of all or a portion of the required area, the amount due shall be based upon the rate specified in 88-424. This requirement shall be satisfied prior to issuance of certificate of occupancy, or prior to the recording of the final plat, whichever occurs first.
5. The developer shall submit a streetscape plan with street tree planting plan per 88-425-03 for approval and permitting by the Parks & Recreation Department's Forestry Division prior to beginning work in the public right-of-way.

*Condition(s) by Public Works Department. Contact Nicolas Bosonetto at (816) 513-2746 / nicolas.bosonetto@kcmo.org with questions.*

6. PW - Major Street Plan: In the Major Street Plan, Mexico City Ave is supposed to go straight north and connect with Hwy 92. The MPD proposes to redirect Mexico City Ave to the West and connect to Bethel Road. This would not provide a direct connection between the major highways (Hwy 92 and I-29) and between the airport. The new alignment of Mexico City Ave will require amendment of the Major Street Plan, through the CPC and Council. The new alignment is therefore not approved by approval of this MPD and the applicant must follow the amendment process.

*Condition(s) by Public Works Department. Contact Terry Thomas at (816) 513-2510 / Terry.A.Thomas@kcmo.org with questions.*

7. All previous conditions as approved by ordinance 220883 (10/06/2022) under case number CD-CPC-2022-00097 shall remain.

*Condition(s) by Water Services Department. Contact Heather Massey at (816) 513-2111 / heather.massey@kcmo.org with questions.*

8. The developer shall ensure that water and fire service lines should meet current Water Services Department Rules and Regulations. Prior to issuance of Certificate of Occupancy.  
<https://www.kcwater.us/wp-content/uploads/2025/02/2025-Final-Rules-and-Regulations-for-Water-Service-Lines.pdf>

*Condition(s) by Water Services Department. Contact Kirk Rome at (816) 513-0368 / kirk.rome@kcmo.org with questions.*

9. The developer shall submit water main extension plans meeting KC Water Rules and Regulations and prepared by a Missouri PE. The water main extension plans shall be under contract (permit) prior to final platting or building permit issuance whichever occurs first. The water main extension plans shall provide sufficient flow and pressure to service the proposed developments.

*Condition(s) by Water Services Department. Contact Philip Taylor at (816) 513-0146 / philip.taylor@kcmo.org with questions.*

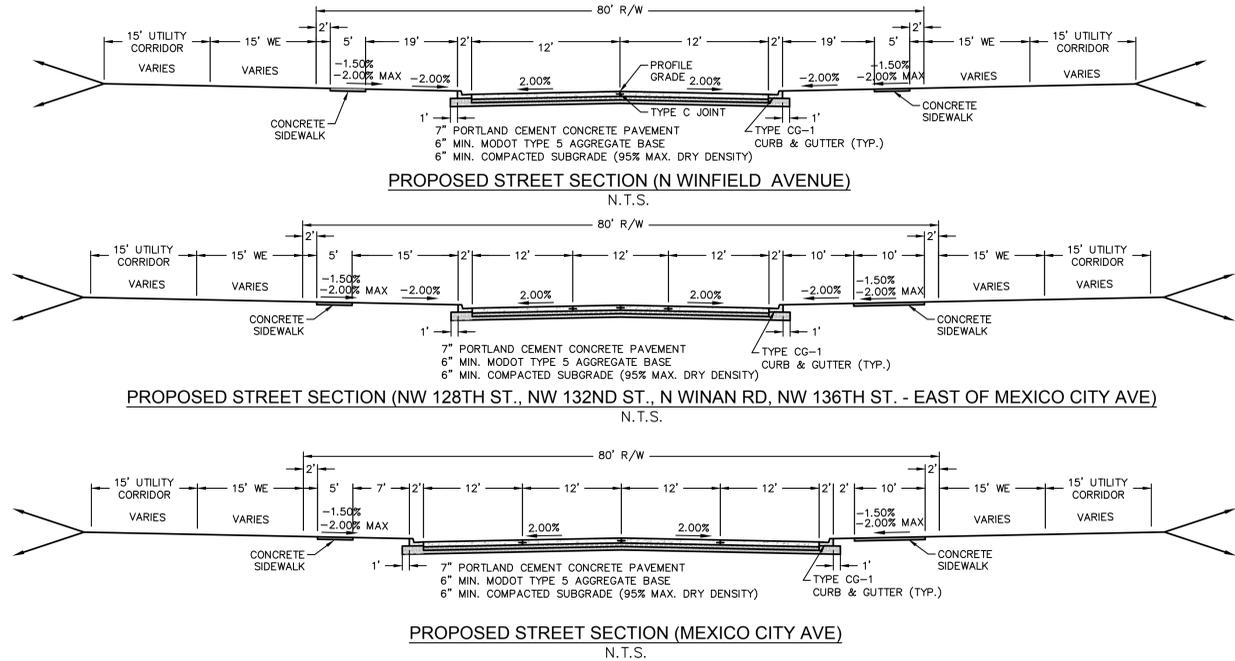
10. All conditions remain per CPC-2022-00097 as previously approved by Ordinance 220883 on 10/6/2022.







ARCHITECTURAL CHARACTER IMAGE FOR PROPOSED INDUSTRIAL WAREHOUSE USE



**GENERAL NOTES:**

- EXISTING ZONING IS MPD & AG-R. PROPOSED ZONING IS MPD. TOTAL LAND AREA: 2,143.21 AC.
- LAND AREA OF EXISTING AND PROPOSED STREET RIGHT-OF-WAY: 68.00 AC.
- NET LAND AREA: 2422.44 AC.
- PROPOSED USES: SEE ALLOWED USES LIST ON THIS SHEET (C102).
- FINAL BUILDING HEIGHTS FOR EACH LOT ARE SUBJECT TO FEDERAL AVIATION ADMINISTRATION (FAA) APPROVAL.
- GROSS BUILDING AREA FOR PROJECT SHALL NOT EXCEED 24,000,000 SF.
- GROSS FLOOR AREA RATIO FOR PROJECT: MAXIMUM FAR 5.0.
- RATIO AND NUMBER OF REQUIRED AND PROPOSED PARKING FOR EACH USE SHALL BE DETERMINED AT TIME OF MPD FINAL PLAN SUBMITTAL FOR EACH LOT. PARKING RATIOS SHALL BE DETERMINED BY USE PER CHAPTER 88-420-06.
- NUMBER OF REQUIRED AND PROPOSED SHORT TERM AND LONG TERM BICYCLE PARKING SPACES FOR EACH USE SHALL BE DETERMINED AT TIME OF MPD FINAL PLAN SUBMITTAL FOR EACH LOT.
- COMMENCEMENT AND COMPLETION DATES FOR EACH AREA ARE AS FOLLOWS:

- AREA 1 - 2022 - 2027
- AREA 2 - 2027 - 2032
- AREA 3 - 2032 - 2037
- AREA 4 - 2037 - 2042

HOWEVER, ANTICIPATED COMMENCEMENT AND COMPLETION DATES FOR EACH PHASE ARE SUBJECT TO CHANGE AND ARE DEPENDENT UPON MARKET DEMAND

- FINAL MPD PLANS DO NOT REQUIRE APPROVAL OF THE CITY PLAN COMMISSION UNLESS THE FINAL MPD PLAN PROPOSES A CHANGE IN ALIGNMENT TO ANY STREET IDENTIFIED ON THE MAJOR STREET PLAN IN A MANNER IMPACTING ANY PROPERTY OWNERS OUTSIDE THE PLAN AREA AS DETERMINED BY THE PUBLIC WORKS DEPARTMENT OR PROPOSES AN INCREASE IN THE TOTAL BUILDING FLOOR AREA BEYOND THAT APPROVED ON THE PRELIMINARY DEVELOPMENT PLAN BY MORE THAN 10% OR PROPOSES THE ADDITION OR DELETION OF ANY USES OR PROPOSES BUILDING HEIGHTS EXCEEDING THAT PERMITTED BY THE AVIATION DEPARTMENT AND OR THE FEDERAL AVIATION ADMINISTRATION WHICHEVER IS MORE RESTRICTIVE.
- PROPOSED CONTOURS, BMPs, GRADES, EASEMENTS, TREELINE TO REMAIN, AND UTILITIES ARE SUBJECT TO FINAL ENGINEERING DESIGN, PRIVATE UTILITY COMPANY APPROVAL, MPD FINAL PLAN APPROVAL, AND BUILDING PERMIT PLAN APPROVAL.
- MPD FINAL PLAN SHALL INCLUDE DETAILS ON BUILDING ELEVATIONS, LANDSCAPING, AND A LIGHTING PLAN SHOWING NO DIRECT ILLUMINATION BEYOND THE RIGHT-OF-WAY.
- PROPOSED STREET AND RIGHT-OF-WAY WIDTHS, LOCATIONS, AND ALIGNMENTS ARE PRELIMINARY AND SUBJECT TO CHANGE. FINAL DESIGN OF STREET SECTIONS SHALL BE PER MPD FINAL PLAN AND PERMIT PLANS.
- INGRESS AND EGRESS TO EACH LOT WILL BE FROM A DEDICATED PUBLIC STREET, PRIVATE STREET AND/OR ACCESS EASEMENT. PUBLIC WATER AND SEWER INFRASTRUCTURE SHALL BE ALLOWED WITHIN PRIVATE STREETS SO LONG AS THEY ARE CONTAINED WITHIN A TRACT TO BE OWNED AND MAINTAINED BY THE OWNER'S ASSOCIATION AND SO LONG AS A COVENANT TO MAINTAIN IS PROVIDED.
- PROPOSED BUILDING SETBACKS: 20' FROM RIGHT-OF-WAY AND EXTERNAL PROPERTY LINES, ZERO FEET (0') FROM INTERNAL LOT LINES AS LONG AS REQUIRED BUILDING SEPARATION PER BUILDING CODE IS MET AT TIME OF BUILDING PERMIT APPLICATION.
- PROPOSED PARKING LOT SETBACKS: 10' FROM PROPERTY LINES AND STREET RIGHT-OF-WAY, ZERO FEET (0') FROM INTERNAL LOT LINES.
- SIGNAGE: ALLOWED PER KANSAS CITY, MO ZONING ORDINANCE SECTION 88-445. MONUMENT SIGNS MAY BE INSTALLED WITH A MINIMUM SETBACK OF 10 FEET FROM THE RIGHT OF WAY.
- ROOFTOP SIGNS FLUSH WITH THE ROOF SHALL BE ALLOWED AND WILL BE INDICATED ON THE MPD FINAL PLAN FOR EACH LOT (WHEN PROPOSED). SEE NOTE #2 UNDER 'ZONING & DEVELOPMENT CODE DEVIATIONS REQUESTED' ON THIS SHEET.
- ANY PYLON AND / OR OUTDOOR ADVERTISING SIGNAGE SHALL BE A PART OF A COUNCIL APPROVED SIGN PLAN.
- LANDSCAPE PLANS SHALL RECEIVE ADMINISTRATIVE APPROVAL WITH EACH MPD FINAL PLAN AND ARE SUBJECT TO KANSAS CITY AVIATION DEPARTMENT'S APPROVAL. IF THE LANDSCAPE PLAN FAILS TO MEET MINIMUM CODE REQUIREMENTS DUE TO AVIATION DEPARTMENT RESTRICTIONS, THE MPD FINAL PLAN APPLICANT SHALL ENTER INTO AN AGREEMENT WITH THE PARKS DEPARTMENT. THE AGREEMENT SHALL IDENTIFY THAT THE COST OF SAID LANDSCAPING CAN EITHER BE PAID AS A DIRECT PAYMENT TO THE PARKS DEPARTMENT TO BE USED FOR PARKS DEPARTMENT PROJECTS OR CAN BE EXPENDED BY THE APPLICANT ON LANDSCAPING, TRAILS OR OTHER PARKS DEPARTMENT RELATED PROJECTS. SUCH PARKS DEPARTMENT PROJECTS MUST BE LOCATED IN CITY COUNCIL DISTRICTS 1 OR 2.
- THIS PLAN SHALL SERVE AS A PRELIMINARY PLAN. ALL REQUIRED PRELIMINARY PLAN INFORMATION IS CONTAINED WITHIN THIS PLAN SET.
- SUBJECT TO DEVELOPMENT NOTE 2 ON SHEET C103, THE PLAN PERMITS TRANSFERABILITY OF THE TOTAL ALLOWED BUILDING AREA BETWEEN PHASES, SO IF ONE PHASE DID NOT UTILIZE ITS ALLOWED BUILDING AREA, ANOTHER PHASE COULD ADD THAT UNUSED AMOUNT TO ITS BUILDING AREA.
- THIS MPD IS EXEMPT FROM CHAPTER 88-424-TREE PRESERVATION AS THIS WAS A PREVIOUSLY APPROVED PLAN, CHAPTER 88-424-03-L.
- THE CONSTRUCTION OF A WATER MAIN ALONG 132ND/ ST FROM N. MEXICO CITY AVE TO N. WINAN RD WILL BE DEFERRED UNTIL ANY PORTION OF THE PROPERTY IS PLATTED SOUTH OF 132ND/ ST FROM N. MEXICO CITY AVE TO N. WINAN RD., OR BEFORE AND BUILDING PERMITS ARE ISSUED ON ANY PORTION OF THE PROPERTY SOUTH OF 132ND/ ST FROM N. MEXICO CITY AVE TO N. WINAN RD, OR UNTIL WATER PRESSURE AND FLOW DEMANDS FROM A USER THAT REQUIRES 1 MILLION GALLONS PER DAY OR MORE FOR THE PROPERTY REQUIRE THIS SEGMENT TO BE INSTALLED WHICHEVER OCCURS FIRST (TRIGGERING EVENT).
- THE PUBLIC WORKS DEPARTMENT AND/OR KC WATER RETAINS THE DISCRETION TO DEFER OR WAIVE THE REQUIREMENT FOR RIGHT-OF-WAY DEDICATION AND/OR PUBLIC IMPROVEMENTS TIED TO ANY FINAL PLAT WITHIN THE OVERALL DEVELOPMENT. SUCH DECISIONS SHALL BE MADE IN CONSIDERATION OF THE SPECIFIC CIRCUMSTANCES AND OVERALL IMPACT ON CITY INFRASTRUCTURE AND PUBLIC WELFARE.
- FOR THE AVOIDANCE OF DOUBT AND SUBJECT TO DEVELOPMENT NOTE 1 ON SHEET C103, ALL 'ALLOWED USES' NOTED ON SHEET C102 ARE PERMITTED IN EACH LOT WITHIN THIS MPD PLAN, NOTWITHSTANDING ANY OTHER PROVISIONS OF THIS MPD PLAN WHICH CLASSIFY A PARTICULAR LOT AS 'INDUSTRIAL,' 'COMMERCIAL' OR ANOTHER GENERAL USE CLASSIFICATION.
- SCHEDULE FOR THE ADMINISTRATIVE APPROVAL OF FINAL MPDS SHALL FOLLOW THE DEVELOPMENT REVIEW COMMITTEE CALENDAR.

**ALLOWED USES:**

**PUBLIC/CIVIC**

- BICYCLE SHARING FACILITY
- CLUB, LODGE, OR FRATERNAL ORGANIZATION
- COLLEGE/UNIVERSITY
- DAY CARE
- HOSPITAL
- PARK/RECREATION
- RELIGIOUS ASSEMBLY
- SAFETY SERVICE
- SCHOOLS
- UTILITIES AND SERVICES (INCLUDING BASIC, MINOR)

**COMMERCIAL**

- ANIMAL SERVICE
- ARTIST WORK OR SALES SPACE
- BUILDING MAINTENANCE SERVICE
- BUSINESS EQUIPMENT SALES AND SERVICE
- BUSINESS SUPPORT SERVICE (EXCEPT DAY LABOR EMPLOYMENT AGENCY)
- COMMUNICATIONS SERVICE ESTABLISHMENTS
- DRIVE-THROUGH FACILITY/EATING AND DRINKING ESTABLISHMENTS
- ENTERTAINMENT AND SPECTATOR SPORTS
- FINANCIAL SERVICES (EXCEPT PAWN SHOP AND SHORT TERM LOAN ESTABLISHMENT)
- FOOD AND BEVERAGE RETAIL SALES
- GASOLINE AND FUEL SALES
- LODGING (HOTEL/MOTEL)
- SHORT TERM RENTAL
- MOBILE VENDOR PARK
- OFFICE/MEDICAL
- REPAIR OR LAUNDRY SURFACE, CONSUMER
- OFFICE, ADMINISTRATIVE, PROFESSIONAL OR GENERAL
- PARKING, ACCESSORY
- PARKING, NON-ACCESSORY
- PERSONAL IMPROVEMENT SERVICE
- RESEARCH SERVICE
- UNDERGROUND COMMERCIAL
- RETAIL SALES
- OUTDOOR RETAIL SALES - CLASS A
- OUTDOOR RETAIL SALES - CLASS B
- SPORTS AND RECREATION, PARTICIPANT
- VEHICLE SALES AND SERVICE
- CAR WASH/CLEANING SERVICE
- HEAVY EQUIPMENT SALES/RENTAL
- LIGHT EQUIPMENT SALES/RENTAL (INDOOR)
- LIGHT EQUIPMENT SALES/RENTAL (OUTDOOR)

**INDUSTRIAL**

- MANUFACTURING, PRODUCTION AND INDUSTRIAL SERVICE
- ARTISAN
- LIMITED
- GENERAL
- UNDERGROUND MINING/QUARRYING/MANUFACTURING
- RECYCLING SERVICE
- LIMITED
- GENERAL
- SELF-STORAGE WAREHOUSE
- WAREHOUSING, WHOLESALING, STORAGE, AND FREIGHT MOVEMENT
- INDOOR
- OUTDOOR
- UNDERGROUND
- ACCESSORY SERVICES
- WIRELESS COMMUNICATION FACILITY
- FREESTANDING
- CO-LOCATED ANTENNA

**OTHER**

- AGRICULTURAL

**PROHIBITED USES:**

**RESIDENTIAL**

- HOUSEHOLD LIVING
- SINGLE-FAMILY HOME
- IN SINGLE-PURPOSE RESIDENTIAL BUILDING
- IN MIXED-USE BUILDING

**PUBLIC/CIVIC**

- DETENTION AND CORRECTIONAL FACILITY
- HALFWAY HOUSE

**COMMERCIAL**

- ADULT BUSINESS
- ADULT MEDIA STORE
- ADULT MOTION PICTURE THEATER
- SEX SHOP
- DAY LABOR EMPLOYMENT AGENCY
- PAWN SHOP
- SHORT-TERM LOAN ESTABLISHMENT
- FUNERAL AND INTERMENT SERVICE
- CEMETERY/COLUMBARIUM/MAUSOLEUM
- CREMATING
- UNDERTAKING
- REUSE OF OFFICIALLY DESIGNATED HISTORIC LANDMARK (LOCAL OR NATIONAL) IF PROPOSED USE IS NOT PERMITTED
- VEHICLE SALES AND SERVICES
- MOTOR VEHICLE REPAIR, LIMITED
- MOTOR VEHICLE REPAIR, GENERAL
- VEHICLE STORAGE/TOWING

**INDUSTRIAL**

- JUNK/SALVAGE YARD
- MANUFACTURING, PRODUCTION AND INDUSTRIAL SERVICE
- INTENSIVE
- WASTE RELATED USE
- COMPOSTING FACILITY
- DEMOLITION DEBRIS LANDFILL
- SOLID WASTE SEPARATION FACILITY
- TRANSFER STATION

**CONTENT EXEMPTIONS REQUESTED:**

THE FOLLOWING EXEMPTIONS FROM THE KANSAS CITY, MISSOURI CITY PLANNING AND DEVELOPMENT (DEVELOPMENT MANAGEMENT DIVISION) REQUIRED CONTENT CHECKLIST ARE BEING REQUESTED:

- GRAPHIC AND WRITTEN SCALE OF ONE INCH EQUALS 200 FEET FOR APPLICATIONS CONSISTING OF OVER 200 ACRES.
- LOCATION AND DIMENSIONS OF THE WIDTHS OF PROPOSED PRIVATE VEHICULAR ACCESS INTO THE PROPERTY.
- LOCATION OF PROPOSED BUILDINGS AND STRUCTURES WITH DIMENSIONS OF SETBACK FROM PROPOSED STREET RIGHT-OF-WAY AND ADJACENT PROPERTY LINES, DIMENSIONS OF BUILDING WIDTH AND LENGTH, NUMBER OF FLOORS, GROSS FLOOR AREA PER FLOOR AND TOTAL BUILDING AREA (FOR EACH INDIVIDUAL BUILDING).
- IDENTIFICATION OF PROPOSED USE WITH EACH BUILDING, BUILDING ENTRANCES AND EXITS, DOCKS OR OTHER SERVICE ENTRANCES, OUTDOOR STORAGE AND SALES AREAS, AND OTHER PAVED AREAS.
- LOCATION OF PROPOSED PARKING SPACES, AISLES, AND DRIVES WITH WRITTEN SETBACK DIMENSIONS FROM PROPOSED STREET RIGHTS-OF-WAY AND ADJACENT PROPERTY LINES; TYPICAL WIDTH AND LENGTH OF PARKING SPACES; NUMBER OF PARKING SPACES PER ROW, AND WIDTH OF PARKING AISLES.
- LOCATION AND IDENTIFICATION OF BUILDINGS, STRUCTURES, ACCESS, AND PARKING AREAS IN EACH PHASE.

**PLAN SHEET EXEMPTIONS REQUESTED:**

THE FOLLOWING EXEMPTIONS FROM THE KANSAS CITY, MISSOURI CITY PLANNING AND DEVELOPMENT (DEVELOPMENT MANAGEMENT DIVISION) REQUIRED PLAN SHEETS CHECKLIST ARE BEING REQUESTED:

- LANDSCAPE PLAN (CONCEPT)
- BUILDING ELEVATIONS (CONCEPT)

**ZONING & DEVELOPMENT CODE DEVIATIONS REQUESTED:**

THE FOLLOWING DEVIATIONS FROM THE KANSAS CITY, MISSOURI ZONING AND DEVELOPMENT CODE ARE BEING REQUESTED:

- THE FINAL MPD PLANS MAY BE ADMINISTRATIVELY APPROVED BY THE CITY PLANNING AND DEVELOPMENT DIRECTOR. FINAL MPD PLANS DO NOT REQUIRE APPROVAL OF THE CITY PLAN COMMISSION UNLESS THE FINAL MPD PLAN PROPOSES A CHANGE IN ALIGNMENT TO ANY STREET IDENTIFIED ON THE MAJOR STREET PLAN IN A MANNER IMPACTING ANY PROPERTY OWNERS OUTSIDE THE PLAN AREA OR PROPOSES AN INCREASE IN THE TOTAL BUILDING FLOOR AREA BEYOND THAT APPROVED ON THE PRELIMINARY DEVELOPMENT PLAN BY MORE THAN 10% OR PROPOSES THE ADDITION OR DELETION OF ANY USES OR PROPOSES BUILDING HEIGHTS EXCEEDING THAT PERMITTED BY THE AVIATION DEPARTMENT AND OR THE FEDERAL AVIATION ADMINISTRATION WHICHEVER IS MORE RESTRICTIVE.
- ROOFTOP SIGNS FLUSH WITH THE ROOF SHALL BE ALLOWED AND MAY BE ADMINISTRATIVELY APPROVED WITH THE MPD FINAL PLANS.
- EXEMPTION FROM CHAPTER 88-424 - TREE PRESERVATION AS THIS WAS A PREVIOUSLY APPROVED PLAN.

**GENERAL DESIGN GUIDELINES:**

- MATERIALS FOR BUILDING FACADES ARE ENCOURAGED TO BE LIMITED IN NUMBER TO THREE, ONE OF WHICH WILL BE THE PREDOMINANT MATERIAL.
- PRINCIPAL BUILDING MATERIALS FOR INDUSTRIAL USES SHALL BE CONCRETE, ARCHITECTURAL METAL, AND GLASS.
- ALL FANS, VENTS, COOLING TOWERS, SKYLIGHTS AND ANY EQUIPMENT LOCATED ON THE ROOF OF ANY IMPROVEMENTS SHALL BE LOCATED IN A MANNER TO MINIMIZE THEIR DISTRACTION FROM THE ARCHITECTURAL ATTRACTIVENESS OF THE IMPROVEMENT, AND IN A MANNER TO SCREEN THEM FROM SIGHT OF TRAFFIC.
- SITE LIGHTING FOR ALL LOTS SHALL BE DESIGNED TO FUNCTION IN A SAFE AND EFFICIENT MANNER.
- EACH LOT SHALL PROVIDE SUFFICIENT ON-SITE LOADING FACILITIES TO ACCOMMODATE SITE ACTIVITIES.
- FENCING FOR SCREENING OR SECURITY PURPOSES SHALL BE BLACK POWDER COATED CHAIN LINK FOR EACH LOT AS NECESSARY.

88-425 - OTHER DEVELOPMENT STANDARDS	
88-408 PARKLAND DEDICATION	NOT APPLICABLE
88-415 STREAM BUFFERS	SEE SHEET C107
88-430 OUTDOOR LIGHTING	SEE GENERAL NOTE #14 ON THIS SHEET (C102)
88-435 OUTDOOR DISPLAY, STORAGE, AND WORK AREAS	ALLOWED WITHIN PROPOSED COMMERCIAL AND INDUSTRIAL USES
88-445 SIGNS	SEE GENERAL NOTES #19 & #20 ON THIS SHEET (C102)
88-450 PEDESTRIAN STANDARDS	SHALL BE MET WITH MPD FINAL PLAN FOR EACH LOT OR PHASE.

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drawn by: \_\_\_\_\_  
checked by: \_\_\_\_\_  
approved by: \_\_\_\_\_  
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project no.: A21-06188  
drawing no.: C\_NOT01\_02106188  
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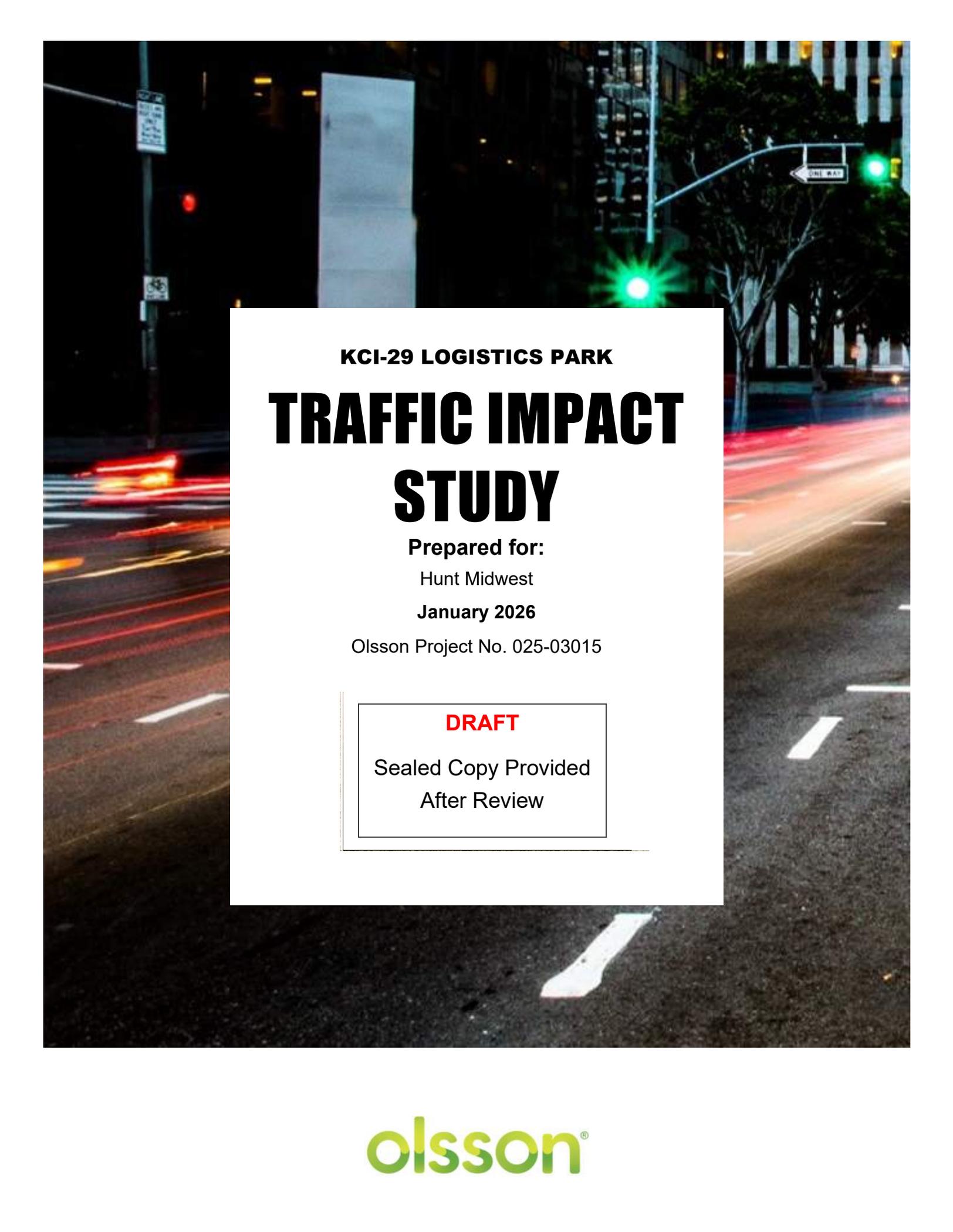












**KCI-29 LOGISTICS PARK**

# **TRAFFIC IMPACT STUDY**

**Prepared for:**

Hunt Midwest

**January 2026**

Olsson Project No. 025-03015

**DRAFT**

Sealed Copy Provided  
After Review

**olsson**<sup>®</sup>

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# 1. INTRODUCTION

*This report is a revision to the traffic impact study submitted for this master plan development in September 2022. Changes include updates to land use, updated phasing/development plan, and an updated route for the connection of Mexico City Avenue.*

This report studies the traffic impacts of the proposed KCI-29 Logistics Park multi-use development located in Kansas City, Missouri. The approximate boundaries of the proposed full build development are Bethel Road to the west, Interurban Road to the east, Highway 92 to the North and I-29/128<sup>th</sup> Street to the south. The location of the proposed development and study area is shown on the Vicinity Map in **Figure 1**.

Revisions to the planned road network and development land uses are presented in this report. Approved/planned sites and road networks that are built/under construction are presented. Guidance on potential future road network geometrics to support the master plan development are provided. The road network should be evaluated as development occurs and improvements are implemented to ensure the road network supports development.

This report presents the potential impacts of the proposed KCI-29 Logistics Park development on the existing and planned roadway network and, as appropriate, recommends additional turn lanes, storage bay modifications, and intersection control methods per the City of Kansas City *Traffic Engineer and Operations Manual*, the City of Kansas City's *Major Street Plan*, and the Missouri Department of Transportation's (MoDOT) *Engineer Policy Guide (EPG)*. Study intersections are presented in **Figure 1**. The study intersections for the existing road network are the following:

- Highway 92 and Bethel Road
- Highway 92 and Winan Road
- Highway 92 and Interurban Road
- Interurban Road and 128<sup>th</sup> Street
- Bethel Road and Roanridge Road
- Roanridge Road and Roanridge Road
- Winan Road and 128<sup>th</sup> Street
- Winan Road and 132<sup>nd</sup> Street
- Mexico City Avenue and 132<sup>nd</sup> Street
- Mexico City Avenue and I-29 Northbound Ramps
- Mexico City Avenue and I-29 Southbound Ramps

Study intersections that are due to planned improvements to the road network are the following:

- Winan Road and 136<sup>th</sup> Street
- Mexico City Avenue and Bethel Road
- Mexico City Avenue and 136<sup>th</sup> Street
- 132<sup>nd</sup> Street and Windfield Avenue

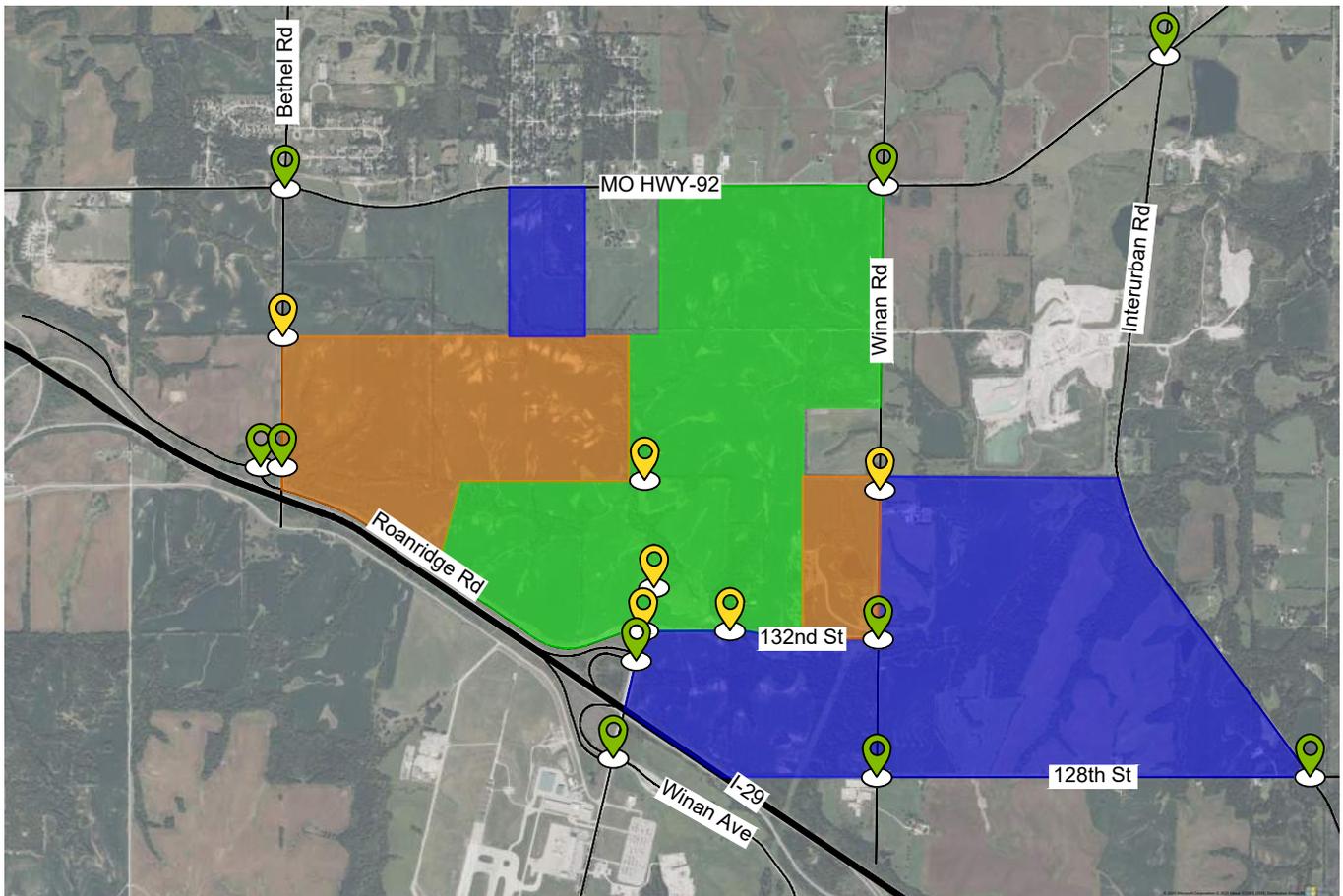
The following scenarios were analyzed considering weekday AM and PM peak hour periods:

- Build Year 2028 Conditions
- Build Year 2034 Conditions
- Build Year 2040 Conditions

Existing conditions of the network were presented in the September 2022 traffic impact study. Since submittal of the September 2022 traffic impact study, portions of the planned road network have been built and development projects are under construction. The Build Year 2028 conditions analysis presents the most current base development scenario, representing the road network with currently built/under construction projects complete and approved/known development projects.

# FIGURE 1

## Kansas City, Missouri Vicinity Map



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### LEGEND



Phase 1 - Build Year 2028

Phase 2 - Build Year 2034

Phase 3 - Build Year 2040



Study Intersection

Study Intersection  
(Approximate Location of  
Proposed Public Intersections)

## 2. DATA COLLECTION

### 2.1 Traffic Counts

Due to on-going construction of the road network and development project sites, data could not be collected at all study intersections. Traffic count data was collected at the intersection of Highway 92 and Bethel Road on July 1<sup>st</sup>, 2025, and at the intersections of Mexico City Avenue with the I-29 Ramps on September 23<sup>rd</sup>, 2025.

Reviewing the count data collected, traffic volumes along Highway 92 were noted to be similar between the 2022 and 2025 count data. For analysis purposes, 2025 count data was used at the intersection of Highway 92 and Bethel Road. All other counts along Highway 92, Bethel Road, Winan Road, and Interurban reference the 2022 count data.

With construction actively occurring within the KCI-29 Logistics Park, count data was expected to be skewed at the intersections of Mexico City Avenue and the I-29 Ramps. Traffic data could not be collected at the intersection of Mexico City Avenue and 132<sup>nd</sup> Street due to road closures. Reviewing the 2025 count data, traffic volumes for movements to/from south of the project area were noted to be similar to the 2022 count data. Understanding the influence of construction traffic in the area, the 2022 count data was referenced for study intersections located along Mexico City Avenue. Traffic count data is provided in **Appendix A**.

### 2.2 Planned Road Network

Several road improvements are planned to support master plan development. **Section 3** presents the road network under each scenario.

MoDOT has a planned road improvement project along Highway 92, with the intersection of Highway 92 and Bethel Road as the eastern limit of the improvements. The intersection of Highway 92 and Bethel Road is planned to be improved from a stop-controlled (minor streets) intersection to a single lane roundabout. Preliminary design plans for the improvement were referenced and incorporated in the analysis conducted for the study.

**Figure 2** illustrates the planned road network.

### 2.3 Planned/Approved Development Projects

Memorandums and/or traffic impact studies conducted for approved/planned development projects were obtained. The approved/planned development projects considered in this study include:

- Project Gateway (ACE Hardware) – Approved site with construction completed. The memorandum dated September 6<sup>th</sup>, 2023, was referenced for the purposes of this study.

- Project Falcon – Approved site is currently under construction, memorandum dated April 10<sup>th</sup>, 2024, was referenced for the purposes of this study. Construction is anticipated to be complete by early 2026.
- Love’s Travel Stop – Site is currently in site planning, a traffic impact study conducted by others dated July 9<sup>th</sup>, 2025, was obtained for the site. At the time of this memorandum this study has not been approved to Olsson’s knowledge. Trip generation presented in the July 2025 report was conducted referencing a previous edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. Trip generation was conducted by Olsson for the purposes of this report using the latest ITE *Trip Generation Manual* (12<sup>th</sup> edition).

### 3. NETWORK CHARACTERISTICS

Associated with recommendations made in the September 2022 traffic impact study, several improvements have been made to the public road network to support development of the KCI-29 Logistics Park. For the purposes of this study, projects that are complete or planned within the immediate future were considered built under Build Year 2028 and are presented here as the base condition.

Within the study area there are nine roadways that were considered during analysis: Highway 92, Roanridge Road, Mexico City Avenue, 132<sup>nd</sup> Street, 136<sup>th</sup> Street, 128<sup>th</sup> Street, Bethel Road, Winan Road and Interurban Road.

Mexico City Avenue and portions of 132<sup>nd</sup> Street/Roanridge Road have been improved within the study area. 136<sup>th</sup> Street has been partially constructed east of Mexico City Avenue, terminating as a cul-de-sac.

Some rural segments of roadways along Interurban Road, Winan Road, Bethel Road, 128<sup>th</sup> Street and sections of 132<sup>nd</sup> Street/Roanridge Road are narrow roadways with no shoulder, rolling terrain, and poor pavement conditions. The following weight restrictions were noted within the study area:

- No trucks over 7-tons are allowed south of the intersection of 128<sup>th</sup> Street and Interurban Road.
- There is a 12-ton weight limit on Winan Road and Interurban Road north of Highway 92.

State maintenance of Mexico City Avenue begins approximately 530 feet north of the I-29 Northbound Ramp, extending south through the I-29 interchange. A section of Roanridge Road from approximately 2,500 feet west of Mexico City Avenue to Bethel Road is maintained by MoDOT. Highway 92 within the study limits is maintained by MoDOT.

Functional classification for roadways maintained by MoDOT was acquired referencing MoDOT's *Functional Classification Map*. Functional classification for roadways maintained by Kansas City was acquired referencing Kansas City's *Major Street Plan*. The city is in the process of updating the *Major Street Plan*, identified updates within the study area are reflected in this study.

The network characteristics that are currently in place or under construction are summarized in **Table 1**.

**Table 1. Planned Road Network Summary.**

Roadway	Functional Classification	Maintaining Jurisdiction	Typical Section	Median Type	Posted Speed
Highway 92	Principal Arterial	MoDOT	2-Lane	Undivided	55 mph
Roanridge Road	Local	MoDOT	2-Lane	Undivided	45/55 mph*
	Local Link	KCMO	3-Lane	Divided/Undivided	35 mph
Mexico City Avenue	Major Collector	MoDOT	5-Lane	Divided	45 mph
	Thoroughfare	KCMO	4-Lane	Divided	45 mph
128 <sup>th</sup> Street	Thoroughfare	KCMO	2-Lane	Undivided	35 mph
132 <sup>nd</sup> Street	Thoroughfare	KCMO	2-Lane	Undivided	45 mph
136 <sup>th</sup> Street	Thoroughfare	KCMO	3-Lane	Undivided	35 mph
Bethel Road	Thoroughfare	KCMO	2-Lane	Undivided	45 mph**
Winan Road	Thoroughfare	KCMO	2-Lane	Undivided	55 mph south of Highway 92
Interurban Road	Thoroughfare	KCMO	2-Lane	Undivided	40/45 mph***

\*The section of Roanridge Road within MoDOT jurisdiction is 55 mph. The section of Roanridge Road from Bethel Road west to the termination point of Roanridge Road does not have a posted speed limit. 45 mph was assumed as the speed limit for the unposted section based on review of similar study roads.

\*\*Posted speed limit not noted for Bethel Road within the study area. A northbound 45 mph sign is present along Bethel Road north of Highway 92. 45 mph was assumed for the study area section of Bethel Road.

\*\*\*Interurban Road is 45 mph for the southbound direction from Highway 92 to 128<sup>th</sup> Street. For the northbound direction the posted speed limit is 40 mph from 128<sup>th</sup> Street to 144<sup>th</sup> Street. North of 144<sup>th</sup> Street, the posted speed limit transitions to 45 mph.

Several planned improvements were considered in this study and will be reflected in build year 2028, 2034 and 2040 scenarios to support planned development.

**Build Year 2028 Planned Improvements:**

- Extension of Mexico City Avenue approximately 1,500 feet north of 136<sup>th</sup> Street, ending in a cul-de-sac to service planned development to the north.

**Build Year 2034 Planned Improvements:**

- Mexico City Avenue will be extended from the planned terminus located approximately 1,500 feet north of 136<sup>th</sup> Street, transitioning from a north/south roadway to an east/west roadway to intersect Bethel Road.
  - This is a modification from the September 2022 report, which considered Mexico City Avenue extending north to Highway 92. The alignment of Mexico City Avenue to Bethel Road is proposed to support maximum developable area for the KCI-29 Logistics Park.
- 132<sup>nd</sup> Street will be improved from Winan Road to approximately 2,000 feet west at the current terminus of road improvements.
- 136<sup>th</sup> Street will be extended approximately 1,000 feet from the current terminus east of Mexico City Avenue to intersect Winan Road.
  - The September 2022 report considered 136<sup>th</sup> Street extending west of Mexico City Avenue. Under this update, 136<sup>th</sup> Street will not extend west, and will only be considered between Mexico City Avenue and Winan Road.

**Build Year 2040 Planned Improvements:**

- Improvements are not planned for this scenario. The study will present if additional roadway improvements are needed to support year 2040 development.

### **3.1 Multi-Modal System Review**

A review of existing and planned multi-modal facilities was conducted. Pedestrian facilities (sidewalk) are provided along improved study area roadways under the jurisdiction of Kansas City, Missouri. Sidewalk is provided in the following locations:

- Mexico City Avenue: Sidewalk is provided along the east side of the roadway and multi-use trail is provided along the west side of the roadway from approximately 760 feet north of the intersection with the I-29 Northbound Ramp, planned to be extended to 136<sup>th</sup> Street.

- 132<sup>nd</sup> Street: Sidewalk is provided along the south side of the roadway and multi-use trail is provided along the north side of the roadway from approximately 2,000 feet west of Mexico City Avenue to approximately 1,400 feet east of Mexico City Avenue.

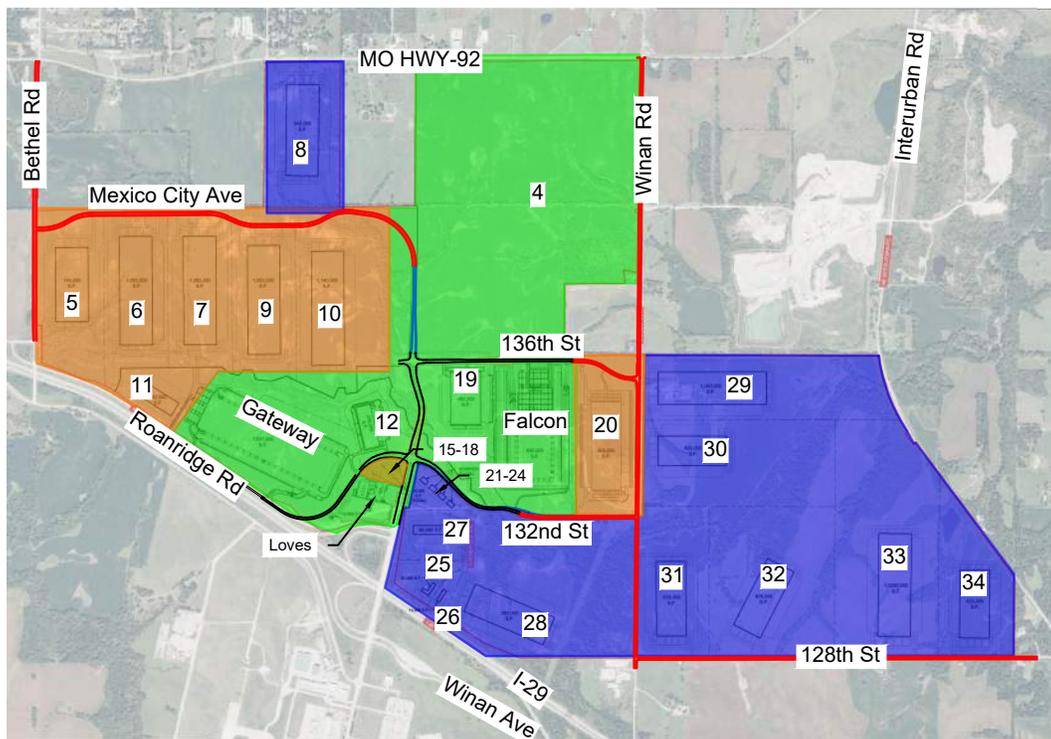
Pedestrian accommodations, including marked crosswalk, pedestrian signal heads and pedestrian push buttons, are provided at the intersection of Mexico City Avenue and 132<sup>nd</sup> Street.

No bicycle facilities are present in existing conditions. Reviewing the *Bike KC Master Plan Draft 2019*, bicycle facilities are planned in the study area along Highway 92, Mexico City Avenue, 132<sup>nd</sup> Street, a portion of Winan Road from 132<sup>nd</sup> Street to 128<sup>th</sup> Street, 128<sup>th</sup> Street, and Interurban Road. Highway 92, Mexico City Avenue, 128<sup>th</sup> Street and Interurban Road are shown to have major separated protected bicycle lanes. A future trail along Roanridge Road is also shown on the plan. A trail is proposed to be constructed with the development of the site. The location and extents of the proposed trail are unknown at the time of the report.

No transit facilities are currently located within the study area. Reviewing the *NorthRail Streetcar Study*, the KC Streetcar currently does not have plans to extend the existing route near the study area.

# FIGURE 2

## Kansas City, Missouri Planned Road Network



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### LEGEND

- |   |                           |   |                           |   |                                     |   |  |
|---|---------------------------|---|---------------------------|---|-------------------------------------|---|--|
|  | Phase 1 - Build Year 2028 |  | Phase 3 - Build Year 2040 |  | Existing Roadway                    |  | Future Roadway and/or Future Road Improvements |
|  | Phase 2 - Build Year 2034 |   |                           |  | Roadway to be Completed by EOY 2026 |   |  |

## 4. PROPOSED LAND USE AND SITE CHARACTERISTICS

The proposed master plan development is a mixed-use site with planned development occurring in three phases. The proposed master site plan and planned phasing are presented in **Figure 2**. Phase 1 includes approved/planned development projects and is considered under Build Year 2028. Phase 2 consists of planned warehouse and restaurant land uses and is considered under Build Year 2034. Phase 3 development consists of planned warehouse, hotel, and retail land uses and is considered under Build Year 2040; this is the full build scenario. **Table 2A** and **2B** summarizes the land use associated with each phase of development.

The master plan provides a development plan for the project area. As property is developed, the road network should be developed based on actual traffic volumes and operational needs.

**Table 2A. Proposed Development Phasing Summary.**

Development Phase	Project	Land Use	Size
Phase 1	Project Gateway	Warehouse	1,500,000 SF
	Project Falcon	Warehouse	630,000 SF
	Love's Travel Stop	Travel Center	15,590 SF Building 16 Passenger Fueling 8 Truck Fueling
	Building 4	Industrial	1,500,000 SF
	Building 12	Warehouse	200,000 SF
	Building 19	Warehouse	490,000 SF

**Table 2B. Proposed Development Phasing Summary.**

Development Phase	Project	Land Use	Size
Phase 2	Building 5	Warehouse	740,000 SF
	Building 6	Warehouse	1,083,000 SF
	Building 7	Warehouse	1,083,000 SF
	Building 9	Warehouse	1,083,000 SF
	Building 10	Warehouse	1,140,000 SF
	Building 11	Warehouse	182,000 SF
	Building 15	Retail	5,000 SF
	Building 15	Fast-Food Restaurant with Drive-Thru	2,000 SF
	Building 16	Coffee Shop (no indoor seating)	1 drive-thru lane
	Building 17	Fast-Food Restaurant with Drive-Thru	4,400 SF
	Building 18	Retail	7,000 SF
	Building 20	Warehouse	805,000 SF
Phase 3	Building 8	Warehouse	912,000 SF
	Buildings 21-24	Retail	40,000 SF
	Building 25	Hotel	150 Rooms
	Building 26	Hotel	125 Rooms
	Building 27	Retail	90,000 SF
	Building 28	Warehouse	780,000 SF
	Building 29	Warehouse	1,083,000 SF
	Building 30	Warehouse	624,000 SF
	Building 31	Warehouse	676,000 SF
	Building 32	Warehouse	676,000 SF
	Building 33	Warehouse	1,026,000 SF
	Building 24	Warehouse	622,000 SF

## 4.1 Trip Generation

To determine the impact of potential site traffic on the roadway network, expected trips associated with the proposed site were generated and applied to the study network. Two methodologies were used for development of trip generation. For sites with approved traffic studies, the approved trip generation was referenced for the site. For planned sites (un-built) and future proposed development, trip generation was conducted referencing the Institute of Transportation Engineers (ITE) *Trip Generation Manual (12<sup>th</sup> Edition)*. The manual provides methods for estimating traffic volumes of common land uses.

When a site supports multiple uses, internal capture can be considered. Internal capture represents the portion of trips generated within a site that begin and end within the development; the trips stay within the site and do not access the external road network. Due to the separation of the logistics park with public roadways, internal capture and a reduction of trips due to mixed-uses was not considered for this report. This may result in a conservative representation of new vehicle trips to the road network.

Pass-by trips represent those trips associated with a site that are already on the roadway network; these trips do not represent new trips to a roadway system. Reviewing the proposed uses for the site, it is anticipated that the travel center and restaurant uses located within the logistics park may result in pass-by trips for vehicles traveling to different destinations within the logistics park. For the purposes of this study, pass-by trips will not be presented until build year 2040, which represents full development of the site.

### 4.1.1 Phase 1 Development

Phase 1 development consists of approved or known planned development projects. Trip generation for the Love's Travel Stop was conducted referencing the *Trip Generation Manual* travel center land use (LU 955). This is a new land use to the manual and is expected to better reflect trip generation for this site type. A detailed summary of phase 1 daily and peak hour trip generation is provided in **Table 3**.

**Table 3. Phase 1 Development Trip Generation.**

Development	Average Weekday	AM Peak Hour			PM Peak Hour		
		Total	Enter	Exit	Total	Enter	Exit
Project Gateway	1,515	183	132	51	224	85	139
Project Falcon	3,946	163	124	39	652	118	534
Love's Travel Stop	5,309	266	136	130	313	153	160
Building 4	3,750	475	430	45	375	35	340
Building 12	214	33	25	8	42	12	30
Building 19	651	61	47	14	72	20	52
<b>Total Phase 1 Trips</b>	<b>15,385</b>	<b>1,181</b>	<b>894</b>	<b>287</b>	<b>1,678</b>	<b>423</b>	<b>1,255</b>

The expected trips generated by the site were categorized by vehicle type, accounting for both passenger cars and trucks. Truck trips were determined referencing ITE methodology. **Table 4** summarizes trips for the AM and PM peak hour periods for phase 1 development by vehicle type.

**Table 4. Phase 1 Trip Generation by Vehicle Classification.**

Vehicle Type	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Passenger Vehicle	938	778	160	1,460	311	1,149
Truck	243	116	127	218	112	106
<b>Total Phase 1 Trips</b>	<b>1,181</b>	<b>894</b>	<b>287</b>	<b>1,678</b>	<b>423</b>	<b>1,255</b>

### 4.1.2 Phase 2 Development

Phase 2 development consists of planned future development projects. Trip generation was conducted as presented above. A detailed summary of phase 2 daily and peak hour trip generation is provided in **Table 5**.

**Table 5. Phase 2 Development Trip Generation.**

Development	Average Weekday	AM Peak Hour			PM Peak Hour		
		Total	Enter	Exit	Total	Enter	Exit
Building 5	1,056	87	67	20	101	28	73
Building 6	1,592	122	94	28	139	39	100
Building 7	1,592	122	94	28	139	39	100
Building 9	1,592	122	94	28	139	39	100
Building 10	1,680	127	98	29	145	41	104
Building 11	186	32	25	7	40	11	29
Building 15	1,168	86	45	41	111	57	54
Building 16	179	36	18	18	15	8	7
Building 17	2,017	150	77	73	142	74	68
Building 18	381	28	15	13	60	30	30
Building 20	1,158	94	72	22	108	30	78
<b>Total Phase 2 Trips</b>	<b>12,601</b>	<b>1,006</b>	<b>699</b>	<b>307</b>	<b>1,139</b>	<b>396</b>	<b>743</b>

**Table 6** summarizes trips for the AM and PM peak hour periods for phase 2 development by vehicle type.

**Table 6. Phase 2 Trip Generation by Vehicle Classification.**

Vehicle Type	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Passenger Vehicle	882	636	246	1,015	333	682
Truck	124	63	61	124	63	61
<b>Total Phase 2 Trips</b>	<b>1,006</b>	<b>699</b>	<b>307</b>	<b>1,139</b>	<b>396</b>	<b>743</b>

### 4.1.3 Phase 3 Development

Phase 3 development consists of planned future development projects. Trip generation was conducted as presented above. A detailed summary of phase 3 daily and peak hour trip generation is provided in **Table 7**.

**Table 7. Phase 3 Development Trip Generation.**

Development	Average Weekday	AM Peak Hour			PM Peak Hour		
		Total	Enter	Exit	Total	Enter	Exit
Building 8	1,325	105	81	24	120	34	86
Buildings 21-24	2,615	64	39	25	190	93	97
Building 25	876	51	27	24	71	36	35
Building 26	730	43	22	21	59	30	29
Building 27	5,884	143	88	55	428	210	218
Building 28	1,119	91	70	21	105	29	76
Building 29	1,592	122	94	28	139	39	100
Building 30	875	76	59	17	88	25	63
Building 31	957	81	62	19	94	26	68
Building 32	957	81	62	19	94	26	68
Building 33	1,503	116	89	27	132	37	95
Building 34	872	76	59	17	88	25	63
<b>Total Phase 3 Trips</b>	<b>19,305</b>	<b>1,049</b>	<b>752</b>	<b>297</b>	<b>1,608</b>	<b>610</b>	<b>998</b>

**Table 8** summarizes trips for the AM and PM peak hour periods for phase 3 development by vehicle type.

**Table 8. Phase 3 Trip Generation by Vehicle Classification.**

Vehicle Type	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Passenger Vehicle	920	687	233	1,479	545	934
Truck	129	65	64	129	65	64
<b>Total Phase 3 Trips</b>	<b>1,049</b>	<b>752</b>	<b>297</b>	<b>1,608</b>	<b>610</b>	<b>998</b>

#### 4.1.4 Full Build Development

Total trip generation for the site is provided in **Table 9**. When compared to the trip generation presented in the September 2022 traffic impact study, the AM peak hour trips are reduced, and the daily and PM peak hour trips are increased.

**Table 9. Full Build Development Trip Generation.**

Development	Average Weekday	AM Peak Hour			PM Peak Hour		
		Total	Enter	Exit	Total	Enter	Exit
Phase 1	15,385	1,181	894	287	1,678	423	1,255
Phase 2	12,601	1,006	699	307	1,139	396	743
Phase 3	19,305	1,049	752	297	1,608	610	998
<b>Total Development Trips</b>	<b>47,291</b>	<b>3,236</b>	<b>2,345</b>	<b>891</b>	<b>4,425</b>	<b>1,429</b>	<b>2,996</b>

**Table 10** summarizes trips for the AM and PM peak hour periods for the full build development by vehicle type.

**Table 10. Full Build Development Trip Generation by Vehicle Classification.**

Vehicle Type	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Passenger Vehicle	2,740	2,101	639	3,954	1,189	2,765
Truck	496	244	252	471	240	231
<b>Total Development Trips</b>	<b>3,236</b>	<b>2,345</b>	<b>891</b>	<b>4,425</b>	<b>1,429</b>	<b>2,996</b>

Pass-by trips were considered under full build development only. It is anticipated that trips (passenger vehicle and truck) proceeding to sites within the logistics park may travel to adjacent travel center or restaurant land uses along the same path. **Table 11** summarizes total trip generation for the site considering primary and pass-by trips. Primary trips are trips introduced to the network specifically for a proposed development. Pass-by trips are those trips already on the network for a different use, that stop at a site within the same trip.

**Table 11. Full Build Development Primary and Pass-By Trips.**

Vehicle Type	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Primary Trips	2,960	2,207	753	4,097	1,265	2,832
Pass-By Trips	276	138	138	328	164	164
<b>Total Development Trips</b>	<b>3,236</b>	<b>2,345</b>	<b>891</b>	<b>4,425</b>	<b>1,429</b>	<b>2,996</b>

## 4.2 Trip Distribution

Trip distribution was developed for the proposed development considering the existing trips on the network, anticipated land use, and review of surrounding areas. Trip distribution percentages did not change from the previously submitted master study dated September 2022. Trip distribution was developed considering passenger vehicle trips and truck trips separate. This is due to the consideration that truck traffic will primarily utilize the interstate network and not travel along the local road network. Trip distribution varies for build year 2028 and build years 2034 and 2040 due to the available road network. Trip distribution percentages for build year 2028 are presented in **Table 12**.

**Table 12. Build Year 2028 Trip Distribution.**

Direction	Passenger Vehicle Trip Distribution	Truck Trip Distribution
West via I-29 (access I-29 Northbound, I-435 Westbound)	35%	50%
East via I-29 (access I-29 Southbound, I-435 Eastbound)	63%	50%
East via Highway 92	-	-
West via Highway 92	-	-
South via Mexico City Avenue	2%	-
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>

Trip distribution percentages for build years 2034 and 2040 are presented in **Table 13**.

**Table 13. Build Years 2034 and 2040 Trip Distribution.**

Direction	Passenger Vehicle Trip Distribution	Truck Trip Distribution
West via I-29 (access I-29 Northbound, I-435 Westbound)	25%	50%
East via I-29 (access I-29 Southbound, I-435 Eastbound)	58%	50%
East via Highway 92	5%	-
West via Highway 92	10%	-
South via Mexico City Avenue	2%	-
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>

### 4.3 Proposed Roads

**Section 3** presents the existing and planned roadway network. Two variations from the Kansas City *Master Street Plan* are proposed:

- Mexico City Avenue is proposed to extend north of 136<sup>th</sup> Street, transitioning west to intersect with Bethel Road. Extension of Mexico City Avenue north to Highway 92 is no longer proposed.
- 136<sup>th</sup> Street will extend east of Mexico City Avenue to intersect with Winan Avenue. Extension of 136<sup>th</sup> Street west of Mexico City Avenue to Bethel Road is no longer proposed.

City planning review is recommended to determine if this modification is acceptable.

### 4.4 Proposed Access

Access points are expected to be proposed along KCMO and MoDOT maintained roadways to support development projects. **Table 1** presented the roadways planned to support the development with jurisdiction and classification. Access points shown on the site plan referenced for the purposes of this study are preliminary and may change as properties develop over the next 15 years. General guidance regarding agency procedures for both KCMO and MoDOT is provided and should be considered as detailed plans are developed for each site. As the KCI-29 Logistics Park develops, evaluation of individual development plans and proposed access should be conducted to ensure adequate access management is provided. Depending on location and development plan, deceleration lanes may need to be provided at site drives.

Operational analysis is provided for major study intersections; operations of intersections and expected queuing should be considered when determining access locations. Access should not be located within the influence of queuing or turn bays associated with public road network intersections.

#### **4.4.1 Kansas City Access Spacing**

The following guidance should be applied to roadways maintained (or proposed to be maintained) by KCMO. Access requirements and guidelines were referenced from the *Kansas City Traffic Engineer and Operations Manual*. Road classifications are presented in the *Kansas City Major Street Plan*. The *Major Street Plan* uses different road classification terminology than the *Traffic Engineer and Operations Manual*. Roads with a 'thoroughfare' classification in the *Master Street Plan* are assumed to be the equivalent of a 'primary arterial' road as defined in the *Traffic Engineer and Operations Manual*. Similarly, roads with a 'local link' classification are assumed to be the equivalent of 'collector'. These assumptions were made based on the road classification definitions provided in the *Traffic Engineer and Operations Manual*. Access requirements and guidelines from the *Traffic Engineer and Operations Manual* are presented in this section.

##### **4.4.1.1 Public Roadway Planning**

The minimum intersection spacing between public roads shall be one mile along principal arterial roads and a quarter mile along collector roads. City guidance presents the preference of the use of raised medians over two-way left-turn lanes (TWLTL) along City roadways. However, the use of TWLTLs is acknowledged and considered under the following conditions:

1. Commercial driveways made up substantial portion of the total driveways.
2. The percentage of vehicles turning left at the peak hour is at least 20 percent.
3. Average daily traffic (ADT) is in the range of 10,000 to 28,000 vehicles per day.
4. Commercial driveway density is less than 12 per mile in each direction.

##### **4.4.1.2 Access Spacing and Geometrics**

Guidelines for driveway geometrics are presented below. Where possible, driveways should be aligned across public roadways. Pedestrian accommodations should be considered at access points to support the planned pedestrian and bicycle network. **Table 14** summarizes acceptable driveway width per KCMO standards.

**Table 14. KCMO Recommended Driveway Widths.**

Type of Use	Standard		Divided <sup>(a)</sup>		Median
	Min	Max	Min	Max	
Commercial	24'	30'	14' <sup>(b)</sup>	24'	6'
Industrial					
Trucks	24'	30' <sup>(c)</sup>	18' <sup>(b)</sup>	30'	6'
Special	18'	30'	24'	30'	2'
Passenger Vehicles	Same as commercial				

(a) Width on each side of median.

(b) Applies to one-way driveways.

(c) 35 feet for three lanes (1 in/2out) with approval.

- The minimum radius of a commercial or industrial driveway is recommended as 24 feet and the maximum is 30 feet. For all driveways, the travel path of the turning vehicles should be considered.
- The minimum recommended throat length for a driveway varies by the peak hour volume (PHV) for both directions. Low volume drives with a 150 PHV should have a minimum throat length of 40 feet. Medium volumes drives with a PHV of 150 to 400 vehicles should have a minimum throat length of 60 feet. Throat length for high volume roads with a PHV of greater than 400 vehicles should be based on the results of a traffic study.
  - The majority of access proposed with this development plan is expected to service heavy vehicle (semi) traffic. To support the expected larger vehicles, a minimum throat length of 100 feet is recommended to accommodate these vehicles at drives servicing heavy vehicle/industrial traffic.
- The minimum driveway spacing for aligned and offset driveways shall be 250 feet for drives along a primary arterial road and 150 feet for driveways along a collector road.
- Minimum sight distance shall be provided at each intersection and driveways.
  - Vertical and horizontal curvature can impact sight distance and should be considered when determining driveway placement.
  - Landscaping and signage planned with site development should not restrict or limit sight distance.

#### **4.4.2 MoDOT Access Spacing**

The following guidance should be applied to roadways maintained (or proposed to be maintained) by MoDOT. Access requirements and guidelines were referenced from MoDOT's *Engineering Policy Guide (EPG)*, section 940.

#### **4.4.2.1 Public Roadway Planning**

The existing public roadways maintained by MoDOT include Mexico City Avenue (at the I-29 interchange), portions of Roanridge Road (west of Mexico City Avenue), and Highway 92. Referencing the MoDOT EPG, the spacing of roadways from interchange terminals is suggested to be between 1,320 feet to 2,640 feet. The intersection of Mexico City Avenue and Roanridge Road/132<sup>nd</sup> Street has been relocated and reconstructed further north from the previous location, providing 1,340 feet spacing between the I-29 Northbound Ramp and 132<sup>nd</sup> Street.

The intersection spacing between public roads along Highway 92 is suggested at half a mile to a mile. Similarly, the suggested intersection spacing along Mexico City Avenue and Roanridge Road is 660 feet to 1,320 feet.

Three lane TWLTLs may be used on non-freeway roads when the annual average daily traffic (AADT) of the design year is less than 17,500 vehicles per day (vpd). Five lane TWLTLs may be used on non-freeway roads when the AADT of the design year is less than 28,000 vpd. If the AADT of the design year is greater than 28,000 vpd, it is recommended to use a raised median.

#### **4.4.2.2 Access Spacing and Geometrics**

Guidelines for driveway geometrics are presented below. Where possible, driveways should align across public roadways.

Pedestrian accommodations should be considered at access points to support the planned pedestrian and bicycle network.

Within the study area, the minimum driveway spacing for full access drives along Highway 92 is suggested at 440 feet. Similarly, the minimum full access driveway spacing along Roanridge Road and Mexico City Avenue is suggested at 220 feet. The minimum clearance from an intersection corner is the same as the minimum driveway spacing. The minimum driveway spacing for right-in/right-out drives along Highway 92 is suggested at 220 feet. The minimum driveway spacing for right-in/right-out drives along Roanridge Road and Mexico City Avenue is suggested at 110 feet.

- The radius for commercial driveways is suggested at 25 feet where the speed limit is less than 45 mph and 50 feet where the speed limit is greater than 45 mph. Driveway radii for industrial driveways should be designed to accommodate the typical large truck that uses the driveway.
- Driveways shall not be less than 20 feet wide, nor more than 54 feet wide, excluding the median. Recommended driveway width based on driveway peak hour volumes for commercial/industrial drives are presented in **Table 15**.

**Table 15. MoDOT Recommended Driveway Widths.**

Driveway Traffic Category	Peak Hour Traffic Using Driveway	Two-Way Access	One-Way Access
Low Volume	<150	28ft <sup>(b)</sup> -42ft <sup>(c)</sup>	20ft <sup>(a)</sup>
Median Volumes	150-400	42ft <sup>(c)</sup> -54ft <sup>(d)</sup>	20ft <sup>(a)</sup> -30ft <sup>(b)</sup>
High Volumes	>400	Traffic Study	Generally N/A

- (a) One lane driveways.
- (b) Driveway striped for two lanes.
- (c) Driveway striped for three lanes.
- (d) Driveway striped for four lanes.

- The minimum permitted throat length varies by the peak hour volume (PHV) for both directions of travel. Low volume roads with a 150 PHV should have a minimum throat length of 20 feet. Medium volume roads with a PHV of 150 to 400 vehicles should have a minimum throat length of 60 feet. High volume roads with a PHV of greater than 400 vehicles should be based on the results of a study.
  - The majority of access proposed with this development is expected to service heavy vehicle (semi) traffic. To support the expected larger vehicles, a minimum throat length of 100 feet is recommended to accommodate these vehicles at drives servicing heavy vehicle/industrial traffic.
- Minimum sight distance shall be provided at each intersection and driveways.
  - Vertical and horizontal curvature can impact sight distance and should be considered when determining driveway placement.
  - Landscaping and signage planned with site development should not restrict or limit sight distance.

## 5. BUILD YEAR 2028 CONDITIONS

Build Year 2028 traffic conditions were evaluated to represent the known conditions of the network with the built/under construction road network and planned/approved development projects. Based on a review of historical traffic volumes, and considering the proposed development, a growth rate of 2 percent was used for this study (consistent with the September 2022 study). The growth rate was applied to through movements along Highway 92 and to movements to/from the south along Mexico City Avenue at the I-29 interchange.

### 5.1 Network Characteristics and Development Projects

Details on the road network and planned development are provided in **Section 3**.

### 5.1.1 Planned Roadway Access

Under this scenario, access to phase 1 sites is provided via 132<sup>nd</sup> Street, Roanridge Road, 136<sup>th</sup> Street, and Mexico City Avenue.

### 5.1.2 Phase 1 Planned/Approved Development Projects

This scenario considers the development of Project Gateway, Project Falcon and buildings 4, 10 and 13-14 which represents warehouse, industrial, and travel center land uses.

Trip generation for phase 1 development is summarized in **Table 16**. Trip generation was presented in detail in **Section 4.1.1**. **Figure 3** illustrates Phase 1 development peak hour volumes. **Figure 4** illustrates Build Year 2028 peak hour traffic volumes. **Figure 5** illustrates Build Year 2028 lane configurations and traffic control.

**Table 16. Phase 1 Trip Generation.**

Development Phase	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Phase 1 Trips	1,181	894	287	1,678	423	1,255

### 5.2 Build Year 2028 Warrant Analysis

This scenario considers the built/under construction network. Signal and turn lane warrant analysis is not presented as the network is expected to be built to support planned/approved development.

Adequate right-of-way should be provided along study area roadways to support the potential need for future turn lanes or alternative traffic control at public street intersections as well as along public roads at access locations.

### 5.3 Build Year 2028 Capacity Analysis

Capacity analysis was performed for the study intersections using the Build Year 2028 lane configurations and traffic control. Analysis was conducted using Synchro, Version 12, based on the *Highway Capacity Manual* (HCM) delay methodologies. SIDRA was used for roundabout analysis. 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 high delay. **Table 17** shows the delays associated with each LOS grade for signalized and unsignalized intersections, respectively. Queuing analysis was conducted referencing the 95<sup>th</sup> percentile queue length. This represents the queue length that has a 5 percent probability of being exceeded during the peak hour period.

**Table 17. Intersection Level of Service Criteria.**

Level of Service	Average Control Delay (seconds)	
	Signalized	Unsignalized
<b>A</b>	< 10	< 10
<b>B</b>	> 10-20	> 10-15
<b>C</b>	> 20-35	> 15-25
<b>D</b>	> 35-55	> 25-35
<b>E</b>	> 55-80	> 35-50
<b>F</b>	> 80	> 50

*Highway Capacity Manual (7<sup>th</sup> Edition)*

For the purposes of this analysis, a peak hour factor of 0.92 was used for all study intersections. Heavy vehicle percentages were based on existing conditions and modified for expected development traffic.

Access to proposed development sites is expected to be provided via new/improved roadways. No further improvements to the public road network were considered when evaluating build year 2028 conditions.

Signalized intersections are expected to operate at LOS C or better during both the AM and PM peak hour periods. The majority of individual movements at signalized intersections are expected to operate at LOS D or better. Some movements are reported at a LOS E, which can be attributed to experiencing higher delay due to serving a low volume of traffic or a movement that is accommodating a higher volume movement at the intersection. 95<sup>th</sup>-percentile queuing is expected to be acceptable and contained within available turn lane storage.

Unsignalized movements are expected to operate at LOS C or better during the AM and PM peak hour periods. The Build Year 2028 capacity analysis summary is illustrated in **Figure 6A** and **6B**. Detailed results are provided in **Appendix B**.

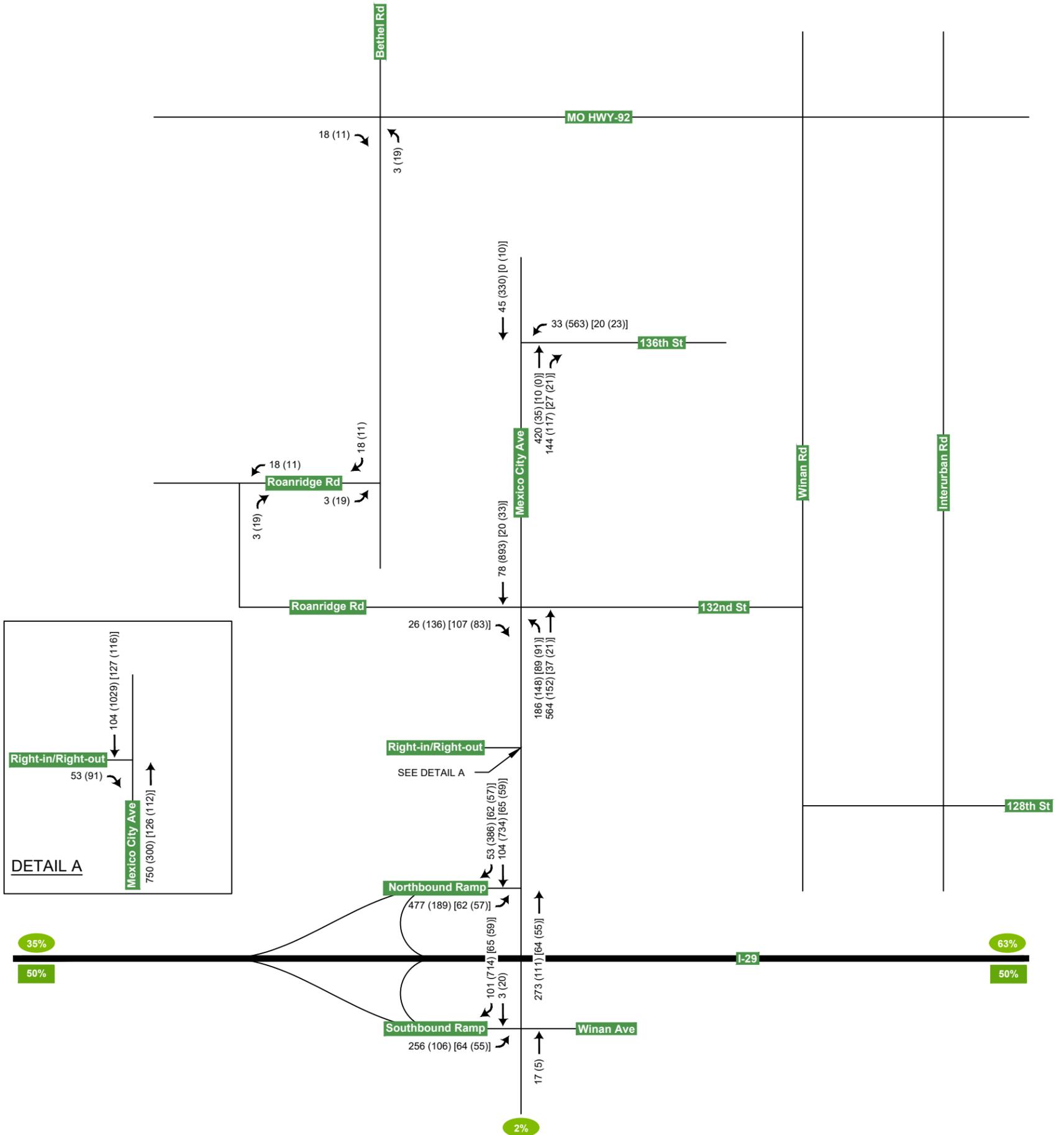
## 5.4 Build Year 2028 Conditions Simulation

A simulation model was developed for the study area using SimTraffic software. The simulation model includes the signalized intersections along Mexico City Avenue from the I-29 interchange extending north through 136<sup>th</sup> Street. The simulation model was developed as a tool to supplement capacity analysis conducted using Synchro and to provide a visual representation of the corridor. The simulation represents AM and PM peak hour periods considering the expected Build Year 2028 traffic volumes. The Mexico City Avenue corridor is currently under construction and not all proposed trips are on the road network, so the simulation model cannot

be calibrated to existing conditions. Simulation settings were adjusted to represent expected conditions. SimTraffic model runs were prepared consistent with MoDOT guidance found in the EPG. Simulation results represent expected acceptable operations of the network. Detailed SimTraffic simulation reports are provided in **Appendix B**.

# FIGURE 3

## Build Year 2028 Trip Distribution Phase 1 Development Trips



### LEGEND

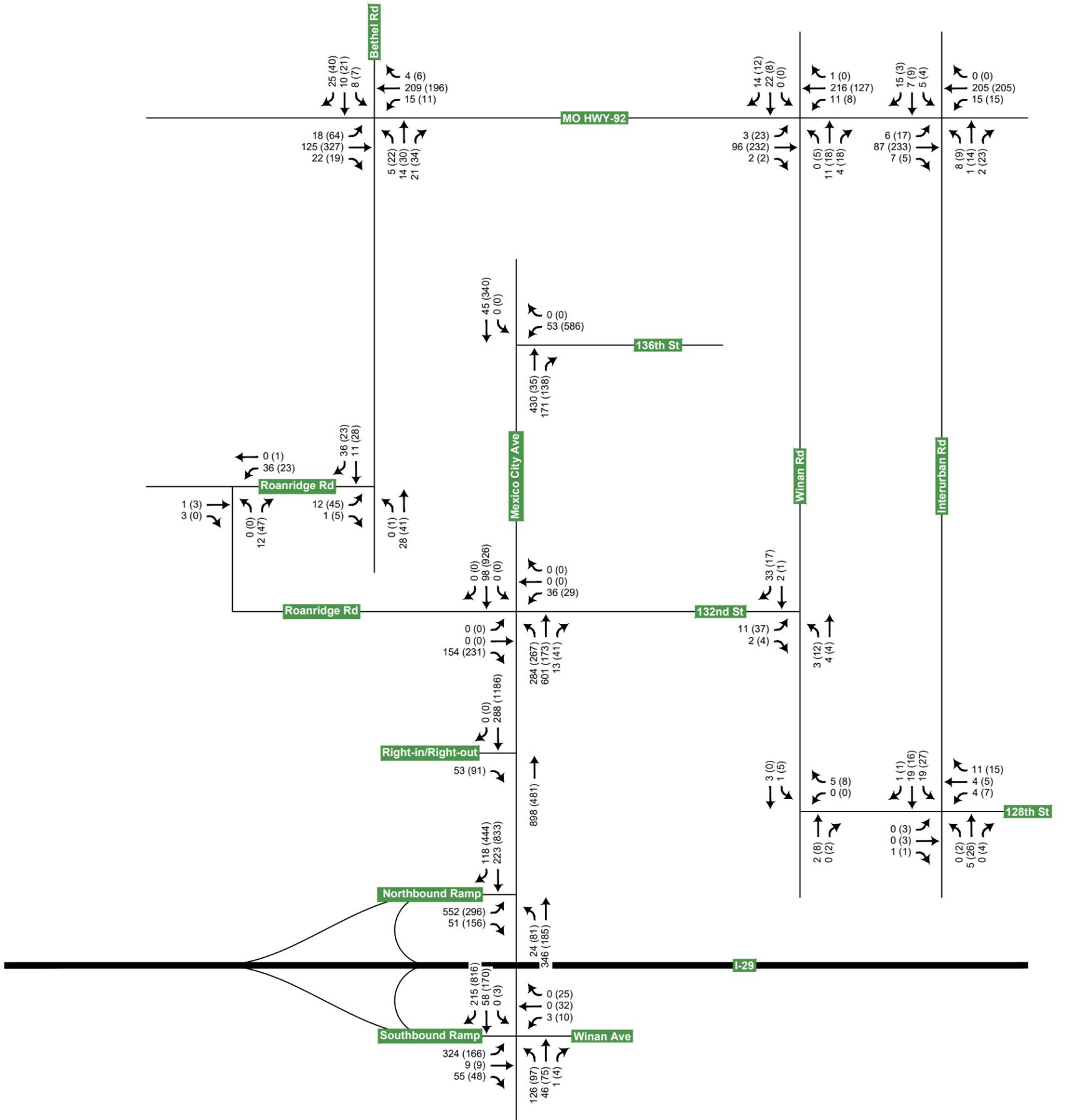
AM (PM) Primary Peak Hour Trips (Car)

[AM (PM)] Primary Peak Hour Trips (Truck)

XX% To/From Car Trip Distribution Percentages

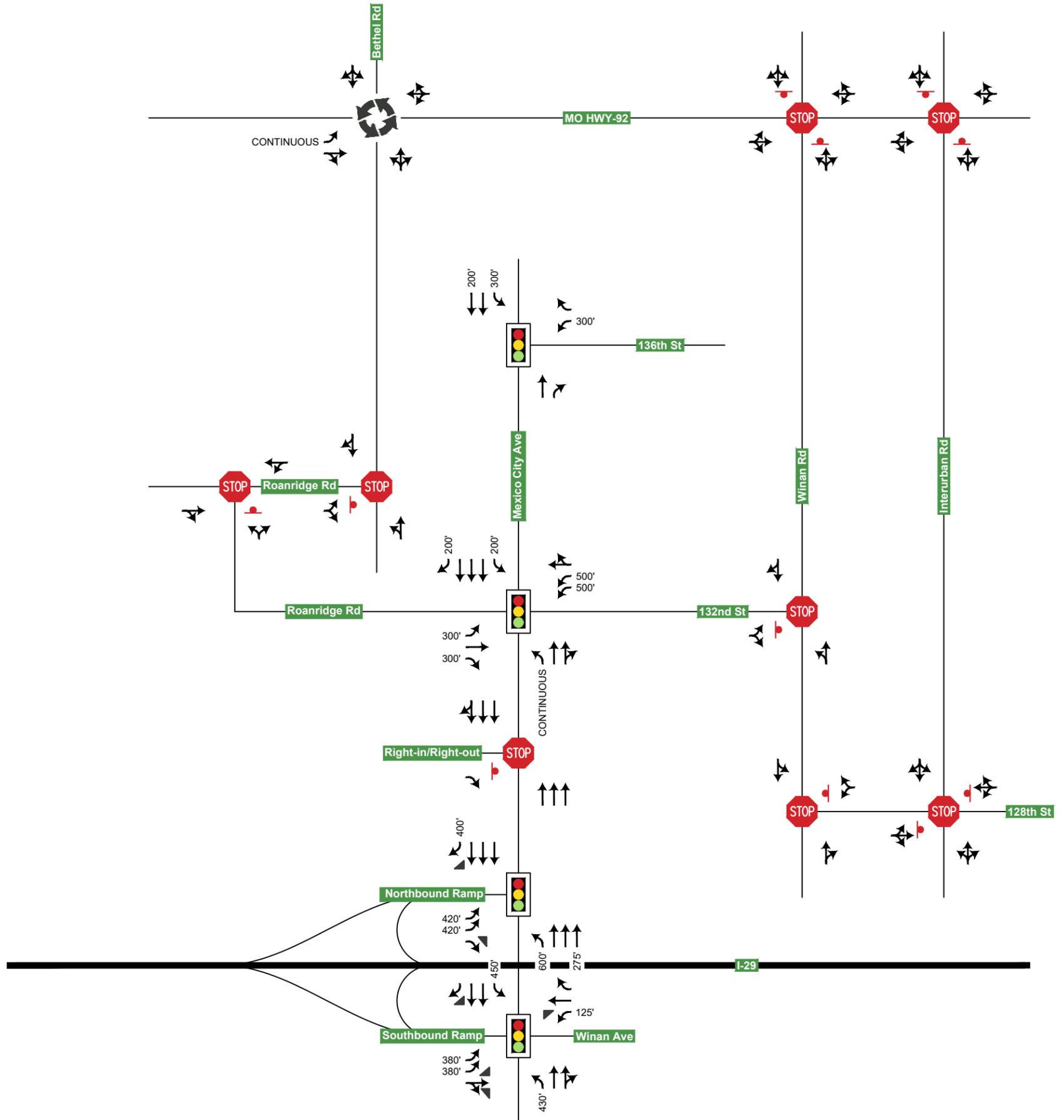
XX% To/From Truck Trip Distribution Percentages

**FIGURE 4**  
Build Year 2028  
Peak Hour Volumes



# FIGURE 5

Build Year 2028  
Lane Configuration and Traffic Control



## LEGEND

xx' → Lane Configuration & Storage Length



Signalized Intersection



Stop Controlled Intersection

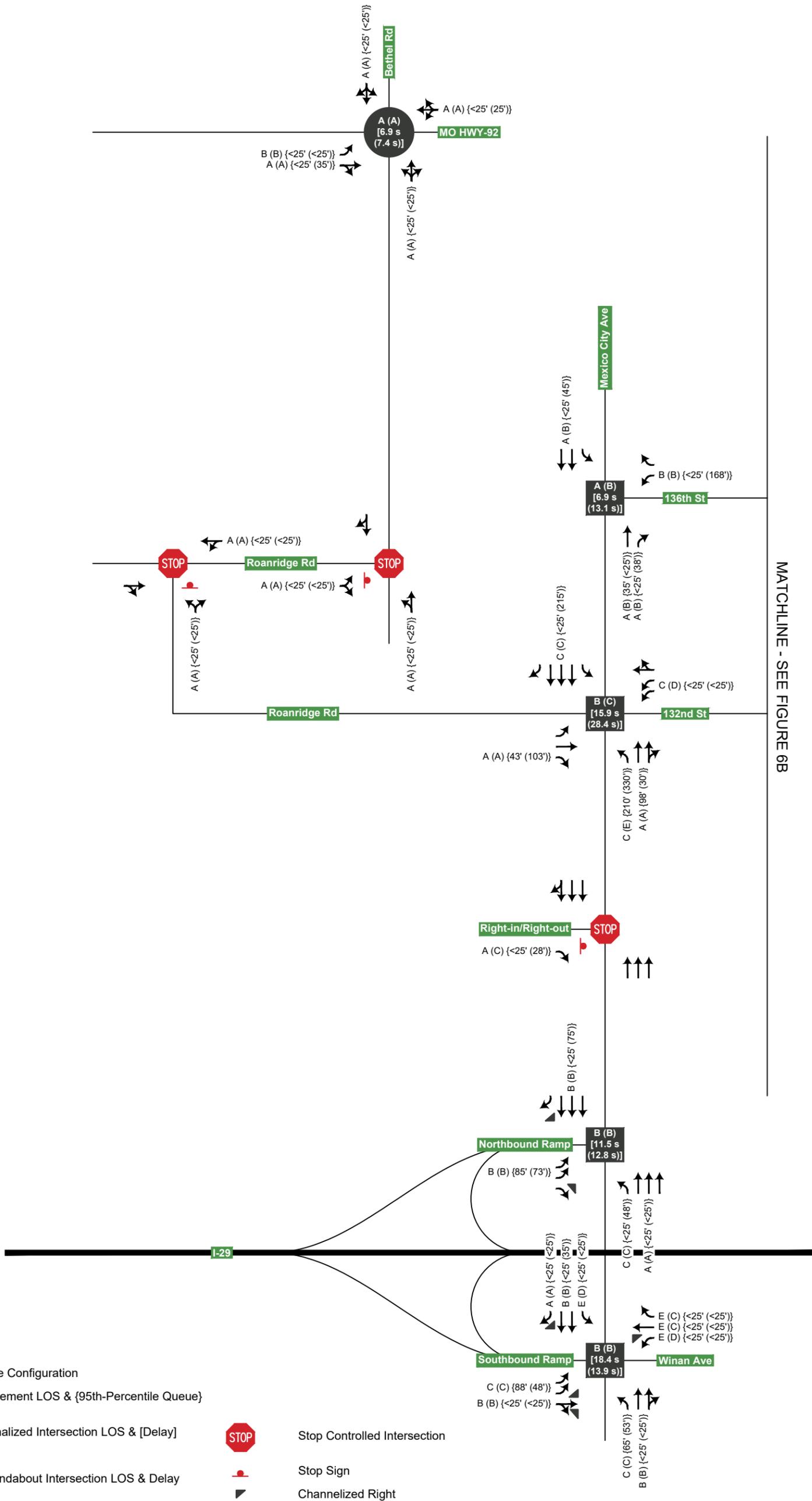
Stop Sign

Channelized Right



Roundabout Intersection

**FIGURE 6A**  
Build Year 2028  
Capacity Analysis



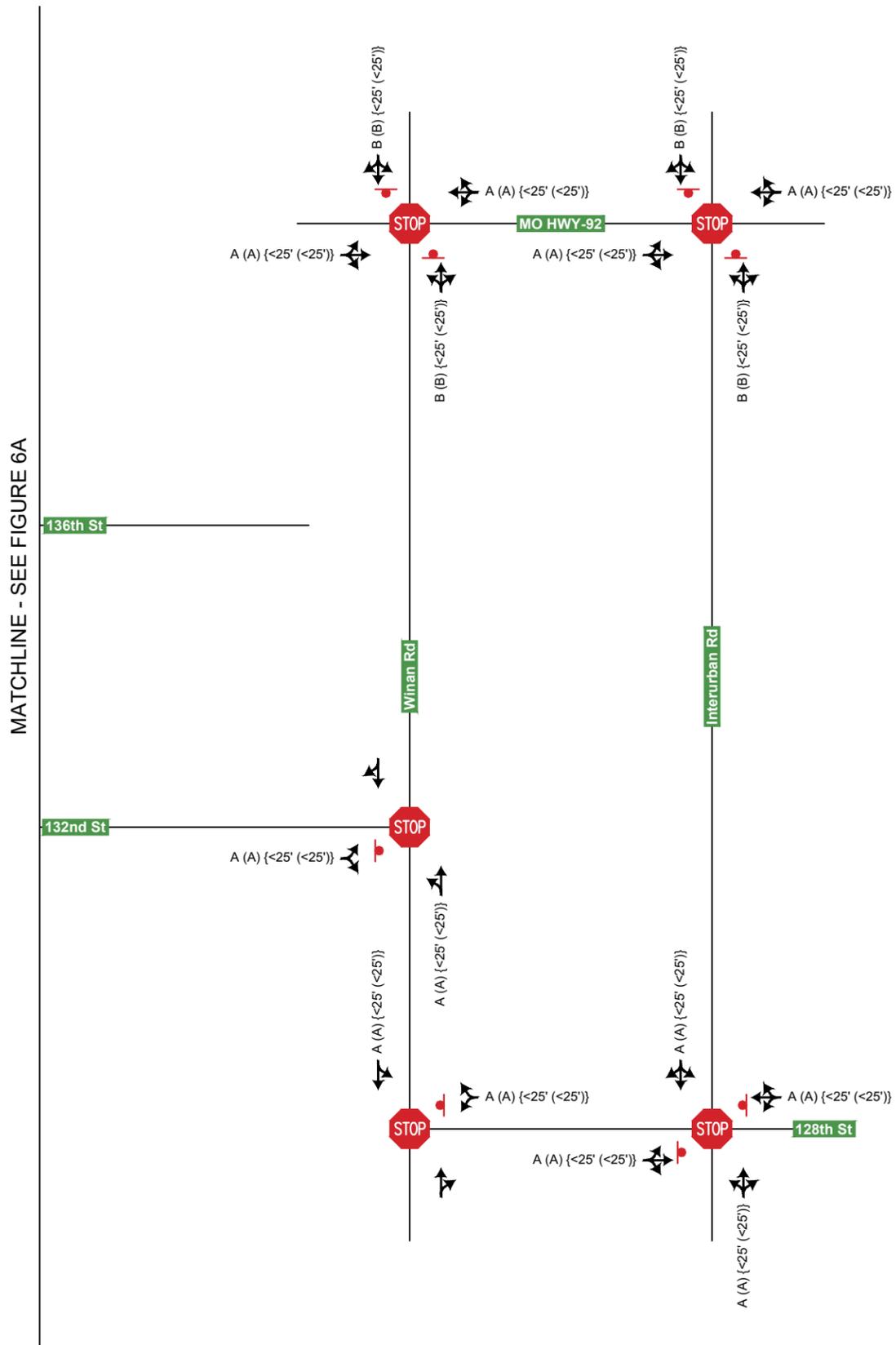
**LEGEND**

- Lane Configuration
- AM (PM) {AM\* (PM\*)} Movement LOS & {95th-Percentile Queue}
- C(D)  
[AM s  
(PM s)] Signalized Intersection LOS & [Delay]
- A (A)  
[AM s  
(PM s)] Roundabout Intersection LOS & Delay

- Stop Controlled Intersection
- Stop Sign
- Channelized Right

# FIGURE 6B

Build Year 2028  
Capacity Analysis



## LEGEND

-  Lane Configuration
- AM (PM) {AM\* (PM\*)} Movement LOS & {95th-Percentile Queue}
-  Stop Controlled Intersection
-  Stop Sign

## 6. BUILD YEAR 2034 CONDITIONS

Build Year 2034 traffic conditions were evaluated to represent the study area with phases 1 and 2 development in place. The traffic volume growth rate was applied as presented in **Section 5**.

