



BOONE RIDGE MIXED USE REZONE TRANSPORTATION PLANNING RULE TRANSPORTATION STUDY

SEPTEMBER 2022

PREPARED FOR:

Mosaic Development Services, LLC



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TABLE OF CONTENTS

EXECUTIVE SUMMARY	5
EXISTING CONDITIONS.....	6
STUDY AREA	6
EXISTING TRAFFIC VOLUMES AND OPERATIONS	8
CRASH ANALYSIS	13
FUTURE 2037 CONDITIONS.....	15
BACKGROUND GROWTH	15
CURRENT AND PROPOSED ZONING TRIP GENERATION.....	16
FUTURE 2037 TRAFFIC VOLUMES AND OPERATIONS	24
REQUIRED MITIGATIONS AND TPR REVIEW.....	29
TRANSPORTATION PLANNING RULE REVIEW	29
INTERSECTION OPERATIONS MITIGATIONS	30
TPR FINDINGS	31
SUPPLEMENTAL ANALYSIS	32
WEEKDAY PM PEAK HOUR WEAVING ANALYSIS	32
WEEKDAY PM PEAK HOUR QUEUING ANALYSIS	33
SATURDAY PEAK HOUR INTERSECTION ANALYSIS	33
SATURDAY PEAK HOUR QUEUING ANALYSIS	35
SUMMARY	36
APPENDIX CONTENTS.....	A
APPENDIX A. TRAFFIC COUNT DATA (PM PEAK)	A
APPENDIX B: CRASH DATA (2016 – 2020)	B
APPENDIX C: IN-PROCESS DEVELOPMENT VOLUMES	C
APPENDIX D: LOS DESCRIPTION	D
APPENDIX E: HCM REPORTS – EXISTING 2022	E
APPENDIX F: HCM REPORTS – FUTURE 2037 - CURRENT ZONING.....	F
APPENDIX G: HCM REPORTS – FUTURE 2037 - PROPOSED ZONING.....	G
APPENDIX H: HCM REPORTS – FUTURE 2037 – PROPOSED ZONING MITIGATIONS	H
APPENDIX I: WEEKDAY PM PEAK HOUR WEAVING REPORT	I
APPENDIX J: SATURDAY ANALYSIS (TRAFFIC VOLUMES & HCM REPORTS)	J
APPENDIX K: CONCEPT DESIGNS AND COST ESTIMATES.....	K

LIST OF FIGURES

FIGURE 1: STUDY AREA	6
FIGURE 2: EXISTING 2022 TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL	10
FIGURE 3: TRIP DISTRIBUTION.....	21
FIGURE 4: PROJECT TRIPS – CURRENT ZONING.....	22
FIGURE 5: PROJECT TRIPS – PROPOSED ZONING	23
FIGURE 6: FUTURE 2037 TRAFFIC VOLUMES – CURRENT ZONING	25
FIGURE 7: FUTURE 2037 TRAFFIC VOLUMES – PROPOSED ZONING.....	26
FIGURE 8: FUTURE 2025 SATURDAY MIDDAY PEAK TRAFFIC VOLUMES	34

LIST OF TABLES

TABLE 1: STUDY AREA ROADWAY CHARACTERISTICS	7
TABLE 2: EXISTING 2022 STUDY INTERSECTION OPERATIONS (WEEKDAY PM PEAK HOUR)	12
TABLE 3: INTERSECTION CRASH RATES (2016 - 2020).....	13
TABLE 4: ALLOWABLE LAND USES UNDER CURRENT AND PROPOSED ZONING.....	17
TABLE 5: REASONABLE WORST CASE DEVELOPMENT CONSTRAINTS	17
TABLE 6: WORST-CASE TRIP GENERATION SUMMARY FOR CURRENT AND PROPOSED LAND USE	19
TABLE 7: FUTURE 2037 STUDY INTERSECTION OPERATIONS (PM PEAK HOUR)	28
TABLE 8: STUDY INTERSECTION OPERATIONS WITH MITIGATIONS (2037).....	30
TABLE 9: MITIGATION COST ESTIMATES	31
TABLE 10: QUEUE LENGTHS (95TH PERCENTILE)	33
TABLE 11: WORST-CASE TRIP GENERATION SUMMARY (SATURDAY PEAK HOUR)	34
TABLE 12: FUTURE (2025) BUILD STUDY INTERSECTION OPERATIONS (SATURDAY PEAK HOUR)	35
TABLE 13: SATURDAY PEAK HOUR QUEUE LENGTHS (95TH PERCENTILE)	35

EXECUTIVE SUMMARY

The purpose of this transportation study is to determine the transportation impacts of the proposed zone change of a 24.66-acre parcel from Residential Agriculture (RA) zoning to a combination of Mixed-Use II (MU-II) and Mixed-Use III (MU-III) zoning. The parcel is located on the southeast corner of the Kuebler Boulevard and 27th Avenue intersection.

To understand the impact of the zone change on the surrounding transportation system, the 2022 Existing Conditions, 2037 Current Zoning, and 2037 Proposed Zoning scenarios were evaluated. The following is a summary of the transportation analysis findings from the zone change analysis.

- All study intersections except the Kuebler Boulevard/Battle Creek Road intersection meet the City's operating standards or ODOT Mobility Target under the 2022 Existing Conditions scenario.
- Under the 2037 Current Zoning scenario, four of the nine study intersections fail to meet operating standards. These intersections include Kuebler Boulevard/Commercial Street, Kuebler Boulevard/Battle Creek Road, Kuebler Boulevard/27th Avenue, and Kuebler Boulevard/36th Avenue.
- Under the 2037 Proposed Zoning scenario, five study intersections fail to meet the operating standards. These intersections include all of those listed above, plus the Site Access on 27th Avenue.
- The proposed zone change causes a significant effect at five of the study intersections. These intersections must be mitigated back to meet the greater of the following: the operating standard/mobility target or the v/c ratio of the equivalent 2037 Current Zoning scenario. The mitigation improvements that were identified are listed below.
 - **Kuebler Boulevard/Commercial Street:** Implement signal timing improvements/optimizations, such as increasing the cycle length by five seconds.
 - **Kuebler Boulevard/Battle Creek Road:** Install dual southbound left turn lanes with a storage length of 280 ft each to match the existing left turn lane.
 - **Kuebler Boulevard/27th Avenue:** Install a second northbound right turn lane and second northbound left turn lane with storage lengths that match the existing turn lanes.
 - **Kuebler Boulevard/36th Avenue:** Install a separate westbound right turn lane with a storage length of 200 ft to match the existing left turn lane.
 - **Site Access/27th Avenue:** Add a dedicated westbound right turn lane.
- Based on the queuing analysis results, we recommend that the applicant extend the dual westbound left turn lanes at Kuebler Boulevard/27th Avenue to 650 feet to accommodate future 2037 vehicle queues turning onto 27th Avenue.

EXISTING CONDITIONS

This chapter details the existing study area conditions including the study intersections, existing bicycle and pedestrian facilities, existing transit facilities, roadway network, future planned projects, existing traffic volumes and operations, and collision analysis in the transportation network surrounding the proposed parcel in Salem, Oregon. Supporting details are provided in the appendix.

STUDY AREA

The proposed zone change is for a 25-acre parcel from the existing Residential Agriculture (RA) zoning to a combination of Mixed-Use II (MU-II) and Mixed-Use III (MU-III) zoning. The project site and study intersections are shown in Figure 1.

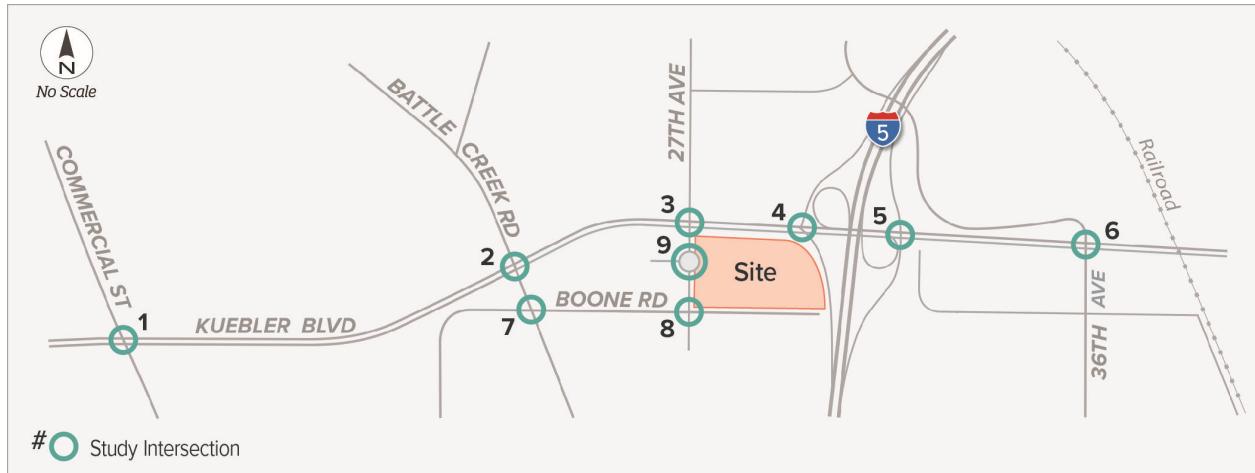


FIGURE 1: STUDY AREA

The following study intersections were selected for analysis:

1. Kuebler Boulevard/Commercial Street
2. Kuebler Boulevard/Battle Creek Road
3. Kuebler Boulevard/27th Avenue
4. Kuebler Boulevard/I-5 Southbound Ramps
5. Kuebler Boulevard/I-5 Northbound Ramps
6. Kuebler Boulevard/36th Avenue
7. Battle Creek Road/Boone Road
8. Boone Road/27th Avenue
9. 27th Avenue/Project Site Access

ROADWAY NETWORK

Key roadways within the study area include Kuebler Boulevard, Commercial Street, Battle Creek Road, 27th Avenue, 36th Avenue, Boone Road, and Interstate-5. The jurisdiction, functional classifications, and characteristics of each of the study area roadways are listed in Table 1.

TABLE 1: STUDY AREA ROADWAY CHARACTERISTICS

ROADWAY	JURISDICTION	FUNCTIONAL CLASSIFICATION	LANES	POSTED SPEED	SIDEWALKS	BIKE LANES
I-5 INTERSTATE	ODOT	Freeway	6	60	No	No
KUEBLER BOULEVARD	City of Salem	Parkway	2 - 4 ^a	45	Yes	Yes
COMMERCIAL STREET	City of Salem	Major Arterial	4	45	Yes	Yes
BATTLE CREEK ROAD	City of Salem	Minor Arterial	2	40	Partial ^b	Yes
36 TH AVENUE	City of Salem	Minor Arterial	2	35-45 ^c	No	Partial ^d
27 TH AVENUE	City of Salem	Collector	3	Not Posted ^e	Partial ^f	Partial ^f
BOONE ROAD	City of Salem	Collector	2	35	Yes	Partial

^a Kuebler Boulevard east of the I-5 interchange reduces to 2 lanes.

^b There are no sidewalks on the northeast side of Battle Creek Road SE north of Kuebler Boulevard.

^c Posted Speed Limit is 35 mph north of Kuebler Boulevard and 45 mph south of Kuebler Boulevard.

^d There are bicycle lanes on both sides of 36th Avenue NE north of Kuebler Boulevard.

^e No posted Speed Limit.

^f There are sidewalks on the west side of 27th Avenue and there are approximately 350 feet of bicycle lanes on both sides of 27th Avenue SE north and south of Kuebler Boulevard.

PEDESTRIAN, BICYCLE, AND TRANSIT FACILITIES

There are currently bicycle lanes and sidewalks along Kuebler Boulevard and Commercial Street within the study area. Partial sidewalks can be found on Battle Creek Road and 27th Avenue. Partial bike lanes can be found on 36th Avenue and 27th Avenue in the study area.

The closest transit stop to the project site is located at the intersection of Kuebler Boulevard and Battle Creek Road. Cherriots Route 6 (Fairview Industrial) provides service to that bus stop every day except Sunday with headways of approximately 60 minutes. The route travels between south Salem and the Downtown Transit Center via Kuebler Boulevard, Fairview Industrial Drive, and 25th Street.

PLANNED PROJECTS

There is one planned capital improvement project in the study area.¹

- **Commercial Street SE: Madrona Avenue SE to Robins Lane SE Signal**

Improvements - Design and construction of signalized intersection upgrades on Commercial St SE from Madrona Ave SE to Robins Ln SE to improve traffic flow and vehicle safety. (CIP 1014). This project is estimated to cost \$773,750.

There are also multiple projects listed in the Salem 2035 Transportation System Plan (TSP).²

- **Battle Creek Road (Kuebler Boulevard to Hillrose Street) (109)** – Upgrade street to Minor Arterial standards (3 lanes with sidewalk and bike lanes). High Priority.
- **Kuebler Boulevard SE (Interstate 5 Interchange to Turner Road SE) (134)** – Widen to Parkway standards with four travel lanes, paved or raised median, bicycle lanes, and sidewalks. Medium Priority.
- **Battle Creek Road SE (Kuebler Boulevard SE to Wiltsey Road SE) (140)** – Widen the roadway to increase the capacity by adding a center turn lane. Bicycle lanes and sidewalks are to be included. Low Priority.
- **Boone Road SE (Reed Lane SE/Barnes Road SE to Battle Creek Road SE) (129)** – Upgrade to urban standards. Low Priority.

EXISTING TRAFFIC VOLUMES AND OPERATIONS

An analysis of the 2022 existing intersection operations was performed for the study intersections. Intersections are the focus of the analysis because they are the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity. Intersection operations were analyzed for the PM peak hour, which is when project and study area traffic volumes are expected to be the highest.

The following intersections were selected for data collection and analysis based on other recent transportation studies conducted in the same area:

1. Kuebler Boulevard/Commercial Street SE
2. Kuebler Boulevard/Battle Creek Road SE
3. Kuebler Boulevard/27th Avenue SE
4. Kuebler Boulevard/ I-5 Southbound Ramps
5. Kuebler Boulevard/I-5 Northbound Ramps
6. Kuebler Boulevard/36th Avenue SE
7. Battle Creek Road SE/Boone Road SE
8. Boone Road SE/27th Avenue SE

¹ <https://www.cityofsalem.net/Pages/capital-improvement-project-map.aspx>, Accessed November 2020.

² Salem Transportation System Plan, City of Salem, Amended January 13, 2020.

Traffic counts were collected in May 2022 and utilized for this analysis. The traffic counts were collected during the PM peak period (4:00 pm – 6:00 pm).

The 2022 traffic volumes are shown in Figure 2 and the original two-hour traffic counts are included in the appendix.

At the request of the City, DKS also completed a supplemental analysis of the Saturday Peak Hour traffic volumes. This analysis focused on just two of the gateway study intersections and only analyzed the estimated Year of Opening (2025) volumes. These Saturday counts were collected in May 2022 during the Weekend Midday peak period (12:00 pm – 2:00 pm).

ODOT ANALYSIS PROCEDURES MANUAL (APM)

Following ODOT methodology provided in the Analysis Procedures Manual (APM)³, a seasonal adjustment factor was not needed since the study area is located within the Salem Metropolitan Planning Organization (MPO). Weekday peak hour counts approximate the 30HV in this case.

Typically, per the APM, a system peak hour would be developed for the study area, but since the study area spans over 2-miles of the Kuebler Boulevard corridor (from 36th Avenue to Commercial Street) and portions of Boone Road, a system peak hour was not appropriate for this analysis as it would be attempting to capture both the peak activity at the I-5 interchange (freeway serving regional commuter traffic) and peak activity at Boone Road (collector serving residential areas), which are likely different peak hours.

³ Analysis Procedures Manual, Oregon Department of Transportation, Updated December 2019.

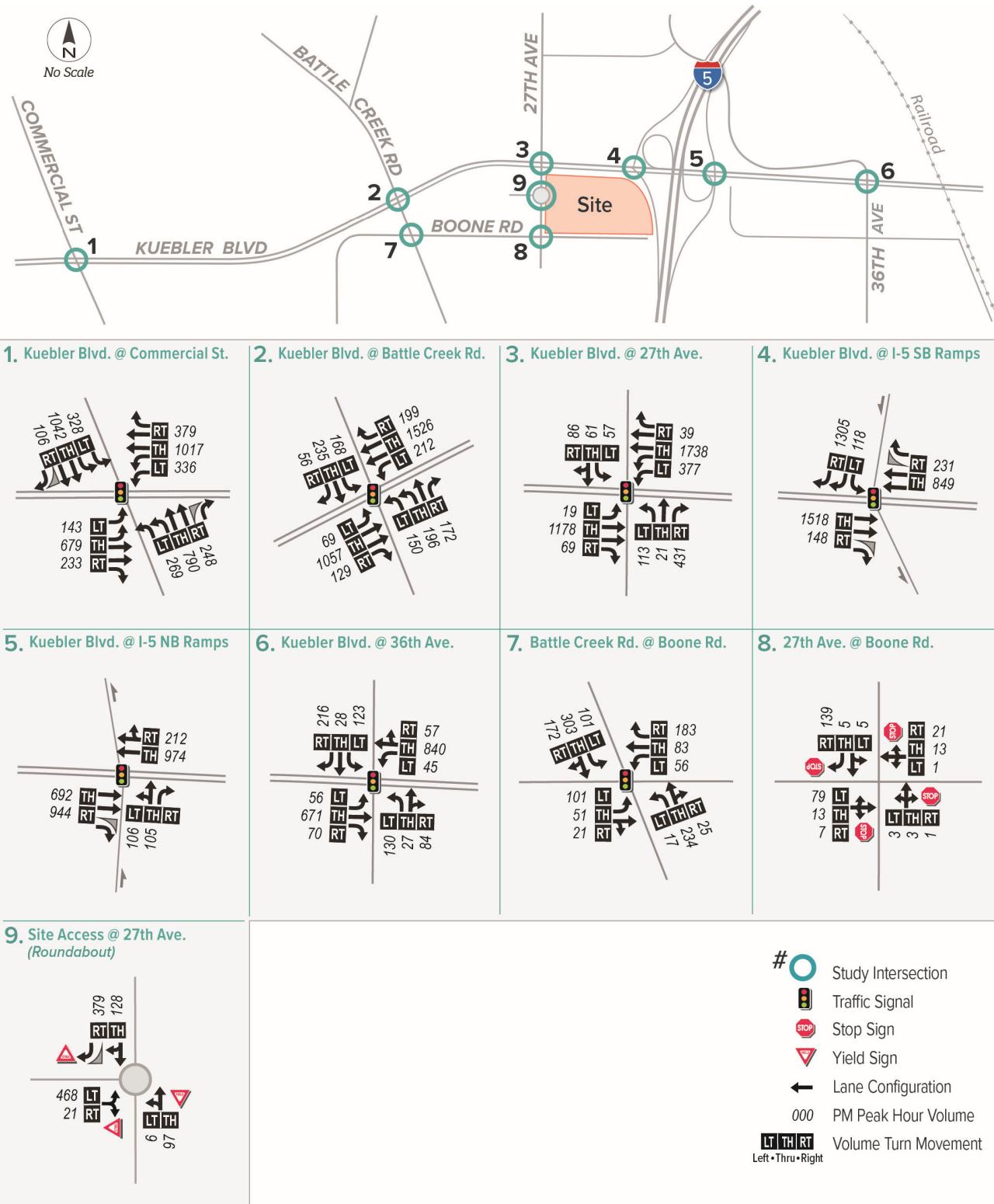


FIGURE 2: EXISTING 2022 TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL

INTERSECTION PERFORMANCE MEASURES

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures that provide a good representation of intersection operations. In addition, they are often incorporated into agency mobility standards.