### 6.1 Network Characteristics and Development Projects

Details on the road network and planned development are provided in **Section 3**.

#### 6.1.1 Planned Roadway Access

Under this scenario, access to phase 2 sites is provided via 132<sup>nd</sup> Street, Roanridge Road, 136<sup>th</sup> Street, and Mexico City Avenue. Mexico City Avenue extends to Bethel Road under this scenario.

Dependent upon how development occurs, improvements to Bethel Road and Winan Avenue (potential road widening and pavement surface improvements) may be needed to support development. As individual properties develop, vehicular routing and traffic volumes on current unimproved roadways should be reviewed.

#### 6.1.2 Phase 2 Projects

This scenario considers the development of buildings 5, 6, 7, 9, 10, 11, 15, 16, 17, 18 and 20 which consists of warehouse, restaurant, and retail uses. Trip generation for phase 2 development is summarized in **Table 18**. Trip generation was presented in detail in **Section 4.1.2**. **Figure 7** illustrates Phases 1 and 2 development peak hour volumes. **Figure 8** illustrates Build Year 2034 peak hour traffic volumes.

Table 18. Phase 2 Trip Generation.

Development Phase	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Phase 2 Trips	1,006	699	307	1,139	396	743

## 6.2 Build Year 2034 Warrant Analysis

### 6.2.1 Signal Warrants

A traffic signal may be justified if traffic conditions meet any of the applicable nine signal warrants described in the 2009 Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides criteria for conducting an engineering study to determine whether a traffic signal is appropriate at an intersection. Based on the data available for this study, only the peak hour warrant (warrant 3) was evaluated, and is based on projected traffic volumes. As development occurs within the study area, monitoring of traffic volumes should be conducted

and signal warrant analysis reviewed. Traffic signals should be installed based on realized traffic volumes.

Based on Build Year 2034 traffic volumes, signals are not expected to be warranted at any of the unsignalized study intersections.

### 6.2.2 Turn Lane Warrants

MoDOT's EPG was reviewed for turn lanes along study area roadways under MoDOT and KCMO jurisdiction. Turn lane warrants were reviewed for public intersections; as properties develop, turn lane warrant analysis should be conducted to determine if auxiliary lanes are needed to support the planned development at proposed drive locations. As presented in **Section 5.2**, adequate right-of-way should be provided along study area roadways providing access to development for future lane needs.

**Left-turn lanes:** Reviewing warrant criteria, the warrant for left-turn lanes is expected to be met at the following study intersection:

- Westbound Highway 92 at Winan Avenue (AM only)

**Right-turn Lanes:** No warrant criteria for right-turn lanes is expected to be met under this scenario.

Turn lane warrant analysis is provided in **Appendix C**. Capacity analysis will be reviewed to determine if turn lanes are recommended.

## 6.3 Build Year 2034 Improvements

Based on a review of expected operations, turn lane warrants, and considering development of the KCI-29 Logistics Park, the following improvements are recommended under Build Year 2034 conditions.

*These improvements are based on the development plan as of the writing of this report. Actual traffic volumes and intersection/roadway operations should be reviewed to determine when improvements are warranted and should be constructed. As properties are developed, traffic study should be conducted to confirm realized operations. Access spacing and turn lanes at individual drive locations should be reviewed for each development.*

### Mexico City Avenue and I-29 Southbound Ramp

- Monitor the southbound right-turn movement operations to determine when dual southbound right-turn lanes are needed.

### Mexico City Avenue and 132<sup>nd</sup> Street

- Northbound dual left-turn lanes, 400-foot and continuous.
- Two northbound through lanes.
- 300-foot northbound right-turn lane.
- 200-foot westbound right-turn lane.

### Mexico City Avenue and 136<sup>th</sup> Street

- One additional northbound through lane (two lanes total).
- Northbound through lane to terminate as a right-turn lane north of 136<sup>th</sup> Street at KCI-29 Logistics Park Lot 4 drive.
- Continue Mexico City Avenue as a three-lane section (center two-way left-turn lane) from north of 136<sup>th</sup> Street (north of the Lot 4 drive) to Bethel Avenue. Two southbound through lanes along Mexico City Avenue at the intersection with 136<sup>th</sup> Street.
- Dual westbound left turn lanes
- 300-foot westbound right turn lane

### Mexico City Avenue and Bethel Road

- Provide separate westbound left-turn and right-turn lanes.
- 200-foot southbound left-turn lane.

### 136<sup>th</sup> Street and Winan Avenue

- The eastbound approach should be a separate left and right-turn.
- 200-foot northbound left-turn lane.

### Mexico City Avenue Corridor

- Coordinate signalized intersections along the Mexico City Avenue corridor if needed to support operations.
- Monitor traffic volumes and operations; adjust signal timings as needed.

## **6.4 Build Year 2034 Capacity Analysis**

Capacity analysis was performed for the study intersections using the Build Year 2034 lane configurations and traffic control as presented in **Section 5.3**.

Signalized intersections are expected to operate at LOS C or better during both the AM and PM peak hour periods. The majority of individual movements at signalized intersections are expected to operate at LOS D or better. Some movements are reported at a LOS E or F, which can be attributed to experiencing higher delay due to serving a low volume of traffic or a movement that is accommodating a higher volume movement at the intersection. 95<sup>th</sup>-percentile

queuing is expected to be acceptable and contained within available turn lane storage. As development occurs, studies should be conducted to review operations and determine if additional storage or lane improvements are needed to support development.

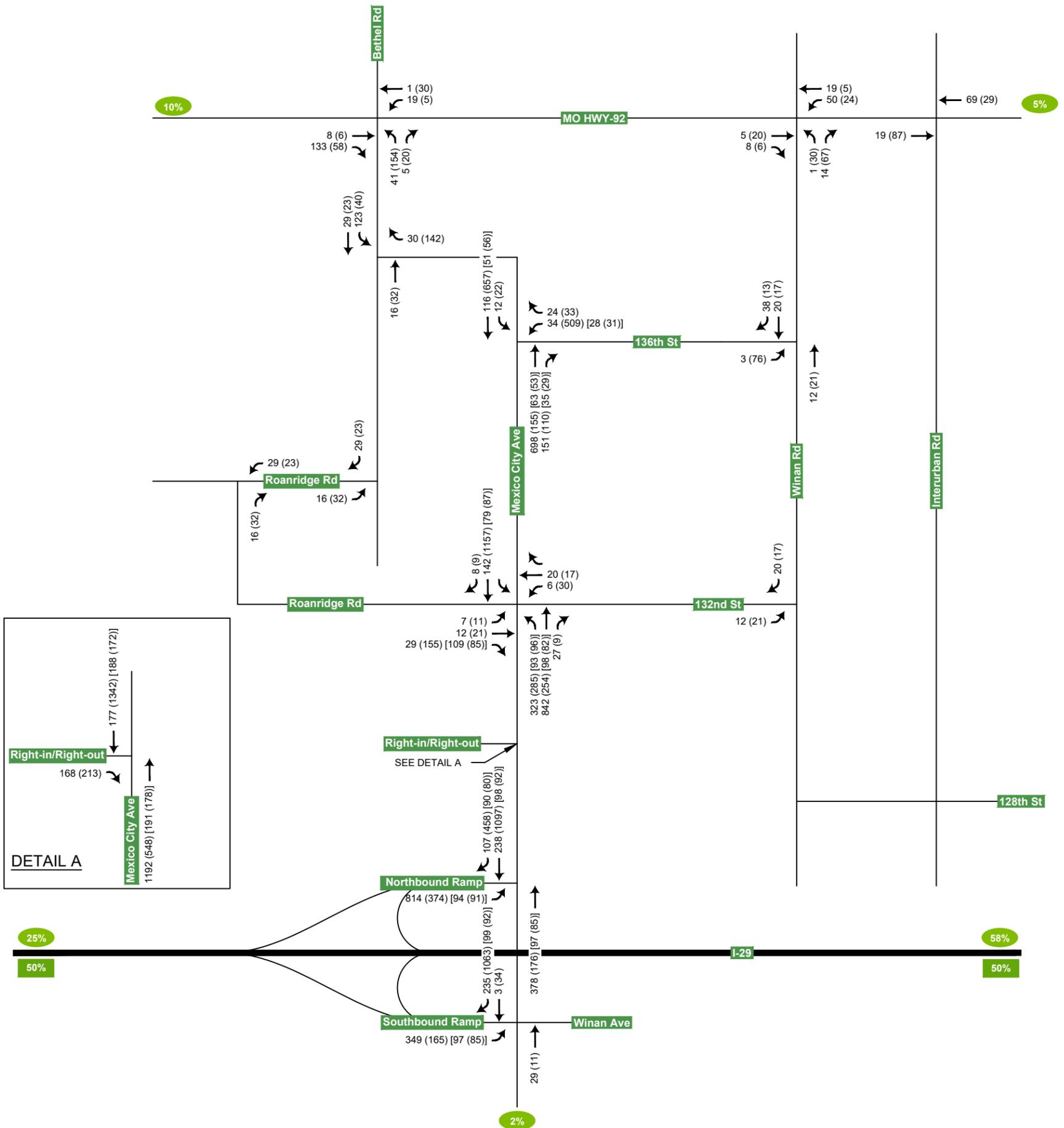
Unsignalized movements are expected to operate at LOS C or better during the AM and PM peak hour periods. **Figure 9** illustrates Build Year 2034 lane configurations and traffic control. The Build Year 2034 capacity analysis summary is illustrated in **Figure 10A** and **10B**. Detailed results are provided in **Appendix C**.

## **6.5 Build Year 2034 Conditions Simulation**

The Build Year 2034 simulation model was updated to represent recommended improvements associated with phases 1 and 2 developments and expected traffic volumes. Simulation results represent expected acceptable operations of the network. As development occurs, operations should be monitored to confirm that the road network supports realized traffic volumes. Detailed SimTraffic simulation reports are provided in **Appendix C**.

# FIGURE 7

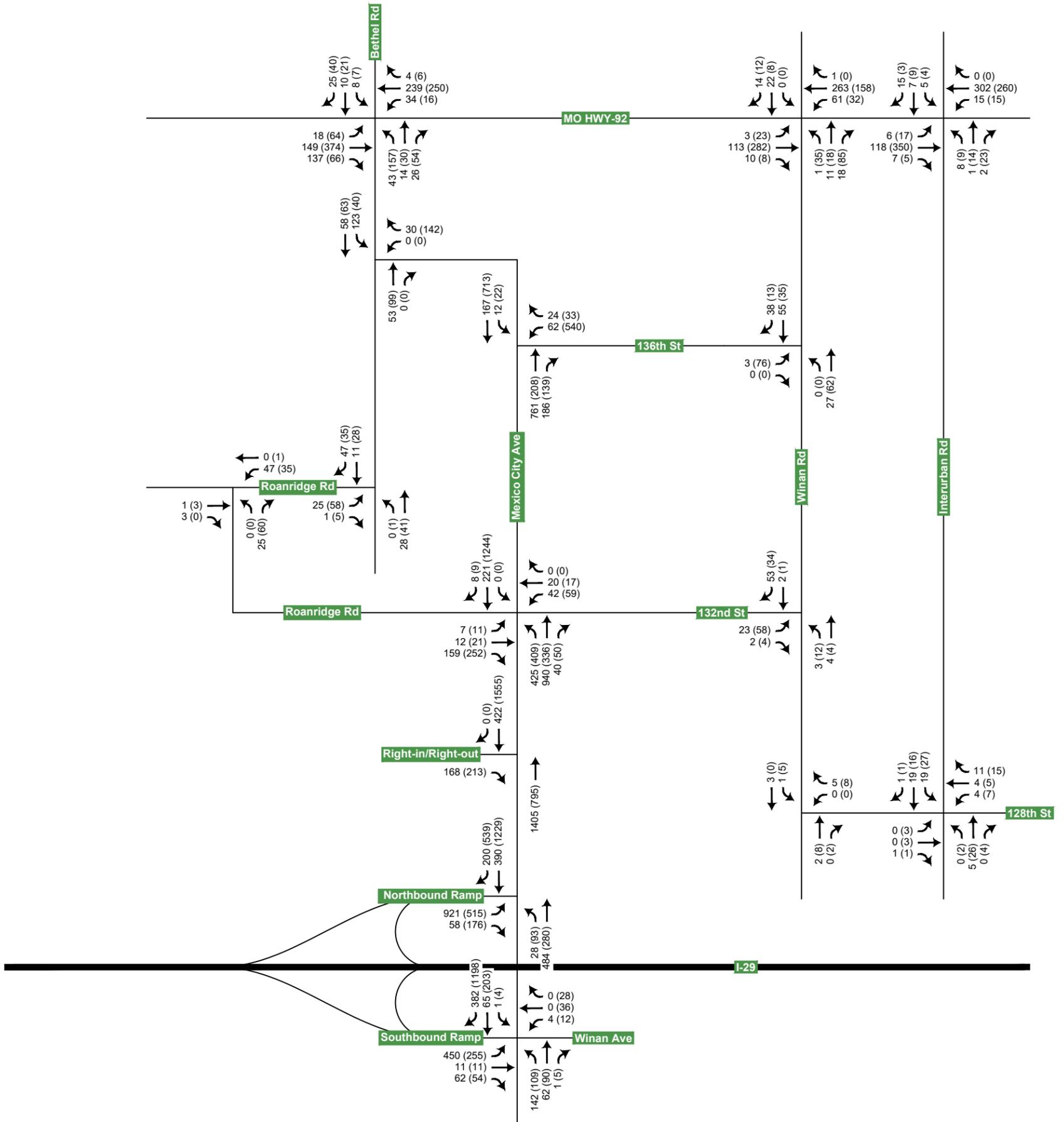
## Build Year 2034 Trip Distribution Phases 1 and 2 Development Trips



### LEGEND

- AM (PM) Primary Peak Hour Trips (Car)
- [AM (PM)] Primary Peak Hour Trips (Truck)
- XX% To/From Car Trip Distribution Percentages
- XX% To/From Truck Trip Distribution Percentages

**FIGURE 8**  
Build Year 2034  
Peak Hour Volumes

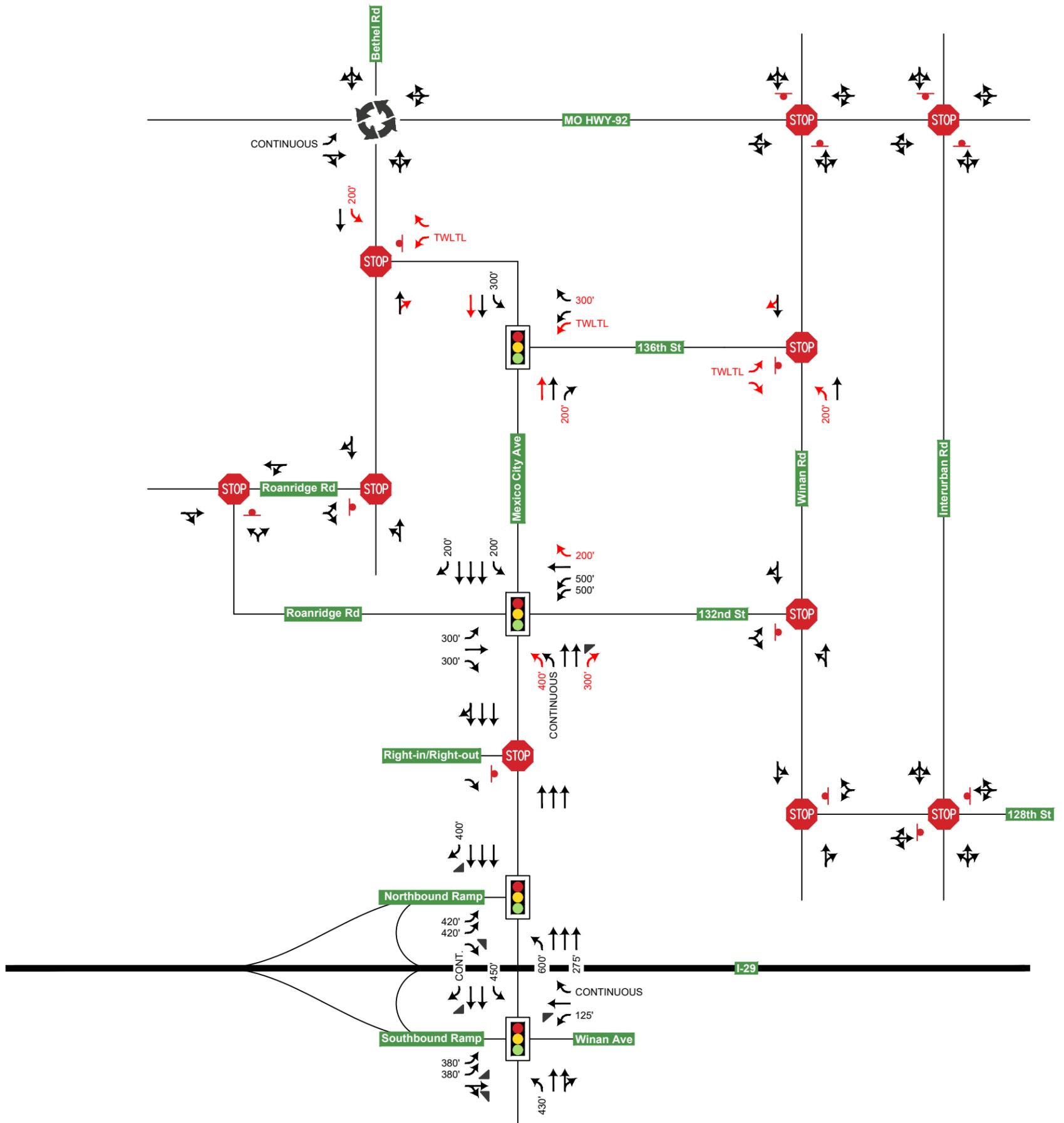


**LEGEND**

AM (PM) Peak Hour Volumes

# FIGURE 9

Build Year 2034  
Lane Configuration and Traffic Control



## LEGEND

xx' → Lane Configuration & Storage Length

xx' → Proposed Lane Configuration & Storage Length

Signalized Intersection

Stop Controlled Intersection

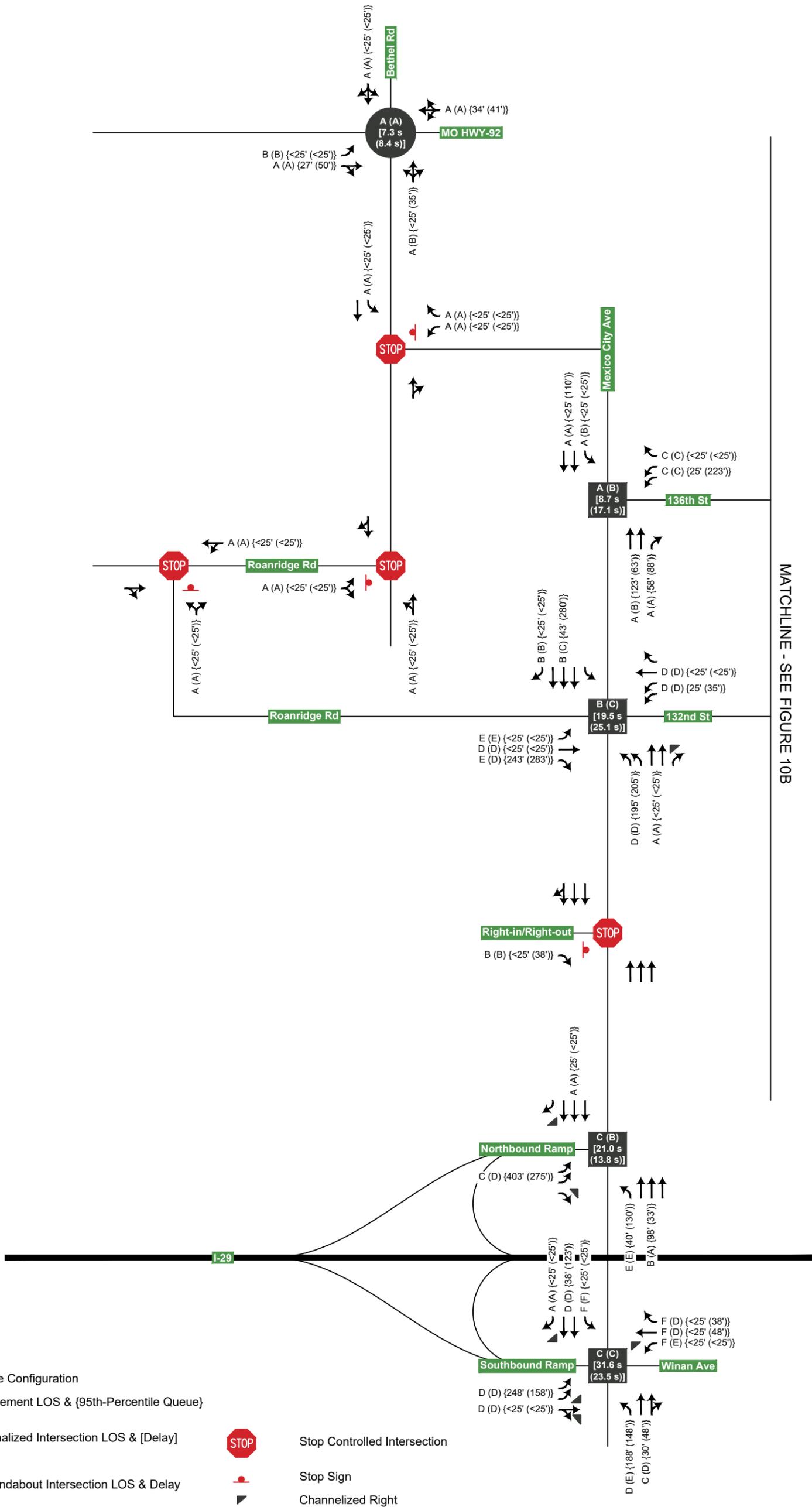
Stop Sign

Channelized Right

Roundabout Intersection

# FIGURE 10A

Build Year 2034  
Capacity Analysis



MATCHLINE - SEE FIGURE 10B

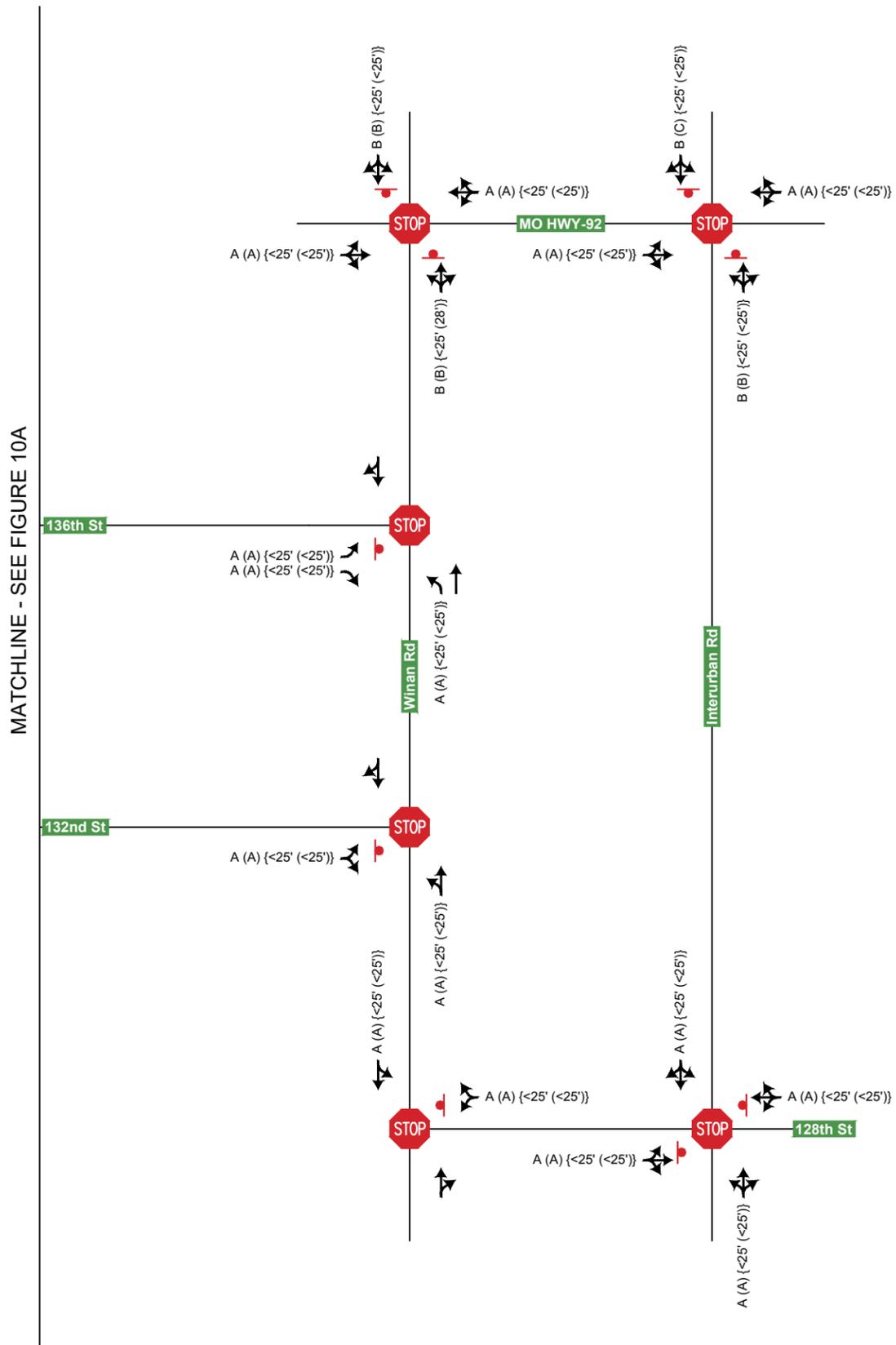
## LEGEND

- Lane Configuration
- AM (PM) {AM' (PM' s)} Movement LOS & {95th-Percentile Queue}
- C(D)  
[AM s  
(PM s)] Signalized Intersection LOS & [Delay]
- A (A)  
[AM s  
(PM s)] Roundabout Intersection LOS & Delay

- Stop Controlled Intersection
- Stop Sign
- Channelized Right

# FIGURE 10B

Build Year 2034  
Capacity Analysis



## LEGEND

-  Lane Configuration
- AM (PM) {AM\* (PM\*)} Movement LOS & {95th-Percentile Queue}
-  Stop Controlled Intersection
-  Stop Sign

## 7. BUILD YEAR 2040 CONDITIONS

Build Year 2040 traffic conditions were evaluated to represent the study area with full build (phases 1, 2 and 3) development in place. The traffic volume growth rate was applied as presented in **Section 5**.

### 7.1 Network Characteristics and Development Projects

Details on the road network and planned development are provided in **Section 3**.

#### 7.1.1 Planned Roadway Access

Under this scenario, access to phase 3 sites is provided via 132<sup>nd</sup> Street, Winan Avenue, 128<sup>th</sup> Street and Highway 92. Dependent upon how development occurs, improvements to Bethel Road, Winan Avenue and 128<sup>th</sup> Street (potential road widening and pavement surface improvements) may be needed to support development. As individual properties develop, vehicular routing and traffic volumes on current unimproved roadways should be reviewed.

#### 7.1.2 Phase 3 Projects

This scenario considers the development of buildings 21 through 34 which consists of warehouse, hotel, and retail uses. Trip generation for phase 3 development is summarized in **Table 19**. Trip generation was presented in detail in **Section 4.1.3**. **Figure 11** illustrates full build (Phases 1, 2 and 3) development peak hour volumes. **Figure 12** illustrates Build Year 2040 peak hour traffic volumes.

**Table 19. Phase 3 Trip Generation.**

Development Phase	AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit
Phase 3 Trips	1,049	752	297	1,608	610	998

## 7.2 Build Year 2040 Warrant Analysis

### 7.2.1 Signal Warrants

Signal warrant analysis was conducted as presented in **Section 6.2.1**.

Based on Build Year 2040 traffic volumes, the intersections of 132<sup>nd</sup> Street with Windfield Avenue and Highway 92 with Winan Road are expected to warrant signalization under the PM peak hour period. Signals are not expected to be warranted at remaining unsignalized study intersections. It is recommended to monitor actualized traffic volumes as development occurs and re-evaluate if signals are needed at these locations. Considering expected operations, the

intersection of 132<sup>nd</sup> Street and Windfield Avenue is presented under signal control. The intersection of Highway 92 and Winan Road is presented maintaining the current stop control.

## 7.2.2 Turn Lane Warrants

Turn lane warrant analysis was conducted as presented in **Section 6.2.2**. As presented in **Section 5.2**, adequate right-of-way should be provided along study area roadways providing access to development for future lane needs.

**Left-turn lanes:** Reviewing warrant criteria, the warrant for left-turn lanes is expected to be met at the following study intersections:

- Westbound Highway 92 at Winan Avenue (AM and PM)
- Northbound Winan Road at 132<sup>nd</sup> Street (PM only)
- Northbound Windfield Avenue at 132<sup>nd</sup> Street (PM only)
- Westbound 132<sup>nd</sup> Street at Windfield Avenue (PM only)

**Right-turn Lanes:** Reviewing warrant criteria, the warrant for right-turn lanes is expected to be met at the following study intersection:

- Eastbound 132<sup>nd</sup> Street at Winan Road (AM only)
- Eastbound 132<sup>nd</sup> Street at Windfield Avenue (AM and PM only)

Turn lane warrant analysis is provided in **Appendix D**. Capacity analysis will be reviewed to determine if turn lanes are recommended.

## 7.3 Build Year 2040 Improvements

Based on a review of expected operations, turn lane warrants, and considering development of the KCI-29 Logistics Park, the following improvements are recommended under Build Year 2040 conditions.

*These improvements are based on the development plan as of the writing of this report. Actual traffic volumes and intersection/roadway operations should be reviewed to determine when improvements are warranted and should be constructed. As properties are developed, traffic study should be conducted to confirm realized operations. Access spacing and turn lanes at individual drive locations should be reviewed for each development.*

### Mexico City Avenue and I-29 Southbound Ramp

- Provide dual southbound right-turn lanes. Convert one southbound through lane to a shared through/right-turn lane to support the improvement.

### Mexico City Avenue and I-29 Northbound Ramp

- 420-foot triple westbound left-turn lanes.

### Mexico City Avenue and 132<sup>nd</sup> Street

- Triple westbound left-turn lanes, 2-500 foot lanes and 1-400 foot lane.
- Provide two eastbound through lanes along 132<sup>nd</sup> Street from Mexico City Avenue to Windfield Avenue. The northbound right-turn movement along Mexico City Avenue should be a free movement to 132<sup>nd</sup> Street.
- Provide an additional northbound through lane (three through lanes total).
- Monitor southbound queuing under future year conditions. Additional storage may be needed for the southbound left and right-turn lanes to prevent blocking by the through queue.

### 132<sup>nd</sup> Street and Windfield Avenue

- Continuous eastbound right-turn lane along 132<sup>nd</sup> Street at Winfield Avenue.
- 250-foot westbound left-turn lane.
- Provide two northbound lanes as separate dedicated left-turn and right-turn lanes. A minimum throat length of 250 feet should be provided along Windfield Avenue. Right-of-way should be preserved at the intersection to support potential dual northbound left-turn lanes. As development south of 132<sup>nd</sup> Street near Windfield Avenue occurs, needed improvements should be based on realized volumes and operations. The intersection should be monitored for signalization; signalization should be provided if dual northbound left-turn lanes are provided.

### 132<sup>nd</sup> Street and Winan Avenue

- 200-foot northbound left-turn lane.
- 200-foot southbound right-turn lane.
- 200-foot eastbound right-turn lane.
- Monitor the operations of the intersection. Operations under future year conditions are expected to be acceptable, but alternate traffic control may be needed if traffic volumes change. Alternative traffic control methods that can be considered include signalization or a roundabout. The proximity of a bridge structure south of the 132<sup>nd</sup> Street along Winan Avenue may impact the traffic control type that can be supported.

### Highway 92 and Winan Road

- 200-foot westbound left-turn lane.

### Mexico City Avenue Corridor

- Coordinate signalized intersections along the Mexico City Avenue corridor if needed to support operations.
- Monitor traffic volumes and operations; adjust signal timings as needed.

## **7.4 Build Year 2040 Capacity Analysis**

Capacity analysis was performed for the study intersections using the Build Year 2040 lane configurations and traffic control as presented in **Section 5.3**.

Signalized intersections are expected to operate at LOS D or better during both the AM and PM peak hour periods. The majority of individual movements at signalized intersections are expected to operate at LOS D or better. Some movements are reported at a LOS E or F, which can be attributed to experiencing higher delay due to serving a low volume of traffic or a movement that is accommodating a higher volume movement at the intersection. 95<sup>th</sup>-percentile queuing is expected to be acceptable and contained within available turn lane storage. As development occurs, studies should be conducted to review operations and determine if additional storage or lane improvements are needed to support development.

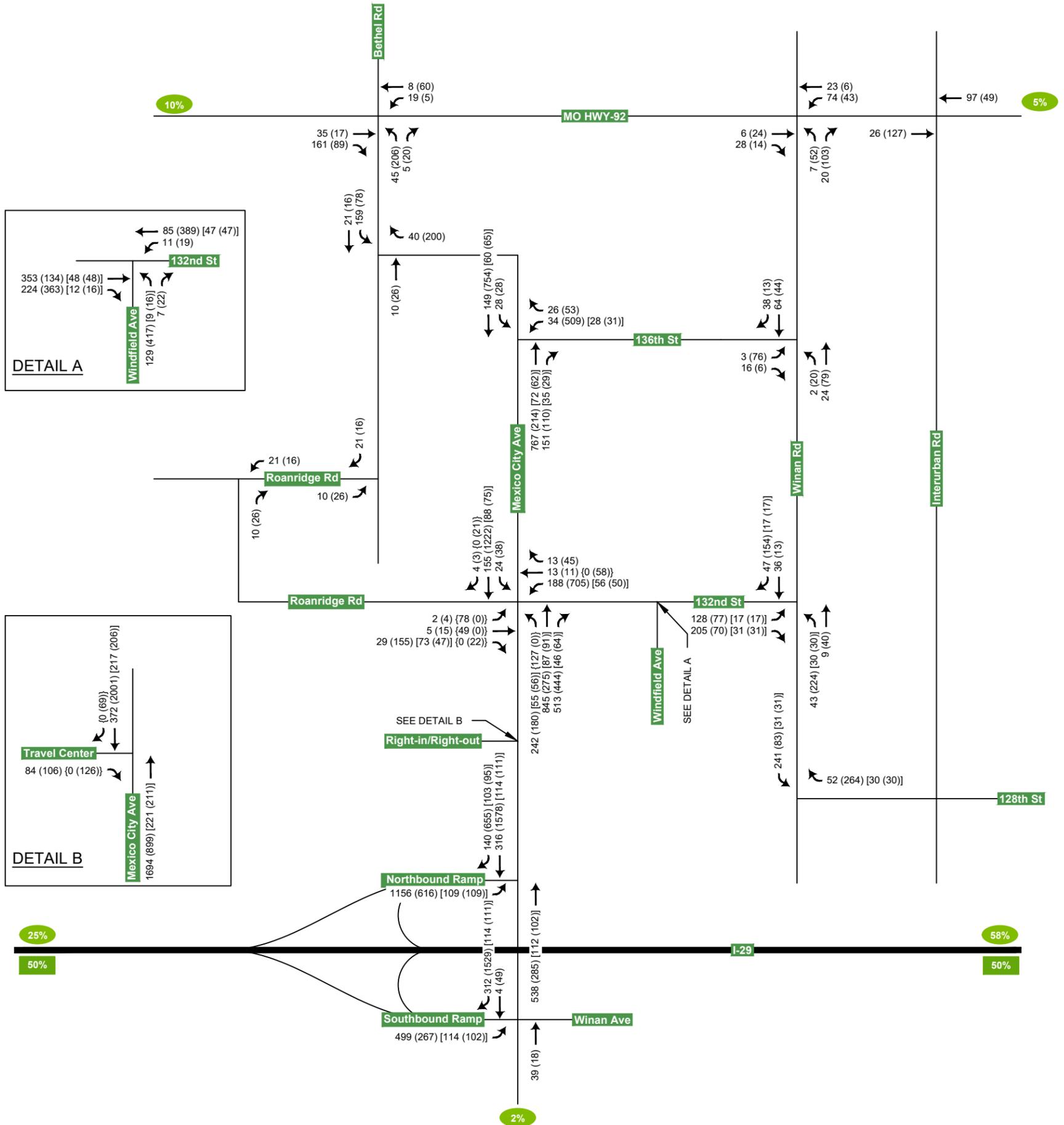
Unsignalized movements are expected to operate at LOS C or better during the AM and PM peak hour periods. **Figure 13** illustrates Build Year 2040 lane configurations and traffic control. The Build Year 2040 capacity analysis summary is illustrated in **Figure 14A** and **14B**. Detailed results are provided in **Appendix D**.

## **7.5 Build Year 2040 Conditions Simulation**

The Build Year 2040 simulation model was updated to represent recommended improvements associated with full build (phases 1, 2 and 3) of the development and expected traffic volumes. Simulation results represent overall expected acceptable operations of the network, although some queuing is noted under future year conditions. As development occurs, operations should be monitored to confirm that the road network supports realized traffic volumes. Detailed SimTraffic simulation reports are provided in **Appendix D**.

# FIGURE 11

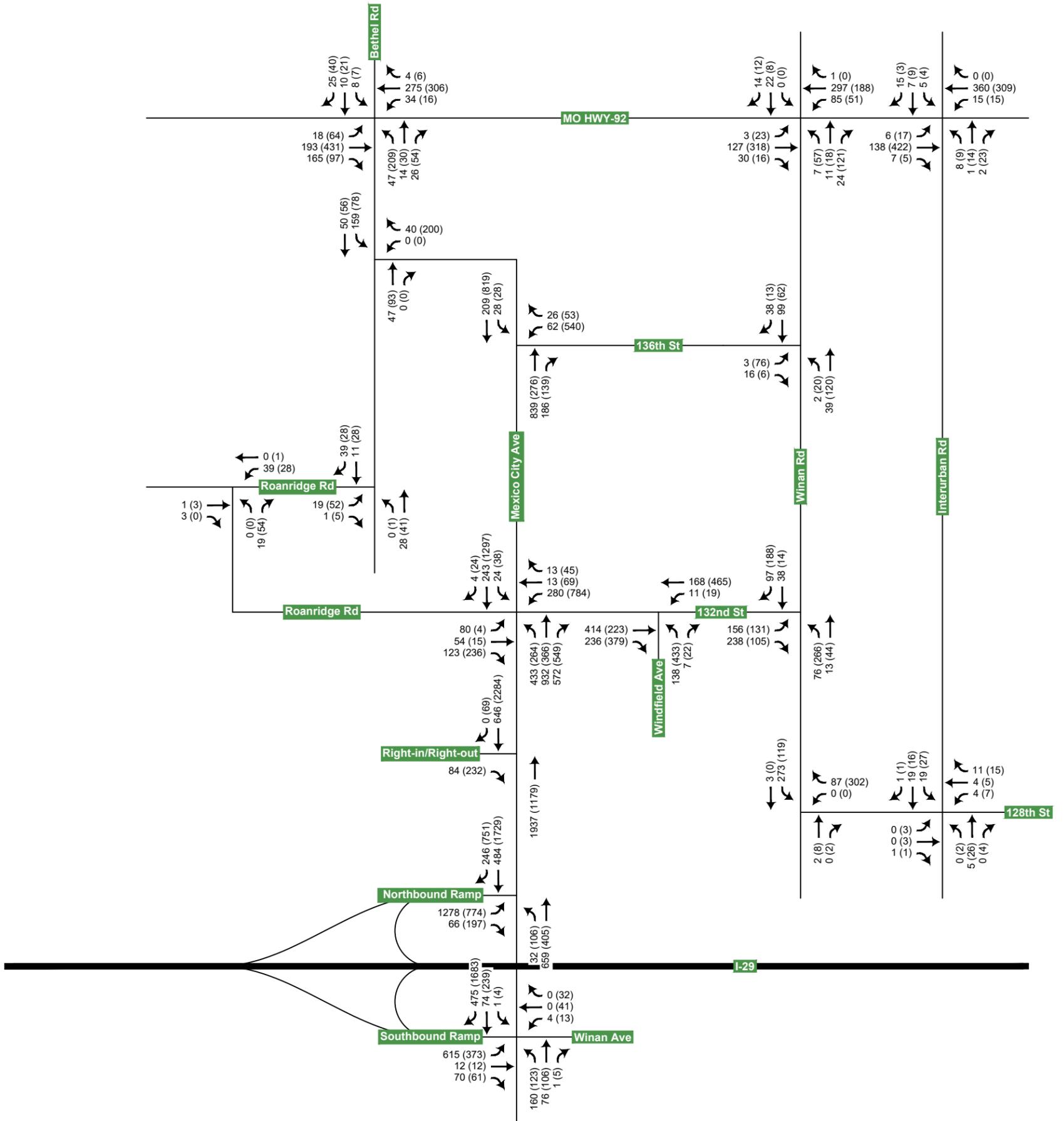
Build Year 2040 Trip Distribution  
Full Build - Phases 1, 2, and 3 Development Trips



## LEGEND

- AM (PM) Primary Peak Hour Trips (Car)
- [AM (PM)] Primary Peak Hour Trips (Truck)
- {AM (PM)} Pass-By Peak Hour Trips
- XX% To/From Car Trip Distribution Percentages
- XX% To/From Truck Trip Distribution Percentages

**FIGURE 12**  
Build Year 2040  
Peak Hour Volumes

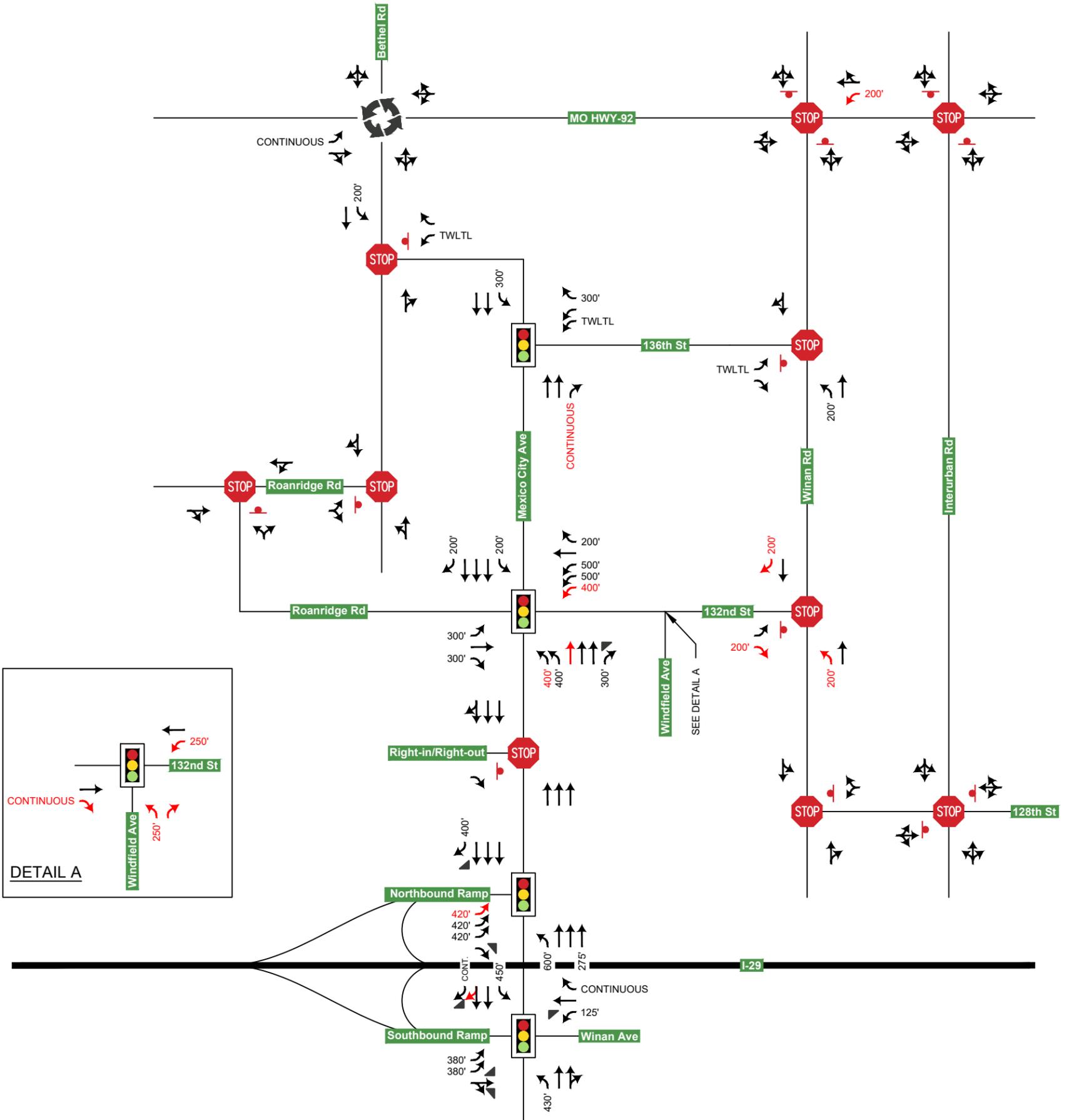


**LEGEND**

AM (PM) Peak Hour Volumes

# FIGURE 13

Build Year 2040  
Lane Configuration and Traffic Control

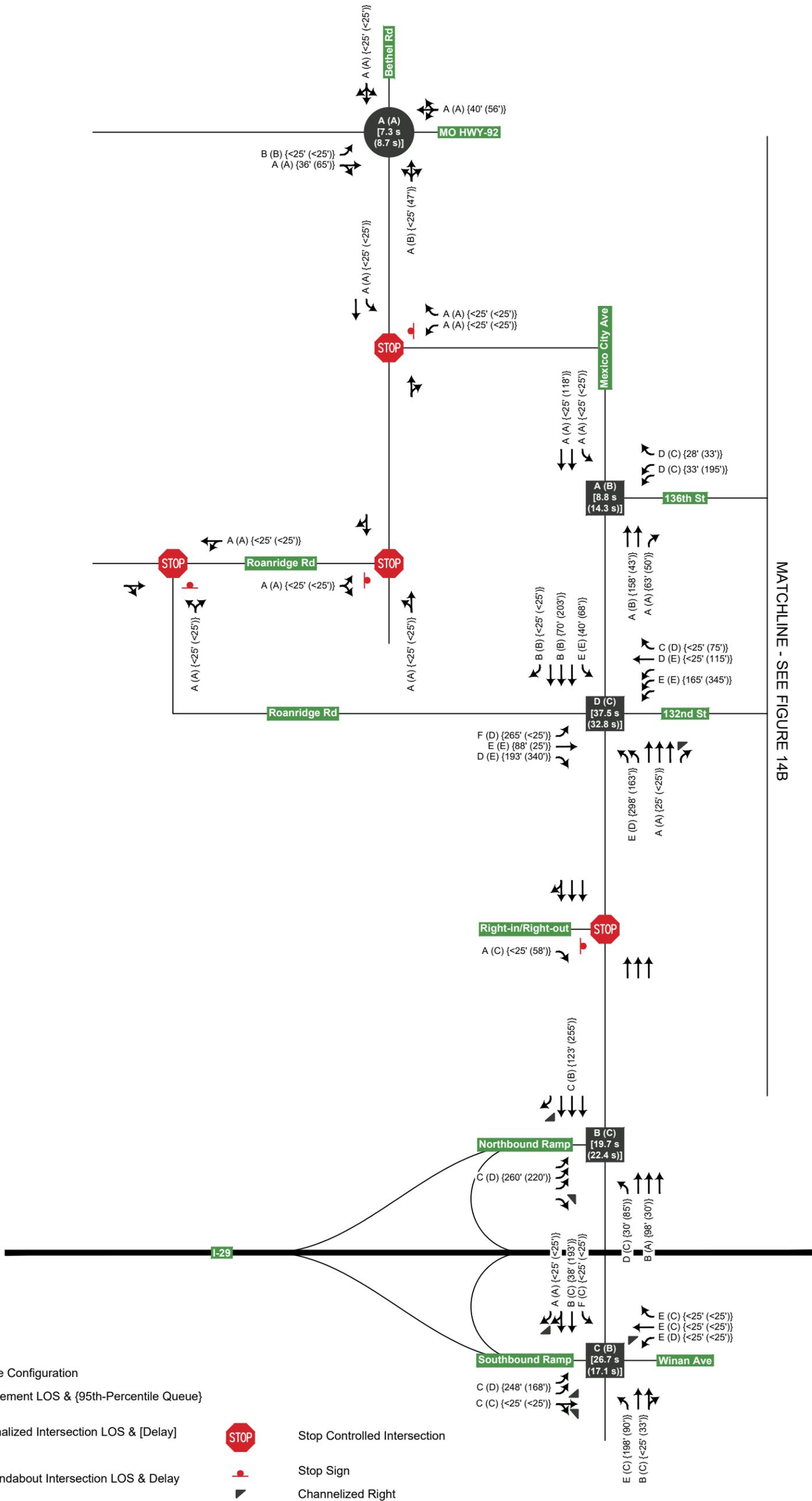


### LEGEND

- |       |  |   |                         |
|-------|--|---|-------------------------|
| xx' → | Lane Configuration & Storage Length          | ⬇ | Stop Sign               |
| xx' → | Proposed Lane Configuration & Storage Length | ◀ | Channelized Right       |
|       | Signalized Intersection                      |   | Roundabout Intersection |
|       | Stop Controlled Intersection                 |   |                         |

# FIGURE 14A

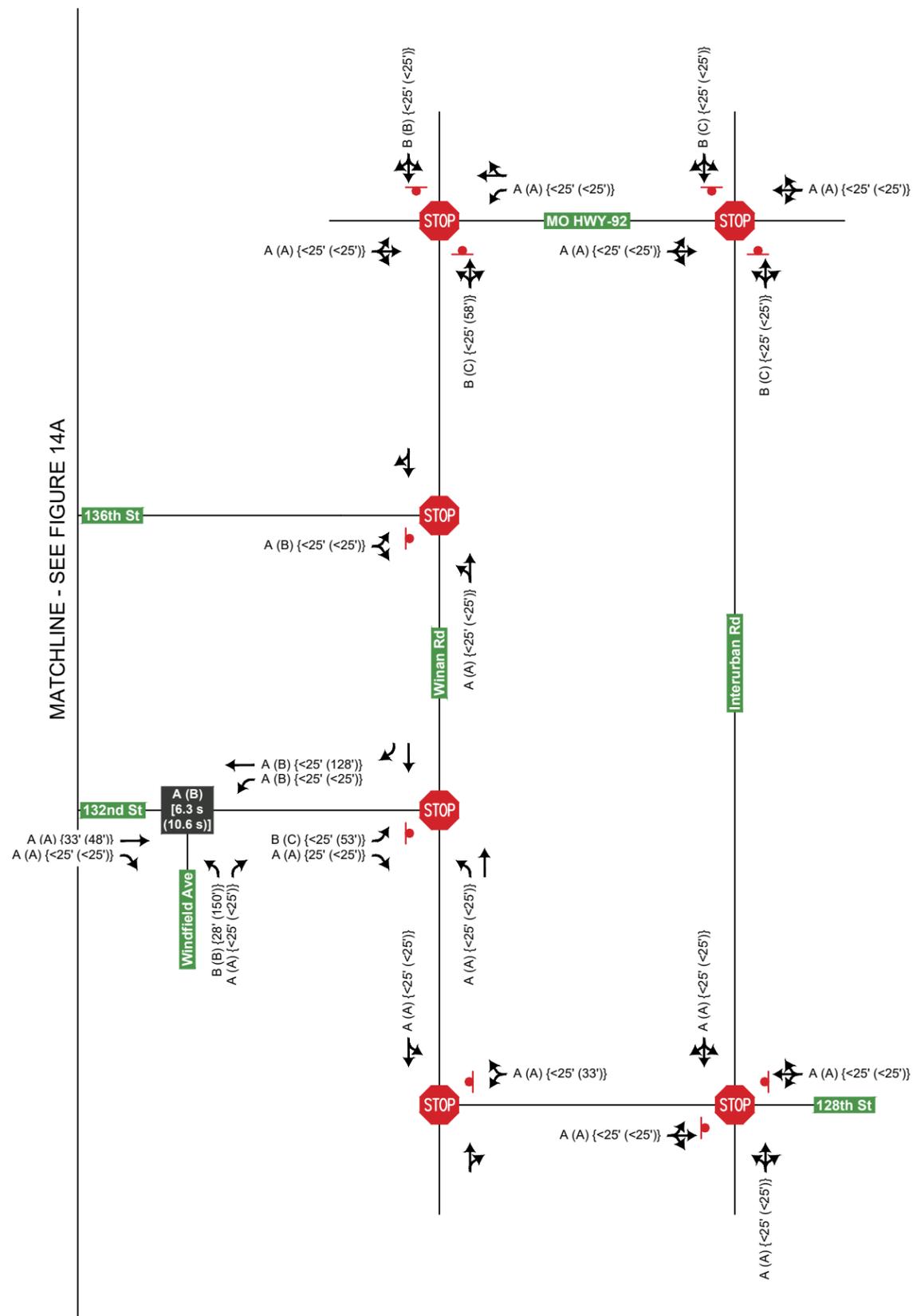
Build Year 2040  
Capacity Analysis



MATCHLINE - SEE FIGURE 14B

# FIGURE 14B

Build Year 2040  
Capacity Analysis



## LEGEND

- Lane Configuration
- AM (PM) {AM' (PM')} Movement LOS & {95th-Percentile Queue}
- C(D) [AM s] [PM s] Signalized Intersection LOS & [Delay]
- Stop Controlled Intersection
- Stop Sign

## 8. SUMMARY

This report studies the traffic impacts of the proposed KCI-29 Logistics Park multi-use development located in Kansas City, Missouri. This report is a revision to the traffic impact study submitted for this site in September 2022 and presents modifications to planned development type, development phasing, and the planned road network.

This study presents analysis of the master plan development and guidance on improvements as traffic volumes develop. It is recommended to monitor the roadway network and construct improvements as needed to support actual traffic volumes and operations.

### 8.1 Conclusions

The general findings for this traffic impact study include the following:

1. The proposed development, at full build, will represent over 18 million square feet of development. The site will support primarily industrial/warehouse land uses, with additional development including travel center, retail, restaurant and hotel uses.
  - a. For the purposes of this study, the development was considered to be constructed in phases over a fifteen-year period. As the area develops improvements to the public road network may be required. As this study is based on planned development and future growth volumes, consideration of actual volumes and operations should be considered in future year scenarios when developing improvement plans.
2. At the writing of this report, detailed development plans for each site within the KCI-29 Logistics Park was not available. As properties develop, traffic review should be conducted to evaluate proposed access locations and traffic control. KCMO or MoDOT driveway guidance should be followed when developing access spacing. Operational analysis is provided for major study intersections; operations of intersections and expected queuing should be considered when determining access locations. Access should not be located within the influence of queuing or turn bays associated with public road network intersections.

### 8.2 Recommendations

Based on review and analysis of the scenarios studied, the following improvements are recommended. Recommended improvements are based on the conditions presented in the study associated with proposed development as well as the growth of existing traffic volumes. As future year scenarios develop, additional studies should be conducted to determine if recommended improvements are needed to support the realized future year volumes. Signalization should be installed based on realized traffic volumes; the information presented in this study is based on estimates of traffic growth and development volumes.

Turn lanes should be constructed with recommended storage plus taper. Turn bay storage was determined based on analysis of each development scenario. As the road network and intersections are built, consideration should be given to constructing turn bays at the full build recommended turn bay length, as appropriate, dependent upon realized development plans.

*The following improvements are provided as guidance for a potential road network to support full build of the master plan site. These recommendations can be layered to build the network to provide acceptable operations based on realized volumes. The full build conditions represent improvements to support anticipated development and future year traffic growth; the full build of the network may not be necessary as actual operations are realized.*

### **General Recommendations (applicable to all scenarios/entirety of KCI-29 Logistics Park)**

- Dependent upon how development occurs, improvements to Bethel Road, Winan Avenue and 128<sup>th</sup> Street (potential road widening and pavement surface improvements) may be needed to support development. As individual properties develop, vehicular routing and traffic volumes on current unimproved roadways should be reviewed.
- Monitor traffic volumes and operations as development occurs within the logistics park. Adjust signal timings and/or provide signal coordination as needed.
- Monitor intersection operations. Extension of turn lane storage or alternate traffic control may be needed to support future year conditions.
- Turn lanes and traffic control should be evaluated for all drive locations as new development is proposed. Access spacing and design should follow KCMO or MoDOT guidelines.

### **8.2.1 Build Year 2028 Conditions**

- Extension of Mexico City Avenue approximately 1,500 feet north of 136<sup>th</sup> Street, ending in a cul-de-sac to service planned development to the north.

### **8.2.2 Build Year 2034 Conditions**

#### **Mexico City Avenue and I-29 Southbound Ramp**

- Monitor the southbound right-turn movement operations to determine when dual southbound right-turn lanes are needed.

#### **Mexico City Avenue and 132<sup>nd</sup> Street**

- Northbound dual left-turn lanes, 400-foot and continuous.
- Two northbound through lanes.
- 300-foot northbound right-turn lane.
- 200-foot westbound right-turn lane.

Mexico City Avenue and 136<sup>th</sup> Street

- One additional northbound through lane (two lanes total).
- Northbound through lane to terminate as a right-turn lane north of 136<sup>th</sup> Street at KCI-29 Logistics Park Lot 4 drive.
- Continue Mexico City Avenue as a three-lane section (center two-way left-turn lane) from north of 136<sup>th</sup> Street (north of the Lot 4 drive) to Bethel Avenue. Two southbound through lanes along Mexico City Avenue at the intersection with 136<sup>th</sup> Street.
- Dual westbound left turn lanes
- 300-foot westbound right turn lane

Mexico City Avenue and Bethel Road

- Provide separate westbound left-turn and right-turn lanes.
- 200-foot southbound left-turn lane.

136<sup>th</sup> Street and Winan Avenue

- The eastbound approach should be a separate left and right-turn.
- 200-foot northbound left-turn lane.

**8.2.3 Build Year 2040 Conditions**Mexico City Avenue and I-29 Southbound Ramp

- Provide dual southbound right-turn lanes. Convert one southbound through lane to a shared through/right-turn lane to support the improvement.

Mexico City Avenue and I-29 Northbound Ramp

- 420-foot triple westbound left-turn lanes.

Mexico City Avenue and 132<sup>nd</sup> Street

- Triple westbound left-turn lanes, 2-500 foot lanes and 1-400 foot lane.
- Provide two eastbound through lanes along 132<sup>nd</sup> Street from Mexico City Avenue to Windfield Avenue. The northbound right-turn movement along Mexico City Avenue should be a free movement to 132<sup>nd</sup> Street.
- Provide an additional northbound through lane (three through lanes total).
- Monitor southbound queuing under future year conditions. Additional storage may be needed for the southbound left and right-turn lanes to prevent blocking by the through queue.

### 132<sup>nd</sup> Street and Windfield Avenue

- Continuous eastbound right-turn lane along 132<sup>nd</sup> Street at Winfield Avenue.
- 250-foot westbound left-turn lane.
- Provide two northbound lanes as separate dedicated left-turn and right-turn lanes. A minimum throat length of 250 feet should be provided along Windfield Avenue. Right-of-way should be preserved at the intersection to support potential dual northbound left-turn lanes. As development south of 132<sup>nd</sup> Street near Windfield Avenue occurs, needed improvements should be based on realized volumes and operations. The intersection should be monitored for signalization; signalization should be provided if dual northbound left-turn lanes are provided.

### 132<sup>nd</sup> Street and Winan Avenue

- 200-foot northbound left-turn lane.
- 200-foot southbound right-turn lane.
- 200-foot eastbound right-turn lane.
- Monitor the operations of the intersection. Operations under future year conditions are expected to be acceptable, but alternate traffic control may be needed if traffic volumes change. Alternative traffic control methods that can be considered include signalization or a roundabout. The proximity of a bridge structure south of the 132<sup>nd</sup> Street along Winan Avenue may impact the traffic control type that can be supported.

### Highway 92 and Winan Road

- 200-foot westbound left-turn lane.

# **APPENDIX A**

## Data Collection

## Turning Movement Counts

State Route 92 & North Winan Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915785, Location: 39.354388, -94.695398



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy 92 Eastbound					Hwy 92 Westbound					Winan Northbound					Winan Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	1	13	0	0	14	1	54	4	0	59	0	2	0	0	2	5	6	0	0	11	86
7:15AM	0	20	0	0	20	0	47	5	0	52	2	0	0	0	2	4	3	0	0	7	81
7:30AM	1	30	3	0	34	0	49	2	0	51	1	0	0	0	1	1	4	0	0	5	91
7:45AM	0	29	0	0	29	0	56	0	0	56	1	1	0	0	2	4	3	0	0	7	94
Hourly Total	2	92	3	0	97	1	206	11	0	218	4	3	0	0	7	14	16	0	0	30	352
8:00AM	0	18	0	0	18	0	53	1	0	54	0	1	1	0	2	6	1	0	0	7	81
8:15AM	0	21	1	0	22	0	29	3	0	32	0	0	0	0	0	6	2	0	0	8	62
8:30AM	2	17	2	0	21	0	24	2	0	26	0	0	1	0	1	2	1	0	0	3	51
8:45AM	1	18	2	0	21	0	33	2	0	35	0	0	1	0	1	1	1	0	0	2	59
Hourly Total	3	74	5	0	82	0	139	8	0	147	0	1	3	0	4	15	5	0	0	20	253
4:00PM	0	45	5	0	50	1	26	2	0	29	2	0	2	0	4	3	3	1	0	7	90
4:15PM	0	41	4	0	45	0	30	1	0	31	5	2	4	0	11	3	3	0	0	6	93
4:30PM	4	50	3	0	57	1	19	1	0	21	4	4	1	0	9	2	0	0	0	2	89
4:45PM	0	56	7	0	63	0	27	2	0	29	4	6	2	0	12	3	4	0	0	7	111
Hourly Total	4	192	19	0	215	2	102	6	0	110	15	12	9	0	36	11	10	1	0	22	383
5:00PM	0	54	7	0	61	0	32	1	0	33	5	7	1	0	13	1	0	0	0	1	108
5:15PM	0	65	3	0	68	0	32	4	0	36	3	3	1	0	7	4	0	0	0	4	115
5:30PM	2	48	6	0	56	0	28	1	0	29	3	2	1	0	6	4	2	0	0	6	97
5:45PM	0	32	3	0	35	2	25	2	0	29	2	3	3	0	8	4	2	0	0	6	78
Hourly Total	2	199	19	0	220	2	117	8	0	127	13	15	6	0	34	13	4	0	0	17	398
<b>Total</b>	<b>11</b>	<b>557</b>	<b>46</b>	<b>0</b>	<b>614</b>	<b>5</b>	<b>564</b>	<b>33</b>	<b>0</b>	<b>602</b>	<b>32</b>	<b>31</b>	<b>18</b>	<b>0</b>	<b>81</b>	<b>53</b>	<b>35</b>	<b>1</b>	<b>0</b>	<b>89</b>	<b>1386</b>
<b>% Approach</b>	1.8%	90.7%	7.5%	0%	-	0.8%	93.7%	5.5%	0%	-	39.5%	38.3%	22.2%	0%	-	59.6%	39.3%	1.1%	0%	-	-
<b>% Total</b>	0.8%	40.2%	3.3%	0%	<b>44.3%</b>	0.4%	40.7%	2.4%	0%	<b>43.4%</b>	2.3%	2.2%	1.3%	0%	<b>5.8%</b>	3.8%	2.5%	0.1%	0%	<b>6.4%</b>	-
<b>Lights</b>	10	539	45	0	<b>594</b>	5	544	31	0	<b>580</b>	30	31	18	0	<b>79</b>	52	34	1	0	<b>87</b>	1340
<b>% Lights</b>	90.9%	96.8%	97.8%	0%	<b>96.7%</b>	100%	96.5%	93.9%	0%	<b>96.3%</b>	93.8%	100%	100%	0%	<b>97.5%</b>	98.1%	97.1%	100%	0%	<b>97.8%</b>	96.7%
<b>Articulated Trucks</b>	1	4	0	0	<b>5</b>	0	4	1	0	<b>5</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	10
<b>% Articulated Trucks</b>	9.1%	0.7%	0%	0%	<b>0.8%</b>	0%	0.7%	3.0%	0%	<b>0.8%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0.7%
<b>Buses and Single-Unit Trucks</b>	0	14	1	0	<b>15</b>	0	16	1	0	<b>17</b>	2	0	0	0	<b>2</b>	1	1	0	0	<b>2</b>	36
<b>% Buses and Single-Unit Trucks</b>	0%	2.5%	2.2%	0%	<b>2.4%</b>	0%	2.8%	3.0%	0%	<b>2.8%</b>	6.3%	0%	0%	0%	<b>2.5%</b>	1.9%	2.9%	0%	0%	<b>2.2%</b>	2.6%

\*L: Left, R: Right, T: Thru, U: U-Turn

State Route 92 & North Winan Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

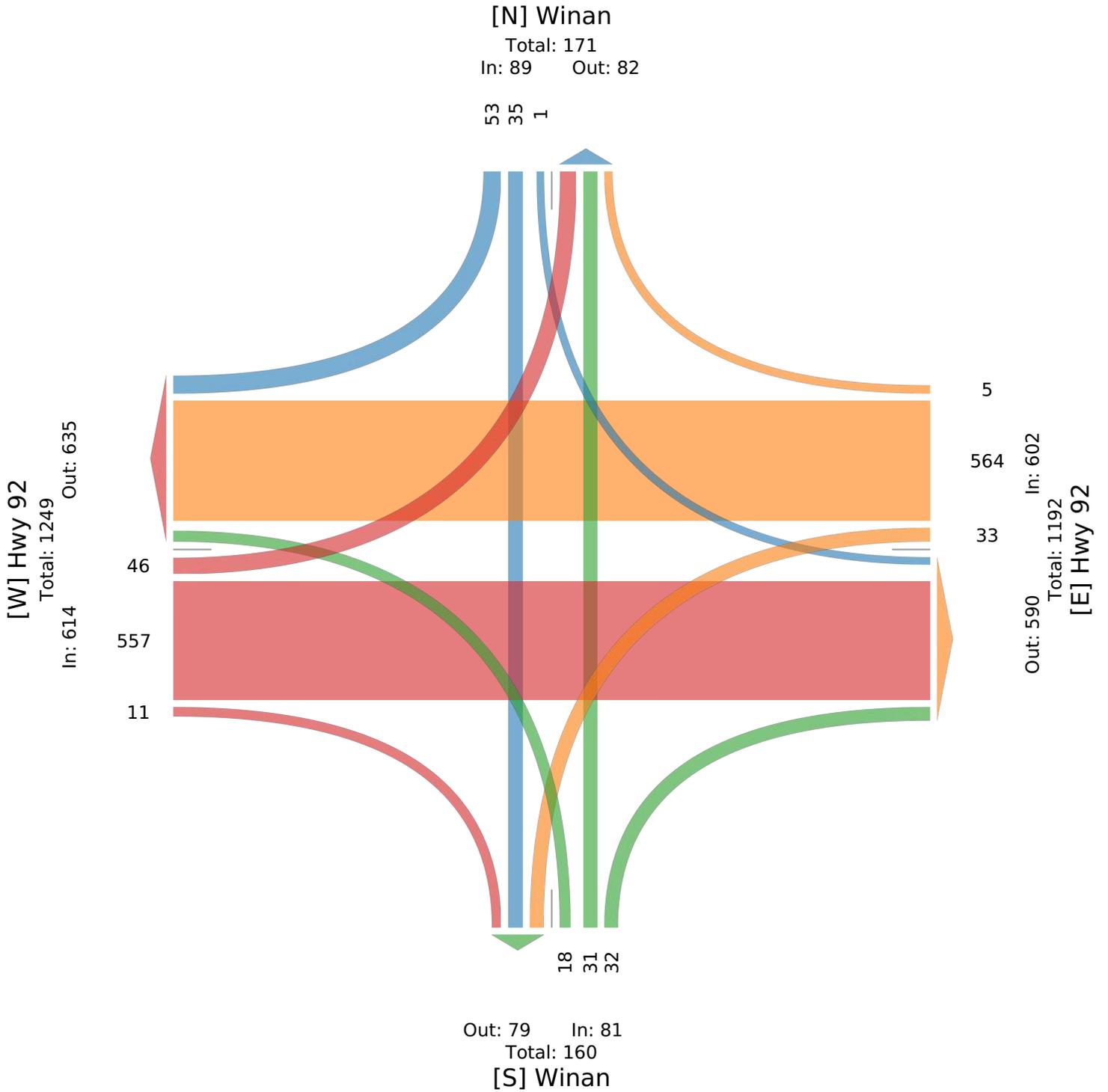
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915785, Location: 39.354388, -94.695398



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



State Route 92 & North Winan Road - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915785, Location: 39.354388, -94.695398



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy 92 Eastbound					Hwy 92 Westbound					Winan Northbound					Winan Southbound					Int	
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App		
2022-01-20 7:00AM	1	13	0	0	14	1	54	4	0	59	0	2	0	0	2	5	6	0	0	11	86	
7:15AM	0	20	0	0	20	0	47	5	0	52	2	0	0	0	2	4	3	0	0	7	81	
7:30AM	1	30	3	0	34	0	49	2	0	51	1	0	0	0	1	1	4	0	0	5	91	
7:45AM	0	29	0	0	29	0	56	0	0	56	1	1	0	0	2	4	3	0	0	7	94	
<b>Total</b>	2	92	3	0	97	1	206	11	0	218	4	3	0	0	7	14	16	0	0	30	352	
<b>% Approach</b>	2.1%	94.8%	3.1%	0%	-	0.5%	94.5%	5.0%	0%	-	57.1%	42.9%	0%	0%	-	46.7%	53.3%	0%	0%	-	-	
<b>% Total</b>	0.6%	26.1%	0.9%	0%	27.6%	0.3%	58.5%	3.1%	0%	61.9%	1.1%	0.9%	0%	0%	2.0%	4.0%	4.5%	0%	0%	8.5%	-	
<b>PHF</b>	0.500	0.767	0.250	-	0.713	0.250	0.920	0.550	-	0.924	0.500	0.375	-	-	0.875	0.700	0.667	-	-	0.682	0.936	
<b>Lights</b>	2	87	3	0	92	1	198	11	0	210	2	3	0	0	5	14	16	0	0	30	337	
<b>% Lights</b>	100%	94.6%	100%	0%	94.8%	100%	96.1%	100%	0%	96.3%	50.0%	100%	0%	0%	71.4%	100%	100%	0%	0%	100%	95.7%	
<b>Articulated Trucks</b>	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0.5%	0%	0%	0.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.3%
<b>Buses and Single-Unit Trucks</b>	0	5	0	0	5	0	7	0	0	7	2	0	0	0	2	0	0	0	0	0	14	
<b>% Buses and Single-Unit Trucks</b>	0%	5.4%	0%	0%	5.2%	0%	3.4%	0%	0%	3.2%	50.0%	0%	0%	0%	28.6%	0%	0%	0%	0%	0%	4.0%	

\* L: Left, R: Right, T: Thru, U: U-Turn

State Route 92 & North Winan Road - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

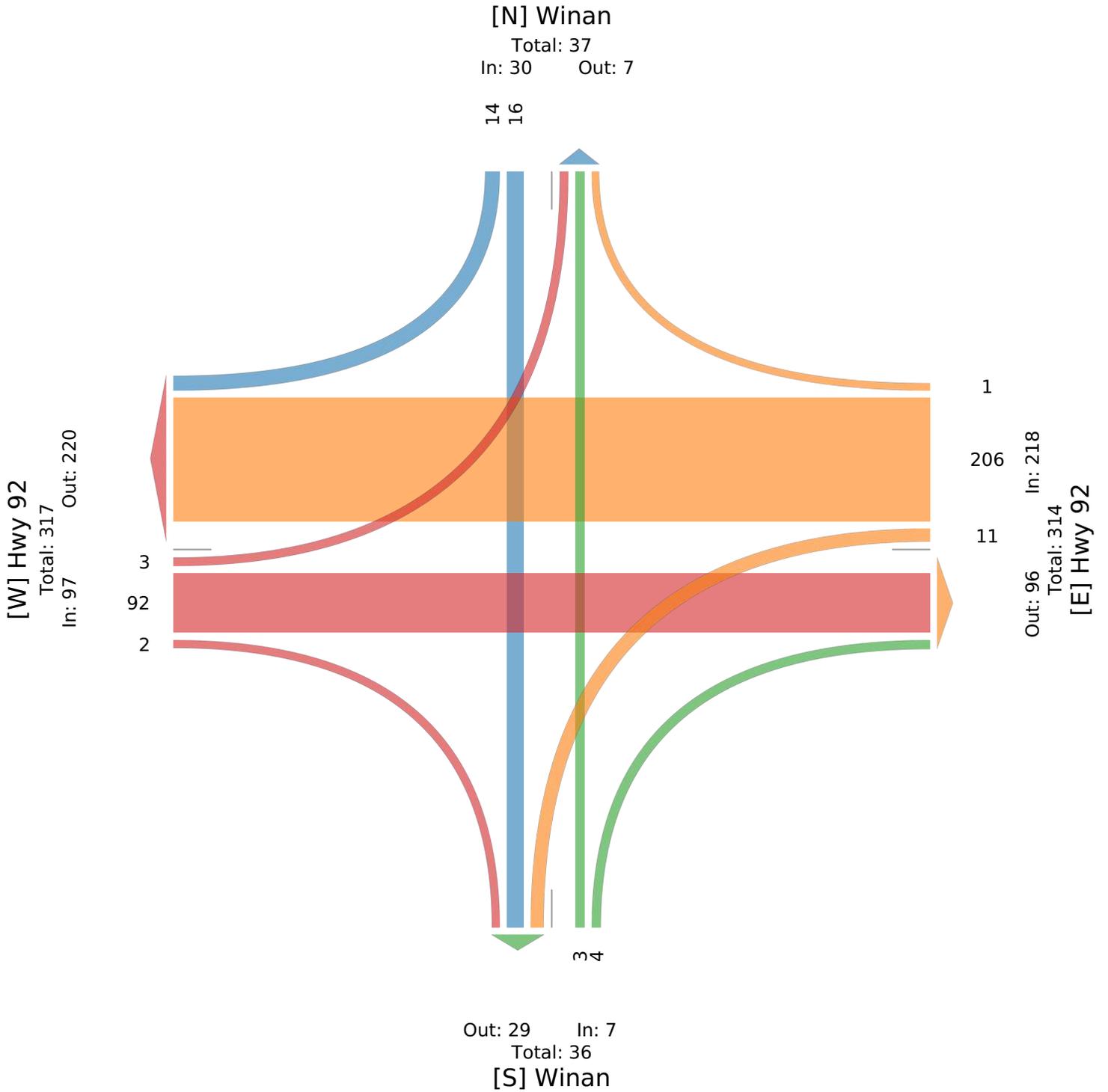
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915785, Location: 39.354388, -94.695398



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



State Route 92 & North Winan Road - TMC

Thu Jan 20, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915785, Location: 39.354388, -94.695398



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy 92 Eastbound					Hwy 92 Westbound					Winan Northbound					Winan Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 4:45PM	0	56	7	0	<b>63</b>	0	27	2	0	<b>29</b>	4	6	2	0	<b>12</b>	3	4	0	0	<b>7</b>	<b>111</b>
5:00PM	0	54	7	0	<b>61</b>	0	32	1	0	<b>33</b>	5	7	1	0	<b>13</b>	1	0	0	0	<b>1</b>	<b>108</b>
5:15PM	0	65	3	0	<b>68</b>	0	32	4	0	<b>36</b>	3	3	1	0	<b>7</b>	4	0	0	0	<b>4</b>	<b>115</b>
5:30PM	2	48	6	0	<b>56</b>	0	28	1	0	<b>29</b>	3	2	1	0	<b>6</b>	4	2	0	0	<b>6</b>	<b>97</b>
<b>Total</b>	<b>2</b>	<b>223</b>	<b>23</b>	<b>0</b>	<b>248</b>	<b>0</b>	<b>119</b>	<b>8</b>	<b>0</b>	<b>127</b>	<b>15</b>	<b>18</b>	<b>5</b>	<b>0</b>	<b>38</b>	<b>12</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>431</b>
<b>% Approach</b>	0.8%	89.9%	9.3%	0%	-	0%	93.7%	6.3%	0%	-	39.5%	47.4%	13.2%	0%	-	66.7%	33.3%	0%	0%	-	-
<b>% Total</b>	0.5%	51.7%	5.3%	0%	<b>57.5%</b>	0%	27.6%	1.9%	0%	<b>29.5%</b>	3.5%	4.2%	1.2%	0%	<b>8.8%</b>	2.8%	1.4%	0%	0%	<b>4.2%</b>	-
<b>PHF</b>	0.250	0.858	0.821	-	<b>0.912</b>	-	0.930	0.500	-	<b>0.882</b>	0.750	0.643	0.625	-	<b>0.731</b>	0.750	0.375	-	-	<b>0.643</b>	0.937
<b>Lights</b>	2	220	22	0	<b>244</b>	0	116	8	0	<b>124</b>	15	18	5	0	<b>38</b>	12	6	0	0	<b>18</b>	424
<b>% Lights</b>	100%	98.7%	95.7%	0%	<b>98.4%</b>	0%	97.5%	100%	0%	<b>97.6%</b>	100%	100%	100%	0%	<b>100%</b>	100%	100%	0%	0%	<b>100%</b>	98.4%
<b>Articulated Trucks</b>	0	2	0	0	<b>2</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	2
<b>% Articulated Trucks</b>	0%	0.9%	0%	0%	<b>0.8%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0.5%
<b>Buses and Single-Unit Trucks</b>	0	1	1	0	<b>2</b>	0	3	0	0	<b>3</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	5
<b>% Buses and Single-Unit Trucks</b>	0%	0.4%	4.3%	0%	<b>0.8%</b>	0%	2.5%	0%	0%	<b>2.4%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	1.2%

\* L: Left, R: Right, T: Thru, U: U-Turn

State Route 92 & North Winan Road - TMC

Thu Jan 20, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

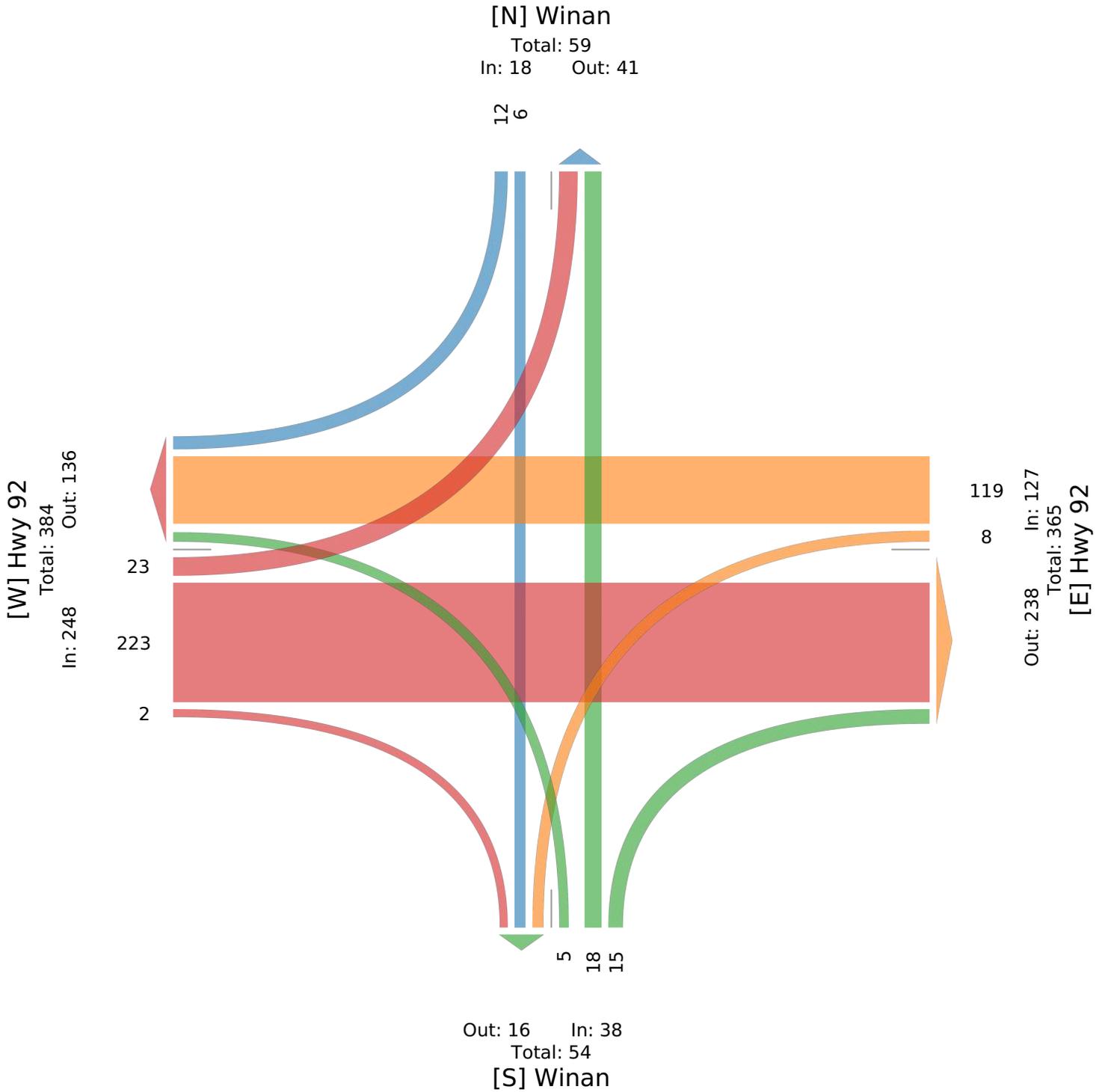
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915785, Location: 39.354388, -94.695398



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



132nd Street & North Winan Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915781, Location: 39.332314, -94.695631



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	132nd Eastbound				Winan Northbound				Winan Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 7:00AM	0	2	0	2	0	0	0	0	10	1	0	11	13
7:15AM	0	3	0	3	0	0	0	0	11	0	0	11	14
7:30AM	2	2	0	4	0	1	0	1	5	0	0	5	10
7:45AM	0	4	0	4	1	2	0	3	5	1	0	6	13
Hourly Total	2	11	0	13	1	3	0	4	31	2	0	33	50
8:00AM	0	1	0	1	0	1	0	1	1	0	0	1	3
8:15AM	0	0	0	0	0	0	0	0	4	0	0	4	4
8:30AM	1	1	0	2	0	2	0	2	5	0	0	5	9
8:45AM	1	1	0	2	0	1	0	1	3	1	0	4	7
Hourly Total	2	3	0	5	0	4	0	4	13	1	0	14	23
4:00PM	1	5	0	6	0	0	0	0	3	1	0	4	10
4:15PM	1	11	0	12	0	0	0	0	3	0	0	3	15
4:30PM	2	8	0	10	0	2	0	2	5	1	0	6	18
4:45PM	0	9	0	9	3	3	0	6	6	0	0	6	21
Hourly Total	4	33	0	37	3	5	0	8	17	2	0	19	64
5:00PM	1	12	0	13	1	1	0	2	1	0	0	1	16
5:15PM	1	8	0	9	0	2	0	2	5	0	0	5	16
5:30PM	2	6	0	8	0	1	0	1	3	1	0	4	13
5:45PM	2	10	0	12	1	0	0	1	6	0	0	6	19
Hourly Total	6	36	0	42	2	4	0	6	15	1	0	16	64
<b>Total</b>	14	83	0	97	6	16	0	22	76	6	0	82	201
<b>% Approach</b>	14.4%	85.6%	0%	-	27.3%	72.7%	0%	-	92.7%	7.3%	0%	-	-
<b>% Total</b>	7.0%	41.3%	0%	48.3%	3.0%	8.0%	0%	10.9%	37.8%	3.0%	0%	40.8%	-
<b>Lights</b>	12	80	0	92	5	15	0	20	73	5	0	78	190
<b>% Lights</b>	85.7%	96.4%	0%	94.8%	83.3%	93.8%	0%	90.9%	96.1%	83.3%	0%	95.1%	94.5%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	1	0	0	1	1
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	1.3%	0%	0%	1.2%	0.5%
<b>Buses and Single-Unit Trucks</b>	2	3	0	5	1	1	0	2	2	1	0	3	10
<b>% Buses and Single-Unit Trucks</b>	14.3%	3.6%	0%	5.2%	16.7%	6.3%	0%	9.1%	2.6%	16.7%	0%	3.7%	5.0%

\*L: Left, R: Right, T: Thru, U: U-Turn

132nd Street & North Winan Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

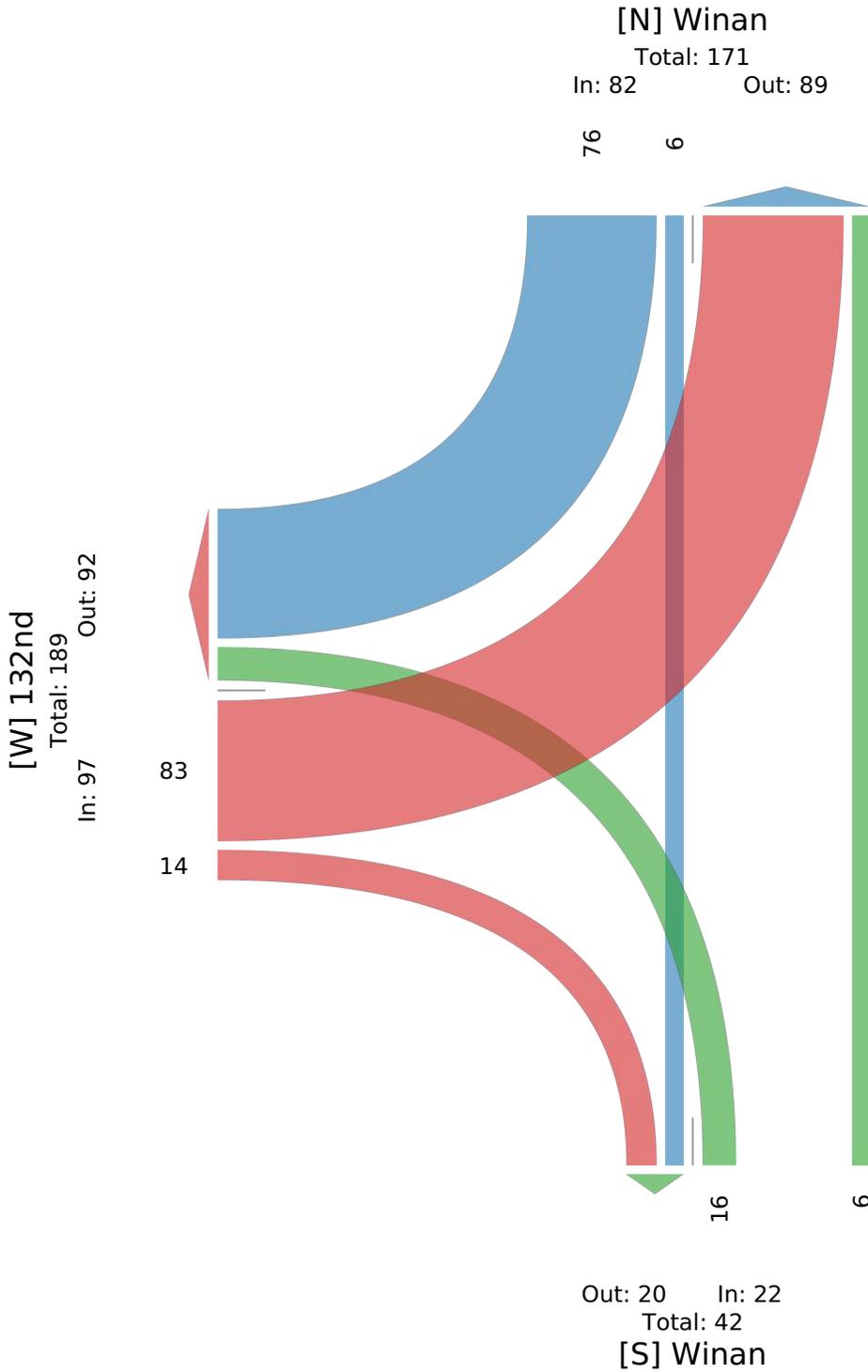
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915781, Location: 39.332314, -94.695631



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



132nd Street & North Winan Road - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915781, Location: 39.332314, -94.695631



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	132nd Eastbound				Winan Northbound				Winan Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 7:00AM	0	2	0	2	0	0	0	0	10	1	0	11	13
7:15AM	0	3	0	3	0	0	0	0	11	0	0	11	14
7:30AM	2	2	0	4	0	1	0	1	5	0	0	5	10
7:45AM	0	4	0	4	1	2	0	3	5	1	0	6	13
<b>Total</b>	2	11	0	13	1	3	0	4	31	2	0	33	50
<b>% Approach</b>	15.4%	84.6%	0%	-	25.0%	75.0%	0%	-	93.9%	6.1%	0%	-	-
<b>% Total</b>	4.0%	22.0%	0%	26.0%	2.0%	6.0%	0%	8.0%	62.0%	4.0%	0%	66.0%	-
<b>PHF</b>	0.250	0.688	-	0.813	0.250	0.375	-	0.333	0.705	0.500	-	0.750	0.893
<b>Lights</b>	0	8	0	8	0	3	0	3	31	2	0	33	44
<b>% Lights</b>	0%	72.7%	0%	61.5%	0%	100%	0%	75.0%	100%	100%	0%	100%	88.0%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	2	3	0	5	1	0	0	1	0	0	0	0	6
<b>% Buses and Single-Unit Trucks</b>	100%	27.3%	0%	38.5%	100%	0%	0%	25.0%	0%	0%	0%	0%	12.0%

\* L: Left, R: Right, T: Thru, U: U-Turn

132nd Street & North Winan Road - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

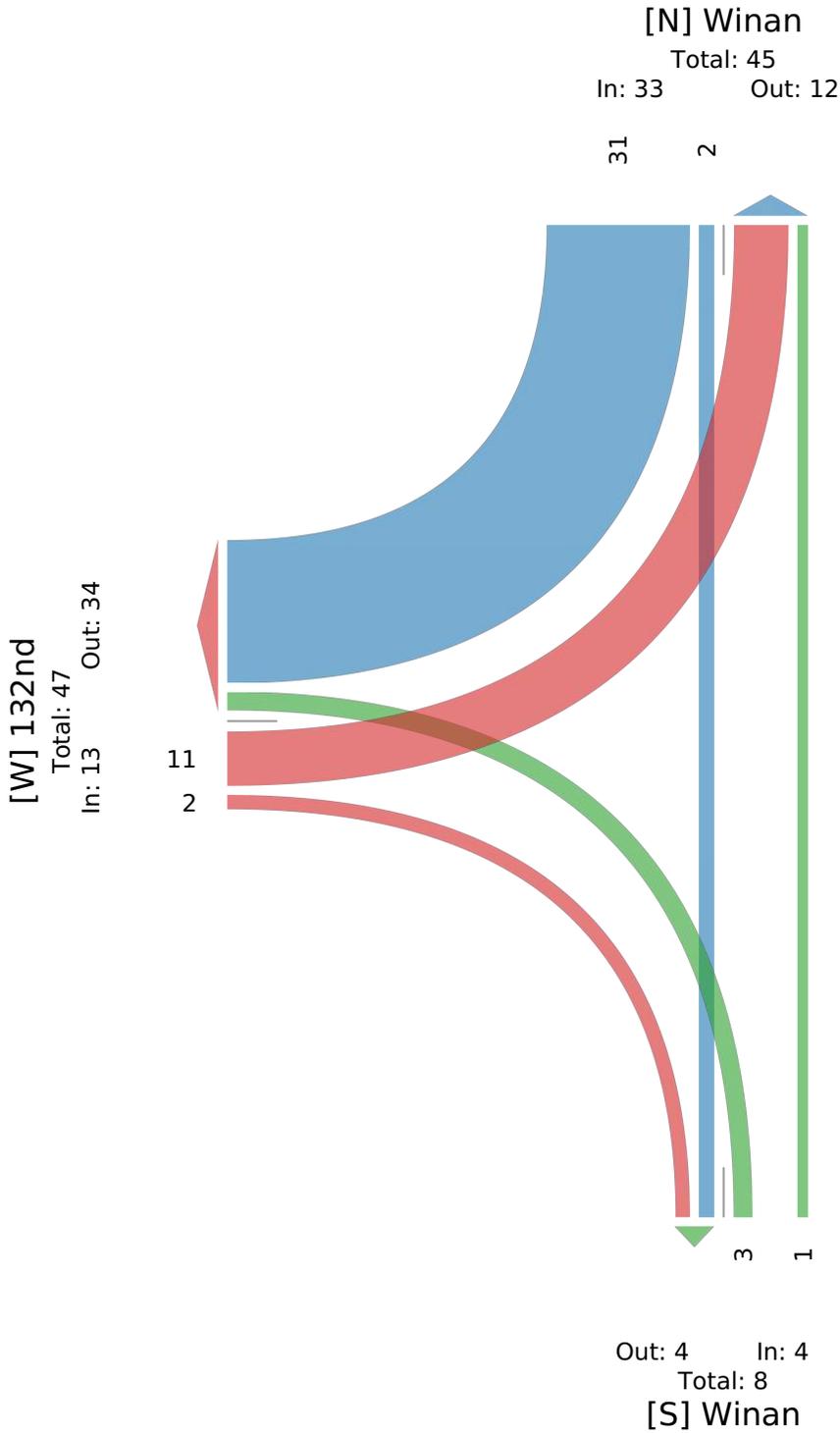
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915781, Location: 39.332314, -94.695631



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



132nd Street & North Winan Road - TMC

Thu Jan 20, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915781, Location: 39.332314, -94.695631



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	132nd Eastbound				Winan Northbound				Winan Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 4:30PM	2	8	0	10	0	2	0	2	5	1	0	6	18
4:45PM	0	9	0	9	3	3	0	6	6	0	0	6	21
5:00PM	1	12	0	13	1	1	0	2	1	0	0	1	16
5:15PM	1	8	0	9	0	2	0	2	5	0	0	5	16
<b>Total</b>	4	37	0	41	4	8	0	12	17	1	0	18	71
<b>% Approach</b>	9.8%	90.2%	0%	-	33.3%	66.7%	0%	-	94.4%	5.6%	0%	-	-
<b>% Total</b>	5.6%	52.1%	0%	57.7%	5.6%	11.3%	0%	16.9%	23.9%	1.4%	0%	25.4%	-
<b>PHF</b>	0.500	0.771	-	0.788	0.333	0.667	-	0.500	0.708	0.250	-	0.750	0.845
<b>Lights</b>	4	37	0	41	4	7	0	11	16	0	0	16	68
<b>% Lights</b>	100%	100%	0%	100%	100%	87.5%	0%	91.7%	94.1%	0%	0%	88.9%	95.8%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	1	0	0	1	1
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	5.9%	0%	0%	5.6%	1.4%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	1	0	1	0	1	0	1	2
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	12.5%	0%	8.3%	0%	100%	0%	5.6%	2.8%

\* L: Left, R: Right, T: Thru, U: U-Turn

132nd Street & North Winan Road - TMC

Thu Jan 20, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

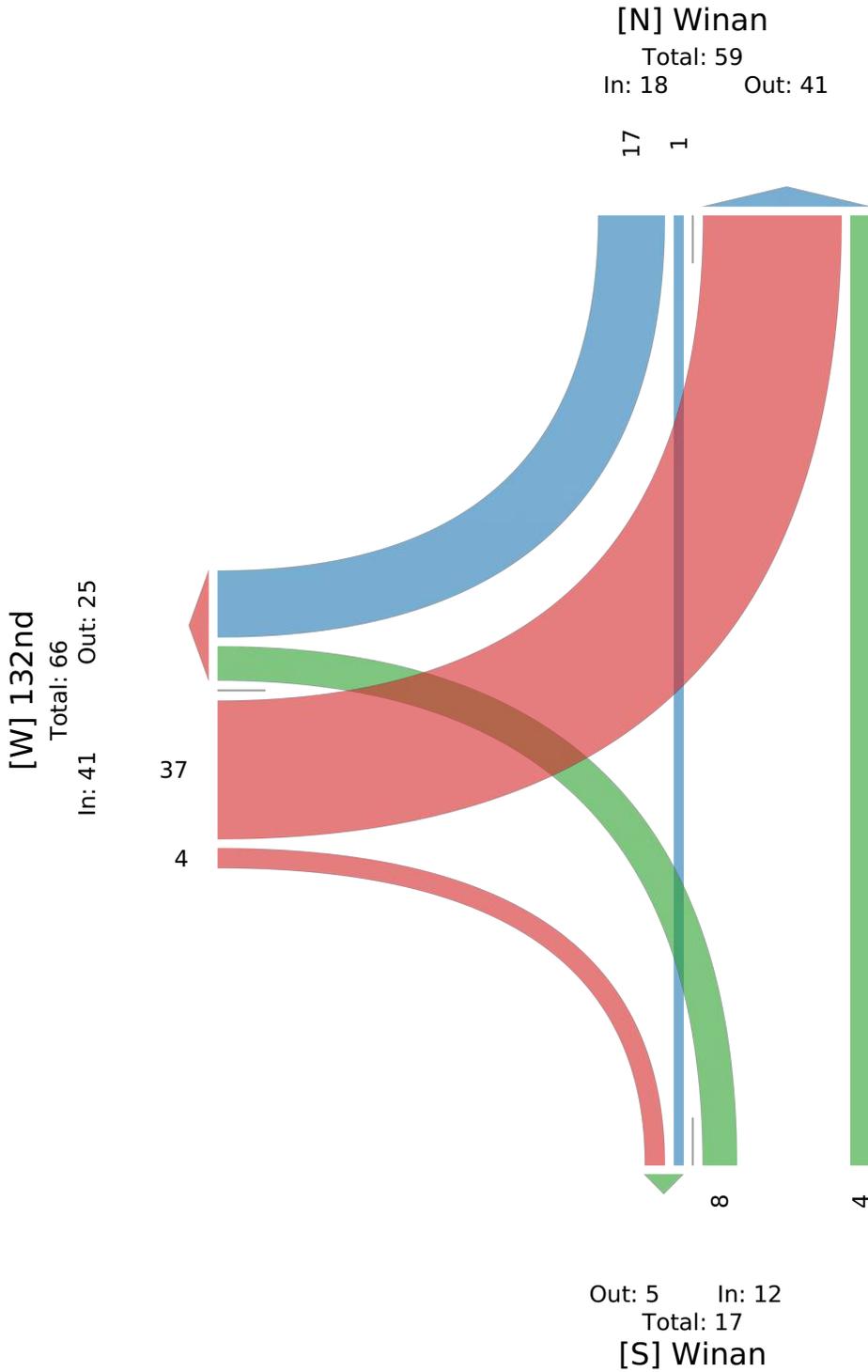
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915781, Location: 39.332314, -94.695631



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



I-29 at Mexico City Avenue EB Interchange - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915791, Location: 39.326441, -94.712127



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ramps Eastbound					Winan Ave Westbound					Mexico City Northbound					Mexico City Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	11	2	1	0	14	0	0	2	0	2	0	8	30	0	38	11	13	0	0	24	78
7:15AM	17	2	1	0	20	0	0	0	0	0	0	5	36	0	41	13	16	1	0	30	91
7:30AM	13	0	2	0	15	0	0	0	0	0	1	6	27	0	34	11	11	0	0	22	71
7:45AM	12	5	0	0	17	0	0	1	0	1	0	6	28	0	34	14	13	0	0	27	79
Hourly Total	53	9	4	0	66	0	0	3	0	3	1	25	121	0	147	49	53	1	0	103	319
8:00AM	16	1	0	0	17	0	0	1	0	1	0	4	20	0	24	3	8	0	0	11	53
8:15AM	7	3	0	0	10	1	0	1	0	2	1	9	32	0	42	5	12	0	0	17	71
8:30AM	12	1	0	0	13	0	1	0	0	1	1	10	18	0	29	7	12	0	0	19	62
8:45AM	7	1	2	0	10	1	3	0	0	4	0	4	15	0	19	6	18	0	0	24	57
Hourly Total	42	6	2	0	50	2	4	2	0	8	2	27	85	0	114	21	50	0	0	71	243
4:00PM	10	2	0	0	12	1	5	2	0	8	0	16	27	0	43	7	27	1	0	35	98
4:15PM	10	4	1	0	15	0	3	1	0	4	0	15	13	0	28	6	32	0	0	38	85
4:30PM	19	2	0	0	21	9	10	3	0	22	1	23	25	0	49	11	39	1	0	51	143
4:45PM	9	3	2	0	14	3	7	2	0	12	0	6	15	0	21	12	33	0	1	46	93
Hourly Total	48	11	3	0	62	13	25	8	0	46	1	60	80	0	141	36	131	2	1	170	419
5:00PM	9	1	1	0	11	8	9	3	0	20	2	16	28	0	46	5	36	1	0	42	119
5:15PM	9	3	2	0	14	4	5	2	0	11	1	17	25	0	43	15	35	0	0	50	118
5:30PM	9	3	0	0	12	9	10	0	0	19	0	12	29	0	41	5	28	0	0	33	105
5:45PM	5	1	0	0	6	7	11	1	0	19	2	11	25	0	38	7	34	2	0	43	106
Hourly Total	32	8	3	0	43	28	35	6	0	69	5	56	107	0	168	32	133	3	0	168	448
<b>Total</b>	175	34	12	0	221	43	64	19	0	126	9	168	393	0	570	138	367	6	1	512	1429
<b>% Approach</b>	79.2%	15.4%	5.4%	0%	-	34.1%	50.8%	15.1%	0%	-	1.6%	29.5%	68.9%	0%	-	27.0%	71.7%	1.2%	0.2%	-	-
<b>% Total</b>	12.2%	2.4%	0.8%	0%	15.5%	3.0%	4.5%	1.3%	0%	8.8%	0.6%	11.8%	27.5%	0%	39.9%	9.7%	25.7%	0.4%	0.1%	35.8%	-
<b>Lights</b>	160	34	10	0	204	43	63	19	0	125	9	153	360	0	522	133	345	6	1	485	1336
<b>% Lights</b>	91.4%	100%	83.3%	0%	92.3%	100%	98.4%	100%	0%	99.2%	100%	91.1%	91.6%	0%	91.6%	96.4%	94.0%	100%	100%	94.7%	93.5%
<b>Articulated Trucks</b>	9	0	1	0	10	0	0	0	0	0	0	10	20	0	30	1	10	0	0	11	51
<b>% Articulated Trucks</b>	5.1%	0%	8.3%	0%	4.5%	0%	0%	0%	0%	0%	0%	6.0%	5.1%	0%	5.3%	0.7%	2.7%	0%	0%	2.1%	3.6%
<b>Buses and Single-Unit Trucks</b>	6	0	1	0	7	0	1	0	0	1	0	5	13	0	18	4	12	0	0	16	42
<b>% Buses and Single-Unit Trucks</b>	3.4%	0%	8.3%	0%	3.2%	0%	1.6%	0%	0%	0.8%	0%	3.0%	3.3%	0%	3.2%	2.9%	3.3%	0%	0%	3.1%	2.9%

\*L: Left, R: Right, T: Thru, U: U-Turn

I-29 at Mexico City Avenue EB Interchange - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

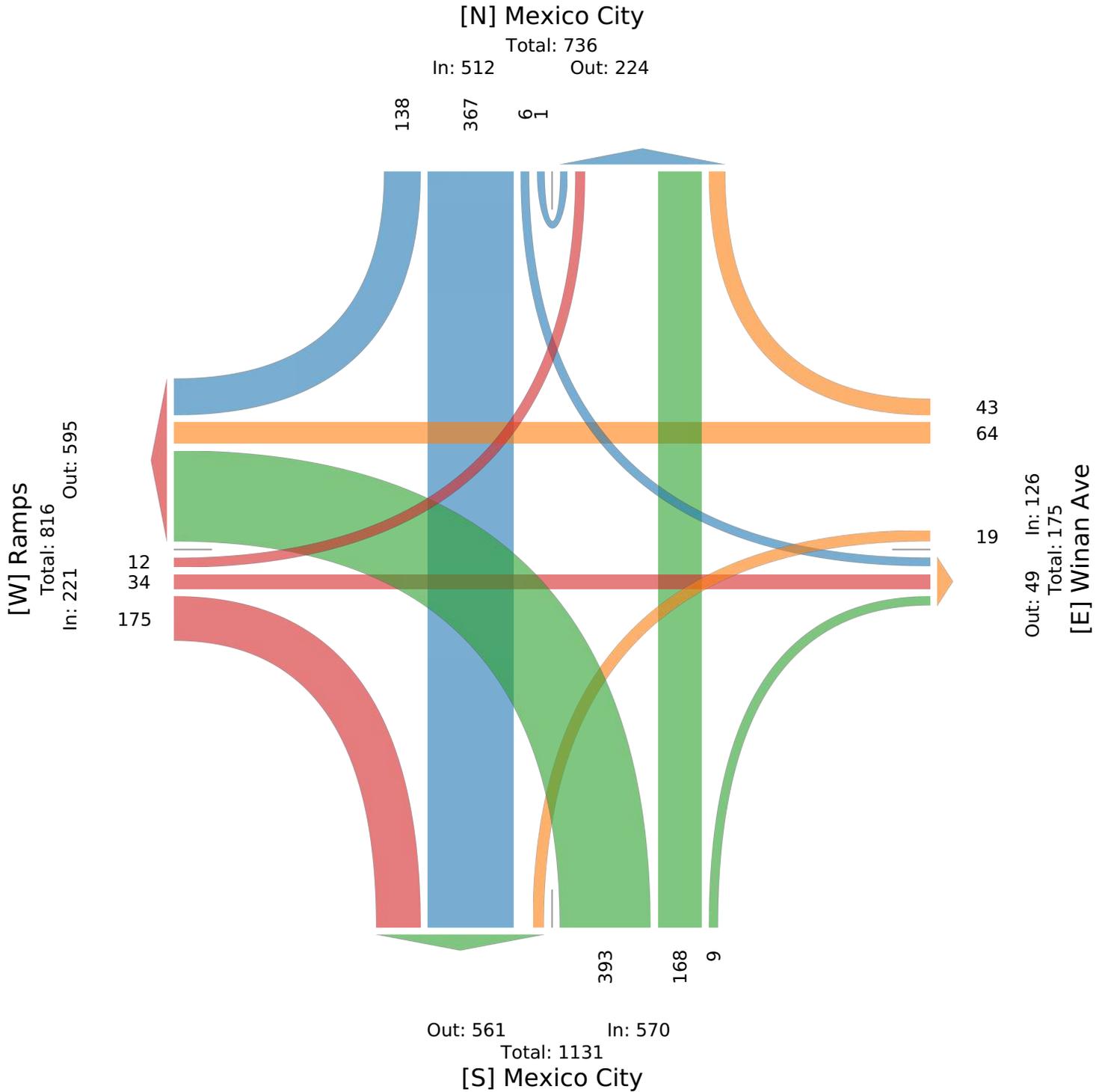
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915791, Location: 39.326441, -94.712127



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



I-29 at Mexico City Avenue EB Interchange - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915791, Location: 39.326441, -94.712127



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ramps Eastbound					Winan Ave Westbound					Mexico City Northbound					Mexico City Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	11	2	1	0	14	0	0	2	0	2	0	8	30	0	38	11	13	0	0	24	78
7:15AM	17	2	1	0	20	0	0	0	0	0	0	5	36	0	41	13	16	1	0	30	91
7:30AM	13	0	2	0	15	0	0	0	0	0	1	6	27	0	34	11	11	0	0	22	71
7:45AM	12	5	0	0	17	0	0	1	0	1	0	6	28	0	34	14	13	0	0	27	79
<b>Total</b>	53	9	4	0	66	0	0	3	0	3	1	25	121	0	147	49	53	1	0	103	319
<b>% Approach</b>	80.3%	13.6%	6.1%	0%	-	0%	0%	100%	0%	-	0.7%	17.0%	82.3%	0%	-	47.6%	51.5%	1.0%	0%	-	-
<b>% Total</b>	16.6%	2.8%	1.3%	0%	20.7%	0%	0%	0.9%	0%	0.9%	0.3%	7.8%	37.9%	0%	46.1%	15.4%	16.6%	0.3%	0%	32.3%	-
<b>PHF</b>	0.779	0.450	0.500	-	0.825	-	-	0.375	-	0.375	0.250	0.781	0.840	-	0.896	0.875	0.828	0.250	-	0.858	0.876
<b>Lights</b>	50	9	3	0	62	0	0	3	0	3	1	20	109	0	130	47	47	1	0	95	290
<b>% Lights</b>	94.3%	100%	75.0%	0%	93.9%	0%	0%	100%	0%	100%	100%	80.0%	90.1%	0%	88.4%	95.9%	88.7%	100%	0%	92.2%	90.9%
<b>Articulated Trucks</b>	3	0	0	0	3	0	0	0	0	0	0	4	10	0	14	0	4	0	0	4	21
<b>% Articulated Trucks</b>	5.7%	0%	0%	0%	4.5%	0%	0%	0%	0%	0%	0%	16.0%	8.3%	0%	9.5%	0%	7.5%	0%	0%	3.9%	6.6%
<b>Buses and Single-Unit Trucks</b>	0	0	1	0	1	0	0	0	0	0	0	1	2	0	3	2	2	0	0	4	8
<b>% Buses and Single-Unit Trucks</b>	0%	0%	25.0%	0%	1.5%	0%	0%	0%	0%	0%	0%	4.0%	1.7%	0%	2.0%	4.1%	3.8%	0%	0%	3.9%	2.5%

\* L: Left, R: Right, T: Thru, U: U-Turn

I-29 at Mexico City Avenue EB Interchange - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

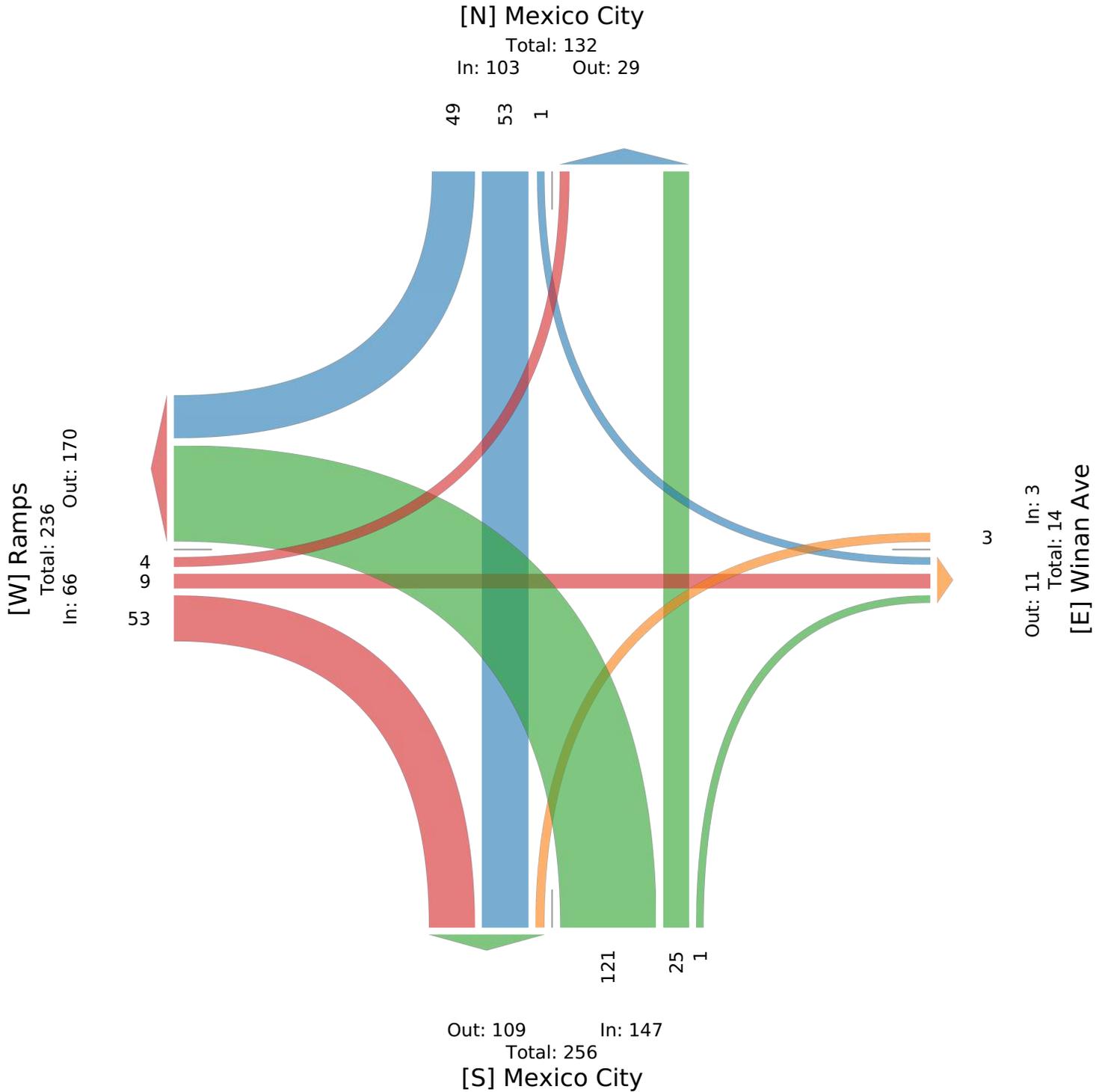
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915791, Location: 39.326441, -94.712127



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



I-29 at Mexico City Avenue EB Interchange - TMC

Thu Jan 20, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915791, Location: 39.326441, -94.712127



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ramps Eastbound					Winan Ave Westbound					Mexico City Northbound					Mexico City Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 4:30PM	19	2	0	0	21	9	10	3	0	22	1	23	25	0	49	11	39	1	0	51	143
4:45PM	9	3	2	0	14	3	7	2	0	12	0	6	15	0	21	12	33	0	1	46	93
5:00PM	9	1	1	0	11	8	9	3	0	20	2	16	28	0	46	5	36	1	0	42	119
5:15PM	9	3	2	0	14	4	5	2	0	11	1	17	25	0	43	15	35	0	0	50	118
<b>Total</b>	46	9	5	0	60	24	31	10	0	65	4	62	93	0	159	43	143	2	1	189	473
<b>% Approach</b>	76.7%	15.0%	8.3%	0%	-	36.9%	47.7%	15.4%	0%	-	2.5%	39.0%	58.5%	0%	-	22.8%	75.7%	1.1%	0.5%	-	-
<b>% Total</b>	9.7%	1.9%	1.1%	0%	12.7%	5.1%	6.6%	2.1%	0%	13.7%	0.8%	13.1%	19.7%	0%	33.6%	9.1%	30.2%	0.4%	0.2%	40.0%	-
<b>PHF</b>	0.605	0.750	0.625	-	0.714	0.667	0.775	0.833	-	0.739	0.500	0.674	0.830	-	0.811	0.717	0.917	0.500	0.250	0.926	0.827
<b>Lights</b>	39	9	5	0	53	24	31	10	0	65	4	60	89	0	153	40	137	2	1	180	451
<b>% Lights</b>	84.8%	100%	100%	0%	88.3%	100%	100%	100%	0%	100%	100%	96.8%	95.7%	0%	96.2%	93.0%	95.8%	100%	100%	95.2%	95.3%
<b>Articulated Trucks</b>	4	0	0	0	4	0	0	0	0	0	0	2	2	0	4	1	4	0	0	5	13
<b>% Articulated Trucks</b>	8.7%	0%	0%	0%	6.7%	0%	0%	0%	0%	0%	0%	3.2%	2.2%	0%	2.5%	2.3%	2.8%	0%	0%	2.6%	2.7%
<b>Buses and Single-Unit Trucks</b>	3	0	0	0	3	0	0	0	0	0	0	0	2	0	2	2	2	0	0	4	9
<b>% Buses and Single-Unit Trucks</b>	6.5%	0%	0%	0%	5.0%	0%	0%	0%	0%	0%	0%	0%	2.2%	0%	1.3%	4.7%	1.4%	0%	0%	2.1%	1.9%

\* L: Left, R: Right, T: Thru, U: U-Turn

I-29 at Mexico City Avenue EB Interchange - TMC

Thu Jan 20, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

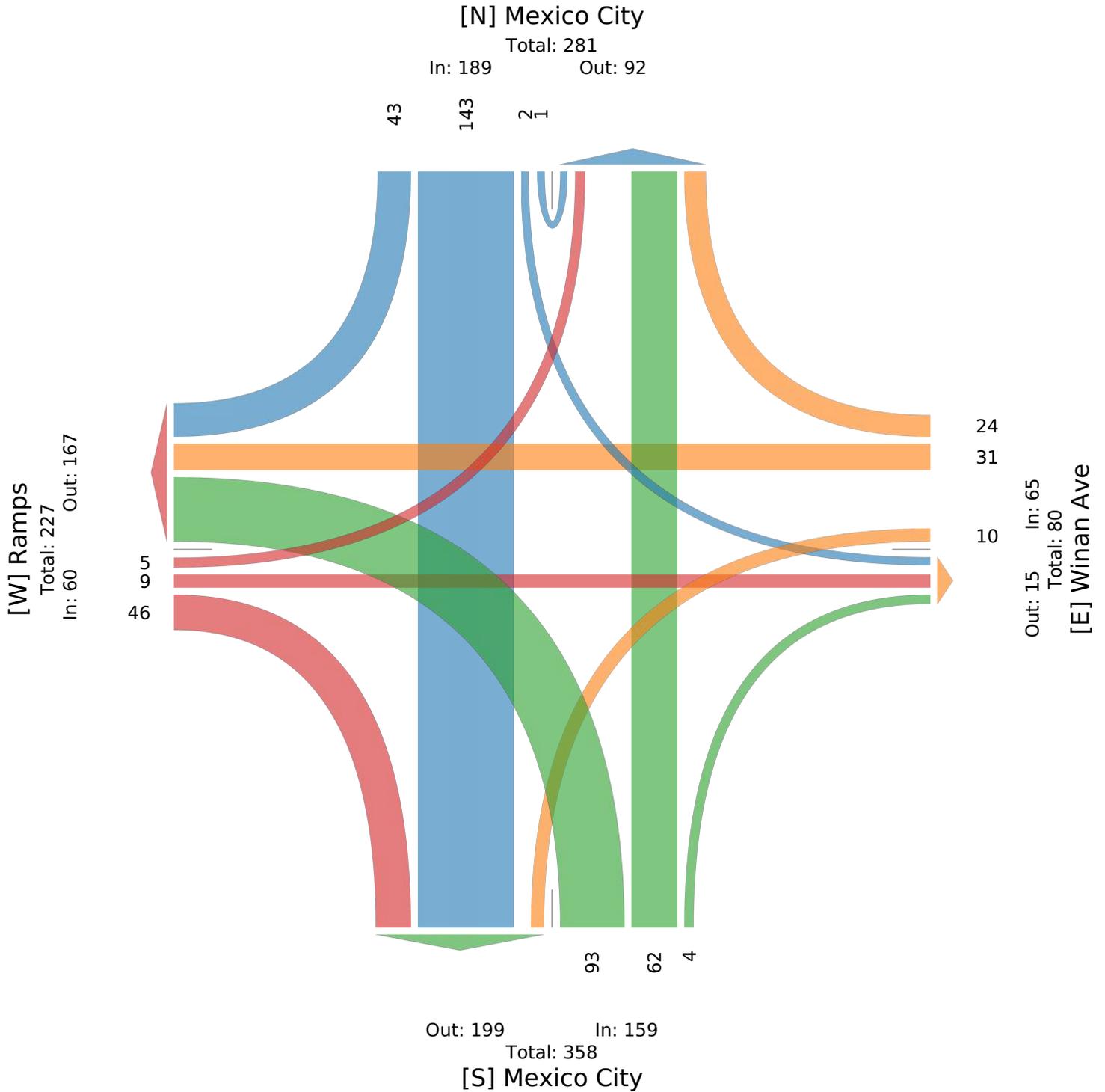
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915791, Location: 39.326441, -94.712127



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



I-29 at Mexico City Avenue WB Interchange - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915789, Location: 39.331223, -94.710706



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ramps Eastbound				Mexico City Northbound				Mexico City Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 7:00AM	9	0	0	9	2	8	0	10	1	14	0	15	34
7:15AM	18	4	0	22	2	5	0	7	0	14	0	14	43
7:30AM	11	4	0	15	2	7	0	9	1	11	0	12	36
7:45AM	11	5	0	16	3	2	1	6	1	15	0	16	38
Hourly Total	49	13	0	62	9	22	1	32	3	54	0	57	151
8:00AM	7	2	0	9	0	5	0	5	0	3	0	3	17
8:15AM	14	0	0	14	0	10	0	10	0	5	0	5	29
8:30AM	14	2	0	16	2	7	0	9	1	7	0	8	33
8:45AM	15	2	0	17	1	7	0	8	1	6	0	7	32
Hourly Total	50	6	0	56	3	29	0	32	2	21	0	23	111
4:00PM	34	13	0	47	2	15	0	17	0	3	0	3	67
4:15PM	31	17	0	48	2	12	0	14	0	5	0	5	67
4:30PM	38	8	0	46	7	25	2	34	0	10	0	10	90
4:45PM	36	12	0	48	5	8	0	13	1	12	0	13	74
Hourly Total	139	50	0	189	16	60	2	78	1	30	0	31	298
5:00PM	38	17	0	55	4	22	0	26	0	5	0	5	86
5:15PM	34	13	0	47	3	20	0	23	0	13	0	13	83
5:30PM	29	10	0	39	3	18	0	21	1	5	0	6	66
5:45PM	36	14	0	50	1	17	0	18	0	7	0	7	75
Hourly Total	137	54	0	191	11	77	0	88	1	30	0	31	310
<b>Total</b>	375	123	0	498	39	188	3	230	7	135	0	142	870
<b>% Approach</b>	75.3%	24.7%	0%	-	17.0%	81.7%	1.3%	-	4.9%	95.1%	0%	-	-
<b>% Total</b>	43.1%	14.1%	0%	57.2%	4.5%	21.6%	0.3%	26.4%	0.8%	15.5%	0%	16.3%	-
<b>Lights</b>	349	120	0	469	37	170	3	210	7	132	0	139	818
<b>% Lights</b>	93.1%	97.6%	0%	94.2%	94.9%	90.4%	100%	91.3%	100%	97.8%	0%	97.9%	94.0%
<b>Articulated Trucks</b>	10	0	0	10	0	15	0	15	0	1	0	1	26
<b>% Articulated Trucks</b>	2.7%	0%	0%	2.0%	0%	8.0%	0%	6.5%	0%	0.7%	0%	0.7%	3.0%
<b>Buses and Single-Unit Trucks</b>	16	3	0	19	2	3	0	5	0	2	0	2	26
<b>% Buses and Single-Unit Trucks</b>	4.3%	2.4%	0%	3.8%	5.1%	1.6%	0%	2.2%	0%	1.5%	0%	1.4%	3.0%

\*L: Left, R: Right, T: Thru, U: U-Turn

I-29 at Mexico City Avenue WB Interchange - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

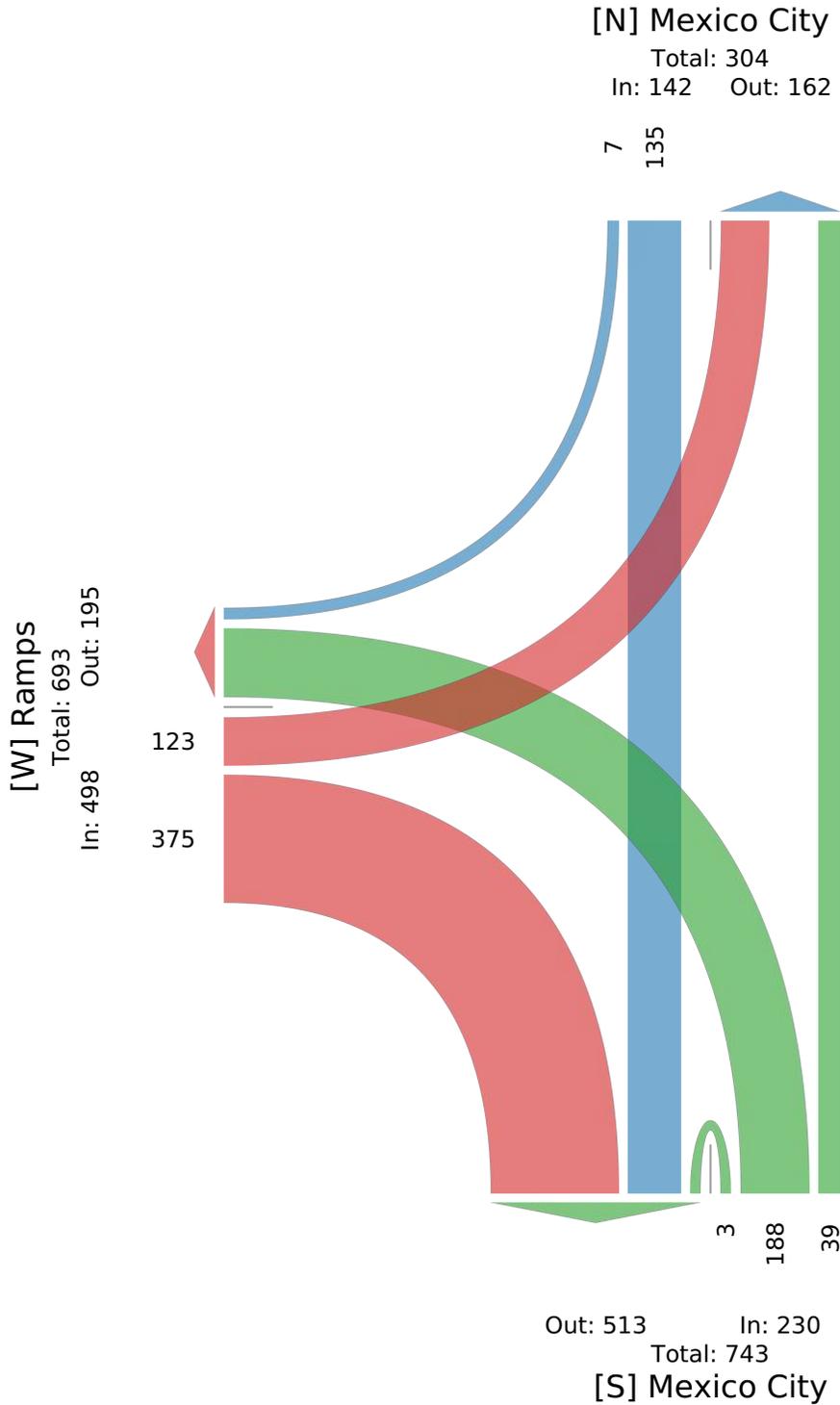
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915789, Location: 39.331223, -94.710706



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



I-29 at Mexico City Avenue WB Interchange - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915789, Location: 39.331223, -94.710706



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Ramps Eastbound				Mexico City Northbound				Mexico City Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 7:00AM	9	0	0	9	2	8	0	10	1	14	0	15	34
7:15AM	18	4	0	22	2	5	0	7	0	14	0	14	43
7:30AM	11	4	0	15	2	7	0	9	1	11	0	12	36
7:45AM	11	5	0	16	3	2	1	6	1	15	0	16	38
<b>Total</b>	49	13	0	62	9	22	1	32	3	54	0	57	151
<b>% Approach</b>	79.0%	21.0%	0%	-	28.1%	68.8%	3.1%	-	5.3%	94.7%	0%	-	-
<b>% Total</b>	32.5%	8.6%	0%	41.1%	6.0%	14.6%	0.7%	21.2%	2.0%	35.8%	0%	37.7%	-
<b>PHF</b>	0.681	0.650	-	0.705	0.750	0.688	0.250	0.800	0.750	0.900	-	0.891	0.878
<b>Lights</b>	40	11	0	51	7	16	1	24	3	54	0	57	132
<b>% Lights</b>	81.6%	84.6%	0%	82.3%	77.8%	72.7%	100%	75.0%	100%	100%	0%	100%	87.4%
<b>Articulated Trucks</b>	3	0	0	3	0	6	0	6	0	0	0	0	9
<b>% Articulated Trucks</b>	6.1%	0%	0%	4.8%	0%	27.3%	0%	18.8%	0%	0%	0%	0%	6.0%
<b>Buses and Single-Unit Trucks</b>	6	2	0	8	2	0	0	2	0	0	0	0	10
<b>% Buses and Single-Unit Trucks</b>	12.2%	15.4%	0%	12.9%	22.2%	0%	0%	6.3%	0%	0%	0%	0%	6.6%

\* L: Left, R: Right, T: Thru, U: U-Turn

I-29 at Mexico City Avenue WB Interchange - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915789, Location: 39.331223, -94.710706



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Mexico City

Total: 79

In: 57 Out: 22

3 54

[W] Ramps

Total: 87

In: 62 Out: 25

13

49

1 22 9

Out: 104

In: 32

Total: 136

[S] Mexico City

I-29 at Mexico City Avenue WB Interchange - TMC

Thu Jan 20, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915789, Location: 39.331223, -94.710706



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

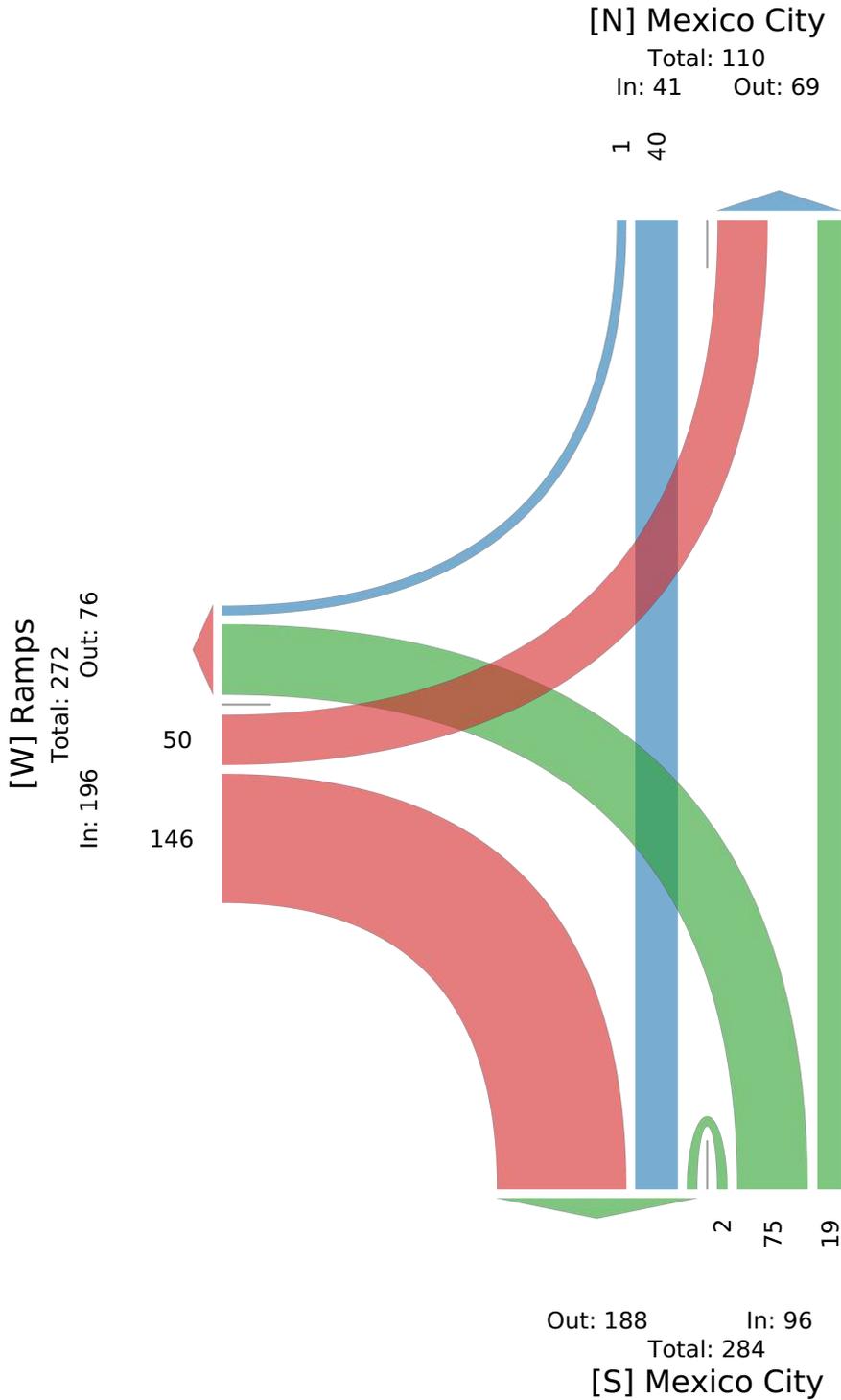
Leg Direction	Ramps Eastbound				Mexico City Northbound				Mexico City Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 4:30PM	38	8	0	46	7	25	2	34	0	10	0	10	90
4:45PM	36	12	0	48	5	8	0	13	1	12	0	13	74
5:00PM	38	17	0	55	4	22	0	26	0	5	0	5	86
5:15PM	34	13	0	47	3	20	0	23	0	13	0	13	83
<b>Total</b>	146	50	0	196	19	75	2	96	1	40	0	41	333
<b>% Approach</b>	74.5%	25.5%	0%	-	19.8%	78.1%	2.1%	-	2.4%	97.6%	0%	-	-
<b>% Total</b>	43.8%	15.0%	0%	58.9%	5.7%	22.5%	0.6%	28.8%	0.3%	12.0%	0%	12.3%	-
<b>PHF</b>	0.961	0.735	-	0.891	0.679	0.750	0.250	0.706	0.250	0.769	-	0.788	0.925
<b>Lights</b>	139	50	0	189	19	72	2	93	1	38	0	39	321
<b>% Lights</b>	95.2%	100%	0%	96.4%	100%	96.0%	100%	96.9%	100%	95.0%	0%	95.1%	96.4%
<b>Articulated Trucks</b>	5	0	0	5	0	3	0	3	0	1	0	1	9
<b>% Articulated Trucks</b>	3.4%	0%	0%	2.6%	0%	4.0%	0%	3.1%	0%	2.5%	0%	2.4%	2.7%
<b>Buses and Single-Unit Trucks</b>	2	0	0	2	0	0	0	0	0	1	0	1	3
<b>% Buses and Single-Unit Trucks</b>	1.4%	0%	0%	1.0%	0%	0%	0%	0%	0%	2.5%	0%	2.4%	0.9%

\* L: Left, R: Right, T: Thru, U: U-Turn

I-29 at Mexico City Avenue WB Interchange - TMC  
 Thu Jan 20, 2022  
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915789, Location: 39.331223, -94.710706



Provided by: Gewalt Hamilton Associates Inc.  
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Mexico City Ave & NW Roanridge Rd - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915780, Location: 39.332654, -94.710268



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Roanridge Eastbound					Roanridge Westbound					Mexico City Northbound					Dirt Road Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	4	0	0	0	4	0	0	11	0	11	2	0	0	0	2	0	0	0	0	0	17
7:15AM	4	0	0	0	4	0	0	10	0	10	3	1	2	0	6	0	0	0	0	0	20
7:30AM	6	0	0	0	6	0	0	6	0	6	4	0	2	0	6	0	0	0	0	0	18
7:45AM	7	0	0	0	7	0	0	8	0	8	3	0	4	1	8	0	0	0	0	0	23
Hourly Total	21	0	0	0	21	0	0	35	0	35	12	1	8	1	22	0	0	0	0	0	78
8:00AM	1	0	0	0	1	0	0	2	0	2	1	0	1	0	2	0	0	0	0	0	5
8:15AM	1	0	0	0	1	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	5
8:30AM	3	0	0	0	3	0	1	4	0	5	3	1	0	0	4	0	1	0	0	1	13
8:45AM	0	0	0	0	0	0	0	6	0	6	2	1	0	0	3	0	1	0	0	1	10
Hourly Total	5	0	0	0	5	0	1	16	0	17	6	2	1	0	9	0	2	0	0	2	33
4:00PM	2	0	0	0	2	0	2	1	0	3	6	0	7	0	13	0	0	0	0	0	18
4:15PM	2	0	0	0	2	0	0	3	0	3	11	0	8	0	19	0	0	0	0	0	24
4:30PM	2	0	0	0	2	0	0	7	0	7	11	0	4	0	15	0	0	0	0	0	24
4:45PM	4	0	0	0	4	0	0	8	0	8	9	0	6	1	16	0	0	0	0	0	28
Hourly Total	10	0	0	0	10	0	2	19	0	21	37	0	25	1	63	0	0	0	0	0	94
5:00PM	2	0	0	0	2	0	0	2	0	2	13	0	7	0	20	0	0	0	0	0	24
5:15PM	4	0	0	0	4	0	0	7	0	7	7	0	8	2	17	0	0	0	0	0	28
5:30PM	2	0	0	0	2	0	0	4	0	4	9	0	5	0	14	0	0	0	0	0	20
5:45PM	0	1	0	0	1	0	0	6	0	6	11	0	4	1	16	0	0	0	0	0	23
Hourly Total	8	1	0	0	9	0	0	19	0	19	40	0	24	3	67	0	0	0	0	0	95
<b>Total</b>	<b>44</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>45</b>	<b>0</b>	<b>3</b>	<b>89</b>	<b>0</b>	<b>92</b>	<b>95</b>	<b>3</b>	<b>58</b>	<b>5</b>	<b>161</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>300</b>
<b>% Approach</b>	97.8%	2.2%	0%	0%	-	0%	3.3%	96.7%	0%	-	59.0%	1.9%	36.0%	3.1%	-	0%	100%	0%	0%	-	-
<b>% Total</b>	14.7%	0.3%	0%	0%	15.0%	0%	1.0%	29.7%	0%	30.7%	31.7%	1.0%	19.3%	1.7%	53.7%	0%	0.7%	0%	0%	0.7%	-
<b>Lights</b>	43	1	0	0	44	0	2	87	0	89	92	3	57	5	157	0	2	0	0	2	292
<b>% Lights</b>	97.7%	100%	0%	0%	97.8%	0%	66.7%	97.8%	0%	96.7%	96.8%	100%	98.3%	100%	97.5%	0%	100%	0%	0%	100%	97.3%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	1.1%	0%	1.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.3%
<b>Buses and Single-Unit Trucks</b>	1	0	0	0	1	0	1	1	0	2	3	0	1	0	4	0	0	0	0	0	7
<b>% Buses and Single-Unit Trucks</b>	2.3%	0%	0%	0%	2.2%	0%	33.3%	1.1%	0%	2.2%	3.2%	0%	1.7%	0%	2.5%	0%	0%	0%	0%	0%	2.3%

\*L: Left, R: Right, T: Thru, U: U-Turn

Mexico City Ave & NW Roanridge Rd - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

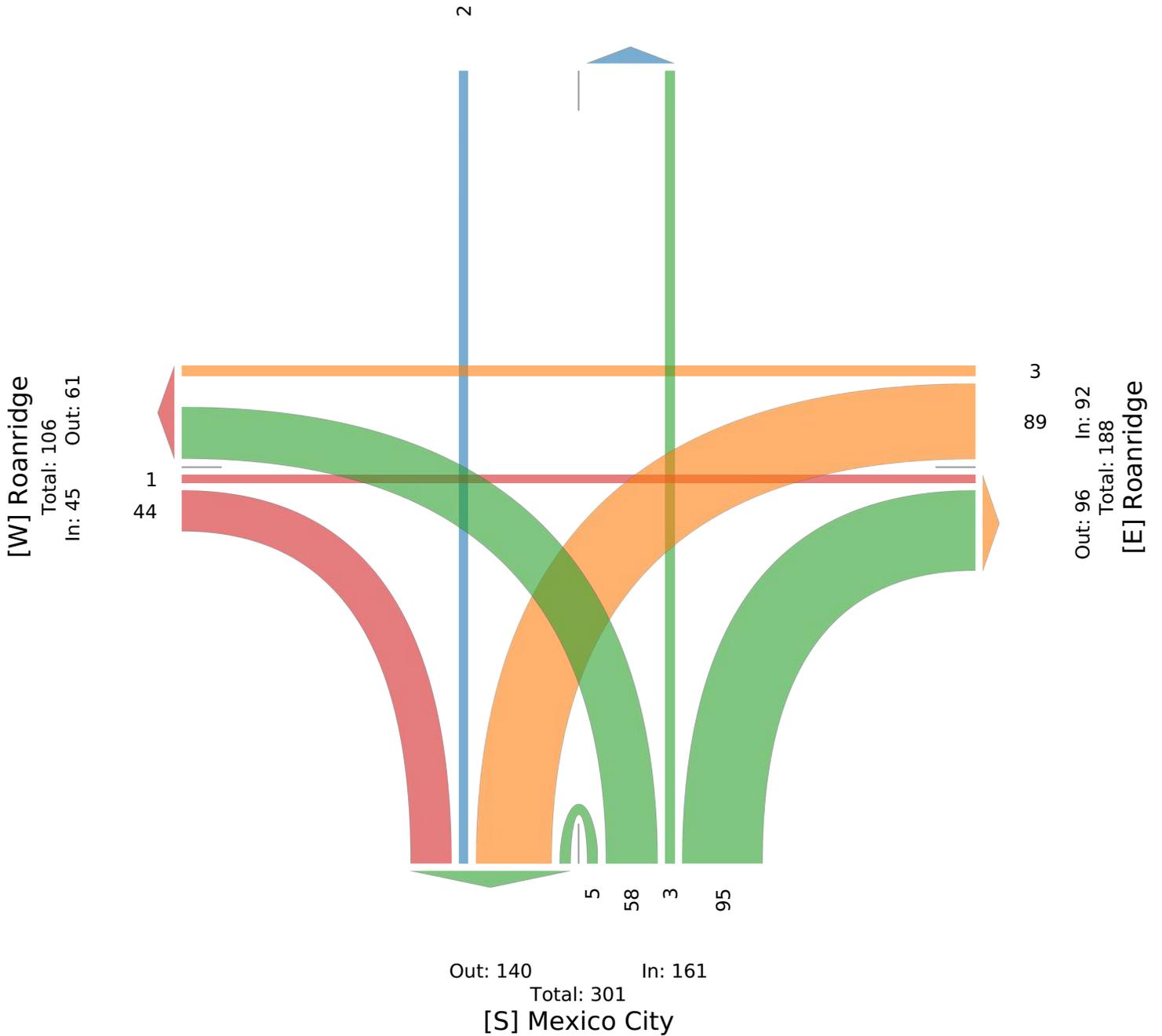
ID: 915780, Location: 39.332654, -94.710268



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Dirt Road

Total: 5  
In: 2 Out: 3



Mexico City Ave & NW Roanridge Rd - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915780, Location: 39.332654, -94.710268



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Roanridge Eastbound					Roanridge Westbound					Mexico City Northbound					Dirt Road Southbound					Int
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-01-20 7:00AM	4	0	0	0	4	0	0	11	0	11	2	0	0	0	2	0	0	0	0	0	17
7:15AM	4	0	0	0	4	0	0	10	0	10	3	1	2	0	6	0	0	0	0	0	20
7:30AM	6	0	0	0	6	0	0	6	0	6	4	0	2	0	6	0	0	0	0	0	18
7:45AM	7	0	0	0	7	0	0	8	0	8	3	0	4	1	8	0	0	0	0	0	23
<b>Total</b>	21	0	0	0	21	0	0	35	0	35	12	1	8	1	22	0	0	0	0	0	78
<b>% Approach</b>	100%	0%	0%	0%	-	0%	0%	100%	0%	-	54.5%	4.5%	36.4%	4.5%	-	0%	0%	0%	0%	-	-
<b>% Total</b>	26.9%	0%	0%	0%	26.9%	0%	0%	44.9%	0%	44.9%	15.4%	1.3%	10.3%	1.3%	28.2%	0%	0%	0%	0%	0%	-
<b>PHF</b>	0.750	-	-	-	0.750	-	-	0.795	-	0.795	0.750	0.250	0.500	0.250	0.688	-	-	-	-	-	0.848
<b>Lights</b>	21	0	0	0	21	0	0	35	0	35	9	1	8	1	19	0	0	0	0	0	75
<b>% Lights</b>	100%	0%	0%	0%	100%	0%	0%	100%	0%	100%	75.0%	100%	100%	100%	86.4%	0%	0%	0%	0%	-	96.2%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	3
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25.0%	0%	0%	0%	13.6%	0%	0%	0%	0%	-	3.8%

\* L: Left, R: Right, T: Thru, U: U-Turn

Mexico City Ave & NW Roanridge Rd - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915780, Location: 39.332654, -94.710268

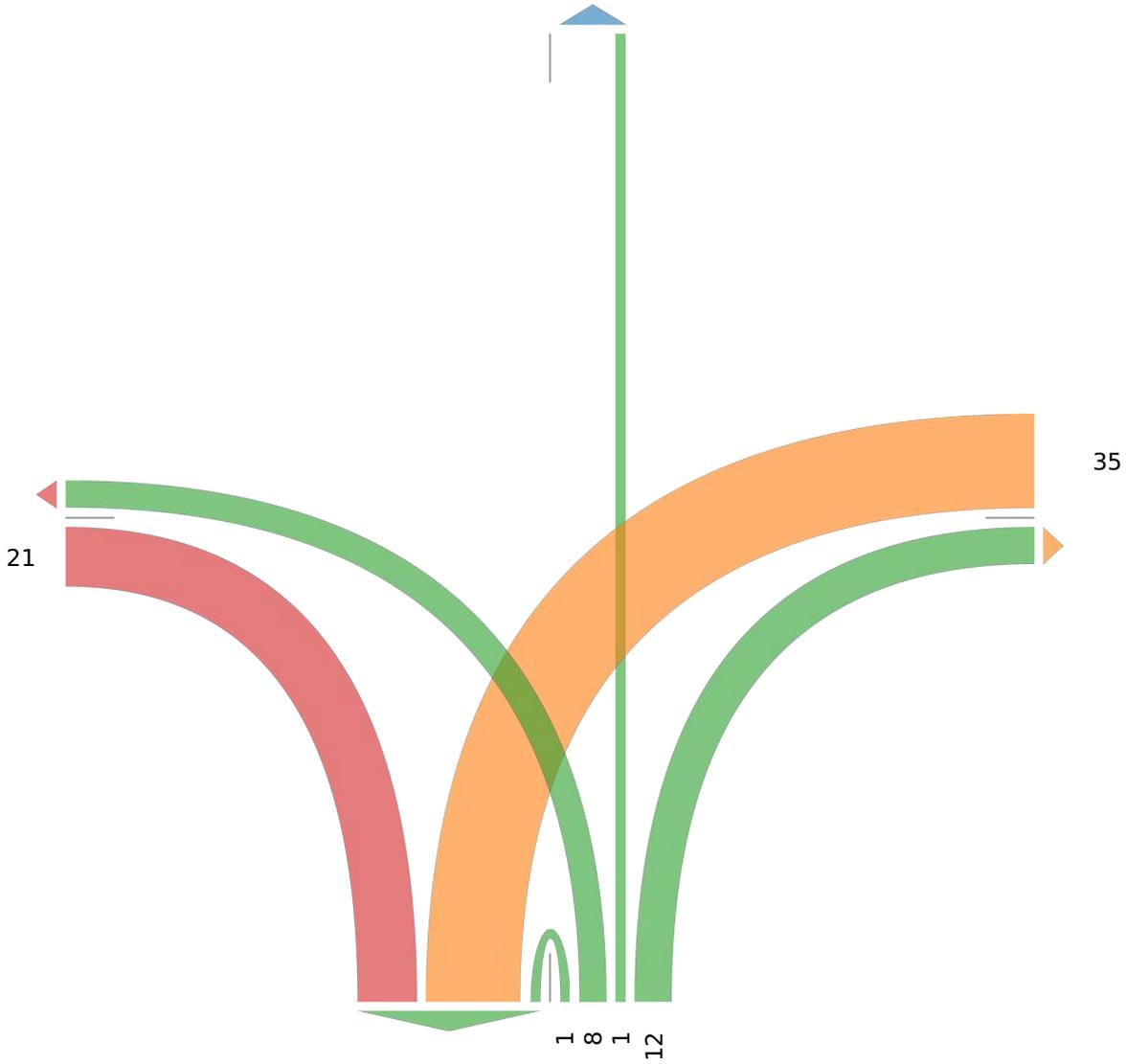


Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Dirt Road

Total: 1  
In: 0 Out: 1

[W] Roanridge  
Total: 29  
In: 21 Out: 8



[E] Roanridge  
Out: 12 In: 35  
Total: 47

Out: 57 In: 22  
Total: 79  
[S] Mexico City

Mexico City Ave & NW Roanridge Rd - TMC  
 Thu Jan 20, 2022  
 PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915780, Location: 39.332654, -94.710268



Provided by: Gewalt Hamilton Associates Inc.  
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Roanridge Eastbound					Roanridge Westbound					Mexico City Northbound					Dirt Road Southbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2022-01-20 4:30PM	2	0	0	0	2	0	0	7	0	7	11	0	4	0	15	0	0	0	0	0	24
4:45PM	4	0	0	0	4	0	0	8	0	8	9	0	6	1	16	0	0	0	0	0	28
5:00PM	2	0	0	0	2	0	0	2	0	2	13	0	7	0	20	0	0	0	0	0	24
5:15PM	4	0	0	0	4	0	0	7	0	7	7	0	8	2	17	0	0	0	0	0	28
<b>Total</b>	12	0	0	0	12	0	0	24	0	24	40	0	25	3	68	0	0	0	0	0	104
<b>% Approach</b>	100%	0%	0%	0%	-	0%	0%	100%	0%	-	58.8%	0%	36.8%	4.4%	-	0%	0%	0%	0%	-	-
<b>% Total</b>	11.5%	0%	0%	0%	11.5%	0%	0%	23.1%	0%	23.1%	38.5%	0%	24.0%	2.9%	65.4%	0%	0%	0%	0%	0%	-
<b>PHF</b>	0.750	-	-	-	0.750	-	-	0.750	-	0.750	0.769	-	0.781	0.375	0.850	-	-	-	-	-	0.929
<b>Lights</b>	12	0	0	0	12	0	0	22	0	22	40	0	25	3	68	0	0	0	0	0	102
<b>% Lights</b>	100%	0%	0%	0%	100%	0%	0%	91.7%	0%	91.7%	100%	0%	100%	100%	100%	0%	0%	0%	0%	-	98.1%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	4.2%	0%	4.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	1.0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	0%	4.2%	0%	4.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	1.0%

\* L: Left, R: Right, T: Thru, U: U-Turn

Mexico City Ave & NW Roanridge Rd - TMC

Thu Jan 20, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

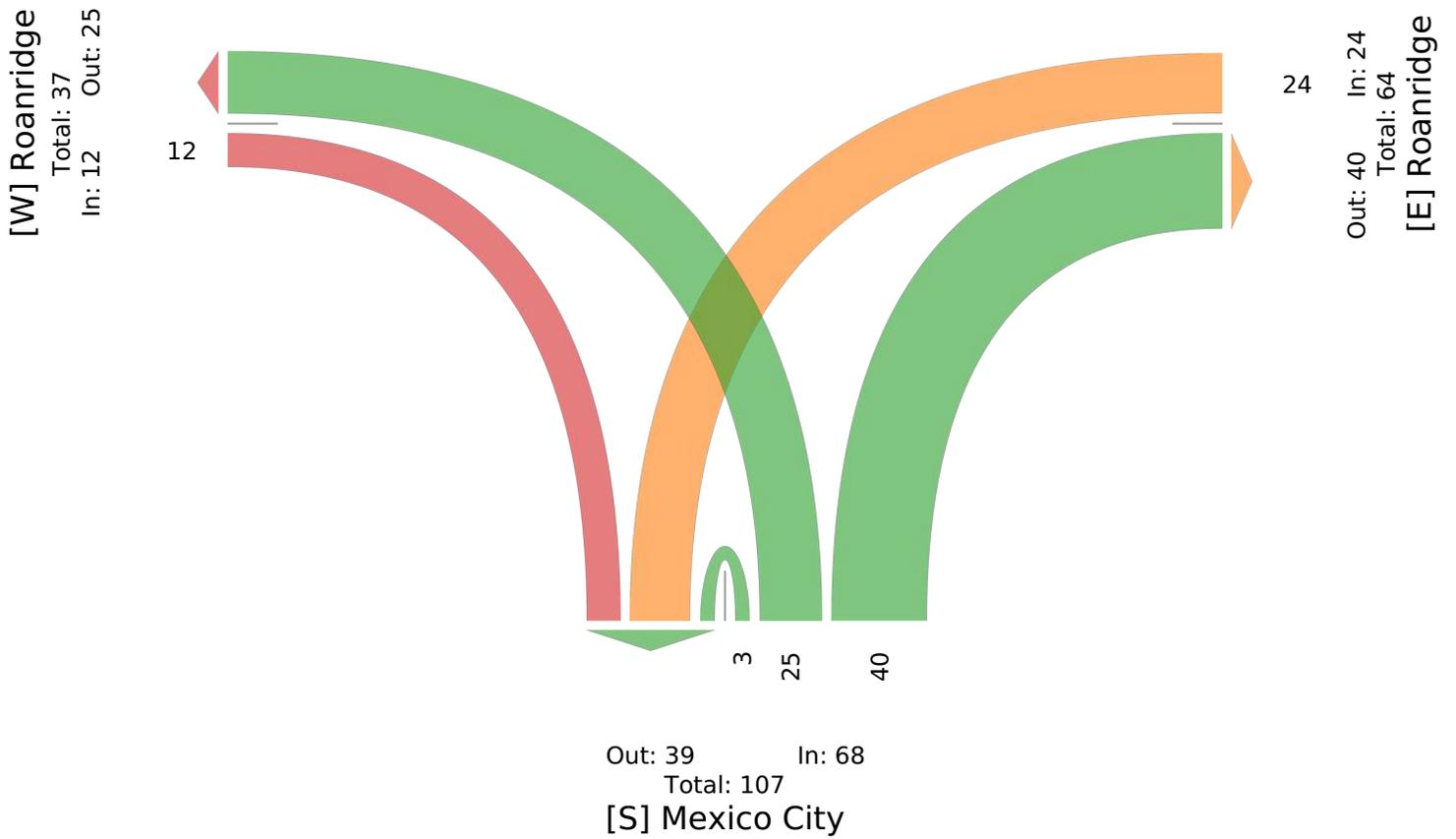
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915780, Location: 39.332654, -94.710268



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



North Bethel Avenue & Northwest Roanridge Ro... - TMC  
 Thu Jan 20, 2022  
 Full Length (7 AM-9 AM, 4 PM-6 PM)  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915787, Location: 39.340619, -94.732932

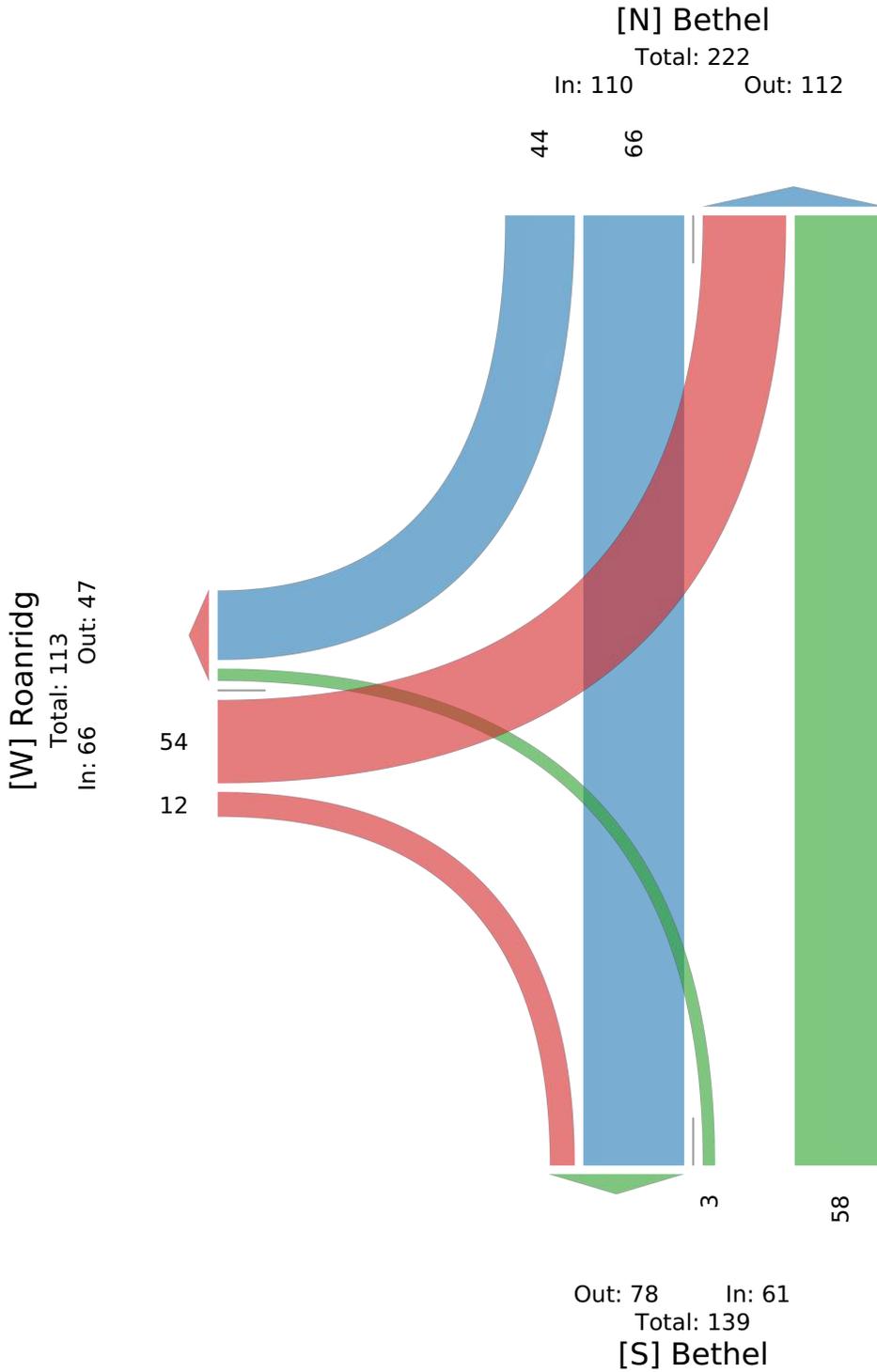


Provided by: Gewalt Hamilton Associates Inc.  
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Roanridg Eastbound				Bethel Northbound				Bethel Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 7:00AM	0	0	0	0	1	0	0	1	3	3	0	6	7
7:15AM	0	2	0	2	6	0	0	6	4	1	0	5	13
7:30AM	0	2	0	2	6	0	0	6	6	3	0	9	17
7:45AM	1	0	0	1	2	0	0	2	7	2	0	9	12
Hourly Total	1	4	0	5	15	0	0	15	20	9	0	29	49
8:00AM	0	4	0	4	2	0	0	2	1	2	0	3	9
8:15AM	0	0	0	0	0	1	0	1	1	2	0	3	4
8:30AM	1	0	0	1	2	0	0	2	2	1	0	3	6
8:45AM	0	0	0	0	2	0	0	2	0	10	0	10	12
Hourly Total	1	4	0	5	6	1	0	7	4	15	0	19	31
4:00PM	1	9	0	10	4	0	0	4	2	4	0	6	20
4:15PM	4	6	0	10	7	0	0	7	3	4	0	7	24
4:30PM	0	3	0	3	5	0	0	5	2	4	0	6	14
4:45PM	0	8	0	8	4	1	0	5	4	11	0	15	28
Hourly Total	5	26	0	31	20	1	0	21	11	23	0	34	86
5:00PM	1	5	0	6	3	0	0	3	3	6	0	9	18
5:15PM	3	6	0	9	7	0	0	7	3	5	0	8	24
5:30PM	1	4	0	5	5	0	0	5	2	6	0	8	18
5:45PM	0	5	0	5	2	1	0	3	1	2	0	3	11
Hourly Total	5	20	0	25	17	1	0	18	9	19	0	28	71
<b>Total</b>	<b>12</b>	<b>54</b>	<b>0</b>	<b>66</b>	<b>58</b>	<b>3</b>	<b>0</b>	<b>61</b>	<b>44</b>	<b>66</b>	<b>0</b>	<b>110</b>	<b>237</b>
<b>% Approach</b>	18.2%	81.8%	0%	-	95.1%	4.9%	0%	-	40.0%	60.0%	0%	-	-
<b>% Total</b>	5.1%	22.8%	0%	<b>27.8%</b>	24.5%	1.3%	0%	<b>25.7%</b>	18.6%	27.8%	0%	<b>46.4%</b>	-
<b>Lights</b>	11	53	0	<b>64</b>	58	2	0	<b>60</b>	44	63	0	<b>107</b>	231
<b>% Lights</b>	91.7%	98.1%	0%	<b>97.0%</b>	100%	66.7%	0%	<b>98.4%</b>	100%	95.5%	0%	<b>97.3%</b>	97.5%
<b>Articulated Trucks</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>	0	0	0	<b>0</b>	0
<b>% Articulated Trucks</b>	0%	0%	0%	<b>0%</b>	0%	0%	0%	<b>0%</b>	0%	0%	0%	<b>0%</b>	0%
<b>Buses and Single-Unit Trucks</b>	1	1	0	<b>2</b>	0	1	0	<b>1</b>	0	3	0	<b>3</b>	6
<b>% Buses and Single-Unit Trucks</b>	8.3%	1.9%	0%	<b>3.0%</b>	0%	33.3%	0%	<b>1.6%</b>	0%	4.5%	0%	<b>2.7%</b>	2.5%

\*L: Left, R: Right, T: Thru, U: U-Turn

North Bethel Avenue & Northwest Roanridge Ro... - TMC  
 Thu Jan 20, 2022  
 Full Length (7 AM-9 AM, 4 PM-6 PM)  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915787, Location: 39.340619, -94.732932



North Bethel Avenue & Northwest Roanridge Ro... - TMC  
 Thu Jan 20, 2022  
 AM Peak (7:15 AM - 8:15 AM)  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915787, Location: 39.340619, -94.732932

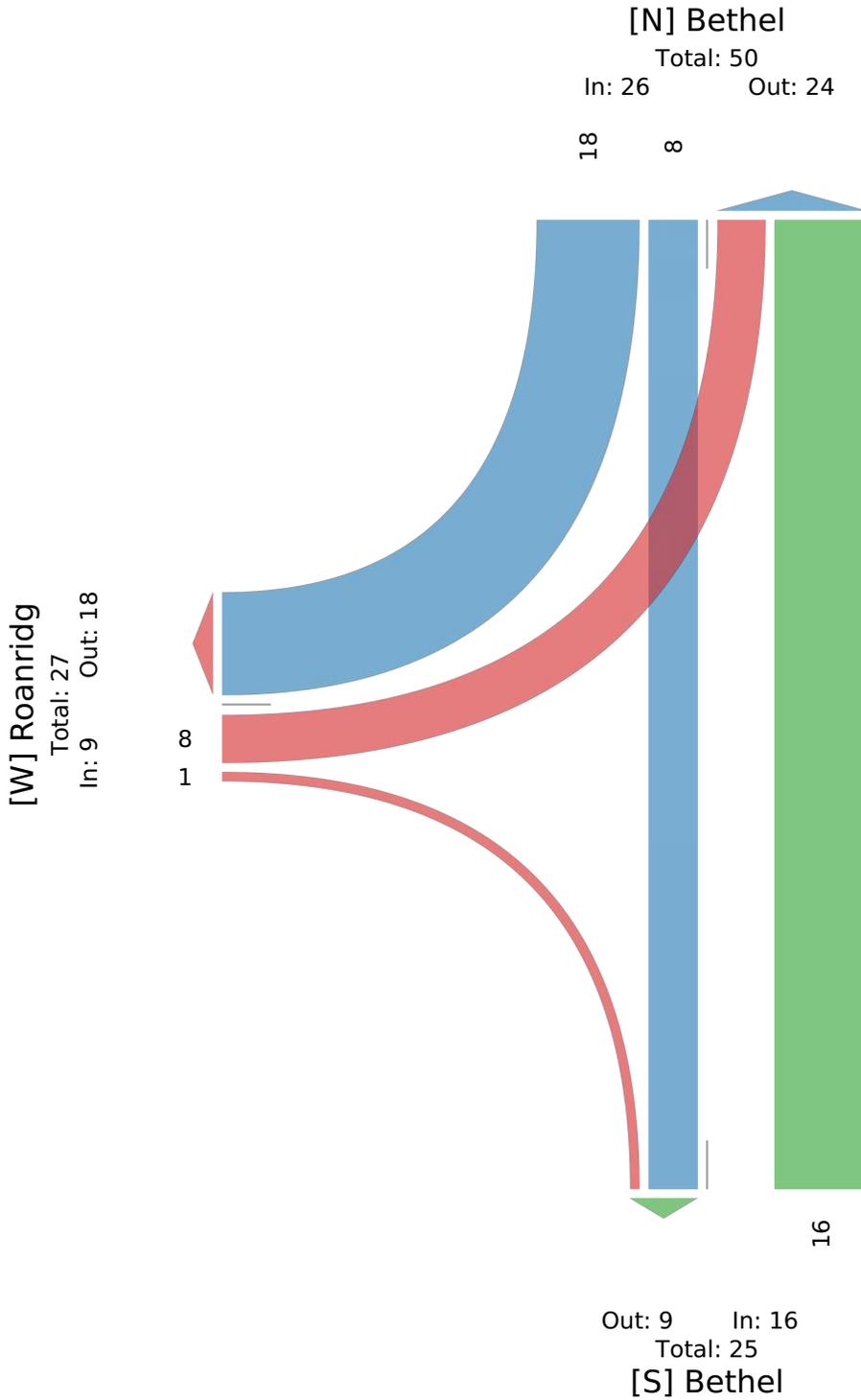


Provided by: Gewalt Hamilton Associates Inc.  
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Roanridg Eastbound				Bethel Northbound				Bethel Southbound				
Time	R	L	U	App	T	L	U	App	R	T	U	App	Int
2022-01-20 7:15AM	0	2	0	2	6	0	0	6	4	1	0	5	13
7:30AM	0	2	0	2	6	0	0	6	6	3	0	9	17
7:45AM	1	0	0	1	2	0	0	2	7	2	0	9	12
8:00AM	0	4	0	4	2	0	0	2	1	2	0	3	9
<b>Total</b>	1	8	0	9	16	0	0	16	18	8	0	26	51
<b>% Approach</b>	11.1%	88.9%	0%	-	100%	0%	0%	-	69.2%	30.8%	0%	-	-
<b>% Total</b>	2.0%	15.7%	0%	17.6%	31.4%	0%	0%	31.4%	35.3%	15.7%	0%	51.0%	-
<b>PHF</b>	0.250	0.500	-	0.563	0.667	-	-	0.667	0.643	0.667	-	0.722	0.750
<b>Lights</b>	1	8	0	9	16	0	0	16	18	7	0	25	50
<b>% Lights</b>	100%	100%	0%	100%	100%	0%	0%	100%	100%	87.5%	0%	96.2%	98.0%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	12.5%	0%	3.8%	2.0%

\* L: Left, R: Right, T: Thru, U: U-Turn

North Bethel Avenue & Northwest Roanridge Ro... - TMC  
 Thu Jan 20, 2022  
 AM Peak (7:15 AM - 8:15 AM)  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915787, Location: 39.340619, -94.732932



North Bethel Avenue & Northwest Roanridge Ro... - TMC  
 Thu Jan 20, 2022  
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915787, Location: 39.340619, -94.732932

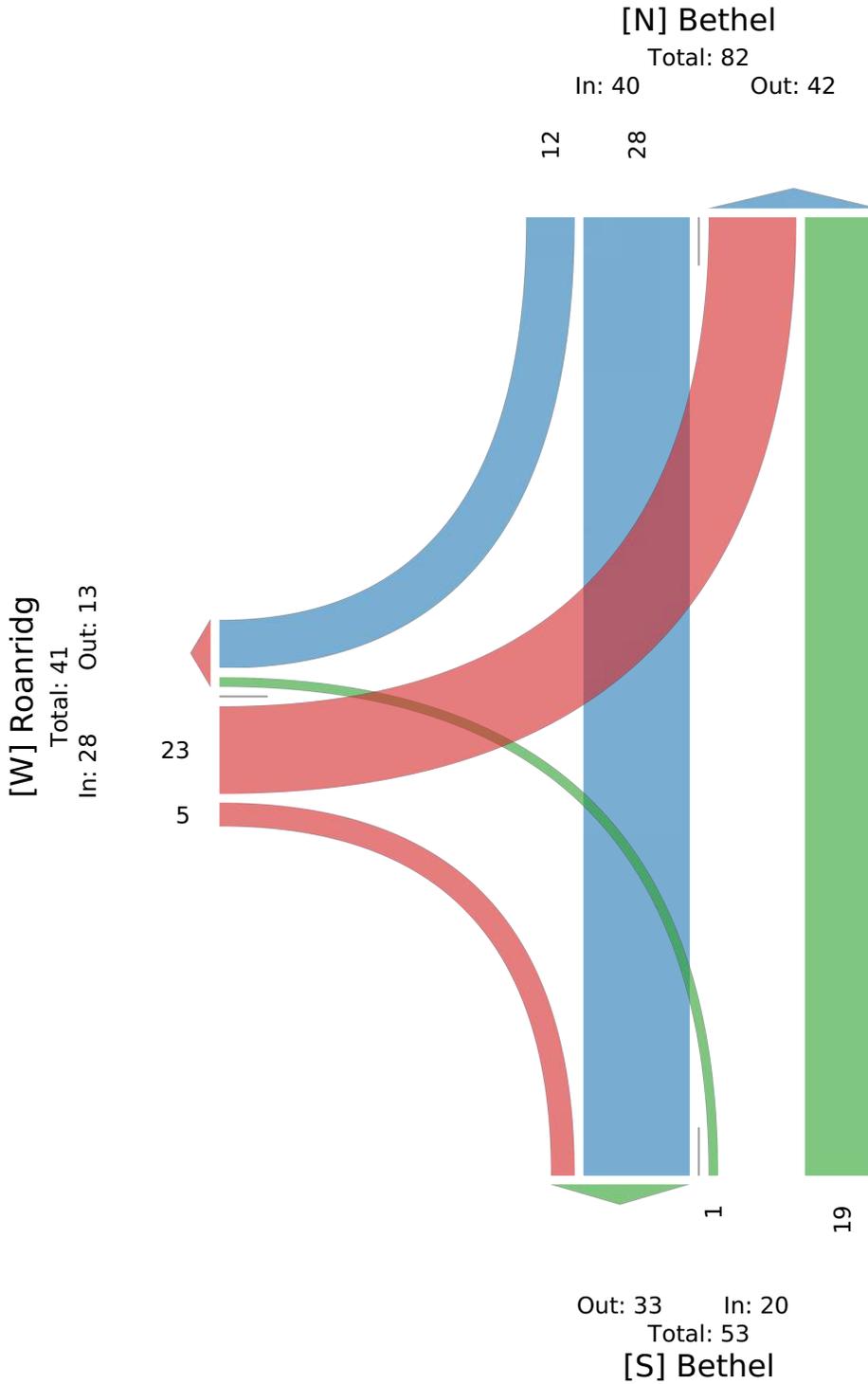


Provided by: Gewalt Hamilton Associates Inc.  
 625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Roanridg Eastbound				Bethel Northbound				Bethel Southbound				Int
	R	L	U	App	T	L	U	App	R	T	U	App	
2022-01-20 4:45PM	0	8	0	8	4	1	0	5	4	11	0	15	28
5:00PM	1	5	0	6	3	0	0	3	3	6	0	9	18
5:15PM	3	6	0	9	7	0	0	7	3	5	0	8	24
5:30PM	1	4	0	5	5	0	0	5	2	6	0	8	18
<b>Total</b>	5	23	0	28	19	1	0	20	12	28	0	40	88
<b>% Approach</b>	17.9%	82.1%	0%	-	95.0%	5.0%	0%	-	30.0%	70.0%	0%	-	-
<b>% Total</b>	5.7%	26.1%	0%	31.8%	21.6%	1.1%	0%	22.7%	13.6%	31.8%	0%	45.5%	-
<b>PHF</b>	0.417	0.719	-	0.778	0.679	0.250	-	0.714	0.750	0.636	-	0.667	0.786
<b>Lights</b>	5	23	0	28	19	1	0	20	12	27	0	39	87
<b>% Lights</b>	100%	100%	0%	100%	100%	100%	0%	100%	100%	96.4%	0%	97.5%	98.9%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	3.6%	0%	2.5%	1.1%

\* L: Left, R: Right, T: Thru, U: U-Turn

North Bethel Avenue & Northwest Roanridge Ro... - TMC  
 Thu Jan 20, 2022  
 PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour  
 All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)  
 All Movements  
 ID: 915787, Location: 39.340619, -94.732932



Northwest 128 Street & Interurban Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915783, Location: 39.325621, -94.668516



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	128th Eastbound					128th Westbound					Interurban Northbound					Interurban Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	0	1	1	0	2	1	0	0	0	1	1	0	0	0	1	0	3	4	0	7	11
7:15AM	0	0	0	0	0	0	0	2	0	2	0	2	0	0	2	0	4	2	0	6	10
7:30AM	0	0	0	0	0	1	2	2	0	5	0	0	0	0	0	0	8	3	0	11	16
7:45AM	1	0	0	0	1	2	0	1	0	3	0	1	0	0	1	0	7	0	1	8	13
Hourly Total	1	1	1	0	3	4	2	5	0	11	1	3	0	0	4	0	22	9	1	32	50
8:00AM	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	1	3	7	0	11	15
8:15AM	0	0	0	0	0	8	0	1	0	9	0	2	0	0	2	0	1	6	2	9	20
8:30AM	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	0	4	6	1	11	14
8:45AM	1	0	0	0	1	0	1	1	0	2	0	2	0	0	2	0	4	5	1	10	15
Hourly Total	1	0	0	0	1	8	4	2	0	14	0	8	0	0	8	1	12	24	4	41	64
4:00PM	1	1	1	0	3	5	1	3	0	9	2	4	0	0	6	0	3	5	1	9	27
4:15PM	0	1	1	0	2	2	0	1	0	3	1	5	0	0	6	0	7	11	0	18	29
4:30PM	0	1	1	0	2	5	2	2	0	9	0	8	0	0	8	1	5	8	0	14	33
4:45PM	0	0	0	0	0	3	2	1	0	6	1	9	2	0	12	0	1	2	0	3	21
Hourly Total	1	3	3	0	7	15	5	7	0	27	4	26	2	0	32	1	16	26	1	44	110
5:00PM	0	1	1	0	2	2	1	0	0	3	0	8	0	0	8	0	3	10	0	13	26
5:15PM	0	0	0	0	0	3	0	2	0	5	1	4	0	0	5	0	4	5	0	9	19
5:30PM	1	3	3	0	7	3	0	1	0	4	2	2	0	0	4	0	2	4	2	8	23
5:45PM	0	0	0	0	0	3	2	1	0	6	2	5	1	0	8	0	6	11	0	17	31
Hourly Total	1	4	4	0	9	11	3	4	0	18	5	19	1	0	25	0	15	30	2	47	99
<b>Total</b>	<b>4</b>	<b>8</b>	<b>8</b>	<b>0</b>	<b>20</b>	<b>38</b>	<b>14</b>	<b>18</b>	<b>0</b>	<b>70</b>	<b>10</b>	<b>56</b>	<b>3</b>	<b>0</b>	<b>69</b>	<b>2</b>	<b>65</b>	<b>89</b>	<b>8</b>	<b>164</b>	<b>323</b>
<b>% Approach</b>	20.0%	40.0%	40.0%	0%	-	54.3%	20.0%	25.7%	0%	-	14.5%	81.2%	4.3%	0%	-	1.2%	39.6%	54.3%	4.9%	-	-
<b>% Total</b>	1.2%	2.5%	2.5%	0%	<b>6.2%</b>	11.8%	4.3%	5.6%	0%	<b>21.7%</b>	3.1%	17.3%	0.9%	0%	<b>21.4%</b>	0.6%	20.1%	27.6%	2.5%	<b>50.8%</b>	-
<b>Lights</b>	4	8	8	0	<b>20</b>	38	14	16	0	<b>68</b>	10	55	3	0	<b>68</b>	2	64	89	8	<b>163</b>	319
<b>% Lights</b>	100%	100%	100%	0%	<b>100%</b>	100%	100%	88.9%	0%	<b>97.1%</b>	100%	98.2%	100%	0%	<b>98.6%</b>	100%	98.5%	100%	100%	<b>99.4%</b>	98.8%
<b>Articulated Trucks</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	0	0	0	0	<b>0</b>	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	<b>0</b>	0	0	2	0	<b>2</b>	0	1	0	0	<b>1</b>	0	1	0	0	<b>1</b>	4
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	11.1%	0%	<b>2.9%</b>	0%	1.8%	0%	0%	<b>1.4%</b>	0%	1.5%	0%	0%	<b>0.6%</b>	1.2%

\*L: Left, R: Right, T: Thru, U: U-Turn

Northwest 128 Street & Interurban Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

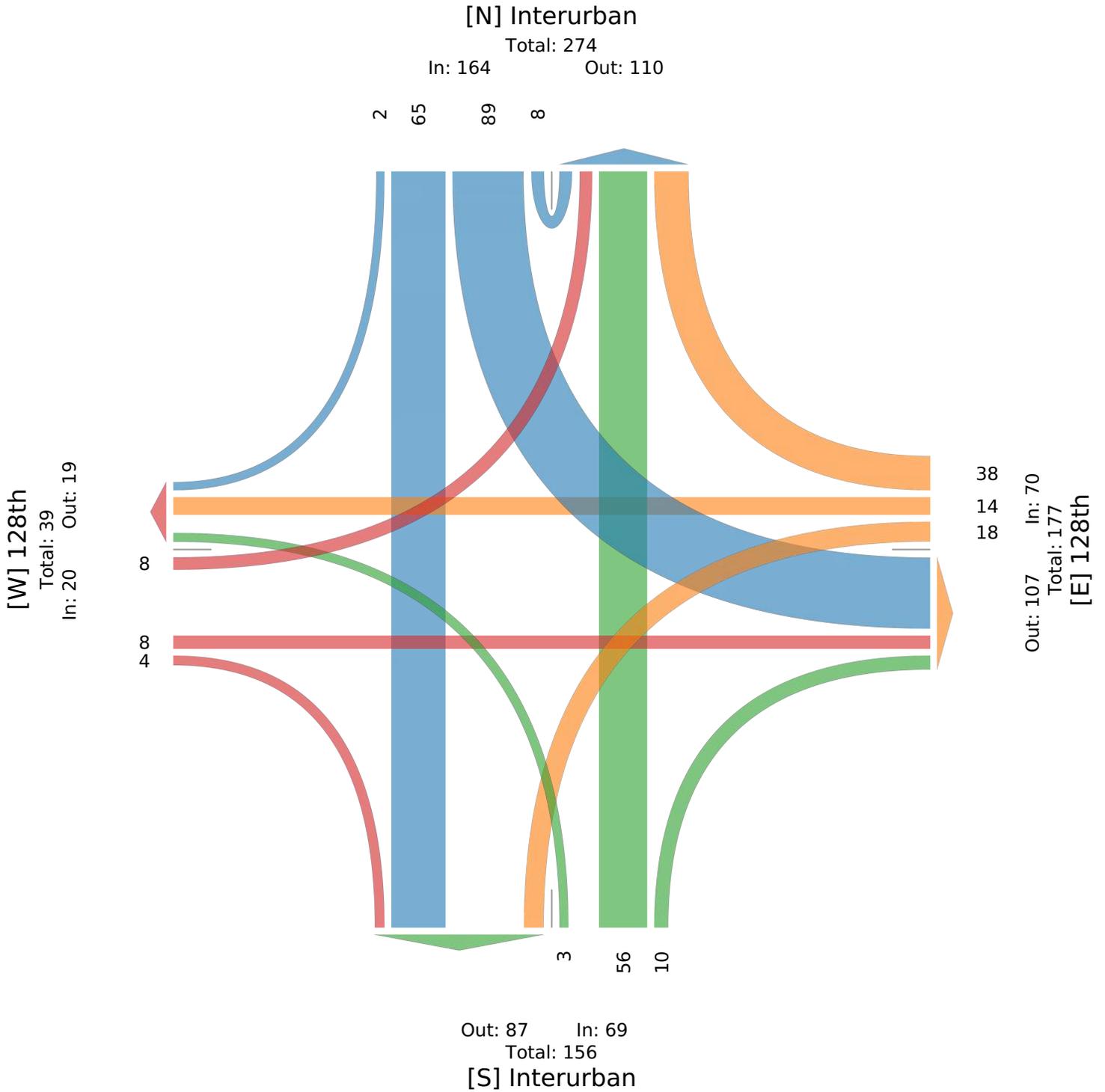
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915783, Location: 39.325621, -94.668516