- **Level of service (LOS):** A “report card” rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays. A description of Level of Service (LOS) is provided in the appendix and includes a list of the delay values (in seconds) that correspond to each LOS designation.
- **Volume-to-capacity (v/c) ratio:** A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 0.95, congestion increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

REQUIRED OPERATING STANDARDS

The City of Salem requires signalized intersections to operate at a level of service (LOS) E with a volume-to-capacity (v/c) ratio of 0.90 or better. For unsignalized intersections, the City requires LOS E but does not require an intersection to meet a specified v/c ratio.⁴

Intersections at the I-5 interchange are required to operate according to ODOT mobility standards set forth in the Oregon Highway Plan (OHP).⁵ The volume-to-capacity ratio targets for peak operating conditions at intersections at interstate highways inside of an MPO is 0.85.

EXISTING 2022 OPERATING CONDITIONS

The existing traffic operations at the study intersections were evaluated for both the weekday PM peak hour using the Highway Capacity Manual, 6th Edition methodology for unsignalized and signalized intersections.⁶

The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection for the weekday PM peak hour are listed in Table 2. As shown, all signalized study intersections except one intersection meet the required operating standard or mobility target during the PM peak hour.

⁴ Division 6 of the City of Salem Department Public Works Design Standards Administrative Rules.

⁵ Oregon Transportation Commission (OTC) Amendment 05-16 to the 1999 Oregon Highway Plan, Table 6: Volume to Capacity Ratio Targets for Peak Hour Operating Conditions, Appendix A.

⁶ *Highway Capacity Manual*, 6th Edition, Transportation Research Board, Washington DC, 2017.

The Kuebler Boulevard/Battle Creek Road intersection does not meet the City of Salem standard under existing conditions.

While volume-to-capacity and delay are related, there is not a direct one-for-one correlation between the two. Of primary difference for signalized intersections, delay is the average delay for all vehicles while volume-to-capacity is dictated by the combination of the worst conflicting movements. For example, while the intersection of Kuebler Boulevard/Commercial Street has a higher average delay than Kuebler Boulevard/Battle Creek Road, the Commercial Street intersection has relatively balanced conflicting movements where no one set of specific movements is detrimentally worse than the others, resulting in a lower volume-to-capacity ratio.

TABLE 2: EXISTING 2022 STUDY INTERSECTION OPERATIONS (WEEKDAY PM PEAK HOUR)

INTERSECTION	AGENCY	OPERATING STANDARD/ MOBILITY TARGET	WEEKDAY PM PEAK HOUR		
			V/C	DELAY	LOS
SIGNALIZED					
KUEBLER BLVD/ COMMERCIAL ST	City of Salem	LOS E v/c ≤ 0.90	0.88	46.4	D
KUEBLER BLVD/ BATTLE CREEK RD	City of Salem	LOS E v/c ≤ 0.90	0.91	34.3	C
KUEBLER BLVD/ 27 TH AVE	City of Salem	LOS E v/c ≤ 0.90	0.82	34.3	C
KUEBLER BLVD/ I-5 SB RAMPS	ODOT	v/c ≤ 0.85	0.65	10.3	B
KUEBLER BLVD/ I-5 NB RAMPS	ODOT	v/c ≤ 0.85	0.41	3.3	A
KUEBLER BLVD/ 36 TH AVE	City of Salem	LOS E v/c ≤ 0.90	0.78	19.2	B
BATTLE CREEK RD/ BOONE RD	City of Salem	LOS E v/c ≤ 0.90	0.60	23.4	C
ALL-WAY STOP-CONTROLLED					
BOONE RD/ 27TH AVE	City of Salem	LOS E	0.19 (SB)	7.9	A
ROUNABOUT					
27 TH AVE/PROJECT SITE ACCESS	City of Salem	LOS E v/c ≤ 0.90	0.44 (EB)	6.1	A
Signalized Intersections: v/c = Volume-to-Capacity Ratio of Intersection Delay = Average Stopped Delay per Vehicle (sec) LOS = Level of Service of Intersection		All-Way Stop-Controlled & Roundabout Intersections: v/c = Volume-to-Capacity Ratio of Worst Movement (Approach) Delay = Average Stopped Delay per Vehicle (sec) LOS = Level of Service of Intersection			
<u>Bold/Highlighted:</u> Intersection fails to meet operating standards or mobility targets.					

CRASH ANALYSIS

The most recent five years (2016-2020) of available crash data for the study area was obtained from the ODOT crash database and was used to evaluate the safety performance of the study intersections. The new roundabout along 27th Avenue was excluded as it was constructed after the most recent available crash data. A total of 267 crashes occurred at the eight study intersections. All crash data is provided in the appendix.

The two primary types of crashes were rear-end crashes (177 crashes, 66% of total) and turning movement crashes (56 crashes, 21% of total). The most common crash causes were 'failing to avoid vehicle ahead' (46%) and 'did not yield right-of-way' (13%). There were no fatalities, but there were five serious injury crashes. And there were no bicycle crashes, but there were three pedestrian crashes.

CRASH RATES

The total number of crashes observed at an intersection is typically related to the volume of traffic traveling through said intersection. Because of this relationship, a commonly used measure to evaluate the safety performance of an intersection is the intersection crash rate, which is the number of crashes per year per million entering vehicles (MEV).

ODOT has developed a list of statewide comparison crash rates which represent the expected crash rate for different types of intersections across the state. If an observed crash rate is higher than the corresponding ODOT statewide comparison crash rate, this would indicate a potential safety concern and would warrant additional safety investigation. Table 3 shows the crash rates for each study intersection.

TABLE 3: INTERSECTION CRASH RATES (2016 - 2020)

INTERSECTION	AADT	TOTAL	CRASH SEVERITY					OBSERVED CRASH RATE	STATEWIDE COMPARISON CRASH RATE
			FATAL	SERIOUS INJURY	MINOR INJURY	POSSIBLE INJURY	PDO		
KUEBLER BLVD/ COMMERCIAL ST	49,100	91	-	1	6	42	42	1.016	0.860
KUEBLER BLVD/ BATTLE CREEK RD	44,900	45	-	1	7	23	14	0.549	0.860
KUEBLER BLVD/ 27 TH AVE	39,700	21	-	-	4	10	7	0.290	0.860
KUEBLER BLVD/ I-5 SB RAMPS	42,800	30	-	-	4	12	14	0.384	0.509
KUEBLER BLVD/ I-5 NB RAMPS	31,800	21	-	-	1	10	10	0.362	0.509
KUEBLER BLVD/ 36 TH AVE	26,300	40	-	-	9	14	17	0.833	0.860
BATTLE CREEK RD/ BOONE RD	12,200	18	-	3	3	4	8	0.808	0.408
27 TH AVE/ BOONE RD	2,600	1	-	-	-	-	1	0.211	0.408

Bold/Highlighted: The observed crash rate is higher than the critical crash rate.

As shown, the Kuebler Boulevard/Commercial Street and Battle Creek Road/Boone Road intersections have observed crash rates above their respective reference population crash rates. However, these crashes only reflect data from 2016-2020 and do not account for all recent intersection upgrades. As the below recent projects are expected to reduce the likelihood of crashes, no additional safety improvements are recommended at this time.

- The Kuebler Boulevard/Commercial Street intersection received signal visibility safety upgrades in the middle of the crash data timeframe and then Red-Light Running cameras were installed in 2020.
- The Battle Creek Road/Boone Road intersection was converted from two-way stop-controlled to a traffic signal in 2022 prior to the opening of Costco, which is not reflected in the crash data timeframe.

SAFETY PRIORITY INDEX SYSTEM (SPIS)

The Safety Priority Index System (SPIS) is a ranking system developed by ODOT to identify potential safety concerns on state highways. SPIS scores are developed based upon crash frequency, crash severity, and traffic volume for a 0.10 mile or variable length segment along the state highway over a rolling three-year window (i.e., every year it is updated with the most recent three years). Based on the 2020 SPIS data, which includes crash data from 2017 to 2019, there are four SPIS locations at or near the study intersections listed below:

- Kuebler Boulevard/Commercial Street Intersection – Top 5%
- Kuebler Boulevard/Battle Creek Road Intersection – Top 10%
- Kuebler Boulevard/27th Avenue Intersection – Top 10%
- Kuebler Boulevard/36th Avenue Intersection – Top 10%

FUTURE 2037 CONDITIONS

This chapter reviews the impacts that the proposed zone change would have on the City of Salem study area transportation system. This section contains information on the anticipated background growth, project trip generation, trip distribution, and future 2037 traffic operations for the worst-case scenario given the current zoning and proposed development.

BACKGROUND GROWTH

Future background growth projections included both regional growth and growth from specific in-process developments. After accounting for the specific in-process developments, a conservative annual background growth rate of 1.5% was applied to the traffic counts.

The overall regional growth was first estimated using the Salem-Keizer Area Transportation Study (SKATS) travel demand model.⁷ The existing 2017 and future 2043 model evaluation yielded an average annual growth rate of 2% per year along Kuebler Boulevard between Commercial Street and 36th Avenue. This rate includes the anticipated traffic from multiple in-process developments in the area.

The in-process developments within the project analysis area have been approved by the City of Salem and are anticipated to be completed by the 2037 horizon year. These developments include the following:

- 27th Avenue Apartments: 96 multi-family apartment units located on the northwest corner of 27th Avenue and Marietta Street
- Coburn Grand View: 225 single family home lots to be built in 3 phases east of Battle Creek Rd and west of Strong Rd in Salem
- Coburn Terrance Subdivision: 29 single-family homes located on the southwest corner of 27th Avenue and Strong Road
- Four Creeks Subdivision: 227 single-family homes located on the northwest corner of Landau Street and Battle Creek Road
- Landau Heights Subdivision: 91 single-family homes located on the southwest corner of Landau Street and Battle Creek Road
- The Reserve at Battle Creek Subdivision: 63 single-family homes located south of Landau Street and east of Battle Creek Road
- Woodscape Glen Housing: 184 multi-family apartment units located at 5205 Battle Creek Road
- Kuebler Gateway Shopping Center: Multiple retail pads located on the northeast corner of Kuebler Boulevard and 27th Avenue

These developments have documented trip generation estimates that have been approved by the City and are more accurate than the regional SKATS model. The trip generation estimates for each in-process development (included in the appendix) were manually included in the background

⁷ Link Volume Analysis, 2043 and 2017 SKATS travel demand models.

growth in the study area. To avoid double-counting these in-process developments, the 2% annual growth rate obtained from the SKATS model was reduced to a conservative 1.5% annual growth rate.

FUTURE TRANSPORTATION SYSTEM IMPROVEMENTS

Within the study area, there are no future transportation system improvements conditioned on any of the above listed in-process developments.

CURRENT AND PROPOSED ZONING TRIP GENERATION

A zone change is proposed at the 24.66-acre subject parcel from Residential Agriculture (RA) zoning to Mixed-Use II (MU-II) and Mixed-Use III (MU-III) zoning. The parcel is located on the southeast corner of the Kuebler Boulevard and 27th Avenue intersection.

Trip generation rates are used to estimate the trip generation of a land use, typically based on its building size. These rates are used to estimate the difference in trip generation rates between the current and proposed zoning. Trip generation rates are provided by the Institute of Transportation Engineers (ITE) in the Trip Generation Manual⁸ and are calculated based on trip data collected at similar land uses.

ALLOWABLE LAND USES PER CITY ZONING CODE

A list of the potential land uses allowed in the City of Salem Development Code per lane use were explored. Table 4 shows the average Weekday and PM peak hour trip generation rates for the allowable land uses for the current and proposed zoning.

REASONABLE WORST-CASE LAND USES

To determine the reasonable worst-case land use trip generation for both zonings, the parcel size and developable building footprint must be determined. The size of the subject parcel is 24.66 acres and typically 30% of the total parcel size is assumed to be developable for buildings. This equates to a maximum building footprint square footage of approximately 322 KSF on the entire property. The rest of the parcel (70%) is assumed to be parking lots, sidewalks, internal roadways, and landscaping.

Because the parcel is so large, the worst-case land use will be a combination of multiple allowable land use types. To determine a reasonable building footprint in square feet of each land use type, the City of Salem development code and ITE Trip Generation Manual are referenced for standards or typical sizes for that land use. Actual assumed square footage for each land use type for the reasonable worst-case development scenario are shown in Table 5.

⁸ *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers, 2021.

TABLE 4: ALLOWABLE LAND USES UNDER CURRENT AND PROPOSED ZONING

LAND USE	ITE DESCRIPTION (CODE)	UNITS ^a	PM PEAK RATE	DAILY RATE	APPLICABLE ZONING
CURRENT ZONING (RA)					
SINGLE FAMILY	Single Family Detached (210)	DU	0.99	9.44	RA
DAY CARE CENTER	Day Care Center (565)	KSF	11.12	47.62	RA
PROPOSED ZONING (MU-II and MU-III)					
MULTI-FAMILY HOUSING	Multi-Family Housing (220)	DU	0.51	6.74	MU-II, MU-III
EATING/DRINKING ESTABLISHMENT	Sit-Down Restaurant (932)	KSF	9.77	112.18	MU-II, MU-III
EATING/DRINKING ESTABLISHMENT	Fast-Food Restaurant with Drive-Through Window (934)	KSF	33.0	471.0	MU-II
EATING/DRINKING ESTABLISHMENT	Coffee/Donut Shop with Drive-Through Window (937)	KSF	43.50	820.5	MU-II, MU-III
GAS STATION	Gas Station/Convenience Store (945)	Fuel Stations	13.99	205.35	MU-II, MU-III
DAY CARE CENTER	Day Care (565)	KSF	11.12	47.62	MU-II, MU-III
GENERAL OFFICE	Office (710)	KSF	1.15	9.74	MU-II, MU-III
OUTPATIENT MEDICAL SERVICES	Medical-Dental Office (720)	KSF	3.46	34.80	MU-II, MU-III
RETAIL SALES	Shopping Center (820)	KSF	3.81	37.75	MU-II, MU-III
RETAIL SALES	Supermarket (850)	KSF	9.24	106.78	MU-II, MU-III
BANK SERVICES	Drive-In Bank (912)	KSF	20.50	112.3	MU-II, MU-III
SHORT-TERM COMMERCIAL LODGING	Hotel (310)	Rooms	0.59	7.99	MU-II, MU-III

^a DU = dwelling unit, KSF = 1,000 square feet

TABLE 5: REASONABLE WORST CASE DEVELOPMENT CONSTRAINTS

LAND USE	ITE DESCRIPTION (CODE)	CONSTRAINTS ^a	MAXIMUM DEVELOPABLE SIZE OF LAND USE
CURRENT ZONING (RESIDENTIAL AGRICULTURE - RA)			
SINGLE FAMILY	Single Family Detached (210)	Maximum Density 10 DU/acre (City Code)	182 DU ^b
DAY CARE CENTER	Day Care Center (565)	Maximum 10 KSF (ITE, other local daycares)	10 KSF
PROPOSED ZONING (MU-II and MU-III)			
EATING/DRINKING ESTABLISHMENT	Sit-Down Restaurant (932)	Maximum 11 KSF (ITE)	11 KSF
EATING/DRINKING ESTABLISHMENT	Fast-Food Restaurant with Drive-Through Window (934)	Maximum 7 KSF (ITE)	7 KSF
EATING/DRINKING ESTABLISHMENT	Coffee/Donut Shop with Drive-Through Window (937)	Maximum 2.5 KSF (ITE)	2.5 KSF
GAS STATION	Gas Station/Convenience Store (945)	Maximum of 24 Fueling Stations (ITE)	24 Fueling Stations
DAY CARE CENTER	Day Care (565)	Maximum 10 KSF (ITE, other local daycares)	10 KSF
GENERAL OFFICE	Office (710)	Maximum 30% Building Coverage	322 KSF
OUTPATIENT MEDICAL SERVICES	Medical-Dental Office (720)	Maximum of 92 KSF (ITE)	92 KSF
RETAIL SALES	Shopping Center (820)	Maximum 30% Lot Coverage	322 KSF
RETAIL SALES	Supermarket (850)	Maximum 55 KSF (ITE)	55 KSF
BANK SERVICES	Drive-In Bank (912)	Maximum 15 KSF (ITE)	15 KSF
SHORT-TERM COMMERCIAL LODGING	Hotel (310)	Maximum 250 Rooms (ITE)	250 Rooms

^a DU = dwelling unit, KSF = 1,000 square feet

^b Conservatively assumes one dwelling unit per lot; does not account for recent middle housing legislation which allows for higher density development on parcels zones for single family.

Based on the information presented, the reasonable worst-case scenario for the current zoning would likely be a combination of a day care center and single-family housing. The reasonable worst-case scenario for the proposed zoning will be a mix of the commercial, office, and retail land uses shown.

WORST-CASE TRIP GENERATION INCLUDING INTERNAL AND PASS-BY TRIPS

A grouping of reasonable worst-case land uses was determined for the site under the current and proposed zoning, and trip generation estimates were created.

Internal trip reductions were first applied to the restaurants, convenience market, supermarket, and shopping center land uses. The internal trip reductions are calculated using methodology from the current ITE Trip Generation Handbook⁹ and are applied prior to the pass-by trip reduction.

Some of the proposed land uses (commercial and retail) provides the opportunity for pass-by vehicle trips coming from and returning to the adjacent traffic stream (i.e., Kuebler Boulevard) that would not create new trips within the study area. To estimate pass-by trips, the methodology outlined in the current ITE Trip Generation Handbook was used. Pass-by trips for the site would depart from Kuebler Boulevard and enter and exit the site via 27th Avenue SE and return to Kuebler Boulevard. These trips result in new driveway turning movement trips only and would not increase the total traffic to Kuebler Boulevard. The pass-by rates are provided in the ITE Trip Generation Handbook and are shown in the table below.

The proposed zone change (based on a reasonable worst-case scenario) is estimated to generate 12,010 net new daily trips including 1,115 (519 in, 596 out) net new PM peak hour trips (or 25,348 total daily trips, before applying reductions for internal, pass-by, and current zoning trips). Table 6 summarizes the daily and PM peak hour vehicle trip generation estimates, which were used for intersection operations analysis.

TABLE 6: WORST-CASE TRIP GENERATION SUMMARY FOR CURRENT AND PROPOSED LAND USE

LAND USE	ITE DESCRIPTION (CODE)	SIZE ^A	PM TRIPS			DAILY TRIPS
			IN	OUT	TOTAL	
CURRENT ZONING (RESIDENTIAL AGRICULTURE - RA)						
SINGLE FAMILY	Single Family Detached (210)	182 units	109	65	174	1,751
DAYCARE	Day Care Center (565)	10 KSF	52	59	111	476
Current Zoning (RA) Total Trips			161	124	285	2,227
PROPOSED ZONING (MU-II and MU-III)						
EATING/DRINKING ESTABLISHMENT	Sit Down Restaurant (932)	8 KSF	44	28	72	858
	<i>Internal Reduction (45%)</i>		-20	-13	-33	-386
	<i>Pass-By Reduction (43%)</i>		-10	-6	-16	-203

⁹ *Trip Generation Handbook 3rd Edition*, Institute of Transportation Engineers.

LAND USE	ITE DESCRIPTION (CODE)	SIZE ^A	PM TRIPS			DAILY TRIPS
			IN	OUT	TOTAL	
EATING/DRINKING ESTABLISHMENT	Fast-Food Restaurant with Drive-Through Window (934)	5 KSF	86	79	165	2,337
	<i>Internal Reduction (45%)</i>		-39	-36	-75	-1052
	<i>Pass-By Reduction (50%)</i>		-24	-22	-46	-643
EATING/DRINKING ESTABLISHMENT	Fast-Food Restaurant with Drive-Through Window (934)	5 KSF	86	79	165	2,337
	<i>Internal Reduction (45%)</i>		-39	-36	-75	-1052
	<i>Pass-By Reduction (50%)</i>		-24	-22	-46	-643
EATING/DRINKING ESTABLISHMENT	Coffee/Donut Shop with Drive-Through Window (937)	2 KSF	39	39	78	1,067
	<i>Internal Reduction (45%)</i>		-18	-18	-36	-480
	<i>Pass-By Reduction (83%)</i>		-17	-17	-34	-487
RETAIL	Shopping Plaza (821)	81 KSF	351	380	731	7,654
	<i>Internal Reduction (15%)</i>		-53	-57	-110	-1,148
	<i>Pass-By Reduction (34%)</i>		-101	-110	-211	-2,212
RETAIL	Shopping Plaza (821)	88 KSF	381	414	795	8,315
	<i>Internal Reduction (15%)</i>		-57	-62	-119	-1,247
	<i>Pass-By Reduction (34%)</i>		-110	-120	-230	-2,403
HOTEL	Hotel (310)	124 Rooms	37	36	73	991
	<i>Internal Reduction (56%)</i>		-21	-20	-41	-555
OFFICE	Office (710)	55 KSF	14	66	80	597
	<i>Internal Reduction (38%)</i>		-6	-25	-31	-227
OFFICE	Medical-Dental Office (720)	20 KSF	23	56	79	720
	<i>Internal Reduction (38%)</i>		-9	-21	-30	-274
APARTMENTS	Multifamily Housing (220)	70 DU	22	13	35	472
	<i>Internal Reduction (69%)</i>		-16	-9	-25	-326
Proposed Zoning (MU-II & MU-III) Net New Primary Trips			519	596	1,115	12,010
NET DIFFERENCE (Proposed Zoning – Current Zoning)			+358	+472	+830	+9,783

^AKSF = 1,000 square feet

TRIP DISTRIBUTION

Trip distribution provides an estimation of where project trips would be coming from and going to. It is given as a percentage at key gateways to the study area and is used to route project trips through the study intersections. The estimated trip distribution percentages were determined from the existing traffic counts and the future 2043 SKATS travel demand model. The given distributions at the study intersections for the current and proposed zoning are shown on Figure 4.

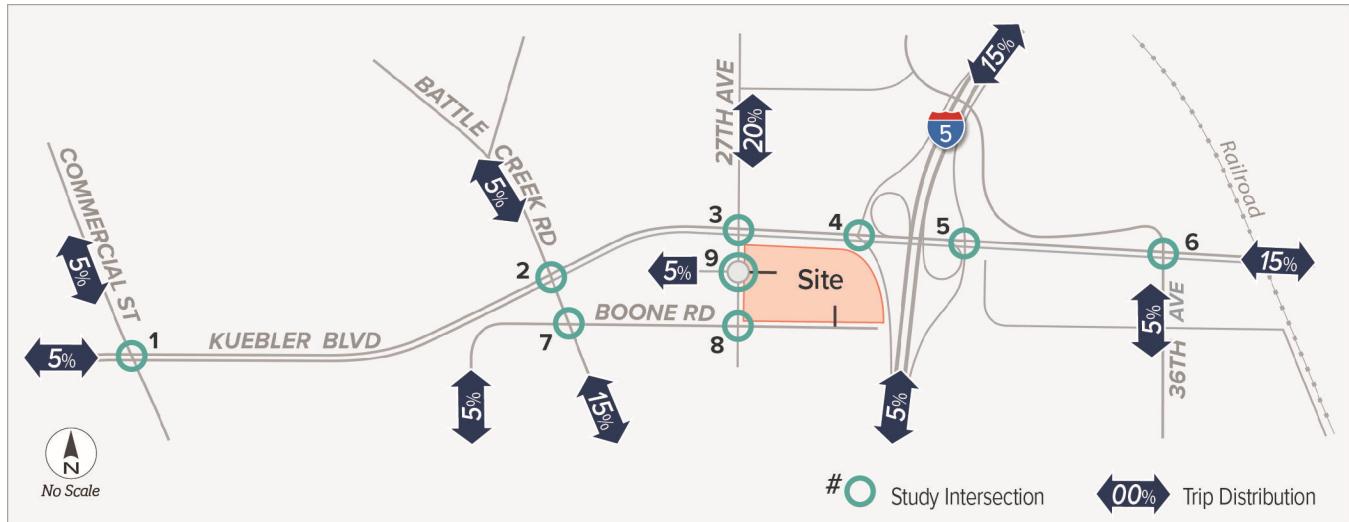


FIGURE 3: TRIP DISTRIBUTION

As shown, 20% of project trips are estimated to travel to/from the north via 27th Avenue, which is consistent with the SKATS model projections but is much higher than the existing traffic counts. This notable change is due to the expected commercial and residential development north of Kuebler Boulevard that will result in higher volumes of through traffic on 27th Avenue in the future.

Figure 4 and Figure 5 provide the trip generation and distribution of the project trips under the current and proposed zoning conditions.

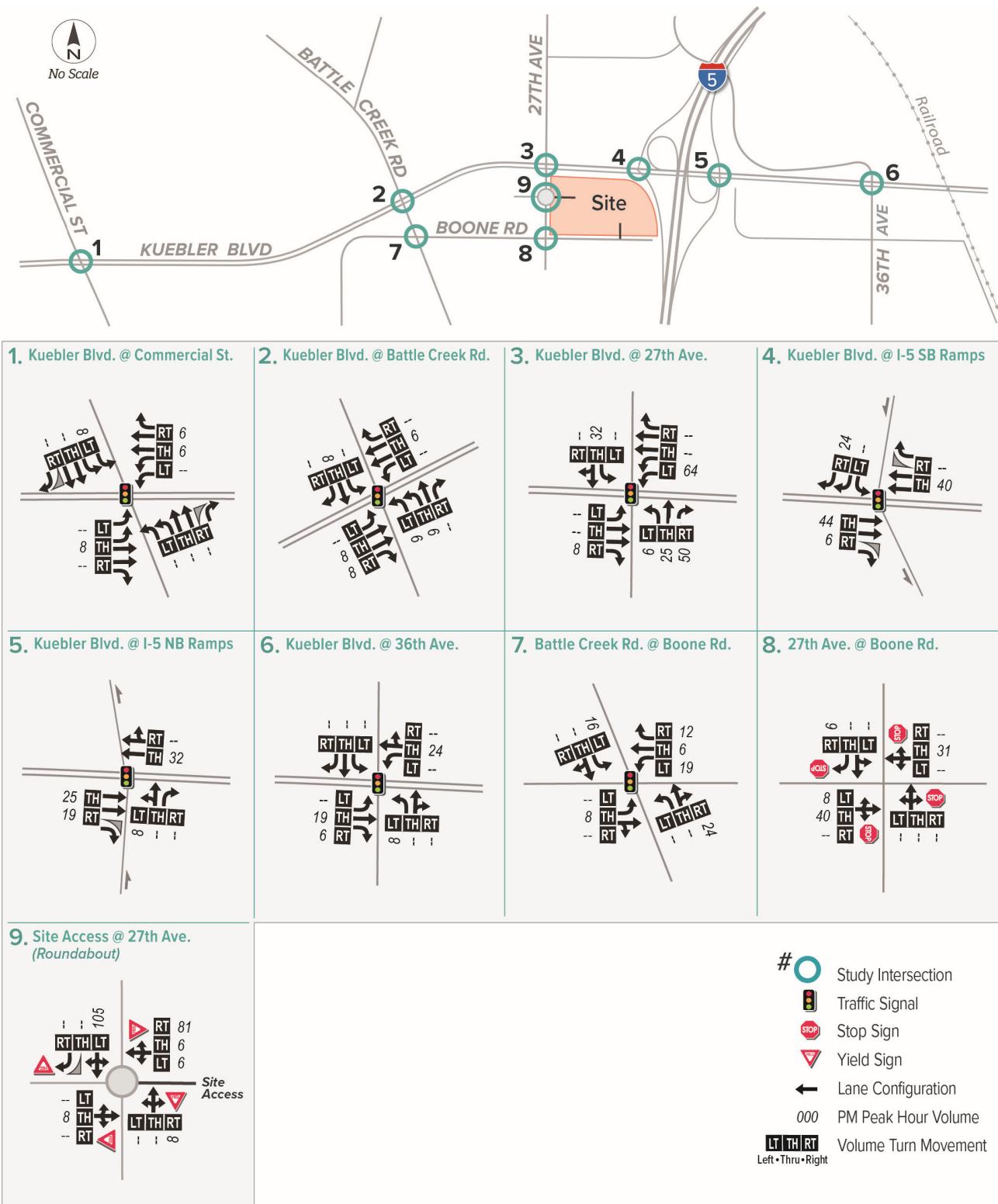


FIGURE 4: PROJECT TRIPS – CURRENT ZONING

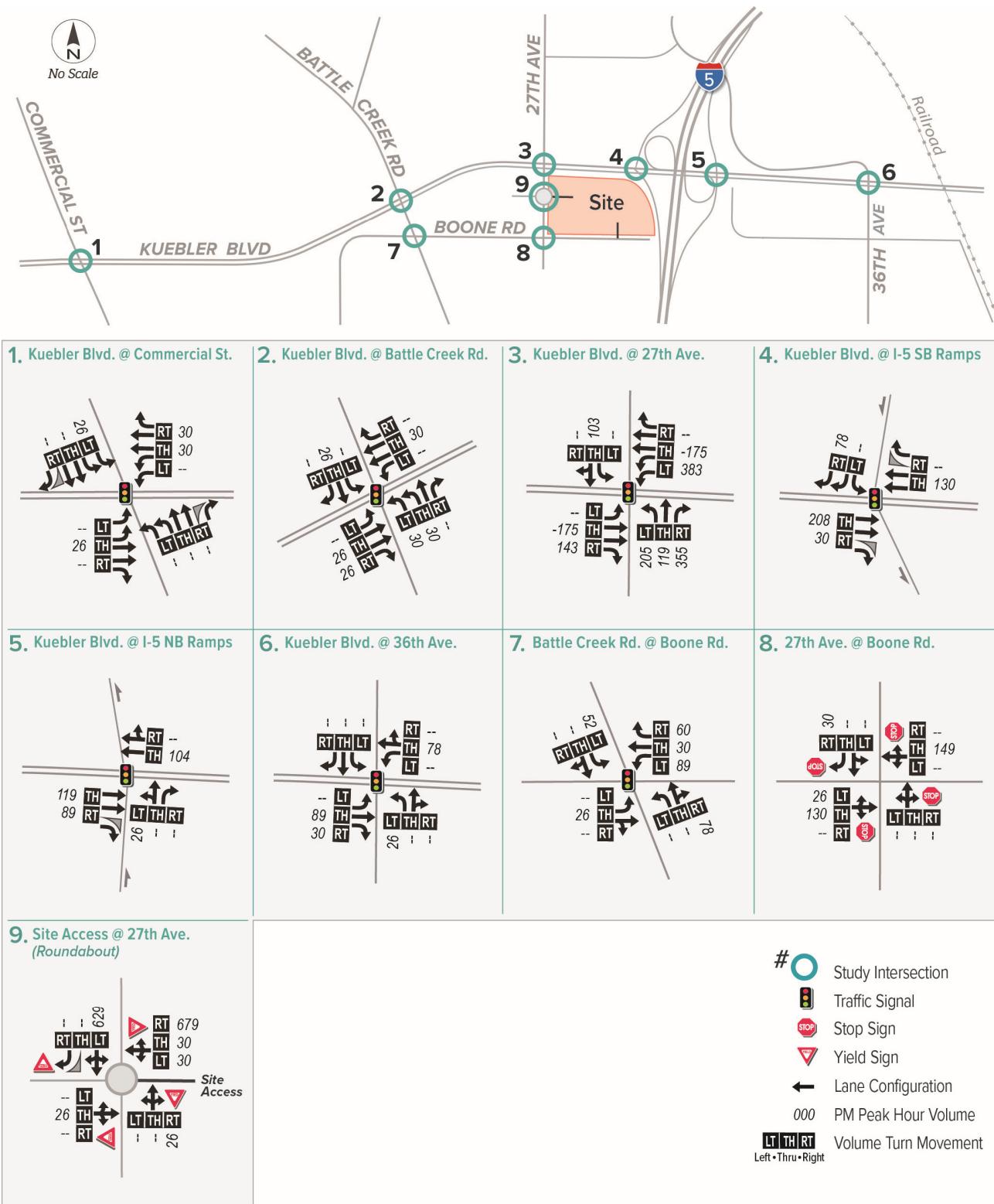


FIGURE 5: PROJECT TRIPS – PROPOSED ZONING

FUTURE 2037 TRAFFIC VOLUMES AND OPERATIONS

An analysis of the 2037 future intersection operations was performed for the study intersections. Two future analysis scenarios were evaluated: 2037 Current Zoning and 2037 Proposed Zoning.

Both scenarios include the background traffic growth between 2022 and 2037 (assumed to grow at a rate of 1.5% per year) and the trip generation for the in-process developments.

The 2037 Current Zoning scenario also contains the trip generation for the single-family homes and day care as shown in Table 6. And the 2037 Proposed Zoning scenario contains the trip generation for the various commercial and retail land uses as shown in Table 6. The intersection turning movement volumes for both scenarios are shown in Figure 6 and Figure 7.