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northwest 128 Street & Interurban Road - TMC

Thu Jan 20, 2022

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915783, Location: 39.325621, -94.668516



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	128th Eastbound					128th Westbound					Interurban Northbound					Interurban Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:30AM	0	0	0	0	0	1	2	2	0	5	0	0	0	0	0	0	8	3	0	11	16
7:45AM	1	0	0	0	1	2	0	1	0	3	0	1	0	0	1	0	7	0	1	8	13
8:00AM	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	1	3	7	0	11	15
8:15AM	0	0	0	0	0	8	0	1	0	9	0	2	0	0	2	0	1	6	2	9	20
<b>Total</b>	1	0	0	0	1	11	4	4	0	19	0	5	0	0	5	1	19	16	3	39	64
<b>% Approach</b>	100%	0%	0%	0%	-	57.9%	21.1%	21.1%	0%	-	0%	100%	0%	0%	-	2.6%	48.7%	41.0%	7.7%	-	-
<b>% Total</b>	1.6%	0%	0%	0%	1.6%	17.2%	6.3%	6.3%	0%	29.7%	0%	7.8%	0%	0%	7.8%	1.6%	29.7%	25.0%	4.7%	60.9%	-
<b>PHF</b>	0.250	-	-	-	0.250	0.344	0.500	0.500	-	0.528	-	0.625	-	-	0.625	0.250	0.594	0.571	0.375	0.886	0.800
<b>Lights</b>	1	0	0	0	1	11	4	3	0	18	0	4	0	0	4	1	18	16	3	38	61
<b>% Lights</b>	100%	0%	0%	0%	100%	100%	100%	75.0%	0%	94.7%	0%	80.0%	0%	0%	80.0%	100%	94.7%	100%	100%	97.4%	95.3%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	1	3
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	0%	25.0%	0%	5.3%	0%	20.0%	0%	0%	20.0%	0%	5.3%	0%	0%	2.6%	4.7%

\* L: Left, R: Right, T: Thru, U: U-Turn

Northwest 128 Street & Interurban Road - TMC

Thu Jan 20, 2022

AM Peak (7:30 AM - 8:30 AM)

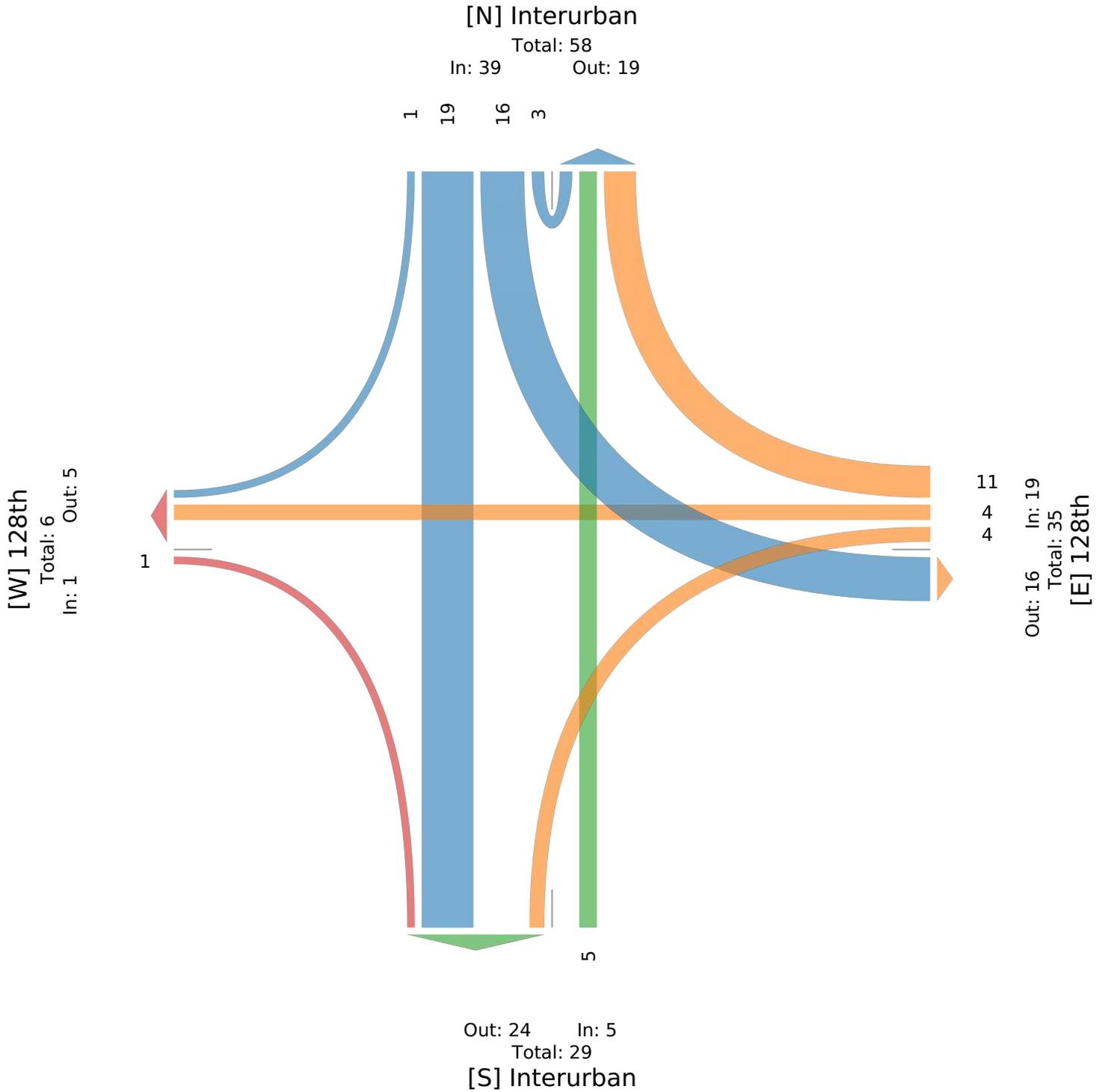
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915783, Location: 39.325621, -94.668516



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northwest 128 Street & Interurban Road - TMC

Thu Jan 20, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915783, Location: 39.325621, -94.668516



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	128th Eastbound					128th Westbound					Interurban Northbound					Interurban Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 4:00PM	1	1	1	0	3	5	1	3	0	9	2	4	0	0	6	0	3	5	1	9	27
4:15PM	0	1	1	0	2	2	0	1	0	3	1	5	0	0	6	0	7	11	0	18	29
4:30PM	0	1	1	0	2	5	2	2	0	9	0	8	0	0	8	1	5	8	0	14	33
4:45PM	0	0	0	0	0	3	2	1	0	6	1	9	2	0	12	0	1	2	0	3	21
<b>Total</b>	1	3	3	0	7	15	5	7	0	27	4	26	2	0	32	1	16	26	1	44	110
<b>% Approach</b>	14.3%	42.9%	42.9%	0%	-	55.6%	18.5%	25.9%	0%	-	12.5%	81.3%	6.3%	0%	-	2.3%	36.4%	59.1%	2.3%	-	-
<b>% Total</b>	0.9%	2.7%	2.7%	0%	6.4%	13.6%	4.5%	6.4%	0%	24.5%	3.6%	23.6%	1.8%	0%	29.1%	0.9%	14.5%	23.6%	0.9%	40.0%	-
<b>PHF</b>	0.250	0.750	0.750	-	0.583	0.750	0.625	0.583	-	0.750	0.500	0.722	0.250	-	0.667	0.250	0.571	0.591	0.250	0.611	0.833
<b>Lights</b>	1	3	3	0	7	15	5	7	0	27	4	26	2	0	32	1	16	26	1	44	110
<b>% Lights</b>	100%	100%	100%	0%	100%	100%	100%	100%	0%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

\* L: Left, R: Right, T: Thru, U: U-Turn

Northwest 128 Street & Interurban Road - TMC

Thu Jan 20, 2022

PM Peak (4 PM - 5 PM) - Overall Peak Hour

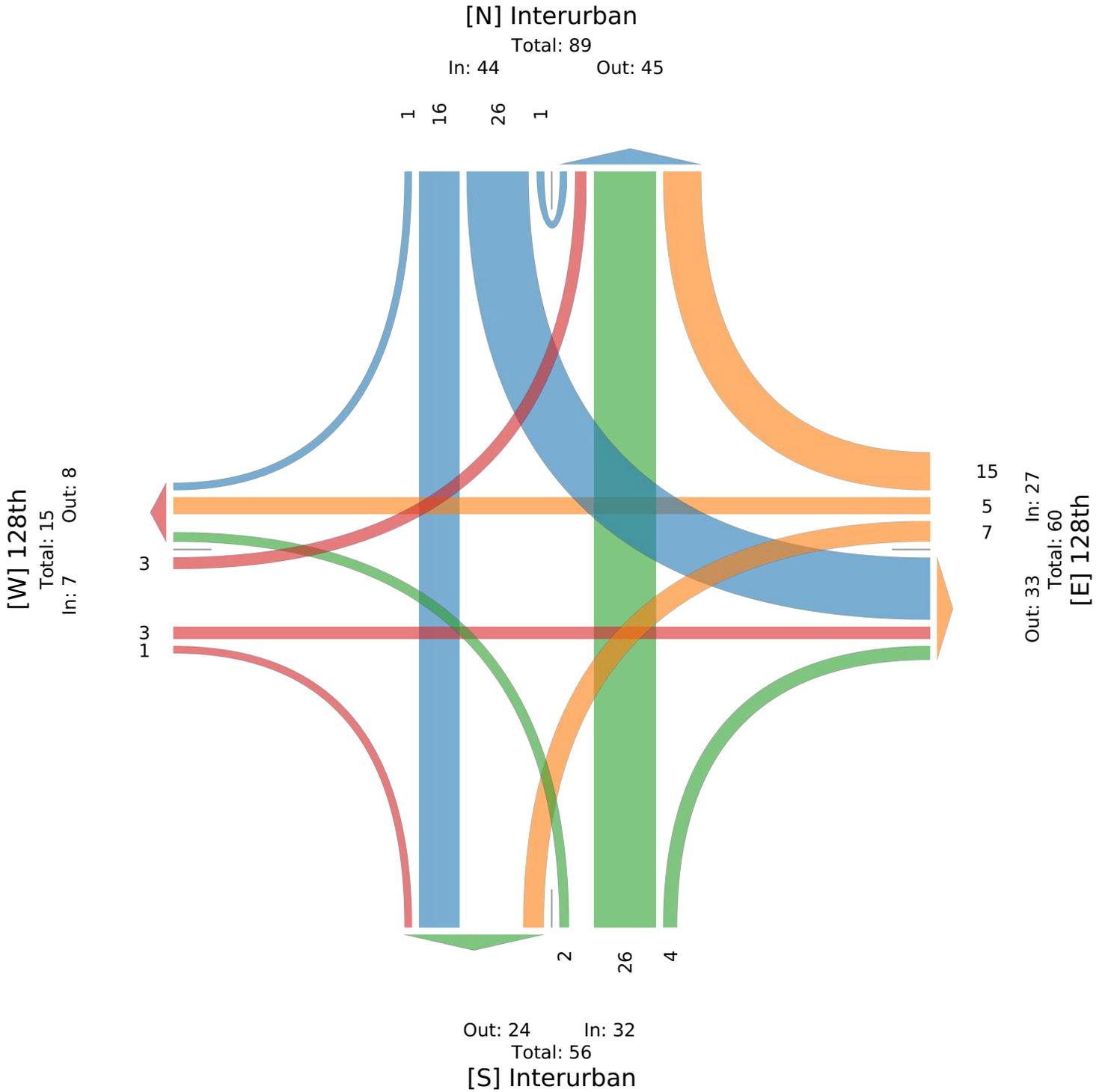
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915783, Location: 39.325621, -94.668516



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northwest 128 Street & North Winan Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915782, Location: 39.325575, -94.695711



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Farm Road Eastbound					128th Westbound					Winan Northbound					Winan Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
7:15AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
7:45AM	0	0	0	0	0	1	0	0	0	1	0	2	0	0	2	0	0	1	0	1	4
Hourly Total	0	0	0	0	0	2	0	0	0	2	0	2	0	0	2	0	1	2	0	3	7
8:00AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	3
8:45AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	2	3
Hourly Total	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	0	2	1	0	3	8
4:00PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	0	2	3
4:15PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2
4:30PM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	2	4
4:45PM	0	0	0	0	0	5	0	0	0	5	0	1	0	0	1	0	1	0	0	1	7
Hourly Total	0	0	0	0	0	6	0	2	0	8	0	2	0	0	2	0	2	4	0	6	16
5:00PM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	3
5:15PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	3
5:30PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	3	0	3	5
5:45PM	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	2	0	0	2	4
Hourly Total	0	0	0	0	0	3	0	1	0	4	1	3	0	0	4	0	2	5	0	7	15
<b>Total</b>	0	0	0	0	0	16	0	3	0	19	1	7	0	0	8	0	7	12	0	19	46
<b>% Approach</b>	0%	0%	0%	0%	-	84.2%	0%	15.8%	0%	-	12.5%	87.5%	0%	0%	-	0%	36.8%	63.2%	0%	-	-
<b>% Total</b>	0%	0%	0%	0%	0%	34.8%	0%	6.5%	0%	41.3%	2.2%	15.2%	0%	0%	17.4%	0%	15.2%	26.1%	0%	41.3%	-
<b>Lights</b>	0	0	0	0	0	16	0	3	0	19	1	5	0	0	6	0	5	12	0	17	42
<b>% Lights</b>	0%	0%	0%	0%	-	100%	0%	100%	0%	100%	100%	71.4%	0%	0%	75.0%	0%	71.4%	100%	0%	89.5%	91.3%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	2	0	0	2	4
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	28.6%	0%	0%	25.0%	0%	28.6%	0%	0%	10.5%	8.7%

\*L: Left, R: Right, T: Thru, U: U-Turn

Northwest 128 Street & North Winan Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

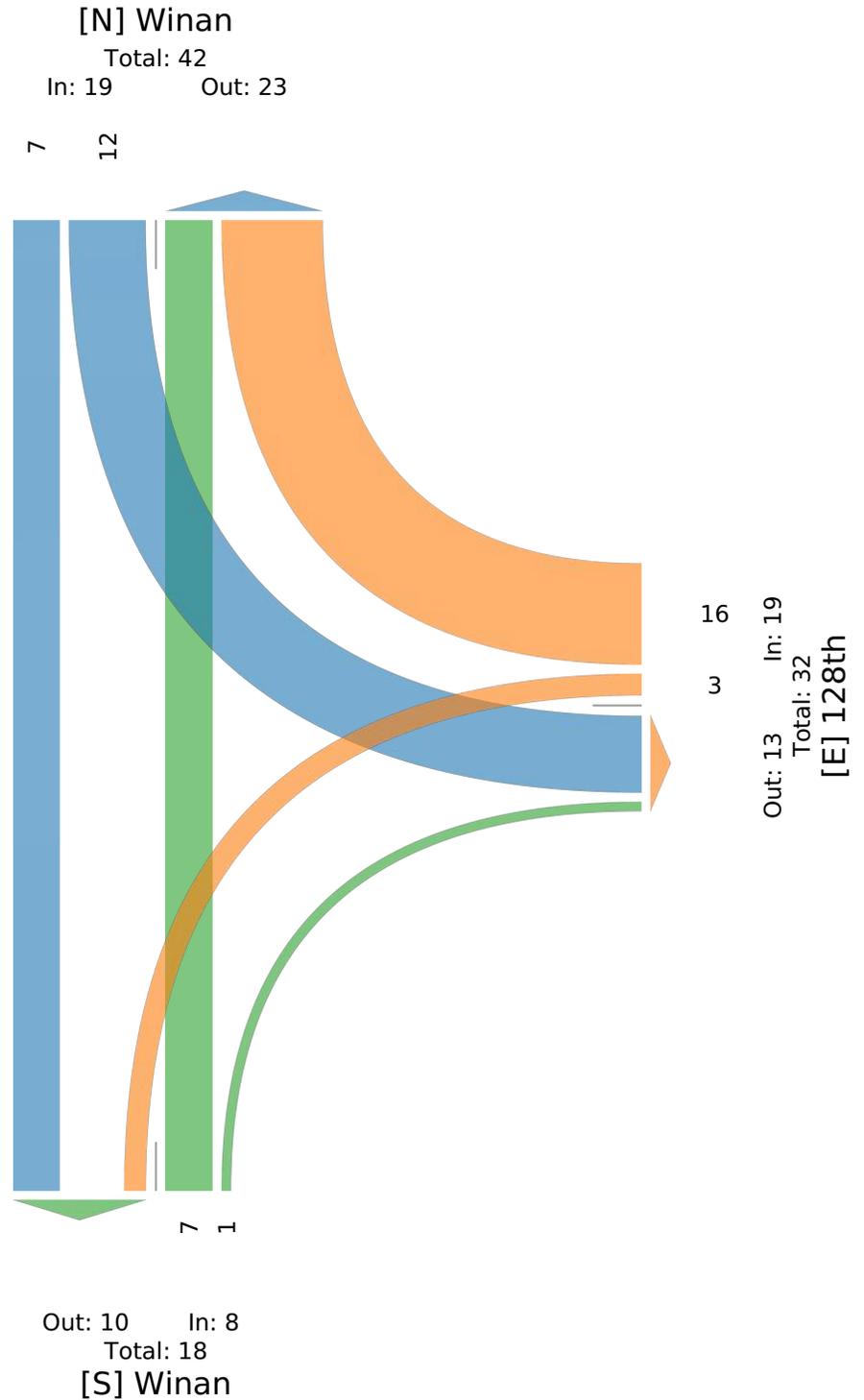
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915782, Location: 39.325575, -94.695711



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Northwest 128 Street & North Winan Road - TMC

Thu Jan 20, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915782, Location: 39.325575, -94.695711



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Farm Road Eastbound					128th Westbound					Winan Northbound					Winan Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:45AM	0	0	0	0	0	1	0	0	0	1	0	2	0	0	2	0	0	1	0	1	4
8:00AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	3
<b>Total</b>	0	0	0	0	0	5	0	0	0	5	0	2	0	0	2	0	1	1	0	2	9
<b>% Approach</b>	0%	0%	0%	0%	-	100%	0%	0%	0%	-	0%	100%	0%	0%	-	0%	50.0%	50.0%	0%	-	-
<b>% Total</b>	0%	0%	0%	0%	<b>0%</b>	55.6%	0%	0%	0%	<b>55.6%</b>	0%	22.2%	0%	0%	<b>22.2%</b>	0%	11.1%	11.1%	0%	<b>22.2%</b>	-
<b>PHF</b>	-	-	-	-	-	0.625	-	-	-	<b>0.625</b>	-	0.250	-	-	<b>0.250</b>	-	0.250	0.250	-	<b>0.500</b>	0.563
<b>Lights</b>	0	0	0	0	0	5	0	0	0	5	0	1	0	0	1	0	1	1	0	2	8
<b>% Lights</b>	0%	0%	0%	0%	-	100%	0%	0%	0%	<b>100%</b>	0%	50.0%	0%	0%	<b>50.0%</b>	0%	100%	100%	0%	<b>100%</b>	88.9%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%	0%	0%	0%	<b>0%</b>	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	<b>0%</b>	0%	50.0%	0%	0%	<b>50.0%</b>	0%	0%	0%	0%	<b>0%</b>	11.1%

\* L: Left, R: Right, T: Thru, U: U-Turn

Northwest 128 Street & North Winan Road - TMC

Thu Jan 20, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915782, Location: 39.325575, -94.695711

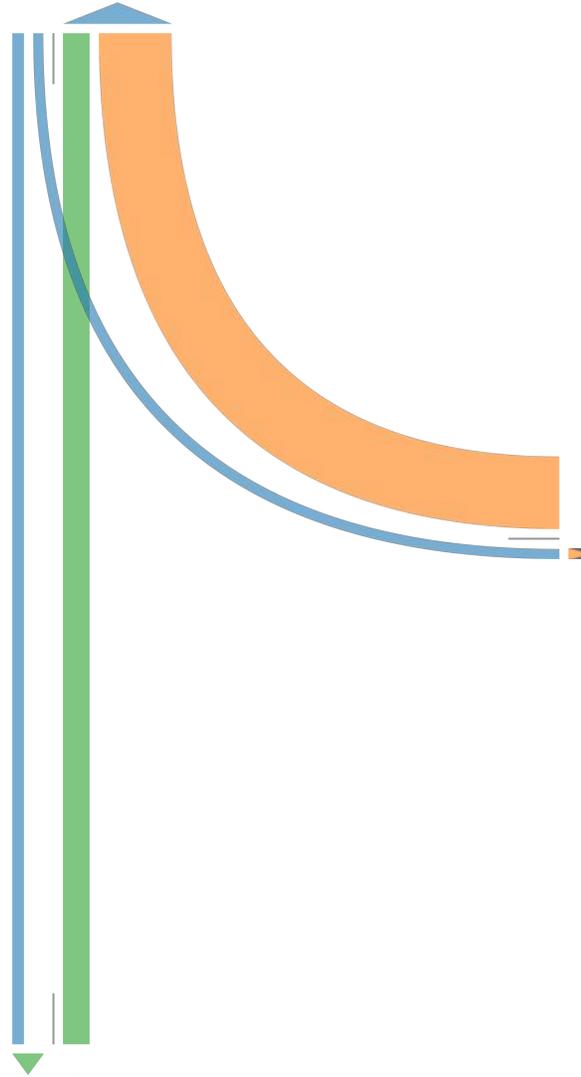


Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Winan

Total: 9  
In: 2 Out: 7

4



5

Out: 1 In: 5  
Total: 6  
[E] 128th

Out: 1 In: 2  
Total: 3  
[S] Winan

Northwest 128 Street & North Winan Road - TMC

Thu Jan 20, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915782, Location: 39.325575, -94.695711



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Farm Road Eastbound					128th Westbound					Winan Northbound					Winan Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 4:45PM	0	0	0	0	0	5	0	0	0	5	0	1	0	0	1	0	1	0	0	1	7
5:00PM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	3
5:15PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	3
5:30PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	3	0	3	5
<b>Total</b>	0	0	0	0	0	7	0	0	0	7	1	4	0	0	5	0	1	5	0	6	18
<b>% Approach</b>	0%	0%	0%	0%	-	100%	0%	0%	0%	-	20.0%	80.0%	0%	0%	-	0%	16.7%	83.3%	0%	-	-
<b>% Total</b>	0%	0%	0%	0%	0%	38.9%	0%	0%	0%	38.9%	5.6%	22.2%	0%	0%	27.8%	0%	5.6%	27.8%	0%	33.3%	-
<b>PHF</b>	-	-	-	-	-	0.350	-	-	-	0.350	0.250	0.500	-	-	0.625	-	0.250	0.417	-	0.500	0.643
<b>Lights</b>	0	0	0	0	0	7	0	0	0	7	1	4	0	0	5	0	1	5	0	6	18
<b>% Lights</b>	0%	0%	0%	0%	-	100%	0%	0%	0%	100%	100%	100%	0%	0%	100%	0%	100%	100%	0%	100%	100%
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Articulated Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Buses and Single-Unit Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% Buses and Single-Unit Trucks</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

\* L: Left, R: Right, T: Thru, U: U-Turn

Northwest 128 Street & North Winan Road - TMC

Thu Jan 20, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

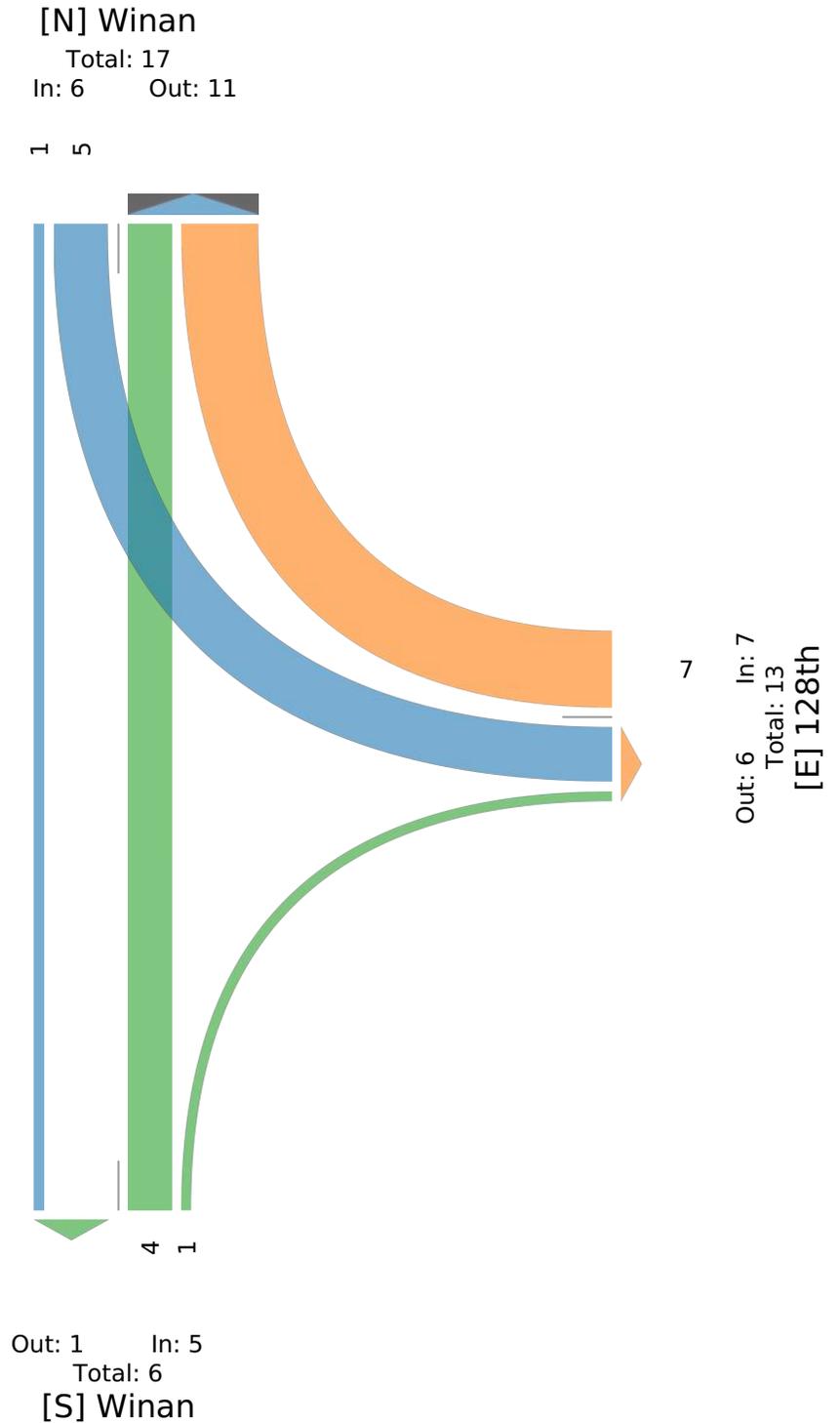
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915782, Location: 39.325575, -94.695711



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



State Route 92 & Interurban Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915784, Location: 39.360736, -94.677765



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy 92 Eastbound					Hwy 92 Westbound					Interurban Northbound					Interurban Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 7:00AM	2	11	1	0	14	0	52	1	0	53	0	0	2	0	2	5	2	0	0	7	76
7:15AM	1	21	0	0	22	0	46	5	0	51	2	0	1	0	3	5	1	0	0	6	82
7:30AM	1	22	3	0	26	0	51	5	0	56	0	0	2	0	2	2	2	3	0	7	91
7:45AM	3	29	2	0	34	0	48	4	0	52	0	1	3	0	4	3	2	2	0	7	97
Hourly Total	7	83	6	0	96	0	197	15	0	212	2	1	8	0	11	15	7	5	0	27	346
8:00AM	4	14	0	0	18	0	48	0	0	48	0	0	1	0	1	2	2	2	0	6	73
8:15AM	1	17	2	0	20	0	25	4	0	29	0	1	3	0	4	2	5	0	0	7	60
8:30AM	0	19	1	0	20	2	30	4	0	36	0	1	0	0	1	2	2	0	0	4	61
8:45AM	2	14	1	0	17	1	27	5	0	33	0	1	2	0	3	1	1	2	0	4	57
Hourly Total	7	64	4	0	75	3	130	13	0	146	0	3	6	0	9	7	10	4	0	21	251
4:00PM	2	40	3	0	45	0	27	2	0	29	3	1	2	0	6	2	1	0	0	3	83
4:15PM	0	46	4	0	50	0	22	7	0	29	0	4	2	0	6	5	5	0	0	10	95
4:30PM	1	39	4	0	44	0	21	4	0	25	0	4	0	0	4	0	1	0	0	1	74
4:45PM	4	55	3	0	62	1	29	2	0	32	7	3	2	0	12	0	1	2	0	3	109
Hourly Total	7	180	14	0	201	1	99	15	0	115	10	12	6	0	28	7	8	2	0	17	361
5:00PM	0	56	4	0	60	2	28	2	0	32	5	4	3	0	12	0	6	1	0	7	111
5:15PM	0	66	5	0	71	0	31	1	0	32	6	4	3	0	13	2	0	0	0	2	118
5:30PM	1	47	5	0	53	1	24	1	0	26	5	3	1	0	9	1	2	1	0	4	92
5:45PM	3	29	2	0	34	1	25	2	0	28	5	2	2	0	9	2	2	2	0	6	77
Hourly Total	4	198	16	0	218	4	108	6	0	118	21	13	9	0	43	5	10	4	0	19	398
<b>Total</b>	<b>25</b>	<b>525</b>	<b>40</b>	<b>0</b>	<b>590</b>	<b>8</b>	<b>534</b>	<b>49</b>	<b>0</b>	<b>591</b>	<b>33</b>	<b>29</b>	<b>29</b>	<b>0</b>	<b>91</b>	<b>34</b>	<b>35</b>	<b>15</b>	<b>0</b>	<b>84</b>	<b>1356</b>
<b>% Approach</b>	4.2%	89.0%	6.8%	0%	-	1.4%	90.4%	8.3%	0%	-	36.3%	31.9%	31.9%	0%	-	40.5%	41.7%	17.9%	0%	-	-
<b>% Total</b>	1.8%	38.7%	2.9%	0%	<b>43.5%</b>	0.6%	39.4%	3.6%	0%	<b>43.6%</b>	2.4%	2.1%	2.1%	0%	<b>6.7%</b>	2.5%	2.6%	1.1%	0%	<b>6.2%</b>	-
<b>Lights</b>	20	516	35	0	571	8	517	49	0	574	33	29	23	0	85	32	35	15	0	82	1312
<b>% Lights</b>	80.0%	98.3%	87.5%	0%	<b>96.8%</b>	100%	96.8%	100%	0%	<b>97.1%</b>	100%	100%	79.3%	0%	<b>93.4%</b>	94.1%	100%	100%	0%	<b>97.6%</b>	96.8%
<b>Articulated Trucks</b>	2	1	2	0	5	0	1	0	0	1	0	0	3	0	3	2	0	0	0	2	11
<b>% Articulated Trucks</b>	8.0%	0.2%	5.0%	0%	<b>0.8%</b>	0%	0.2%	0%	0%	<b>0.2%</b>	0%	0%	10.3%	0%	<b>3.3%</b>	5.9%	0%	0%	0%	<b>2.4%</b>	0.8%
<b>Buses and Single-Unit Trucks</b>	3	8	3	0	14	0	16	0	0	16	0	0	3	0	3	0	0	0	0	0	33
<b>% Buses and Single-Unit Trucks</b>	12.0%	1.5%	7.5%	0%	<b>2.4%</b>	0%	3.0%	0%	0%	<b>2.7%</b>	0%	0%	10.3%	0%	<b>3.3%</b>	0%	0%	0%	0%	<b>0%</b>	2.4%

\*L: Left, R: Right, T: Thru, U: U-Turn

State Route 92 & Interurban Road - TMC

Thu Jan 20, 2022

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915784, Location: 39.360736, -94.677765



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

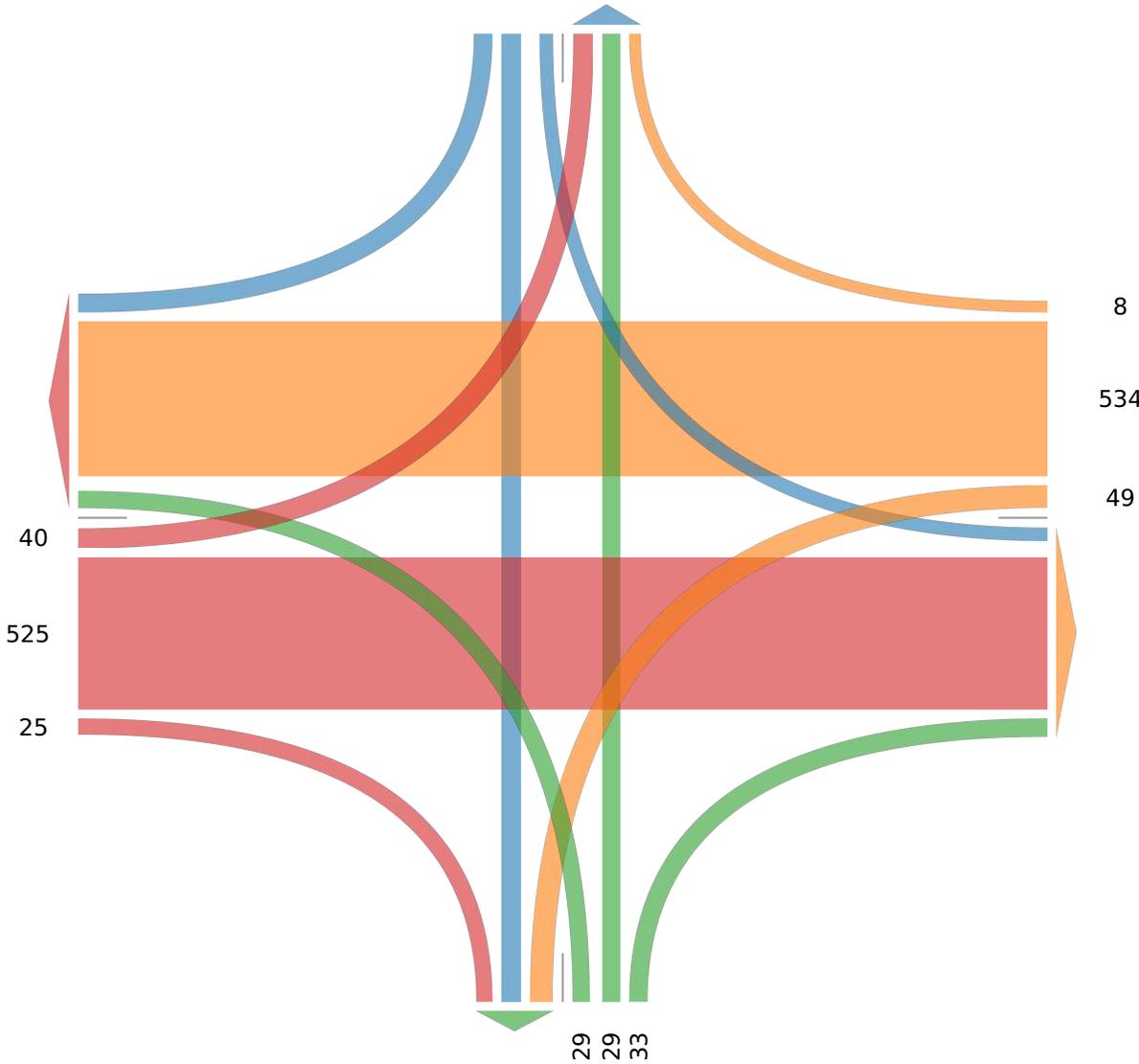
[N] Interurban

Total: 161

In: 84 Out: 77

34 35 15

[W] Hwy 92  
Total: 1187  
In: 590 Out: 597



8  
534  
49  
In: 591  
Total: 1164  
Out: 573  
[E] Hwy 92

Out: 109 In: 91  
Total: 200  
[S] Interurban

State Route 92 & Interurban Road - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915784, Location: 39.360736, -94.677765



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy 92 Eastbound					Hwy 92 Westbound					Interurban Northbound					Interurban Southbound					Int	
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App		
2022-01-20 7:00AM	2	11	1	0	14	0	52	1	0	53	0	0	2	0	2	5	2	0	0	7	76	
7:15AM	1	21	0	0	22	0	46	5	0	51	2	0	1	0	3	5	1	0	0	6	82	
7:30AM	1	22	3	0	26	0	51	5	0	56	0	0	2	0	2	2	2	3	0	7	91	
7:45AM	3	29	2	0	34	0	48	4	0	52	0	1	3	0	4	3	2	2	0	7	97	
<b>Total</b>	7	83	6	0	96	0	197	15	0	212	2	1	8	0	11	15	7	5	0	27	346	
<b>% Approach</b>	7.3%	86.5%	6.3%	0%	-	0%	92.9%	7.1%	0%	-	18.2%	9.1%	72.7%	0%	-	55.6%	25.9%	18.5%	0%	-	-	
<b>% Total</b>	2.0%	24.0%	1.7%	0%	27.7%	0%	56.9%	4.3%	0%	61.3%	0.6%	0.3%	2.3%	0%	3.2%	4.3%	2.0%	1.4%	0%	7.8%	-	
<b>PHF</b>	0.583	0.716	0.500	-	0.706	-	0.947	0.750	-	0.946	0.250	0.250	0.667	-	0.688	0.750	0.875	0.417	-	0.964	0.892	
<b>Lights</b>	6	79	5	0	90	0	193	15	0	208	2	1	4	0	7	15	7	5	0	27	332	
<b>% Lights</b>	85.7%	95.2%	83.3%	0%	93.8%	0%	98.0%	100%	0%	98.1%	100%	100%	50.0%	0%	63.6%	100%	100%	100%	0%	100%	96.0%	
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
<b>% Articulated Trucks</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25.0%	0%	18.2%	0%	0%	0%	0%	0%	0%	0.6%
<b>Buses and Single-Unit Trucks</b>	1	4	1	0	6	0	4	0	0	4	0	0	2	0	2	0	0	0	0	0	0	12
<b>% Buses and Single-Unit Trucks</b>	14.3%	4.8%	16.7%	0%	6.3%	0%	2.0%	0%	0%	1.9%	0%	0%	25.0%	0%	18.2%	0%	0%	0%	0%	0%	0%	3.5%

\* L: Left, R: Right, T: Thru, U: U-Turn

State Route 92 & Interurban Road - TMC

Thu Jan 20, 2022

AM Peak (7 AM - 8 AM)

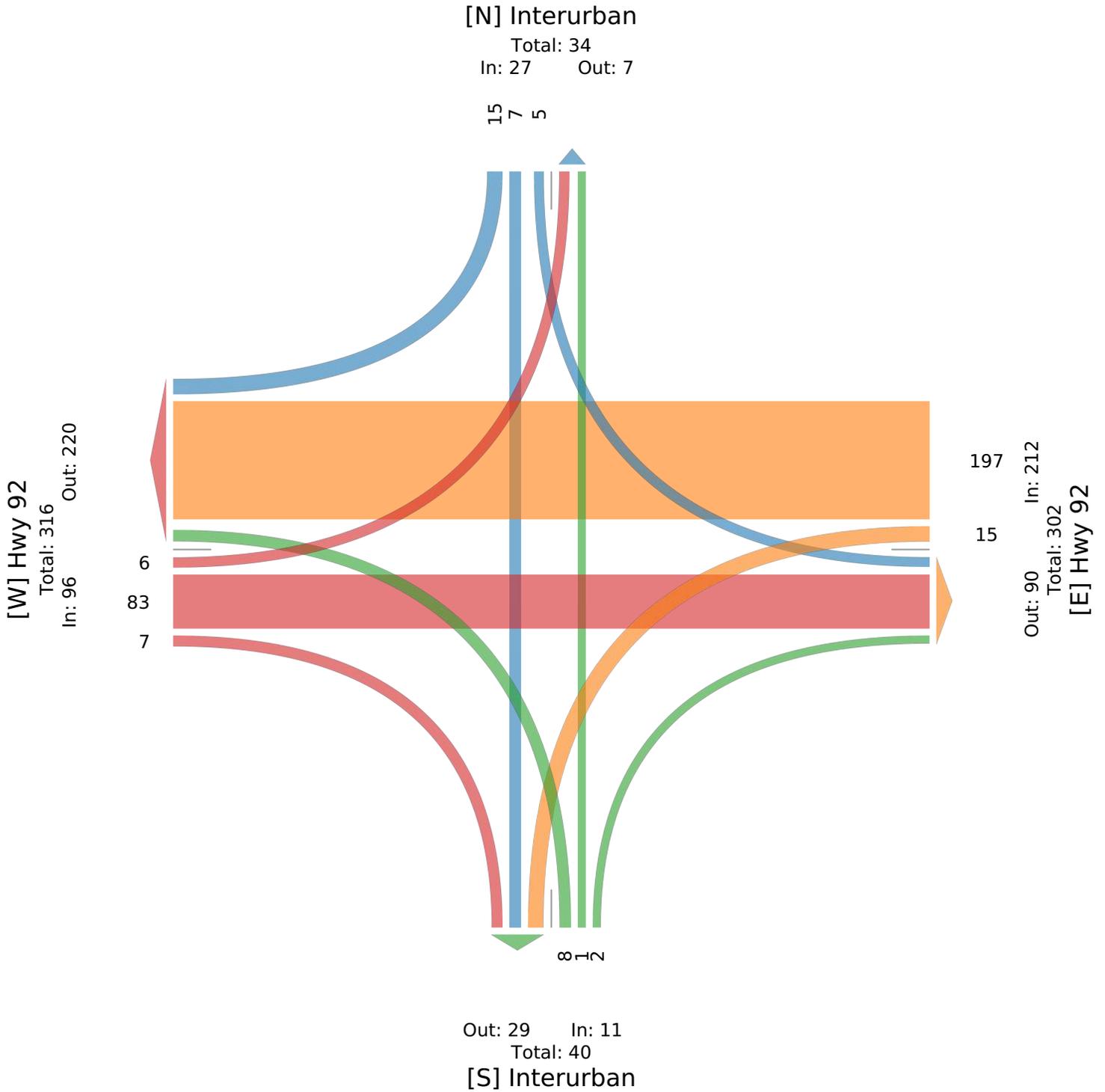
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915784, Location: 39.360736, -94.677765



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



State Route 92 & Interurban Road - TMC

Thu Jan 20, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915784, Location: 39.360736, -94.677765



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Hwy 92 Eastbound					Hwy 92 Westbound					Interurban Northbound					Interurban Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2022-01-20 4:45PM	4	55	3	0	62	1	29	2	0	32	7	3	2	0	12	0	1	2	0	3	109
5:00PM	0	56	4	0	60	2	28	2	0	32	5	4	3	0	12	0	6	1	0	7	111
5:15PM	0	66	5	0	71	0	31	1	0	32	6	4	3	0	13	2	0	0	0	2	118
5:30PM	1	47	5	0	53	1	24	1	0	26	5	3	1	0	9	1	2	1	0	4	92
<b>Total</b>	5	224	17	0	246	4	112	6	0	122	23	14	9	0	46	3	9	4	0	16	430
<b>% Approach</b>	2.0%	91.1%	6.9%	0%	-	3.3%	91.8%	4.9%	0%	-	50.0%	30.4%	19.6%	0%	-	18.8%	56.3%	25.0%	0%	-	-
<b>% Total</b>	1.2%	52.1%	4.0%	0%	57.2%	0.9%	26.0%	1.4%	0%	28.4%	5.3%	3.3%	2.1%	0%	10.7%	0.7%	2.1%	0.9%	0%	3.7%	-
<b>PHF</b>	0.313	0.848	0.850	-	0.866	0.500	0.903	0.750	-	0.953	0.821	0.875	0.750	-	0.885	0.375	0.375	0.500	-	0.571	0.911
<b>Lights</b>	4	222	17	0	243	4	110	6	0	120	23	14	9	0	46	3	9	4	0	16	425
<b>% Lights</b>	80.0%	99.1%	100%	0%	98.8%	100%	98.2%	100%	0%	98.4%	100%	100%	100%	0%	100%	100%	100%	100%	0%	100%	98.8%
<b>Articulated Trucks</b>	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
<b>% Articulated Trucks</b>	20.0%	0.4%	0%	0%	0.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.5%
<b>Buses and Single-Unit Trucks</b>	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
<b>% Buses and Single-Unit Trucks</b>	0%	0.4%	0%	0%	0.4%	0%	1.8%	0%	0%	1.6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.7%

\* L: Left, R: Right, T: Thru, U: U-Turn

State Route 92 & Interurban Road - TMC

Thu Jan 20, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 915784, Location: 39.360736, -94.677765



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

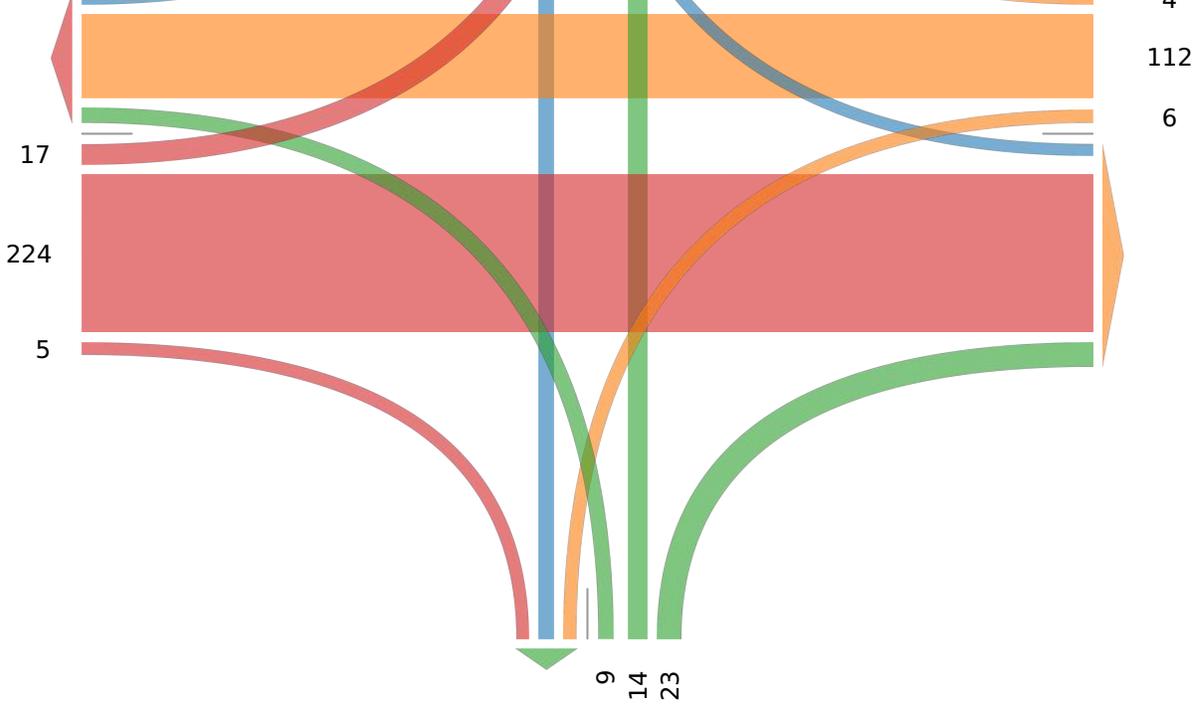
[N] Interurban

Total: 51

In: 16 Out: 35

3 9 4

[W] Hwy 92  
Total: 370  
In: 246 Out: 124



Out: 251 In: 122  
Total: 373  
[E] Hwy 92

Out: 20 In: 46  
Total: 66

[S] Interurban

92 & Bethel Rd - TMC

Tue Jul 1, 2025

Full Length (6 AM-9 AM, 3 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1312397, Location: 39.354183, -94.732904



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	SR 92 Eastbound					SR 92 Westbound					Bethel Rd Northbound					Bethel Rd Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2025-07-01 6:00AM	0	11	1	0	12	1	41	4	0	46	2	0	0	0	2	1	1	1	0	3	63
6:15AM	0	16	0	0	16	2	52	4	0	58	1	0	1	0	2	4	0	0	0	4	80
6:30AM	2	21	1	0	24	2	58	5	0	65	0	2	1	0	3	2	3	0	0	5	97
6:45AM	1	21	5	0	27	5	60	3	0	68	5	7	0	0	12	2	1	0	0	3	110
Hourly Total	3	69	7	0	79	10	211	16	0	237	8	9	2	0	19	9	5	1	0	15	350
7:00AM	1	13	3	0	17	2	52	8	0	62	2	3	0	0	5	7	2	3	0	12	96
7:15AM	0	27	9	0	36	6	60	4	0	70	6	4	0	0	10	5	4	4	0	13	129
7:30AM	2	25	4	0	31	1	44	4	0	49	8	0	0	0	8	7	3	1	0	11	99
7:45AM	1	28	4	0	33	2	51	5	0	58	6	3	1	0	10	6	3	3	0	12	113
Hourly Total	4	93	20	0	117	11	207	21	0	239	22	10	1	0	33	25	12	11	0	48	437
8:00AM	2	24	4	0	30	0	45	5	0	50	5	4	1	0	10	5	2	2	0	9	99
8:15AM	0	31	4	0	35	0	55	0	0	55	3	4	0	0	7	8	2	2	0	12	109
8:30AM	1	37	6	0	44	2	50	5	0	57	7	3	0	0	10	6	3	1	0	10	121
8:45AM	1	35	4	0	40	1	47	3	0	51	5	3	0	0	8	3	3	1	0	7	106
Hourly Total	4	127	18	0	149	3	197	13	0	213	20	14	1	0	35	22	10	6	0	38	435
3:00PM	0	34	8	0	42	3	28	8	0	39	11	8	1	0	20	10	1	3	0	14	115
3:15PM	0	54	10	0	64	1	45	9	0	55	8	5	0	0	13	7	7	1	0	15	147
3:30PM	0	63	9	0	72	3	20	10	0	33	5	2	1	0	8	2	4	3	0	9	122
3:45PM	0	52	13	0	65	2	41	6	0	49	5	4	2	0	11	12	4	3	0	19	144
Hourly Total	0	203	40	0	243	9	134	33	0	176	29	19	4	0	52	31	16	10	0	57	528
4:00PM	2	79	17	0	98	4	39	1	0	44	13	1	0	0	14	8	3	6	0	17	173
4:15PM	2	49	15	0	66	5	41	1	0	47	8	5	0	0	13	9	4	2	0	15	141
4:30PM	0	92	18	0	110	1	38	2	0	41	6	11	1	0	18	11	1	2	0	14	183
4:45PM	2	78	14	0	94	2	35	4	0	41	9	6	0	0	15	6	4	1	0	11	161
Hourly Total	6	298	64	0	368	12	153	8	0	173	36	23	1	0	60	34	12	11	0	57	658
5:00PM	0	73	21	0	94	3	50	4	0	57	9	7	2	0	18	8	4	4	0	16	185
5:15PM	0	71	11	0	82	0	57	1	0	58	10	6	0	0	16	15	6	0	0	21	177
5:30PM	1	65	13	0	79	3	49	11	0	63	10	2	0	0	12	4	6	1	0	11	165
5:45PM	0	50	8	0	58	1	32	7	0	40	11	4	0	0	15	2	1	2	0	5	118
Hourly Total	1	259	53	0	313	7	188	23	0	218	40	19	2	0	61	29	17	7	0	53	645
<b>Total</b>	18	1049	202	0	1269	52	1090	114	0	1256	155	94	11	0	260	150	72	46	0	268	3053
<b>% Approach</b>	1.4%	82.7%	15.9%	0%	-	4.1%	86.8%	9.1%	0%	-	59.6%	36.2%	4.2%	0%	-	56.0%	26.9%	17.2%	0%	-	-
<b>% Total</b>	0.6%	34.4%	6.6%	0%	41.6%	1.7%	35.7%	3.7%	0%	41.1%	5.1%	3.1%	0.4%	0%	8.5%	4.9%	2.4%	1.5%	0%	8.8%	-
<b>Lights</b>	18	988	199	0	1205	51	1034	105	0	1190	149	93	11	0	253	144	71	40	0	255	2903
<b>% Lights</b>	100%	94.2%	98.5%	0%	95.0%	98.1%	94.9%	92.1%	0%	94.7%	96.1%	98.9%	100%	0%	97.3%	96.0%	98.6%	87.0%	0%	95.1%	95.1%
<b>Articulated Trucks</b>	0	20	0	0	20	0	18	2	0	20	0	0	0	0	0	0	0	1	0	1	41
<b>% Articulated Trucks</b>	0%	1.9%	0%	0%	1.6%	0%	1.7%	1.8%	0%	1.6%	0%	0%	0%	0%	0%	0%	0%	2.2%	0%	0.4%	1.3%
<b>Buses and Single-Unit Trucks</b>	0	41	3	0	44	1	38	7	0	46	6	1	0	0	7	6	1	5	0	12	109
<b>% Buses and Single-Unit Trucks</b>	0%	3.9%	1.5%	0%	3.5%	1.9%	3.5%	6.1%	0%	3.7%	3.9%	1.1%	0%	0%	2.7%	4.0%	1.4%	10.9%	0%	4.5%	3.6%

\*L: Left, R: Right, T: Thru, U: U-Turn

92 & Bethel Rd - TMC

Tue Jul 1, 2025

Full Length (6 AM-9 AM, 3 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1312397, Location: 39.354183, -94.732904



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

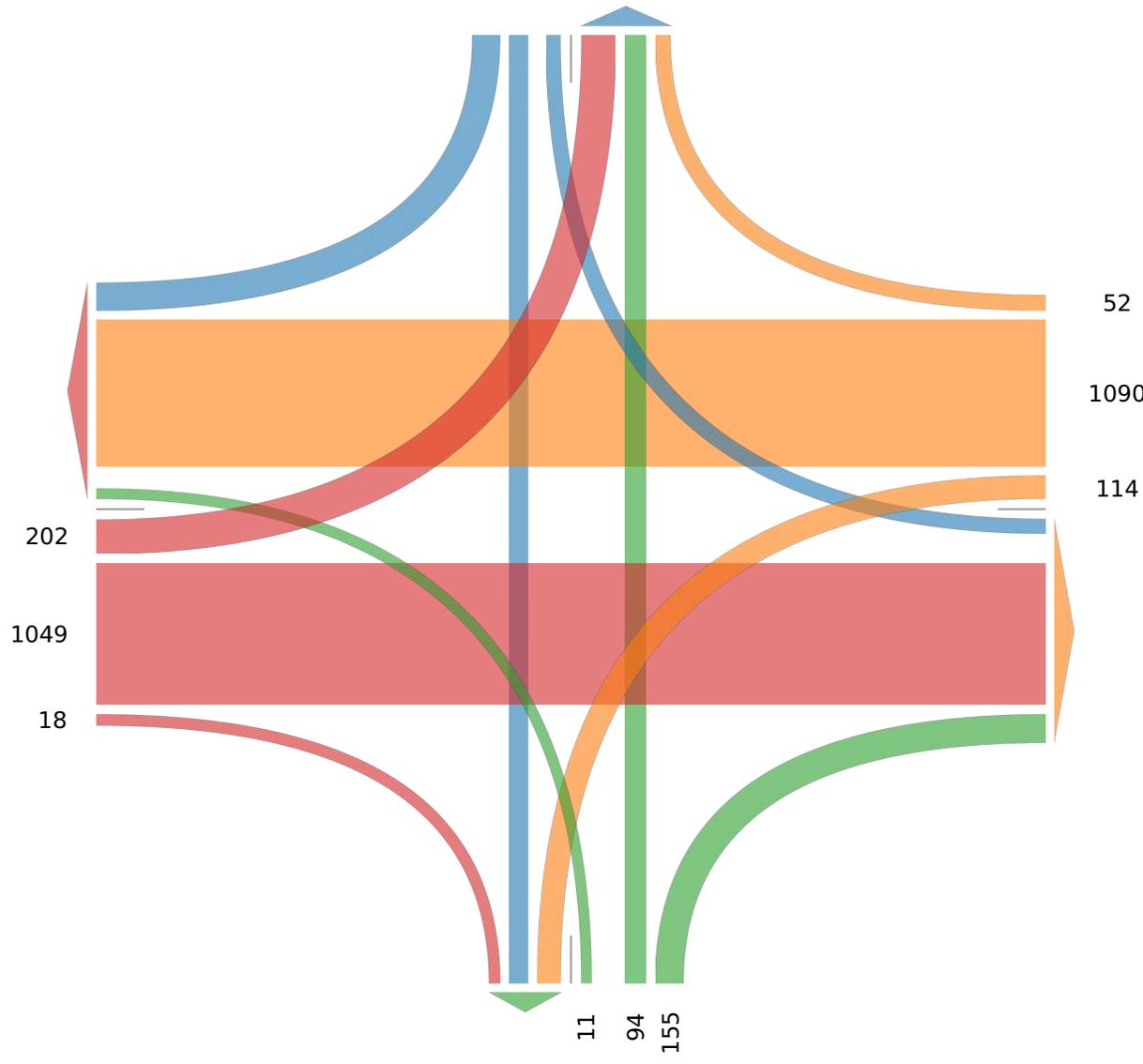
[N] Bethel Rd

Total: 616

In: 268 Out: 348

150  
72  
46

[W] SR 92  
Total: 2520  
In: 1269 Out: 1251



[E] SR 92  
Total: 2506  
In: 1256 Out: 1250

Out: 204 In: 260  
Total: 464

[S] Bethel Rd

92 & Bethel Rd - TMC

Tue Jul 1, 2025

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1312397, Location: 39.354183, -94.732904



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	SR 92 Eastbound					SR 92 Westbound					Bethel Rd Northbound					Bethel Rd Southbound					Int
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	
2025-07-01 7:45AM	1	28	4	0	33	2	51	5	0	58	6	3	1	0	10	6	3	3	0	12	113
8:00AM	2	24	4	0	30	0	45	5	0	50	5	4	1	0	10	5	2	2	0	9	99
8:15AM	0	31	4	0	35	0	55	0	0	55	3	4	0	0	7	8	2	2	0	12	109
8:30AM	1	37	6	0	44	2	50	5	0	57	7	3	0	0	10	6	3	1	0	10	121
<b>Total</b>	4	120	18	0	142	4	201	15	0	220	21	14	2	0	37	25	10	8	0	43	442
<b>% Approach</b>	2.8%	84.5%	12.7%	0%	-	1.8%	91.4%	6.8%	0%	-	56.8%	37.8%	5.4%	0%	-	58.1%	23.3%	18.6%	0%	-	-
<b>% Total</b>	0.9%	27.1%	4.1%	0%	32.1%	0.9%	45.5%	3.4%	0%	49.8%	4.8%	3.2%	0.5%	0%	8.4%	5.7%	2.3%	1.8%	0%	9.7%	-
<b>PHF</b>	0.500	0.811	0.750	-	0.807	0.500	0.914	0.750	-	0.948	0.750	0.875	0.500	-	0.925	0.781	0.833	0.667	-	0.896	0.913
<b>Lights</b>	4	98	18	0	120	4	185	15	0	204	18	13	2	0	33	24	9	4	0	37	394
<b>% Lights</b>	100%	81.7%	100%	0%	84.5%	100%	92.0%	100%	0%	92.7%	85.7%	92.9%	100%	0%	89.2%	96.0%	90.0%	50.0%	0%	86.0%	89.1%
<b>Articulated Trucks</b>	0	8	0	0	8	0	6	0	0	6	0	0	0	0	0	0	0	1	0	1	15
<b>% Articulated Trucks</b>	0%	6.7%	0%	0%	5.6%	0%	3.0%	0%	0%	2.7%	0%	0%	0%	0%	0%	0%	0%	12.5%	0%	2.3%	3.4%
<b>Buses and Single-Unit Trucks</b>	0	14	0	0	14	0	10	0	0	10	3	1	0	0	4	1	1	3	0	5	33
<b>% Buses and Single-Unit Trucks</b>	0%	11.7%	0%	0%	9.9%	0%	5.0%	0%	0%	4.5%	14.3%	7.1%	0%	0%	10.8%	4.0%	10.0%	37.5%	0%	11.6%	7.5%

\* L: Left, R: Right, T: Thru, U: U-Turn

92 & Bethel Rd - TMC

Tue Jul 1, 2025

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1312397, Location: 39.354183, -94.732904



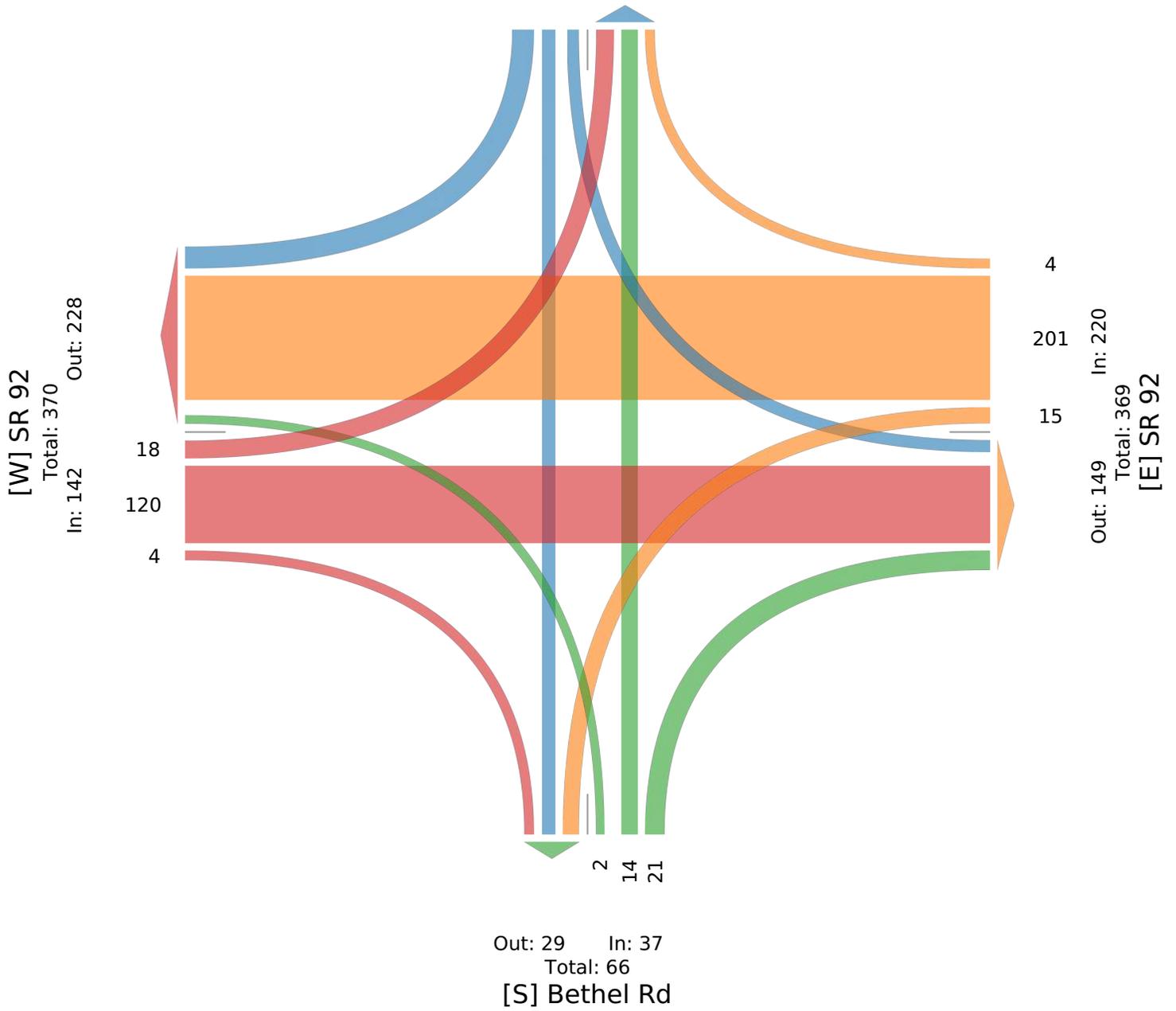
Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Bethel Rd

Total: 79

In: 43 Out: 36

25 10 8



92 & Bethel Rd - TMC

Tue Jul 1, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1312397, Location: 39.354183, -94.732904



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	SR 92 Eastbound					SR 92 Westbound					Bethel Rd Northbound					Bethel Rd Southbound					Int	
	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App		
2025-07-01 4:30PM	0	92	18	0	110	1	38	2	0	41	6	11	1	0	18	11	1	2	0	14	183	
4:45PM	2	78	14	0	94	2	35	4	0	41	9	6	0	0	15	6	4	1	0	11	161	
5:00PM	0	73	21	0	94	3	50	4	0	57	9	7	2	0	18	8	4	4	0	16	185	
5:15PM	0	71	11	0	82	0	57	1	0	58	10	6	0	0	16	15	6	0	0	21	177	
<b>Total</b>	2	314	64	0	380	6	180	11	0	197	34	30	3	0	67	40	15	7	0	62	706	
<b>% Approach</b>	0.5%	82.6%	16.8%	0%	-	3.0%	91.4%	5.6%	0%	-	50.7%	44.8%	4.5%	0%	-	64.5%	24.2%	11.3%	0%	-	-	
<b>% Total</b>	0.3%	44.5%	9.1%	0%	53.8%	0.8%	25.5%	1.6%	0%	27.9%	4.8%	4.2%	0.4%	0%	9.5%	5.7%	2.1%	1.0%	0%	8.8%	-	
<b>PHF</b>	0.250	0.853	0.762	-	0.864	0.500	0.789	0.688	-	0.849	0.850	0.682	0.375	-	0.931	0.667	0.625	0.438	-	0.738	0.954	
<b>Lights</b>	2	311	64	0	377	6	179	11	0	196	33	30	3	0	66	40	15	7	0	62	701	
<b>% Lights</b>	100%	99.0%	100%	0%	99.2%	100%	99.4%	100%	0%	99.5%	97.1%	100%	100%	0%	98.5%	100%	100%	100%	0%	100%	99.3%	
<b>Articulated Trucks</b>	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
<b>% Articulated Trucks</b>	0%	0.3%	0%	0%	0.3%	0%	0.6%	0%	0%	0.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.3%	
<b>Buses and Single-Unit Trucks</b>	0	2	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3	
<b>% Buses and Single-Unit Trucks</b>	0%	0.6%	0%	0%	0.5%	0%	0%	0%	0%	0%	2.9%	0%	0%	0%	1.5%	0%	0%	0%	0%	0%	0.4%	

\* L: Left, R: Right, T: Thru, U: U-Turn

92 & Bethel Rd - TMC

Tue Jul 1, 2025

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)

All Movements

ID: 1312397, Location: 39.354183, -94.732904



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Bethel Rd

Total: 162

In: 62 Out: 100

40  
15  
7

[W] SR 92

Total: 603  
Out: 223

In: 380

64

314

2

6  
180  
11

Out: 355 In: 197

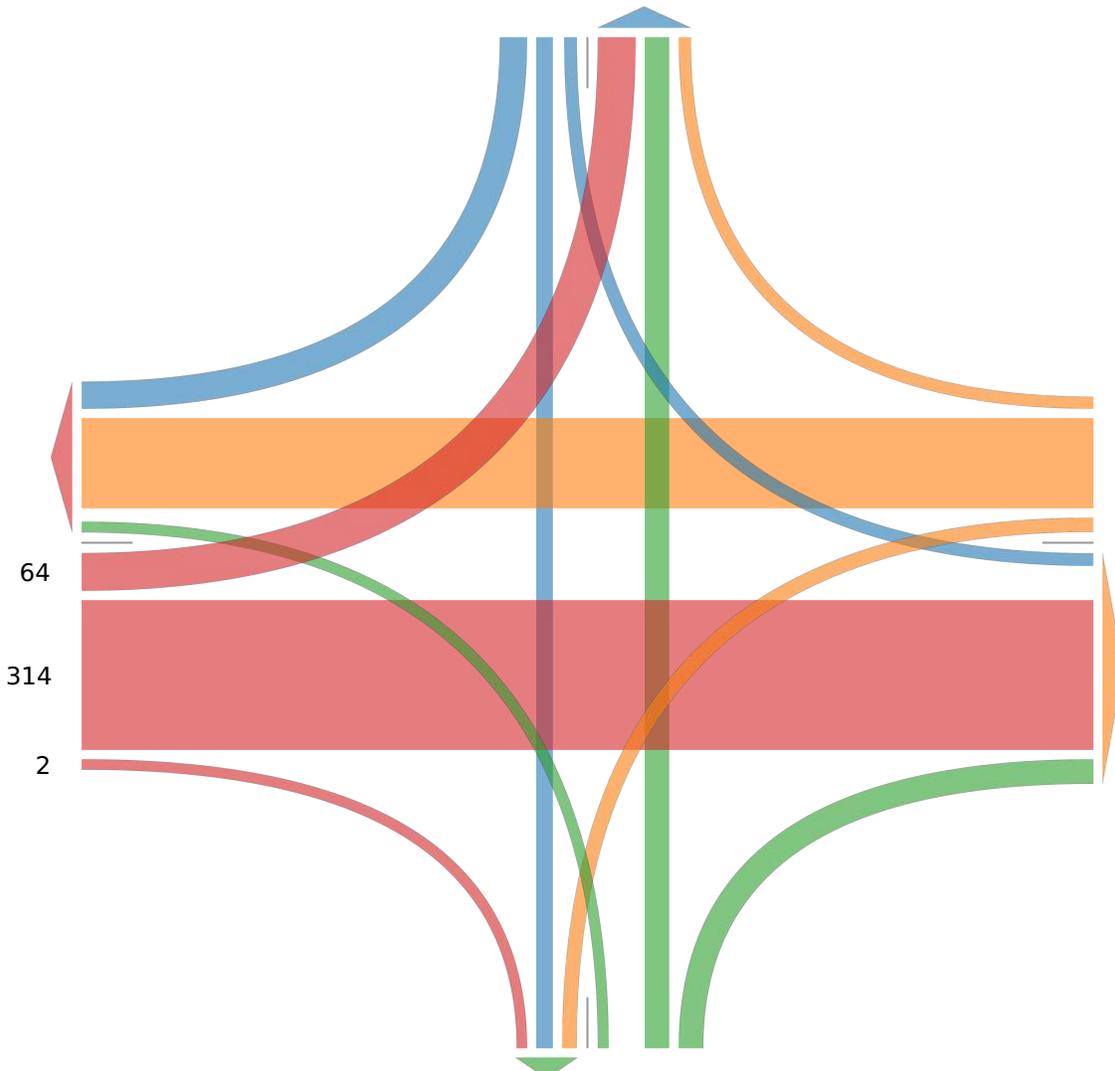
Total: 552

[E] SR 92

Out: 28 In: 67  
Total: 95

[S] Bethel Rd

3  
30  
34



## **APPENDIX B**

Build Year 2028 Conditions

# Capacity Analysis

# LANE SUMMARY

Site: 1 [HW 92 and Bethel - 2028 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road  
 MUTCD (FHWA 2009) example number: 2B-22  
 Roundabout Guide (TRB 2010) example number: A-1  
 Site Category: (None)  
 Roundabout

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]			ft	ft
South: Bethel Road															
Lane 1 <sup>d</sup>	43	2.0	43	2.0	1112	0.039	100	6.2	LOS A	0.1	3.8	Full	1600	0.0	0.0
Approach	43	2.0	43	2.0		0.039		6.2	LOS A	0.1	3.8				
East: Highway 92															
Lane 1 <sup>d</sup>	248	2.0	248	2.0	1394	0.178	100	6.7	LOS A	1.0	24.6	Full	1600	0.0	0.0
Approach	248	2.0	248	2.0		0.178		6.7	LOS A	1.0	24.6				
North: Bethel Road															
Lane 1 <sup>d</sup>	47	2.0	47	2.0	1181	0.040	100	6.6	LOS A	0.2	5.0	Full	1600	0.0	0.0
Approach	47	2.0	47	2.0		0.040		6.6	LOS A	0.2	5.0				
West: Highway 92															
Lane 1	20	2.0	20	2.0	1186	0.016	100	13.0	LOS B	0.1	2.0	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	160	2.0	160	2.0	1668	0.096	100	6.6	LOS A	0.5	12.7	Full	1600	0.0	0.0
Approach	179	2.0	179	2.0		0.096		7.3	LOS A	0.5	12.7				
All Vehicles	517	2.0	517	2.0		0.178		6.9	LOS A	1.0	24.6				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Bethel Road											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From S						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N	E				v/c	%	%	%	No.
Lane 1	5	15	23	43	2.0	1112	0.039	100	NA	NA	
Approach	5	15	23	43	2.0		0.039				
East: Highway 92											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	S	W	N				v/c	%	%	%	No.
Lane 1	16	227	4	248	2.0	1394	0.178	100	NA	NA	

Approach	16	227	4	248	2.0		0.178				
North: Bethel Road											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N							Satn	Util.	SL	Ov.	Lane
To Exit:	E	S	W			Cap.	v/c	%	%	No.	
						veh/h					
Lane 1	9	11	27	47	2.0	1181	0.040	100	NA	NA	
Approach	9	11	27	47	2.0		0.040				
West: Highway 92											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Satn	Util.	SL	Ov.	Lane
To Exit:	N	E	S			Cap.	v/c	%	%	No.	
						veh/h					
Lane 1	20	-	-	20	2.0	1186	0.016	100	NA	NA	
Lane 2	-	136	24	160	2.0	1668	0.096	100	NA	NA	
Approach	20	136	24	179	2.0		0.096				
Total %HV Deg.Satn (v/c)											
All Vehicles	517	2.0		0.178							

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis												
	Exit Lane Number	Short Lane Length	Percent Opng in Lane	Flow Rate	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Flow Rate	Deg. Satn	Min. Delay	Merge Delay
		ft	%	veh/h	pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
East: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
North: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
West: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

# LANE LEVEL OF SERVICE

## Lane Level of Service

 Site: 1 [HW 92 and Bethel - 2028 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

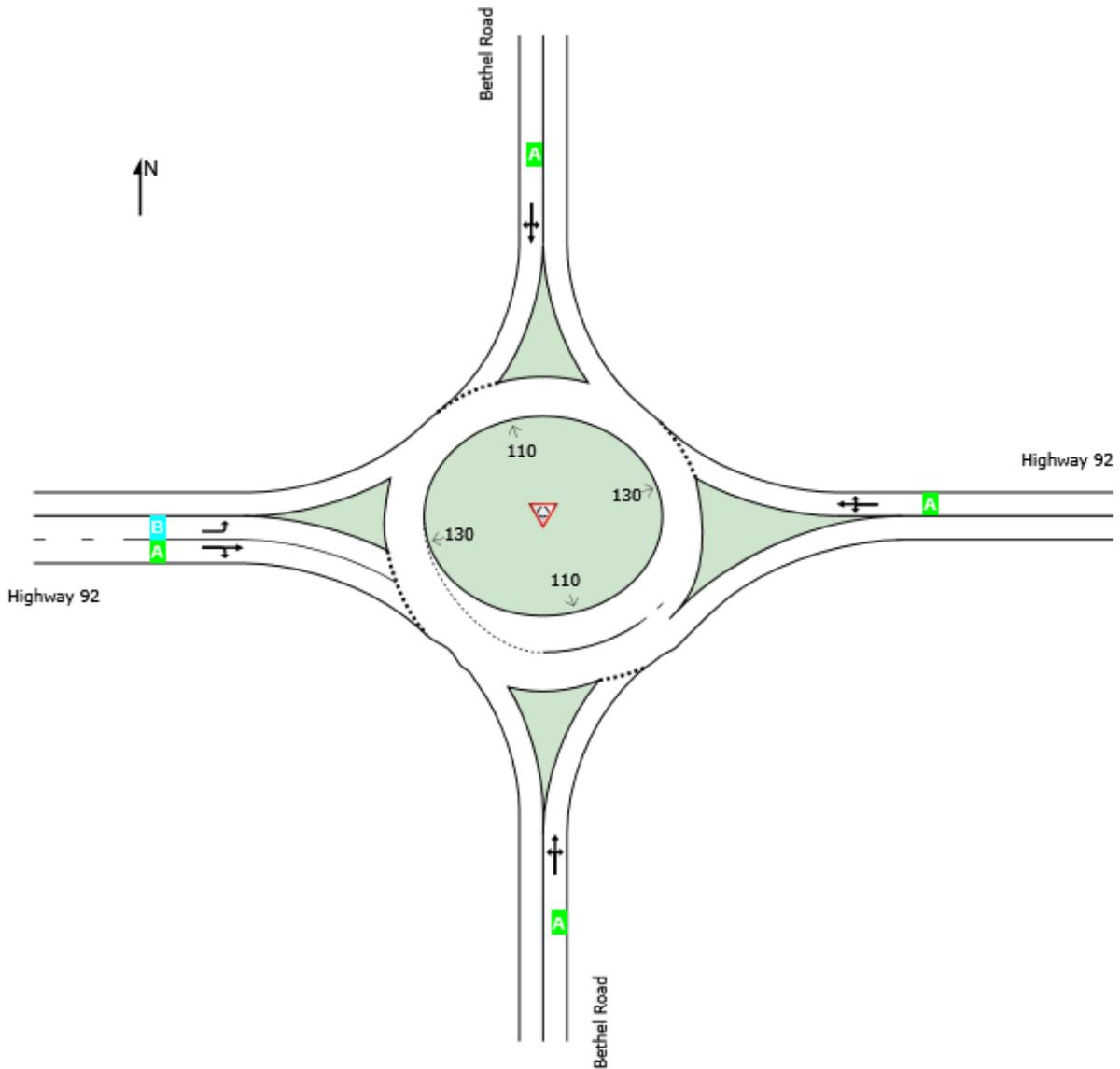
MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

HCM 7th TWSC  
5: N Winan Rd & Highway 92

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	96	2	11	216	1	0	11	4	0	22	14
Future Vol, veh/h	3	96	2	11	216	1	0	11	4	0	22	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	0	2	2
Mvmt Flow	3	104	2	12	235	1	0	12	4	0	24	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	236	0	0	107	0	0	383	372	105	376	372	235
Stage 1	-	-	-	-	-	-	112	112	-	259	259	-
Stage 2	-	-	-	-	-	-	271	260	-	117	113	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.52	6.22	7.1	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4.018	3.318	3.5	4.018	3.318
Pot Cap-1 Maneuver	1331	-	-	1484	-	-	579	558	949	585	558	804
Stage 1	-	-	-	-	-	-	898	803	-	750	693	-
Stage 2	-	-	-	-	-	-	740	693	-	893	802	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1331	-	-	1484	-	-	537	552	949	563	551	804
Mov Cap-2 Maneuver	-	-	-	-	-	-	537	552	-	563	551	-
Stage 1	-	-	-	-	-	-	896	801	-	743	687	-
Stage 2	-	-	-	-	-	-	694	687	-	873	800	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.23			0.36			10.95			11.11		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	621	53	-	-	87	-	-	628
HCM Lane V/C Ratio	0.026	0.002	-	-	0.008	-	-	0.062
HCM Ctrl Dly (s/v)	11	7.7	0	-	7.4	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

HCM 7th TWSC  
 6: NW Interurban Rd & Highway 92

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	87	7	15	205	0	8	1	2	5	7	15
Future Vol, veh/h	6	87	7	15	205	0	8	1	2	5	7	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	2	2	2
Mvmt Flow	7	95	8	16	223	0	9	1	2	5	8	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	223	0	0	102	0	0	371	367	98	364	371	223
Stage 1	-	-	-	-	-	-	111	111	-	255	255	-
Stage 2	-	-	-	-	-	-	259	255	-	108	115	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1346	-	-	1490	-	-	586	562	958	592	559	817
Stage 1	-	-	-	-	-	-	894	803	-	749	696	-
Stage 2	-	-	-	-	-	-	746	696	-	897	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1346	-	-	1490	-	-	557	552	958	580	549	817
Mov Cap-2 Maneuver	-	-	-	-	-	-	557	552	-	580	549	-
Stage 1	-	-	-	-	-	-	889	799	-	740	687	-
Stage 2	-	-	-	-	-	-	714	687	-	889	796	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.46			0.51			11.1			10.54		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	602	106	-	-	123	-	-	679
HCM Lane V/C Ratio	0.02	0.005	-	-	0.011	-	-	0.043
HCM Ctrl Dly (s/v)	11.1	7.7	0	-	7.4	0	-	10.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

HCM 7th TWSC  
 7: Roanridge Road & NW Roanridge Rd

Intersection						
Int Delay, s/veh	7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	3	36	0	0	12
Future Vol, veh/h	1	3	36	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	0	0	2
Mvmt Flow	1	3	39	0	0	13

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	4	0	81 3
Stage 1	-	-	-	-	3 -
Stage 2	-	-	-	-	78 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	1617	-	926 1081
Stage 1	-	-	-	-	1026 -
Stage 2	-	-	-	-	950 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1617	-	904 1081
Mov Cap-2 Maneuver	-	-	-	-	904 -
Stage 1	-	-	-	-	1026 -
Stage 2	-	-	-	-	927 -

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7.28	8.37
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1081	-	-	1617	-
HCM Lane V/C Ratio	0.012	-	-	0.024	-
HCM Ctrl Dly (s/v)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

HCM 7th TWSC  
 8: Bethel Rd & NW Roanridge Rd

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	12	1	0	28	11	36
Future Vol, veh/h	12	1	0	28	11	36
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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	0	2	2	2
Mvmt Flow	13	1	0	30	12	39

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	62	32	51	0	0
Stage 1	32	-	-	-	-
Stage 2	30	-	-	-	-
Critical Hdwy	6.42	6.22	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.2	-	-
Pot Cap-1 Maneuver	944	1042	1568	-	-
Stage 1	991	-	-	-	-
Stage 2	992	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	944	1042	1568	-	-
Mov Cap-2 Maneuver	944	-	-	-	-
Stage 1	991	-	-	-	-
Stage 2	992	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.84	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1568	-	951	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Ctrl Dly (s/v)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

# HCM 7th Signalized Intersection Summary

## 9: Mexico City Ave & 136th Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	53	0	430	171	0	45
Future Volume (veh/h)	53	0	430	171	0	45
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1337	1900	1870	1663	1900	1870
Adj Flow Rate, veh/h	58	0	467	186	0	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	38	0	2	16	0	2
Cap, veh/h	198	250	788	594	442	1498
Arrive On Green	0.16	0.00	0.42	0.42	0.00	0.42
Sat Flow, veh/h	1273	1610	1870	1409	1810	3647
Grp Volume(v), veh/h	58	0	467	186	0	49
Grp Sat Flow(s),veh/h/ln	1273	1610	1870	1409	1810	1777
Q Serve(g_s), s	1.1	0.0	5.5	2.5	0.0	0.2
Cycle Q Clear(g_c), s	1.1	0.0	5.5	2.5	0.0	0.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	198	250	788	594	442	1498
V/C Ratio(X)	0.29	0.00	0.59	0.31	0.00	0.03
Avail Cap(c_a), veh/h	808	1022	1913	1441	754	5014
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	6.3	5.5	0.0	4.8
Incr Delay (d2), s/veh	0.8	0.0	0.7	0.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4	0.0	1.4	0.5	0.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	11.4	0.0	7.0	5.8	0.0	4.8
LnGrp LOS	B		A	A		A
Approach Vol, veh/h	58		653			49
Approach Delay, s/veh	11.4		6.7			4.8
Approach LOS	B		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	0.0	18.0			18.0	10.4
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	5.0	29.0			40.0	18.0
Max Q Clear Time (g_c+I1), s	0.0	7.5			2.2	3.1
Green Ext Time (p_c), s	0.0	3.2			0.2	0.1
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			6.9			
HCM 7th LOS			A			

# HCM 7th Signalized Intersection Summary

## 11: Mexico City Ave & NW Roanridge Rd/132nd St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖↗	↖		↖	↑↗		↖	↑↑↑	↗
Traffic Volume (veh/h)	0	0	154	36	0	0	284	601	13	0	98	0
Future Volume (veh/h)	0	0	154	36	0	0	284	601	13	0	98	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No		No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	877	1870	1900	1900	1441	1811	1870	1900	1604	1900
Adj Flow Rate, veh/h	0	0	167	39	0	0	309	653	14	0	107	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	69	2	0	0	31	6	2	0	20	0
Cap, veh/h	3	330	320	134	562	0	352	1825	39	3	797	293
Arrive On Green	0.00	0.00	0.17	0.04	0.00	0.00	0.26	0.53	0.53	0.00	0.18	0.00
Sat Flow, veh/h	1810	1900	744	3456	1900	0	1372	3444	74	1810	4378	1610
Grp Volume(v), veh/h	0	0	167	39	0	0	309	326	341	0	107	0
Grp Sat Flow(s),veh/h/ln	1810	1900	744	1728	1900	0	1372	1721	1798	1810	1459	1610
Q Serve(g_s), s	0.0	0.0	5.2	0.7	0.0	0.0	14.2	7.2	7.3	0.0	1.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	5.2	0.7	0.0	0.0	14.2	7.2	7.3	0.0	1.4	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	3	330	320	134	562	0	352	911	952	3	797	293
V/C Ratio(X)	0.00	0.00	0.52	0.29	0.00	0.00	0.88	0.36	0.36	0.00	0.13	0.00
Avail Cap(c_a), veh/h	206	360	332	446	562	0	583	1071	1119	137	1196	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	3.8	30.8	0.0	0.0	23.5	9.0	9.0	0.0	22.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.4	1.2	0.0	0.0	8.4	0.2	0.2	0.0	0.1	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	1.7	0.5	0.0	0.0	8.4	3.8	3.9	0.0	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	5.2	32.0	0.0	0.0	31.9	9.2	9.2	0.0	22.7	0.0
LnGrp LOS			A	C			C	A	A		C	
Approach Vol, veh/h		167			39			976			107	
Approach Delay, s/veh		5.2			32.0			16.4			22.7	
Approach LOS		A			C			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.9	18.0	8.1	16.9	0.0	40.9	0.0	25.0				
Change Period (Y+Rc), s	6.0	6.0	5.5	5.5	6.0	6.0	4.5	5.5				
Max Green Setting (Gmax), s	22.0	18.0	8.5	12.5	5.0	41.0	7.5	14.5				
Max Q Clear Time (g_c+110), s	110.2	3.4	2.7	7.2	0.0	9.3	0.0	0.0				
Green Ext Time (p_c), s	0.7	0.4	0.0	0.2	0.0	3.9	0.0	0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		15.9
HCM 7th LOS		B

Notes  
User approved pedestrian interval to be less than phase max green.

HCM 7th TWSC  
 13: N Winan Rd & 132nd St

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	11	2	3	4	2	33
Future Vol, veh/h	11	2	3	4	2	33
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	-	-	-	-	-
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	12	2	3	4	2	36

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	31	20	38	0	0
Stage 1	20	-	-	-	-
Stage 2	11	-	-	-	-
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	983	1058	1572	-	-
Stage 1	1003	-	-	-	-
Stage 2	1012	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	981	1058	1572	-	-
Mov Cap-2 Maneuver	981	-	-	-	-
Stage 1	1000	-	-	-	-
Stage 2	1012	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.68	3.13	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	771	-	992	-	-
HCM Lane V/C Ratio	0.002	-	0.014	-	-
HCM Ctrl Dly (s/v)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

# HCM 7th Signalized Intersection Summary

## 14: Mexico City Ave & I-29 NB Off Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	552	51	24	346	223	118
Future Volume (veh/h)	552	51	24	346	223	118
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1737	1870	1870	1633	1470	1115
Adj Flow Rate, veh/h	600	0	26	376	242	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	2	2	18	29	53
Cap, veh/h	1047		56	1681	991	
Arrive On Green	0.33	0.00	0.03	0.38	0.25	0.00
Sat Flow, veh/h	3209	1585	1781	4606	4146	945
Grp Volume(v), veh/h	600	0	26	376	242	0
Grp Sat Flow(s),veh/h/ln	1605	1585	1781	1486	1338	945
Q Serve(g_s), s	6.3	0.0	0.6	2.3	2.0	0.0
Cycle Q Clear(g_c), s	6.3	0.0	0.6	2.3	2.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1047		56	1681	991	
V/C Ratio(X)	0.57		0.47	0.22	0.24	
Avail Cap(c_a), veh/h	2300		704	5399	2876	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.3	0.0	19.3	8.6	12.2	0.0
Incr Delay (d2), s/veh	1.1	0.0	5.9	0.1	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.4	0.0	0.5	0.9	0.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	12.4	0.0	25.2	8.7	12.5	0.0
LnGrp LOS	B		C	A	B	
Approach Vol, veh/h	600			402	242	
Approach Delay, s/veh	12.4			9.8	12.5	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.3	16.0		19.2		21.3
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	16.0	29.0		29.0		49.0
Max Q Clear Time (g_c+I1), s	2.6	4.0		8.3		4.3
Green Ext Time (p_c), s	0.0	2.7		5.0		5.0

### Intersection Summary

HCM 7th Control Delay, s/veh	11.5
HCM 7th LOS	B

### Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 15: Mexico City Ave & I-29 SB Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↘		↙	↑	↗	↙	↗		↙	↗	↗
Traffic Volume (veh/h)	324	9	55	3	0	0	126	46	1	1	58	215
Future Volume (veh/h)	324	9	55	3	0	0	126	46	1	1	58	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1870	1870	1900	1900	1870	1870	1870	1870	1870	1455
Adj Flow Rate, veh/h	352	10	0	3	0	0	137	50	1	1	63	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	20	2	2	2	0	0	2	2	2	2	2	30
Cap, veh/h	475	274		7	4	3	220	1019	20	4	585	
Arrive On Green	0.16	0.15	0.00	0.00	0.00	0.00	0.12	0.29	0.29	0.00	0.16	0.00
Sat Flow, veh/h	2963	1870	0	1781	1900	1610	1781	3563	71	1781	3554	1233
Grp Volume(v), veh/h	352	10	0	3	0	0	137	25	26	1	63	0
Grp Sat Flow(s),veh/h/ln	1481	1870	0	1781	1900	1610	1781	1777	1858	1781	1777	1233
Q Serve(g_s), s	5.4	0.2	0.0	0.1	0.0	0.0	3.5	0.5	0.5	0.0	0.7	0.0
Cycle Q Clear(g_c), s	5.4	0.2	0.0	0.1	0.0	0.0	3.5	0.5	0.5	0.0	0.7	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	475	274		7	4	3	220	508	531	4	585	
V/C Ratio(X)	0.74	0.04		0.41	0.00	0.00	0.62	0.05	0.05	0.27	0.11	
Avail Cap(c_a), veh/h	569	565		530	766	649	481	668	698	654	1680	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.0	17.4	0.0	23.5	0.0	0.0	19.7	12.2	12.2	23.6	16.8	0.0
Incr Delay (d2), s/veh	4.6	0.1	0.0	39.4	0.0	0.0	4.1	0.1	0.1	46.8	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.5	0.2	0.0	0.2	0.0	0.0	2.6	0.3	0.3	0.1	0.5	0.0
Unsig. Movement Delay, s/veh												8.40
LnGrp Delay(d), s/veh	23.5	17.4	0.0	62.9	0.0	0.0	23.8	12.3	12.3	70.4	17.0	8.4
LnGrp LOS	C	B		E			C	B	B	E	B	A
Approach Vol, veh/h		362			3			188			298	
Approach Delay, s/veh		23.4			62.9			20.7			10.4	
Approach LOS		C			E			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	20.8	6.1	12.8	13.0	15.4	13.5	5.4				
Change Period (Y+Rc), s	7.6	7.2	5.9	* 5.9	7.2	7.6	5.9	5.9				
Max Green Setting (Gmax), s	17.4	17.8	14.1	* 14	12.8	22.4	9.1	19.1				
Max Q Clear Time (g_c+1), s	12.0	2.5	2.1	2.2	5.5	2.7	7.4	0.0				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.0	0.3	0.4	0.3	0.0				

### Intersection Summary

HCM 7th Control Delay, s/veh	18.4
HCM 7th LOS	B

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is included in calculations of the approach delay and intersection delay.