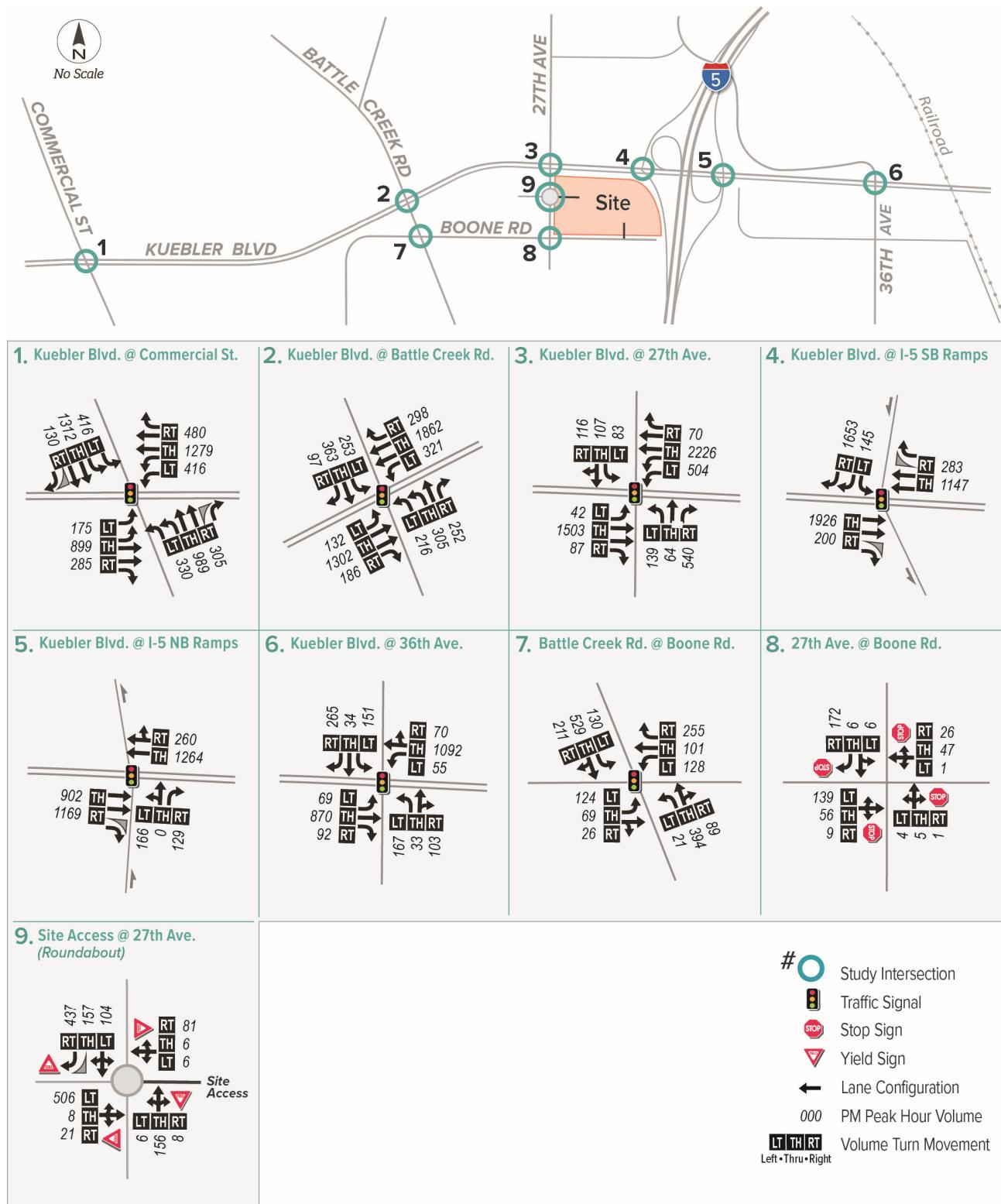


FIGURE 6: FUTURE 2037 TRAFFIC VOLUMES – CURRENT ZONING

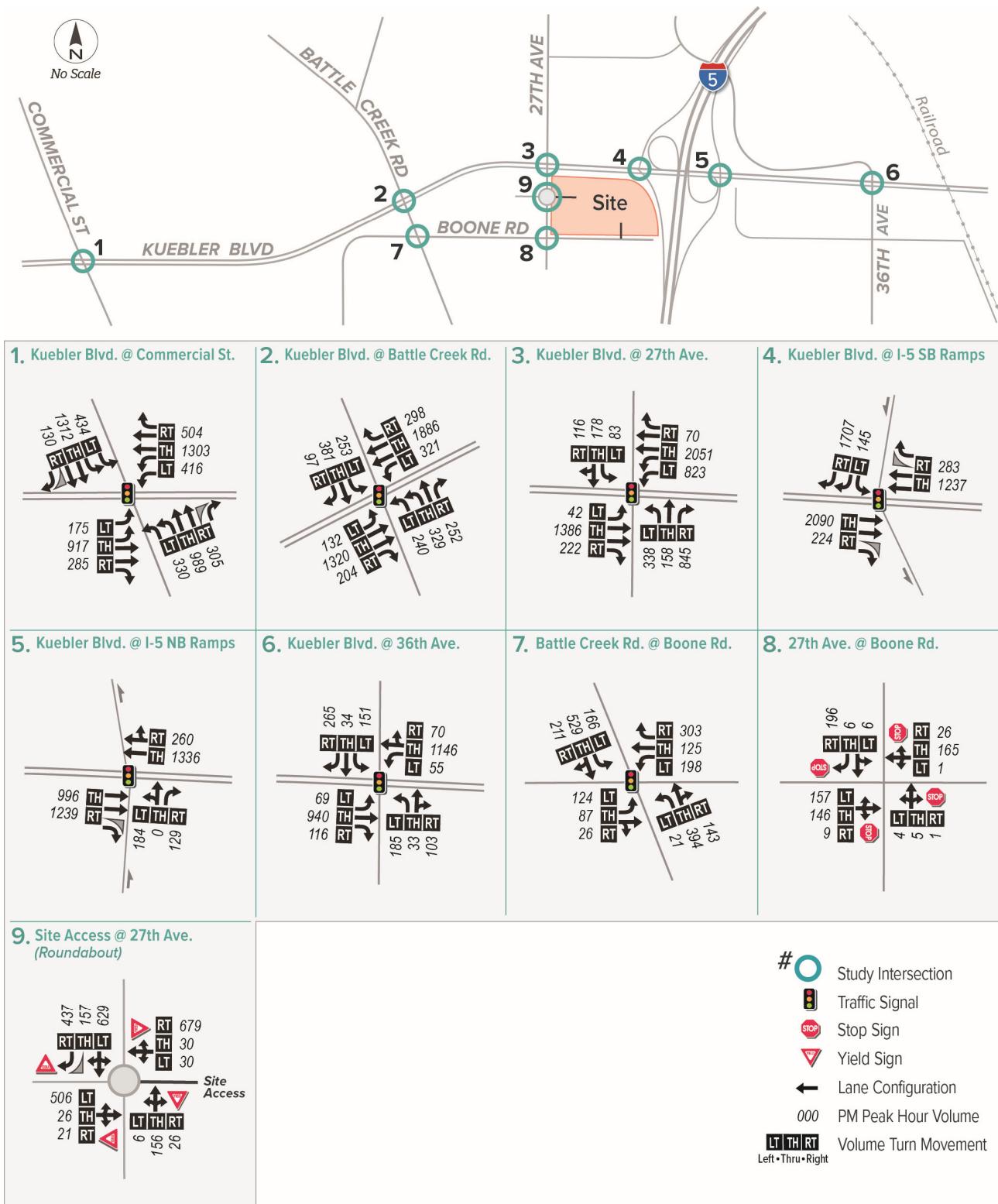


FIGURE 7: FUTURE 2037 TRAFFIC VOLUMES – PROPOSED ZONING

FUTURE 2037 OPERATING CONDITIONS

Table 7 shows the intersection operations for the study intersections in the PM peak hour for the 2037 Current and Proposed Zoning scenarios (both scenarios include all background growth, in-process developments, and planned improvements).

As shown, four of the nine intersections fail to meet the operating standard or mobility target under the 2037 Current Zoning scenario. Those intersections are:

- Kuebler Boulevard/Commercial Street
- Kuebler Boulevard/Battle Creek Road
- Kuebler Boulevard/27th Avenue
- Kuebler Boulevard/36th Avenue

Under the 2037 Proposed Zoning scenario, five of the nine intersections fail to meet the operating standard or mobility target. Those intersections are:

- Kuebler Boulevard/Commercial Street
- Kuebler Boulevard/Battle Creek Road
- Kuebler Boulevard/27th Avenue
- Kuebler Boulevard/36th Avenue
- Site Access on 27th Avenue

These locations will be evaluated against the Transportation Planning Rule (TPR) criteria to determine if the proposed zone change will have a significant effect on the intersections. Mitigations may be required at locations that are determined to be significantly affected.

TABLE 7: FUTURE 2037 STUDY INTERSECTION OPERATIONS (PM PEAK HOUR)

INTERSECTION	AGENCY	OPERATING STANDARD/ MOBILITY TARGET	CURRENT ZONING			PROPOSED ZONING		
			V/C	DELAY	LOS	V/C	DELAY	LOS
SIGNALIZED								
KUEBLER BLVD/ COMMERCIAL ST	City of Salem	LOS E v/c ≤ 0.90	1.10	76.7	F	1.11	78.9	F
KUEBLER BLVD/ BATTLE CREEK RD	City of Salem	LOS E v/c ≤ 0.90	1.19	88.1	F	1.21	94.0	F
KUEBLER BLVD/ 27 TH AVE	City of Salem	LOS E v/c ≤ 0.90	1.27	99.9	F	1.57	170.9	F
KUEBLER BLVD/ I-5 SB RAMPS	ODOT	v/c ≤ 0.85	0.82	11.5	B	0.85	12.7	B
KUEBLER BLVD/ I-5 NB RAMPS	ODOT	v/c ≤ 0.85	0.54	3.8	A	0.58	3.9	A
KUEBLER BLVD/ 36 TH AVE	City of Salem	LOS E v/c ≤ 0.90	1.08	38.8	D	1.13	46.2	D
BATTLE CREEK RD/ BOONE RD	City of Salem	LOS E v/c ≤ 0.90	0.71	18.4	B	0.76	21.5	C
ALL-WAY STOP-CONTROLLED								
27TH AVE/ BOONE RD	City of Salem	LOS E	0.27 (EB)	8.7	A	0.44 (EB)	10.6	B
ROUNABOUT								
27TH AVENUE SE/ PROJECT SITE ACCESS	City of Salem	LOS E v/c ≤ 0.90	0.55 (EB)	7.4	A	1.16 (WB)	49.4	E

Signalized Intersections:

v/c = Volume-to-Capacity Ratio of Intersection
 Delay = Average Stopped Delay per Vehicle (sec)
 LOS = Level of Service of Intersection

All-Way Stop-Controlled & Roundabout Intersections:

v/c = Volume-to-Capacity Ratio of Worst Movement (Approach)
 Delay = Average Stopped Delay per Vehicle (sec)
 LOS = Level of Service of Intersection

Bold/Highlighted: Intersection fails to meet operating standards or mobility targets.

REQUIRED MITIGATIONS AND TPR REVIEW

This section covers the requirements of the Transportation Planning Rule (TPR) and the necessary mitigation strategies for each of the study intersections.

TRANSPORTATION PLANNING RULE REVIEW

To preserve the function of the study area roadways and to provide safe access to the proposed development, it is recommended that a series of transportation mitigation measures be performed. These measures should also significantly reduce any significant transportation impacts resulting from the proposed zone change from Residential Agriculture (RA) zoning to a combination of Mixed-Use II (MU-II) and Mixed-Use III (MU-III) zoning.

TPR MITIGATION REQUIREMENTS

Transportation system planning in Oregon is guided and enforced by Statewide Planning Goal 12: Transportation. The Transportation Planning Rule (TPR), OAR 660-012, describes how to implement Planning Goal 12 in all communities throughout the State. By implementing Planning Goal 12, the TPR promotes the development of safe, convenient, and economic transportation systems that are designed to reduce reliance on the automobile. OAR 660-012-0060 of the TPR addresses amendments to plans and land use regulations and includes measures to be taken to ensure allowed land uses are consistent with the identified function and capacity of existing and planned transportation facilities. This rule includes criteria for identifying significant effects of plan or land use regulation amendments on transportation facilities, actions to be taken when a significant effect would occur, identification of planned facilities, and coordination with transportation facility providers.

The transportation impact analysis in this report indicates that five facilities in the surrounding transportation network will be significantly affected by the proposed change in zoning. See the list below:

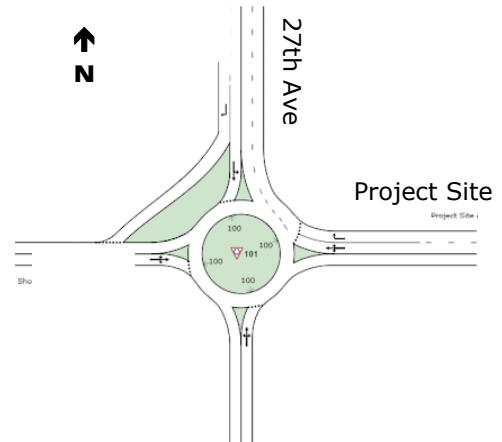
- Kuebler Boulevard/Commercial Street
- Kuebler Boulevard/Battle Creek Road
- Kuebler Boulevard/27th Avenue
- Kuebler Boulevard/36th Avenue
- Site Access/27th Avenue

The intersections that are significantly impacted must be mitigated to meet either the greater of the operating standard/mobility target or the v/c ratio of the equivalent 2037 current zoning scenario

INTERSECTION OPERATIONS MITIGATIONS

The transportation analysis documented in this report indicates that five of the following study intersections will be significantly impacted by the proposed zone change as defined by the TPR Guidelines. Therefore, mitigation improvements were identified to address the significant impacts to the local transportation system. These are described below as well as planning level cost estimates.

- **Kuebler Boulevard/Commercial Street:** Implement signal timing improvements/optimizations, such as increasing the cycle length by five seconds.
- **Kuebler Boulevard/Battle Creek Road:** Install dual southbound left turn lanes with a storage length of 280 ft each to match the existing left turn lane.
- **Kuebler Boulevard/27th Avenue:** Install a second northbound right turn lane and second northbound left turn lane with storage lengths that match the existing turn lanes.
- **Kuebler Boulevard/36th Avenue:** Install a separate westbound right turn lane with a storage length of 200 ft to match the existing left turn lane.
- **Site Access/27th Avenue:** Add a dedicated westbound right turn lane (see figure above).



The mitigation strategies must mitigate project impacts to meet either the greater of the operating standard/mobility target or the v/c ratio of the equivalent 2037 Current Zoning scenario. Table 8 shows the required mitigations for the zone change.

TABLE 8: STUDY INTERSECTION OPERATIONS WITH MITIGATIONS (2037)

INTERSECTION	OPERATIONS STANDARDS FOR MITIGATION	MITIGATION	PM PEAK HOUR		
			V/C	DELAY	LOS
SIGNALIZED					
KUEBLER BLVD/ BATTLE CREEK RD	1.19 & LOS F	Dual SBL	1.12	87.1	F
KUEBLER BLVD/ 27 TH AVE	1.27 & LOS F	Dual NBR and Dual NBL	1.18	106.8	F
KUEBLER BLVD/ 36 TH AVE	1.08 & LOS E	Separate WBR lane, requires widening east leg of intersection	1.08	36.4	D
ROUNABOUT					
27TH ST/ SITE ACCESS	LOS E v/c ≤ 0.90	Add a second WBR lane	0.86 (EB)	14.3	B

Signalized Intersections:

v/c = Volume-to-Capacity Ratio of Intersection
Delay = Average Stopped Delay per Vehicle (sec)
LOS = Level of Service of Intersection

Roundabout Intersections:

v/c = Volume-to-Capacity Ratio of Worst Movement (Approach)
Delay = Average Approach Delay of Intersection (sec)
LOS = Level of Service of Intersection

MITIGATION PLANNING LEVEL COST ESTIMATES

Planning level cost estimates were generated to identify total proposed mitigation costs. These costs were provided by DKS and Westech Engineering. Table 9 identifies the estimated cost per intersection.

TABLE 9: MITIGATION COST ESTIMATES

INTERSECTION	MITIGATION	PLANNING LEVEL COST ESTIMATE
Kuebler Blvd/Battle Creek Road	Install dual SBL turn lanes	\$1,200,000
Kuebler Blvd/27 th Ave	Install dual NBR and dual NBL turn lanes, provide protected phasing for NBL and SBL, extend WBL turn lane	\$1,700,000
Kuebler Blvd/36 th Ave	Install dedicated WBR lane	\$500,000
	<i>Subtotal</i>	\$3,400,000
27th Ave/Site Access	Install WBR slip lane to the roundabout	\$600,000
	TOTAL	\$4,000,000

Per TPR requirements, all mitigations shall be constructed prior to occupancy.

TPR FINDINGS

With the mitigations outlined above, the proposed zone change will not degrade the transportation system and all TPR criteria outlined in OAR 660-012 are satisfied.

SUPPLEMENTAL ANALYSIS

The previous sections of this report present the analysis and findings pertinent to the statewide transportation planning rule (TPR) criteria that guide the proposed comprehensive plan map amendment and zone change. At the request of City staff, DKS conducted the following additional analysis related to queuing and weaving in the vicinity of the project site.

WEEKDAY PM PEAK HOUR WEAVING ANALYSIS

Weaving analysis on Kuebler Boulevard between 27th Avenue and the I-5 Southbound Ramps was conducted under the 2037 Proposed Zoning with Mitigation scenario to determine the segment level of service. Currently, vehicles destined for the I-5 southbound on-ramp or I-5 northbound on-ramp must be in the outside (south lane) of the two eastbound lanes on Kuebler Boulevard to access the interchange on ramps.

For vehicles on 27th Avenue leaving the project site and turning onto Kuebler Boulevard, there will be two northbound right turn lanes that will feed into the two eastbound lanes on Kuebler Boulevard. Guide signage installation is recommended both within the project site and on 27th to direct vehicles to their desired destination (outside right turn lane for vehicles destined for I-5, inside right turn lane for vehicles destined for Mill Creek). However, some vehicle weaving is still likely to occur along the segment between 27th Avenue intersection and the I-5 Southbound Ramp intersection. It is recommended that the developer be responsible for signage maintenance within the site.

The Highway Capacity Manual (6th Edition) freeway weaving analysis was applied to the Kuebler Boulevard segment between 27th Avenue intersection and the I-5 South On-Ramp (815 feet). It was assumed there would be a balanced mix of vehicles entering the segment in the correct lane and those needing to make a lane change. The resulting weaving level of service is LOS C, which indicates there is adequate segment capacity for the estimated traffic volumes and lane changes.

WEAVING SENSITIVITY ANALYSIS

An additional sensitivity analysis was conducted to evaluate a worst-case weaving scenario which conservatively assumed that all vehicles destined for I-5 (northbound or southbound) would need to complete their weaving maneuver before the I-5 South ramp intersection, even though vehicles destined for I-5 North would have an additional 1,000 feet to make necessary lane changes. Additionally, it was assumed that all vehicles already on Kuebler Boulevard destined for I-5 would be required to make at least one lane change and all vehicles turning off 27th and going through the I-5 interchange towards Mill Creek would also be required to make at least one lane change.

Given these parameters, the resulting worst-case weaving level of service on Kuebler Boulevard between the 27th Avenue intersection and the I-5 Southbound On-Ramp (815 feet) is LOS D. Although there is no City of Salem standard for level of service for segments, LOS D is typically considered acceptable in urban areas. There is no indication that even the worst-case weaving on Kuebler Boulevard between 27th Avenue and I-5 will result in unacceptable operations.

WEEKDAY PM PEAK HOUR QUEUING ANALYSIS

A 95th percentile queuing analysis was performed using SimTraffic 10 under 2037 Proposed Zoning with Mitigations conditions during the weekday PM peak hour. The analysis focused on the Kuebler Boulevard/27th Avenue intersection and the roundabout at 27th Avenue/Site Access.

The queueing analysis reported 95th percentile queue lengths. The queue lengths are shown in Table 10 below.

TABLE 10: QUEUE LENGTHS (95TH PERCENTILE)

		2037 CURRENT ZONING			2037 PROPOSED ZONING WITH MITIGATION		
INTERSECTION	MOVEMENT	AVAILABLE STORAGE	95 TH %ILE QUEUE	MOVEMENT	AVAILABLE STORAGE	95 TH %ILE QUEUE	
Kuebler Blvd/ 27 th Ave (Signal)	NB	LT	245 ft ^a	245 ft	NB	Dual LT	245 ft ^a
		THR	320 ft	220 ft		THR	320 ft
		RT	280 ft ^a	350 ft		Dual RT	320 ft
	WB	Dual LT	475 ft	465 ft	WB	Dual LT	475 ft
27 th Ave/ Site Access (Round- about)	WB	LT-THR-RT		-	WB	RT	-
				15 ft		LT-THR-RT	30 ft
	SB	RT	320 ft	45 ft	SB	RT	320 ft
		LT-THR-RT	320 ft	25 ft		LT-THR-RT	70 ft

^a Maximum available storage for any northbound movement on 27th Avenue is approximately 320 feet from the stop bar at Kuebler Boulevard to the crosswalk on the north leg of the roundabout.

Red/Bold = 95th Percentile Queue exceeds the Available Storage

As shown above, the 95th percentile queues at the Kuebler Boulevard/27th Avenue traffic indicate vehicle queuing will exceed available storage for the dual westbound left turn lanes on Kuebler Boulevard under the 2037 proposed zoning scenario.

It is recommended that the applicant extend the westbound dual left turn lanes on Kuebler Boulevard at 27th Avenue to 650 feet to accommodate future vehicle queues turning onto 27th Avenue.

SATURDAY PEAK HOUR INTERSECTION ANALYSIS

TPR evaluations are conducted only for the weekday PM peak hour because comparisons must be made to the City's adopted Transportation System Plan, which only includes weekday PM peak hour analysis. As such, analyses of alternate peak hours or non-weekday traffic conditions have no bearing on TPR findings. However, at the request of City staff, DKS analyzed the vehicle operations (v/c ratio, delay, and LOS) under Year of Opening (2025) Build conditions during the Saturday midday peak hour at two of the study intersections to confirm that the transportation system can accommodate traffic during peak retail operations.

The Year of Opening (2025) volumes were developed using 2022 collected Saturday traffic counts and were grown to 2025 conditions using the same growth rate percentage (1.5%) as the PM peak hour volumes. The site's potential trip generation under the proposed zoning was estimated for the Saturday midday peak hour and added to the background volumes. See Table 11 and Figure 8 for the estimated weekend peak hour trip generation for the site. The site vehicle trips were distributed through the study area using the same percentages as the PM peak hour trips.