HCM 7th TWSC  
 16: N Winan Rd & NW 128th St

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	5	2	0	1	3
Future Vol, veh/h	0	5	2	0	1	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	0	2	2
Mvmt Flow	0	5	2	0	1	3

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	8	2	0	0	2	0
Stage 1	2	-	-	-	-	-
Stage 2	5	-	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1019	1082	-	-	1620	-
Stage 1	1026	-	-	-	-	-
Stage 2	1023	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1018	1082	-	-	1620	-
Mov Cap-2 Maneuver	1018	-	-	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	8.34	0	1.81
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 1082	450	-
HCM Lane V/C Ratio	-	- 0.005	0.001	-
HCM Ctrl Dly (s/v)	-	- 8.3	7.2	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

HCM 7th TWSC  
 17: NW Interurban Rd & NW 128th St

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	4	4	11	0	5	0	19	19	1
Future Vol, veh/h	0	0	1	4	4	11	0	5	0	19	19	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	2	2	2	2	0	2	0	2	2	2
Mvmt Flow	0	0	1	4	4	12	0	5	0	21	21	1

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	70	68	21	67	68	5	22	0	0	5	0	0
Stage 1	62	62	-	5	5	-	-	-	-	-	-	-
Stage 2	8	5	-	62	63	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	927	827	1056	925	822	1078	1607	-	-	1616	-	-
Stage 1	954	847	-	1017	891	-	-	-	-	-	-	-
Stage 2	1019	895	-	949	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	900	816	1056	913	811	1078	1607	-	-	1616	-	-
Mov Cap-2 Maneuver	900	816	-	913	811	-	-	-	-	-	-	-
Stage 1	941	836	-	1017	891	-	-	-	-	-	-	-
Stage 2	1003	895	-	936	831	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Ctrl Dly, s/v	8.41		8.78			0			3.54		
HCM LOS	A		A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1607	-	-	1056	973	868	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.021	0.013	-	-
HCM Ctrl Dly (s/v)	0	-	-	8.4	8.8	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

HCM 7th TWSC  
 18: Mexico City Ave & Travel Center

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	53	0	898	288	0
Future Vol, veh/h	0	53	0	898	288	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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	14	44	0
Mvmt Flow	0	58	0	976	313	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	157	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	732	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	732	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.34	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 732	-	-
HCM Lane V/C Ratio	- 0.079	-	-
HCM Ctrl Dly (s/v)	- 10.3	-	-
HCM Lane LOS	- B	-	-
HCM 95th %tile Q(veh)	- 0.3	-	-

# LANE SUMMARY

Site: 1 [HW 92 and Bethel - 2028 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]			ft	ft
South: Bethel Road															
Lane 1 <sup>d</sup>	93	2.0	93	2.0	938	0.100	100	8.2	LOS A	0.4	10.2	Full	1600	0.0	0.0
Approach	93	2.0	93	2.0		0.100		8.2	LOS A	0.4	10.2				
East: Highway 92															
Lane 1 <sup>d</sup>	232	2.0	232	2.0	1296	0.179	100	7.0	LOS A	1.0	25.0	Full	1600	0.0	0.0
Approach	232	2.0	232	2.0		0.179		7.0	LOS A	1.0	25.0				
North: Bethel Road															
Lane 1 <sup>d</sup>	74	2.0	74	2.0	1177	0.063	100	6.1	LOS A	0.3	8.2	Full	1600	0.0	0.0
Approach	74	2.0	74	2.0		0.063		6.1	LOS A	0.3	8.2				
West: Highway 92															
Lane 1	70	2.0	70	2.0	1178	0.059	100	13.1	LOS B	0.3	7.5	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	376	2.0	376	2.0	1659	0.227	100	6.7	LOS A	1.4	35.0	Full	1600	0.0	0.0
Approach	446	2.0	446	2.0		0.227		7.7	LOS A	1.4	35.0				
All Vehicles	845	2.0	845	2.0		0.227		7.4	LOS A	1.4	35.0				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Bethel Road											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane No.	
From S						Cap. veh/h	v/c	%	%		
To Exit:	W	N	E								
Lane 1	24	33	37	93	2.0	938	0.100	100	NA	NA	
Approach	24	33	37	93	2.0		0.100				
East: Highway 92											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane No.	
From E						Cap. veh/h	v/c	%	%		
To Exit:	S	W	N								
Lane 1	12	213	7	232	2.0	1296	0.179	100	NA	NA	

Approach	12	213	7	232	2.0		0.179				
<b>North: Bethel Road</b>											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From N To Exit:	E	S	W			Cap. veh/h	v/c	%	%		
Lane 1	8	23	43	74	2.0	1177	0.063	100	NA	NA	
Approach	8	23	43	74	2.0		0.063				
<b>West: Highway 92</b>											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From W To Exit:	N	E	S			Cap. veh/h	v/c	%	%		
Lane 1	70	-	-	70	2.0	1178	0.059	100	NA	NA	
Lane 2	-	355	21	376	2.0	1659	0.227	100	NA	NA	
Approach	70	355	21	446	2.0		0.227				
<b>Total %HV Deg. Satn (v/c)</b>											
All Vehicles	845	2.0		0.227							

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<b>Merge Analysis</b>											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.											

<b>Variable Demand Analysis</b>				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
<b>South: Bethel Road</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>East: Highway 92</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>North: Bethel Road</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>West: Highway 92</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

# LANE LEVEL OF SERVICE

## Lane Level of Service

 Site: 1 [HW 92 and Bethel - 2028 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

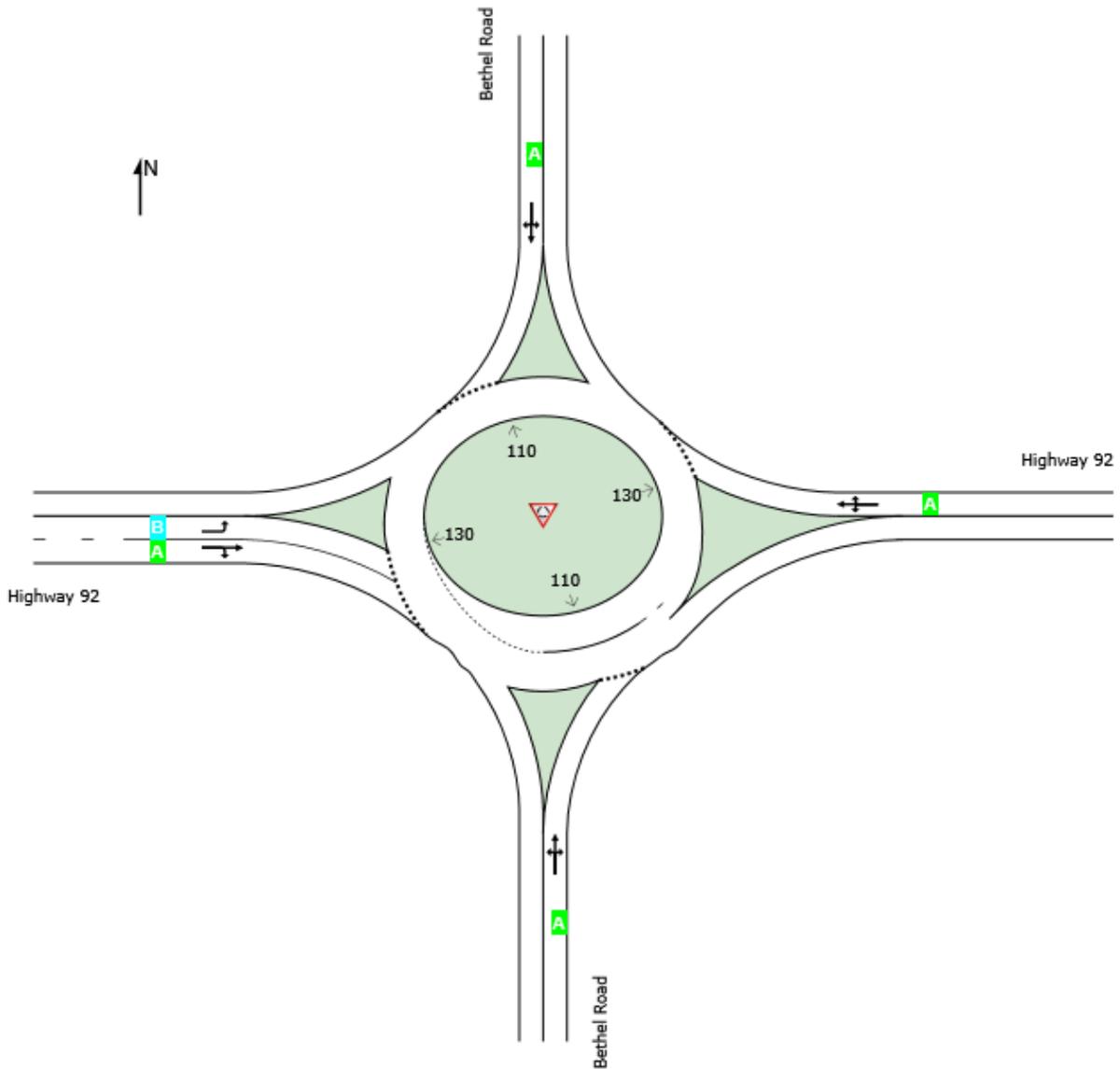
MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

HCM 7th TWSC  
5: N Winan Rd & Highway 92

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	232	2	8	127	0	5	18	18	0	8	12
Future Vol, veh/h	23	232	2	8	127	0	5	18	18	0	8	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	0	2	2
Mvmt Flow	25	252	2	9	138	0	5	20	20	0	9	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	138	0	0	254	0	0	463	459	253	467	460	138
Stage 1	-	-	-	-	-	-	303	303	-	155	155	-
Stage 2	-	-	-	-	-	-	160	155	-	312	304	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.318
Pot Cap-1 Maneuver	1446	-	-	1311	-	-	509	499	785	509	498	910
Stage 1	-	-	-	-	-	-	706	663	-	852	769	-
Stage 2	-	-	-	-	-	-	842	769	-	703	663	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1446	-	-	1311	-	-	480	485	785	464	485	910
Mov Cap-2 Maneuver	-	-	-	-	-	-	480	485	-	464	485	-
Stage 1	-	-	-	-	-	-	692	650	-	846	763	-
Stage 2	-	-	-	-	-	-	815	763	-	651	649	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.67			0.46			11.7			10.52		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	582	161	-	-	107	-	-	674
HCM Lane V/C Ratio	0.077	0.017	-	-	0.007	-	-	0.032
HCM Ctrl Dly (s/v)	11.7	7.5	0	-	7.8	0	-	10.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.1

HCM 7th TWSC  
 6: NW Interurban Rd & Highway 92

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	233	5	15	205	0	9	14	23	4	9	3
Future Vol, veh/h	17	233	5	15	205	0	9	14	23	4	9	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	2	2	2
Mvmt Flow	18	253	5	16	223	0	10	15	25	4	10	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	223	0	0	259	0	0	553	548	256	553	551	223
Stage 1	-	-	-	-	-	-	293	293	-	255	255	-
Stage 2	-	-	-	-	-	-	260	255	-	298	296	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1346	-	-	1306	-	-	444	444	783	444	442	817
Stage 1	-	-	-	-	-	-	715	670	-	749	696	-
Stage 2	-	-	-	-	-	-	745	696	-	711	668	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1346	-	-	1306	-	-	419	430	783	402	429	817
Mov Cap-2 Maneuver	-	-	-	-	-	-	419	430	-	402	429	-
Stage 1	-	-	-	-	-	-	704	660	-	738	686	-
Stage 2	-	-	-	-	-	-	721	686	-	661	658	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.51			0.53			12.18			13.09		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	552	119	-	-	123	-	-	462
HCM Lane V/C Ratio	0.091	0.014	-	-	0.012	-	-	0.038
HCM Ctrl Dly (s/v)	12.2	7.7	0	-	7.8	0	-	13.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

HCM 7th TWSC  
 7: Roanridge Road & NW Roanridge Rd

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	23	1	0	47
Future Vol, veh/h	3	0	23	1	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	2	2	0	2
Mvmt Flow	3	0	25	1	0	51

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	3	0	54 3
Stage 1	-	-	-	-	3 -
Stage 2	-	-	-	-	51 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	1619	-	959 1081
Stage 1	-	-	-	-	1025 -
Stage 2	-	-	-	-	977 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1619	-	944 1081
Mov Cap-2 Maneuver	-	-	-	-	944 -
Stage 1	-	-	-	-	1025 -
Stage 2	-	-	-	-	961 -

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	6.96	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1081	-	-	1618	-
HCM Lane V/C Ratio	0.047	-	-	0.015	-
HCM Ctrl Dly (s/v)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

HCM 7th TWSC  
 8: Bethel Rd & NW Roanridge Rd

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	45	5	1	41	28	23
Future Vol, veh/h	45	5	1	41	28	23
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	-	-	-	-	-
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	49	5	1	45	30	25

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	90	43	55	0	0
Stage 1	43	-	-	-	-
Stage 2	47	-	-	-	-
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	911	1027	1549	-	-
Stage 1	980	-	-	-	-
Stage 2	976	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	910	1027	1549	-	-
Mov Cap-2 Maneuver	910	-	-	-	-
Stage 1	979	-	-	-	-
Stage 2	976	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.16	0.17	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	43	-	921	-	-
HCM Lane V/C Ratio	0.001	-	0.059	-	-
HCM Ctrl Dly (s/v)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

# HCM 7th Signalized Intersection Summary

## 9: Mexico City Ave & 136th Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	586	0	35	138	0	340
Future Volume (veh/h)	586	0	35	138	0	340
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1841	1900	1870	1678	1900	1856
Adj Flow Rate, veh/h	637	0	38	150	0	370
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	0	2	15	0	3
Cap, veh/h	741	681	539	410	510	1017
Arrive On Green	0.42	0.00	0.29	0.29	0.00	0.29
Sat Flow, veh/h	1753	1610	1870	1422	1810	3618
Grp Volume(v), veh/h	637	0	38	150	0	370
Grp Sat Flow(s),veh/h/ln	1753	1610	1870	1422	1810	1763
Q Serve(g_s), s	13.7	0.0	0.6	3.5	0.0	3.5
Cycle Q Clear(g_c), s	13.7	0.0	0.6	3.5	0.0	3.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	741	681	539	410	510	1017
V/C Ratio(X)	0.86	0.00	0.07	0.37	0.00	0.36
Avail Cap(c_a), veh/h	1266	1163	765	582	723	2376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	10.7	11.8	0.0	11.8
Incr Delay (d2), s/veh	3.1	0.0	0.1	0.5	0.0	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	0.0	0.3	1.5	0.0	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.0	0.0	10.8	12.3	0.0	12.0
LnGrp LOS	B		B	B		B
Approach Vol, veh/h	637		188			370
Approach Delay, s/veh	14.0		12.0			12.0
Approach LOS	B		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	0.0	18.0			18.0	23.6
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	5.0	17.0			28.0	30.0
Max Q Clear Time (g_c+I1), s	0.0	5.5			5.5	15.7
Green Ext Time (p_c), s	0.0	0.5			2.1	1.9
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			13.1			
HCM 7th LOS			B			

# HCM 7th Signalized Intersection Summary

## 11: Mexico City Ave & NW Roanridge Rd/132nd St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘↗	↘		↘	↑↗		↘	↑↑↑	↗
Traffic Volume (veh/h)	0	0	231	29	0	0	267	173	41	0	926	0
Future Volume (veh/h)	0	0	231	29	0	0	267	173	41	0	926	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No		No		No		No	
Adj Sat Flow, veh/h/ln	1900	1900	1366	1870	1900	1900	1396	1722	1870	1900	1841	1900
Adj Flow Rate, veh/h	0	0	251	32	0	0	290	188	45	0	1007	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	36	2	0	0	34	12	2	0	4	0
Cap, veh/h	2	299	442	112	499	0	298	1542	360	2	1418	454
Arrive On Green	0.00	0.00	0.16	0.03	0.00	0.00	0.22	0.59	0.59	0.00	0.28	0.00
Sat Flow, veh/h	1810	1900	1158	3456	1900	0	1330	2632	615	1810	5025	1610
Grp Volume(v), veh/h	0	0	251	32	0	0	290	115	118	0	1007	0
Grp Sat Flow(s),veh/h/ln	1810	1900	1158	1728	1900	0	1330	1636	1611	1810	1675	1610
Q Serve(g_s), s	0.0	0.0	7.6	0.7	0.0	0.0	16.4	2.4	2.5	0.0	13.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	7.6	0.7	0.0	0.0	16.4	2.4	2.5	0.0	13.6	0.0
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	2	299	442	112	499	0	298	958	944	2	1418	454
V/C Ratio(X)	0.00	0.00	0.57	0.29	0.00	0.00	0.97	0.12	0.12	0.00	0.71	0.00
Avail Cap(c_a), veh/h	155	313	451	296	499	0	298	958	944	119	2056	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	6.9	35.8	0.0	0.0	29.2	7.0	7.0	0.0	24.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.6	1.4	0.0	0.0	44.4	0.1	0.1	0.0	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	4.1	0.5	0.0	0.0	13.2	1.2	1.2	0.0	8.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.0	8.5	37.2	0.0	0.0	73.5	7.0	7.1	0.0	25.1	0.0
LnGrp LOS			A	D			E	A	A		C	
Approach Vol, veh/h		251			32			523			1007	
Approach Delay, s/veh		8.5			37.2			43.9			25.1	
Approach LOS		A			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.0	27.4	8.0	17.4	0.0	50.4	0.0	25.4				
Change Period (Y+Rc), s	6.0	6.0	5.5	5.5	6.0	6.0	4.5	5.5				
Max Green Setting (Gmax), s	31.0	31.0	6.5	12.5	5.0	43.0	6.5	13.5				
Max Q Clear Time (g_c+11g), s	15.6	15.6	2.7	9.6	0.0	4.5	0.0	0.0				
Green Ext Time (p_c), s	0.0	5.8	0.0	0.2	0.0	1.3	0.0	0.0				

Intersection Summary		
HCM 7th Control Delay, s/veh		28.4
HCM 7th LOS		C

**Notes**  
User approved pedestrian interval to be less than phase max green.

HCM 7th TWSC  
 13: N Winan Rd & 132nd St

Intersection						
Int Delay, s/veh	6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	37	4	12	4	1	17
Future Vol, veh/h	37	4	12	4	1	17
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	-	-	-	-	-
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	40	4	13	4	1	18

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	41	10	20	0	0
Stage 1	10	-	-	-	-
Stage 2	30	-	-	-	-
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	971	1071	1597	-	-
Stage 1	1013	-	-	-	-
Stage 2	992	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	963	1071	1597	-	-
Mov Cap-2 Maneuver	963	-	-	-	-
Stage 1	1004	-	-	-	-
Stage 2	992	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.88	5.45	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1350	-	972	-	-
HCM Lane V/C Ratio	0.008	-	0.046	-	-
HCM Ctrl Dly (s/v)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

# HCM 7th Signalized Intersection Summary

## 14: Mexico City Ave & I-29 NB Off Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙↘	↗	↙	↑↑↑	↑↑↑	↗
Traffic Volume (veh/h)	296	156	81	185	833	444
Future Volume (veh/h)	296	156	81	185	833	444
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1618	1870	1870	1455	1796	1707
Adj Flow Rate, veh/h	322	0	88	201	905	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	2	2	30	7	13
Cap, veh/h	553		128	2244	2008	
Arrive On Green	0.19	0.00	0.07	0.56	0.41	0.00
Sat Flow, veh/h	2990	1585	1781	4104	5065	1447
Grp Volume(v), veh/h	322	0	88	201	905	0
Grp Sat Flow(s),veh/h/ln	1495	1585	1781	1324	1635	1447
Q Serve(g_s), s	4.7	0.0	2.3	1.1	6.4	0.0
Cycle Q Clear(g_c), s	4.7	0.0	2.3	1.1	6.4	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	553		128	2244	2008	
V/C Ratio(X)	0.58		0.69	0.09	0.45	
Avail Cap(c_a), veh/h	1496		594	4472	3475	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.9	0.0	21.7	4.8	10.3	0.0
Incr Delay (d2), s/veh	2.1	0.0	6.4	0.0	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.9	0.0	1.9	0.3	3.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	19.9	0.0	28.1	4.8	10.6	0.0
LnGrp LOS	B		C	A	B	
Approach Vol, veh/h	322			289	905	
Approach Delay, s/veh	19.9			11.9	10.6	
Approach LOS	B			B	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	7.5	25.6		14.9		33.1
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	16.0	34.0		24.0		54.0
Max Q Clear Time (g_c+I1), s	4.3	8.4		6.7		3.1
Green Ext Time (p_c), s	0.1	11.2		2.3		2.6

### Intersection Summary

HCM 7th Control Delay, s/veh	12.8
HCM 7th LOS	B

### Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 15: Mexico City Ave & I-29 SB Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↘		↔	↑	↗	↔	↕		↔	↕↕	↗
Traffic Volume (veh/h)	166	9	48	10	32	25	97	75	4	3	170	816
Future Volume (veh/h)	166	9	48	10	32	25	97	75	4	3	170	816
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1411	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1796
Adj Flow Rate, veh/h	180	10	0	11	35	27	105	82	4	3	185	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	33	2	2	2	2	2	2	2	2	2	2	7
Cap, veh/h	276	299		25	127	108	190	1016	49	10	688	
Arrive On Green	0.11	0.16	0.00	0.01	0.07	0.07	0.11	0.29	0.29	0.01	0.19	0.00
Sat Flow, veh/h	2607	1870	0	1781	1870	1585	1781	3450	167	1781	3554	1522
Grp Volume(v), veh/h	180	10	0	11	35	27	105	42	44	3	185	0
Grp Sat Flow(s),veh/h/ln1303	1870	0	1781	1870	1585	1781	1777	1840	1781	1777	1522	
Q Serve(g_s), s	3.4	0.2	0.0	0.3	0.9	0.8	2.8	0.9	0.9	0.1	2.2	0.0
Cycle Q Clear(g_c), s	3.4	0.2	0.0	0.3	0.9	0.8	2.8	0.9	0.9	0.1	2.2	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	276	299		25	127	108	190	523	542	10	688	
V/C Ratio(X)	0.65	0.03		0.44	0.27	0.25	0.55	0.08	0.08	0.29	0.27	
Avail Cap(c_a), veh/h	727	640		285	410	348	732	977	1011	366	1222	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.7	18.0	0.0	24.7	22.4	22.3	21.4	12.9	12.9	25.0	17.4	0.0
Incr Delay (d2), s/veh	3.1	0.1	0.0	13.7	1.6	1.7	3.5	0.1	0.1	21.3	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln1.9	0.2	0.0	0.0	0.4	0.8	0.6	2.1	0.5	0.6	0.2	1.4	0.0
Unsig. Movement Delay, s/veh												8.40
LnGrp Delay(d), s/veh	24.9	18.0	0.0	38.4	24.0	24.1	25.0	13.0	13.0	46.4	17.8	8.4
LnGrp LOS	C	B		D	C	C	C	B	B	D	B	A
Approach Vol, veh/h		190			73			191			1075	
Approach Delay, s/veh		24.5			26.2			19.6			10.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s7.9	22.1	6.6	14.0	12.6	17.4	11.3	9.3					
Change Period (Y+Rc), s 7.6	7.2	5.9	* 5.9	7.2	7.6	5.9	5.9					
Max Green Setting (Gmax), s 10.4	27.8	8.1	* 17	20.8	17.4	14.1	11.1					
Max Q Clear Time (g_c+1), s 12.1	2.9	2.3	2.2	4.8	4.2	5.4	2.9					
Green Ext Time (p_c), s	0.0	0.7	0.0	0.0	0.3	1.3	0.1					

### Intersection Summary

HCM 7th Control Delay, s/veh	13.9
HCM 7th LOS	B

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is included in calculations of the approach delay and intersection delay.

HCM 7th TWSC  
 16: N Winan Rd & NW 128th St

Intersection						
Int Delay, s/veh	4.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	8	8	2	5	0
Future Vol, veh/h	0	8	8	2	5	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	2	2	0
Mvmt Flow	0	9	9	2	5	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	21	10	0	0	11	0
Stage 1	10	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1001	1072	-	-	1608	-
Stage 1	1018	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	998	1072	-	-	1608	-
Mov Cap-2 Maneuver	998	-	-	-	-	-
Stage 1	1018	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	8.39	0	7.25
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1072	1608
HCM Lane V/C Ratio	-	-	0.008	0.003
HCM Ctrl Dly (s/v)	-	-	8.4	7.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 7th TWSC  
 17: NW Interurban Rd & NW 128th St

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	3	1	7	5	15	2	26	4	27	16	1
Future Vol, veh/h	3	3	1	7	5	15	2	26	4	27	16	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	3	3	1	8	5	16	2	28	4	29	17	1

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	112	114	18	113	112	30	18	0	0	33	0	0
Stage 1	77	77	-	35	35	-	-	-	-	-	-	-
Stage 2	35	37	-	78	77	-	-	-	-	-	-	-
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	866	777	1061	865	778	1044	1598	-	-	1579	-	-
Stage 1	932	831	-	981	866	-	-	-	-	-	-	-
Stage 2	980	864	-	931	831	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	829	761	1061	843	763	1044	1598	-	-	1579	-	-
Mov Cap-2 Maneuver	829	761	-	843	763	-	-	-	-	-	-	-
Stage 1	915	816	-	980	865	-	-	-	-	-	-	-
Stage 2	958	863	-	909	815	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Ctrl Dly, s/v	9.41		9.02		0.45		4.49	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	110	-	-	823	924	1092	-	-
HCM Lane V/C Ratio	0.001	-	-	0.009	0.032	0.019	-	-
HCM Ctrl Dly (s/v)	7.3	0	-	9.4	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

HCM 7th TWSC  
 18: Mexico City Ave & Travel Center

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	91	0	481	1186	0
Future Vol, veh/h	0	91	0	481	1186	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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	23	10	0
Mvmt Flow	0	99	0	523	1289	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	645	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	356	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	356	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	18.96	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	356	-	-
HCM Lane V/C Ratio	-	0.278	-	-
HCM Ctrl Dly (s/v)	-	19	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	1.1	-	-

SimTraffic

Queuing and Blocking Report  
025-03015

Intersection: 9: Mexico City Ave & 136th Street

Movement	WB	NB	NB	SB	SB
Directions Served	L	T	R	T	T
Maximum Queue (ft)	98	105	58	17	49
Average Queue (ft)	41	47	26	5	18
95th Queue (ft)	102	106	58	22	53
Link Distance (ft)		1530	1530	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300				200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	L	L	L	T	TR	T	T	T
Maximum Queue (ft)	102	6	60	201	128	70	47	39	90
Average Queue (ft)	60	4	23	128	44	23	8	13	36
95th Queue (ft)	106	19	56	211	127	68	45	41	92
Link Distance (ft)				482	482	482	1530	1530	1530
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300	500	500						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 14: Mexico City Ave & I-29 NB Off Ramp

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	T	T	T	T	T	T
Maximum Queue (ft)	166	182	47	124	88	72	11	85	131
Average Queue (ft)	81	110	15	53	46	40	3	30	77
95th Queue (ft)	164	178	43	123	87	82	18	81	151
Link Distance (ft)				563	563		763	763	763
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	420	420	600			275			
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report  
025-03015

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	L	T	TR	T	T	R
Maximum Queue (ft)	103	171	28	9	93	41	28	20	53	48
Average Queue (ft)	37	103	6	2	50	13	7	7	28	3
95th Queue (ft)	114	176	26	9	96	43	27	26	55	25
Link Distance (ft)			650			1102	1102	1128	1128	1128
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	380	380		125	430					
Storage Blk Time (%)										
Queuing Penalty (veh)										

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report  
025-03015

Intersection: 9: Mexico City Ave & 136th Street

Movement	WB	NB	NB	SB	SB
Directions Served	L	T	R	T	T
Maximum Queue (ft)	220	43	68	98	134
Average Queue (ft)	160	10	42	42	70
95th Queue (ft)	244	41	70	97	129
Link Distance (ft)		1530	1530	1025	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300				200
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	T	R	L	L	L	T	TR	T	T	T
Maximum Queue (ft)	13	154	5	44	241	4	64	77	173	231
Average Queue (ft)	2	82	1	16	154	1	16	38	80	133
95th Queue (ft)	15	163	9	43	262	6	66	83	173	226
Link Distance (ft)	513				482	482	482	1530	1530	1530
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		300	500	500						
Storage Blk Time (%)										2
Queuing Penalty (veh)										0

Intersection: 14: Mexico City Ave & I-29 NB Off Ramp

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	T	T
Maximum Queue (ft)	168	154	27	90	67	44	37	97	139	182
Average Queue (ft)	92	92	10	41	25	14	13	37	91	124
95th Queue (ft)	173	160	48	79	68	49	42	92	145	198
Link Distance (ft)			679		563	563		763	763	763
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	420	420		600			275			
Storage Blk Time (%)										
Queuing Penalty (veh)										

Queuing and Blocking Report  
025-03015

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	T	R	L	T	TR	L	T	T
Maximum Queue (ft)	88	147	10	14	29	25	78	48	10	20	83	110
Average Queue (ft)	39	82	3	4	12	6	47	22	2	4	34	67
95th Queue (ft)	103	148	16	14	30	24	96	52	12	22	82	106
Link Distance (ft)			650		619	619		1102	1102		1128	1128
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	380	380		125			430			450		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	SB
Directions Served	R
Maximum Queue (ft)	191
Average Queue (ft)	69
95th Queue (ft)	176
Link Distance (ft)	1128
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 0

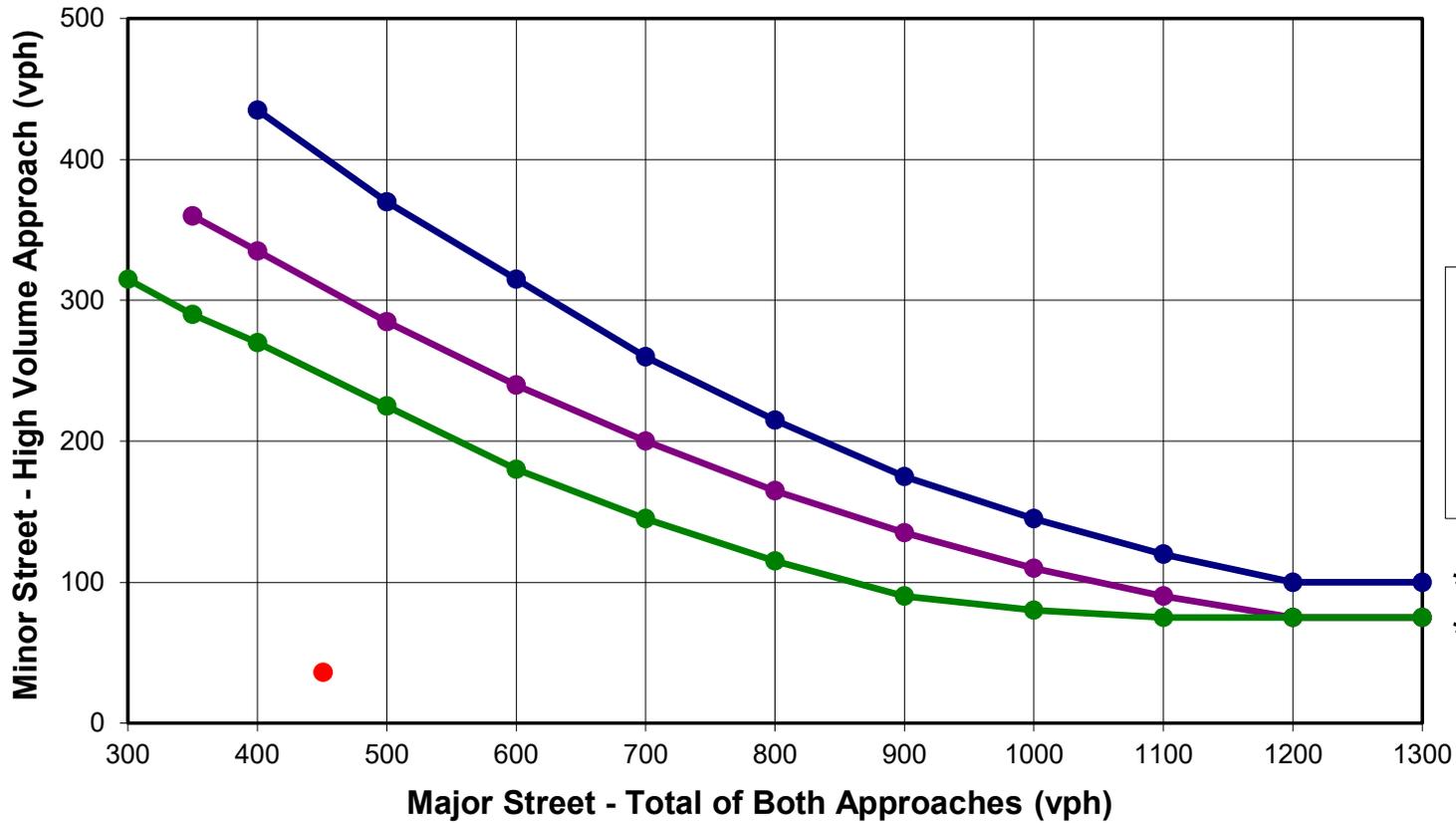
## **APPENDIX C**

Build Year 2034 Conditions

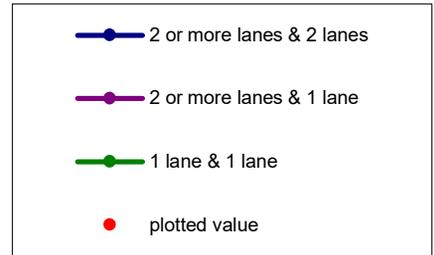
## Warrant Analysis

# 2034 AM Peak Hour Volume Warrant Highway 92 and Winan Road

(Community less than 10,000 population or above 40mph on major street)



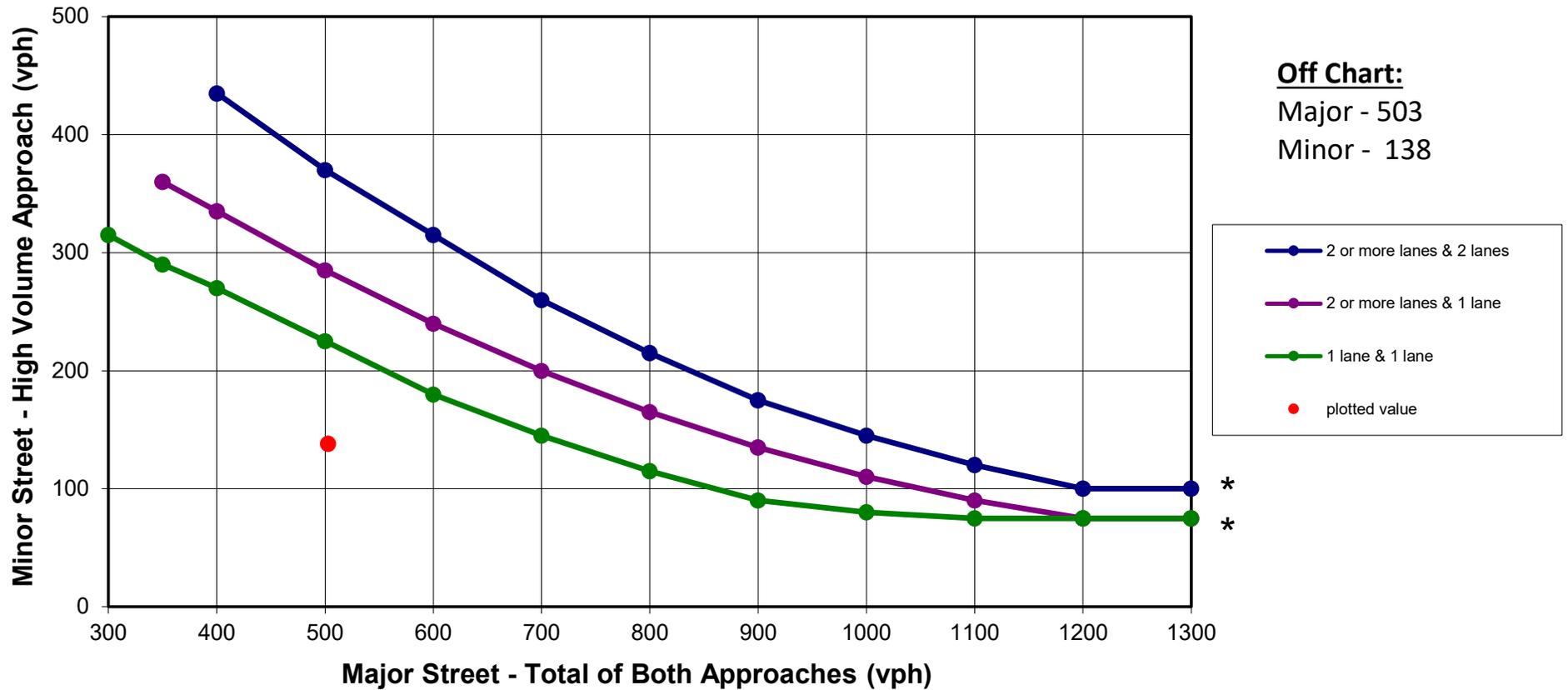
**Off Chart:**  
Major - 451  
Minor - 36



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2034 PM Peak Hour Volume Warrant Highway 92 and Winan Road

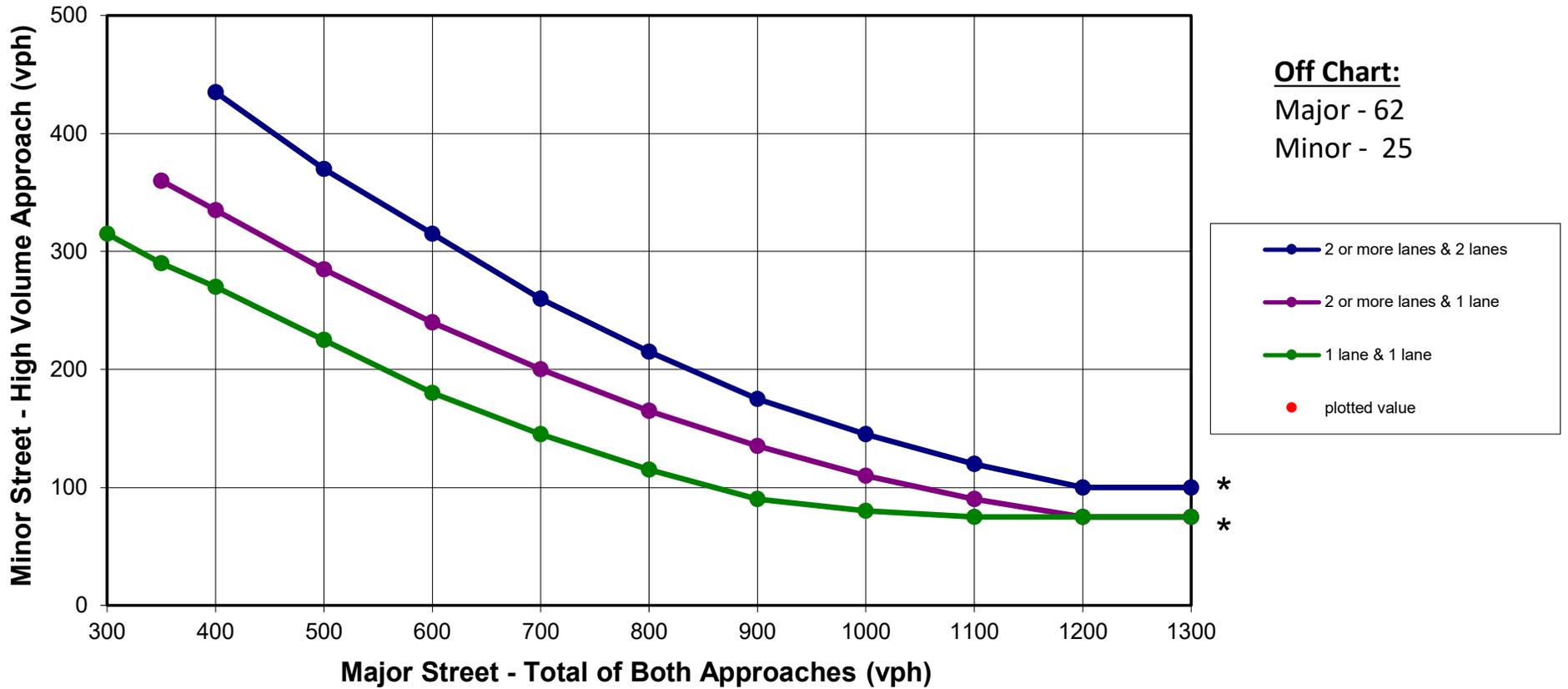
(Community less than 10,000 population or above 40mph on major street)



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2034 AM Peak Hour Volume Warrant 132nd Street and Winan Road

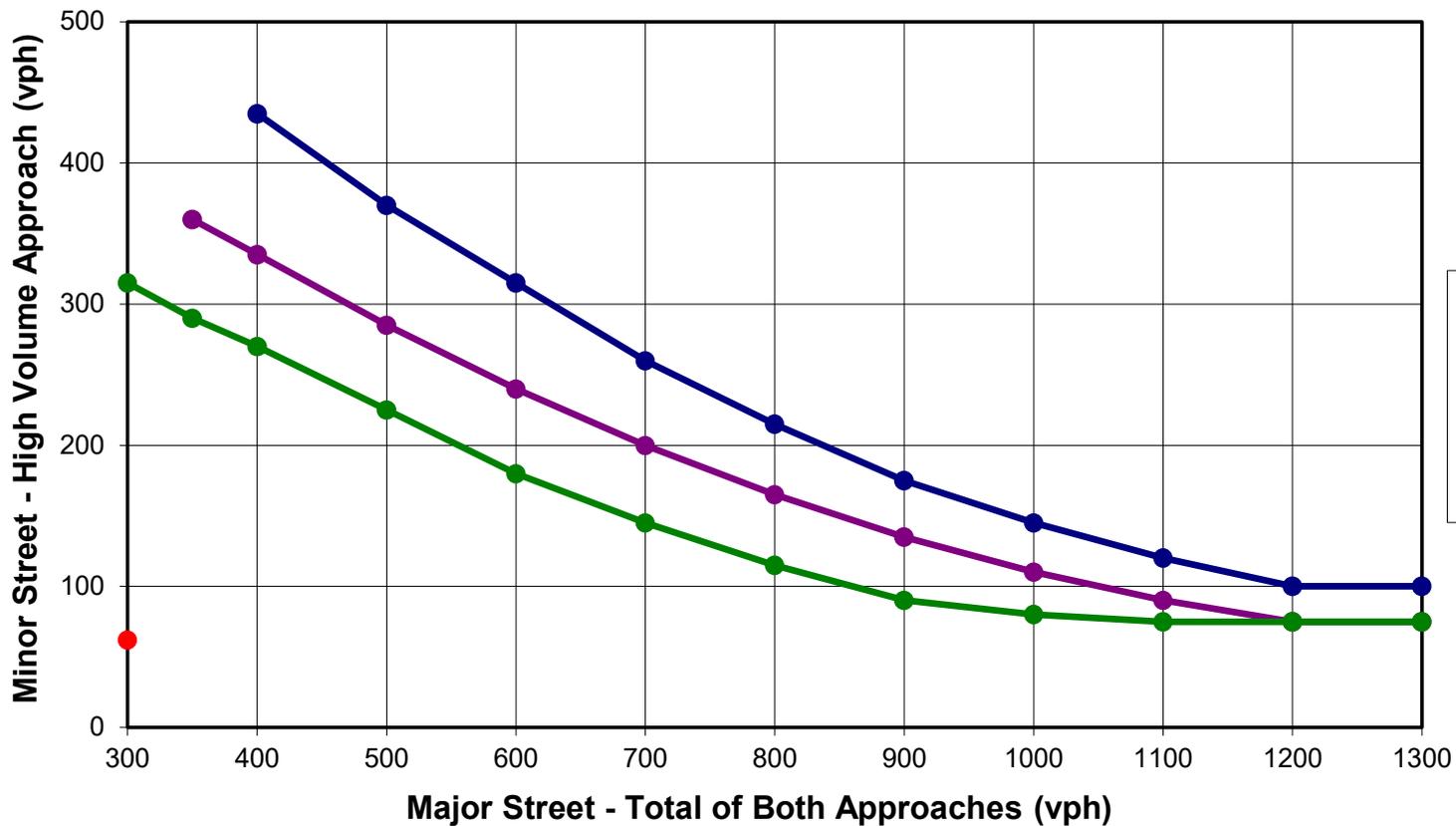
(Community less than 10,000 population or above 40mph on major street)



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2034 PM Peak Hour Volume Warrant 132nd Street and Winan Road

(Community less than 10,000 population or above 40mph on major street)



### Off Chart:

Major - 51

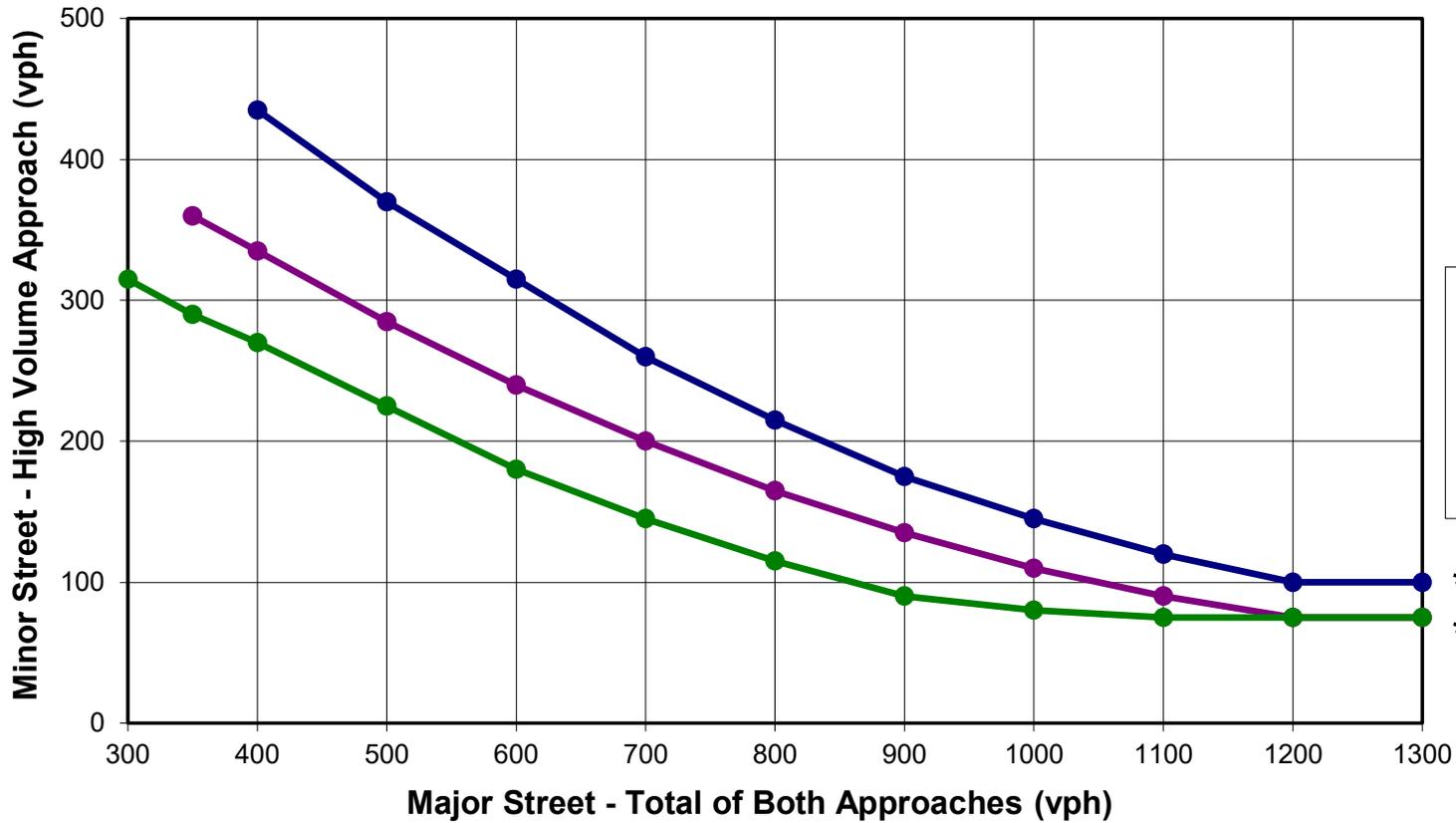
Minor - 62



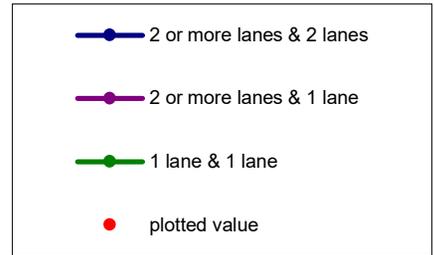
\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2034 AM Peak Hour Volume Warrant Bethel Road and Mexico City Avenue

(Community less than 10,000 population or above 40mph on major street)



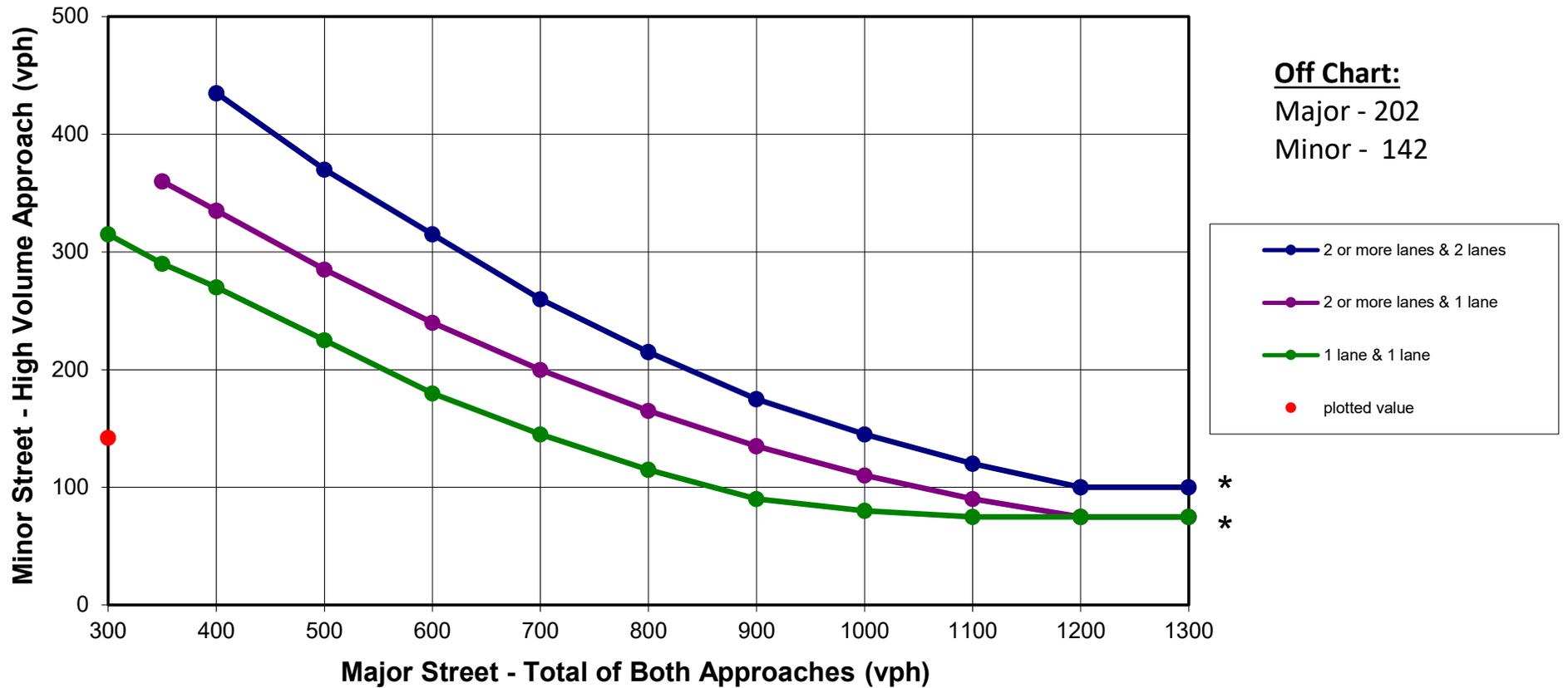
**Off Chart:**  
Major - 234  
Minor - 30



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2034 PM Peak Hour Volume Warrant Bethel Road and Mexico City Avenue

(Community less than 10,000 population or above 40mph on major street)



### Off Chart:

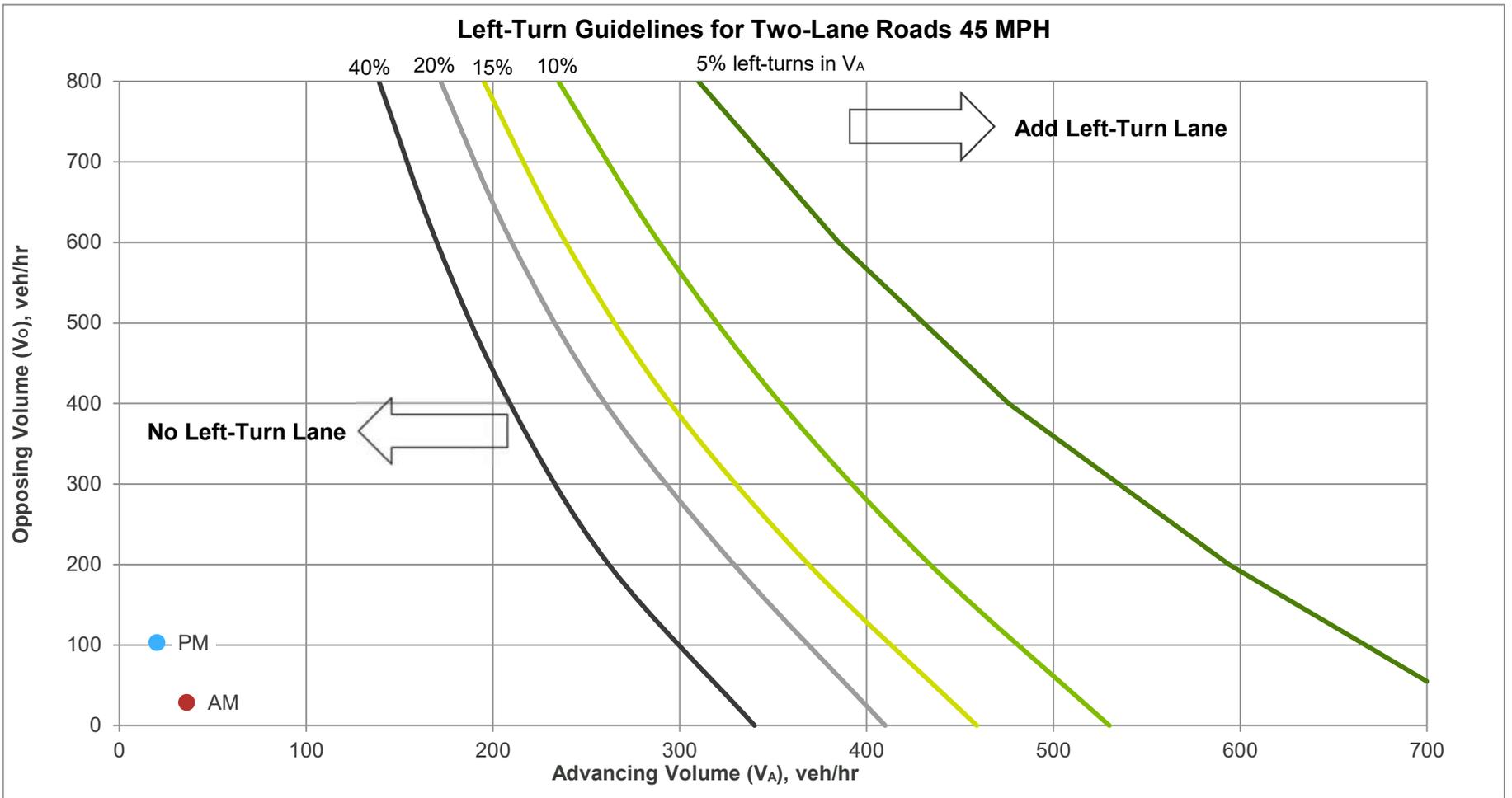
Major - 202

Minor - 142

\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Build Year 2034

### Left-Turn Guidelines for Two-Lane Roads 45 MPH

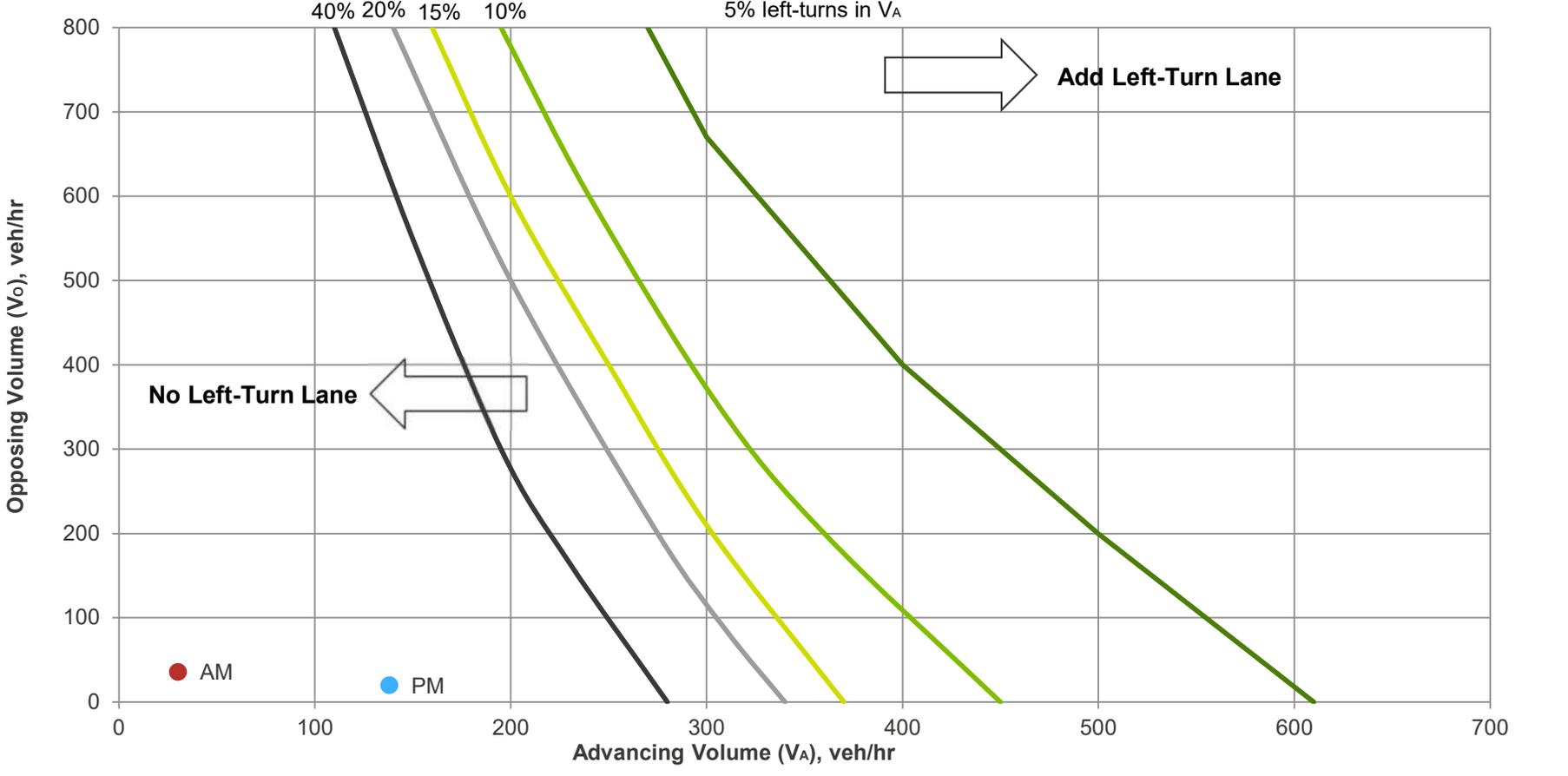


AM Line: 5% PM Line: 5%

Southbound on Winan Road @ Highway 92

Build Year 2034

### Left-Turn Guidelines for Two-Lane Roads 55 MPH

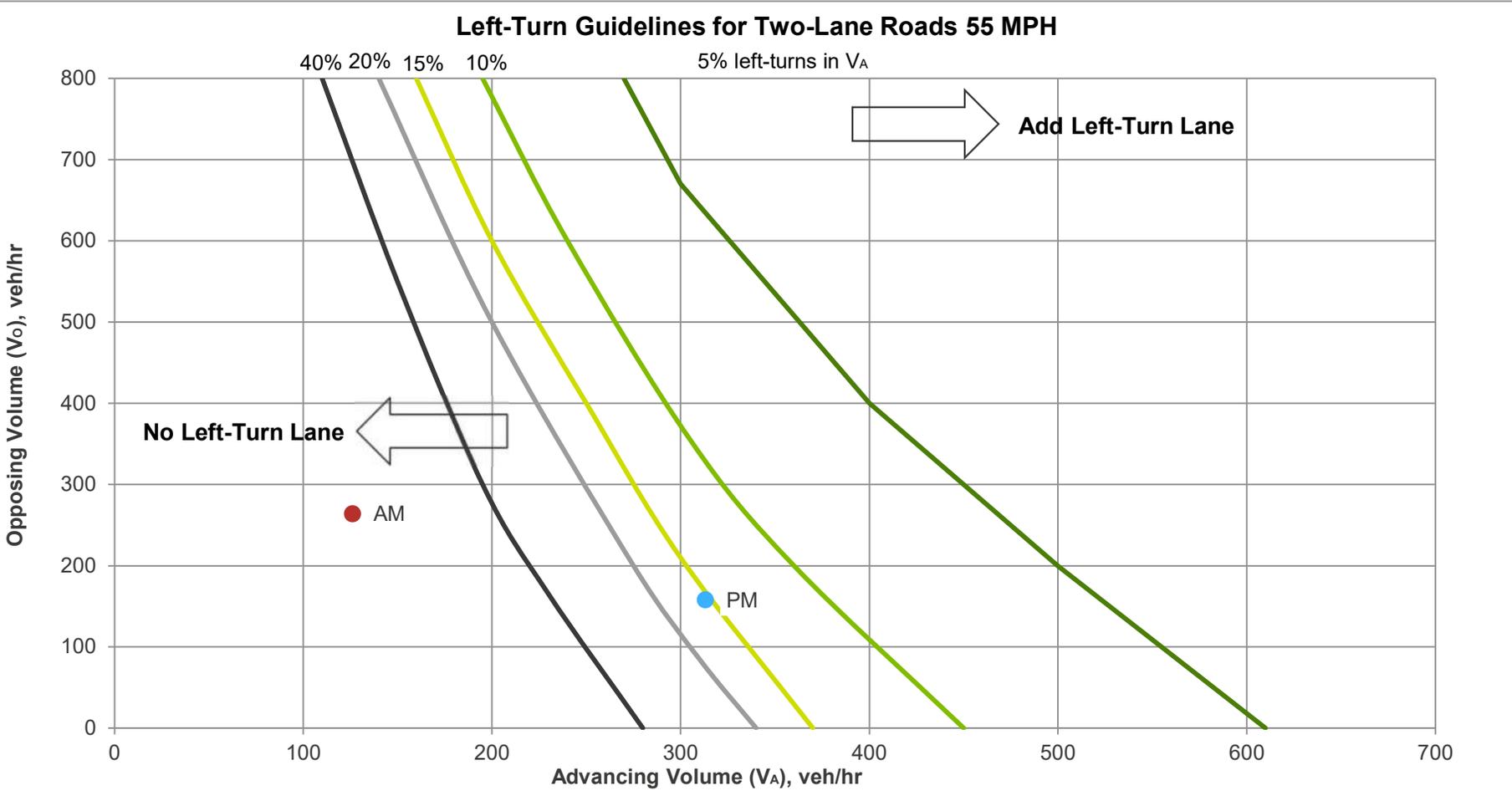


AM Line: 5% PM Line: 40%

Northbound on Winan Road @ Highway 92

Build Year 2034

### Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line:

5%

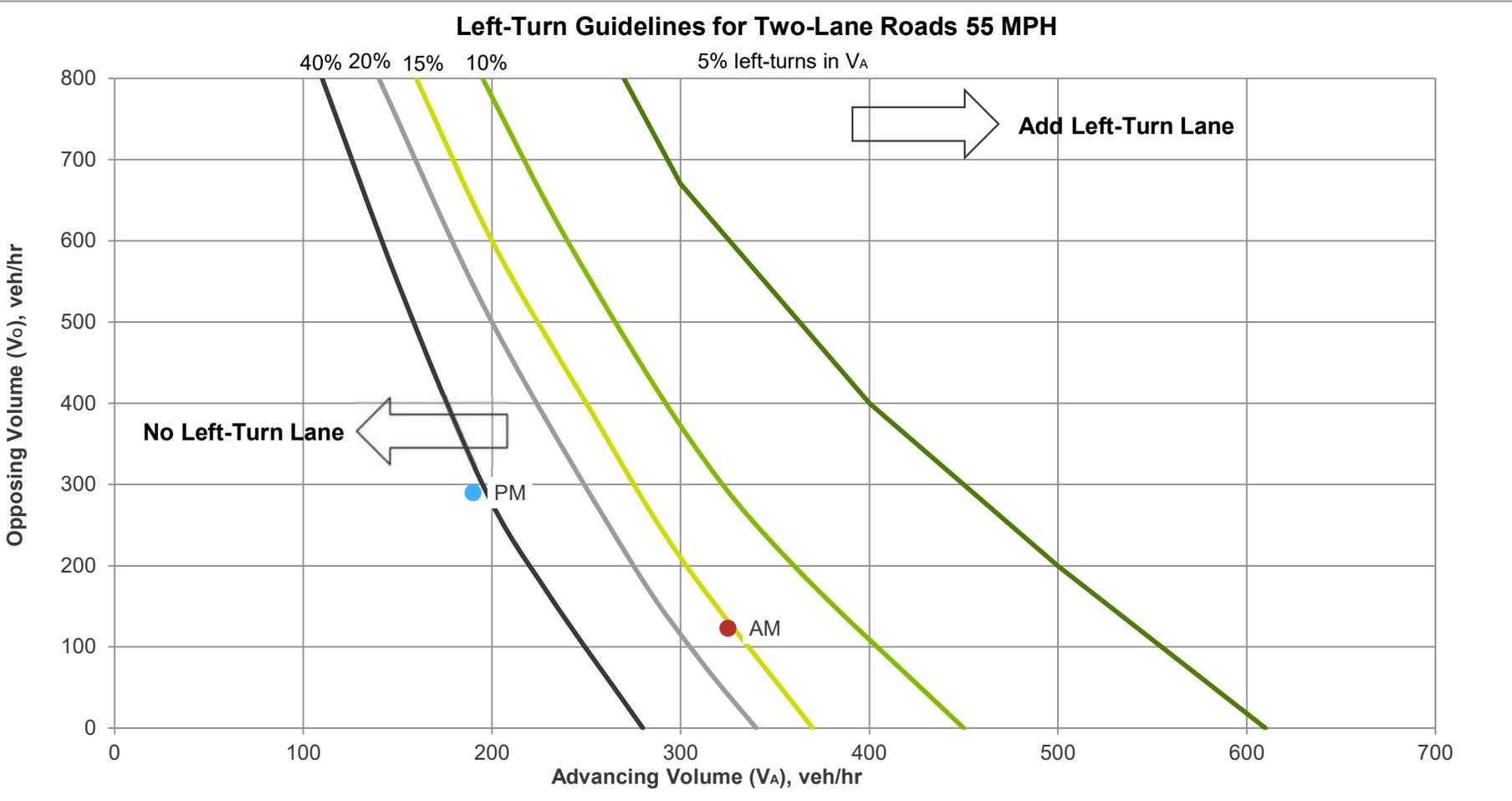
PM Line:

10%

Eastbound on Highway 92 @ Winan Road

Build Year 2034

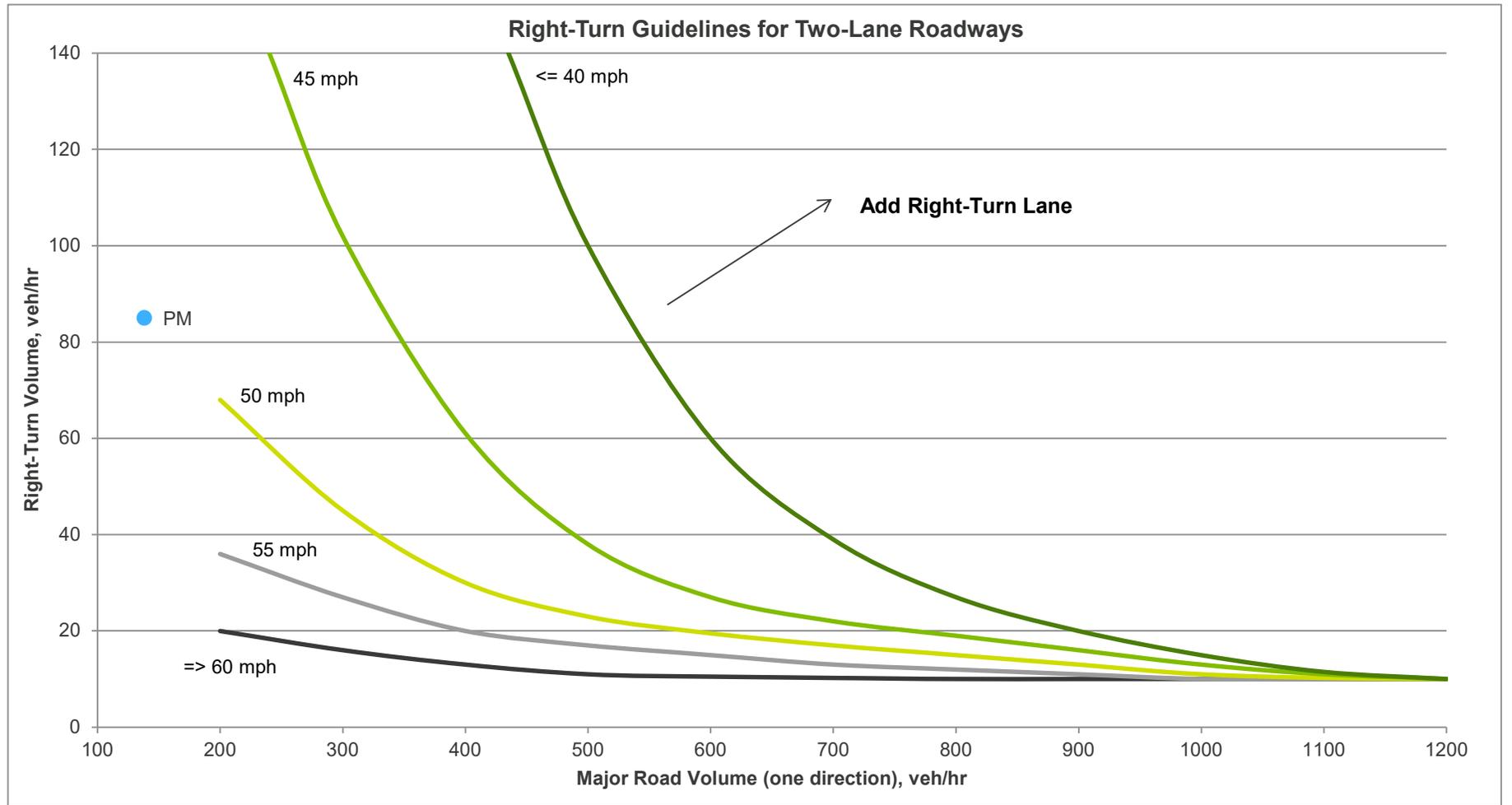
Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line: 20% PM Line: 20%

Westbound on Highway 92 @ Winan Road

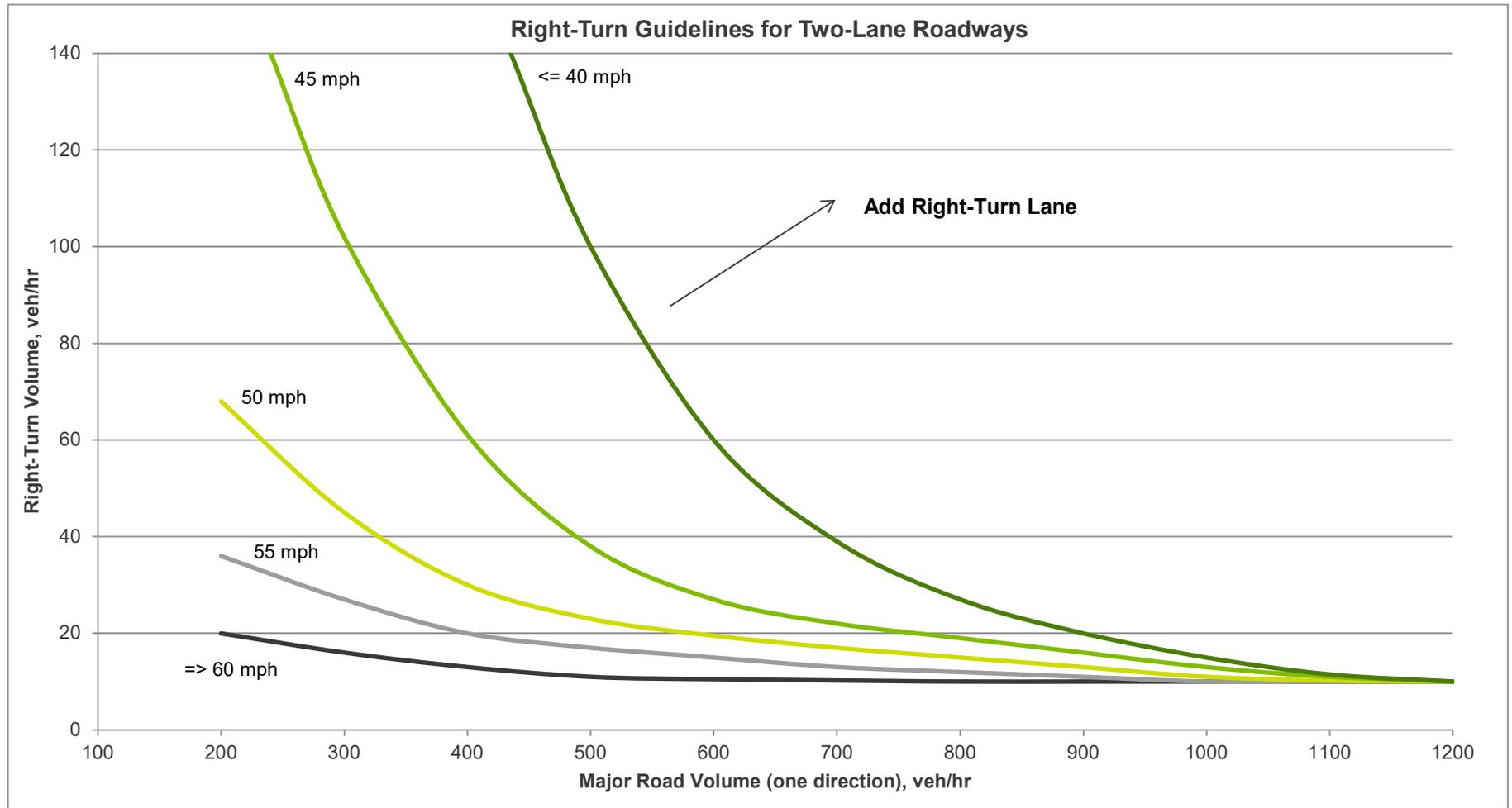
Build Year 2034



Speed: 55

Northbound on Winan Road @ Highway 92

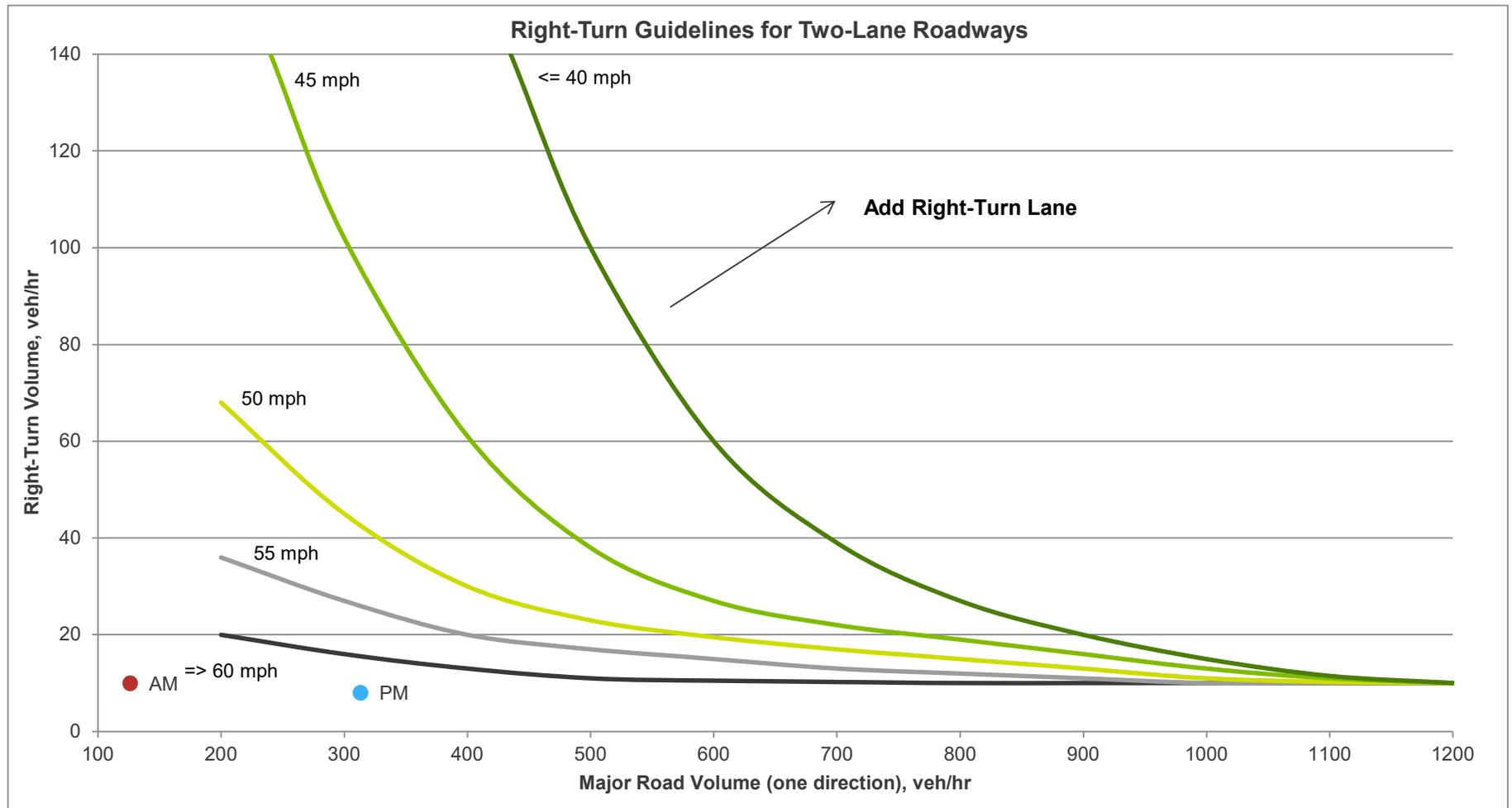
Build Year 2034



Speed: 45

Southbound on Winan Road @ Highway 92

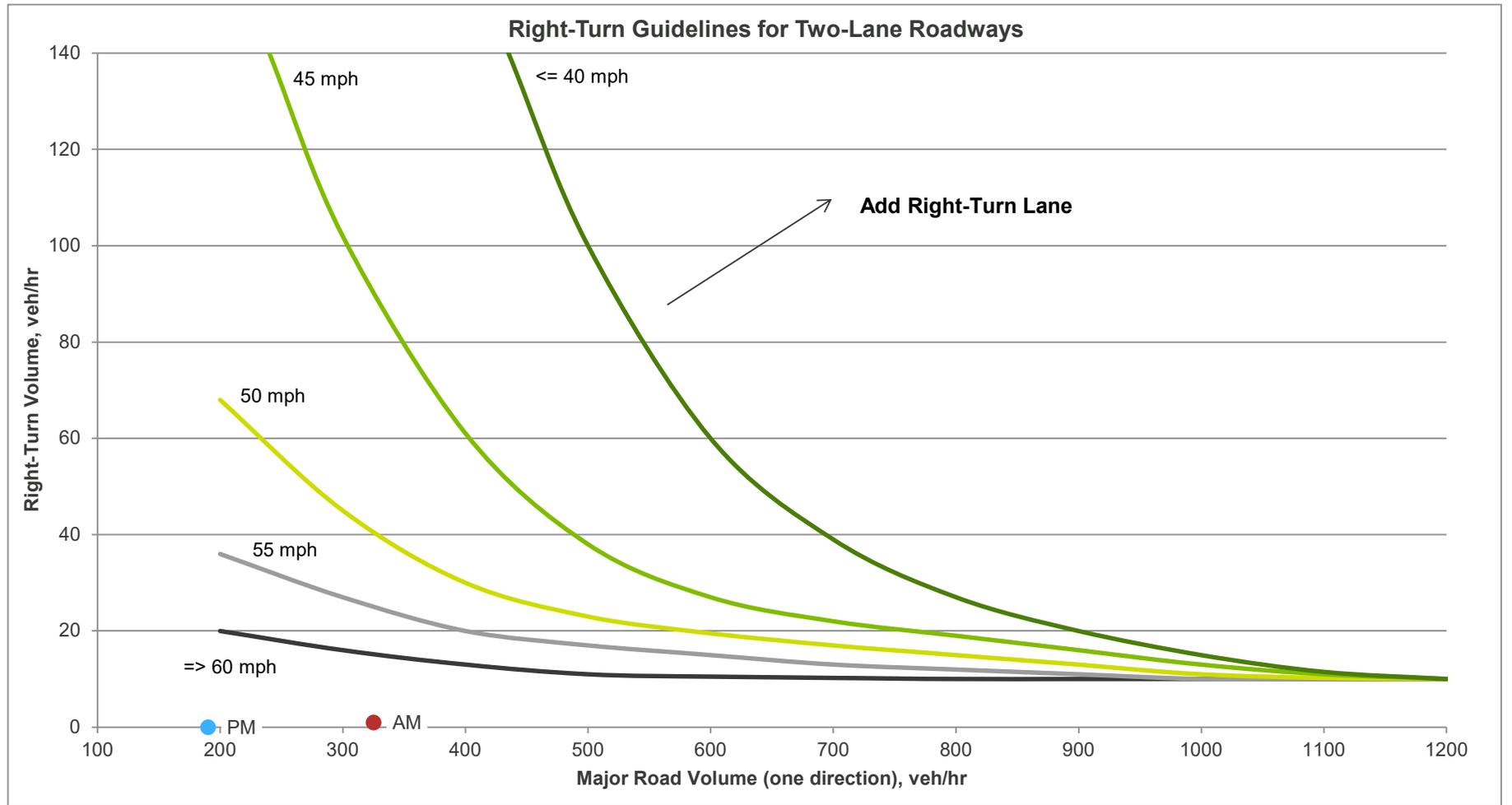
Build Year 2034



Speed: 55

Eastbound on Highway 92 @ Winan Road

Build Year 2034

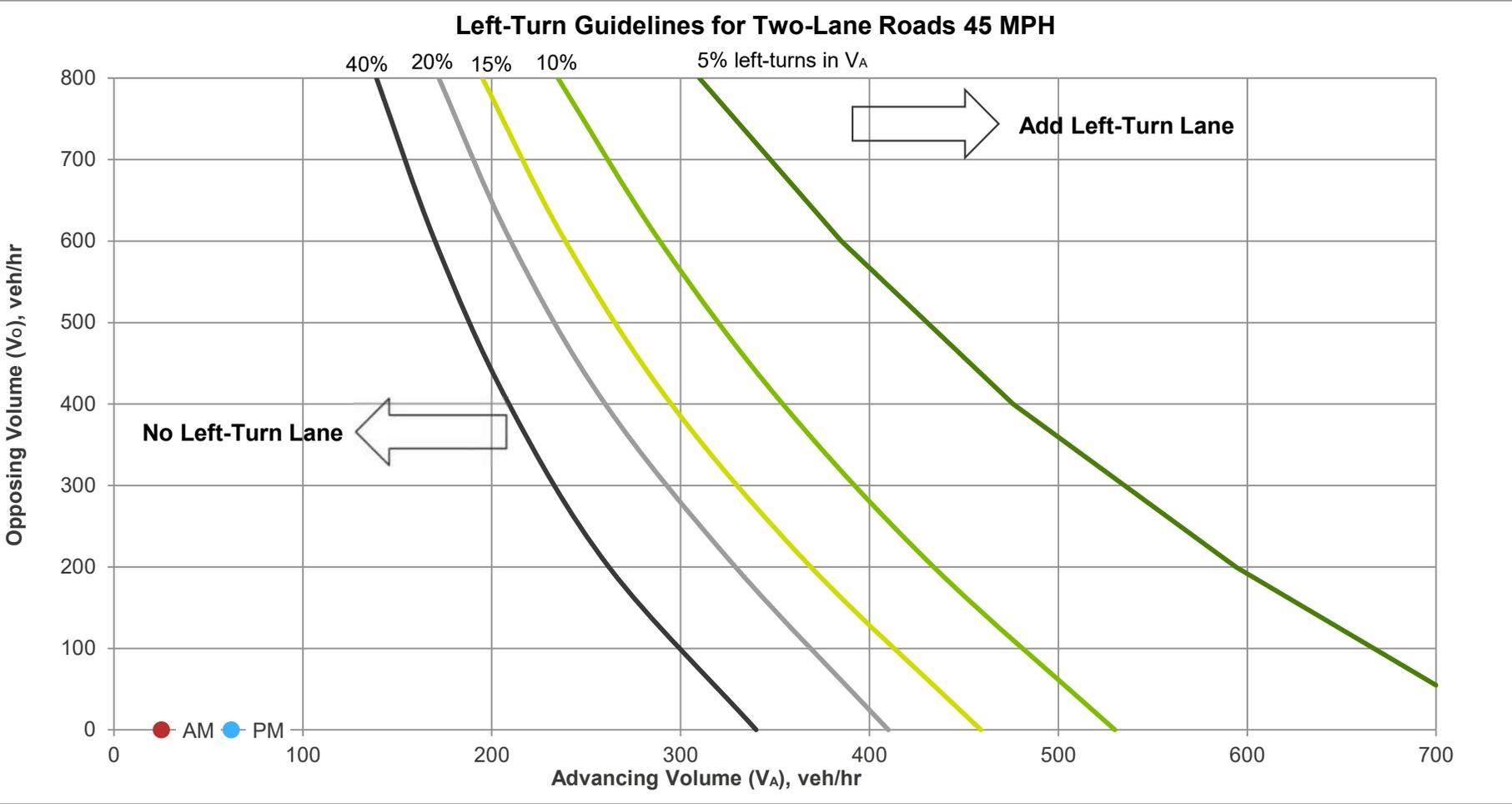


Speed: 55

Westbound on Highway 92 @ Winan Road

Build Year 2034

Left-Turn Guidelines for Two-Lane Roads 45 MPH

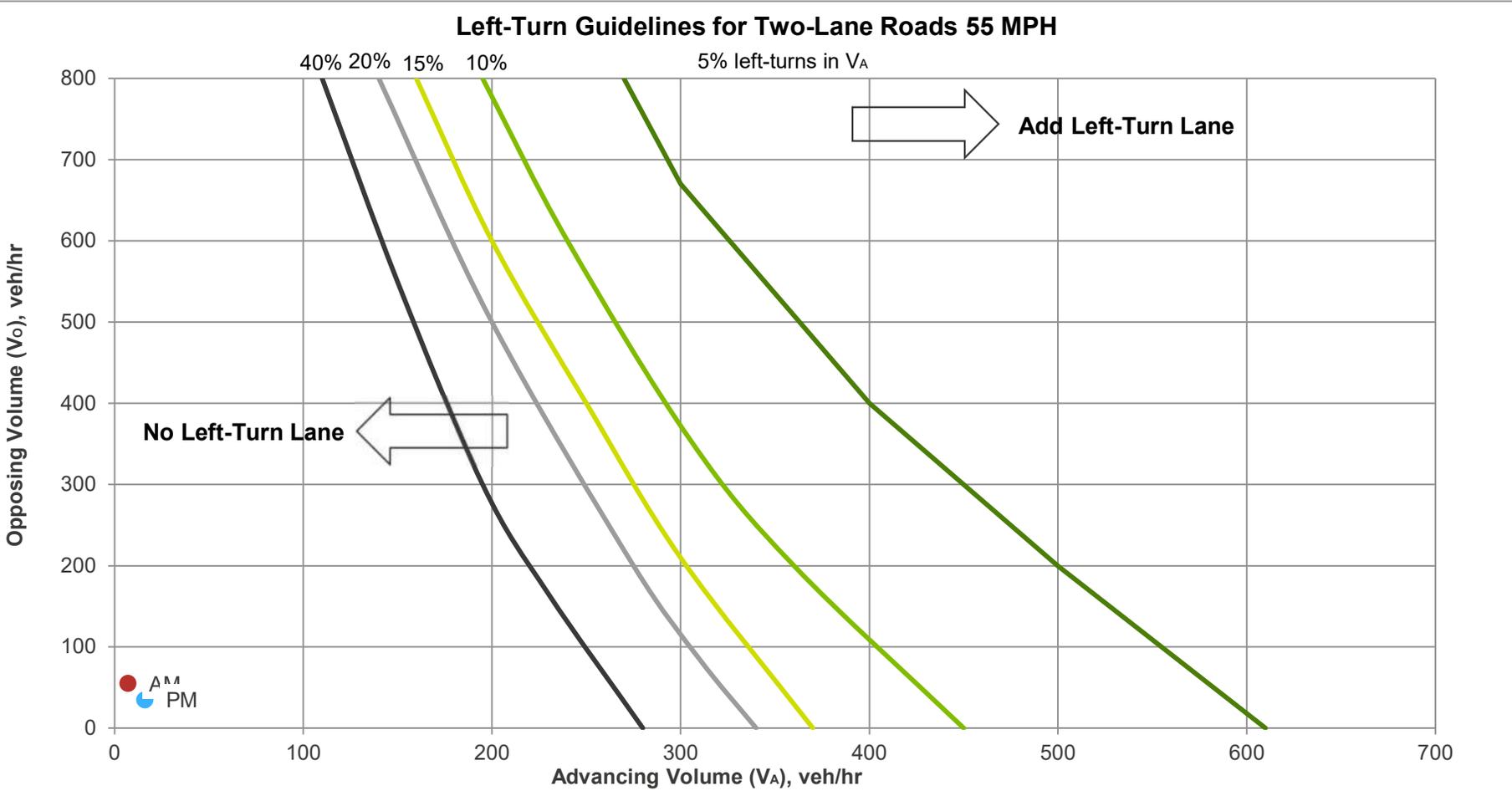


AM Line: 40% PM Line: 40%

Eastbound on 132nd Street @ Winan Road

Build Year 2034

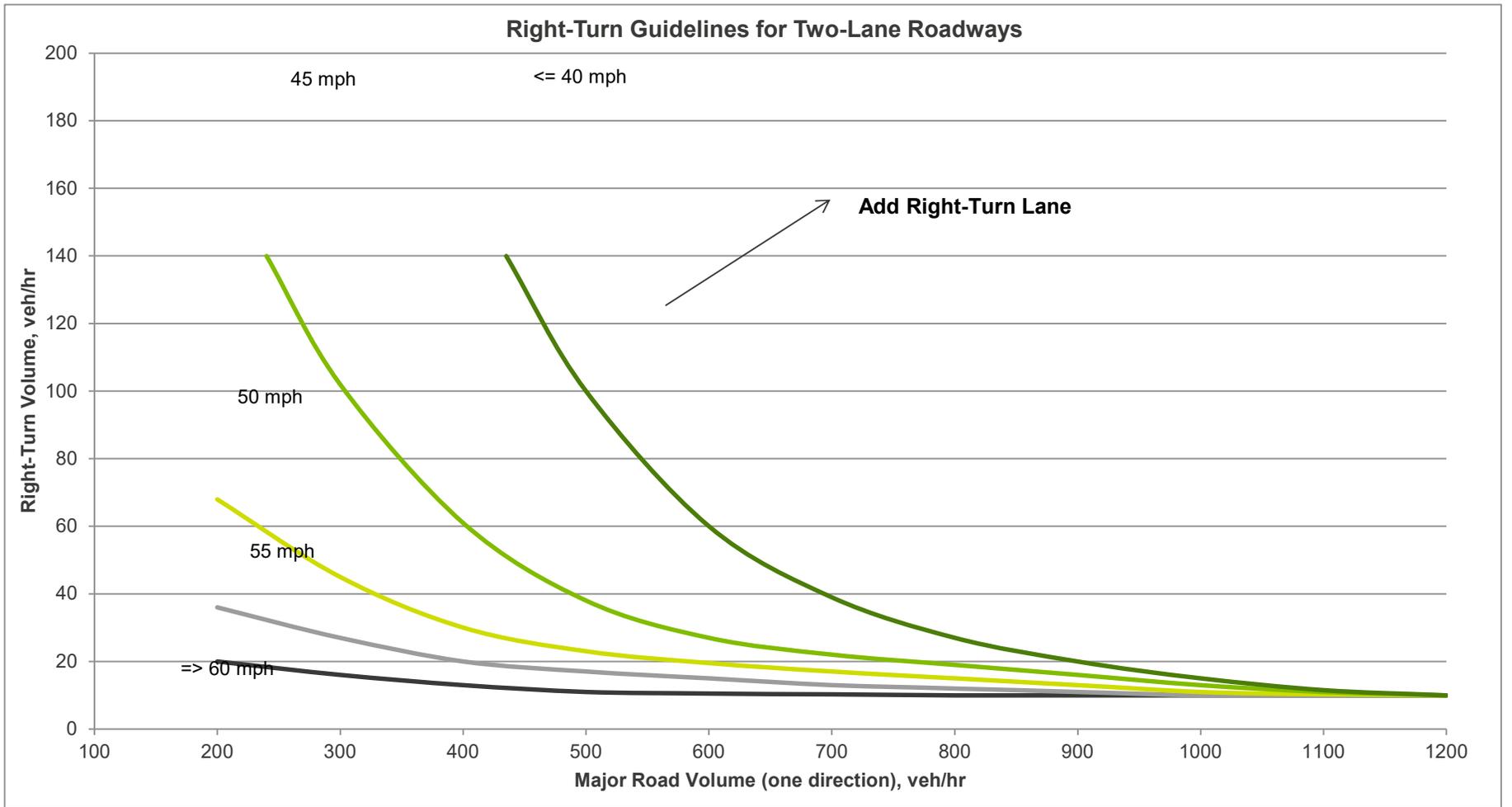
### Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line: 40% PM Line: 40%

Northbound on Winan Road @ 132nd Street

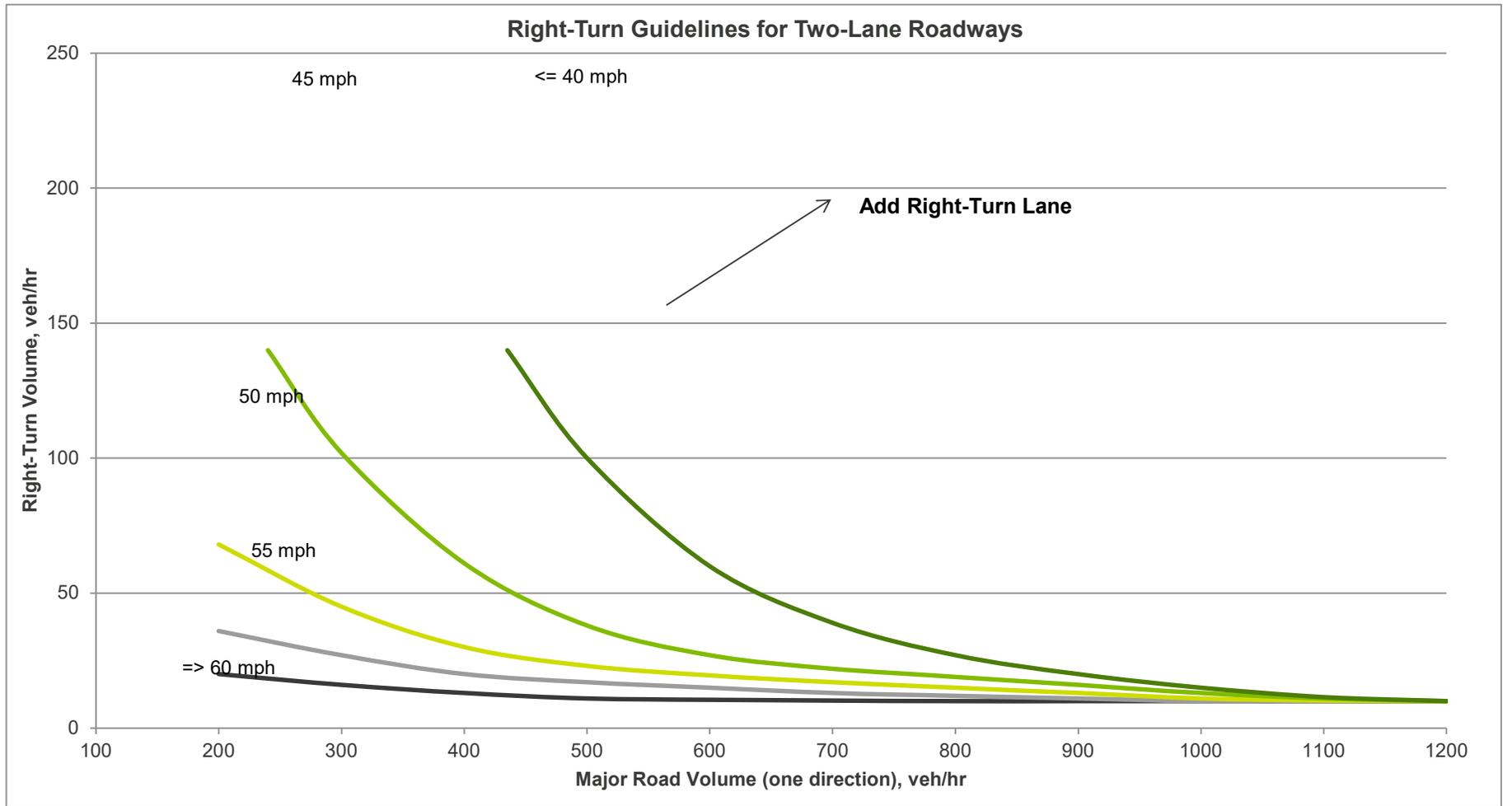
Build Year 2034



Speed: 55

Southbound on Winan Road @ 132nd Street

Build Year 2034

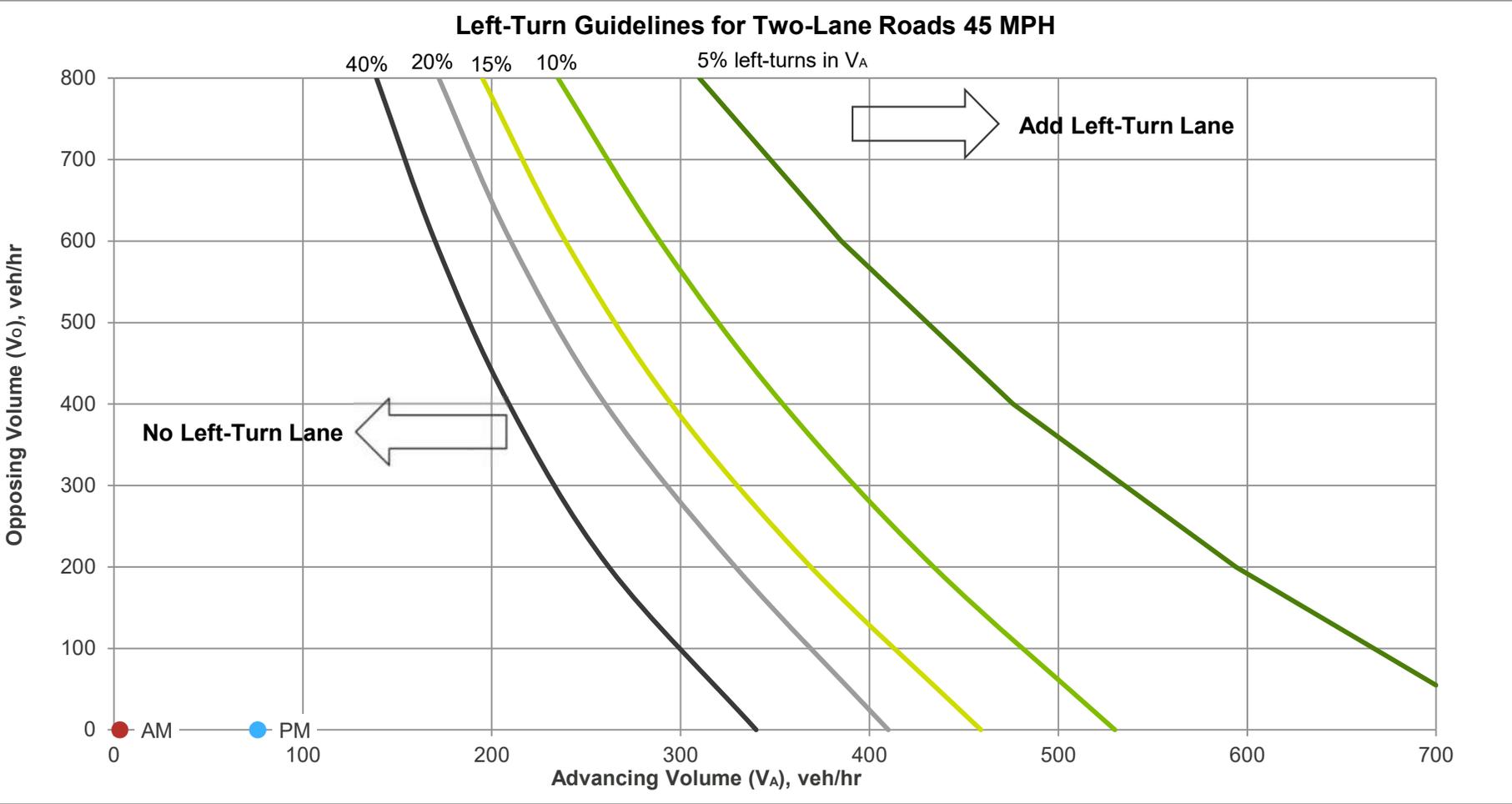


Speed: 45

Eastbound on 132nd Street @ Winan Road

Build Year 2034

Left-Turn Guidelines for Two-Lane Roads 45 MPH

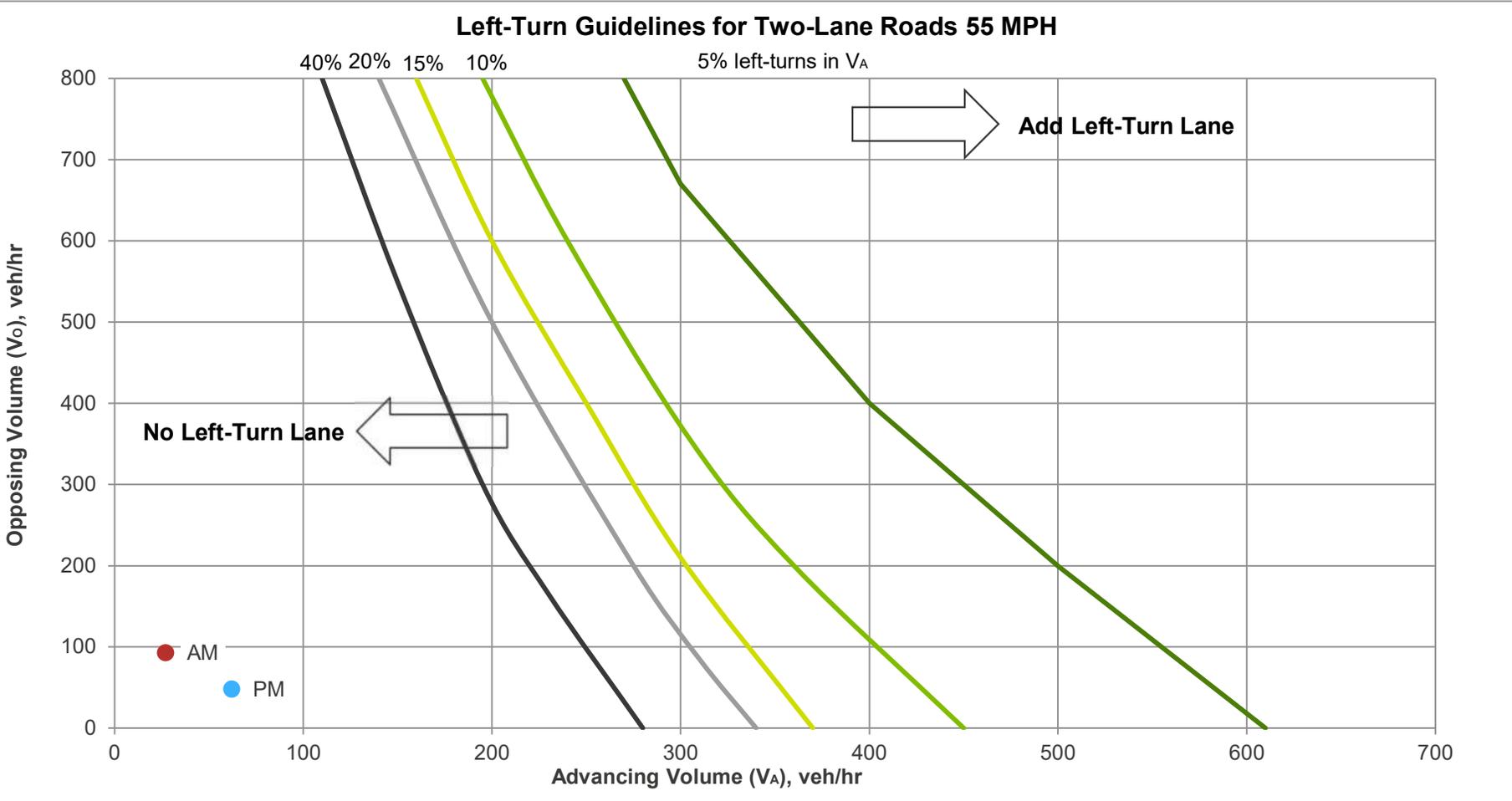


AM Line: 40% PM Line: 40%

Eastbound on 136th Street @ Winan Road

Build Year 2034

Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line:

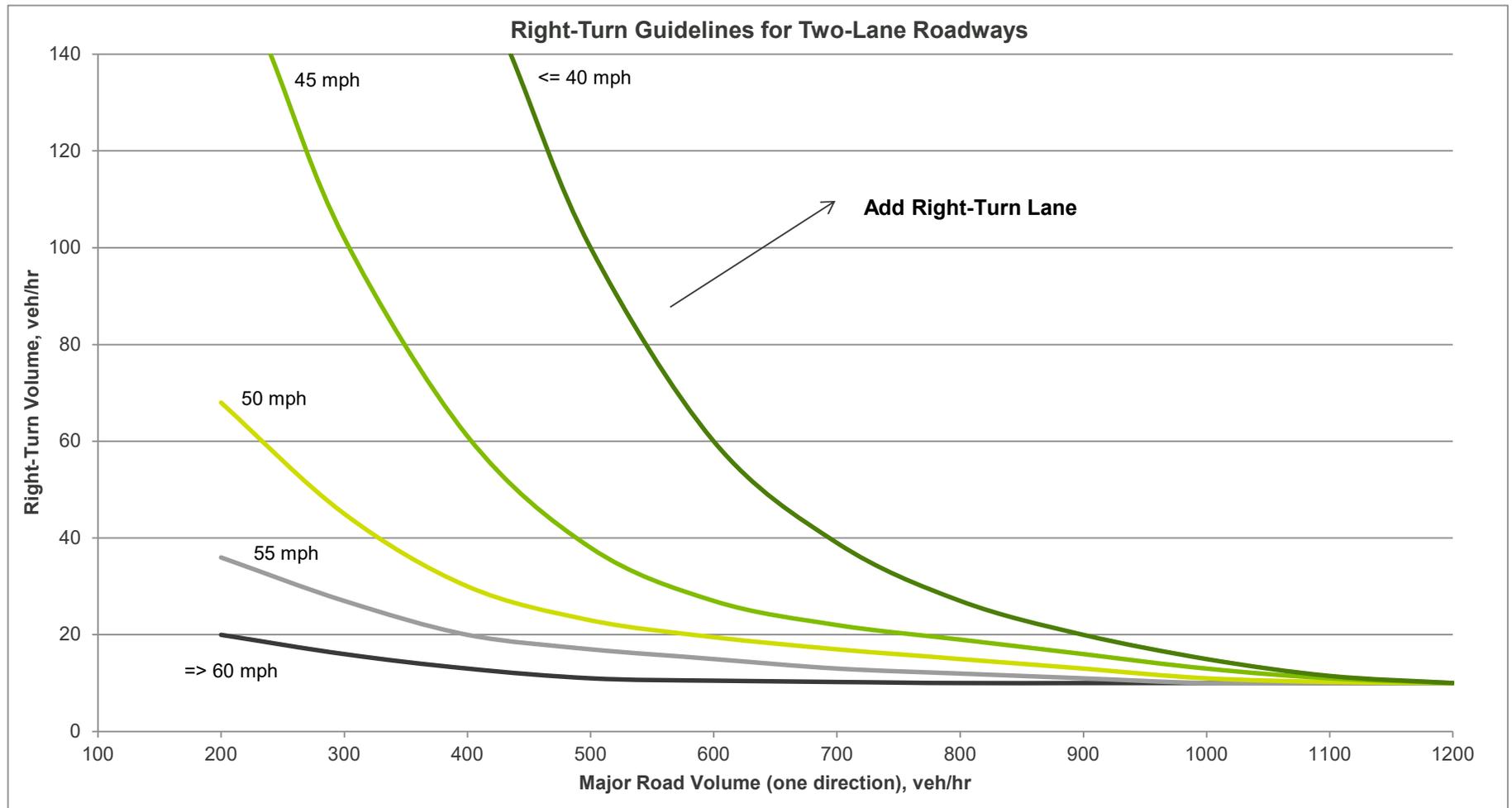
5%

PM Line:

5%

Northbound on Winan Road @ 136th Street

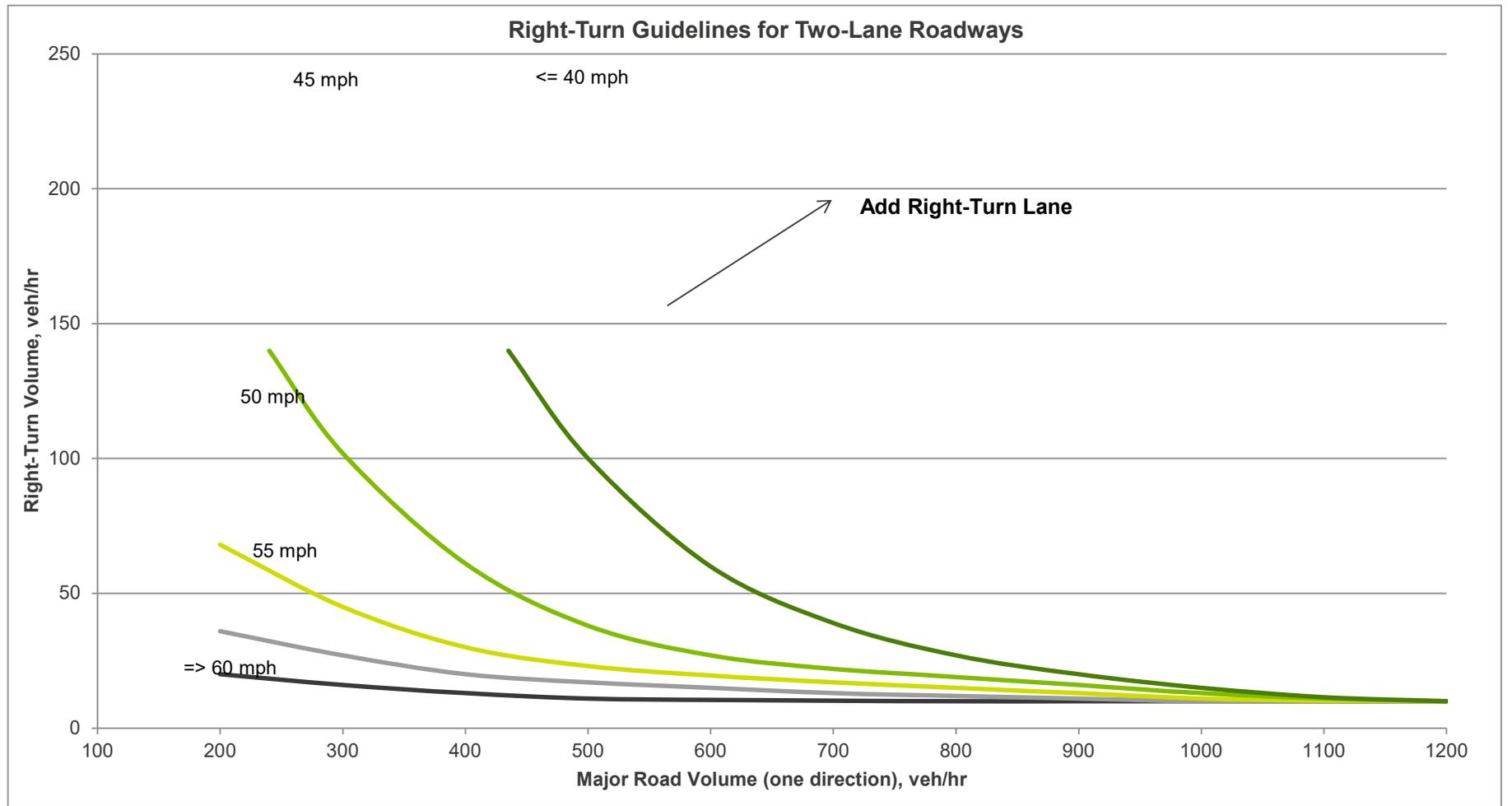
Build Year 2034



Speed: 55

Southbound on Winan Road @ 136th Street

Build Year 2034

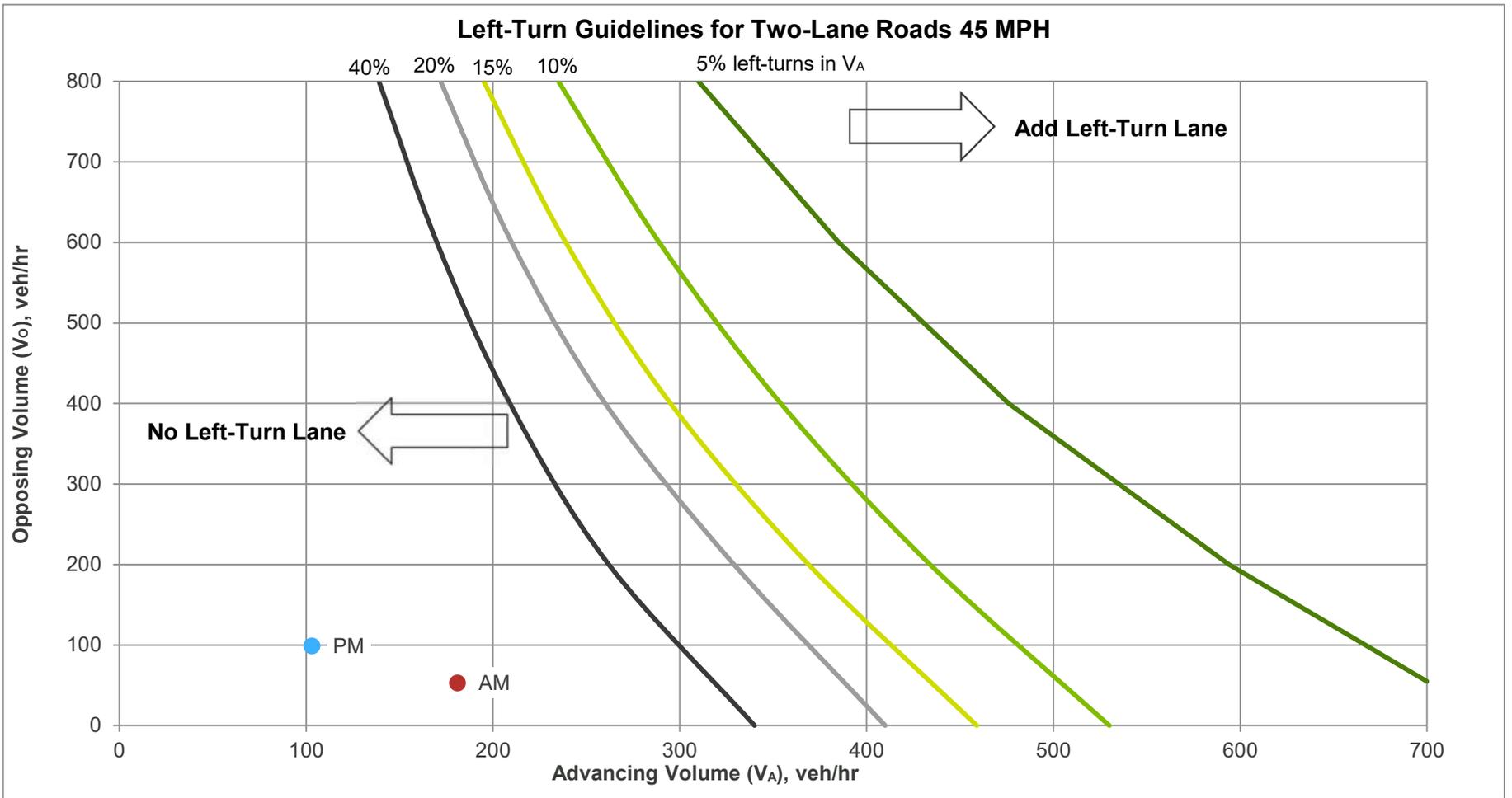


Speed: 45

Eastbound on 136th Street @ Winan Road

Build Year 2034

### Left-Turn Guidelines for Two-Lane Roads 45 MPH

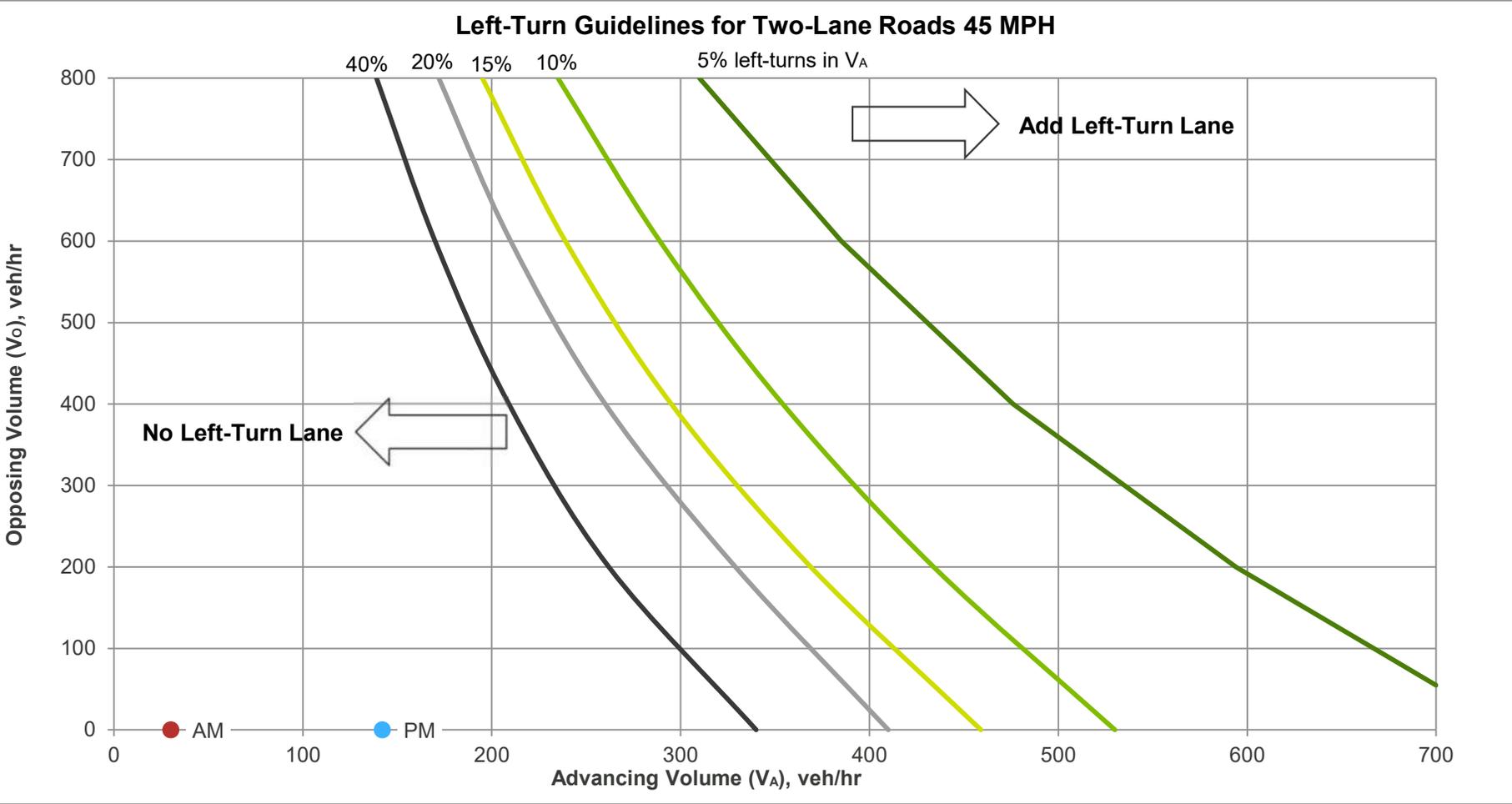


AM Line: 40% PM Line: 40%

Southbound on Bethel Road @ Mexico City Avenue

Build Year 2034

Left-Turn Guidelines for Two-Lane Roads 45 MPH



AM Line:

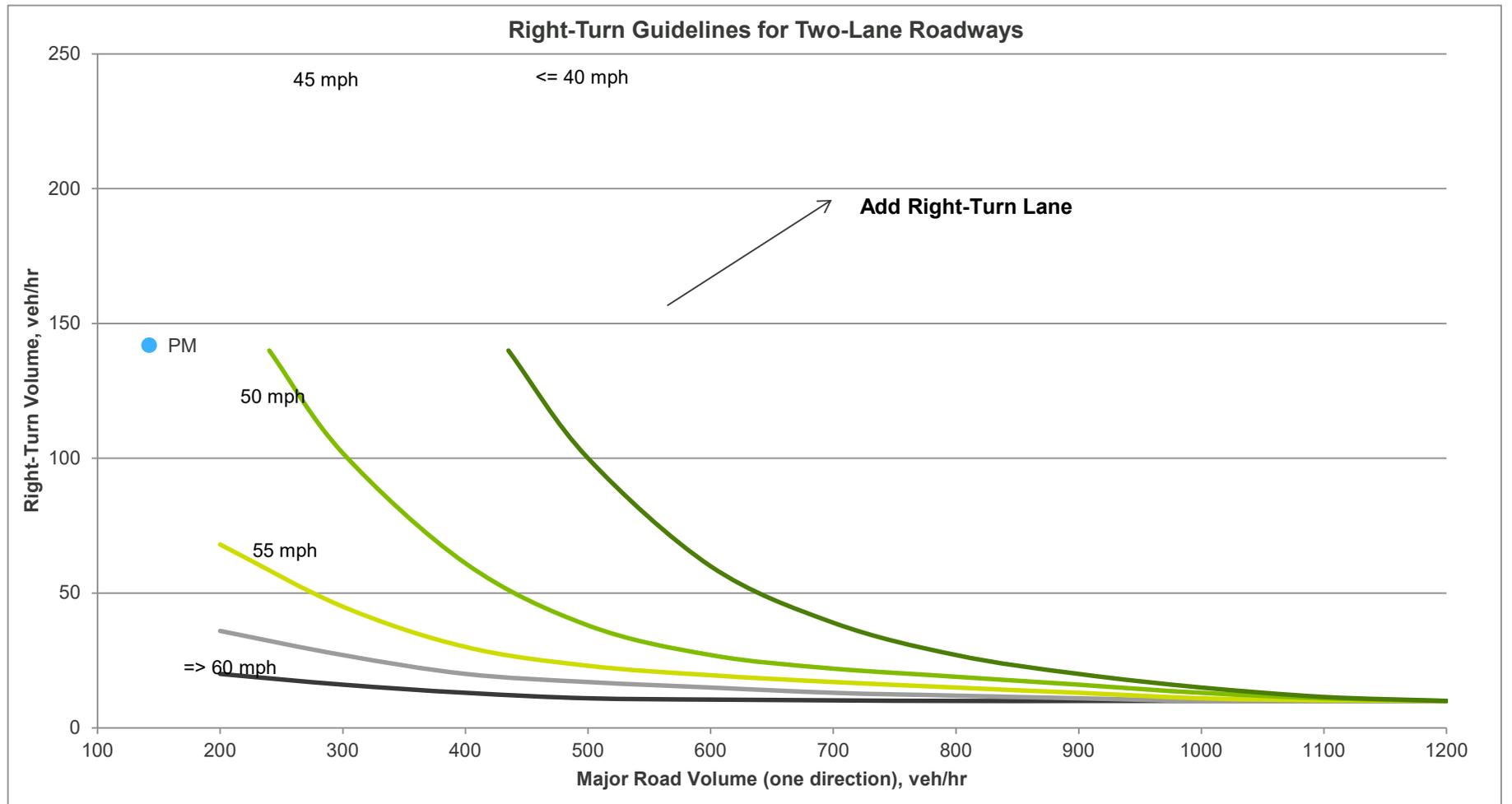
5%

PM Line:

5%

Westbound on Mexico City Avenue @ Bethel Road

Build Year 2034



Speed: 45

Westbound on Mexico City Avenue @ Bethel Road

## Capacity Analysis

# LANE SUMMARY

Site: 1 [HW 92 and Bethel - 2034 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road  
 MUTCD (FHWA 2009) example number: 2B-22  
 Roundabout Guide (TRB 2010) example number: A-1  
 Site Category: (None)  
 Roundabout

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[ Total	HV ]	[ Total	HV ]						[ Veh	Dist ]			%	%
	veh/h	%	veh/h	%	veh/h	v/c	%	sec			ft	ft	%	%	
South: Bethel Road															
Lane 1 <sup>d</sup>	90	2.0	90	2.0	1091	0.083	100	8.9	LOS A	0.3	8.5	Full	1600	0.0	0.0
Approach	90	2.0	90	2.0		0.083		8.9	LOS A	0.3	8.5				
East: Highway 92															
Lane 1 <sup>d</sup>	301	2.0	301	2.0	1344	0.224	100	7.3	LOS A	1.3	33.2	Full	1600	0.0	0.0
Approach	301	2.0	301	2.0		0.224		7.3	LOS A	1.3	33.2				
North: Bethel Road															
Lane 1 <sup>d</sup>	47	2.0	47	2.0	1100	0.042	100	7.1	LOS A	0.2	5.5	Full	1600	0.0	0.0
Approach	47	2.0	47	2.0		0.042		7.1	LOS A	0.2	5.5				
West: Highway 92															
Lane 1	20	2.0	20	2.0	1164	0.017	100	13.2	LOS B	0.1	2.0	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	311	2.0	311	2.0	1644	0.189	100	6.5	LOS A	1.1	26.9	Full	1600	0.0	0.0
Approach	330	2.0	330	2.0		0.189		6.9	LOS A	1.1	26.9				
All Vehicles	768	2.0	768	2.0		0.224		7.3	LOS A	1.3	33.2				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Bethel Road											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From S						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N	E				v/c	%	%	%	No.
Lane 1	47	15	28	90	2.0	1091	0.083	100	NA	NA	
Approach	47	15	28	90	2.0		0.083				
East: Highway 92											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	S	W	N				v/c	%	%	%	No.
Lane 1	37	260	4	301	2.0	1344	0.224	100	NA	NA	

Approach	37	260	4	301	2.0		0.224				
<b>North: Bethel Road</b>											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N							Satn	Util.	SL	Ov.	Lane
To Exit:	E	S	W			Cap.	v/c	%	%	No.	
						veh/h					
Lane 1	9	11	27	47	2.0	1100	0.042	100	NA	NA	
Approach	9	11	27	47	2.0		0.042				
<b>West: Highway 92</b>											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Satn	Util.	SL	Ov.	Lane
To Exit:	N	E	S			Cap.	v/c	%	%	No.	
						veh/h					
Lane 1	20	-	-	20	2.0	1164	0.017	100	NA	NA	
Lane 2	-	162	149	311	2.0	1644	0.189	100	NA	NA	
Approach	20	162	149	330	2.0		0.189				
<b>Total %HV Deg.Satn (v/c)</b>											
All Vehicles	768	2.0			0.224						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<b>Merge Analysis</b>											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.											

<b>Variable Demand Analysis</b>				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
<b>South: Bethel Road</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>East: Highway 92</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>North: Bethel Road</b>				
Lane 1	0.0	0.0	0.0	0.0
<b>West: Highway 92</b>				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

# LANE LEVEL OF SERVICE

## Lane Level of Service

 Site: 1 [HW 92 and Bethel - 2034 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

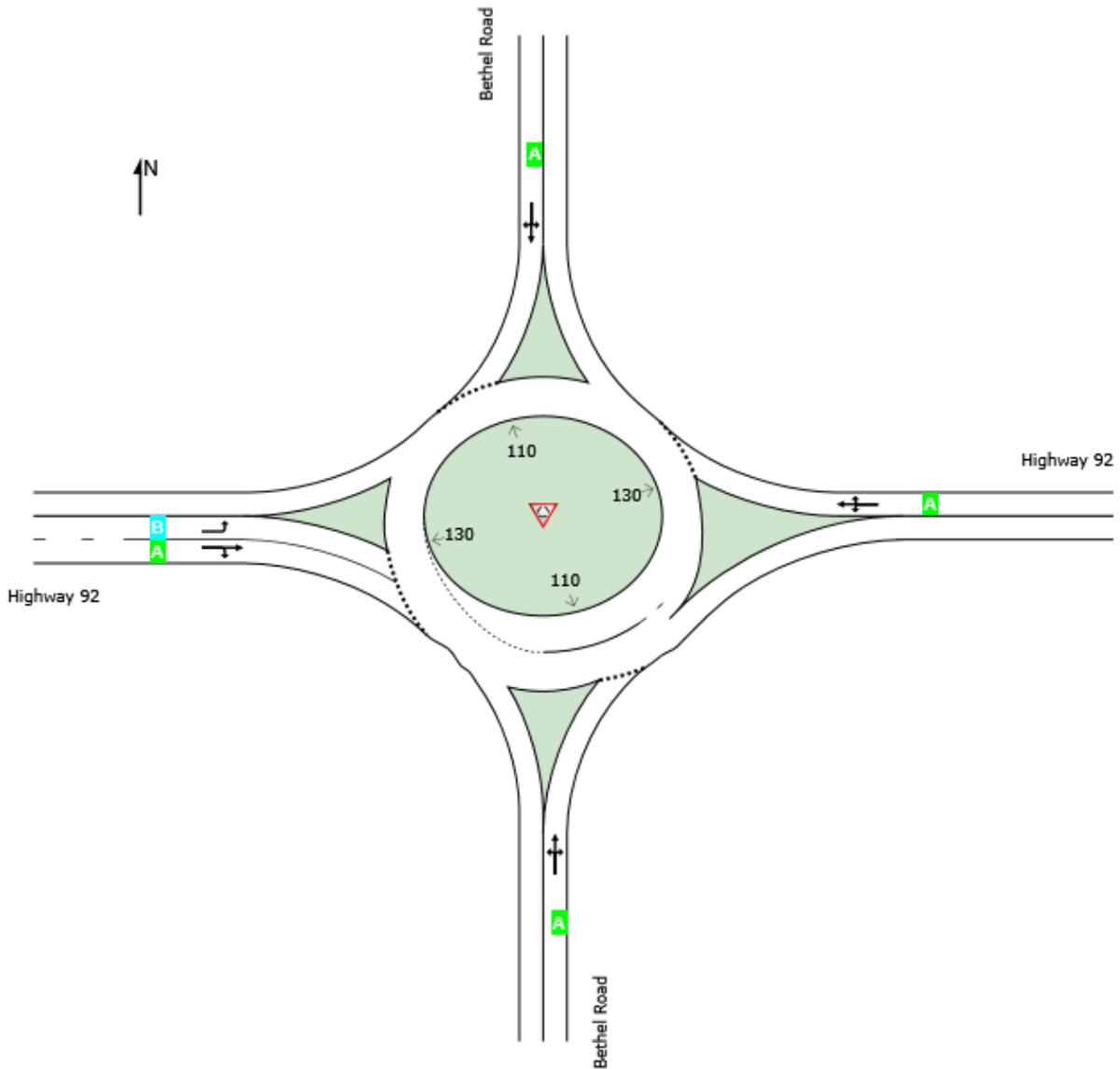
MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

HCM 7th TWSC  
 4: Bethel Rd & Mexico City Avenue

Intersection						
Int Delay, s/veh	4.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	30	53	0	123	58
Future Vol, veh/h	0	30	53	0	123	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	0	2	2
Mvmt Flow	0	33	58	0	134	63

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	388	58	0	0	58
Stage 1	58	-	-	-	-
Stage 2	330	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	619	1009	-	-	1547
Stage 1	970	-	-	-	-
Stage 2	733	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	566	1009	-	-	1547
Mov Cap-2 Maneuver	566	-	-	-	-
Stage 1	970	-	-	-	-
Stage 2	669	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	8.69	0	5.13
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	1009	1547
HCM Lane V/C Ratio	-	-	-	0.032	0.086
HCM Ctrl Dly (s/v)	-	-	0	8.7	7.5
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	0.3

HCM 7th TWSC  
5: N Winan Rd & Highway 92

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	113	10	61	263	1	1	11	18	0	22	14
Future Vol, veh/h	3	113	10	61	263	1	1	11	18	0	22	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2
Mvmt Flow	3	123	11	66	286	1	1	12	20	0	24	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	287	0	0	134	0	0	565	554	128	554	559	286
Stage 1	-	-	-	-	-	-	135	135	-	419	419	-
Stage 2	-	-	-	-	-	-	430	420	-	135	140	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.318
Pot Cap-1 Maneuver	1275	-	-	1451	-	-	435	440	922	446	437	753
Stage 1	-	-	-	-	-	-	869	785	-	616	590	-
Stage 2	-	-	-	-	-	-	603	590	-	873	781	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1275	-	-	1451	-	-	380	415	922	400	413	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	380	415	-	400	413	-
Stage 1	-	-	-	-	-	-	866	783	-	582	558	-
Stage 2	-	-	-	-	-	-	535	558	-	839	778	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.19			1.43			11.16			12.8		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	617	42	-	-	338	-	-	500
HCM Lane V/C Ratio	0.053	0.003	-	-	0.046	-	-	0.078
HCM Ctrl Dly (s/v)	11.2	7.8	0	-	7.6	0	-	12.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.3

HCM 7th TWSC  
6: NW Interurban Rd & Highway 92

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	6	118	7	15	302	0	8	1	2	5	7	15
Future Vol, veh/h	6	118	7	15	302	0	8	1	2	5	7	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	2	2	2
Mvmt Flow	7	128	8	16	328	0	9	1	2	5	8	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	136	0	0	510	506	132	503	510	328
Stage 1	-	-	-	-	-	-	145	145	-	361	361	-
Stage 2	-	-	-	-	-	-	365	361	-	142	149	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1231	-	-	1448	-	-	474	469	917	479	467	713
Stage 1	-	-	-	-	-	-	858	777	-	658	626	-
Stage 2	-	-	-	-	-	-	654	626	-	861	774	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1231	-	-	1448	-	-	447	460	917	468	458	713
Mov Cap-2 Maneuver	-	-	-	-	-	-	447	460	-	468	458	-
Stage 1	-	-	-	-	-	-	853	772	-	648	617	-
Stage 2	-	-	-	-	-	-	623	617	-	853	770	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.36			0.36			12.47			11.61		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	494	82	-	-	85	-	-	574
HCM Lane V/C Ratio	0.024	0.005	-	-	0.011	-	-	0.051
HCM Ctrl Dly (s/v)	12.5	7.9	0	-	7.5	0	-	11.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

HCM 7th TWSC  
 7: Roanridge Road & NW Roanridge Rd

Intersection						
Int Delay, s/veh	7.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	3	47	0	0	25
Future Vol, veh/h	1	3	47	0	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	0	0	2
Mvmt Flow	1	3	51	0	0	27

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	4	0	105 3
Stage 1	-	-	-	-	3 -
Stage 2	-	-	-	-	102 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	1617	-	898 1081
Stage 1	-	-	-	-	1026 -
Stage 2	-	-	-	-	927 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1617	-	869 1081
Mov Cap-2 Maneuver	-	-	-	-	869 -
Stage 1	-	-	-	-	1026 -
Stage 2	-	-	-	-	898 -

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7.3	8.42
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1081	-	-	1617	-
HCM Lane V/C Ratio	0.025	-	-	0.032	-
HCM Ctrl Dly (s/v)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

HCM 7th TWSC  
 8: Bethel Rd & NW Roanridge Rd

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	25	1	0	28	11	47
Future Vol, veh/h	25	1	0	28	11	47
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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	0	2	2	2
Mvmt Flow	27	1	0	30	12	51

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	68	38	63	0	-	0
Stage 1	38	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.2	-	-	-
Pot Cap-1 Maneuver	937	1035	1553	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	937	1035	1553	-	-	-
Mov Cap-2 Maneuver	937	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.95	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1553	-	940	-	-
HCM Lane V/C Ratio	-	-	0.03	-	-
HCM Ctrl Dly (s/v)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

# HCM 7th Signalized Intersection Summary

## 9: Mexico City Ave & 136th Street

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	24	761	186	12	167
Future Volume (veh/h)	62	24	761	186	12	167
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1233	1870	1781	1618	1870	1441
Adj Flow Rate, veh/h	67	26	827	202	13	182
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	45	2	8	19	2	31
Cap, veh/h	298	208	2127	862	396	1968
Arrive On Green	0.13	0.13	0.63	0.63	0.02	0.72
Sat Flow, veh/h	2278	1585	3474	1372	1781	2809
Grp Volume(v), veh/h	67	26	827	202	13	182
Grp Sat Flow(s),veh/h/ln	1139	1585	1692	1372	1781	1369
Q Serve(g_s), s	2.1	1.2	9.6	5.1	0.2	1.6
Cycle Q Clear(g_c), s	2.1	1.2	9.6	5.1	0.2	1.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	298	208	2127	862	396	1968
V/C Ratio(X)	0.22	0.13	0.39	0.23	0.03	0.09
Avail Cap(c_a), veh/h	513	357	2127	862	480	1968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.94	0.94	1.00	1.00
Uniform Delay (d), s/veh	31.1	30.7	7.3	6.5	5.7	3.4
Incr Delay (d2), s/veh	0.4	0.3	0.5	0.6	0.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.8	4.9	2.3	0.1	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	31.5	31.0	7.8	7.1	5.7	3.5
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	93		1029			195
Approach Delay, s/veh	31.4		7.7			3.6
Approach LOS	C		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	7.3	56.3			63.5	16.5
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	5.0	39.0			50.0	18.0
Max Q Clear Time (g_c+I1), s	2.2	11.6			3.6	4.1
Green Ext Time (p_c), s	0.0	6.6			1.1	0.2
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			8.7			
HCM 7th LOS			A			

HCM 7th TWSC  
 10: N Winan Rd & 136th Street

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	27	55	38
Future Vol, veh/h	3	0	0	27	55	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	2	2
Mvmt Flow	3	0	0	29	60	41

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	110	80	101	0	0
Stage 1	80	-	-	-	-
Stage 2	29	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-
Pot Cap-1 Maneuver	887	985	1504	-	-
Stage 1	943	-	-	-	-
Stage 2	993	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	887	985	1504	-	-
Mov Cap-2 Maneuver	887	-	-	-	-
Stage 1	943	-	-	-	-
Stage 2	993	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.07	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1504	-	887	-	-	-
HCM Lane V/C Ratio	-	-	0.004	-	-	-
HCM Ctrl Dly (s/v)	0	-	9.1	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-	-

# HCM 7th Signalized Intersection Summary

## 11: Mexico City Ave & NW Roanridge Rd/132nd St

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	12	159	42	20	0	425	940	40	0	221	8
Future Volume (veh/h)	7	12	159	42	20	0	425	940	40	0	221	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	877	1870	1870	1900	1574	1752	1870	1900	1366	1870
Adj Flow Rate, veh/h	8	13	173	46	22	0	462	1022	0	0	240	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	69	2	2	0	22	10	2	0	36	2
Cap, veh/h	18	150	195	112	192	165	529	1714		258	1775	754
Arrive On Green	0.01	0.08	0.08	0.03	0.10	0.00	0.36	1.00	0.00	0.00	0.48	0.48
Sat Flow, veh/h	1781	1870	744	3456	1870	1610	2908	3328	1585	1810	3730	1585
Grp Volume(v), veh/h	8	13	173	46	22	0	462	1022	0	0	240	9
Grp Sat Flow(s),veh/h/ln	1781	1870	744	1728	1870	1610	1454	1664	1585	1810	1243	1585
Q Serve(g_s), s	0.4	0.6	8.0	1.3	1.1	0.0	14.8	0.0	0.0	0.0	3.6	0.3
Cycle Q Clear(g_c), s	0.4	0.6	8.0	1.3	1.1	0.0	14.8	0.0	0.0	0.0	3.6	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	18	150	195	112	192	165	529	1714		258	1775	754
V/C Ratio(X)	0.45	0.09	0.89	0.41	0.11	0.00	0.87	0.60		0.00	0.14	0.01
Avail Cap(c_a), veh/h	98	150	195	432	281	242	843	1714		258	1775	754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	49.2	42.6	35.5	47.4	40.8	0.0	30.8	0.0	0.0	0.0	14.7	13.8
Incr Delay (d2), s/veh	16.8	0.2	35.7	2.4	0.3	0.0	6.2	1.5	0.0	0.0	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.5	9.7	1.0	0.9	0.0	7.8	0.7	0.0	0.0	1.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	66.1	42.9	71.2	49.8	41.0	0.0	37.0	1.5	0.0	0.0	14.8	13.8
LnGrp LOS	E	D	E	D	D		D	A			B	B
Approach Vol, veh/h		194			68			1484			249	
Approach Delay, s/veh		69.1			47.0			12.6			14.8	
Approach LOS		E			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.2	53.6	8.7	13.5	20.3	57.5	6.5	15.7				
Change Period (Y+Rc), s	6.0	6.0	5.5	5.5	6.0	6.0	5.5	5.5				
Max Green Setting (Gmax), s	29.0	27.5	12.5	8.0	5.0	51.5	5.5	15.0				
Max Q Clear Time (g_c+I1), s	16.8	5.6	3.3	10.0	0.0	2.0	2.4	3.1				
Green Ext Time (p_c), s	1.4	1.4	0.0	0.0	0.0	8.4	0.0	0.0				
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			19.5									
HCM 7th LOS			B									
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 7th TWSC  
 13: N Winan Rd & 132nd St

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	23	2	3	4	2	53
Future Vol, veh/h	23	2	3	4	2	53
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	-	-	-	-	-
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	25	2	3	4	2	58

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	42	31	60	0	0
Stage 1	31	-	-	-	-
Stage 2	11	-	-	-	-
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	969	1043	1544	-	-
Stage 1	992	-	-	-	-
Stage 2	1012	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	967	1043	1544	-	-
Mov Cap-2 Maneuver	967	-	-	-	-
Stage 1	989	-	-	-	-
Stage 2	1012	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.81	3.14	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	771	-	973	-	-
HCM Lane V/C Ratio	0.002	-	0.028	-	-
HCM Ctrl Dly (s/v)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

# HCM 7th Signalized Intersection Summary

## 14: Mexico City Ave & I-29 NB Off Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	921	58	28	484	390	200
Future Volume (veh/h)	921	58	28	484	390	200
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1752	1870	1870	1604	1530	1233
Adj Flow Rate, veh/h	1001	0	30	526	424	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	2	2	20	25	45
Cap, veh/h	1262		50	2146	1762	
Arrive On Green	0.39	0.00	0.03	0.49	0.84	0.00
Sat Flow, veh/h	3237	1585	1781	4522	4313	1045
Grp Volume(v), veh/h	1001	0	30	526	424	0
Grp Sat Flow(s),veh/h/ln	1618	1585	1781	1459	1392	1045
Q Serve(g_s), s	27.3	0.0	1.7	7.0	2.0	0.0
Cycle Q Clear(g_c), s	27.3	0.0	1.7	7.0	2.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1262		50	2146	1762	
V/C Ratio(X)	0.79		0.60	0.25	0.24	
Avail Cap(c_a), veh/h	1748		160	2146	1762	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.0	0.0	48.0	14.8	4.7	0.0
Incr Delay (d2), s/veh	2.9	0.0	10.7	0.3	0.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	16.1	0.0	1.6	3.9	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	29.8	0.0	58.8	15.0	5.0	0.0
LnGrp LOS	C		E	B	A	
Approach Vol, veh/h	1001			556	424	
Approach Delay, s/veh	29.8			17.4	5.0	
Approach LOS	C			B	A	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.8	48.2		45.0		55.0
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	9.0	21.0		54.0		34.0
Max Q Clear Time (g_c+I1), s	3.7	4.0		29.3		9.0
Green Ext Time (p_c), s	0.0	2.4		9.7		6.2

### Intersection Summary

HCM 7th Control Delay, s/veh	21.0
HCM 7th LOS	C

### Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 15: Mexico City Ave & I-29 SB Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↘		↖ ↗	↑	↖ ↗	↖ ↗	↑ ↘		↖ ↗	↑ ↘	↖ ↗
Traffic Volume (veh/h)	450	11	62	4	0	0	142	62	1	1	65	382
Future Volume (veh/h)	450	11	62	4	0	0	142	62	1	1	65	382
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1574	1870	1870	1870	1900	1900	1870	1870	1870	1870	1870	1515
Adj Flow Rate, veh/h	489	12	0	4	0	0	154	67	1	1	71	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	22	2	2	2	0	0	2	2	2	2	2	26
Cap, veh/h	593	261		9	2	2	190	728	11	2	348	
Arrive On Green	0.20	0.14	0.00	0.01	0.00	0.00	0.11	0.20	0.20	0.00	0.10	0.00
Sat Flow, veh/h	2908	1870	0	1781	1900	1610	1781	3584	53	1781	3554	1284
Grp Volume(v), veh/h	489	12	0	4	0	0	154	33	35	1	71	0
Grp Sat Flow(s),veh/h/ln	1454	1870	0	1781	1900	1610	1781	1777	1861	1781	1777	1284
Q Serve(g_s), s	16.1	0.6	0.0	0.2	0.0	0.0	8.5	1.5	1.5	0.1	1.8	0.0
Cycle Q Clear(g_c), s	16.1	0.6	0.0	0.2	0.0	0.0	8.5	1.5	1.5	0.1	1.8	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	593	261		9	2	2	190	361	378	2	348	
V/C Ratio(X)	0.82	0.05		0.43	0.00	0.00	0.81	0.09	0.09	0.41	0.20	
Avail Cap(c_a), veh/h	1137	735		91	97	82	335	423	443	96	370	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.1	37.2	0.0	49.6	0.0	0.0	43.7	32.3	32.3	49.9	41.5	0.0
Incr Delay (d2), s/veh	3.6	0.1	0.0	33.1	0.0	0.0	11.1	0.2	0.2	111.2	0.6	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.9	0.5	0.0	0.3	0.0	0.0	7.5	1.2	1.2	0.2	1.5	0.0
Unsig. Movement Delay, s/veh												8.40
LnGrp Delay(d), s/veh	41.6	37.3	0.0	82.7	0.0	0.0	54.7	32.6	32.6	161.1	42.1	8.4
LnGrp LOS	D	D		F			D	C	C	F	D	A
Approach Vol, veh/h		501			4			222			487	
Approach Delay, s/veh		41.5			82.7			48.0			13.6	
Approach LOS		D			F			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	27.5	6.4	19.9	17.9	17.4	26.3	0.0				
Change Period (Y+Rc), s	7.6	7.2	5.9	* 5.9	7.2	7.6	5.9	5.9				
Max Green Setting (Gmax), s	5.4	23.8	5.1	* 39	18.8	10.4	39.1	5.1				
Max Q Clear Time (g_c+1), s	12.1	3.5	2.2	2.6	10.5	3.8	18.1	0.0				
Green Ext Time (p_c), s	0.0	0.4	0.0	0.0	0.4	0.2	2.3	0.0				

### Intersection Summary

HCM 7th Control Delay, s/veh	31.6
HCM 7th LOS	C

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is included in calculations of the approach delay and intersection delay.

HCM 7th TWSC  
 16: N Winan Rd & NW 128th St

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	0	5	2	0	1	3
Future Vol, veh/h	0	5	2	0	1	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	0	2	2
Mvmt Flow	0	5	2	0	1	3

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	8	2	0	0	2	0
Stage 1	2	-	-	-	-	-
Stage 2	5	-	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1019	1082	-	-	1620	-
Stage 1	1026	-	-	-	-	-
Stage 2	1023	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1018	1082	-	-	1620	-
Mov Cap-2 Maneuver	1018	-	-	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	8.34	0	1.81
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 1082	450	-
HCM Lane V/C Ratio	-	- 0.005	0.001	-
HCM Ctrl Dly (s/v)	-	- 8.3	7.2	0
HCM Lane LOS	-	- A	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

HCM 7th TWSC  
 17: NW Interurban Rd & NW 128th St

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	4	4	11	0	5	0	19	19	1
Future Vol, veh/h	0	0	1	4	4	11	0	5	0	19	19	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	2	2	2	2	0	2	0	2	2	2
Mvmt Flow	0	0	1	4	4	12	0	5	0	21	21	1

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	70	68	21	67	68	5	22	0	0	5	0	0
Stage 1	62	62	-	5	5	-	-	-	-	-	-	-
Stage 2	8	5	-	62	63	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	927	827	1056	925	822	1078	1607	-	-	1616	-	-
Stage 1	954	847	-	1017	891	-	-	-	-	-	-	-
Stage 2	1019	895	-	949	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	900	816	1056	913	811	1078	1607	-	-	1616	-	-
Mov Cap-2 Maneuver	900	816	-	913	811	-	-	-	-	-	-	-
Stage 1	941	836	-	1017	891	-	-	-	-	-	-	-
Stage 2	1003	895	-	936	831	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Ctrl Dly, s/v	8.41		8.78			0			3.54		
HCM LOS	A		A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1607	-	-	1056	973	868	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.021	0.013	-	-
HCM Ctrl Dly (s/v)	0	-	-	8.4	8.8	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

HCM 7th TWSC  
 18: Mexico City Ave & Travel Center

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	168	0	1405	422	0
Future Vol, veh/h	0	168	0	1405	422	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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	14	45	0
Mvmt Flow	0	183	0	1527	459	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	229	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	*862	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %		0		-	-
Mov Cap-1 Maneuver	-	*862	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	862	-	-
HCM Lane V/C Ratio	-	0.212	-	-
HCM Ctrl Dly (s/v)	-	10.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.8	-	-

Notes  
 ~: Volume exceeds capacity     \$: Delay exceeds 300s  
 +: Computation Not Defined     \*: All major volume in platoon

# LANE SUMMARY

Site: 1 [HW 92 and Bethel - 2034 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road  
 MUTCD (FHWA 2009) example number: 2B-22  
 Roundabout Guide (TRB 2010) example number: A-1  
 Site Category: (None)  
 Roundabout

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]			ft	ft
South: Bethel Road															
Lane 1 <sup>d</sup>	262	2.0	262	2.0	900	0.291	100	11.3	LOS B	1.4	34.3	Full	1600	0.0	0.0
Approach	262	2.0	262	2.0		0.291		11.3	LOS B	1.4	34.3				
East: Highway 92															
Lane 1 <sup>d</sup>	296	2.0	296	2.0	1138	0.260	100	7.9	LOS A	1.6	40.6	Full	1600	0.0	0.0
Approach	296	2.0	296	2.0		0.260		7.9	LOS A	1.6	40.6				
North: Bethel Road															
Lane 1 <sup>d</sup>	74	2.0	74	2.0	989	0.075	100	7.2	LOS A	0.4	10.4	Full	1600	0.0	0.0
Approach	74	2.0	74	2.0		0.075		7.2	LOS A	0.4	10.4				
West: Highway 92															
Lane 1	70	2.0	70	2.0	1169	0.059	100	13.1	LOS B	0.3	7.7	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	478	2.0	478	2.0	1648	0.290	100	6.7	LOS A	1.9	49.1	Full	1600	0.0	0.0
Approach	548	2.0	548	2.0		0.290		7.5	LOS A	1.9	49.1				
All Vehicles	1179	2.0	1179	2.0		0.291		8.4	LOS A	1.9	49.1				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Bethel Road											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane No.	
From S						Cap. veh/h	v/c	%	%		
To Exit:	W	N	E								
Lane 1	171	33	59	262	2.0	900	0.291	100	NA	NA	
Approach	171	33	59	262	2.0		0.291				
East: Highway 92											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane No.	
From E						Cap. veh/h	v/c	%	%		
To Exit:	S	W	N								
Lane 1	17	272	7	296	2.0	1138	0.260	100	NA	NA	

Approach	17	272	7	296	2.0		0.260			
North: Bethel Road										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From N							Satn	Util.	SL	Lane
To Exit:	E	S	W			Cap.	v/c	%	%	No.
						veh/h				
Lane 1	8	23	43	74	2.0	989	0.075	100	NA	NA
Approach	8	23	43	74	2.0		0.075			
West: Highway 92										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W							Satn	Util.	SL	Lane
To Exit:	N	E	S			Cap.	v/c	%	%	No.
						veh/h				
Lane 1	70	-	-	70	2.0	1169	0.059	100	NA	NA
Lane 2	-	407	72	478	2.0	1648	0.290	100	NA	NA
Approach	70	407	72	548	2.0		0.290			
Total %HV Deg.Satn (v/c)										
All Vehicles	1179	2.0		0.291						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
East: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
North: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
West: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

# LANE LEVEL OF SERVICE

## Lane Level of Service

 Site: 1 [HW 92 and Bethel - 2034 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

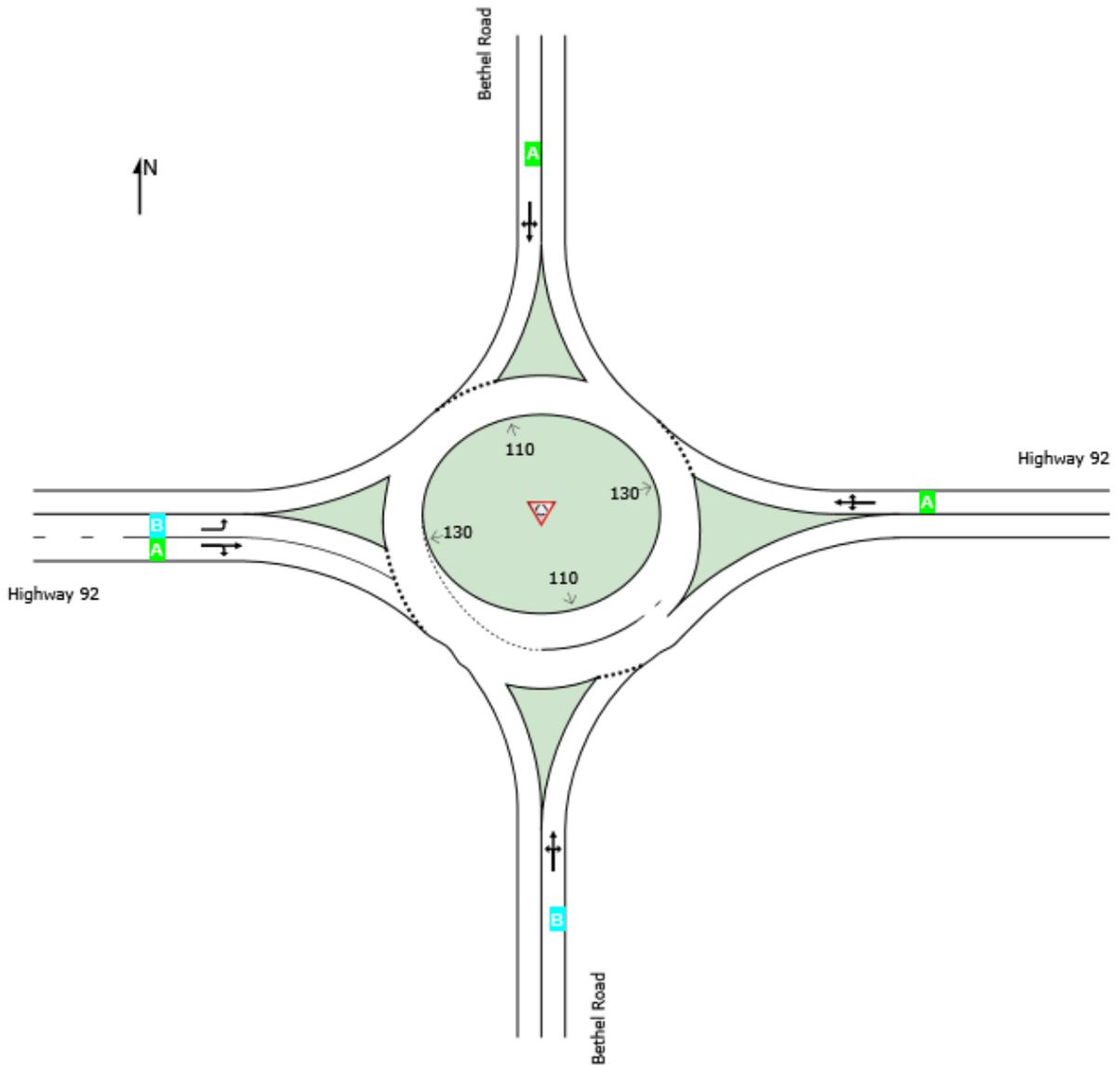
MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

HCM 7th TWSC  
 4: Bethel Rd & Mexico City Avenue

Intersection						
Int Delay, s/veh	4.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔		↔	↔
Traffic Vol, veh/h	0	142	99	0	40	63
Future Vol, veh/h	0	142	99	0	40	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	0	2	2
Mvmt Flow	0	154	108	0	43	68

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	263	108	0	0	108
Stage 1	108	-	-	-	-
Stage 2	155	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	730	946	-	-	1483
Stage 1	922	-	-	-	-
Stage 2	878	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	709	946	-	-	1483
Mov Cap-2 Maneuver	709	-	-	-	-
Stage 1	922	-	-	-	-
Stage 2	852	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	9.54	0	2.91
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	-	946	1483
HCM Lane V/C Ratio	-	-	0.163	0.029
HCM Ctrl Dly (s/v)	-	-	0	9.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1

HCM 7th TWSC  
5: N Winan Rd & Highway 92

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	282	8	32	158	0	35	18	85	0	8	12
Future Vol, veh/h	23	282	8	32	158	0	35	18	85	0	8	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	0	2	2
Mvmt Flow	25	307	9	35	172	0	38	20	92	0	9	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	172	0	0	315	0	0	607	602	311	608	607	172
Stage 1	-	-	-	-	-	-	361	361	-	241	241	-
Stage 2	-	-	-	-	-	-	246	241	-	366	365	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.318
Pot Cap-1 Maneuver	1405	-	-	1245	-	-	409	413	729	411	411	872
Stage 1	-	-	-	-	-	-	658	626	-	767	706	-
Stage 2	-	-	-	-	-	-	758	706	-	657	623	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1405	-	-	1245	-	-	374	392	729	324	390	872
Mov Cap-2 Maneuver	-	-	-	-	-	-	374	392	-	324	390	-
Stage 1	-	-	-	-	-	-	643	612	-	743	684	-
Stage 2	-	-	-	-	-	-	714	684	-	544	610	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.56			1.34			14.24			11.41		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	539	132	-	-	303	-	-	583
HCM Lane V/C Ratio	0.278	0.018	-	-	0.028	-	-	0.037
HCM Ctrl Dly (s/v)	14.2	7.6	0	-	8	0	-	11.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-	-	0.1

HCM 7th TWSC  
 6: NW Interurban Rd & Highway 92

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	350	5	15	260	0	9	14	23	4	9	3
Future Vol, veh/h	17	350	5	15	260	0	9	14	23	4	9	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	2	2	2
Mvmt Flow	18	380	5	16	283	0	10	15	25	4	10	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	283	0	0	386	0	0	740	735	383	740	738	283
Stage 1	-	-	-	-	-	-	420	420	-	315	315	-
Stage 2	-	-	-	-	-	-	320	315	-	425	423	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1280	-	-	1173	-	-	333	347	664	333	345	756
Stage 1	-	-	-	-	-	-	611	589	-	696	655	-
Stage 2	-	-	-	-	-	-	692	655	-	607	588	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1280	-	-	1173	-	-	311	335	664	295	334	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	311	335	-	295	334	-
Stage 1	-	-	-	-	-	-	600	579	-	684	645	-
Stage 2	-	-	-	-	-	-	667	645	-	558	577	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.36			0.44			14.32			15.52		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	436	82	-	-	98	-	-	360
HCM Lane V/C Ratio	0.115	0.014	-	-	0.014	-	-	0.048
HCM Ctrl Dly (s/v)	14.3	7.9	0	-	8.1	0	-	15.5
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.2

HCM 7th TWSC  
 7: Roanridge Road & NW Roanridge Rd

Intersection						
Int Delay, s/veh	7.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	35	1	0	60
Future Vol, veh/h	3	0	35	1	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	2	2	0	2
Mvmt Flow	3	0	38	1	0	65

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	3	0	80 3
Stage 1	-	-	-	-	3 -
Stage 2	-	-	-	-	77 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	1619	-	927 1081
Stage 1	-	-	-	-	1025 -
Stage 2	-	-	-	-	951 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1619	-	905 1081
Mov Cap-2 Maneuver	-	-	-	-	905 -
Stage 1	-	-	-	-	1025 -
Stage 2	-	-	-	-	929 -

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7.08	8.55
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1081	-	-	1618	-
HCM Lane V/C Ratio	0.06	-	-	0.024	-
HCM Ctrl Dly (s/v)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

HCM 7th TWSC  
 8: Bethel Rd & NW Roanridge Rd

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	58	5	1	41	28	35
Future Vol, veh/h	58	5	1	41	28	35
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	-	-	-	-	-
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	63	5	1	45	30	38

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	96	49	68	0	0
Stage 1	49	-	-	-	-
Stage 2	47	-	-	-	-
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	903	1019	1533	-	-
Stage 1	973	-	-	-	-
Stage 2	976	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	902	1019	1533	-	-
Mov Cap-2 Maneuver	902	-	-	-	-
Stage 1	972	-	-	-	-
Stage 2	976	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.27	0.18	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	43	-	911	-	-
HCM Lane V/C Ratio	0.001	-	0.075	-	-
HCM Ctrl Dly (s/v)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

# HCM 7th Signalized Intersection Summary

## 9: Mexico City Ave & 136th Street



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	540	33	208	139	22	713
Future Volume (veh/h)	540	33	208	139	22	713
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1811	1870	1530	1589	1870	1781
Adj Flow Rate, veh/h	587	36	226	151	24	775
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	2	25	21	2	8
Cap, veh/h	723	342	1017	471	759	2146
Arrive On Green	0.22	0.22	0.35	0.35	0.21	0.63
Sat Flow, veh/h	3346	1585	2983	1346	1781	3474
Grp Volume(v), veh/h	587	36	226	151	24	775
Grp Sat Flow(s),veh/h/ln	1673	1585	1453	1346	1781	1692
Q Serve(g_s), s	13.3	1.5	4.4	2.9	0.0	8.7
Cycle Q Clear(g_c), s	13.3	1.5	4.4	2.9	0.0	8.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	723	342	1017	471	759	2146
V/C Ratio(X)	0.81	0.11	0.22	0.32	0.03	0.36
Avail Cap(c_a), veh/h	1213	575	1017	471	759	2146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.99	0.99	1.00	1.00
Uniform Delay (d), s/veh	29.8	25.2	18.3	3.6	10.1	6.9
Incr Delay (d2), s/veh	2.3	0.1	0.5	1.8	0.0	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.9	0.9	2.5	3.5	0.3	4.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	32.1	25.3	18.8	5.4	10.1	7.4
LnGrp LOS	C	C	B	A	B	A
Approach Vol, veh/h	623		377			799
Approach Delay, s/veh	31.7		13.5			7.5
Approach LOS	C		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	22.7	34.0			56.7	23.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	5.0	28.0			39.0	29.0
Max Q Clear Time (g_c+I1), s	2.0	6.4			10.7	15.3
Green Ext Time (p_c), s	0.0	1.7			5.3	1.9
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			17.1			
HCM 7th LOS			B			

HCM 7th TWSC  
 10: N Winan Rd & 136th Street

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	76	0	0	62	35	13
Future Vol, veh/h	76	0	0	62	35	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	2	2
Mvmt Flow	83	0	0	67	38	14

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	112	45	52	0	0
Stage 1	45	-	-	-	-
Stage 2	67	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-
Pot Cap-1 Maneuver	884	1030	1567	-	-
Stage 1	977	-	-	-	-
Stage 2	955	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	884	1030	1567	-	-
Mov Cap-2 Maneuver	884	-	-	-	-
Stage 1	977	-	-	-	-
Stage 2	955	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.49	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1567	-	884	-	-	-
HCM Lane V/C Ratio	-	-	0.093	-	-	-
HCM Ctrl Dly (s/v)	0	-	9.5	0	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-	-

# HCM 7th Signalized Intersection Summary

## 11: Mexico City Ave & NW Roanridge Rd/132nd St

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	21	252	59	17	0	409	336	50	0	1244	9
Future Volume (veh/h)	11	21	252	59	17	0	409	336	50	0	1244	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1396	1870	1870	1900	1559	1544	1870	1900	1796	1870
Adj Flow Rate, veh/h	12	23	274	64	18	0	445	365	0	0	1352	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	34	2	2	0	23	24	2	0	7	2
Cap, veh/h	25	159	311	144	210	181	514	2064		2	2281	737
Arrive On Green	0.01	0.09	0.09	0.04	0.11	0.00	0.30	1.00	0.00	0.00	0.47	0.47
Sat Flow, veh/h	1781	1870	1183	3456	1870	1610	2881	2934	1585	1810	4904	1585
Grp Volume(v), veh/h	12	23	274	64	18	0	445	365	0	0	1352	10
Grp Sat Flow(s),veh/h/ln	1781	1870	1183	1728	1870	1610	1440	1467	1585	1810	1635	1585
Q Serve(g_s), s	0.7	1.1	8.5	1.8	0.9	0.0	14.6	0.0	0.0	0.0	20.4	0.3
Cycle Q Clear(g_c), s	0.7	1.1	8.5	1.8	0.9	0.0	14.6	0.0	0.0	0.0	20.4	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	25	159	311	144	210	181	514	2064		2	2281	737
V/C Ratio(X)	0.48	0.14	0.88	0.45	0.09	0.00	0.87	0.18		0.00	0.59	0.01
Avail Cap(c_a), veh/h	98	159	311	639	402	346	778	2064		109	2281	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.83	0.83
Uniform Delay (d), s/veh	48.9	42.4	21.6	46.8	39.8	0.0	34.0	0.0	0.0	0.0	19.7	14.4
Incr Delay (d2), s/veh	13.2	0.4	23.8	2.2	0.2	0.0	6.7	0.2	0.0	0.0	0.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	0.9	11.3	1.4	0.7	0.0	8.2	0.1	0.0	0.0	11.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	62.1	42.8	45.4	49.0	39.9	0.0	40.7	0.2	0.0	0.0	20.7	14.4
LnGrp LOS	E	D	D	D	D		D	A			C	B
Approach Vol, veh/h		309			82			810			1362	
Approach Delay, s/veh		45.9			47.0			22.5			20.6	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.8	52.5	9.7	14.0	0.0	76.3	6.9	16.7				
Change Period (Y+Rc), s	6.0	6.0	5.5	5.5	6.0	6.0	5.5	5.5				
Max Green Setting (Gmax), s	27.0	23.0	18.5	8.5	6.0	44.0	5.5	21.5				
Max Q Clear Time (g_c+I1), s	16.6	22.4	3.8	10.5	0.0	2.0	2.7	2.9				
Green Ext Time (p_c), s	1.2	0.5	0.1	0.0	0.0	2.4	0.0	0.0				
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			25.1									
HCM 7th LOS			C									
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 7th TWSC  
 13: N Winan Rd & 132nd St

Intersection						
Int Delay, s/veh	5.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	58	4	12	4	1	34
Future Vol, veh/h	58	4	12	4	1	34
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	-	-	-	-	-
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	63	4	13	4	1	37

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	50	20	38	0	0
Stage 1	20	-	-	-	-
Stage 2	30	-	-	-	-
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	959	1058	1572	-	-
Stage 1	1003	-	-	-	-
Stage 2	992	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	951	1058	1572	-	-
Mov Cap-2 Maneuver	951	-	-	-	-
Stage 1	995	-	-	-	-
Stage 2	992	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.04	5.48	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1350	-	957	-	-
HCM Lane V/C Ratio	0.008	-	0.07	-	-
HCM Ctrl Dly (s/v)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

# HCM 7th Signalized Intersection Summary

## 14: Mexico City Ave & I-29 NB Off Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	515	176	93	280	1229	539
Future Volume (veh/h)	515	176	93	280	1229	539
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1633	1870	1870	1455	1781	1678
Adj Flow Rate, veh/h	560	0	101	304	1336	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	18	2	2	30	8	15
Cap, veh/h	709		128	2563	2594	
Arrive On Green	0.23	0.00	0.07	0.65	1.00	0.00
Sat Flow, veh/h	3018	1585	1781	4104	5024	1422
Grp Volume(v), veh/h	560	0	101	304	1336	0
Grp Sat Flow(s),veh/h/ln	1509	1585	1781	1324	1621	1422
Q Serve(g_s), s	17.4	0.0	5.6	2.9	0.0	0.0
Cycle Q Clear(g_c), s	17.4	0.0	5.6	2.9	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	709		128	2563	2594	
V/C Ratio(X)	0.79		0.79	0.12	0.51	
Avail Cap(c_a), veh/h	1056		178	2563	2594	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.9	0.0	45.7	6.8	0.0	0.0
Incr Delay (d2), s/veh	4.5	0.0	14.9	0.1	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.0	0.0	5.2	1.3	0.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	40.4	0.0	60.5	6.9	0.7	0.0
LnGrp LOS	D		E	A	A	
Approach Vol, veh/h	560			405	1336	
Approach Delay, s/veh	40.4			20.3	0.7	
Approach LOS	D			C	A	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.2	59.3		29.5		70.5
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	10.0	39.0		35.0		53.0
Max Q Clear Time (g_c+1), s	7.6	2.0		19.4		4.9
Green Ext Time (p_c), s	0.0	11.4		4.1		4.0

### Intersection Summary

HCM 7th Control Delay, s/veh	13.8
HCM 7th LOS	B

### Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 15: Mexico City Ave & I-29 SB Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↘		↖	↗	↘	↖	↗		↖	↗	↘
Traffic Volume (veh/h)	255	11	54	12	36	28	109	90	5	4	203	1198
Future Volume (veh/h)	255	11	54	12	36	28	109	90	5	4	203	1198
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1411	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1781
Adj Flow Rate, veh/h	277	12	0	13	39	30	118	98	5	4	221	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	33	2	2	2	2	2	2	2	2	2	2	8
Cap, veh/h	352	311		27	87	73	150	616	31	9	355	
Arrive On Green	0.14	0.17	0.00	0.02	0.05	0.05	0.08	0.18	0.18	0.01	0.10	0.00
Sat Flow, veh/h	2607	1870	0	1781	1870	1585	1781	3441	174	1781	3554	1510
Grp Volume(v), veh/h	277	12	0	13	39	30	118	50	53	4	221	0
Grp Sat Flow(s),veh/h/ln	1303	1870	0	1781	1870	1585	1781	1777	1839	1781	1777	1510
Q Serve(g_s), s	10.3	0.5	0.0	0.7	2.0	1.8	6.5	2.4	2.4	0.2	6.0	0.0
Cycle Q Clear(g_c), s	10.3	0.5	0.0	0.7	2.0	1.8	6.5	2.4	2.4	0.2	6.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	352	311		27	87	73	150	318	329	9	355	
V/C Ratio(X)	0.79	0.04		0.48	0.45	0.41	0.79	0.16	0.16	0.43	0.62	
Avail Cap(c_a), veh/h	889	679		109	151	128	299	441	456	114	512	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.8	35.0	0.0	48.9	46.4	46.4	44.9	34.7	34.7	49.6	43.2	0.0
Incr Delay (d2), s/veh	4.7	0.1	0.0	15.2	5.1	5.1	12.2	0.5	0.5	38.4	3.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.3	0.4	0.0	0.8	1.9	1.5	5.9	1.9	2.0	0.4	4.9	0.0
Unsig. Movement Delay, s/veh												8.40
LnGrp Delay(d), s/veh	46.5	35.0	0.0	64.0	51.6	51.5	57.1	35.2	35.2	88.0	47.0	8.4
LnGrp LOS	D	D		E	D	D	E	D	D	F	D	A
Approach Vol, veh/h		289			82			221			1527	
Approach Delay, s/veh		46.0			53.5			46.9			14.2	
Approach LOS		D			D			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	25.1	7.4	22.5	15.6	17.6	19.4	10.5				
Change Period (Y+Rc), s	7.6	7.2	5.9	* 5.9	7.2	7.6	5.9	5.9				
Max Green Setting (Gmax), s	6.4	24.8	6.1	* 36	16.8	14.4	34.1	8.1				
Max Q Clear Time (g_c+1), s	12.2	4.4	2.7	2.5	8.5	8.0	12.3	4.0				
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.2	1.0	1.2	0.1				

### Intersection Summary

HCM 7th Control Delay, s/veh	23.5
HCM 7th LOS	C

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is included in calculations of the approach delay and intersection delay.