TABLE 11: WORST-CASE TRIP GENERATION SUMMARY (SATURDAY PEAK HOUR)

SATURDAY MIDDAY PEAK HOUR TRIPS			
	IN	OUT	TOTAL
Primary Trips	1,329	1,263	2,590
Internal Reduction (Various %)	-423	-397	-820
Pass-By Trip Reductions (Various %)	-298	-290	-588
Net New Project Trips	608	576	1,184

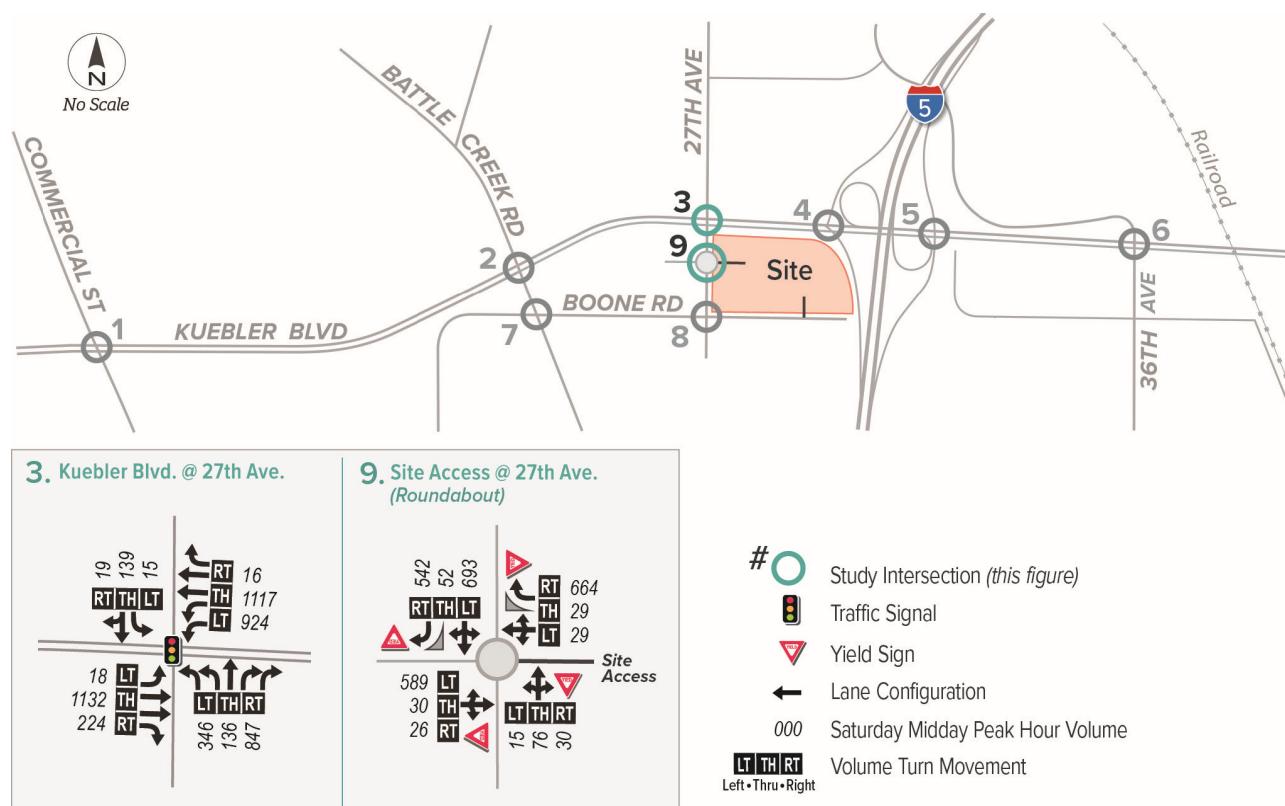


FIGURE 8: FUTURE 2025 SATURDAY MIDDAY PEAK TRAFFIC VOLUMES

For this analysis, the TPR mitigations identified in *Intersection Operations Mitigations* are assumed to be in place at the Kuebler Boulevard/27th Avenue intersection and 27th Avenue/Site Access roundabout. The operations for the Saturday midday peak hour are listed in Table 12. As shown, the intersections meet the City's operating standard.

TABLE 12: FUTURE (2025) BUILD STUDY INTERSECTION OPERATIONS (SATURDAY PEAK HOUR)

INTERSECTION	TRAFFIC CONTROL	OPERATING STANDARD/ MOBILITY TARGET	2025 BUILD WITH TPR MITIGATIONS		
			V/C	DELAY	LOS
KUEBLER BLVD/ 27 TH AVE	Signal	LOS E v/c ≤ 0.90	0.86	73.3	E
27 TH AVE/SITE ACCESS	Roundabout	LOS E	0.82 (EB)	14.4	B
Signalized Intersections: v/c = Volume-to-Capacity Ratio of Intersection Delay = Average Intersection Stopped Delay (sec) LOS = Level of Service of Intersection			Roundabouts: v/c = Volume-to-Capacity Ratio of Worst Movement Delay = Average Intersection Stopped Delay (sec) LOS = Level of Service of Intersection		

SATURDAY PEAK HOUR QUEUING ANALYSIS

A 95th percentile queuing analysis was performed using SimTraffic 10 under 2025 Proposed Zoning with Mitigations conditions during the Saturday peak hour. The analysis focused on the Kuebler Boulevard/27th Avenue intersection and the roundabout at 27th Avenue/Site Access.

As shown in Table 14 below, all weekend peak hour queues will be accommodated within the available storage at the two study intersections evaluated.

TABLE 13: SATURDAY PEAK HOUR QUEUE LENGTHS (95TH PERCENTILE)

INTERSECTION	APPROACH	MOVEMENT	AVAILABLE STORAGE	2025 PROPOSED ZONING WITH MITIGATION
Kuebler Blvd/ 27 th Ave (Signal)	NB	Dual LT	245 ft ^a	245 ft
		THR	320 ft	180 ft
	WB	Dual RT	320 ft	215 ft
		Dual LT	650 ft	650 ft
27th Ave/ Site Access (Roundabout)	WB	RT	-	45 ft
		LT-THR-RT	-	45 ft
	SB	RT	320 ft	20 ft
		THR-LT	320 ft	30 ft

^a Maximum available storage for any northbound movement on 27th Avenue is approximately 320 feet from the stop bar at Kuebler Boulevard to the crosswalk on the north leg of the roundabout.

Red/Bold = 95th Percentile Queue exceeds the Available Storage

SUMMARY

The project site is a 24.66-acre parcel located in the southwest quadrant of Kuebler Boulevard and I-5 in Salem, Oregon. The subject property is currently zoned as Residential Agriculture (RA) and the owner desires to rezone the property to a combination of Mixed-Use II (MU-II) and Mixed-Use III (MU-III) zoning.

The following is a summary of the transportation analysis results and Transportation Planning Rule findings associated with the proposed zone change/comprehensive plan change.

- All study intersections except the Kuebler Boulevard/Battle Creek Road intersection meet the City's operating standards or ODOT Mobility Target under the 2022 Existing Conditions scenario.
- Under the 2037 Current Zoning scenario, four of the nine study intersections fail to meet operating standards. These intersections include Kuebler Boulevard/Commercial Street, Kuebler Boulevard/Battle Creek Road, Kuebler Boulevard/27th Avenue, and Kuebler Boulevard/36th Avenue.
- Under the 2037 Proposed Zoning scenario, five study intersections fail to meet the operating standards. These intersections include all of those listed above, plus the Site Access on 27th Avenue.
- The proposed zone change causes a significant effect at five of the study intersections. These intersections must be mitigated back to meet the greater of the following: the operating standard/mobility target or the v/c ratio of the equivalent 2037 Current Zoning scenario. The mitigation improvements that were identified are listed below.
 - > **Kuebler Boulevard/Commercial Street:** Implement signal timing improvements/optimizations, such as increasing the cycle length by five seconds.
 - > **Kuebler Boulevard/Battle Creek Road:** Install dual southbound left turn lanes with a storage length of 280 ft each to match the existing left turn lane.
 - > **Kuebler Boulevard/27th Avenue:** Install a second northbound right turn lane and second northbound left turn lane with storage lengths that match the existing turn lanes.
 - > **Kuebler Boulevard/36th Avenue:** Install a separate westbound right turn lane with a storage length of 200 ft to match the existing left turn lane.
 - > **Site Access/27th Avenue:** Add a dedicated westbound right turn lane.
- Based on the queuing analysis results, we recommend that the applicant extend the dual westbound left turn lanes on Kuebler Boulevard at 27th Avenue to 650 feet to accommodate estimated future 2037 vehicle queue lengths.
- **With the mitigations outlined in this report, the proposed zone change will not degrade the transportation system and all TPR criteria outlined in OAR 660-012 are satisfied.**

APPENDIX CONTENTS

APPENDIX A. TRAFFIC COUNT DATA (PM PEAK)

APPENDIX B: CRASH DATA (2016 – 2020)

APPENDIX C: IN-PROCESS DEVELOPMENT VOLUMES

APPENDIX D: LOS DESCRIPTION

APPENDIX E: HCM REPORTS – EXISTING 2022

APPENDIX F: HCM REPORTS – FUTURE 2037 - CURRENT ZONING

APPENDIX G: HCM REPORTS – FUTURE 2037 - PROPOSED ZONING

APPENDIX H: HCM REPORTS – FUTURE 2037 – PROPOSED ZONING MITIGATIONS

APPENDIX I: WEEKDAY PM PEAK HOUR WEAVING REPORT

APPENDIX J: SATURDAY ANALYSIS (TRAFFIC VOLUMES & HCM REPORTS)

APPENDIX K: CONCEPT DESIGNS AND COST ESTIMATES

APPENDIX A. TRAFFIC COUNT DATA (PM PEAK)

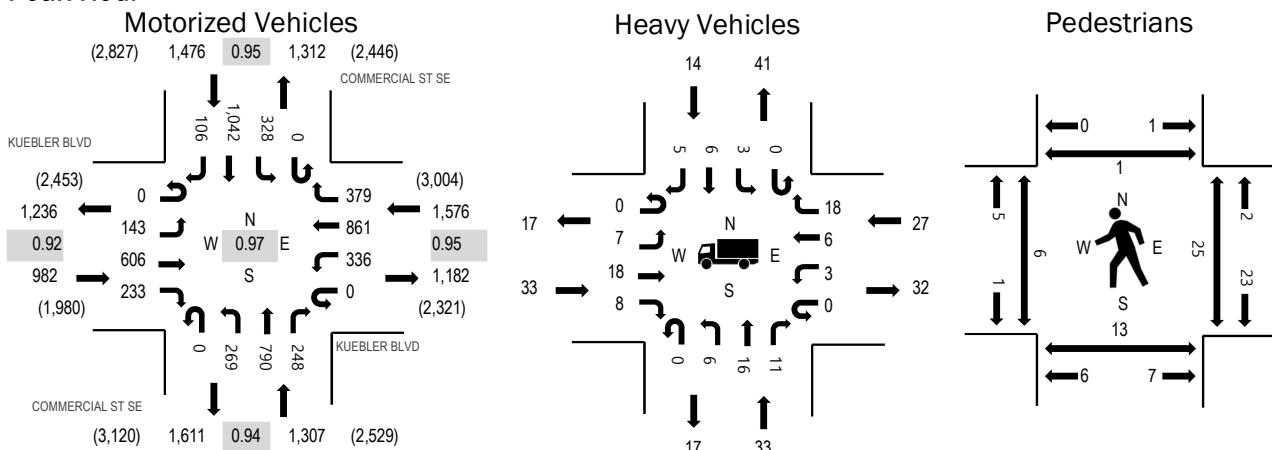
Location: 1 COMMERCIAL ST SE & KUEBLER BLVD PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:20 PM - 05:20 PM

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

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.4%	0.92
WB	1.7%	0.95
NB	2.5%	0.94
SB	0.9%	0.95
All	2.0%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	KUEBLER BLVD				KUEBLER BLVD				COMMERCIAL ST SE				COMMERCIAL ST SE				Total	Rolling Hour	
	Eastbound		Westbound		Northbound		Southbound												
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			
4:00 PM	0	12	69	28	0	24	59	35	0	17	48	20	0	22	81	7	422	5,170	
4:05 PM	0	12	47	16	0	20	57	23	0	24	71	20	0	24	85	8	407	5,221	
4:10 PM	0	18	48	26	0	38	84	22	0	25	53	15	0	19	65	7	420	5,258	
4:15 PM	0	14	61	14	0	20	67	40	0	18	59	17	0	21	75	7	413	5,309	
4:20 PM	0	13	44	17	0	22	62	31	0	23	87	24	0	25	93	8	449	5,341	
4:25 PM	0	19	47	20	0	28	73	26	0	22	69	22	0	16	83	6	431	5,306	
4:30 PM	0	8	73	19	0	24	86	36	0	15	46	26	0	28	72	12	445	5,309	
4:35 PM	0	11	42	11	0	25	59	42	0	18	64	29	0	36	95	11	443	5,258	
4:40 PM	0	13	43	29	0	20	65	29	0	13	68	23	0	28	94	14	439	5,222	
4:45 PM	0	8	67	16	0	40	96	31	0	22	57	20	0	25	64	8	454	5,216	
4:50 PM	0	7	47	19	0	21	54	28	0	14	63	23	0	29	106	6	417	5,187	
4:55 PM	0	18	44	21	0	30	68	24	0	28	56	13	0	29	86	12	429	5,235	
5:00 PM	0	10	49	17	0	35	88	34	0	29	67	18	0	21	82	6	456	5,196	
5:05 PM	0	9	58	22	0	22	65	25	0	23	56	15	0	37	92	1	425		
5:10 PM	0	6	46	27	0	30	63	35	0	22	96	11	0	28	98	11	473		
5:15 PM	0	16	46	15	0	39	82	24	0	35	56	20	0	25	77	7	442		
5:20 PM	0	2	55	19	0	15	74	27	0	12	63	16	0	20	83	10	396		
5:25 PM	0	4	42	17	0	24	58	17	0	23	75	21	0	29	109	15	434		
5:30 PM	0	19	45	19	0	25	71	20	0	35	65	18	0	19	73	13	422		
5:35 PM	0	11	68	18	0	30	84	14	0	19	53	25	0	14	76	9	421		
5:40 PM	0	4	45	18	0	25	62	24	0	19	59	31	0	40	91	6	424		
5:45 PM	0	21	51	33	0	17	67	21	1	29	81	14	0	16	67	8	426		
5:50 PM	0	9	56	29	0	29	95	25	0	27	52	22	0	27	79	7	457		
5:55 PM	0	4	30	19	0	23	73	33	0	20	48	21	0	36	78	10	395		
Count Total	0	268	1,223	489	0	626	1,712	666	1	532	1,512	484	0	614	2,004	209	10,340		
Peak Hour	0	143	606	233	0	336	861	379	0	269	790	248	0	328	1,042	106	5,341		

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway				Interval Start Time	Pedestrians/Bicycles on Crosswalk					
	EB	NB	WB	SB	Total		EB	NB	WB	SB		EB	NB	WB	SB	Total	
4:00 PM	2	2	3	1	8	4:00 PM	0	0	0	1	1	4:00 PM	2	2	0	0	4
4:05 PM	5	3	0	1	9	4:05 PM	0	1	0	0	1	4:05 PM	1	0	0	0	1
4:10 PM	3	1	1	2	7	4:10 PM	0	0	0	0	0	4:10 PM	0	0	1	1	2
4:15 PM	9	1	5	1	16	4:15 PM	0	0	0	0	0	4:15 PM	0	1	4	0	5
4:20 PM	2	1	1	2	6	4:20 PM	0	0	0	0	0	4:20 PM	1	0	1	1	3
4:25 PM	2	3	1	0	6	4:25 PM	0	0	0	0	0	4:25 PM	0	0	1	0	1
4:30 PM	2	4	3	0	9	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	2	1	2	1	6	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	3	0	1	5	4:40 PM	0	0	0	0	0	4:40 PM	0	0	2	0	2
4:45 PM	5	1	0	0	6	4:45 PM	0	1	0	0	1	4:45 PM	0	0	0	0	0
4:50 PM	3	0	2	1	6	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	3	3	1	0	7	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	3	1	2	2	8	5:00 PM	0	0	0	0	0	5:00 PM	1	2	1	0	4
5:05 PM	3	0	0	1	4	5:05 PM	0	0	0	0	0	5:05 PM	0	3	1	0	4
5:10 PM	2	0	0	0	2	5:10 PM	0	0	0	0	0	5:10 PM	2	1	1	0	4
5:15 PM	0	2	1	1	4	5:15 PM	0	0	0	0	0	5:15 PM	1	0	0	0	1
5:20 PM	0	1	1	1	3	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	0	1
5:25 PM	0	1	1	0	2	5:25 PM	0	0	0	1	1	5:25 PM	2	0	0	1	3
5:30 PM	0	2	0	1	3	5:30 PM	0	0	0	0	0	5:30 PM	0	1	0	0	1
5:35 PM	1	2	1	2	6	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	1	1	0	0	2	5:40 PM	0	1	0	0	1	5:40 PM	0	0	1	0	1
5:45 PM	3	1	0	3	7	5:45 PM	0	0	0	0	0	5:45 PM	0	0	1	0	1
5:50 PM	3	0	0	0	3	5:50 PM	0	0	0	0	0	5:50 PM	0	0	1	0	1
5:55 PM	3	0	1	0	4	5:55 PM	1	1	0	0	2	5:55 PM	0	0	0	0	0
Count Total	58	34	26	21	139	Count Total	1	4	0	2	7	Count Total	10	11	15	3	39
Peak Hour	33	33	27	14	107	Peak Hour	0	5	0	1	6	Peak Hour	7	17	26	1	51

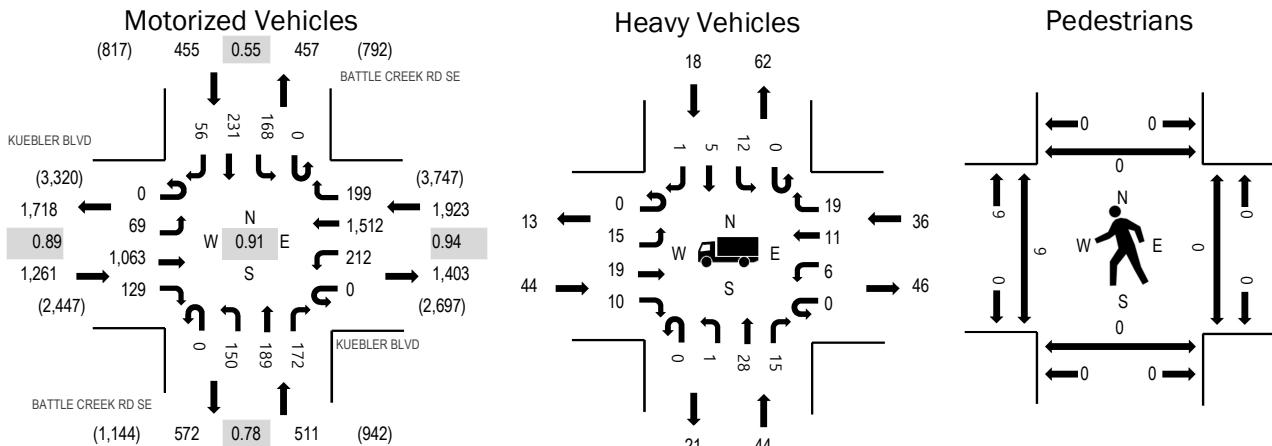
Location: 2 BATTLE CREEK RD SE & KUEBLER BLVD PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:35 PM - 05:35 PM

Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.5%	0.89
WB	1.9%	0.94
NB	8.6%	0.78
SB	4.0%	0.55
All	3.4%	0.91

Traffic Counts - Motorized Vehicles

Interval Start Time	KUEBLER BLVD				KUEBLER BLVD				BATTLE CREEK RD SE				BATTLE CREEK RD SE				Total	Rolling Hour	
	Eastbound		Westbound		Northbound		Southbound												
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			
4:00 PM	0	7	86	12	0	29	118	10	0	18	14	11	0	13	11	2	331	4,021	
4:05 PM	0	4	100	8	0	17	124	18	0	10	16	16	0	9	12	6	340	4,063	
4:10 PM	0	4	76	12	0	19	100	9	0	13	15	17	0	16	24	7	312	4,068	
4:15 PM	0	5	72	11	0	31	137	5	0	10	10	13	0	16	21	4	335	4,140	
4:20 PM	0	8	90	10	0	22	149	11	0	6	13	15	0	14	12	4	354	4,118	
4:25 PM	0	5	70	15	0	14	111	20	0	16	13	15	0	15	26	3	323	4,047	
4:30 PM	0	6	87	7	0	27	101	14	0	12	17	13	0	7	21	1	313	4,092	
4:35 PM	0	4	120	15	0	12	143	17	0	17	15	9	0	12	17	8	389	4,150	
4:40 PM	0	4	95	11	0	14	94	14	0	19	15	9	0	10	13	6	304	4,022	
4:45 PM	0	8	76	10	0	23	124	17	0	13	26	18	0	13	30	5	363	4,094	
4:50 PM	0	2	106	7	0	18	159	14	0	5	14	12	0	10	13	1	361	4,061	
4:55 PM	0	4	85	14	0	9	105	10	0	9	14	19	0	6	10	6	291	3,956	
5:00 PM	0	7	75	9	0	12	113	20	0	7	16	13	0	16	29	3	320	4,007	
5:05 PM	0	3	79	9	0	23	149	13	0	16	8	18	0	16	18	0	352		
5:10 PM	0	2	97	9	0	19	118	16	0	11	12	10	0	14	10	9	327		
5:15 PM	0	4	84	9	0	11	101	11	0	14	12	18	0	20	32	3	319		
5:20 PM	0	3	72	10	0	28	142	21	0	10	7	12	0	9	15	4	333		
5:25 PM	0	8	95	5	0	24	134	15	0	9	11	8	0	12	16	5	342		
5:30 PM	0	7	79	13	0	16	130	15	0	19	15	17	0	21	24	5	361		
5:35 PM	0	2	67	6	0	16	113	14	0	8	12	14	0	14	15	4	285		
5:40 PM	0	9	116	10	0	17	146	20	0	11	15	11	0	6	15	3	379		
5:45 PM	0	0	94	12	0	24	107	10	0	28	16	9	0	9	14	2	325		
5:50 PM	0	7	75	8	0	28	83	16	0	5	14	8	0	5	17	5	271		
5:55 PM	0	10	87	9	0	25	123	15	0	12	4	15	0	11	10	2	323		
Count Total	0	123	2,083	241	0	478	2,924	345	0	298	324	320	0	294	425	98	7,953		
Peak Hour	0	69	1,063	129	0	212	1,512	199	0	150	189	172	0	168	231	56	4,150		

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway				Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB		EB	NB	WB	SB	Total
4:00 PM	1	2	1	0	4	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0
4:05 PM	6	0	1	0	7	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0
4:10 PM	4	0	1	3	8	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0
4:15 PM	0	0	5	0	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0
4:20 PM	3	1	2	1	7	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0
4:25 PM	3	2	2	0	7	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0
4:30 PM	3	2	1	0	6	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0
4:35 PM	1	0	3	0	4	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0
4:40 PM	2	2	1	0	5	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0
4:45 PM	8	1	1	0	10	4:45 PM	0	0	0	0	0	4:45 PM	1	0	0	1
4:50 PM	0	2	2	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0
4:55 PM	4	1	2	0	7	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0
5:00 PM	3	0	0	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0
5:05 PM	3	2	0	0	5	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0
5:10 PM	1	0	1	1	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0
5:15 PM	0	0	2	2	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0
5:20 PM	1	1	4	0	6	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0
5:25 PM	0	1	1	0	2	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0
5:35 PM	2	0	0	0	2	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0
5:45 PM	3	0	1	0	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0
5:50 PM	4	1	1	0	6	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0
5:55 PM	3	2	1	0	6	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0
Count Total	55	20	33	8	116	Count Total	0	0	0	0	0	Count Total	1	0	0	1
Peak Hour	44	44	36	18	142	Peak Hour	0	0	0	0	0	Peak Hour	9	0	0	9



ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

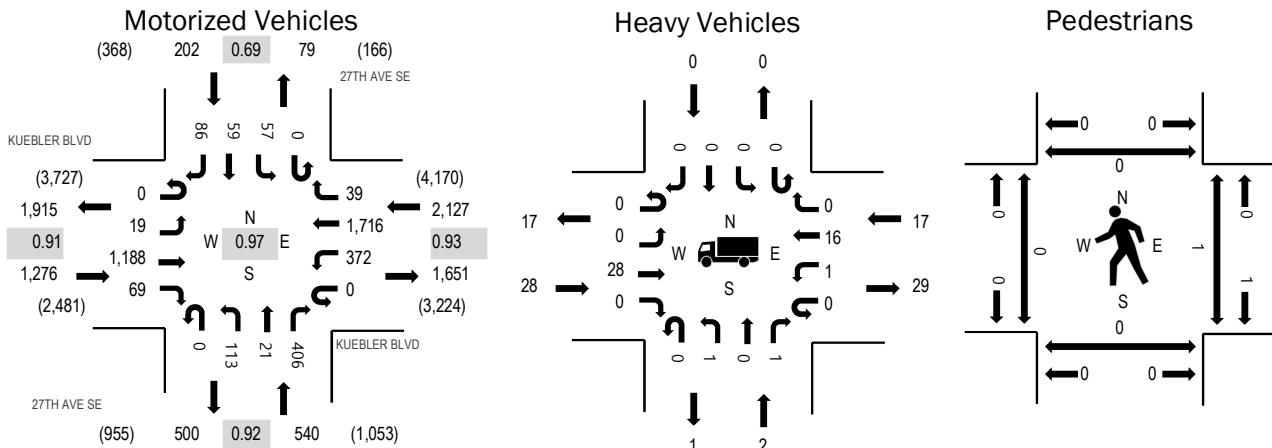
Location: 3 27TH AVE SE & KUEBLER BLVD PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:35 PM - 05:35 PM

Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.2%	0.91
WB	0.8%	0.93
NB	0.4%	0.92
SB	0.0%	0.69
All	1.1%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	KUEBLER BLVD				KUEBLER BLVD				27TH AVE SE				27TH AVE SE				Rolling Hour	
	Eastbound				Westbound				Northbound				Southbound					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	2	111	3	0	35	142	4	0	8	1	23	0	1	3	10	343	4,048
4:05 PM	0	0	96	3	0	35	123	6	0	13	1	30	0	8	3	9	327	4,062
4:10 PM	0	0	128	4	0	27	149	4	0	9	1	21	0	4	1	7	355	4,100
4:15 PM	0	2	79	3	0	25	128	3	0	11	1	44	0	10	5	8	319	4,074
4:20 PM	0	2	91	1	0	33	145	3	0	4	4	37	0	4	4	2	330	4,130
4:25 PM	0	2	88	3	0	37	141	4	0	12	4	31	0	4	4	5	335	4,108
4:30 PM	0	2	99	4	0	31	137	5	0	6	2	34	0	3	6	6	335	4,118
4:35 PM	0	1	122	4	0	28	137	2	0	11	2	31	0	5	5	9	357	4,145
4:40 PM	0	2	100	5	0	37	137	0	0	9	1	34	0	7	2	9	343	4,114
4:45 PM	0	0	108	8	0	35	164	2	0	8	2	35	0	3	6	2	373	4,101
4:50 PM	0	3	99	5	0	31	128	6	0	14	0	48	0	6	5	6	351	4,050
4:55 PM	0	3	75	3	0	27	104	4	0	15	2	31	0	4	3	9	280	4,025
5:00 PM	0	2	103	5	0	29	152	5	0	10	0	29	0	4	6	12	357	4,024
5:05 PM	0	1	82	10	0	35	142	1	0	11	3	39	0	11	14	16	365	
5:10 PM	0	2	103	6	0	27	128	3	0	5	4	37	0	7	3	4	329	
5:15 PM	0	1	127	3	0	27	160	4	0	5	5	34	0	4	2	3	375	
5:20 PM	0	2	73	7	0	33	134	1	0	10	1	30	0	1	8	8	308	
5:25 PM	0	1	89	4	0	27	175	6	0	6	1	31	0	1	0	4	345	
5:30 PM	0	1	107	9	0	36	155	5	0	9	0	27	0	4	5	4	362	
5:35 PM	0	3	87	4	0	25	134	4	0	14	2	34	0	4	2	13	326	
5:40 PM	0	1	92	4	0	31	139	4	0	11	0	33	0	4	7	4	330	
5:45 PM	0	1	97	3	0	31	141	4	0	6	4	28	0	3	1	3	322	
5:50 PM	0	3	100	4	0	32	127	4	0	9	2	34	0	4	1	6	326	
5:55 PM	0	1	75	7	0	31	119	0	0	6	1	32	0	0	2	5	279	
Count Total	0	38	2,331	112	0	745	3,341	84	0	222	44	787	0	106	98	164	8,072	
Peak Hour	0	19	1,188	69	0	372	1,716	39	0	113	21	406	0	57	59	86	4,145	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	0	1	0	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	4	0	1	0	5	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	5	0	7	0	12	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	2	1	0	4	4:15 PM	0	0	0	1	1	4:15 PM	0	0	0	0	0
4:20 PM	1	1	3	0	5	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	3	1	3	0	7	4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0
4:30 PM	4	1	3	0	8	4:30 PM	0	0	0	0	0	4:30 PM	1	0	0	1	2
4:35 PM	3	0	2	0	5	4:35 PM	0	0	1	1	2	4:35 PM	0	0	0	0	0
4:40 PM	2	0	1	0	3	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	6	1	1	0	8	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	2	0	2	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	2	0	2	0	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	2	0	0	0	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	6	0	3	0	9	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	1	0	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	1	0	1
5:15 PM	1	1	2	0	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	2	0	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	1	1	5:25 PM	0	0	0	0	0
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	2	1	0	0	3	5:35 PM	0	0	0	0	0	5:35 PM	1	0	0	1	2
5:40 PM	0	0	1	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	2	0	1	0	3	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	4	0	2	0	6	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	3	0	1	0	4	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	59	8	41	0	108	Count Total	1	0	1	3	5	Count Total	2	0	1	2	5
Peak Hour	28	2	17	0	47	Peak Hour	0	0	1	2	3	Peak Hour	0	0	1	0	1

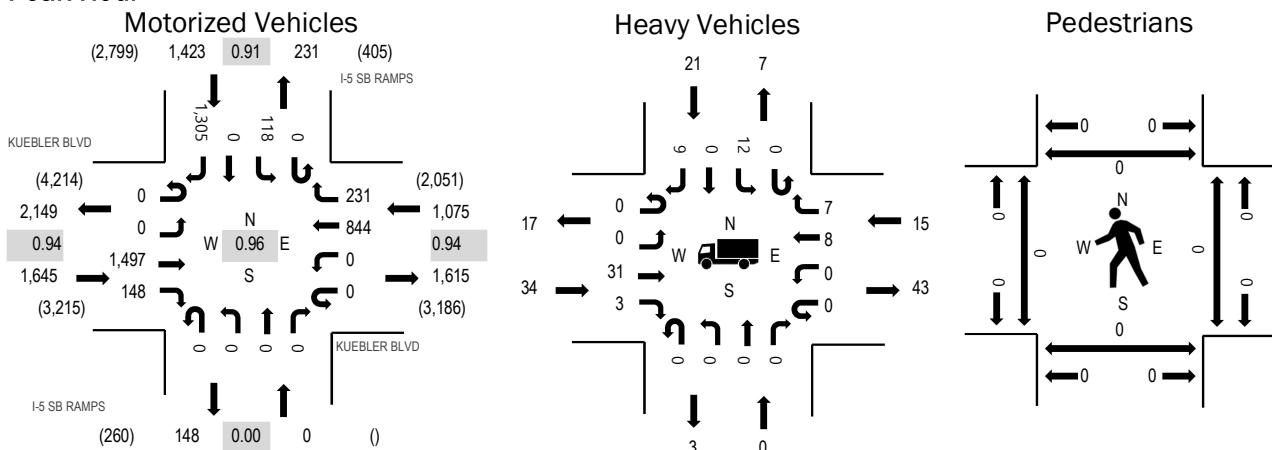
Location: 4 I-5 SB RAMPS & KUEBLER BLVD PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:35 PM - 05:35 PM

Peak 15-Minutes: 04:40 PM - 04:55 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.1%	0.94
WB	1.4%	0.94
NB	0.0%	0.00
SB	1.5%	0.91
All	1.7%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	KUEBLER BLVD				KUEBLER BLVD				I-5 SB RAMPS				I-5 SB RAMPS				Total	Rolling Hour	
	Eastbound		Westbound		Northbound		Southbound												
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			
4:00 PM	0	0	113	5	0	0	82	11	0	0	0	0	0	8	0	99	318	4,019	
4:05 PM	0	0	107	12	0	0	53	15	0	0	0	0	0	8	0	108	303	4,030	
4:10 PM	0	0	145	9	0	0	62	11	0	0	0	0	0	8	0	114	349	4,076	
4:15 PM	0	0	121	15	0	0	82	25	0	0	0	0	0	7	0	97	347	4,054	
4:20 PM	0	0	113	13	0	0	54	18	0	0	0	0	0	10	0	118	326	4,084	
4:25 PM	0	0	122	10	0	0	60	11	0	0	0	0	0	12	0	117	332	4,129	
4:30 PM	0	0	129	6	0	0	69	10	0	0	0	0	0	10	0	109	333	4,110	
4:35 PM	0	0	133	15	0	0	72	18	0	0	0	0	0	9	0	85	332	4,143	
4:40 PM	0	0	134	16	0	0	60	25	0	0	0	0	0	10	0	129	374	4,136	
4:45 PM	0	0	130	9	0	0	91	18	0	0	0	0	0	6	0	111	365	4,077	
4:50 PM	0	0	143	11	0	0	78	15	0	0	0	0	0	4	0	91	342	4,062	
4:55 PM	0	0	120	9	0	0	43	14	0	0	0	0	0	15	0	97	298	4,041	
5:00 PM	0	0	123	10	0	0	73	13	0	0	0	0	0	9	0	101	329	4,046	
5:05 PM	0	0	111	18	0	0	83	27	0	0	0	0	0	8	0	102	349		
5:10 PM	0	0	118	14	0	0	51	20	0	0	0	0	0	10	0	114	327		
5:15 PM	0	0	143	15	0	0	64	25	0	0	0	0	0	9	0	121	377		
5:20 PM	0	0	123	12	0	0	96	19	0	0	0	0	0	10	0	111	371		
5:25 PM	0	0	103	13	0	0	66	15	0	0	0	0	0	18	0	98	313		
5:30 PM	0	0	116	6	0	0	67	22	0	0	0	0	0	10	0	145	366		
5:35 PM	0	0	114	12	0	0	88	11	0	0	0	0	0	4	0	96	325		
5:40 PM	0	0	116	10	0	0	66	19	0	0	0	0	0	15	0	89	315		
5:45 PM	0	0	142	8	0	0	49	14	0	0	0	0	0	14	0	123	350		
5:50 PM	0	0	109	5	0	0	82	16	0	0	0	0	0	10	0	99	321		
5:55 PM	0	0	127	7	0	0	55	13	0	0	0	0	0	7	0	94	303		
Count Total	0	0	2,955	260	0	0	1,646	405	0	0	0	0	0	231	0	2,568	8,065		
Peak Hour	0	0	1,497	148	0	0	844	231	0	0	0	0	0	118	0	1,305	4,143		

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway				Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB		EB	NB	WB	SB	Total
4:00 PM	3	0	1	0	4	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0
4:05 PM	2	0	2	2	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0
4:10 PM	6	0	3	4	13	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0
4:15 PM	4	0	2	3	9	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0
4:20 PM	1	0	0	2	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0
4:25 PM	5	0	3	6	14	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0
4:30 PM	5	0	3	2	10	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0
4:35 PM	3	0	1	2	6	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0
4:40 PM	2	0	0	3	5	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0
4:45 PM	6	0	2	0	8	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0
4:50 PM	2	0	0	2	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0
4:55 PM	4	0	2	2	8	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0
5:00 PM	2	0	0	0	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0
5:05 PM	6	0	2	2	10	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0
5:10 PM	2	0	1	3	6	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0
5:15 PM	3	0	0	3	6	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0
5:20 PM	2	0	3	1	6	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0
5:25 PM	2	0	4	2	8	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0
5:35 PM	2	0	0	0	2	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0
5:40 PM	2	0	0	3	5	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0
5:45 PM	1	0	2	1	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0
5:50 PM	5	0	2	2	9	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0
5:55 PM	3	0	0	2	5	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0
Count Total	73	0	33	48	154	Count Total	0	0	0	0	0	Count Total	0	0	0	0
Peak Hour	34	0	15	21	70	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0

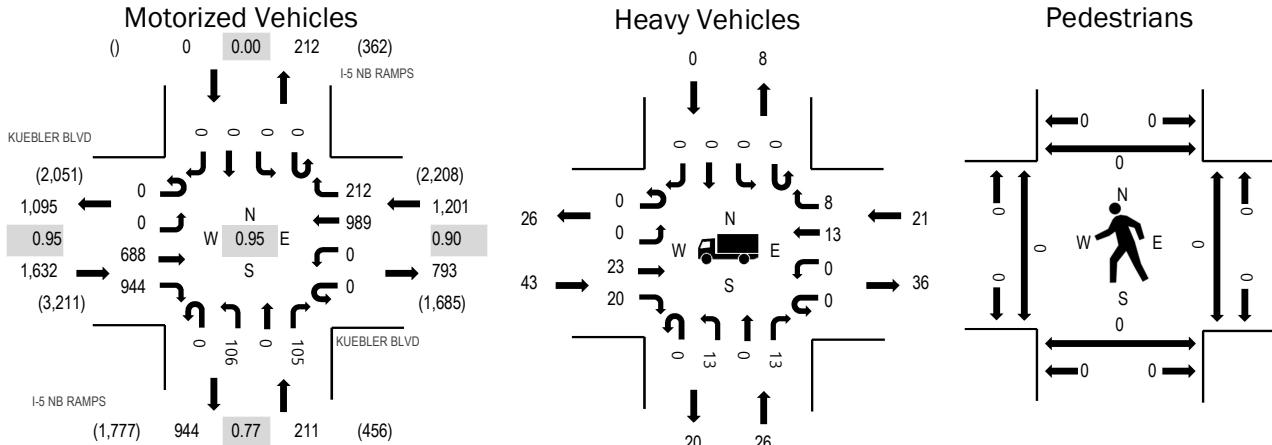
Location: 5 I-5 NB RAMPS & KUEBLER BLVD PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:35 PM - 05:35 PM

Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.6%	0.95
WB	1.7%	0.90
NB	12.3%	0.77
SB	0.0%	0.00
All	3.0%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	KUEBLER BLVD				KUEBLER BLVD				I-5 NB RAMPS				I-5 NB RAMPS				Total	Rolling Hour
	Eastbound		Westbound		Northbound		Southbound		U-Turn		Left		Thru		Right			
4:00 PM	0	0	63	68	0	0	76	12	0	9	0	21	0	0	0	0	249	2,986
4:05 PM	0	0	47	92	0	0	59	25	0	6	0	11	0	0	0	0	240	2,974
4:10 PM	0	0	59	80	0	0	95	23	0	8	1	15	0	0	0	0	281	3,001
4:15 PM	0	0	57	66	0	0	68	9	0	6	0	7	0	0	0	0	213	2,991
4:20 PM	0	0	68	71	0	0	66	8	0	14	0	14	0	0	0	0	241	3,031
4:25 PM	0	0	61	62	0	0	73	8	0	18	0	6	0	0	0	0	228	3,027
4:30 PM	0	0	65	57	0	0	59	16	0	19	0	13	0	0	0	0	229	3,030
4:35 PM	0	0	93	80	0	0	88	20	0	8	0	1	0	0	0	0	290	3,044
4:40 PM	0	0	51	86	0	0	87	18	0	14	0	8	0	0	0	0	264	2,971
4:45 PM	0	0	55	68	0	0	86	11	0	15	0	10	0	0	0	0	245	2,982
4:50 PM	0	0	60	99	0	0	72	15	0	21	0	2	0	0	0	0	269	2,957
4:55 PM	0	0	46	84	0	0	70	24	0	7	0	6	0	0	0	0	237	2,903
5:00 PM	0	0	51	66	0	0	83	20	0	7	0	10	0	0	0	0	237	2,889
5:05 PM	0	0	44	88	0	0	90	28	0	5	0	12	0	0	0	0	267	
5:10 PM	0	0	54	92	0	0	78	35	0	4	0	8	0	0	0	0	271	
5:15 PM	0	0	61	80	0	0	85	11	0	4	0	12	0	0	0	0	253	
5:20 PM	0	0	54	74	0	0	83	7	0	7	0	12	0	0	0	0	237	
5:25 PM	0	0	57	63	0	0	78	15	0	8	0	10	0	0	0	0	231	
5:30 PM	0	0	62	64	0	0	89	8	0	6	0	14	0	0	0	0	243	
5:35 PM	0	0	51	53	0	0	85	9	0	4	0	15	0	0	0	0	217	
5:40 PM	1	0	71	90	0	0	84	15	0	2	0	12	0	0	0	0	275	
5:45 PM	0	0	73	63	0	0	61	10	0	3	0	10	0	0	0	0	220	
5:50 PM	0	0	62	49	0	0	81	8	0	4	0	11	0	0	0	0	215	
5:55 PM	0	0	68	82	0	0	52	5	0	3	1	12	0	0	0	0	223	
Count Total	1	0	1,433	1,777	0	0	1,848	360	0	202	2	252	0	0	0	0	5,875	
Peak Hour	0	0	688	944	0	0	989	212	0	106	0	105	0	0	0	0	3,044	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway				Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB		EB	NB	WB	SB	Total
4:00 PM	2	6	3	0	11	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0
4:05 PM	8	1	3	0	12	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0
4:10 PM	5	6	9	0	20	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0
4:15 PM	6	2	3	0	11	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0
4:20 PM	1	3	1	0	5	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0
4:25 PM	8	5	5	0	18	4:25 PM	1	0	1	0	2	4:25 PM	0	0	0	0
4:30 PM	4	4	2	0	10	4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0
4:35 PM	4	2	2	0	8	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0
4:40 PM	2	2	2	0	6	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0
4:45 PM	6	1	1	0	8	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0
4:50 PM	5	6	1	0	12	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0
4:55 PM	6	1	4	0	11	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0
5:00 PM	2	1	2	0	5	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0
5:05 PM	10	3	0	0	13	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0
5:10 PM	2	1	2	0	5	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0
5:15 PM	2	2	0	0	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0
5:20 PM	3	2	2	0	7	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0
5:25 PM	0	5	5	0	10	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0
5:40 PM	3	0	0	0	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0
5:45 PM	2	0	5	0	7	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0
5:50 PM	3	1	1	0	5	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0
5:55 PM	3	1	0	0	4	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0
Count Total	89	55	53	0	197	Count Total	1	0	2	0	3	Count Total	0	0	0	0
Peak Hour	43	26	21	0	90	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0

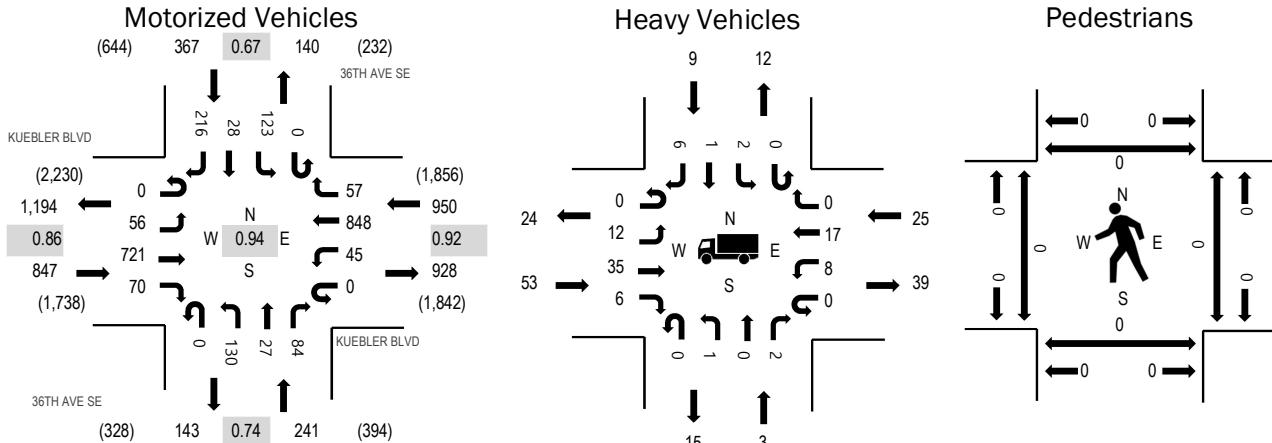
Location: 6 36TH AVE SE & KUEBLER BLVD PM

Date: Tuesday, May 17, 2022

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

Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	6.3%	0.86
WB	2.6%	0.92
NB	1.2%	0.74
SB	2.5%	0.67
All	3.7%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	KUEBLER BLVD				KUEBLER BLVD				36TH AVE SE				36TH AVE SE				Total	Rolling Hour
	Eastbound				Westbound				Northbound				Southbound					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Rolling Hour
4:00 PM	0	9	69	5	0	4	79	4	0	6	1	6	0	2	4	11	200	2,313
4:05 PM	0	4	53	4	0	6	42	4	0	7	3	3	0	13	2	35	176	2,297
4:10 PM	0	0	51	7	0	3	72	2	0	14	2	6	0	13	5	22	197	2,353
4:15 PM	0	7	66	8	0	5	70	3	0	6	2	4	0	6	2	10	189	2,370
4:20 PM	0	1	60	9	0	9	59	6	0	2	1	6	0	4	5	15	177	2,373
4:25 PM	0	4	60	11	0	7	56	3	0	9	4	8	0	10	3	12	187	2,396
4:30 PM	0	5	78	10	0	4	60	2	0	12	1	8	0	9	0	14	203	2,405
4:35 PM	0	8	77	5	0	3	66	3	0	13	4	6	0	10	3	23	221	2,385
4:40 PM	0	2	60	8	0	3	74	2	0	8	5	5	0	9	3	20	199	2,356
4:45 PM	0	4	56	6	0	1	84	6	0	7	1	9	0	6	1	13	194	2,354
4:50 PM	0	9	54	2	0	2	72	5	0	5	0	4	0	6	0	13	172	2,348
4:55 PM	0	4	62	6	0	2	62	11	0	17	1	9	0	11	3	10	198	2,366
5:00 PM	0	2	47	7	0	4	63	4	0	14	1	5	0	11	3	23	184	2,319
5:05 PM	0	3	54	7	0	2	73	6	0	16	5	13	0	21	4	28	232	
5:10 PM	0	2	54	5	0	3	65	4	0	19	0	11	0	18	4	29	214	
5:15 PM	0	8	49	4	0	9	70	4	0	8	2	7	0	9	3	19	192	
5:20 PM	0	3	63	8	0	6	78	4	0	7	4	2	0	9	3	13	200	
5:25 PM	0	6	67	2	0	6	81	6	0	4	3	5	0	4	1	11	196	
5:30 PM	0	3	57	6	0	5	78	4	0	5	1	3	0	10	2	9	183	
5:35 PM	0	1	74	6	0	8	81	2	0	1	1	1	0	5	1	11	192	
5:40 PM	0	3	68	6	0	8	80	0	0	6	1	5	0	6	1	13	197	
5:45 PM	0	3	71	11	0	5	56	4	0	11	2	5	0	13	0	7	188	
5:50 PM	0	2	75	3	0	7	82	2	0	4	0	4	0	3	1	7	190	
5:55 PM	0	2	63	9	0	6	43	1	0	7	0	6	0	5	1	8	151	
Count Total	0	95	1,488	155	0	118	1,646	92	0	208	45	141	0	213	55	376	4,632	
Peak Hour	0	56	721	70	0	45	848	57	0	130	27	84	0	123	28	216	2,405	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	12	0	3	1	16	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	2	1	2	1	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	9	3	7	0	19	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	5	0	2	3	10	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	1	1	1	4	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	6	2	4	1	13	4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0
4:30 PM	8	0	2	1	11	4:30 PM	1	0	1	1	3	4:30 PM	0	0	1	0	1
4:35 PM	4	0	2	3	9	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	2	1	2	0	5	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	3	0	2	0	5	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	6	0	1	0	7	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	8	0	1	2	11	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	3	0	5	1	9	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	6	0	0	1	7	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	3	0	3	0	6	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	2	1	0	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	3	1	2	1	7	5:20 PM	0	0	0	0	0	5:20 PM	0	0	1	0	1
5:25 PM	5	0	5	0	10	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	3	0	0	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	2	0	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	2	0	1	0	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	2	1	5	1	9	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	1	0	2	0	3	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	5	0	1	0	6	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	102	11	55	17	185	Count Total	1	0	2	1	4	Count Total	0	0	2	0	2
Peak Hour	53	3	25	9	90	Peak Hour	1	0	1	1	3	Peak Hour	0	0	2	0	2

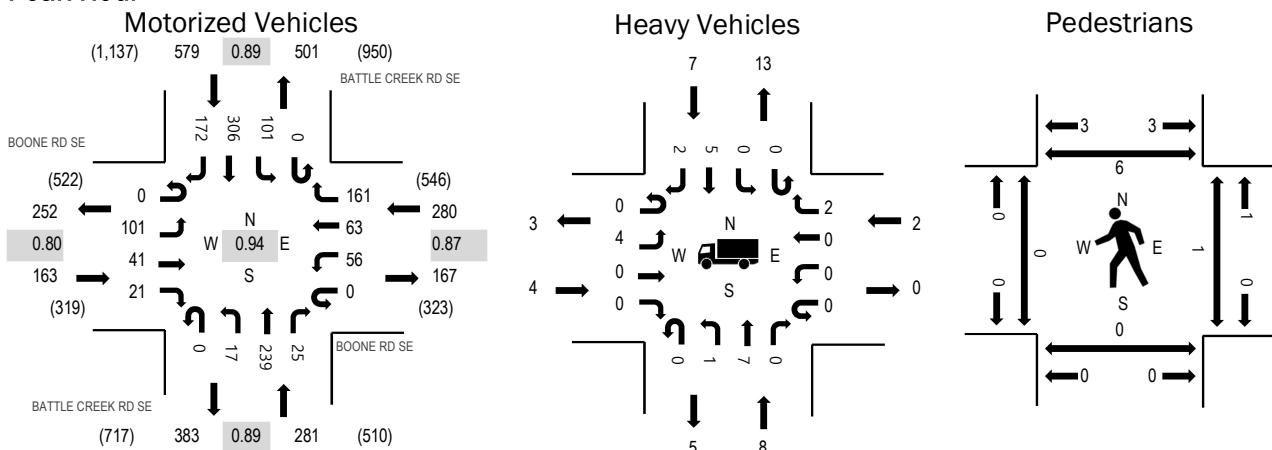
Location: 7 BATTLE CREEK RD SE & BOONE RD SE PM

Date: Tuesday, May 17, 2022

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

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

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.5%	0.80
WB	0.7%	0.87
NB	2.8%	0.89
SB	1.2%	0.89
All	1.6%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	BOONE RD SE Eastbound				BOONE RD SE Westbound				BATTLE CREEK RD SE Northbound				BATTLE CREEK RD SE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	5	3	3	0	6	8	16	0	0	28	1	0	9	23	18	120	1,303
4:05 PM	0	5	1	2	0	3	2	16	0	3	23	4	0	12	24	16	111	1,283
4:10 PM	0	8	7	2	0	0	2	13	0	4	16	0	0	6	20	10	88	1,280
4:15 PM	0	7	2	1	0	2	6	14	0	2	17	3	0	8	34	22	118	1,297
4:20 PM	0	8	4	4	0	6	7	11	0	2	20	3	0	9	28	19	121	1,280
4:25 PM	0	6	6	1	0	6	7	11	0	0	24	3	0	10	22	12	108	1,261
4:30 PM	0	6	3	0	0	3	5	14	0	2	20	3	0	8	26	20	110	1,250
4:35 PM	0	5	2	2	0	2	2	22	0	0	15	1	0	13	29	12	105	1,254
4:40 PM	0	14	2	0	0	10	6	12	0	1	19	1	0	3	27	10	105	1,237
4:45 PM	0	9	5	4	0	8	9	14	0	0	25	3	0	8	36	10	131	1,239
4:50 PM	0	11	1	1	0	7	5	9	0	2	20	1	0	6	24	11	98	1,218
4:55 PM	0	17	5	1	0	3	4	9	0	1	12	2	0	9	13	12	88	1,204
5:00 PM	0	6	4	0	0	2	10	11	0	0	17	2	0	10	25	13	100	1,209
5:05 PM	0	7	4	1	0	7	7	21	0	0	17	0	0	12	20	12	108	
5:10 PM	0	6	4	2	0	6	6	8	0	2	20	3	0	5	29	14	105	
5:15 PM	0	12	3	0	0	5	7	12	0	0	15	1	0	9	25	12	101	
5:20 PM	0	6	0	2	0	4	10	6	0	3	24	1	0	12	18	16	102	
5:25 PM	0	7	4	1	0	2	6	11	0	1	10	0	0	8	26	21	97	
5:30 PM	0	11	6	1	0	2	10	20	0	2	14	0	0	7	26	15	114	
5:35 PM	0	11	3	2	0	3	6	9	0	3	16	1	0	6	23	5	88	
5:40 PM	0	11	1	2	0	2	2	17	0	2	20	1	0	7	25	17	107	
5:45 PM	0	11	3	0	0	4	3	21	0	4	15	3	0	9	22	15	110	
5:50 PM	0	4	4	2	0	1	3	6	0	0	16	3	0	9	16	20	84	
5:55 PM	0	10	4	1	0	1	4	11	0	2	10	1	0	6	26	17	93	
Count Total	0	203	81	35	0	95	137	314	0	36	433	41	0	201	587	349	2,512	
Peak Hour	0	101	41	21	0	56	63	161	0	17	239	25	0	101	306	172	1,303	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	1	1	1	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	0	1	2	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	2	2
4:15 PM	0	0	0	1	1	4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	0	0
4:20 PM	1	0	0	1	2	4:20 PM	0	0	1	1	2	4:20 PM	0	0	1	0	1
4:25 PM	1	1	0	0	2	4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	2	2
4:30 PM	1	1	0	1	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	1	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	1	0	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	1	1
4:45 PM	0	1	0	1	2	4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	1	1
4:50 PM	1	1	0	0	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	1	0	0	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	0	1	0	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	2	2	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	1	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	0	1	2	5:25 PM	0	0	0	0	0	5:25 PM	0	1	0	0	1
5:30 PM	1	0	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	1	0	1
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	1	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	1	0	1
5:55 PM	1	1	0	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	8	11	3	11	33	Count Total	1	0	2	2	5	Count Total	0	1	3	6	10
Peak Hour	4	8	2	7	21	Peak Hour	1	0	2	2	5	Peak Hour	0	0	1	6	7

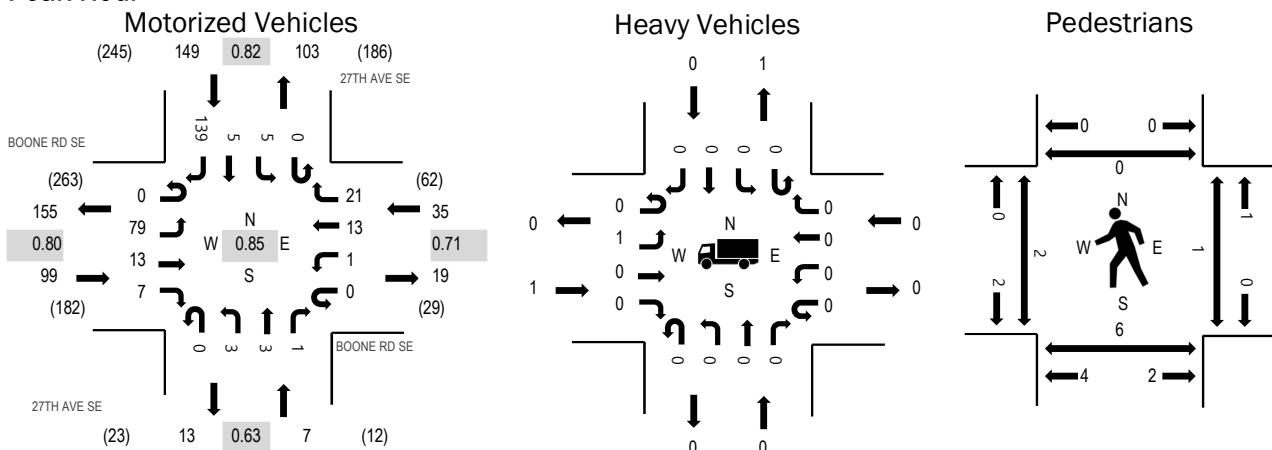
Location: 8 27TH AVE SE & BOONE RD SE PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:25 PM - 05:25 PM