HCM 7th TWSC  
 16: N Winan Rd & NW 128th St

Intersection						
Int Delay, s/veh	4.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	8	8	2	5	0
Future Vol, veh/h	0	8	8	2	5	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	2	2	0
Mvmt Flow	0	9	9	2	5	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	21	10	0	0	11	0
Stage 1	10	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1001	1072	-	-	1608	-
Stage 1	1018	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	998	1072	-	-	1608	-
Mov Cap-2 Maneuver	998	-	-	-	-	-
Stage 1	1018	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	8.39	0	7.25
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1072	1608
HCM Lane V/C Ratio	-	-	0.008	0.003
HCM Ctrl Dly (s/v)	-	-	8.4	7.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 7th TWSC  
 17: NW Interurban Rd & NW 128th St

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	3	1	7	5	15	2	26	4	27	16	1
Future Vol, veh/h	3	3	1	7	5	15	2	26	4	27	16	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	3	3	1	8	5	16	2	28	4	29	17	1

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	112	114	18	113	112	30	18	0	0	33	0	0
Stage 1	77	77	-	35	35	-	-	-	-	-	-	-
Stage 2	35	37	-	78	77	-	-	-	-	-	-	-
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	866	777	1061	865	778	1044	1598	-	-	1579	-	-
Stage 1	932	831	-	981	866	-	-	-	-	-	-	-
Stage 2	980	864	-	931	831	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	829	761	1061	843	763	1044	1598	-	-	1579	-	-
Mov Cap-2 Maneuver	829	761	-	843	763	-	-	-	-	-	-	-
Stage 1	915	816	-	980	865	-	-	-	-	-	-	-
Stage 2	958	863	-	909	815	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Ctrl Dly, s/v	9.41		9.02		0.45		4.49	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	110	-	-	823	924	1092	-	-
HCM Lane V/C Ratio	0.001	-	-	0.009	0.032	0.019	-	-
HCM Ctrl Dly (s/v)	7.3	0	-	9.4	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

HCM 7th TWSC  
 18: Mexico City Ave & Travel Center

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	213	0	795	1555	0
Future Vol, veh/h	0	213	0	795	1555	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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	22	11	0
Mvmt Flow	0	232	0	864	1690	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	845	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	*685	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %		0		-	-
Mov Cap-1 Maneuver	-	*685	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	12.92	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	685	-	-
HCM Lane V/C Ratio	-	0.338	-	-
HCM Ctrl Dly (s/v)	-	12.9	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	1.5	-	-

Notes  
 ~: Volume exceeds capacity     \$: Delay exceeds 300s  
 +: Computation Not Defined     \*: All major volume in platoon

SimTraffic

Queuing and Blocking Report  
025-03015

Intersection: 9: Mexico City Ave & 136th Street

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	41	111	22	154	100	54	27	29	65
Average Queue (ft)	9	54	11	49	34	19	6	5	11
95th Queue (ft)	38	114	27	142	91	54	24	29	45
Link Distance (ft)		854		1530	1530			1019	1019
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300		300			200	300		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	L	T	L	L	T	T	T	T
Maximum Queue (ft)	20	26	150	11	50	37	309	295	273	191	64	77
Average Queue (ft)	3	8	77	2	22	17	216	184	109	79	20	34
95th Queue (ft)	20	26	152	15	50	44	324	342	272	190	75	83
Link Distance (ft)		558					3228		607	607	607	1530
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		300	500	500		400					
Storage Blk Time (%)							0	0		0		
Queuing Penalty (veh)							1	1		0		

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	143	16
Average Queue (ft)	81	2
95th Queue (ft)	164	15
Link Distance (ft)	1530	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report  
025-03015

Intersection: 14: Mexico City Ave & I-29 NB Off Ramp

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	T	T
Maximum Queue (ft)	364	426	116	41	137	129	112	70	143	187
Average Queue (ft)	246	317	0	15	71	73	54	22	79	127
95th Queue (ft)	350	441	0	51	147	132	109	70	149	192
Link Distance (ft)			679		563	563		629	629	629
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	420	420		600			275			
Storage Blk Time (%)		1								
Queuing Penalty (veh)		1								

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	TR	L	L	T	TR	L	T	T	R
Maximum Queue (ft)	215	284	19	11	164	64	42	4	36	80	63
Average Queue (ft)	92	170	6	2	94	28	11	1	14	44	16
95th Queue (ft)	245	320	25	9	170	67	39	7	46	86	67
Link Distance (ft)			650			1102	1102		1128	1128	1128
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	380	380		125	430			450			
Storage Blk Time (%)		0									
Queuing Penalty (veh)		0									

Zone Summary

Zone wide Queuing Penalty: 2
------------------------------

Queuing and Blocking Report  
025-03015

Intersection: 9: Mexico City Ave & 136th Street

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	168	198	23	104	50	93	34	97	166
Average Queue (ft)	101	138	11	59	17	47	12	56	97
95th Queue (ft)	166	203	29	119	56	96	37	97	169
Link Distance (ft)		854		1530	1530			1019	1019
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300		300			200	300		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	L	T	L	L	T	T	T	T
Maximum Queue (ft)	36	39	215	43	65	41	286	289	158	81	295	432
Average Queue (ft)	12	15	116	13	37	13	223	192	48	27	153	258
95th Queue (ft)	37	42	215	45	72	45	305	330	183	77	287	413
Link Distance (ft)		558					3202		607	607	607	1530
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		300	500	500		400					
Storage Blk Time (%)				1								3
Queuing Penalty (veh)				0								0

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	546	220
Average Queue (ft)	329	35
95th Queue (ft)	527	177
Link Distance (ft)	1530	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)	38	
Queuing Penalty (veh)	3	

Queuing and Blocking Report  
025-03015

Intersection: 14: Mexico City Ave & I-29 NB Off Ramp

Movement	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	T	T
Maximum Queue (ft)	299	323	109	98	33	37	40	143	217	260
Average Queue (ft)	204	242	36	56	4	12	9	57	135	172
95th Queue (ft)	314	345	115	105	26	39	36	135	221	279
Link Distance (ft)			679		563	563		629	629	629
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	420	420		600			275			
Storage Blk Time (%)		0								
Queuing Penalty (veh)		0								

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	T	R	L	T	TR	L	T	T
Maximum Queue (ft)	146	219	10	18	56	17	120	53	23	12	255	475
Average Queue (ft)	54	116	3	5	19	7	65	29	9	3	97	211
95th Queue (ft)	162	220	15	20	51	18	130	55	30	15	260	476
Link Distance (ft)			650		619	619		1102	1102		1128	1128
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	380	380		125			430			450		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	SB	B47	B47
Directions Served	R	T	T
Maximum Queue (ft)	511	32	64
Average Queue (ft)	273	6	12
95th Queue (ft)	576	33	71
Link Distance (ft)	1128	563	563
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 4

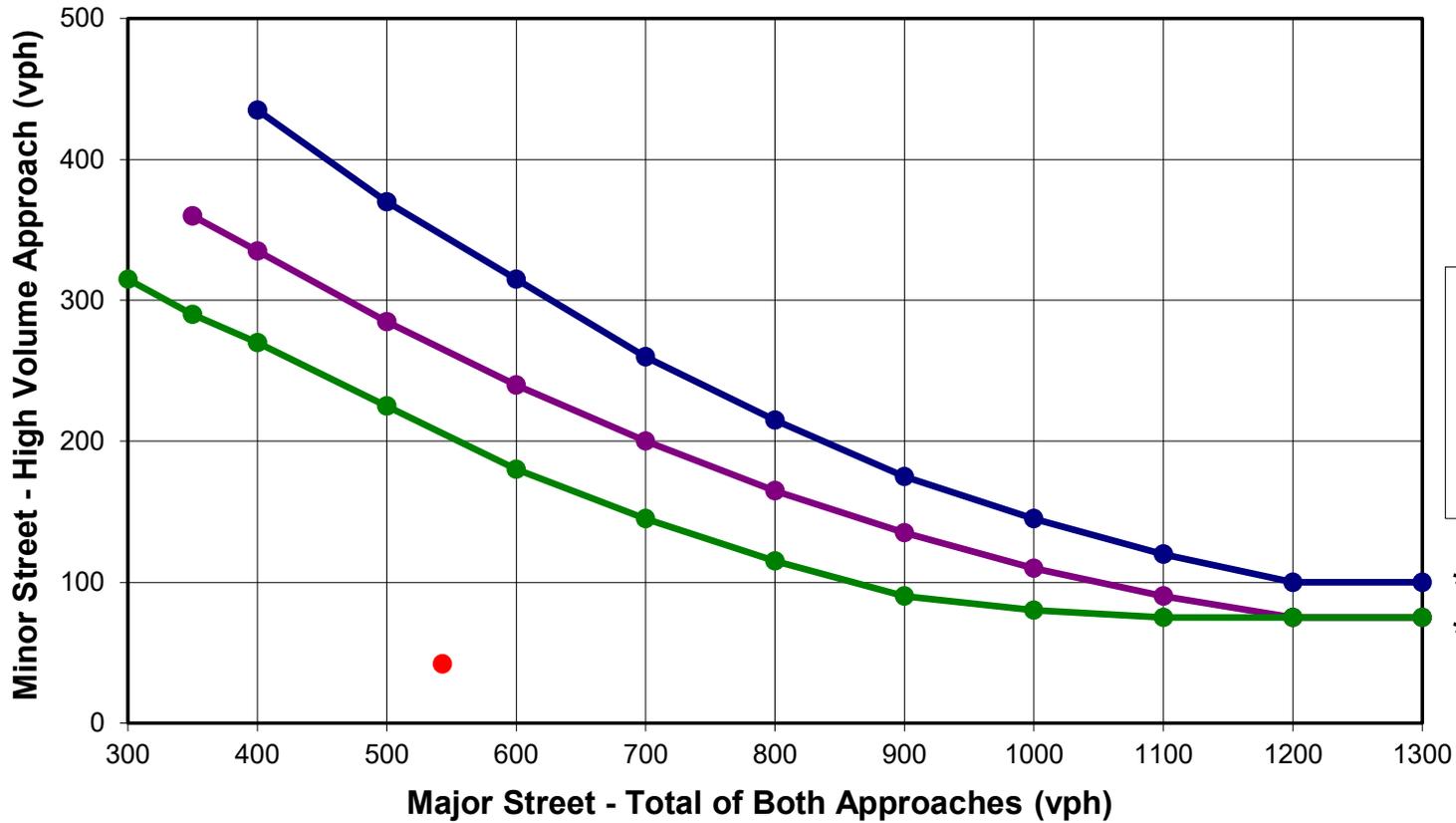
## **APPENDIX D**

Build Year 2040 Conditions

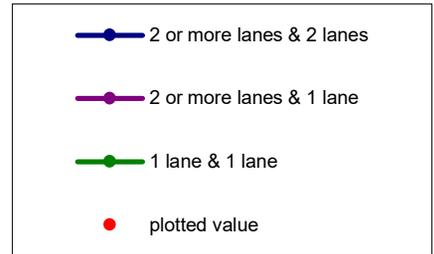
## Warrant Analysis

# 2040 AM Peak Hour Volume Warrant Highway 92 and Winan Road

(Community less than 10,000 population or above 40mph on major street)



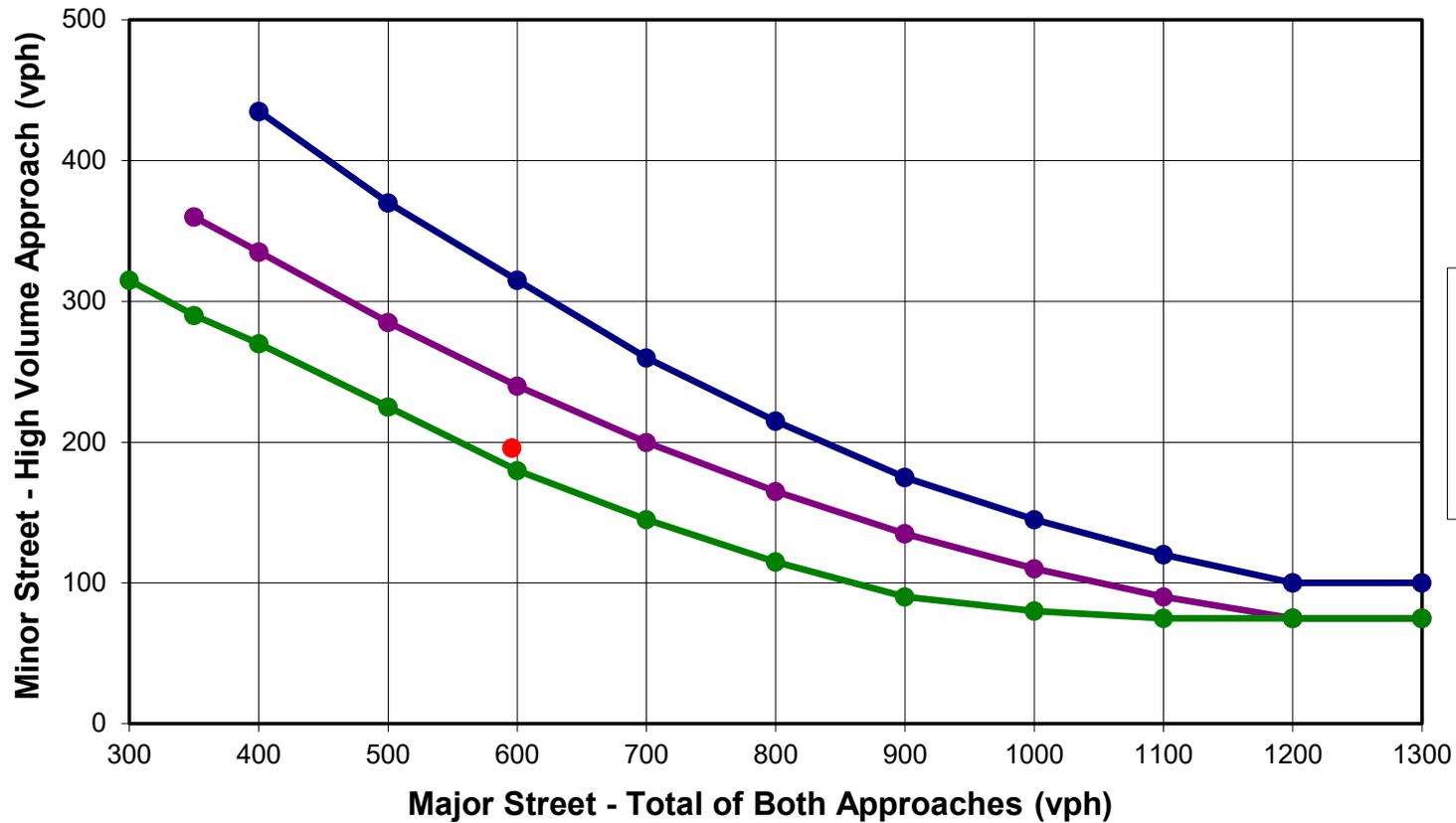
**Off Chart:**  
Major - 543  
Minor - 42



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 PM Peak Hour Volume Warrant Highway 92 and Winan Road

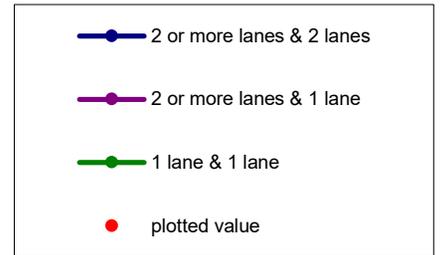
(Community less than 10,000 population or above 40mph on major street)



## Off Chart:

Major - 596

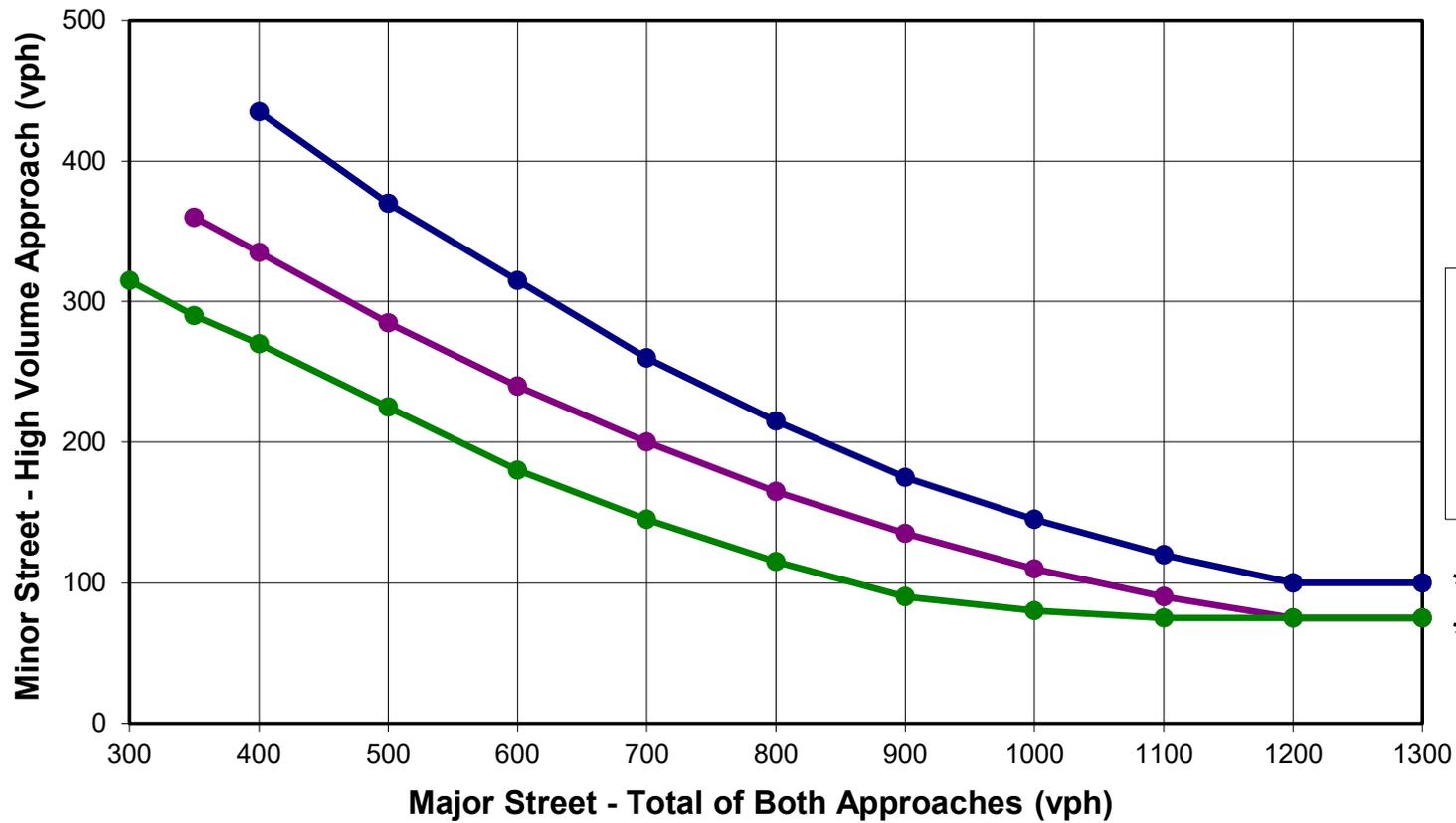
Minor - 196



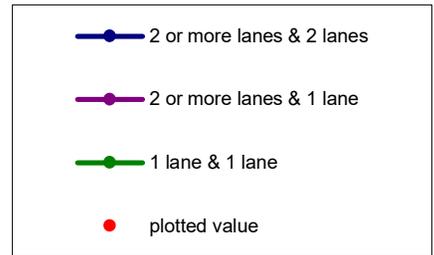
\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 AM Peak Hour Volume Warrant 132nd Street and Winan Road

(Community less than 10,000 population or above 40mph on major street)



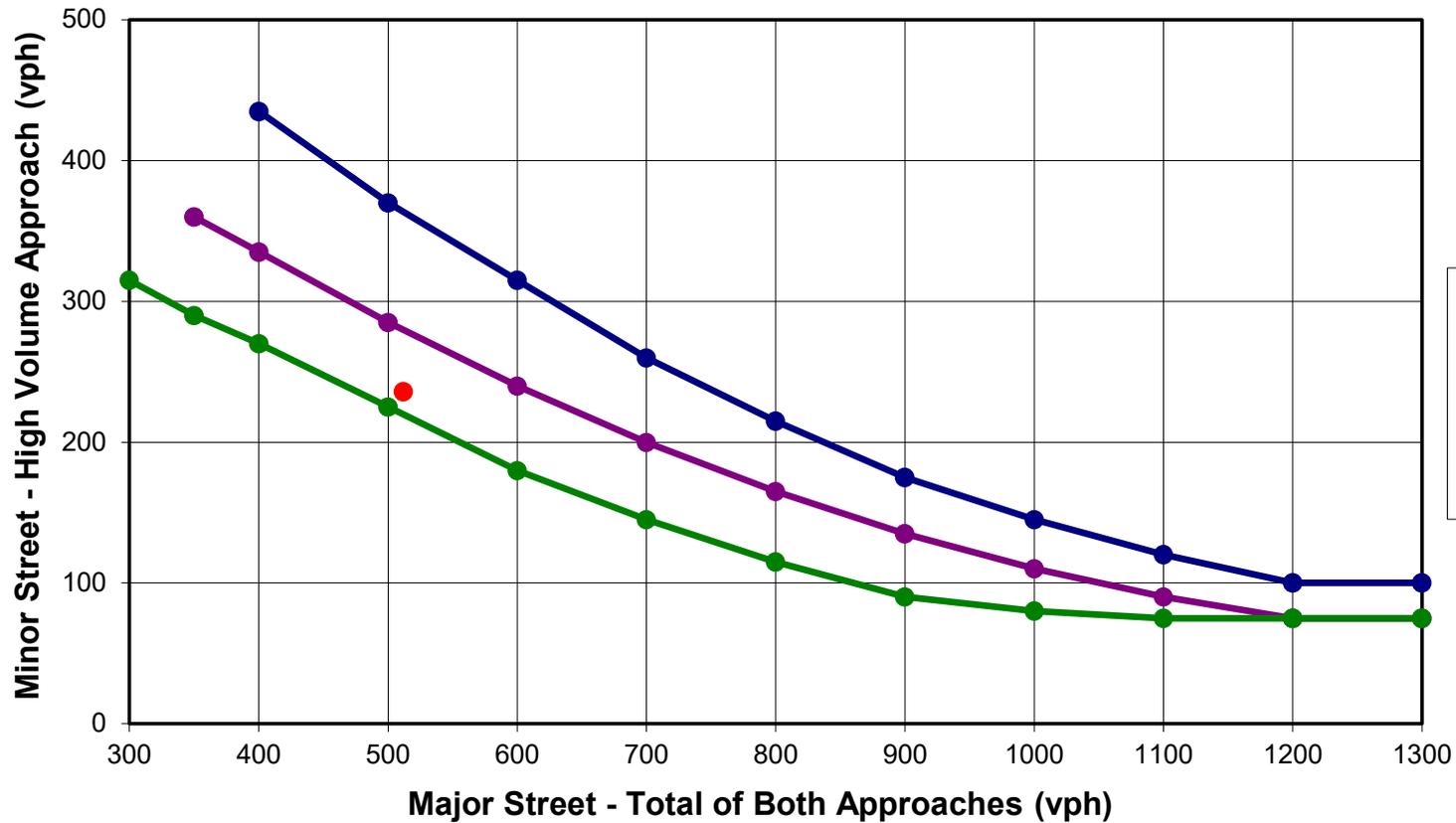
**Off Chart:**  
Major - 224  
Minor - 394



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 PM Peak Hour Volume Warrant 132nd Street and Winan Road

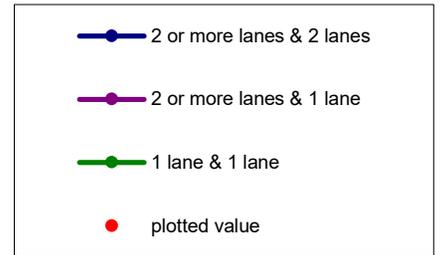
(Community less than 10,000 population or above 40mph on major street)



### Off Chart:

Major - 512

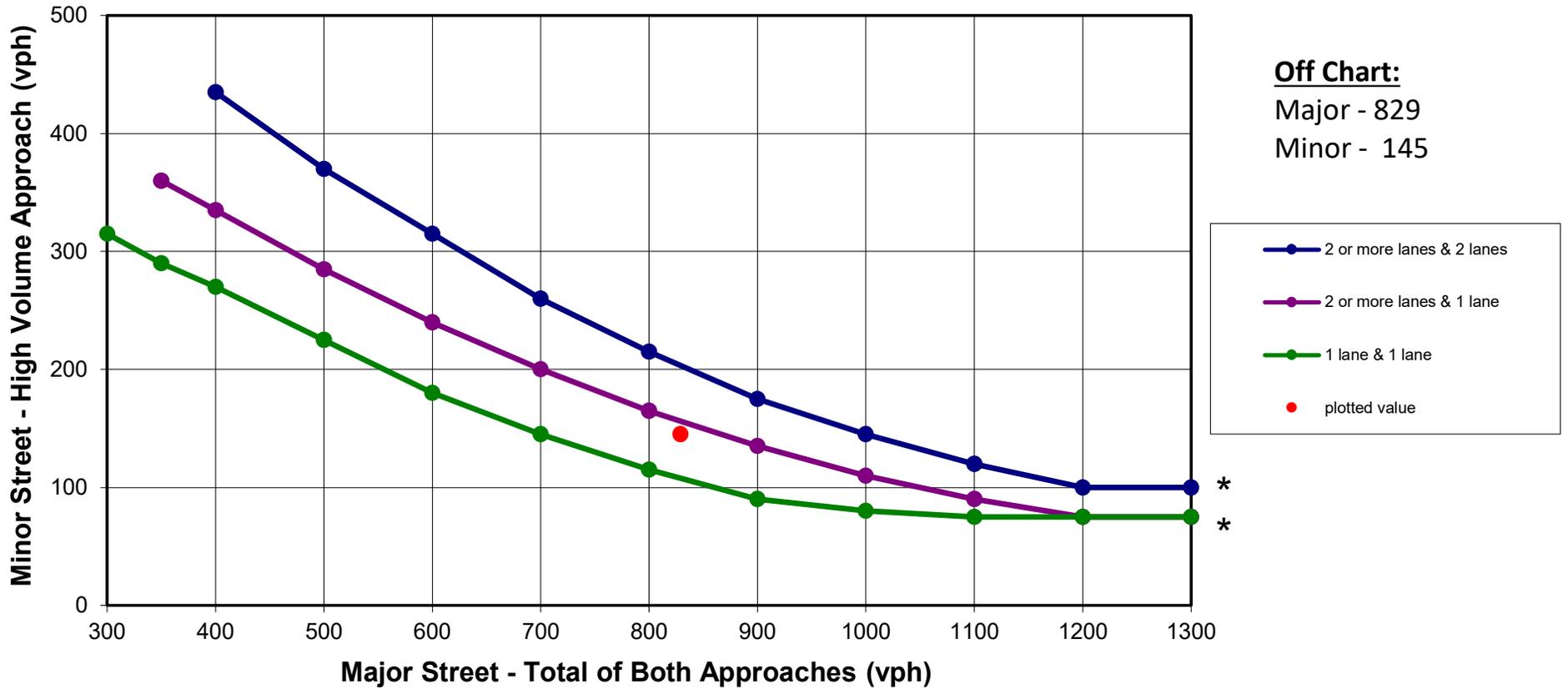
Minor - 236



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 AM Peak Hour Volume Warrant 132nd Street and Windfield Avenue

(Community less than 10,000 population or above 40mph on major street)

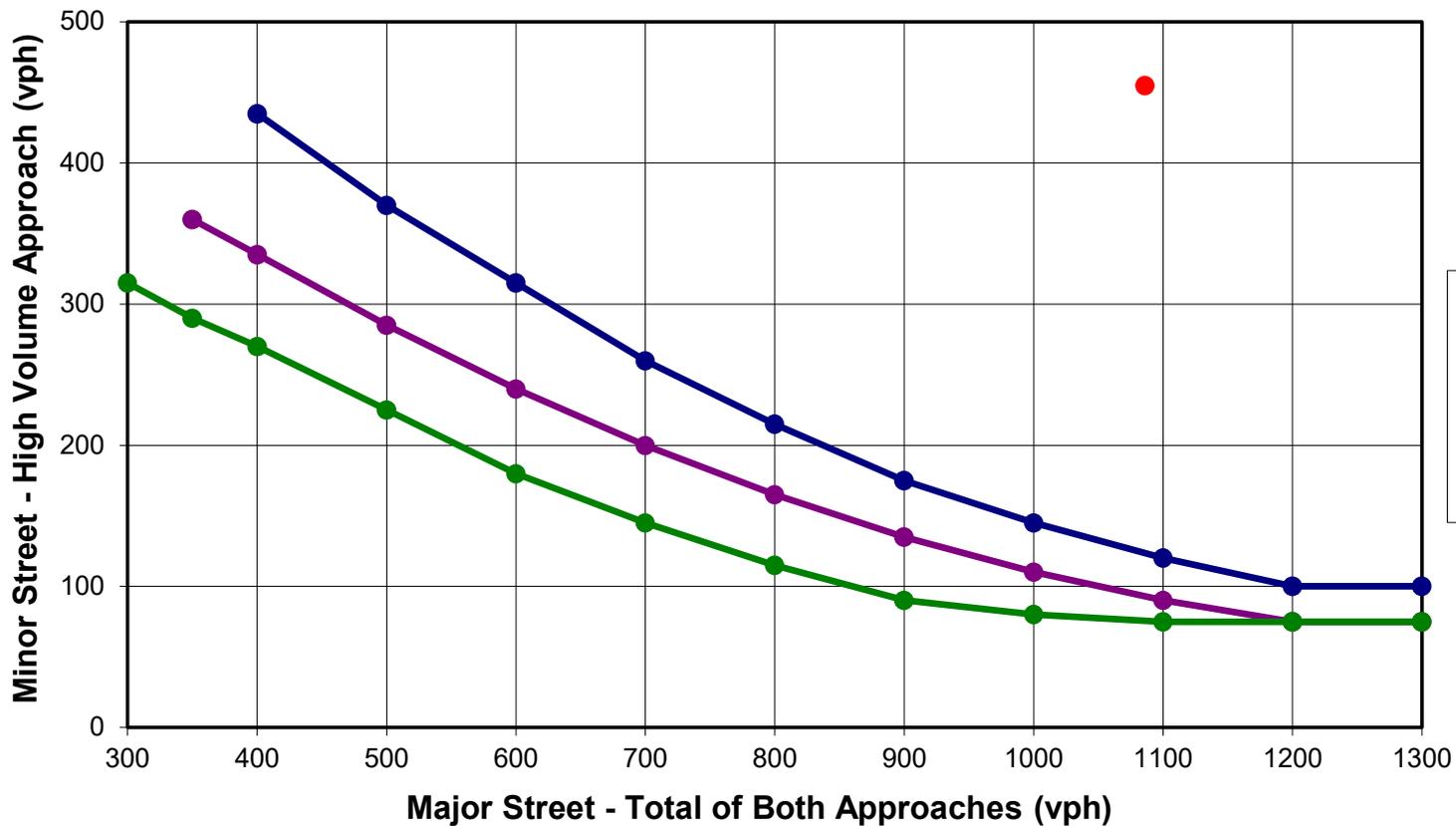


**Off Chart:**  
Major - 829  
Minor - 145

\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 PM Peak Hour Volume Warrant 132nd Street and Windfield Avenue

(Community less than 10,000 population or above 40mph on major street)



### Off Chart:

Major - 1086

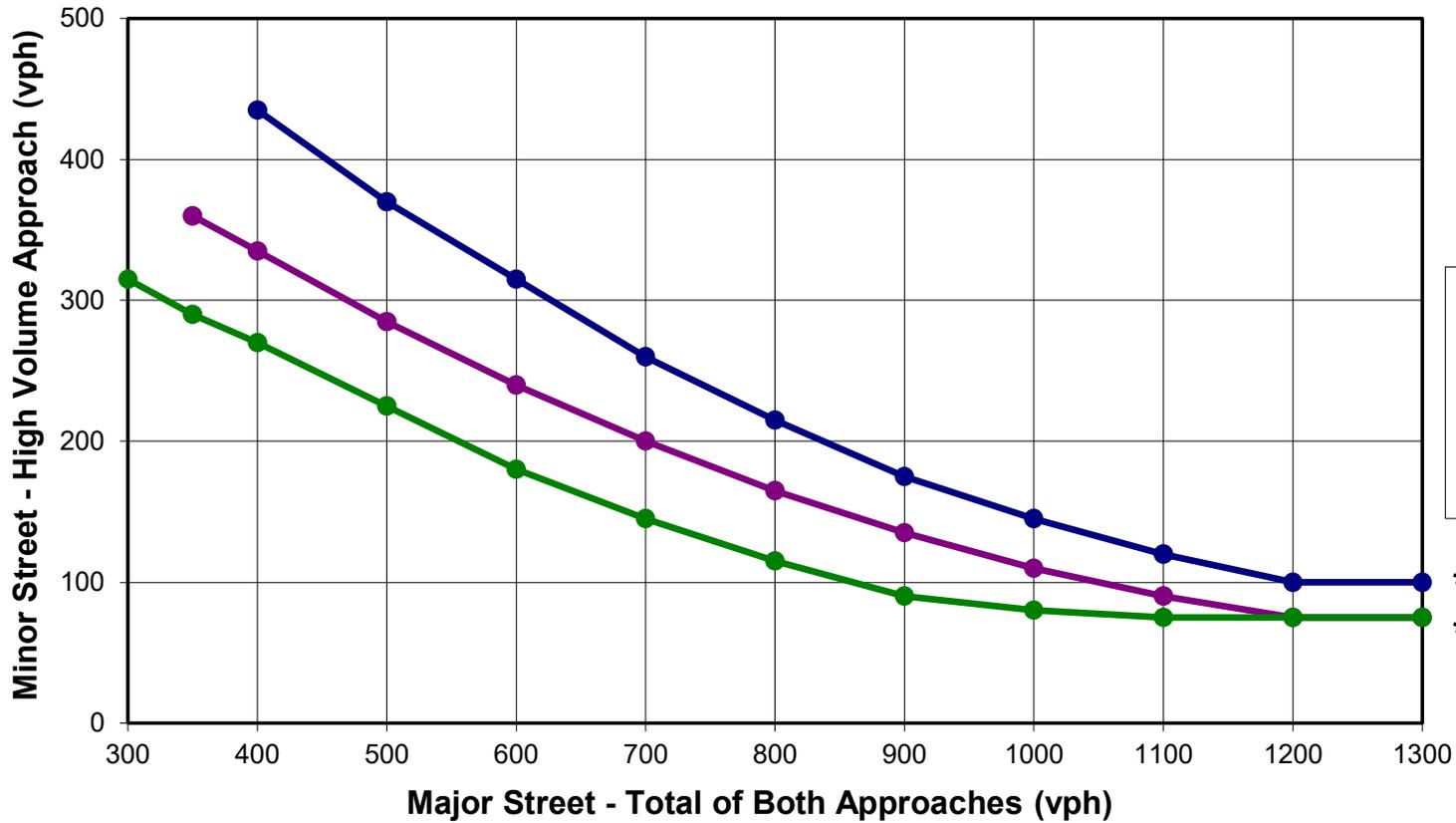
Minor - 455



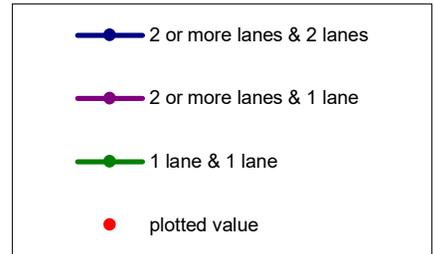
\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 AM Peak Hour Volume Warrant Bethel Road and Mexico City Avenue

(Community less than 10,000 population or above 40mph on major street)



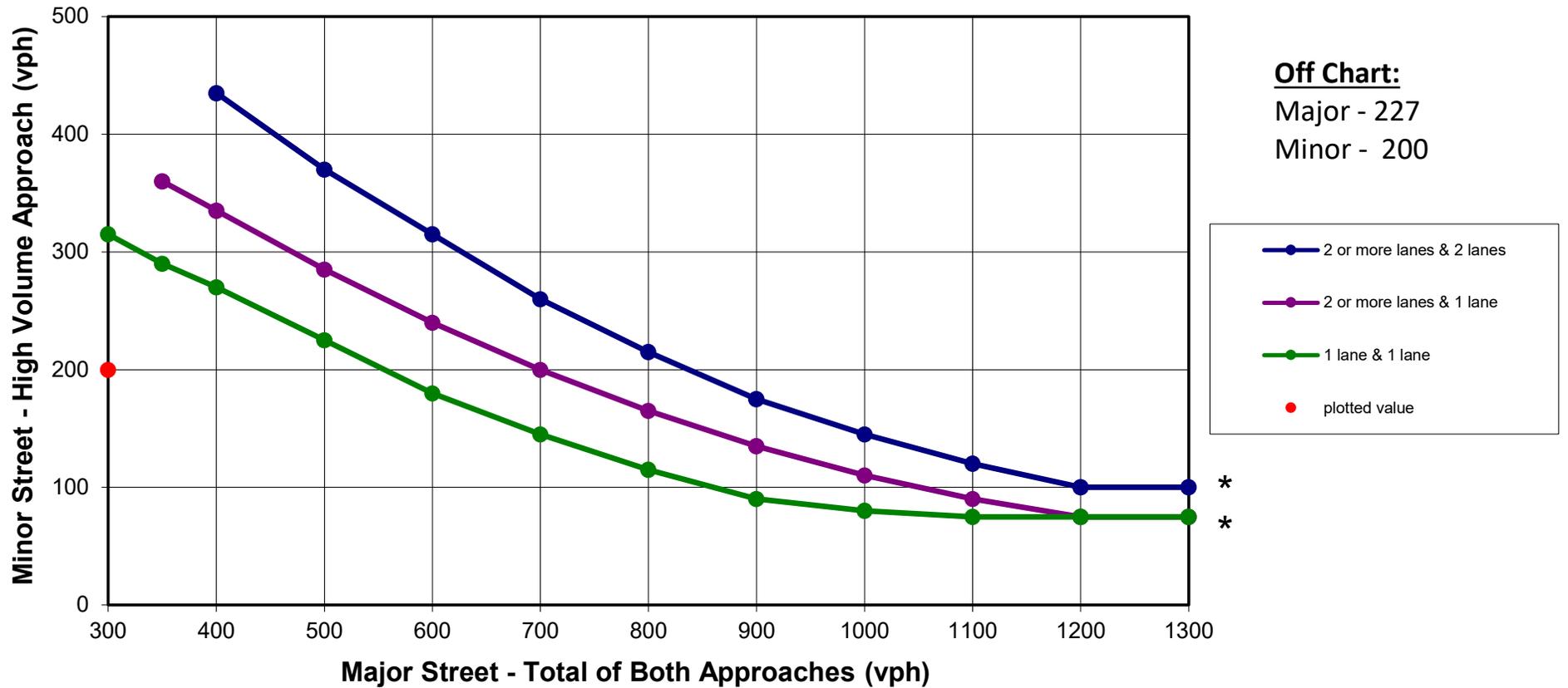
**Off Chart:**  
Major - 256  
Minor - 40



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

# 2040 PM Peak Hour Volume Warrant Bethel Road and Mexico City Avenue

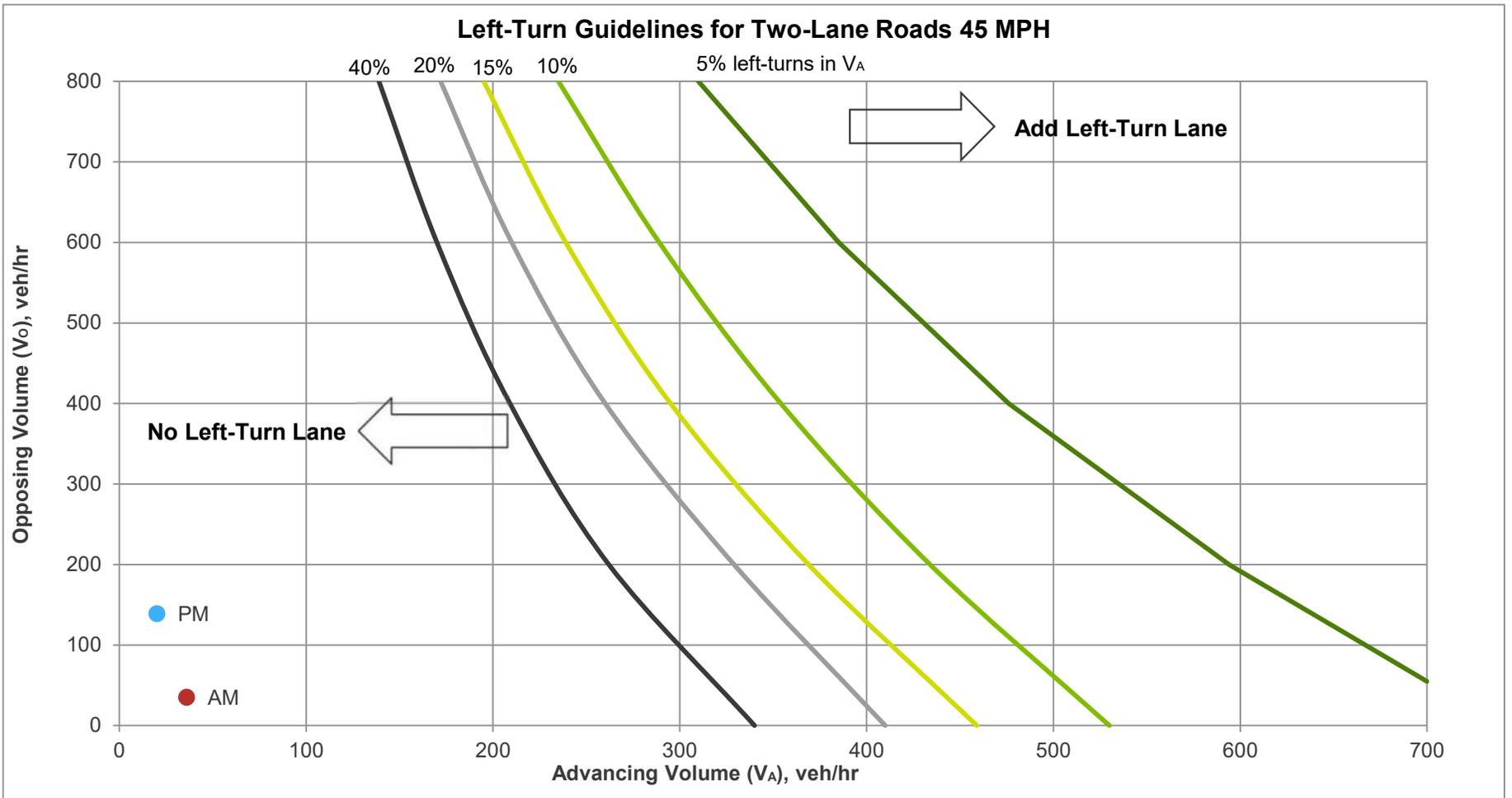
(Community less than 10,000 population or above 40mph on major street)



\*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes

Build Year 2040

### Left-Turn Guidelines for Two-Lane Roads 45 MPH

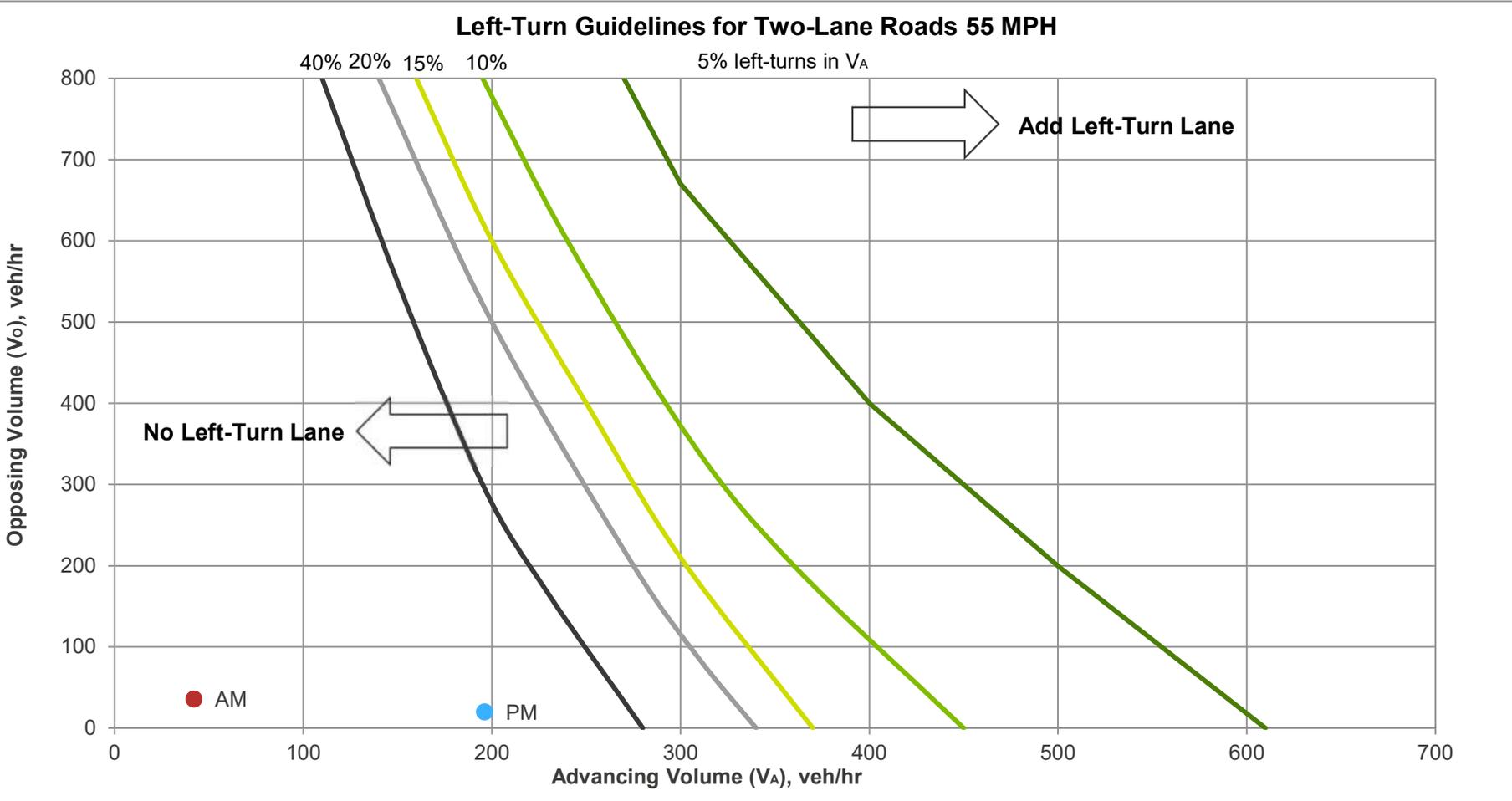


AM Line: 5% PM Line: 5%

Southbound on Winan Road @ Highway 92

Build Year 2040

Left-Turn Guidelines for Two-Lane Roads 55 MPH

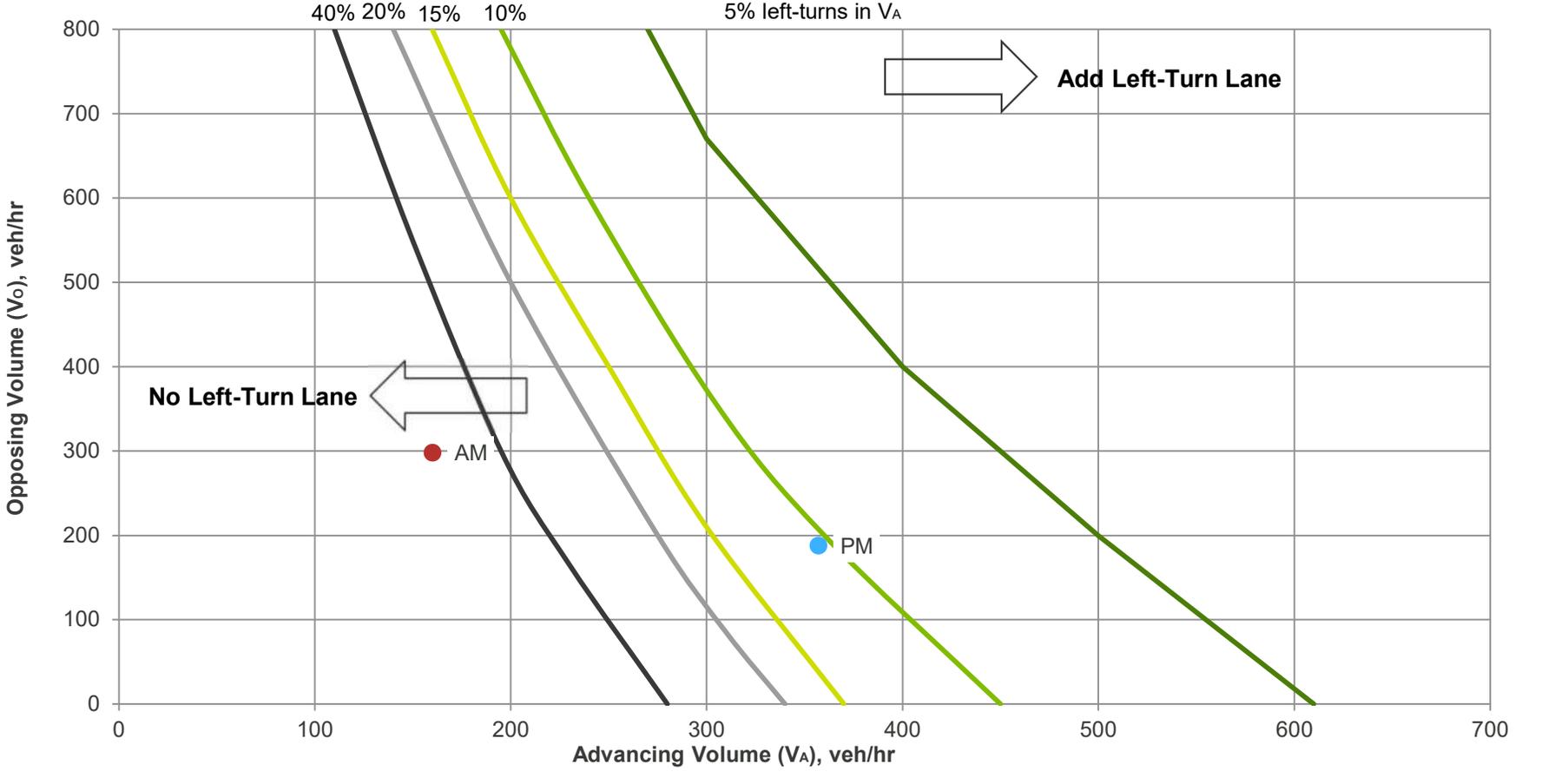


AM Line: 20% PM Line: 40%

Northbound on Winan Road @ Highway 92

Build Year 2040

### Left-Turn Guidelines for Two-Lane Roads 55 MPH

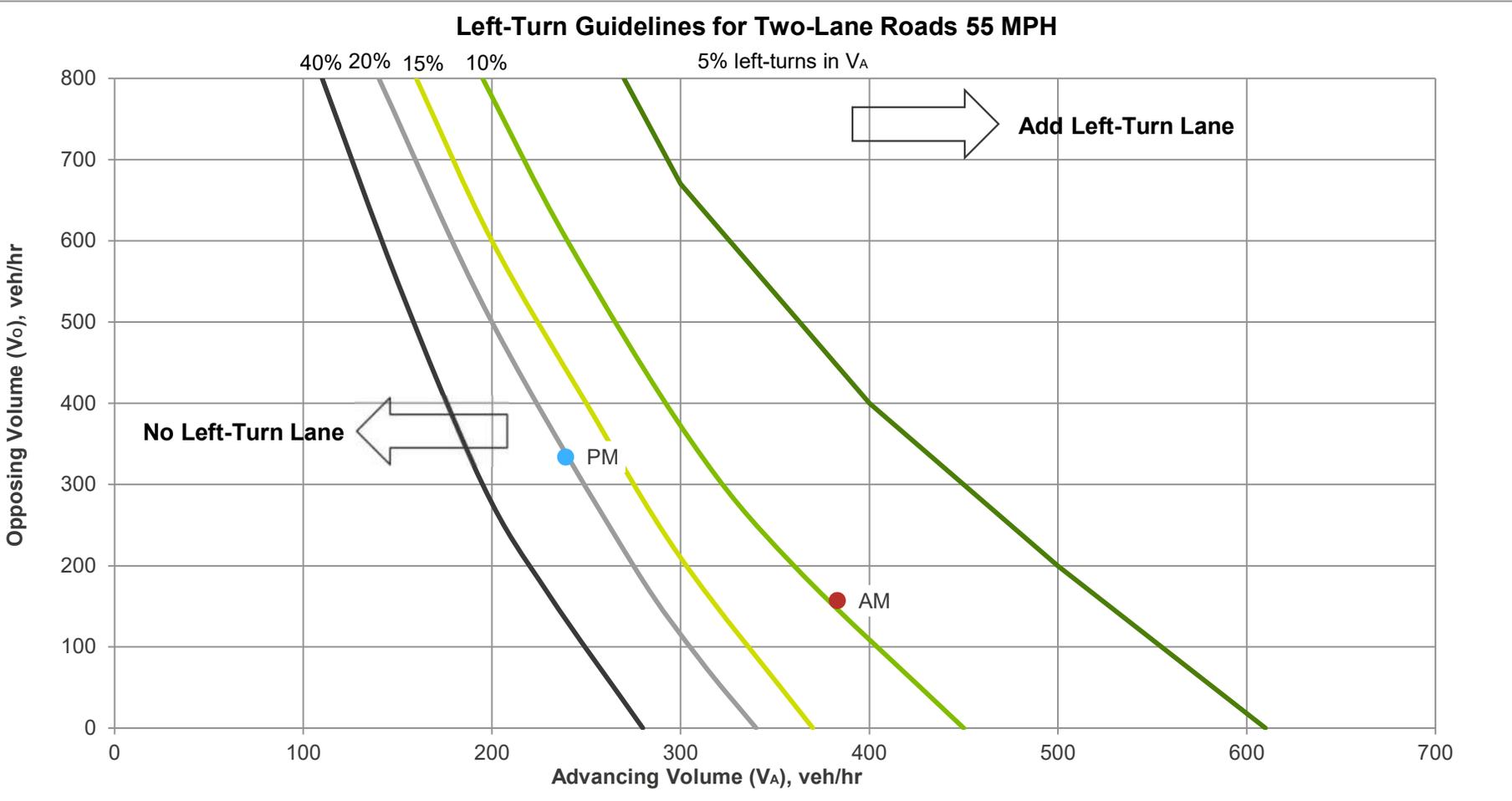


AM Line: 5% PM Line: 10%

Eastbound on Highway 92 @ Winan Road

Build Year 2040

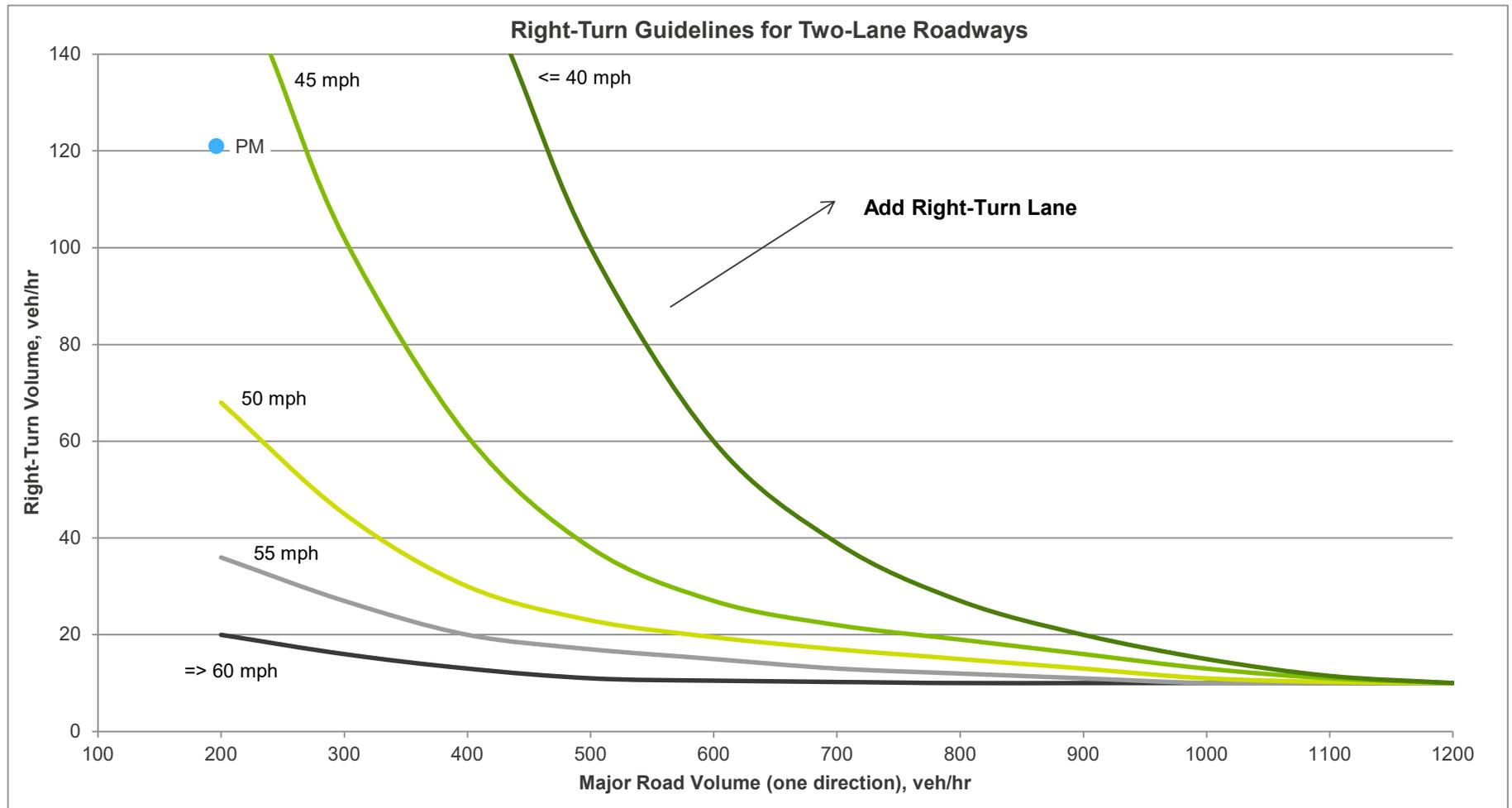
Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line: 40% PM Line: 40%

Westbound on Highway 92 @ Winan Road

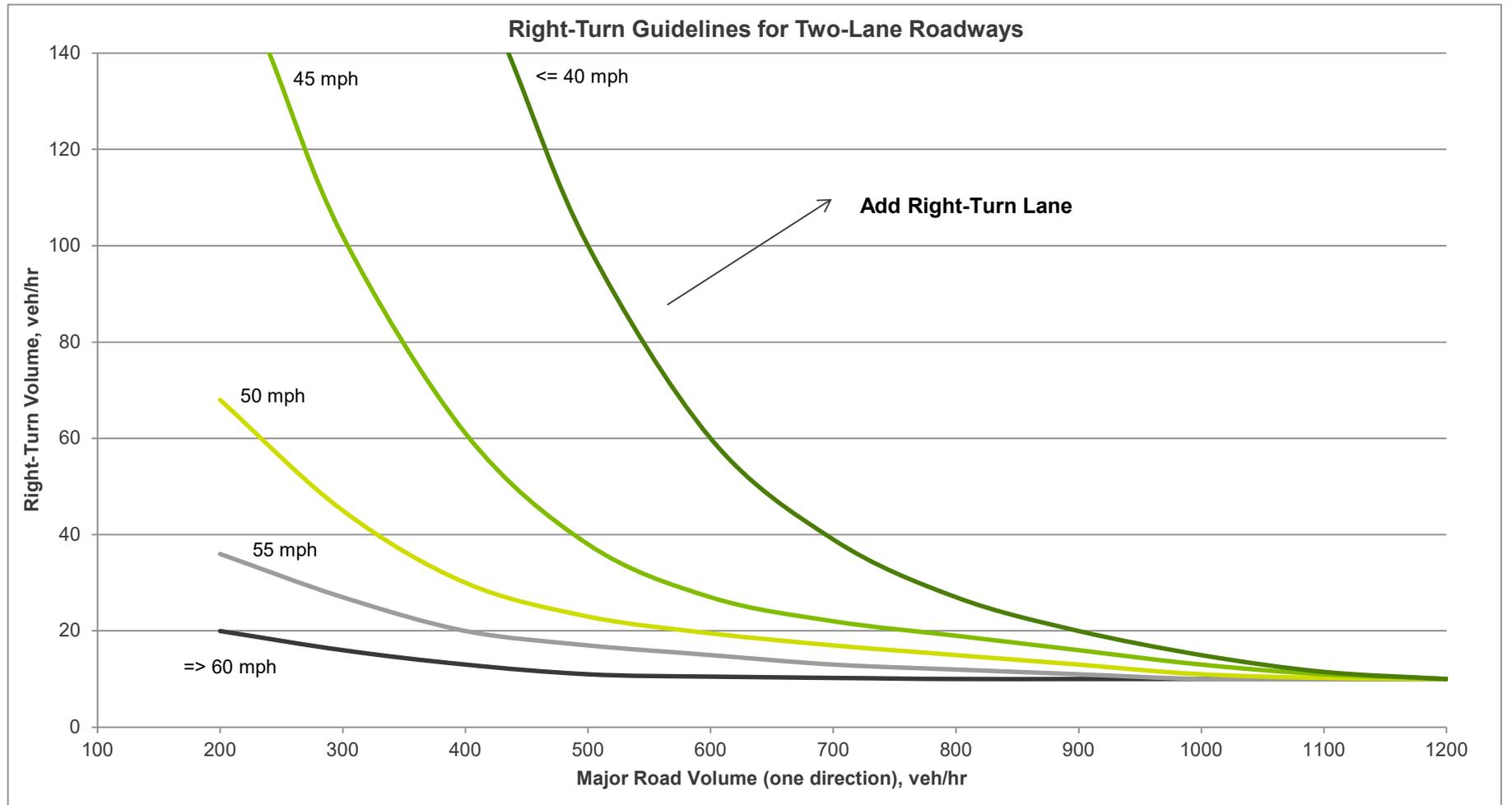
Build Year 2040



Speed: 55

Northbound on Winan Road @ Highway 92

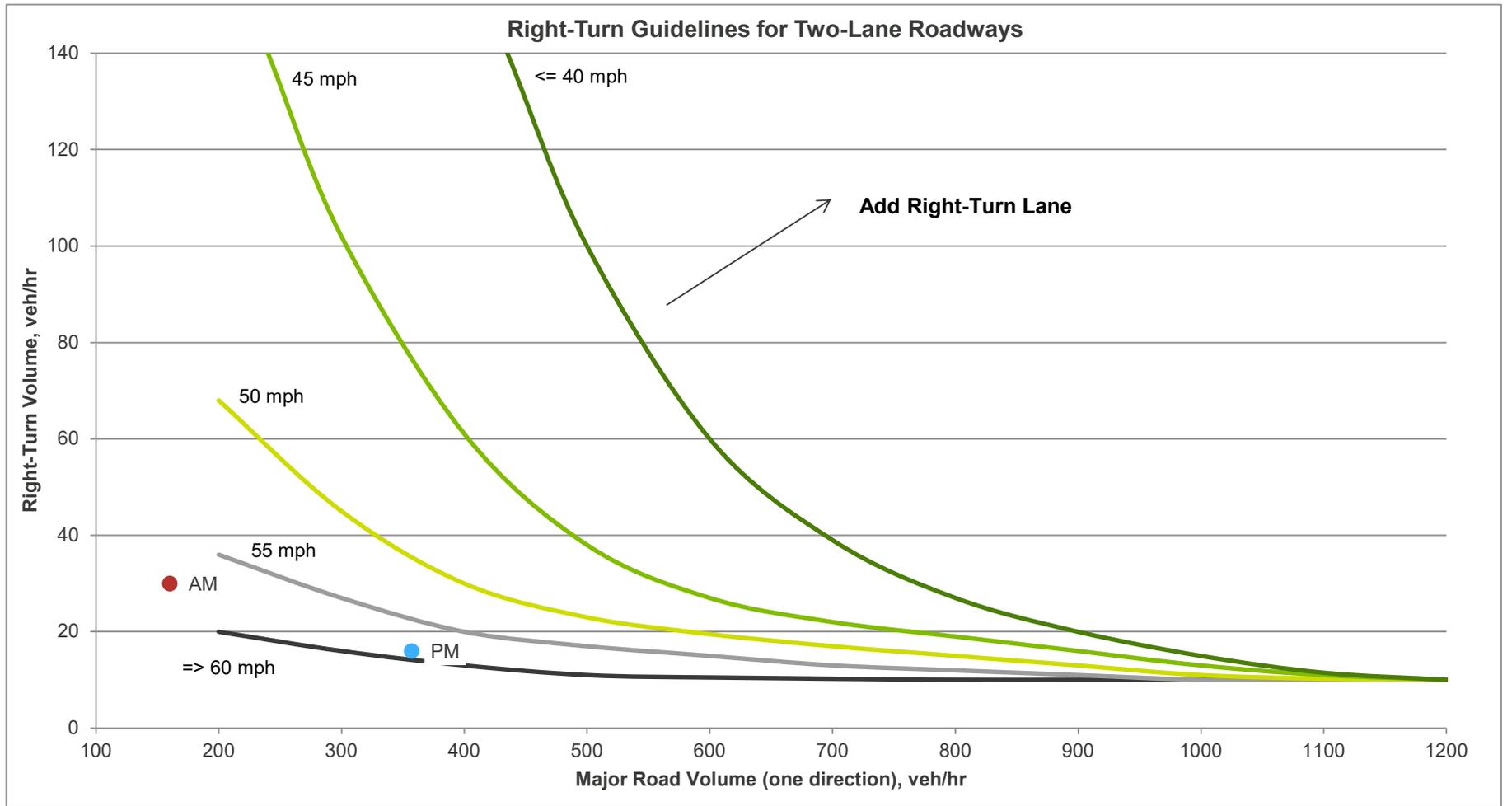
Build Year 2040



Speed: 45

Southbound on Winan Road @ Highway 92

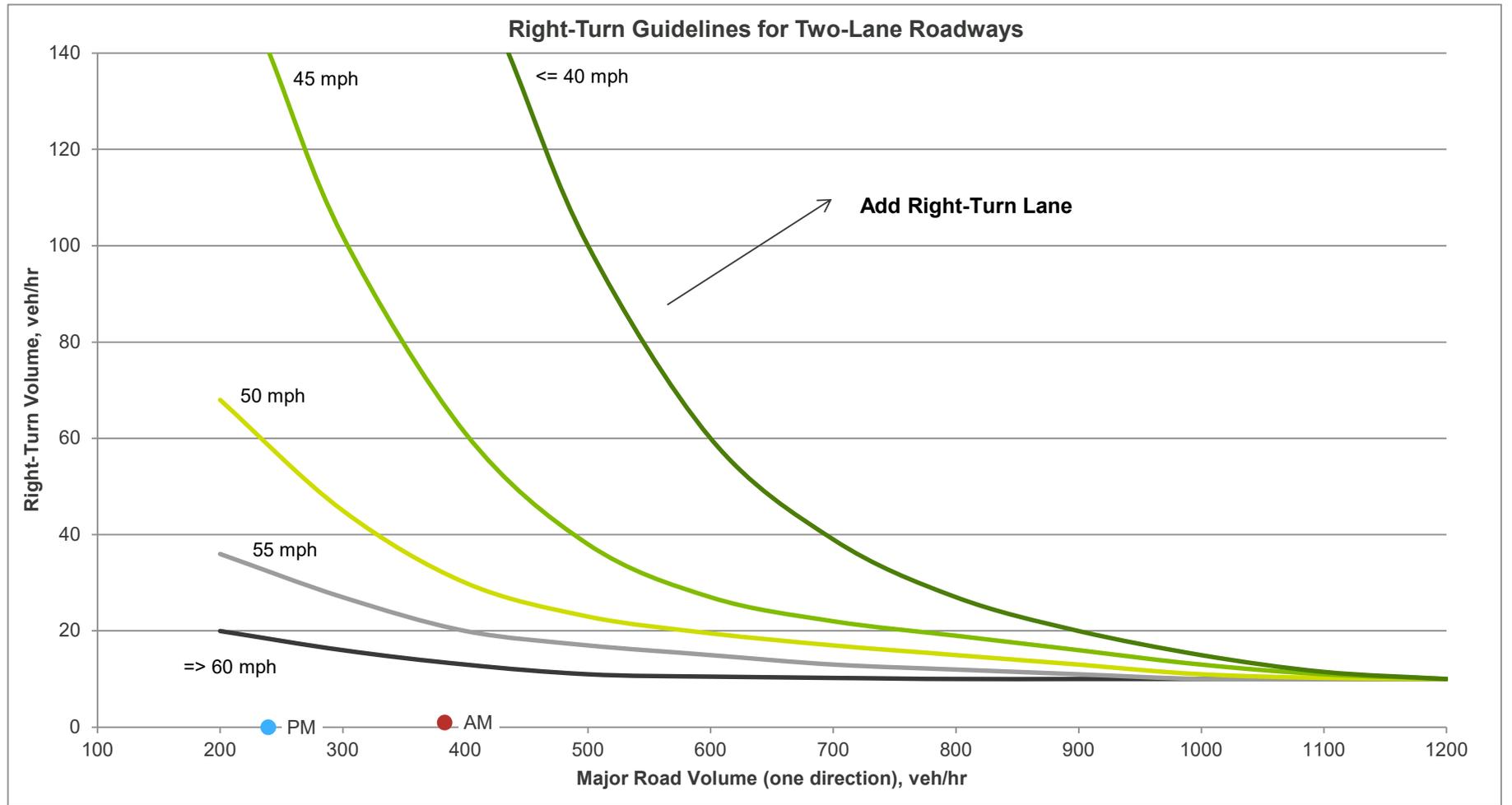
Build Year 2040



Speed: 55

Eastbound on Highway 92 @ Winan Road

Build Year 2040

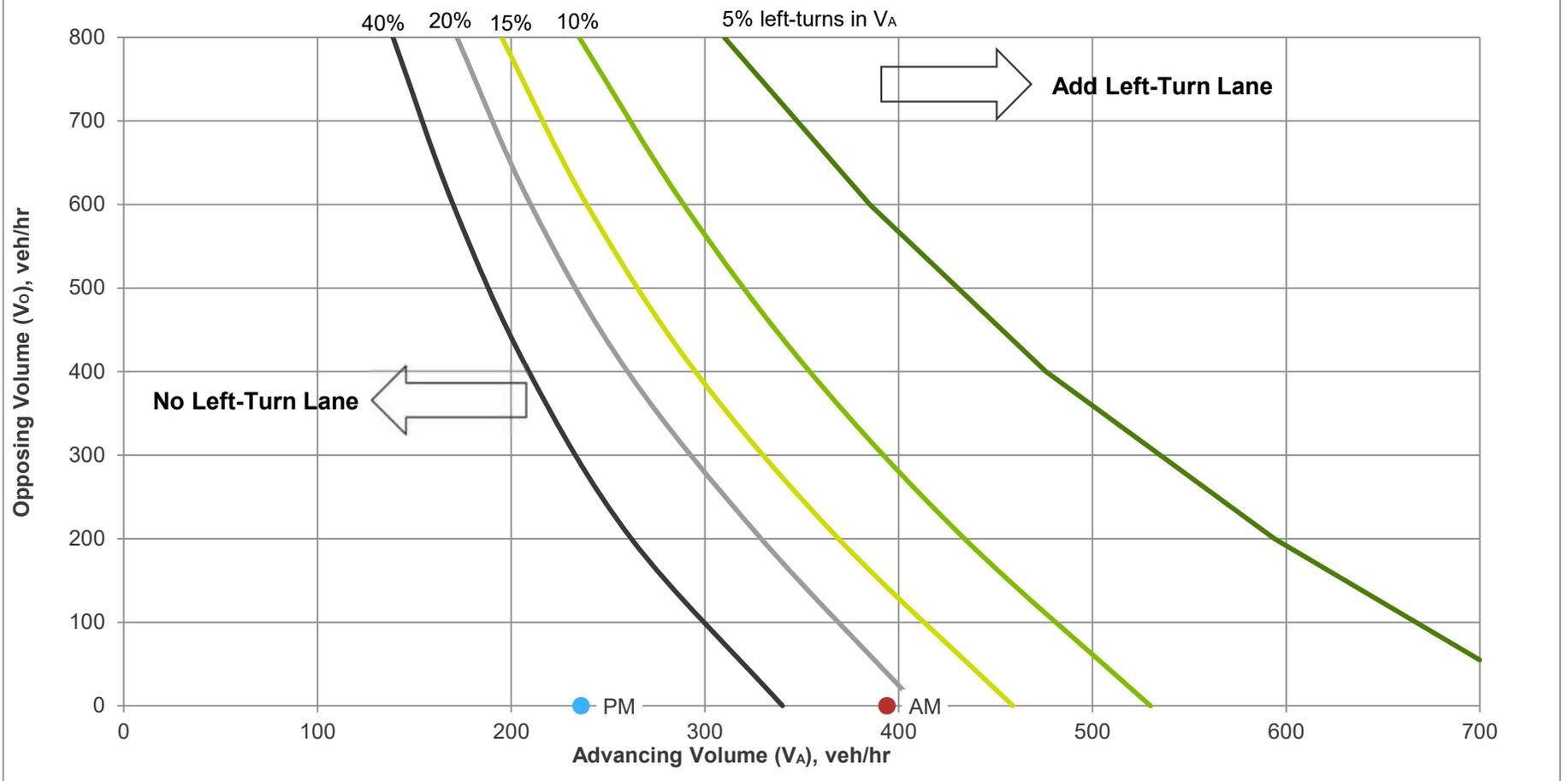


Speed: 55

Westbound on Highway 92 @ Winan Road

Build Year 2040

### Left-Turn Guidelines for Two-Lane Roads 45 MPH

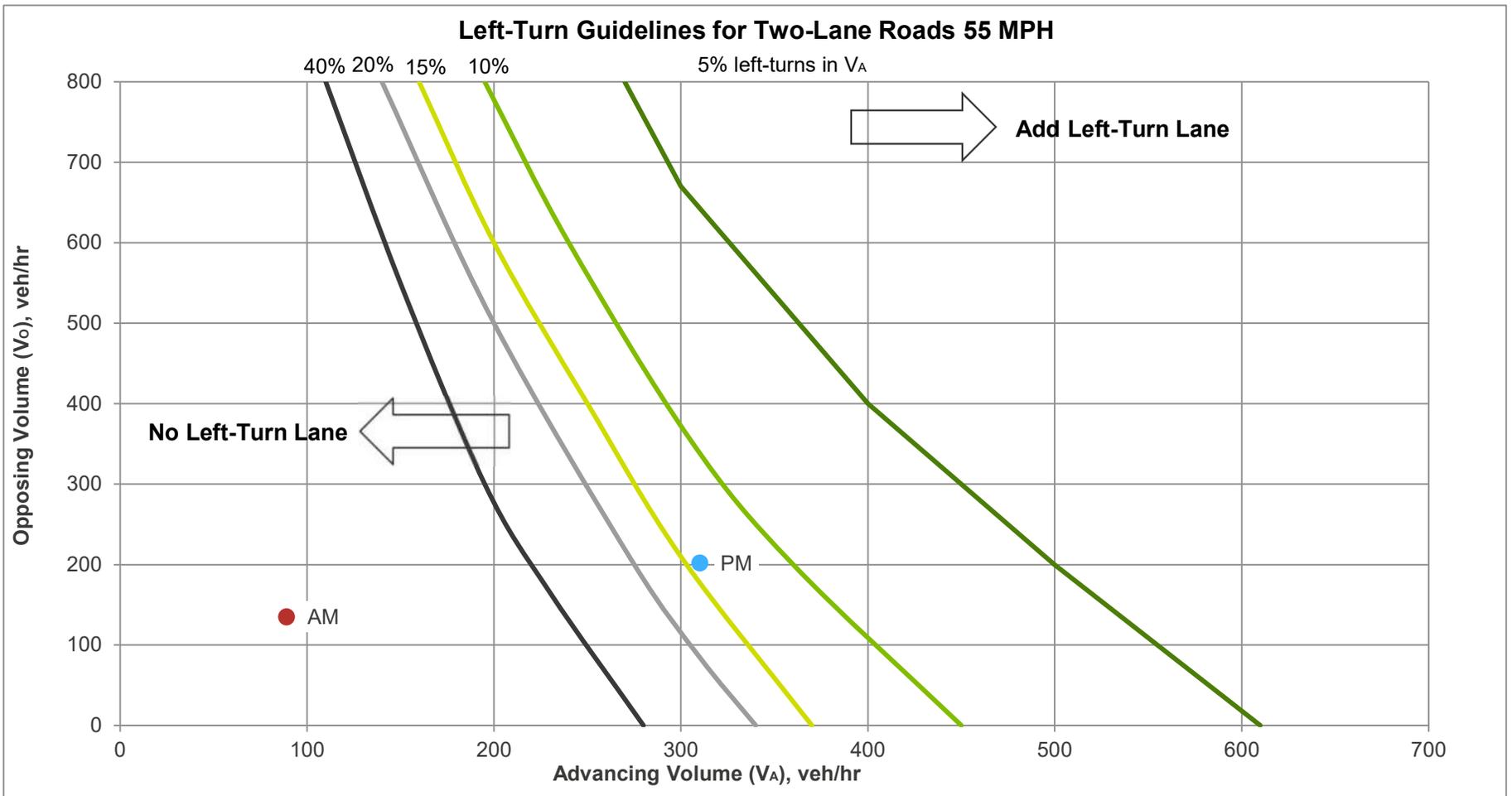


AM Line: 40% PM Line: 40%

Eastbound on 132nd Street @ Winan Road

Build Year 2040

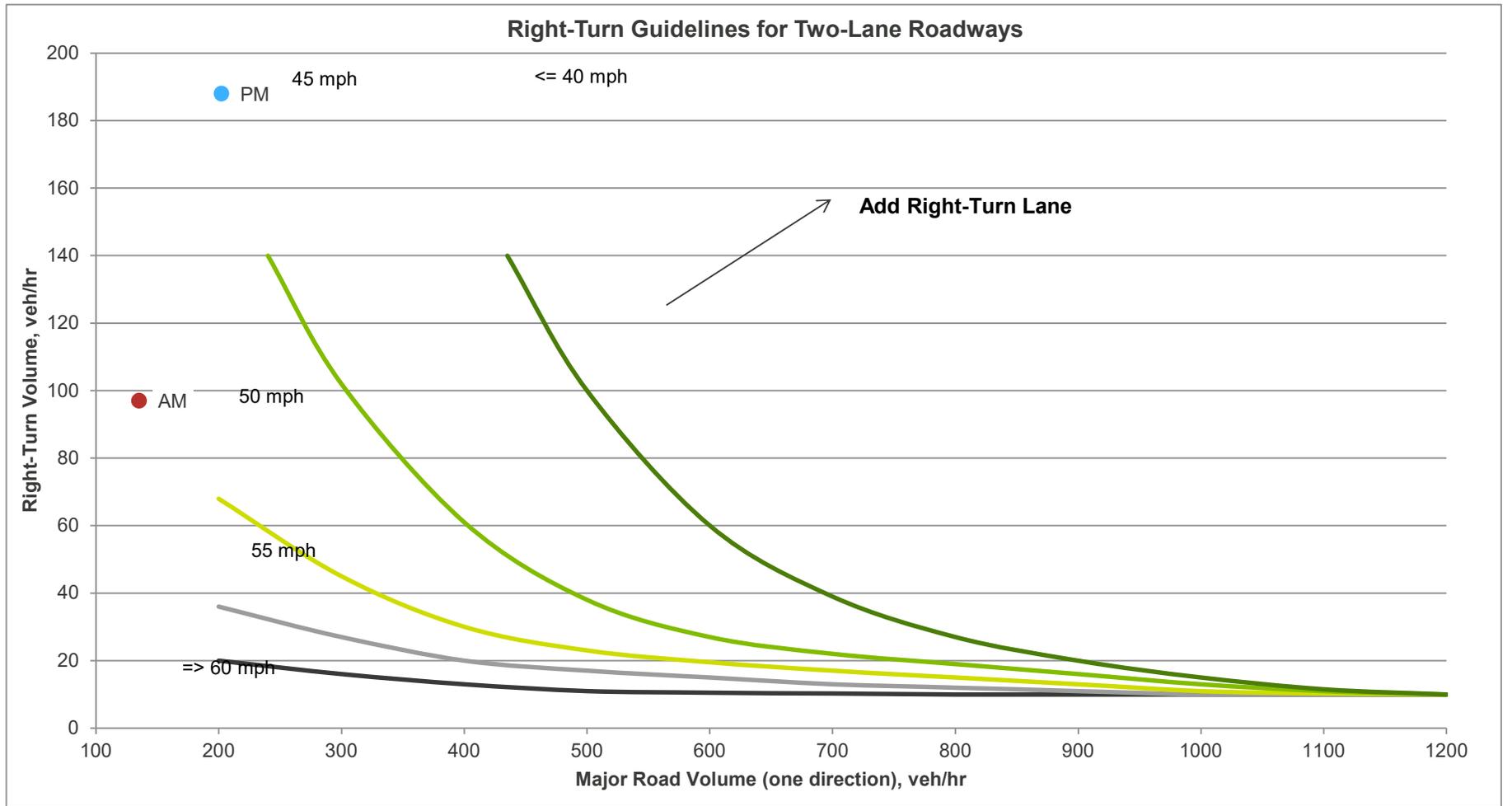
### Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line: 40% PM Line: 40%

Northbound on Winan Road @ 132nd Street

Build Year 2040

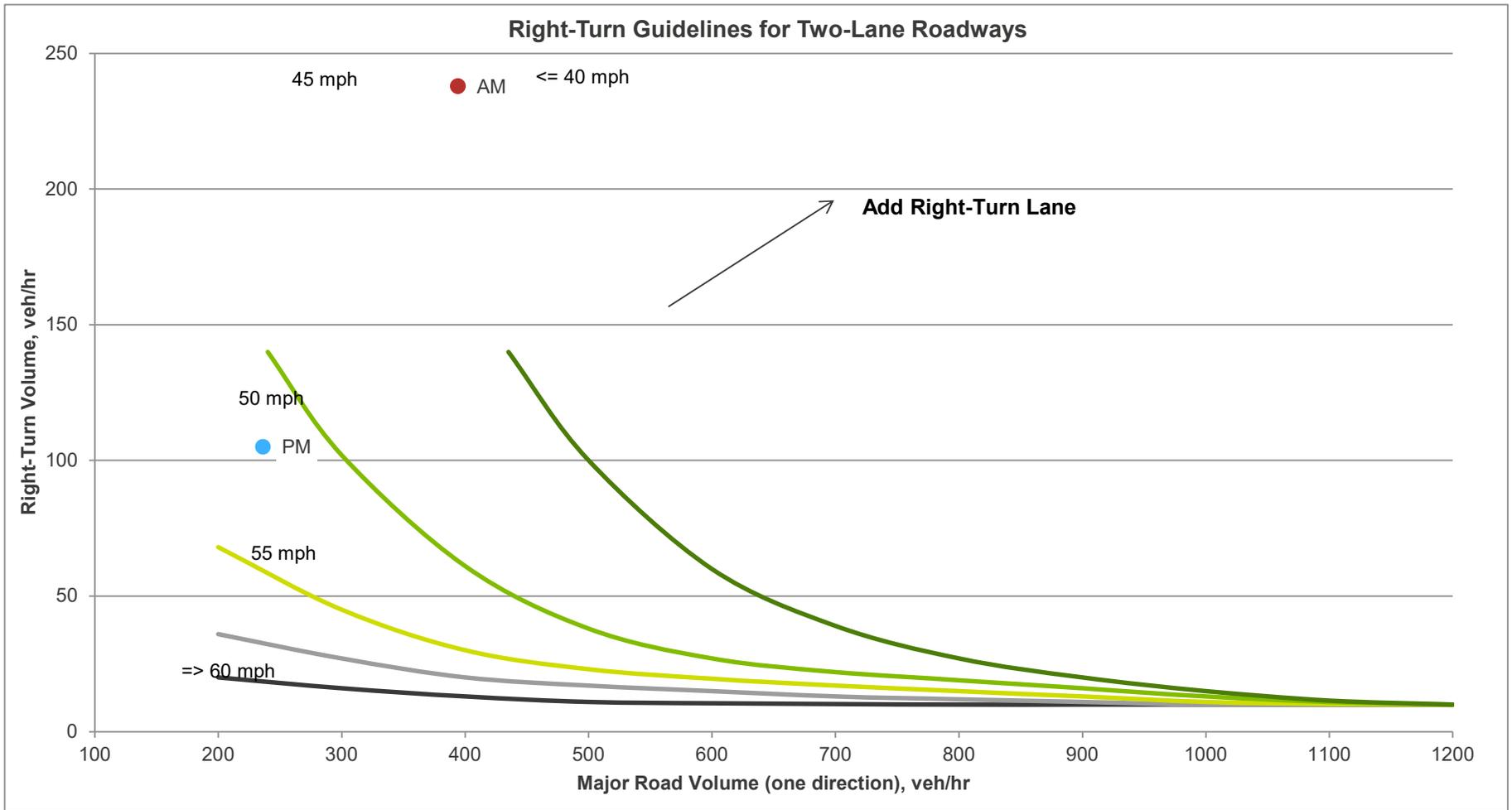


Speed: 55

Southbound on Winan Road @ 132nd Street

Build Year 2040

### Right-Turn Guidelines for Two-Lane Roadways

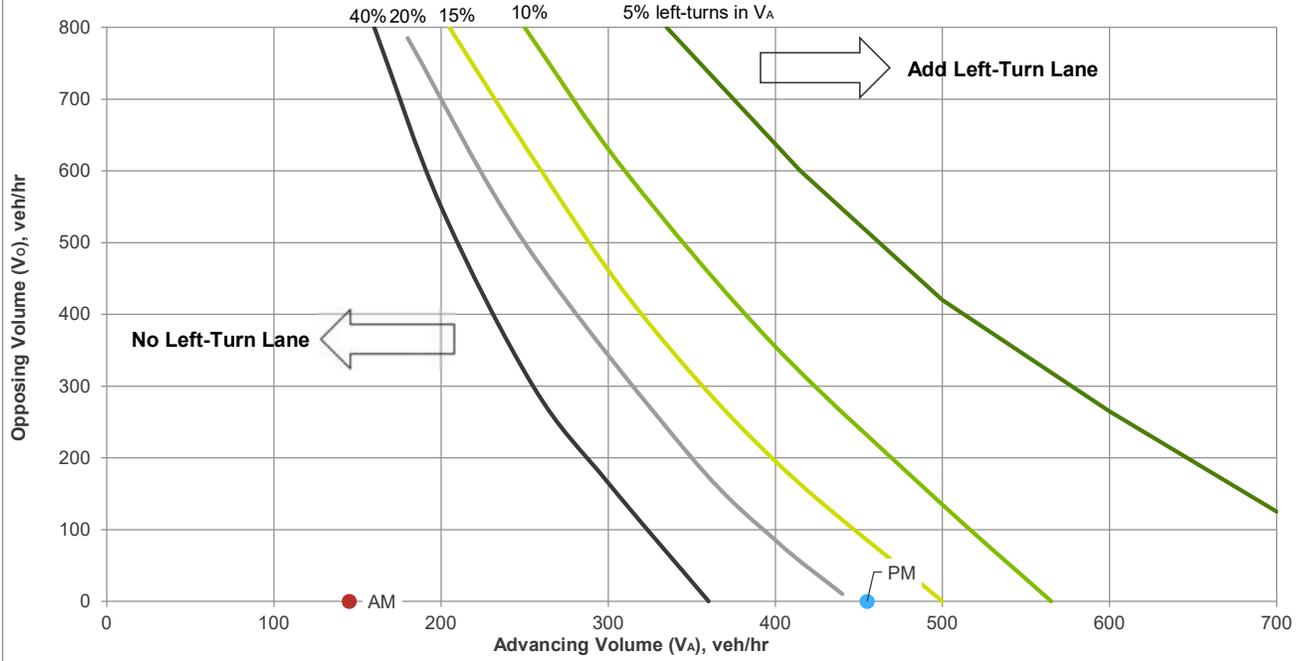


Speed: 45

Eastbound on 132nd Street @ Winan Road

Build Year 2040

### Left-Turn Guidelines for Two-Lane Roads Less Than or Equal to 40 MPH

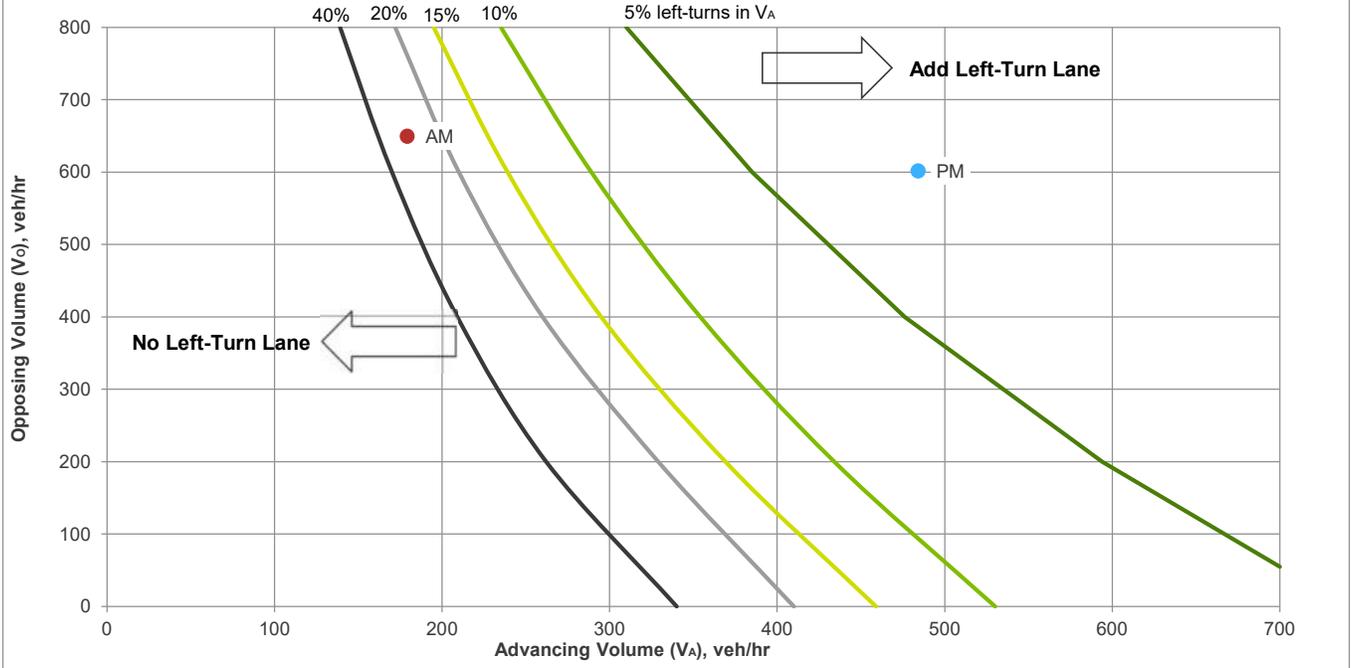


AM Line: 40% PM Line: 40%

Northbound on Windfield Avenue @ 132nd Street

Build Year 2040

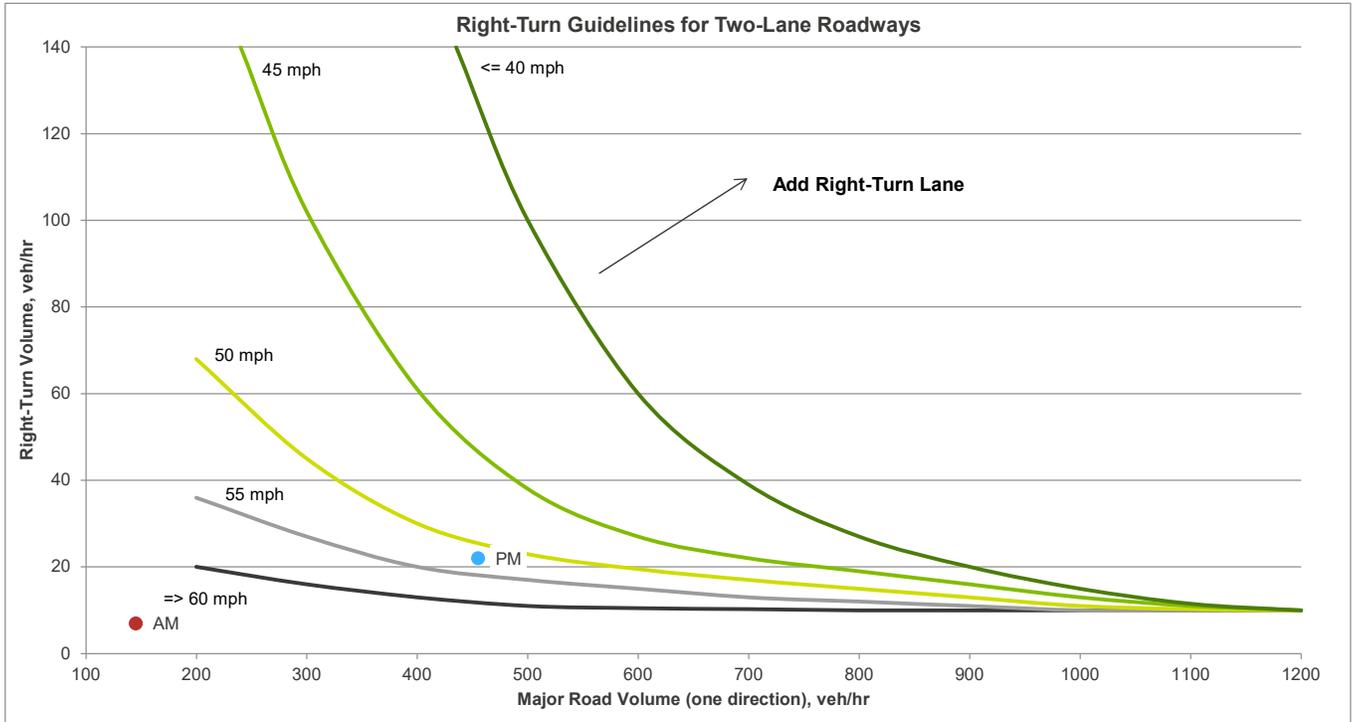
Left-Turn Guidelines for Two-Lane Roads 45 MPH



AM Line: 10% PM Line: 5%

Westbound on 132nd Street @ Windfield Avenue

Build Year 2040

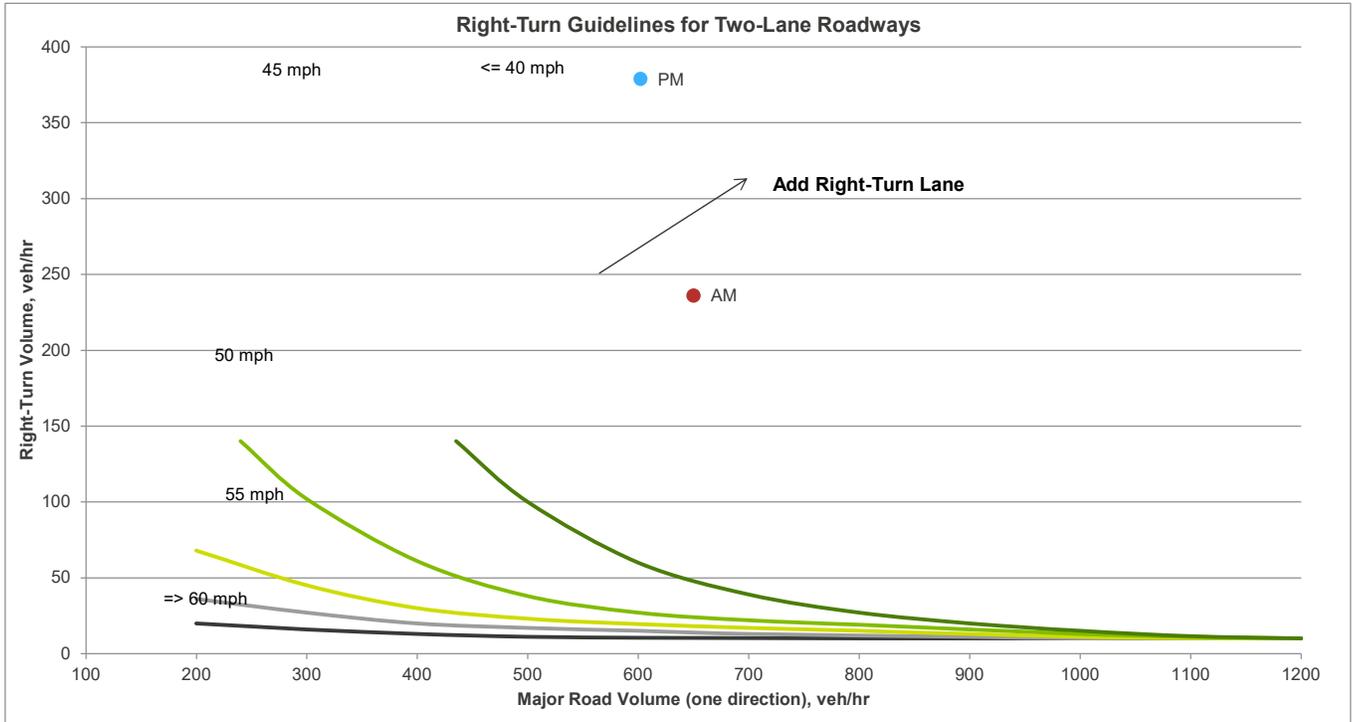


Speed: 35

Northbound on Windfield Avenue @ 132nd Street

Build Year 2040

Right-Turn Guidelines for Two-Lane Roadways

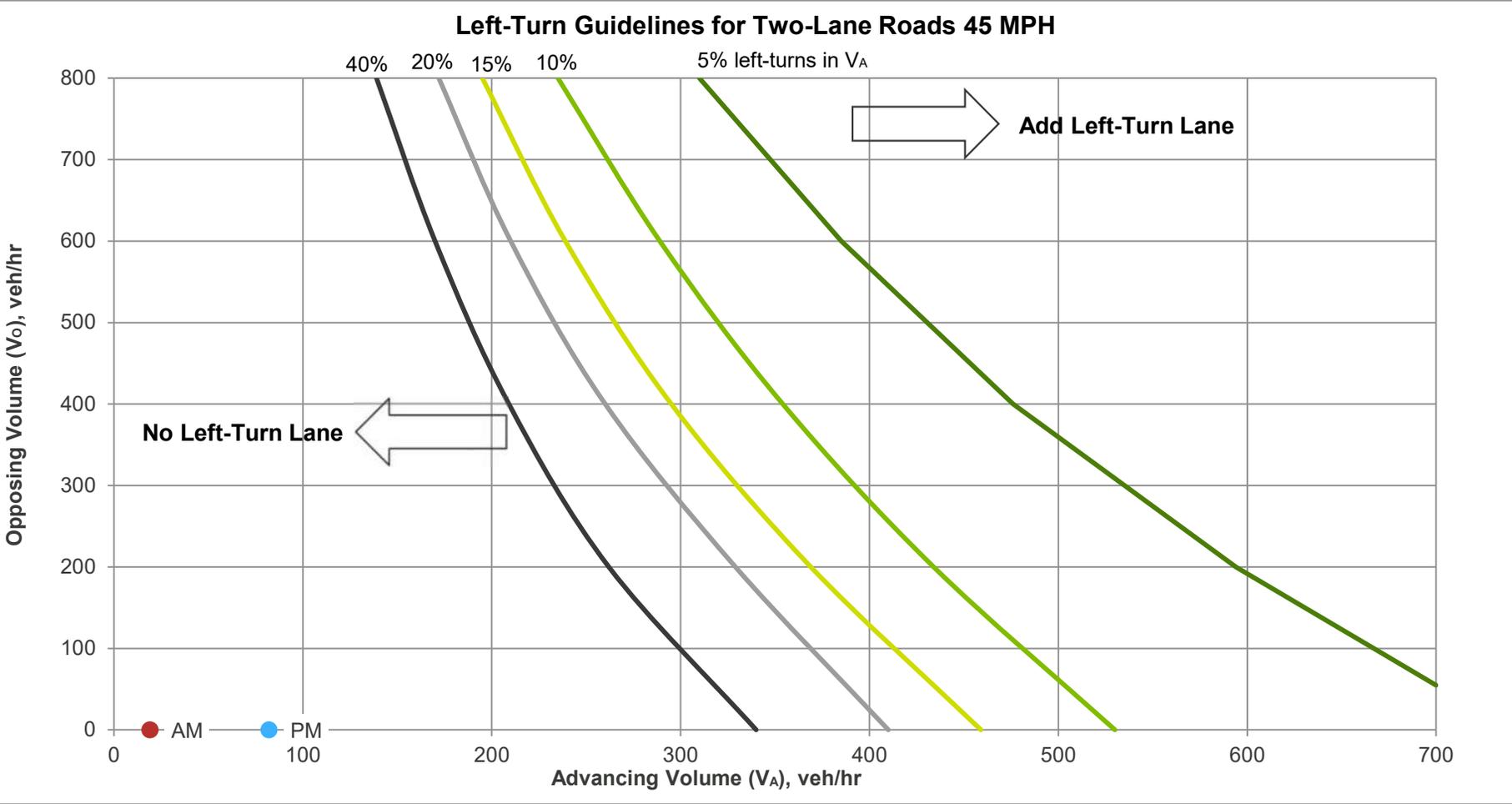


Speed: 45

Eastbound on 132nd Street @ Windfield Avenue

Build Year 2040

Left-Turn Guidelines for Two-Lane Roads 45 MPH

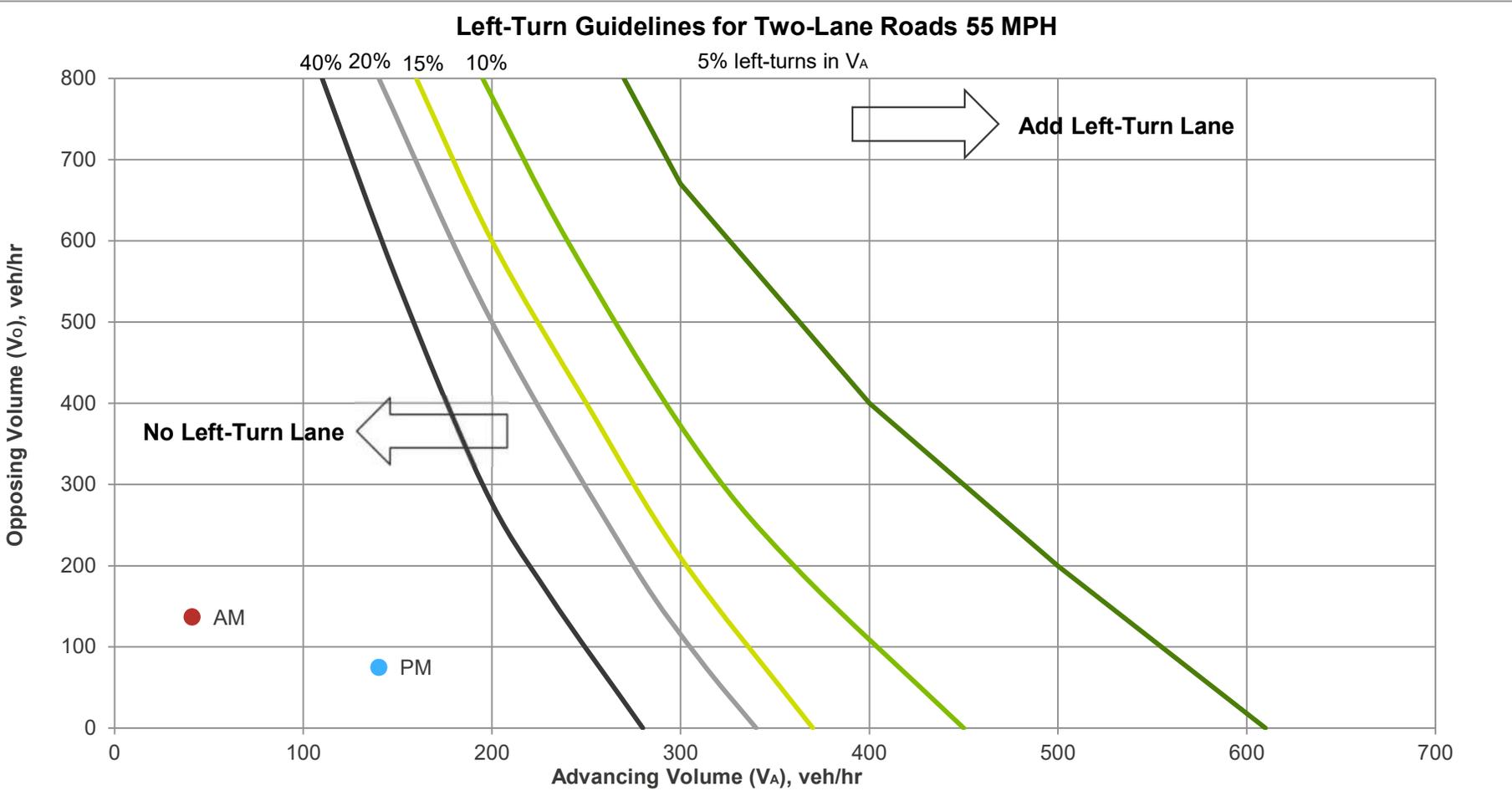


AM Line: 20% PM Line: 40%

Eastbound on 136th Street @ Winan Road

Build Year 2040

Left-Turn Guidelines for Two-Lane Roads 55 MPH



AM Line:

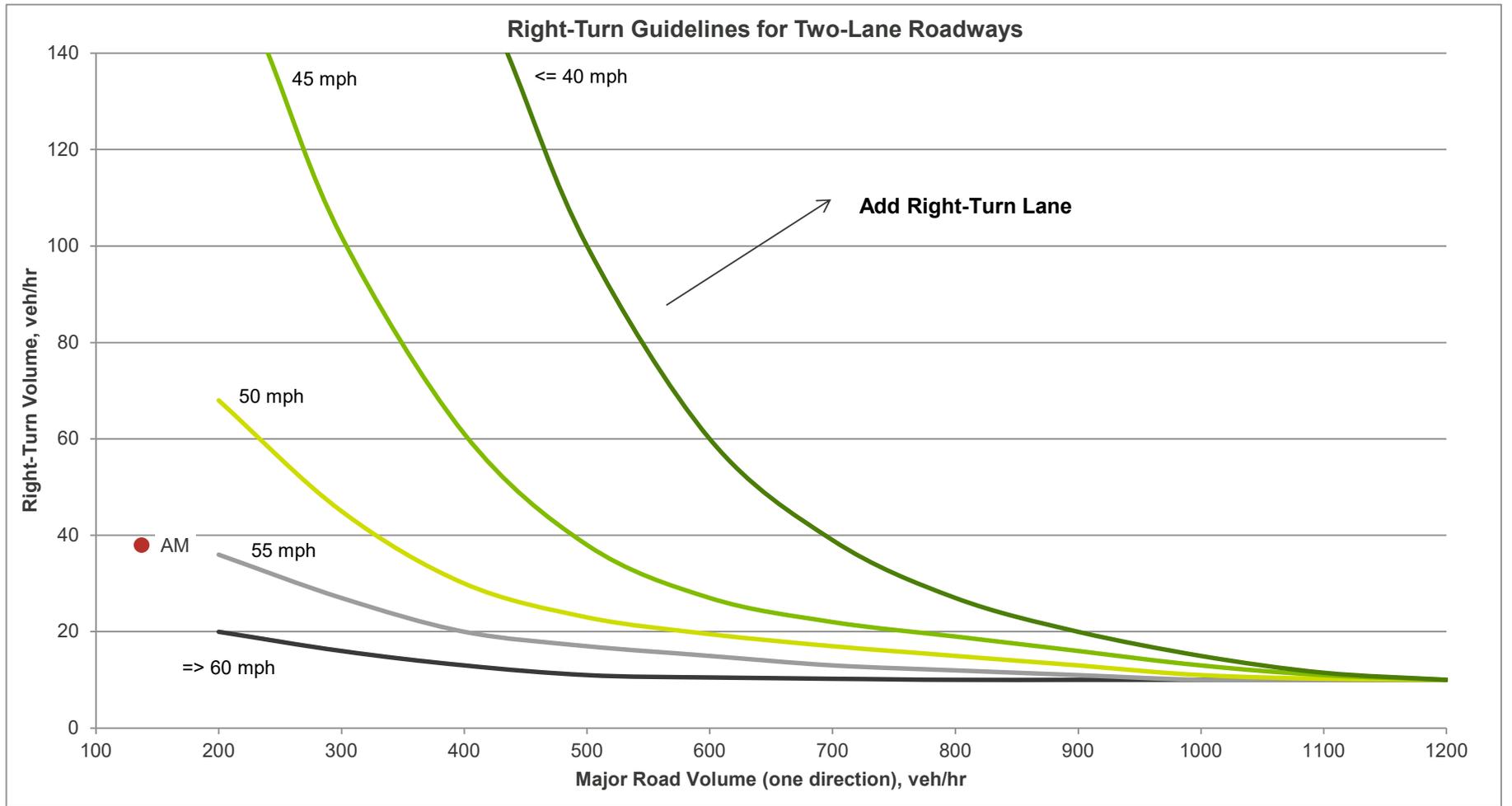
5%

PM Line:

15%

Northbound on Winan Road @ 136th Street

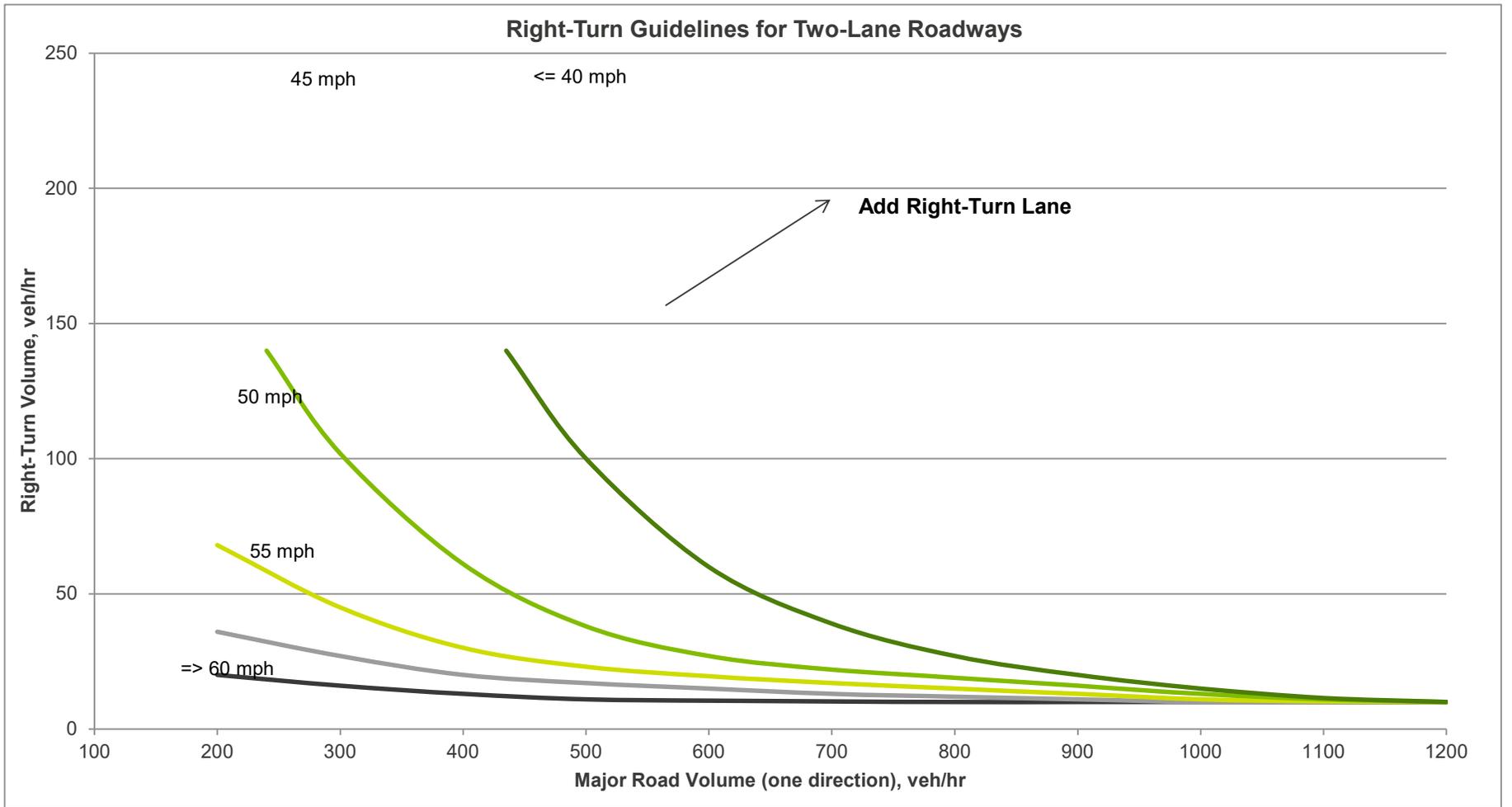
Build Year 2040



Speed: 55

Southbound on Winan Road @ 136th Street

Build Year 2040

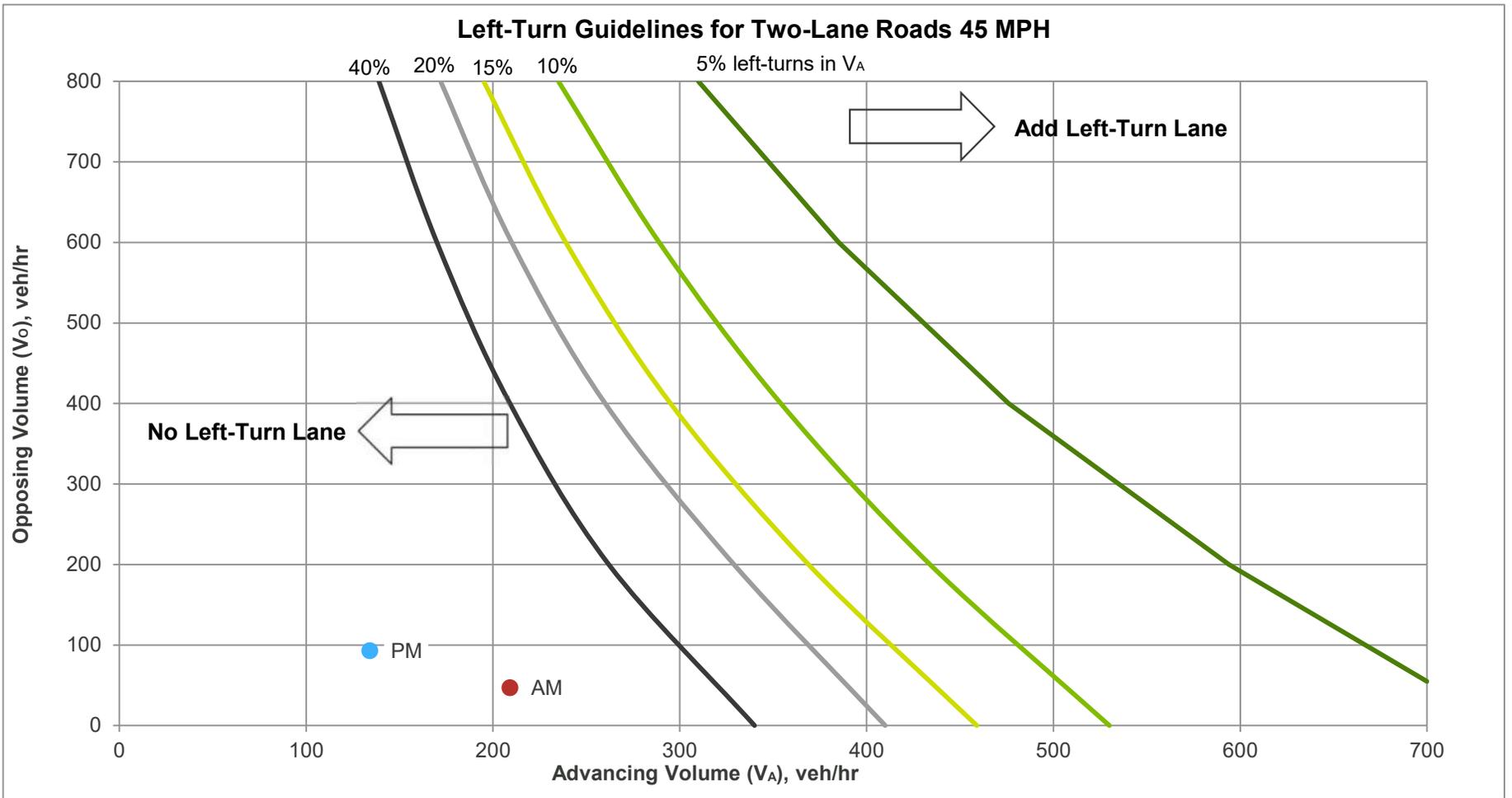


Speed: 45

Eastbound on 136th Street @ Winan Road

Build Year 2040

### Left-Turn Guidelines for Two-Lane Roads 45 MPH

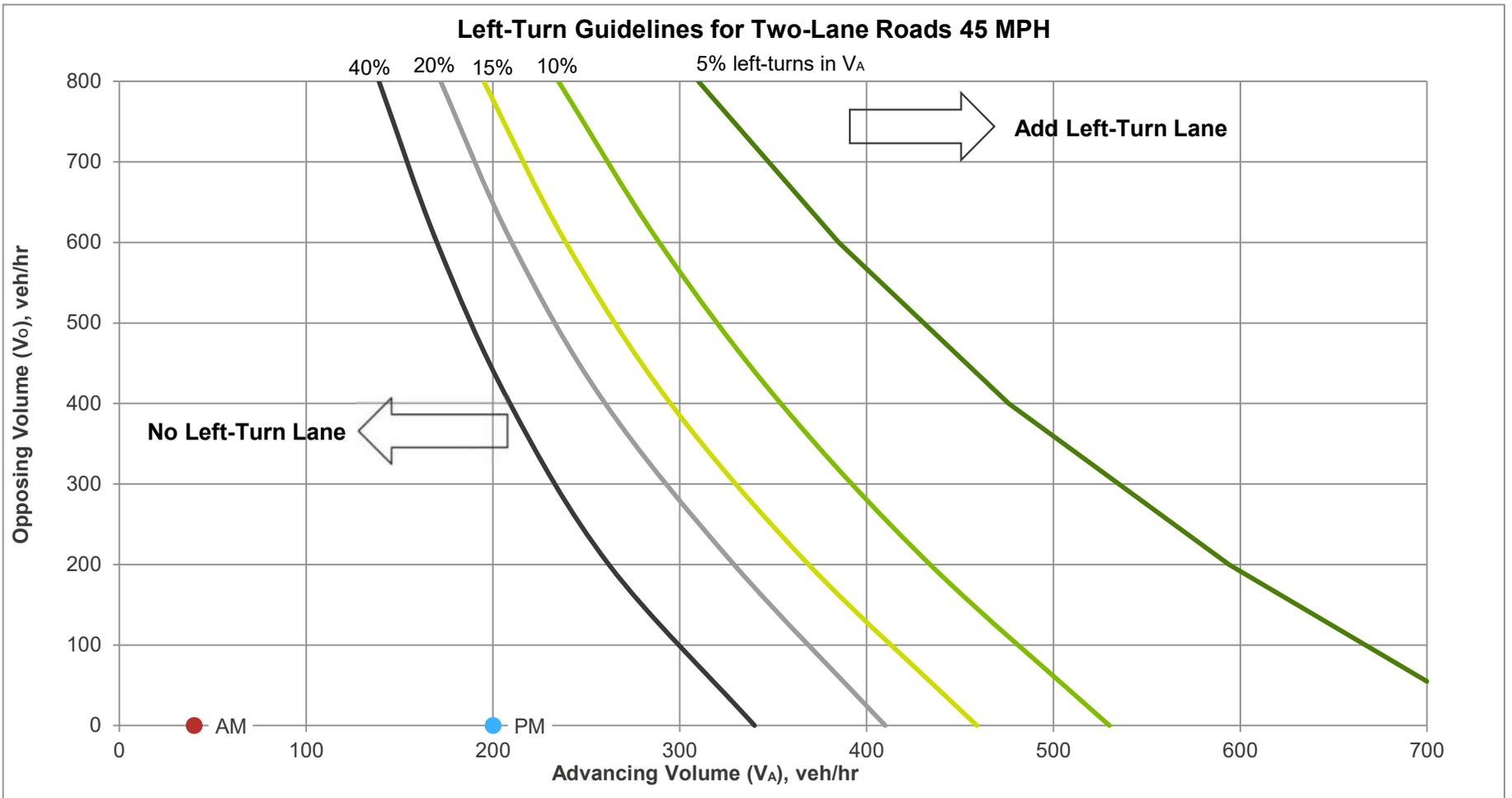


AM Line: 40% PM Line: 40%

Southbound on Bethel Road @ Mexico City Avenue

Build Year 2040

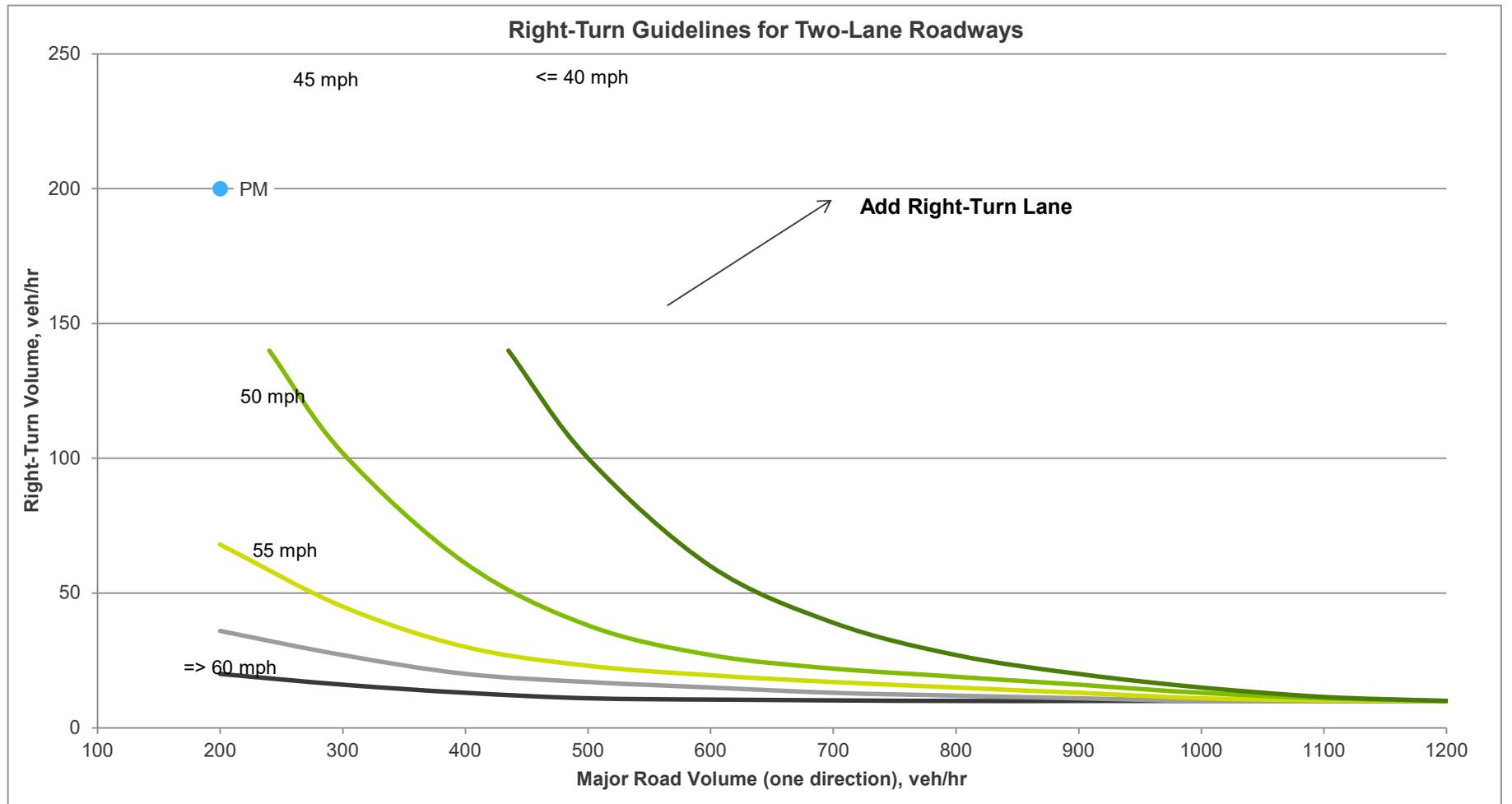
### Left-Turn Guidelines for Two-Lane Roads 45 MPH



AM Line: 5% PM Line: 5%

Westbound on Mexico City Avenue @ Bethel Road

Build Year 2040



Speed: 45

Westbound on Mexico City Avenue @ Bethel Road

## Capacity Analysis

# LANE SUMMARY

Site: 1 [HW 92 and Bethel - 2040 AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]			ft	ft
South: Bethel Road															
Lane 1 <sup>d</sup>	95	2.0	95	2.0	1052	0.090	100	9.2	LOS A	0.4	9.3	Full	1600	0.0	0.0
Approach	95	2.0	95	2.0		0.090		9.2	LOS A	0.4	9.3				
East: Highway 92															
Lane 1 <sup>d</sup>	340	2.0	340	2.0	1336	0.255	100	7.2	LOS A	1.5	39.3	Full	1600	0.0	0.0
Approach	340	2.0	340	2.0		0.255		7.2	LOS A	1.5	39.3				
North: Bethel Road															
Lane 1 <sup>d</sup>	47	2.0	47	2.0	1058	0.044	100	7.3	LOS A	0.2	5.8	Full	1600	0.0	0.0
Approach	47	2.0	47	2.0		0.044		7.3	LOS A	0.2	5.8				
West: Highway 92															
Lane 1	20	2.0	20	2.0	1163	0.017	100	13.2	LOS B	0.1	2.0	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	389	2.0	389	2.0	1643	0.237	100	6.5	LOS A	1.4	35.6	Full	1600	0.0	0.0
Approach	409	2.0	409	2.0		0.237		6.8	LOS A	1.4	35.6				
All Vehicles	890	2.0	890	2.0		0.255		7.3	LOS A	1.5	39.3				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Bethel Road											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From S						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	W	N	E				v/c	%	%	%	No.
Lane 1	51	15	28	95	2.0	1052	0.090	100	NA	NA	
Approach	51	15	28	95	2.0		0.090				
East: Highway 92											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From E						veh/h	Satn	Util.	SL	Ov.	Lane
To Exit:	S	W	N				v/c	%	%	%	No.
Lane 1	37	299	4	340	2.0	1336	0.255	100	NA	NA	

Approach	37	299	4	340	2.0		0.255			
North: Bethel Road										
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	E	S	W			Cap. veh/h	v/c	%	%	
Lane 1	9	11	27	47	2.0	1058	0.044	100	NA	NA
Approach	9	11	27	47	2.0		0.044			
West: Highway 92										
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	N	E	S			Cap. veh/h	v/c	%	%	
Lane 1	20	-	-	20	2.0	1163	0.017	100	NA	NA
Lane 2	-	210	179	389	2.0	1643	0.237	100	NA	NA
Approach	20	210	179	409	2.0		0.237			
Total %HV Deg. Satn (v/c)										
All Vehicles	890	2.0					0.255			

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis											
	Exit Lane Number	Short Lane Length	Percent Opng in Lane	Flow Rate	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Deg. Satn	Min. Delay	Merge Delay
		ft	%	veh/h	pcu/h	sec	sec	veh/h	v/c	sec	sec
There are no Exit Short Lanes for Merge Analysis at this Site.											

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
East: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
North: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
West: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

# LANE LEVEL OF SERVICE

## Lane Level of Service

 **Site: 1 [HW 92 and Bethel - 2040 AM (Site Folder: General)]**

Output produced by **SIDRA INTERSECTION Version: 9.1.1.200**

Roundabout with 1-lane approaches and circulating road

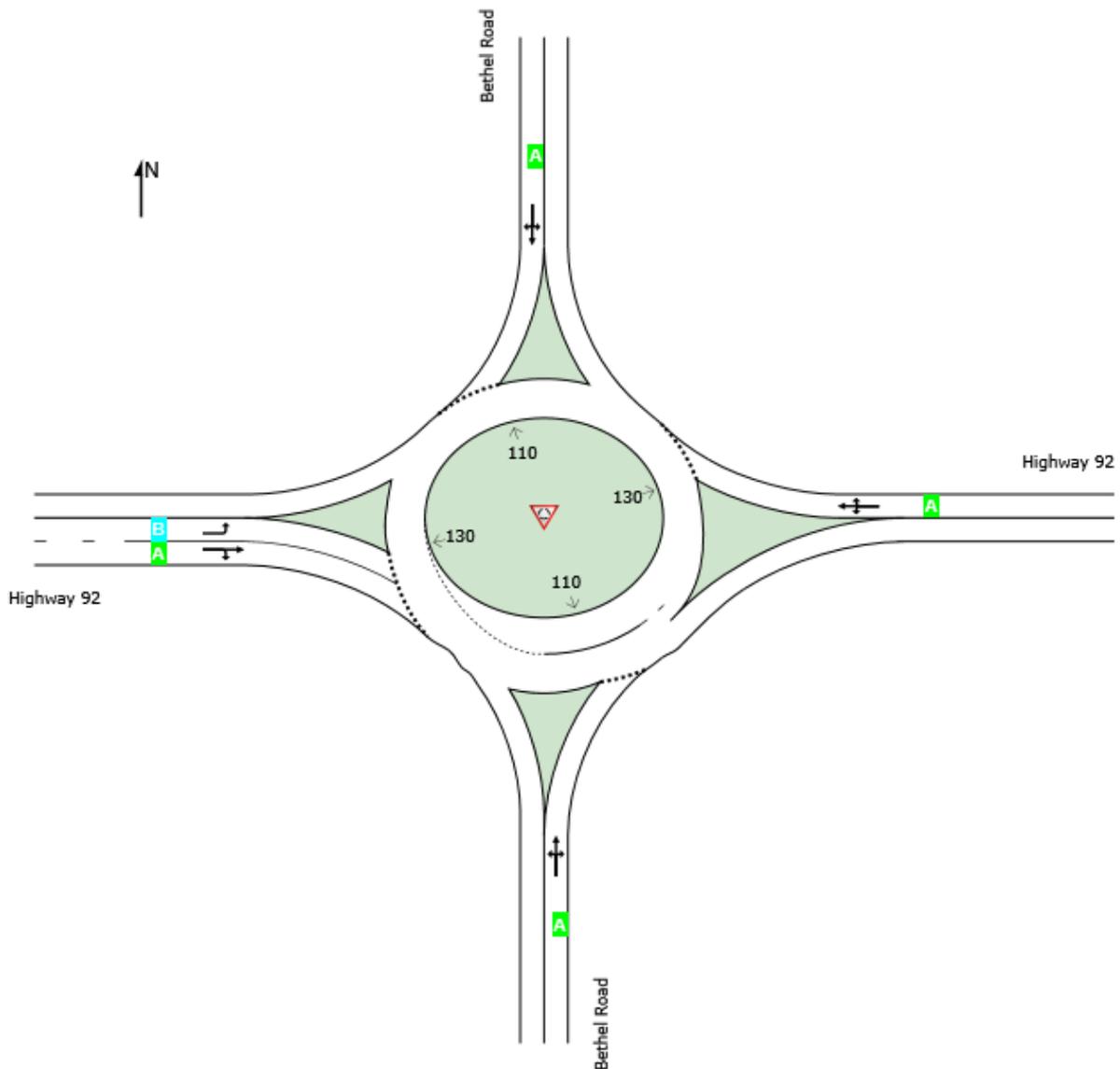
MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

HCM 7th TWSC  
 4: Bethel Rd & Mexico City Avenue

Intersection						
Int Delay, s/veh	5.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶	↷	↶		↶	↷
Traffic Vol, veh/h	0	40	47	0	159	50
Future Vol, veh/h	0	40	47	0	159	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	0	2	2
Mvmt Flow	0	43	51	0	173	54

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	451	51	0	0	51
Stage 1	51	-	-	-	-
Stage 2	400	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218
Pot Cap-1 Maneuver	570	1017	-	-	1555
Stage 1	977	-	-	-	-
Stage 2	681	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	506	1017	-	-	1555
Mov Cap-2 Maneuver	506	-	-	-	-
Stage 1	977	-	-	-	-
Stage 2	606	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	8.7	0	5.78
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	1017	1555
HCM Lane V/C Ratio	-	-	-	0.043	0.111
HCM Ctrl Dly (s/v)	-	-	0	8.7	7.6
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	0.4

HCM 7th TWSC  
5: N Winan Rd & Highway 92

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	3	127	30	85	297	1	7	11	24	0	22	14
Future Vol, veh/h	3	127	30	85	297	1	7	11	24	0	22	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
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	0	2	2
Mvmt Flow	3	138	33	92	323	1	8	12	26	0	24	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	324	0	0	171	0	0	680	670	154	659	685	323
Stage 1	-	-	-	-	-	-	161	161	-	508	508	-
Stage 2	-	-	-	-	-	-	520	509	-	151	177	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.318
Pot Cap-1 Maneuver	1236	-	-	1407	-	-	365	378	892	380	371	718
Stage 1	-	-	-	-	-	-	841	765	-	551	539	-
Stage 2	-	-	-	-	-	-	540	538	-	857	753	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1236	-	-	1407	-	-	311	352	892	333	345	718
Mov Cap-2 Maneuver	-	-	-	-	-	-	311	352	-	333	345	-
Stage 1	-	-	-	-	-	-	839	763	-	515	503	-
Stage 2	-	-	-	-	-	-	470	503	-	816	750	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.15			1.72			12.57			14.15		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	521	33	-	-	1407	-	-	432
HCM Lane V/C Ratio	0.088	0.003	-	-	0.066	-	-	0.09
HCM Ctrl Dly (s/v)	12.6	7.9	0	-	7.7	-	-	14.2
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.3

HCM 7th TWSC  
6: NW Interurban Rd & Highway 92

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	6	138	7	15	360	0	8	1	2	5	7	15
Future Vol, veh/h	6	138	7	15	360	0	8	1	2	5	7	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	2	2	2
Mvmt Flow	7	150	8	16	391	0	9	1	2	5	8	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	391	0	0	158	0	0	595	591	154	588	595	391
Stage 1	-	-	-	-	-	-	167	167	-	424	424	-
Stage 2	-	-	-	-	-	-	428	424	-	164	171	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1167	-	-	1422	-	-	416	420	892	421	418	657
Stage 1	-	-	-	-	-	-	835	760	-	608	587	-
Stage 2	-	-	-	-	-	-	605	587	-	838	757	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1167	-	-	1422	-	-	390	411	892	410	409	657
Mov Cap-2 Maneuver	-	-	-	-	-	-	390	411	-	410	409	-
Stage 1	-	-	-	-	-	-	830	756	-	599	578	-
Stage 2	-	-	-	-	-	-	574	578	-	830	753	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.32			0.3			13.47			12.37		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	437	71	-	-	72	-	-	518
HCM Lane V/C Ratio	0.027	0.006	-	-	0.011	-	-	0.057
HCM Ctrl Dly (s/v)	13.5	8.1	0	-	7.6	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

HCM 7th TWSC  
 7: Roanridge Road & NW Roanridge Rd

Intersection						
Int Delay, s/veh	7.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	3	39	0	0	19
Future Vol, veh/h	1	3	39	0	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	0	0	2
Mvmt Flow	1	3	42	0	0	21

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	4	0	88 3
Stage 1	-	-	-	-	3 -
Stage 2	-	-	-	-	85 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	1617	-	918 1081
Stage 1	-	-	-	-	1026 -
Stage 2	-	-	-	-	944 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1617	-	894 1081
Mov Cap-2 Maneuver	-	-	-	-	894 -
Stage 1	-	-	-	-	1026 -
Stage 2	-	-	-	-	919 -

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7.29	8.39
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1081	-	-	1617	-
HCM Lane V/C Ratio	0.019	-	-	0.026	-
HCM Ctrl Dly (s/v)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

HCM 7th TWSC  
 8: Bethel Rd & NW Roanridge Rd

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	19	1	0	28	11	39
Future Vol, veh/h	19	1	0	28	11	39
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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	0	2	2	2
Mvmt Flow	21	1	0	30	12	42

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	64	33	54	0	0
Stage 1	33	-	-	-	-
Stage 2	30	-	-	-	-
Critical Hdwy	6.42	6.22	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.2	-	-
Pot Cap-1 Maneuver	942	1040	1564	-	-
Stage 1	989	-	-	-	-
Stage 2	992	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	942	1040	1564	-	-
Mov Cap-2 Maneuver	942	-	-	-	-
Stage 1	989	-	-	-	-
Stage 2	992	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.89	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1564	-	947	-	-
HCM Lane V/C Ratio	-	-	0.023	-	-
HCM Ctrl Dly (s/v)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

# HCM 7th Signalized Intersection Summary

## 9: Mexico City Ave & 136th Street

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	26	839	186	28	209
Future Volume (veh/h)	62	26	839	186	28	209
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1233	1870	1767	1618	1870	1470
Adj Flow Rate, veh/h	67	28	912	202	30	227
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	45	2	9	19	2	29
Cap, veh/h	254	177	2283	933	406	2147
Arrive On Green	0.11	0.11	0.68	0.68	0.03	0.77
Sat Flow, veh/h	2278	1585	3445	1372	1781	2867
Grp Volume(v), veh/h	67	28	912	202	30	227
Grp Sat Flow(s),veh/h/ln	1139	1585	1678	1372	1781	1397
Q Serve(g_s), s	2.7	1.6	11.9	5.5	0.5	2.0
Cycle Q Clear(g_c), s	2.7	1.6	11.9	5.5	0.5	2.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	254	177	2283	933	406	2147
V/C Ratio(X)	0.26	0.16	0.40	0.22	0.07	0.11
Avail Cap(c_a), veh/h	365	254	2283	933	498	2147
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.95	0.95	1.00	1.00
Uniform Delay (d), s/veh	40.7	40.2	7.0	6.0	5.1	2.9
Incr Delay (d2), s/veh	0.5	0.4	0.5	0.5	0.1	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	1.1	6.3	2.5	0.3	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	41.2	40.6	7.5	6.5	5.2	3.0
LnGrp LOS	D	D	A	A	A	A
Approach Vol, veh/h	95		1114			257
Approach Delay, s/veh	41.0		7.3			3.3
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.8	74.0			82.9	17.1
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	8.0	58.0			72.0	16.0
Max Q Clear Time (g_c+I1), s	2.5	13.9			4.0	4.7
Green Ext Time (p_c), s	0.0	8.0			1.5	0.2
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			8.8			
HCM 7th LOS			A			

HCM 7th TWSC  
10: N Winan Rd & 136th Street

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↑	↑	
Traffic Vol, veh/h	3	16	2	39	99	38
Future Vol, veh/h	3	16	2	39	99	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	200	-	-	-
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	3	17	2	42	108	41

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	175	128	149	0	-	0
Stage 1	128	-	-	-	-	-
Stage 2	47	-	-	-	-	-
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	815	922	1433	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	814	922	1433	-	-	-
Mov Cap-2 Maneuver	814	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	976	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.05	0.37	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1433	-	814	922	-	-
HCM Lane V/C Ratio	0.002	-	0.004	0.019	-	-
HCM Ctrl Dly (s/v)	7.5	-	9.4	9	-	-
HCM Lane LOS	A	-	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

# HCM 7th Signalized Intersection Summary

## 11: Mexico City Ave & NW Roanridge Rd/132nd St

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				  			 	  		 	  	
Traffic Volume (veh/h)	80	54	123	280	13	13	433	932	572	24	243	4
Future Volume (veh/h)	80	54	123	280	13	13	433	932	572	24	243	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1026	1604	1870	1870	1707	1737	1752	1870	1366	1870
Adj Flow Rate, veh/h	87	59	134	304	14	14	471	1013	0	26	264	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	59	20	2	2	13	11	10	2	36	2
Cap, veh/h	70	167	224	377	257	218	530	2710		156	1832	778
Arrive On Green	0.04	0.09	0.09	0.09	0.14	0.14	0.28	0.95	0.00	0.09	0.49	0.49
Sat Flow, veh/h	1781	1870	869	4307	1870	1585	3155	4742	1485	1781	3730	1585
Grp Volume(v), veh/h	87	59	134	304	14	14	471	1013	0	26	264	4
Grp Sat Flow(s),veh/h/ln	1781	1870	869	1436	1870	1585	1577	1581	1485	1781	1243	1585
Q Serve(g_s), s	5.5	4.2	12.5	9.7	0.9	0.9	20.0	2.1	0.0	1.9	5.4	0.2
Cycle Q Clear(g_c), s	5.5	4.2	12.5	9.7	0.9	0.9	20.0	2.1	0.0	1.9	5.4	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	70	167	224	377	257	218	530	2710		156	1832	778
V/C Ratio(X)	1.24	0.35	0.60	0.81	0.05	0.06	0.89	0.37		0.17	0.14	0.01
Avail Cap(c_a), veh/h	70	167	224	538	327	277	834	2710		156	1832	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.3	59.9	45.7	62.7	52.5	33.9	49.1	1.4	0.0	59.2	19.5	18.2
Incr Delay (d2), s/veh	186.6	1.3	4.4	5.7	0.1	0.1	7.5	0.4	0.0	0.5	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.6	3.5	7.7	6.6	0.8	0.8	11.9	1.0	0.0	1.6	2.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	253.8	61.2	50.0	68.4	52.5	34.0	56.6	1.8	0.0	59.7	19.7	18.2
LnGrp LOS	F	E	D	E	D	C	E	A		E	B	B
Approach Vol, veh/h		280			332			1484			294	
Approach Delay, s/veh		115.7			66.3			19.2			23.2	
Approach LOS		F			E			B			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.5	74.7	17.8	18.0	18.2	86.0	11.0	24.8				
Change Period (Y+Rc), s	6.0	6.0	5.5	5.5	6.0	6.0	5.5	5.5				
Max Green Setting (Gmax), s	37.0	50.0	17.5	12.5	7.0	80.0	5.5	24.5				
Max Q Clear Time (g_c+I1), s	22.0	7.4	11.7	14.5	3.9	4.1	7.5	2.9				
Green Ext Time (p_c), s	1.5	1.8	0.6	0.0	0.0	8.3	0.0	0.1				
<b>Intersection Summary</b>												
HCM 7th Control Delay, s/veh			37.5									
HCM 7th LOS			D									
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

# HCM 7th Signalized Intersection Summary

## 12: Windfield Avenue & 132nd St



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↗	↖
Traffic Volume (veh/h)	414	236	11	168	138	7
Future Volume (veh/h)	414	236	11	168	138	7
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1826	1870	1485	1796	1870
Adj Flow Rate, veh/h	450	257	12	183	150	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	12	5	2	28	7	2
Cap, veh/h	733	971	421	632	345	319
Arrive On Green	0.43	0.43	0.43	0.43	0.20	0.20
Sat Flow, veh/h	1722	1547	741	1485	1711	1585
Grp Volume(v), veh/h	450	257	12	183	150	8
Grp Sat Flow(s),veh/h/ln	1722	1547	741	1485	1711	1585
Q Serve(g_s), s	5.7	2.1	0.4	2.3	2.2	0.1
Cycle Q Clear(g_c), s	5.7	2.1	6.1	2.3	2.2	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	733	971	421	632	345	319
V/C Ratio(X)	0.61	0.26	0.03	0.29	0.44	0.03
Avail Cap(c_a), veh/h	1773	1905	868	1529	1245	1154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.3	2.3	8.7	5.3	9.8	9.0
Incr Delay (d2), s/veh	0.8	0.1	0.0	0.3	0.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.3	0.1	0.1	0.4	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	7.1	2.5	8.7	5.5	10.7	9.1
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	707			195	158	
Approach Delay, s/veh	5.4			5.7	10.6	
Approach LOS	A			A	B	
Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		10.2		18.0		18.0
Change Period (Y+Rc), s		4.5		6.0		6.0
Max Green Setting (Gmax), s		20.5		29.0		29.0
Max Q Clear Time (g_c+I1), s		4.2		7.7		8.1
Green Ext Time (p_c), s		0.4		3.4		0.9
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			6.3			
HCM 7th LOS			A			

HCM 7th TWSC  
 13: N Winan Rd & 132nd St

Intersection						
Int Delay, s/veh	7.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	156	238	76	13	38	97
Future Vol, veh/h	156	238	76	13	38	97
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	200	200	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	13	39	2	2	18
Mvmt Flow	170	259	83	14	41	105

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	221	41	147	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.51	6.33	4.49	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.417	2.551	-	-	-
Pot Cap-1 Maneuver	748	999	1237	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	698	999	1237	-	-	-
Mov Cap-2 Maneuver	698	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	830	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.63	6.93	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1237	-	698	999	-	-
HCM Lane V/C Ratio	0.067	-	0.243	0.259	-	-
HCM Ctrl Dly (s/v)	8.1	-	11.8	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.9	1	-	-

# HCM 7th Signalized Intersection Summary

## 14: Mexico City Ave & I-29 NB Off Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙↙↙	↘	↙	↑↑↑	↑↑↑	↘
Traffic Volume (veh/h)	1278	66	32	659	484	246
Future Volume (veh/h)	1278	66	32	659	484	246
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1767	1870	1870	1648	1544	1292
Adj Flow Rate, veh/h	1389	0	35	716	526	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	2	2	17	24	41
Cap, veh/h	1831		63	1991	1476	
Arrive On Green	0.39	0.00	0.04	0.44	0.12	0.00
Sat Flow, veh/h	4745	1585	1781	4648	4355	1095
Grp Volume(v), veh/h	1389	0	35	716	526	0
Grp Sat Flow(s),veh/h/ln	1582	1585	1781	1500	1405	1095
Q Serve(g_s), s	17.8	0.0	1.4	7.4	8.1	0.0
Cycle Q Clear(g_c), s	17.8	0.0	1.4	7.4	8.1	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	1831		63	1991	1476	
V/C Ratio(X)	0.76		0.56	0.36	0.36	
Avail Cap(c_a), veh/h	2033		229	1991	1476	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.7	0.0	33.2	12.9	23.7	0.0
Incr Delay (d2), s/veh	2.0	0.0	7.5	0.5	0.7	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	10.4	0.0	1.2	3.9	4.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	20.7	0.0	40.7	13.4	24.4	0.0
LnGrp LOS	C		D	B	C	
Approach Vol, veh/h	1389			751	526	
Approach Delay, s/veh	20.7			14.7	24.4	
Approach LOS	C			B	C	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.5	30.5		33.0		37.0
Change Period (Y+Rc), s	4.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	9.0	15.0		30.0		28.0
Max Q Clear Time (g_c+I1), s	3.4	10.1		19.8		9.4
Green Ext Time (p_c), s	0.0	1.4		7.2		7.5

### Intersection Summary

HCM 7th Control Delay, s/veh	19.7
HCM 7th LOS	B

### Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 15: Mexico City Ave & I-29 SB Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↘		↙	↑	↗	↙	↗		↙	↑	↗↗
Traffic Volume (veh/h)	615	12	70	4	0	0	160	76	1	1	74	475
Future Volume (veh/h)	615	12	70	4	0	0	160	76	1	1	74	475
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No		No		No		No	
Adj Sat Flow, veh/h/ln	1618	1870	1870	1870	1900	1900	1870	1870	1870	1870	1870	1544
Adj Flow Rate, veh/h	668	13	0	4	0	0	174	83	1	1	80	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	2	2	2	0	0	2	2	2	2	2	24
Cap, veh/h	770	314		10	3	2	198	1581	19	3	627	
Arrive On Green	0.26	0.17	0.00	0.01	0.00	0.00	0.11	0.44	0.44	0.00	0.34	0.00
Sat Flow, veh/h	2990	1870	0	1781	1900	1610	1781	3596	43	1781	1870	2303
Grp Volume(v), veh/h	668	13	0	4	0	0	174	41	43	1	80	0
Grp Sat Flow(s),veh/h/ln	1495	1870	0	1781	1900	1610	1781	1777	1863	1781	1870	1152
Q Serve(g_s), s	15.0	0.4	0.0	0.2	0.0	0.0	6.7	0.9	0.9	0.0	2.1	0.0
Cycle Q Clear(g_c), s	15.0	0.4	0.0	0.2	0.0	0.0	6.7	0.9	0.9	0.0	2.1	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	770	314		10	3	2	198	781	819	3	627	
V/C Ratio(X)	0.87	0.04		0.42	0.00	0.00	0.88	0.05	0.05	0.39	0.13	
Avail Cap(c_a), veh/h	859	542		127	136	115	198	781	819	178	627	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.8	24.4	0.0	34.7	0.0	0.0	30.6	11.2	11.2	34.9	16.2	0.0
Incr Delay (d2), s/veh	8.9	0.1	0.0	31.8	0.0	0.0	33.4	0.1	0.1	102.5	0.4	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.9	0.3	0.0	0.3	0.0	0.0	7.9	0.6	0.6	0.2	1.5	0.0
Unsig. Movement Delay, s/veh												8.40
LnGrp Delay(d), s/veh	33.8	24.5	0.0	66.5	0.0	0.0	64.0	11.4	11.4	137.4	16.6	8.4
LnGrp LOS	C	C		E			E	B	B	F	B	A
Approach Vol, veh/h		681			4			258			597	
Approach Delay, s/veh		33.6			66.5			46.9			9.7	
Approach LOS		C			E			D			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	38.4	6.3	17.7	15.0	31.1	23.9	0.0				
Change Period (Y+Rc), s	7.6	* 7.6	5.9	* 5.9	7.2	7.6	5.9	5.9				
Max Green Setting (Gmax), s	11	* 11	5.0	* 20	7.8	10.5	20.1	5.0				
Max Q Clear Time (g_c+1/2), s	2.9	2.9	2.2	2.4	8.7	4.1	17.0	0.0				
Green Ext Time (p_c), s	0.0	0.3	0.0	0.0	0.0	0.2	1.1	0.0				

### Intersection Summary

HCM 7th Control Delay, s/veh	26.7
HCM 7th LOS	C

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is included in calculations of the approach delay and intersection delay.

HCM 7th TWSC  
 16: N Winan Rd & NW 128th St

Intersection						
Int Delay, s/veh	8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	87	2	0	273	3
Future Vol, veh/h	0	87	2	0	273	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	34	2	0	11	2
Mvmt Flow	0	95	2	0	297	3

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	599	2	0	0	2	0
Stage 1	2	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Critical Hdwy	6.4	6.54	-	-	4.21	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.606	-	-	2.299	-
Pot Cap-1 Maneuver	468	995	-	-	1563	-
Stage 1	1026	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	379	995	-	-	1563	-
Mov Cap-2 Maneuver	379	-	-	-	-	-
Stage 1	1026	-	-	-	-	-
Stage 2	449	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	9	0	7.76
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	995	1560
HCM Lane V/C Ratio	-	-	0.095	0.19
HCM Ctrl Dly (s/v)	-	-	9	7.8
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.7

HCM 7th TWSC  
 17: NW Interurban Rd & NW 128th St

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	1	4	4	11	0	5	0	19	19	1
Future Vol, veh/h	0	0	1	4	4	11	0	5	0	19	19	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	2	2	2	2	0	2	0	2	2	2
Mvmt Flow	0	0	1	4	4	12	0	5	0	21	21	1

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	70	68	21	67	68	5	22	0	0	5	0	0
Stage 1	62	62	-	5	5	-	-	-	-	-	-	-
Stage 2	8	5	-	62	63	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.12	6.52	6.22	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.518	4.018	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	927	827	1056	925	822	1078	1607	-	-	1616	-	-
Stage 1	954	847	-	1017	891	-	-	-	-	-	-	-
Stage 2	1019	895	-	949	842	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	900	816	1056	913	811	1078	1607	-	-	1616	-	-
Mov Cap-2 Maneuver	900	816	-	913	811	-	-	-	-	-	-	-
Stage 1	941	836	-	1017	891	-	-	-	-	-	-	-
Stage 2	1003	895	-	936	831	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Ctrl Dly, s/v	8.41		8.78			0			3.54		
HCM LOS	A		A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1607	-	-	1056	973	868	-	-
HCM Lane V/C Ratio	-	-	-	0.001	0.021	0.013	-	-
HCM Ctrl Dly (s/v)	0	-	-	8.4	8.8	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

HCM 7th TWSC  
 18: Mexico City Ave & Travel Center

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	84	0	1937	646	0
Future Vol, veh/h	0	84	0	1937	646	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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	11	34	0
Mvmt Flow	0	91	0	2105	702	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	351	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	*827	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %		0		-	-
Mov Cap-1 Maneuver	-	*827	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.89	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	827	-	-
HCM Lane V/C Ratio	-	0.11	-	-
HCM Ctrl Dly (s/v)	-	9.9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Notes  
 ~: Volume exceeds capacity     \$: Delay exceeds 300s  
 +: Computation Not Defined     \*: All major volume in platoon

# LANE SUMMARY

Site: 1 [HW 92 and Bethel - 2040 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ]			ft	ft
South: Bethel Road															
Lane 1 <sup>d</sup>	318	2.0	318	2.0	866	0.368	100	12.2	LOS B	1.8	46.2	Full	1600	0.0	0.0
Approach	318	2.0	318	2.0		0.368		12.2	LOS B	1.8	46.2				
East: Highway 92															
Lane 1 <sup>d</sup>	357	2.0	357	2.0	1083	0.329	100	8.3	LOS A	2.2	55.3	Full	1600	0.0	0.0
Approach	357	2.0	357	2.0		0.329		8.3	LOS A	2.2	55.3				
North: Bethel Road															
Lane 1 <sup>d</sup>	74	2.0	74	2.0	894	0.083	100	8.0	LOS A	0.5	12.1	Full	1600	0.0	0.0
Approach	74	2.0	74	2.0		0.083		8.0	LOS A	0.5	12.1				
West: Highway 92															
Lane 1	70	2.0	70	2.0	1168	0.060	100	13.1	LOS B	0.3	7.9	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	574	2.0	574	2.0	1647	0.348	100	6.7	LOS A	2.5	64.1	Full	1600	0.0	0.0
Approach	643	2.0	643	2.0		0.348		7.4	LOS A	2.5	64.1				
All Vehicles	1392	2.0	1392	2.0		0.368		8.7	LOS A	2.5	64.1				

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Bethel Road											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S						Cap. veh/h	v/c	%	%	No.	
To Exit:	W	N	E								
Lane 1	227	33	59	318	2.0	866	0.368	100	NA	NA	
Approach	227	33	59	318	2.0		0.368				
East: Highway 92											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E						Cap. veh/h	v/c	%	%	No.	
To Exit:	S	W	N								
Lane 1	17	333	7	357	2.0	1083	0.329	100	NA	NA	

Approach	17	333	7	357	2.0		0.329				
North: Bethel Road											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N							Satn	Util.	SL	Ov.	Lane
To Exit:	E	S	W			Cap.	v/c	%	%	No.	
						veh/h					
Lane 1	8	23	43	74	2.0	894	0.083	100	NA	NA	
Approach	8	23	43	74	2.0		0.083				
West: Highway 92											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W							Satn	Util.	SL	Ov.	Lane
To Exit:	N	E	S			Cap.	v/c	%	%	No.	
						veh/h					
Lane 1	70	-	-	70	2.0	1168	0.060	100	NA	NA	
Lane 2	-	468	105	574	2.0	1647	0.348	100	NA	NA	
Approach	70	468	105	643	2.0		0.348				
Total %HV Deg.Satn (v/c)											
All Vehicles	1392	2.0		0.368							

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis												
	Exit Lane Number	Short Lane Length	Percent Opng in Lane	Flow Rate	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Flow Rate	Deg. Satn	Min. Delay	Merge Delay
		ft	%	veh/h	pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec
There are no Exit Short Lanes for Merge Analysis at this Site.												

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
East: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
North: Bethel Road				
Lane 1	0.0	0.0	0.0	0.0
West: Highway 92				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

# LANE LEVEL OF SERVICE

## Lane Level of Service

 Site: 1 [HW 92 and Bethel - 2040 PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Roundabout with 1-lane approaches and circulating road

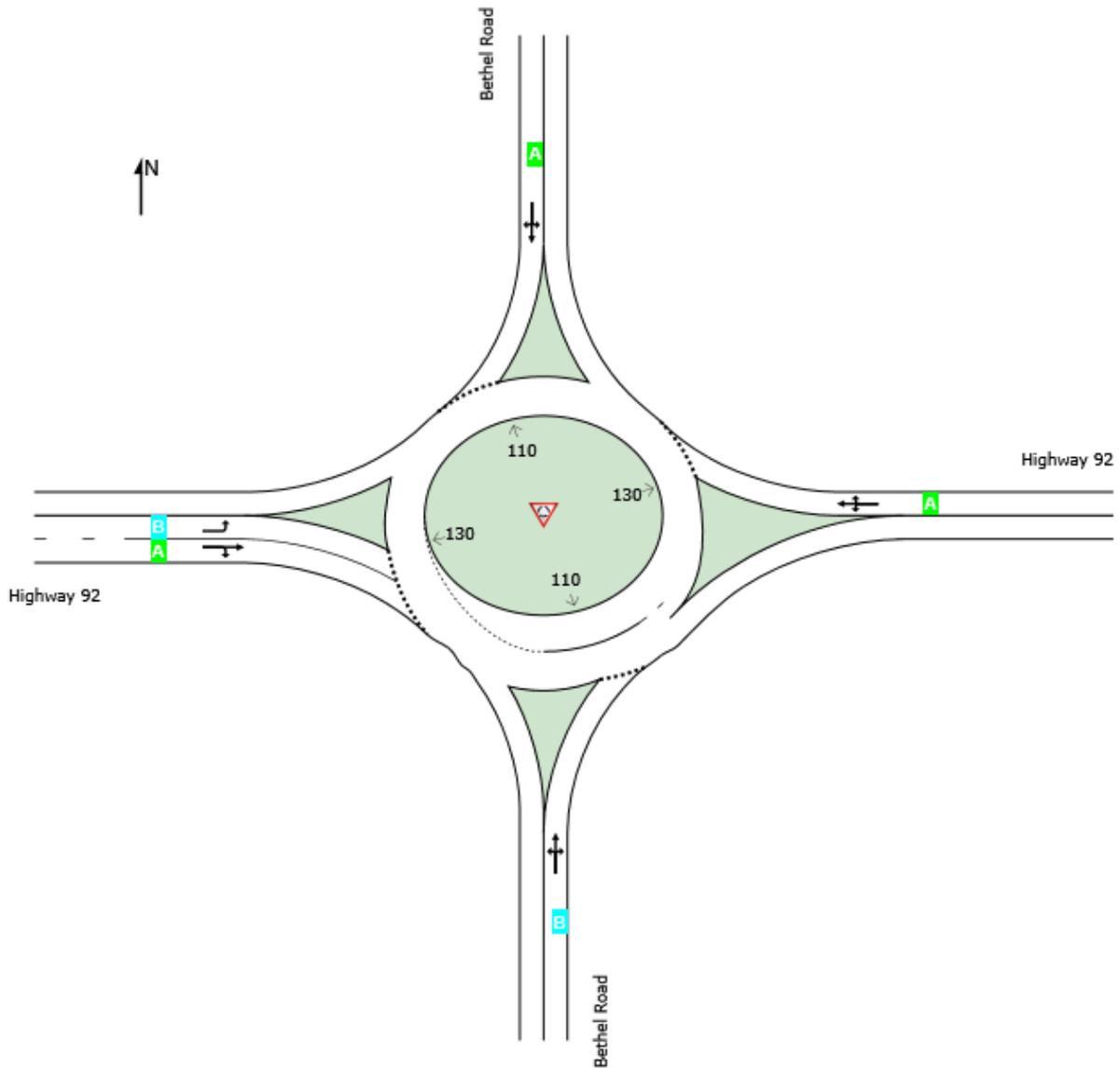
MUTCD (FHWA 2009) example number: 2B-22

Roundabout Guide (TRB 2010) example number: A-1

Site Category: (None)

Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

HCM 7th TWSC  
 4: Bethel Rd & Mexico City Avenue

Intersection						
Int Delay, s/veh	6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔		↔	↔
Traffic Vol, veh/h	0	200	93	0	78	56
Future Vol, veh/h	0	200	93	0	78	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	2	0	2	2
Mvmt Flow	0	217	101	0	85	61

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	332	101	0	0	101	0
Stage 1	101	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	667	954	-	-	1491	-
Stage 1	928	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	629	954	-	-	1491	-
Mov Cap-2 Maneuver	629	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	766	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	9.88	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	954	1491
HCM Lane V/C Ratio	-	-	-	0.228	0.057
HCM Ctrl Dly (s/v)	-	-	0	9.9	7.6
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.9	0.2

HCM 7th TWSC  
5: N Winan Rd & Highway 92

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	23	318	16	51	188	0	57	18	121	0	8	12
Future Vol, veh/h	23	318	16	51	188	0	57	18	121	0	8	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
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	0	2	2	2	0	2	2
Mvmt Flow	25	346	17	55	204	0	62	20	132	0	9	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	204	0	0	363	0	0	724	720	354	721	728	204
Stage 1	-	-	-	-	-	-	404	404	-	315	315	-
Stage 2	-	-	-	-	-	-	320	315	-	405	413	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.1	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.5	4.018	3.318
Pot Cap-1 Maneuver	1367	-	-	1196	-	-	341	354	689	345	350	836
Stage 1	-	-	-	-	-	-	623	599	-	700	655	-
Stage 2	-	-	-	-	-	-	692	655	-	626	594	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1367	-	-	1196	-	-	305	330	689	246	326	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	330	-	246	326	-
Stage 1	-	-	-	-	-	-	609	585	-	668	625	-
Stage 2	-	-	-	-	-	-	641	625	-	479	580	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.49			1.74			18.85			12.31		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	470	115	-	-	1196	-	-	514
HCM Lane V/C Ratio	0.453	0.018	-	-	0.046	-	-	0.042
HCM Ctrl Dly (s/v)	18.8	7.7	0	-	8.2	-	-	12.3
HCM Lane LOS	C	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	2.3	0.1	-	-	0.1	-	-	0.1

HCM 7th TWSC  
 6: NW Interurban Rd & Highway 92

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	422	5	15	309	0	9	14	23	4	9	3
Future Vol, veh/h	17	422	5	15	309	0	9	14	23	4	9	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	0	2	2	2	2	2	2
Mvmt Flow	18	459	5	16	336	0	10	15	25	4	10	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	336	0	0	464	0	0	872	867	461	872	870	336
Stage 1	-	-	-	-	-	-	498	498	-	368	368	-
Stage 2	-	-	-	-	-	-	373	368	-	503	501	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1223	-	-	1097	-	-	271	291	600	271	290	706
Stage 1	-	-	-	-	-	-	554	544	-	651	621	-
Stage 2	-	-	-	-	-	-	647	621	-	551	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1223	-	-	1097	-	-	251	280	600	237	279	706
Mov Cap-2 Maneuver	-	-	-	-	-	-	251	280	-	237	279	-
Stage 1	-	-	-	-	-	-	543	533	-	639	610	-
Stage 2	-	-	-	-	-	-	622	610	-	502	531	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.31			0.39			16.24			17.76		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	370	69	-	-	83	-	-	299
HCM Lane V/C Ratio	0.135	0.015	-	-	0.015	-	-	0.058
HCM Ctrl Dly (s/v)	16.2	8	0	-	8.3	0	-	17.8
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.2

HCM 7th TWSC  
 7: Roanridge Road & NW Roanridge Rd

Intersection						
Int Delay, s/veh	7.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	0	28	1	0	54
Future Vol, veh/h	3	0	28	1	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	2	2	0	2
Mvmt Flow	3	0	30	1	0	59

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	3	0	65 3
Stage 1	-	-	-	-	3 -
Stage 2	-	-	-	-	62 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	1619	-	945 1081
Stage 1	-	-	-	-	1025 -
Stage 2	-	-	-	-	966 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1619	-	928 1081
Mov Cap-2 Maneuver	-	-	-	-	928 -
Stage 1	-	-	-	-	1025 -
Stage 2	-	-	-	-	948 -

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	7.02	8.52
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1081	-	-	1618	-
HCM Lane V/C Ratio	0.054	-	-	0.019	-
HCM Ctrl Dly (s/v)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

HCM 7th TWSC  
 8: Bethel Rd & NW Roanridge Rd

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	52	5	1	41	28	28
Future Vol, veh/h	52	5	1	41	28	28
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	-	-	-	-	-
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	57	5	1	45	30	30

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	92	46	61	0	0
Stage 1	46	-	-	-	-
Stage 2	47	-	-	-	-
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	908	1024	1542	-	-
Stage 1	977	-	-	-	-
Stage 2	976	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	907	1024	1542	-	-
Mov Cap-2 Maneuver	907	-	-	-	-
Stage 1	976	-	-	-	-
Stage 2	976	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	9.21	0.17	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	43	-	916	-	-
HCM Lane V/C Ratio	0.001	-	0.068	-	-
HCM Ctrl Dly (s/v)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 7th Signalized Intersection Summary  
 9: Mexico City Ave & 136th Street

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 		 			 
Traffic Volume (veh/h)	540	53	276	139	28	819
Future Volume (veh/h)	540	53	276	139	28	819
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1811	1870	1574	1589	1870	1781
Adj Flow Rate, veh/h	587	58	300	151	30	890
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	2	22	21	2	8
Cap, veh/h	736	349	940	423	726	2060
Arrive On Green	0.22	0.22	0.63	0.63	0.21	0.61
Sat Flow, veh/h	3346	1585	3069	1346	1781	3474
Grp Volume(v), veh/h	587	58	300	151	30	890
Grp Sat Flow(s),veh/h/ln	1673	1585	1495	1346	1781	1692
Q Serve(g_s), s	11.6	2.1	3.3	1.6	0.0	9.8
Cycle Q Clear(g_c), s	11.6	2.1	3.3	1.6	0.0	9.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	736	349	940	423	726	2060
V/C Ratio(X)	0.80	0.17	0.32	0.36	0.04	0.43
Avail Cap(c_a), veh/h	1147	543	940	423	726	2060
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.99	0.99	1.00	1.00
Uniform Delay (d), s/veh	25.8	22.1	9.5	1.8	9.9	7.3
Incr Delay (d2), s/veh	2.2	0.2	0.9	2.3	0.0	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.8	1.3	1.7	2.0	0.4	4.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	28.0	22.3	10.4	4.1	9.9	7.9
LnGrp LOS	C	C	B	A	A	A
Approach Vol, veh/h	645		451			920
Approach Delay, s/veh	27.5		8.3			8.0
Approach LOS	C		A			A
Timer - Assigned Phs	1	2				6
Phs Duration (G+Y+Rc), s	20.6	28.0				48.6
Change Period (Y+Rc), s	6.0	6.0				6.0
Max Green Setting (Gmax), s	6.0	22.0				34.0
Max Q Clear Time (g_c+I1), s	2.0	5.3				11.8
Green Ext Time (p_c), s	0.0	2.0				5.9
Green Ext Time (p_c), s						1.8
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			14.3			
HCM 7th LOS			B			

HCM 7th TWSC  
 10: N Winan Rd & 136th Street

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	76	6	20	120	62	13
Future Vol, veh/h	76	6	20	120	62	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	200	-	-	-
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	83	7	22	130	67	14

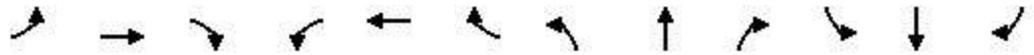
Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	248	74	82	0	0
Stage 1	74	-	-	-	-
Stage 2	174	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	740	987	1516	-	-
Stage 1	948	-	-	-	-
Stage 2	856	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	729	987	1516	-	-
Mov Cap-2 Maneuver	729	-	-	-	-
Stage 1	935	-	-	-	-
Stage 2	856	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.43	1.06	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1516	-	729	987	-	-
HCM Lane V/C Ratio	0.014	-	0.113	0.007	-	-
HCM Ctrl Dly (s/v)	7.4	-	10.6	8.7	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	0	-	-

# HCM 7th Signalized Intersection Summary

## 11: Mexico City Ave & NW Roanridge Rd/132nd St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘↗	↑	↗	↘↗	↑↑↑	↗	↘	↑↑↑	↗
Traffic Volume (veh/h)	4	15	236	784	69	45	264	366	549	38	1297	24
Future Volume (veh/h)	4	15	236	784	69	45	264	366	549	38	1297	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1604	1781	1870	1870	1589	1530	1722	1870	1796	1870
Adj Flow Rate, veh/h	4	16	257	852	75	49	287	398	0	41	1410	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	20	8	2	2	21	25	12	2	7	2
Cap, veh/h	309	107	351	967	160	136	591	2253		65	1839	594
Arrive On Green	0.17	0.06	0.06	0.20	0.09	0.09	0.34	0.90	0.00	0.07	0.75	0.75
Sat Flow, veh/h	1781	1870	1359	4784	1870	1585	2935	4176	1459	1781	4904	1585
Grp Volume(v), veh/h	4	16	257	852	75	49	287	398	0	41	1410	26
Grp Sat Flow(s),veh/h/ln	1781	1870	1359	1595	1870	1585	1468	1392	1459	1781	1635	1585
Q Serve(g_s), s	0.3	1.1	0.0	24.2	5.3	3.6	10.9	1.6	0.0	3.1	23.7	0.6
Cycle Q Clear(g_c), s	0.3	1.1	0.0	24.2	5.3	3.6	10.9	1.6	0.0	3.1	23.7	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	309	107	351	967	160	136	591	2253		65	1839	594
V/C Ratio(X)	0.01	0.15	0.73	0.88	0.47	0.36	0.49	0.18		0.63	0.77	0.04
Avail Cap(c_a), veh/h	309	107	351	1145	488	413	591	2253		102	1839	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	0.59	0.59	0.59	1.00	1.00	0.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	47.9	62.8	47.5	54.2	61.0	45.7	40.7	3.3	0.0	63.9	13.9	11.0
Incr Delay (d2), s/veh	0.0	0.6	7.6	4.5	1.3	0.9	0.6	0.2	0.0	7.7	2.5	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	1.0	13.6	13.8	4.6	3.0	6.5	0.8	0.0	2.7	8.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.9	63.4	55.1	58.7	62.2	46.7	41.3	3.4	0.0	71.7	16.4	11.1
LnGrp LOS	D	E	E	E	E	D	D	A		E	B	B
Approach Vol, veh/h		277			976			685			1477	
Approach Delay, s/veh		55.4			58.4			19.3			17.9	
Approach LOS		E			E			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	34.2	58.5	33.8	13.5	11.1	81.5	29.8	17.5				
Change Period (Y+Rc), s	6.0	6.0	5.5	5.5	6.0	6.0	5.5	5.5				
Max Green Setting (Gmax), s	23.0	52.5	33.5	8.0	8.0	67.5	5.0	36.5				
Max Q Clear Time (g_c+I1), s	12.9	25.7	26.2	3.1	5.1	3.6	2.3	7.3				
Green Ext Time (p_c), s	0.7	11.1	2.1	0.4	0.0	2.8	0.0	0.5				

Intersection Summary												
HCM 7th Control Delay, s/veh			32.8									
HCM 7th LOS			C									

**Notes**  
 User approved pedestrian interval to be less than phase max green.  
 Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 12: Windfield Avenue & 132nd St



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↗	↖
Traffic Volume (veh/h)	223	379	19	465	433	22
Future Volume (veh/h)	223	379	19	465	433	22
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1574	1841	1870	1752	1841	1870
Adj Flow Rate, veh/h	242	412	21	505	471	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	22	4	2	10	4	2
Cap, veh/h	588	1098	380	654	579	523
Arrive On Green	0.37	0.37	0.37	0.37	0.33	0.33
Sat Flow, veh/h	1574	1560	779	1752	1753	1585
Grp Volume(v), veh/h	242	412	21	505	471	24
Grp Sat Flow(s),veh/h/ln	1574	1560	779	1752	1753	1585
Q Serve(g_s), s	4.6	4.3	0.8	10.3	10.0	0.4
Cycle Q Clear(g_c), s	4.6	4.3	5.4	10.3	10.0	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	588	1098	380	654	579	523
V/C Ratio(X)	0.41	0.38	0.06	0.77	0.81	0.05
Avail Cap(c_a), veh/h	1166	1671	666	1298	1212	1096
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.4	2.4	11.4	11.2	12.4	9.2
Incr Delay (d2), s/veh	0.5	0.2	0.1	2.0	2.8	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9	0.1	0.2	5.1	6.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	9.8	2.6	11.5	13.1	15.3	9.3
LnGrp LOS	A	A	B	B	B	A
Approach Vol, veh/h	654			526	495	
Approach Delay, s/veh	5.3			13.1	15.0	
Approach LOS	A			B	B	
Timer - Assigned Phs		2		4		8
Phs Duration (G+Y+Rc), s		19.4		21.1		21.1
Change Period (Y+Rc), s		6.0		6.0		6.0
Max Green Setting (Gmax), s		28.0		30.0		30.0
Max Q Clear Time (g_c+I1), s		12.0		6.6		12.3
Green Ext Time (p_c), s		1.4		2.8		2.9
<b>Intersection Summary</b>						
HCM 7th Control Delay, s/veh			10.6			
HCM 7th LOS			B			

HCM 7th TWSC  
 13: N Winan Rd & 132nd St

Intersection						
Int Delay, s/veh	8.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	131	105	266	44	14	188
Future Vol, veh/h	131	105	266	44	14	188
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	200	200	-	-	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	13	30	11	2	2	9
Mvmt Flow	142	114	289	48	15	204

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	641	15	220	0	-	0
Stage 1	15	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Critical Hdwy	6.53	6.5	4.21	-	-	-
Critical Hdwy Stg 1	5.53	-	-	-	-	-
Critical Hdwy Stg 2	5.53	-	-	-	-	-
Follow-up Hdwy	3.617	3.57	2.299	-	-	-
Pot Cap-1 Maneuver	422	988	1298	-	-	-
Stage 1	980	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	328	988	1298	-	-	-
Mov Cap-2 Maneuver	328	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	513	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	17.46	7.35	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1298	-	328	988	-	-
HCM Lane V/C Ratio	0.223	-	0.434	0.115	-	-
HCM Ctrl Dly (s/v)	8.6	-	24.1	9.1	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.9	-	2.1	0.4	-	-

# HCM 7th Signalized Intersection Summary

## 14: Mexico City Ave & I-29 NB Off Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶↶↶	↷	↶	↶↶↶	↶↶↶	↷
Traffic Volume (veh/h)	774	197	106	405	1729	751
Future Volume (veh/h)	774	197	106	405	1729	751
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1693	1870	1870	1544	1811	1722
Adj Flow Rate, veh/h	841	0	115	440	1879	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	14	2	2	24	6	12
Cap, veh/h	957		185	2605	2119	
Arrive On Green	0.21	0.00	0.10	0.62	0.57	0.00
Sat Flow, veh/h	4546	1585	1781	4355	5107	1459
Grp Volume(v), veh/h	841	0	115	440	1879	0
Grp Sat Flow(s),veh/h/ln	1515	1585	1781	1405	1648	1459
Q Serve(g_s), s	12.5	0.0	4.3	3.1	23.1	0.0
Cycle Q Clear(g_c), s	12.5	0.0	4.3	3.1	23.1	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	957		185	2605	2119	
V/C Ratio(X)	0.88		0.62	0.17	0.89	
Avail Cap(c_a), veh/h	974		229	2605	2119	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.8	0.0	30.1	5.7	13.6	0.0
Incr Delay (d2), s/veh	9.1	0.0	3.5	0.1	6.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.8	0.0	3.4	1.2	10.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	35.9	0.0	33.5	5.8	19.5	0.0
LnGrp LOS	D		C	A	B	
Approach Vol, veh/h	841			555	1879	
Approach Delay, s/veh	35.9			11.6	19.5	
Approach LOS	D			B	B	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	13.3	36.0		20.7		49.3
Change Period (Y+Rc), s	6.0	* 6		6.0		6.0
Max Green Setting (Gmax), s	9.0	* 30		15.0		43.0
Max Q Clear Time (g_c+I1), s	6.3	25.1		14.5		5.1
Green Ext Time (p_c), s	0.1	4.6		0.2		5.8

### Intersection Summary

HCM 7th Control Delay, s/veh	22.4
HCM 7th LOS	C

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

# HCM 7th Signalized Intersection Summary

## 15: Mexico City Ave & I-29 SB Ramp



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↘		↙	↕	↗	↙	↕↗		↙	↕	↗↗
Traffic Volume (veh/h)	373	12	61	13	41	32	123	106	5	4	239	1683
Future Volume (veh/h)	373	12	61	13	41	32	123	106	5	4	239	1683
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1515	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1796
Adj Flow Rate, veh/h	405	13	0	14	45	35	134	115	5	4	260	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	26	2	2	2	2	2	2	2	2	2	2	7
Cap, veh/h	489	412		30	117	99	280	853	37	244	411	
Arrive On Green	0.17	0.22	0.00	0.02	0.06	0.06	0.16	0.25	0.25	0.14	0.22	0.00
Sat Flow, veh/h	2799	1870	0	1781	1870	1585	1781	3470	150	1781	1870	2679
Grp Volume(v), veh/h	405	13	0	14	45	35	134	59	61	4	260	0
Grp Sat Flow(s),veh/h/ln	1399	1870	0	1781	1870	1585	1781	1777	1843	1781	1870	1340
Q Serve(g_s), s	9.8	0.4	0.0	0.5	1.6	1.5	4.8	1.8	1.8	0.1	8.8	0.0
Cycle Q Clear(g_c), s	9.8	0.4	0.0	0.5	1.6	1.5	4.8	1.8	1.8	0.1	8.8	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	489	412		30	117	99	280	437	453	244	411	
V/C Ratio(X)	0.83	0.03		0.46	0.38	0.35	0.48	0.13	0.14	0.02	0.63	
Avail Cap(c_a), veh/h	564	412		127	136	115	280	437	453	244	411	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.9	21.4	0.0	34.1	31.5	31.5	26.9	20.6	20.6	26.1	24.7	0.0
Incr Delay (d2), s/veh	9.2	0.0	0.0	12.6	2.9	3.0	1.8	0.6	0.6	0.0	7.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	6.7	0.3	0.0	0.6	1.4	1.1	3.6	1.3	1.4	0.1	7.7	0.0
Unsig. Movement Delay, s/veh												8.40
LnGrp Delay(d), s/veh	37.1	21.5	0.0	46.7	34.5	34.5	28.7	21.2	21.2	26.2	31.9	8.4
LnGrp LOS	D	C		D	C	C	C	C	C	C	C	A
Approach Vol, veh/h		418			94			254			2093	
Approach Delay, s/veh		36.6			36.3			25.2			11.4	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.2	24.4	7.1	21.3	18.6	23.0	18.1	10.3				
Change Period (Y+Rc), s	7.6	7.2	5.9	* 5.9	7.6	* 7.6	5.9	5.9				
Max Green Setting (Gmax), s	17.2	5.0	* 14	8.8	* 15	14.1	5.1					
Max Q Clear Time (g_c+1/2), s	3.8	2.5	2.4	6.8	10.8	11.8	3.6					
Green Ext Time (p_c), s	0.0	0.7	0.0	0.0	0.1	0.9	0.0					

### Intersection Summary

HCM 7th Control Delay, s/veh	17.1
HCM 7th LOS	B

### Notes

\* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is included in calculations of the approach delay and intersection delay.

HCM 7th TWSC  
 16: N Winan Rd & NW 128th St

Intersection						
Int Delay, s/veh	9.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	0	302	8	2	119	0
Future Vol, veh/h	0	302	8	2	119	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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	10	2	2	26	0
Mvmt Flow	0	328	9	2	129	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	268	10	0	0	11	0
Stage 1	10	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Critical Hdwy	6.4	6.3	-	-	4.36	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.39	-	-	2.434	-
Pot Cap-1 Maneuver	725	1049	-	-	1465	-
Stage 1	1018	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	661	1049	-	-	1465	-
Mov Cap-2 Maneuver	661	-	-	-	-	-
Stage 1	1018	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	9.99	0	7.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1049	1465
HCM Lane V/C Ratio	-	-	0.313	0.088
HCM Ctrl Dly (s/v)	-	-	10	7.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.3

HCM 7th TWSC  
 17: NW Interurban Rd & NW 128th St

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	3	1	7	5	15	2	26	4	27	16	1
Future Vol, veh/h	3	3	1	7	5	15	2	26	4	27	16	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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	3	3	1	8	5	16	2	28	4	29	17	1

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	112	114	18	113	112	30	18	0	0	33	0	0
Stage 1	77	77	-	35	35	-	-	-	-	-	-	-
Stage 2	35	37	-	78	77	-	-	-	-	-	-	-
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	866	777	1061	865	778	1044	1598	-	-	1579	-	-
Stage 1	932	831	-	981	866	-	-	-	-	-	-	-
Stage 2	980	864	-	931	831	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	829	761	1061	843	763	1044	1598	-	-	1579	-	-
Mov Cap-2 Maneuver	829	761	-	843	763	-	-	-	-	-	-	-
Stage 1	915	816	-	980	865	-	-	-	-	-	-	-
Stage 2	958	863	-	909	815	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Ctrl Dly, s/v	9.41		9.02		0.45		4.49	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	110	-	-	823	924	1092	-	-
HCM Lane V/C Ratio	0.001	-	-	0.009	0.032	0.019	-	-
HCM Ctrl Dly (s/v)	7.3	0	-	9.4	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

HCM 7th TWSC  
 18: Mexico City Ave & Travel Center

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	232	0	1179	2248	69
Future Vol, veh/h	0	232	0	1179	2248	69
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	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	18	9	2
Mvmt Flow	0	252	0	1282	2443	75

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	1259	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	*562	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %		0		-	-
Mov Cap-1 Maneuver	-	*562	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	16.53	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 562	-	-
HCM Lane V/C Ratio	- 0.449	-	-
HCM Ctrl Dly (s/v)	- 16.5	-	-
HCM Lane LOS	- C	-	-
HCM 95th %tile Q(veh)	- 2.3	-	-

Notes  
 ~: Volume exceeds capacity      \$: Delay exceeds 300s  
 +: Computation Not Defined      \*: All major volume in platoon

SimTraffic

Queuing and Blocking Report  
025-03015

Intersection: 9: Mexico City Ave & 136th Street

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	42	104	27	209	189	107	30	53	58
Average Queue (ft)	9	63	14	81	85	39	13	18	13
95th Queue (ft)	38	113	32	200	194	104	35	51	53
Link Distance (ft)		854		1525	1525	1525		1019	1019
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300		300				300		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	L	T	R	L	L	T	T
Maximum Queue (ft)	121	74	108	126	199	245	31	26	322	324	229	197
Average Queue (ft)	76	37	63	64	130	178	15	7	230	217	108	109
95th Queue (ft)	151	83	128	153	228	277	43	26	348	361	229	191
Link Distance (ft)		681					1681				602	602
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		300	500	500	500		200	400	400		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	NB	SB	SB	SB	SB	SB
Directions Served	T	L	T	T	T	R
Maximum Queue (ft)	133	49	100	108	177	5
Average Queue (ft)	76	24	51	51	83	1
95th Queue (ft)	132	56	99	110	186	8
Link Distance (ft)	602		1525	1525	1525	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200			200	
Storage Blk Time (%)					2	
Queuing Penalty (veh)					0	

Queuing and Blocking Report  
025-03015

Intersection: 14: Mexico City Ave & I-29 NB Off Ramp

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	R	L	T	T	T	T	T	T
Maximum Queue (ft)	181	346	396	254	47	116	96	112	124	175	174
Average Queue (ft)	109	226	291	39	24	52	54	72	42	97	114
95th Queue (ft)	182	374	408	234	49	113	102	124	98	159	180
Link Distance (ft)				678		557	557		623	623	623
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	420	420	420		400			275			
Storage Blk Time (%)			1	0							
Queuing Penalty (veh)			0	1							

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	L	T	TR	L	T	TR
Maximum Queue (ft)	310	356	51	6	128	38	26	5	48	58
Average Queue (ft)	208	264	11	1	84	17	7	1	16	28
95th Queue (ft)	332	400	55	6	139	43	29	8	40	59
Link Distance (ft)			650			1102	1102		1128	1128
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	380	380		125	430			450		
Storage Blk Time (%)		1								
Queuing Penalty (veh)		1								

Zone Summary

Zone wide Queuing Penalty: 2

Queuing and Blocking Report  
025-03015

Intersection: 9: Mexico City Ave & 136th Street

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	R	L	T	T
Maximum Queue (ft)	140	188	35	160	154	118	51	119	167
Average Queue (ft)	91	135	18	81	52	51	16	76	109
95th Queue (ft)	145	189	39	167	148	122	51	123	178
Link Distance (ft)		854		1525	1525	1525		1019	1019
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300		300				300		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	L	T	R	L	L	T	T
Maximum Queue (ft)	10	132	293	264	320	343	106	38	275	261	163	128
Average Queue (ft)	2	73	215	160	213	263	46	20	199	191	75	75
95th Queue (ft)	18	317	393	252	315	354	102	46	290	304	181	141
Link Distance (ft)		681					1681				602	602
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		300	500	500	500		200	400	400		
Storage Blk Time (%)				9								
Queuing Penalty (veh)				2								

Intersection: 11: Mexico City Ave & NW Roanridge Rd/132nd St

Movement	NB	SB	SB	SB	SB	SB
Directions Served	T	L	T	T	T	R
Maximum Queue (ft)	119	63	272	350	392	226
Average Queue (ft)	55	28	205	248	291	46
95th Queue (ft)	130	66	290	364	430	200
Link Distance (ft)	602		1525	1525	1525	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200			200	
Storage Blk Time (%)			9		27	
Queuing Penalty (veh)			3		6	

Queuing and Blocking Report  
025-03015

Intersection: 14: Mexico City Ave & I-29 NB Off Ramp

Movement	EB	EB	EB	EB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	R	L	T	T	T	T	T	T
Maximum Queue (ft)	199	359	419	310	116	131	123	141	235	275	269
Average Queue (ft)	131	266	322	121	63	77	70	98	146	187	176
95th Queue (ft)	227	387	438	371	119	140	121	147	250	292	283
Link Distance (ft)				678		557	557		623	623	623
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	420	420	420		400			275			
Storage Blk Time (%)		0	1	0							
Queuing Penalty (veh)		0	1	2							

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	TR	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	230	278	27	23	44	41	113	48	30	15	332	333
Average Queue (ft)	125	172	9	7	25	11	71	23	9	1	163	226
95th Queue (ft)	234	283	31	23	53	37	121	56	34	15	340	376
Link Distance (ft)			650		619	619		1102	1102		1128	1128
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	380	380		125			430			450		
Storage Blk Time (%)												0
Queuing Penalty (veh)												0

Intersection: 15: Mexico City Ave & I-29 SB Ramp

Movement	SB	B64
Directions Served	R	T
Maximum Queue (ft)	294	6
Average Queue (ft)	179	1
95th Queue (ft)	365	9
Link Distance (ft)	1128	557
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 15

# KCI 29 MPD

## Public Engagement

<b>Date:</b>	01/07/2026
<b>RE:</b>	Justin Smith
<b>Attendees:</b>	
<b>Project #</b>	CD-CPC-2025-00169 & CD-CPC-2025-00170

## MEETING NOTES

### 1. Attendance

- a. Jacob Hodson – Olsson
- b. David Matthews - Olsson
- c. Nick Heiser – Olsson
- d. Aaron Schmidt – HMW
- e. Katy Clagett – HMW
- f. Tony Borchers – HMW
- g. Troy Culver – HMW
- h. Chris King
- i. Benny Hoy
- j. Austin Baier

### 2. Notes

- Jacob stated that the meeting would be opened to the public at 5:30, and they would wait 15 minutes for public attendees before adjourning.
- No one from the public joined the meeting.
- Jacob informed attendees that the MPD would be heard at the City Planning Commission (CPC) on January 21st, specifying that their case would follow the approval of the major street plan by Public Works, and that the hearing would take place at 9:00 AM on the 10th floor of City Hall.
- Jacob adjourned the meeting at 5:45pm

## SUMMARY

Area Plan Alignment:

**High**, Medium, Low

KC Spirit Playbook Alignment:

High, **Medium**, Low, N/A

CC- Connected City  
DO - Diversity & Opportunity  
HAC- History, Arts & Culture  
HE - Healthy Environment  
PAA - People of All Ages  
POS - Parks & Open Spaces  
SAN - Strong & Accessible Neighborhoods  
SC - Smart City  
SEG - Sustainable & Equitable Growth  
WDC - Well Designed City

Evaluation	Goal	Notes
High		
Medium	SEG WDC	SEG- The area is adjacent to other similar development styles WDC- The amendment contains General Design guidelines which will be applied which each application process
Low		

### Alignment Comments:

This project supports a few goals KCI Area Plan and KC Spirit Playbook. The proposed major amendment to rezone the property to MPD is consistent with future land use designation of Industrial, as the MPD district is oriented toward industrial development. The KCI Area Plan supports industrial uses north of the airport due to the area's remoteness and its significant separation from residential neighborhoods. While the proposed major amendment does not include specific design guidelines relating to landscaping, each project will be subject to an administrative review.