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

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.0%	0.80
WB	0.0%	0.71
NB	0.0%	0.63
SB	0.0%	0.82
All	0.3%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	BOONE RD SE Eastbound				BOONE RD SE Westbound				27TH AVE SE Northbound				27TH AVE SE Southbound				Total	Rolling Hour	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			
4:00 PM	0	5	2	0	0	0	2	2	0	0	0	0	0	1	0	9	21	238	
4:05 PM	0	8	1	0	0	0	0	4	0	0	0	0	0	0	0	0	8	21	242
4:10 PM	0	5	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	10	256
4:15 PM	0	2	2	0	0	0	0	2	0	0	0	0	0	0	0	0	6	12	271
4:20 PM	0	6	1	0	0	0	3	0	0	0	0	0	0	0	1	6	17	281	
4:25 PM	0	8	2	1	0	0	0	2	0	0	0	0	0	0	0	0	6	19	290
4:30 PM	0	10	1	0	0	0	1	1	0	0	0	0	0	0	0	0	4	17	287
4:35 PM	0	3	2	3	0	0	1	3	0	1	1	0	0	0	0	0	17	31	288
4:40 PM	0	6	0	0	0	0	3	1	0	0	0	0	0	0	0	0	12	22	277
4:45 PM	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	1	17	24	277
4:50 PM	0	7	1	0	0	0	0	2	0	0	0	0	0	1	0	12	23	268	
4:55 PM	0	5	2	0	0	0	1	3	0	0	0	0	0	0	2	8	21	271	
5:00 PM	0	11	1	1	0	0	0	0	0	0	0	0	0	0	0	12	25	263	
5:05 PM	0	7	1	1	0	0	2	4	0	1	1	0	0	3	0	15	35		
5:10 PM	0	7	2	0	0	1	1	0	0	0	1	0	0	0	0	13	25		
5:15 PM	0	6	0	0	0	0	3	2	0	1	0	0	0	0	1	9	22		
5:20 PM	0	5	1	1	0	0	1	1	0	0	0	1	0	1	1	14	26		
5:25 PM	0	6	1	0	0	0	1	2	0	0	0	0	0	0	1	5	16		
5:30 PM	0	4	0	2	0	0	3	0	0	0	0	0	0	0	0	9	18		
5:35 PM	0	10	0	1	0	0	2	0	0	1	0	0	0	0	0	6	20		
5:40 PM	0	4	1	1	0	0	0	2	0	2	1	0	0	0	0	11	22		
5:45 PM	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	10	15		
5:50 PM	0	13	0	1	0	0	0	1	0	0	0	0	0	0	1	10	26		
5:55 PM	0	3	0	0	0	0	1	0	0	1	0	0	0	1	0	7	13		
Count Total	0	148	21	13	0	1	27	34	0	7	4	1	0	7	9	229	501		
Peak Hour	0	79	13	7	0	1	13	21	0	3	3	1	0	5	5	139	290		

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway				Interval Start Time	Pedestrians/Bicycles on Crosswalk					
	EB	NB	WB	SB	Total		EB	NB	WB	SB		EB	NB	WB	SB	Total	
4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	2	2	4
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	1	1	4:15 PM	2	0	0	0	2
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	2	0	0	0	2
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	1	2	0	0	3
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	1	1	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	1	1	4:35 PM	0	1	0	0	1
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	1	1	1	0	3
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	1	0	0	1
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	1	1	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	1	1	1	3
5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	2	2	0	0	4
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	2	0	1	0	3	Count Total	0	0	0	4	4	Count Total	8	9	4	3	24
Peak Hour	1	0	0	0	1	Peak Hour	0	0	0	2	2	Peak Hour	2	6	1	0	9

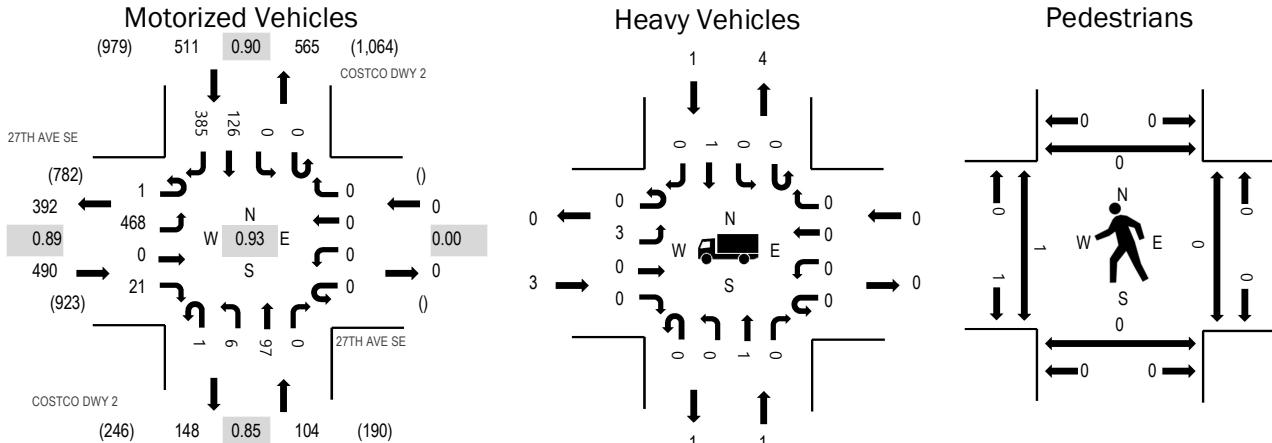
Location: 10 COSTCO DWY 2 & 27TH AVE SE PM

Date: Tuesday, May 17, 2022

Peak Hour: 04:25 PM - 05:25 PM

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

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.6%	0.89
WB	0.0%	0.00
NB	1.0%	0.85
SB	0.2%	0.90
All	0.5%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	27TH AVE SE				27TH AVE SE				COSTCO DWY 2				COSTCO DWY 2				Total	Rolling Hour	
	Eastbound		Westbound		Northbound		Southbound												
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			
4:00 PM	0	28	0	3	0	0	0	0	0	0	2	8	0	0	0	7	42	90	1,071
4:05 PM	0	31	0	2	0	0	0	0	0	0	1	9	0	0	0	6	32	81	1,062
4:10 PM	0	31	0	0	0	0	0	0	0	0	0	6	0	0	0	5	33	75	1,083
4:15 PM	0	48	0	1	0	0	0	0	0	0	0	3	0	0	0	6	35	93	1,099
4:20 PM	0	37	0	1	0	0	0	0	0	0	0	7	0	0	0	5	29	79	1,096
4:25 PM	0	39	0	2	0	0	0	0	0	0	1	8	0	0	0	5	33	88	1,105
4:30 PM	1	38	0	1	0	0	0	0	0	0	2	8	0	0	0	3	34	87	1,085
4:35 PM	0	38	0	1	0	0	0	0	0	1	0	8	0	0	0	14	37	99	1,084
4:40 PM	0	40	0	1	0	0	0	0	0	0	0	6	0	0	0	11	25	83	1,074
4:45 PM	0	36	0	4	0	0	0	0	0	0	1	6	0	0	0	13	43	103	1,075
4:50 PM	0	54	0	3	0	0	0	0	0	0	0	10	0	0	0	11	29	107	1,035
4:55 PM	0	42	0	1	0	0	0	0	0	0	1	7	0	0	0	9	26	86	1,027
5:00 PM	0	31	0	0	0	0	0	0	0	0	1	8	0	0	0	12	29	81	1,021
5:05 PM	0	38	0	2	0	0	0	0	0	0	0	13	0	0	0	15	34	102	
5:10 PM	0	39	0	2	0	0	0	0	0	0	0	9	0	0	0	11	30	91	
5:15 PM	0	38	0	3	0	0	0	0	0	0	0	9	0	0	0	7	33	90	
5:20 PM	0	35	0	1	0	0	0	0	0	0	0	5	0	0	0	15	32	88	
5:25 PM	1	32	0	0	0	0	0	0	0	0	0	7	0	0	0	6	22	68	
5:30 PM	0	30	0	1	0	0	0	0	0	0	0	5	0	0	0	10	40	86	
5:35 PM	0	43	0	2	0	0	0	0	0	0	0	8	0	0	0	4	32	89	
5:40 PM	0	31	0	0	0	0	0	0	0	0	0	9	0	0	0	11	33	84	
5:45 PM	0	32	0	1	0	0	0	0	0	0	0	3	0	0	0	9	18	63	
5:50 PM	0	41	0	2	0	0	0	0	0	0	0	14	0	0	0	11	31	99	
5:55 PM	2	32	0	1	0	0	0	0	0	0	0	4	0	0	0	4	37	80	
Count Total	4	884	0	35	0	0	0	0	1	9	180	0	0	0	210	769	2,092		
Peak Hour	1	468	0	21	0	0	0	0	1	6	97	0	0	0	126	385	1,105		

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway				Interval Start Time	Pedestrians/Bicycles on Crosswalk					
	EB	NB	WB	SB	Total		EB	NB	WB	SB		EB	NB	WB	SB	Total	
4:00 PM	0	2	0	0	2	4:00 PM	0	0	0	0	0	4:00 PM	2	0	0	0	2
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	0	1	4:15 PM	0	0	0	1	1	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1	4:30 PM	0	0	0	1	1	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	1	1	4:35 PM	0	0	0	0	0	4:35 PM	1	0	0	0	1
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	1	0	0	0	1
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	3	4	0	1	8	Count Total	0	0	0	2	2	Count Total	4	0	0	0	4
Peak Hour	3	1	0	1	5	Peak Hour	0	0	0	1	1	Peak Hour	1	0	0	0	1

APPENDIX B: CRASH DATA (2016 – 2020)

000 Crash	015 Street	016 Inters	028 Crash	029 Collisi	031 Weat	032 Road	033 Lightir	034 Traffic	036 Crash	114 Road	117 Sever	118 Inters	126 Bike /	Week of 00	002 Year	007 Count	008 Jurisd	119 State	005 Region	011 Hwy N	013 Lat	014 Long	019 Mp N	001 CRASH	003 Crash	004 Crash	006 Cnty	009 Urban	010 Functi	012 Hwy N	017 From	018 Cmpss
1658704	KUEBLER	COMMERC	S-1STOP	REAR	RAIN	WET	DAY	UNKNOWN	CARELESS	No	Possible In	Yes	Neither	24-Jan-16	2016	Marion	Salem	No	2	44.88204	-123.032	#####	29	11A	24	SALEM-KZ	U PR-ART		500	7		
1711536	KUEBLER	COMMERC	S-1STOP	REAR	RAIN	WET	DLIT	UNKNOWN	CARELESS	No	PDO	Yes	Neither	16-Oct-16	2016	Marion	Salem	No	2	44.88206	-123.032	#####	16	9P	24	SALEM-KZ	U PR-ART		329	7		
1696754	KUEBLER	COMMERC	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	PDO	Yes	Neither	22-May-16	2016	Marion	Salem	No	2	44.88207	-123.031	#####	23	5P	24	SALEM-KZ	U PR-ART		235	7		
1700534	KUEBLER	COMMERC	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	INATTENT	No	PDO	Yes	Neither	19-Jun-16	2016	Marion	Salem	No	2	44.88209	-123.031	#####	24	2P	24	SALEM-KZ	U PR-ART		55	7		
1881183	KUEBLER	COMMERC	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	Possible In	Yes	Neither	8-Mar-20	2020	Marion	Salem	No	2	44.88209	-123.031	3/9/2020	9	7A	24	SALEM-KZ	U PR-ART		75	7		
1660964	COMMERC	KUEBLER	BS-1STOP	REAR	RAIN	WET	DLIT	UNKNOWN	F AVOID	No	Possible In	Yes	Neither	28-Feb-16	2016	Marion	Salem	No	2	44.88253	-123.031	#####	29	7P	24	SALEM-KZ	U PR-ART		111	8		
1712683	COMMERC	KUEBLER	BS-1STOP	REAR	CLD	DRY	DAY	UNKNOWN	F AVOID	No	PDO	Yes	Neither	30-Oct-16	2016	Marion	Salem	No	2	44.88248	-123.031	#####	1	1P	24	SALEM-KZ	U PR-ART		82	8		
1712653	COMMERC	KUEBLER	BS-OTHER	TURN	CLR	DRY	DAY	L-GRN-SIG	IMP-TURN	No	PDO	Yes	Neither	30-Oct-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	2	2P	24	SALEM-KZ	U PR-ART		0	9		
1682928	COMMERC	KUEBLER	BO-1 L-TUR	TURN	RAIN	WET	DLIT	TRF SIGNA	DIS SIG	No	Possible In	Yes	Neither	23-Oct-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	23	6P	24	SALEM-KZ	U PR-ART		0	9		
1704724	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	24-Jul-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	30	2P	24	SALEM-KZ	U PR-ART		0	4		
1888287	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	Possible In	Yes	Neither	30-Aug-20	2020	Marion	Salem	No	2	44.88256	-123.031	9/1/2020	1	2P	24	SALEM-KZ	U PR-ART		122	8		
1700920	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	26-Jun-16	2016	Marion	Salem	No	2	44.88211	-123.03	7/1/2016	1	6P	24	SALEM-KZ	U PR-ART		0	4		
1664184	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Possible In	Yes	Neither	3-Apr-16	2016	Marion	Salem	No	2	44.88211	-123.03	4/6/2016	6	6P	24	SALEM-KZ	U PR-ART		0	7		
1674582	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Possible In	Yes	Neither	24-Jul-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	29	5P	24	SALEM-KZ	U PR-ART		0	3		
1686725	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	RECKLESS	No	Possible In	Yes	Neither	17-Jul-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	21	3P	24	SALEM-KZ	U PR-ART		0	4		
1686818	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Possible In	Yes	Neither	17-Jul-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	21	3P	24	SALEM-KZ	U PR-ART		0	4		
1677154	COMMERC	KUEBLER	BS-STRGHT	REAR	CLR	DRY	DLIT	TRF SIGNA	F AVOID	No	Possible In	Yes	Neither	28-Aug-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	31	9P	24	SALEM-KZ	U PR-ART		0	9		
1881826	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	ILLNESS	No	Possible In	Yes	Neither	5-Apr-20	2020	Marion	Salem	No	2	44.8821	-123.03	4/8/2020	8	2P	24	SALEM-KZ	U PR-ART		0	8		
1837224	COMMERC	KUEBLER	BO-1 L-TUR	TURN	CLR	DRY	DLIT	TRF SIGNA	DIS SIG	No	Possible In	Yes	Neither	16-Jun-19	2019	Marion	Salem	No	2	44.88211	-123.03	#####	18	10P	24	SALEM-KZ	U PR-ART		0	9		
1846048	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	YIELD	F AVOID	No	Possible In	Yes	Neither	20-Oct-19	2019	Marion	Salem	No	2	44.88211	-123.03	#####	26	4P	24	SALEM-KZ	U PR-ART		0	4		
1710416	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	UNK	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	2-Oct-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	3	6P	24	SALEM-KZ	U PR-ART		0	4		
1714848	COMMERC	KUEBLER	BS-1STOP	REAR	CLD	WET	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	27-Nov-16	2016	Marion	Salem	No	2	44.88211	-123.03	#####	28	12P	24	SALEM-KZ	U PR-ART		0	4		
1868525	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	15-Sep-19	2019	Marion	Salem	No	2	44.88211	-123.03	#####	19	9A	24	SALEM-KZ	U PR-ART		0	4		
1908691	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	TOO-CLOS	No	PDO	Yes	Neither	20-Dec-20	2020	Marion	Salem	No	2	44.8821	-123.03	#####	23	8A	24	SALEM-KZ	U PR-ART		0	4		
1859142	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	YIELD	F AVOID	No	PDO	Yes	Neither	7-Apr-19	2019	Marion	Salem	No	2	44.88211	-123.03	4/8/2019	8	2P	24	SALEM-KZ	U PR-ART		0	3		
1841082	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Possible In	Yes	Neither	11-Aug-19	2019	Marion	Salem	No	2	44.88211	-123.03	#####	16	4P	24	SALEM-KZ	U PR-ART		0	7		
1878436	COMMERC	KUEBLER	BS-PED	PED	RAIN	WET	DLIT	TRF SIGNA	NT VISBL	No	Possible In	Yes	Pedestrian	5-Jan-20	2020	Marion	Salem	No	2	44.88211	-123.03	#####	10	6P	24	SALEM-KZ	U PR-ART		0	4		
1847508	COMMERC	KUEBLER	BO-1 L-TUR	TURN	CLD	WET	DUSK	TRF SIGNA	DIS SIG	No	Minor Inju	Yes	Neither	17-Nov-19	2019	Marion	Salem	No	2	44.8821	-123.03	#####	17	5P	24	SALEM-KZ	U PR-ART		0	9		
1899567	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	12-Apr-20	2020	Marion	Salem	No	2	44.88211	-123.03	#####	17	4P	24	SALEM-KZ	U PR-ART		0	4		
1840742	COMMERC	KUEBLER	BO-1 L-TUR	TURN	UNK</																											

000 Crash	015 Street	016 Inters	028 Crash	029 Collisi	031 Weat	032 Road	033 Lightir	034 Traffid	036 Crash	114 Road	117 Sever	118 Inter	126 Bike /	Week of 00	002 Year	007 Count	008 Jurisd	119 State	005 Region	011 Hwy N	013 Lat	014 Long	019 Mp N	001 CRASH	003 Crash	004 Crash	006 Cnty	009 Urban	010 Functi	012 Hwy N	017 From	018 Cmpss
1721390	COMMERC	KUEBLER	BS-1STOP	REAR	RAIN	WET	DAY	R-GRN-SIG F AVOID	No	Possible Inj	Yes	Neither	5-Mar-17	2017	Marion	Salem	No	2	44.88211	-123.03		3/5/2017	5 SP	24	SALEM-KZ	U PR-ART		0	4			
1739600	KUEBLER	COMMERC	BS-1STOP	REAR	CLR	DRY	DAY	R-GRN-SIG F AVOID	No	Possible Inj	Yes	Neither	15-Oct-17	2017	Marion	Salem	No	2	44.88211	-123.03		#####	17 2P	24	SALEM-KZ	U PR-ART		81	3			
1761386	KUEBLER	COMMERC	BS-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	PDO	Yes	Neither	13-Aug-17	2017	Marion	Salem	No	2	44.88212	-123.03		#####	14 6P	24	SALEM-KZ	U PR-ART		115	3			
1757700	KUEBLER	COMMERC	BS-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	PDO	Yes	Neither	4-Jun-17	2017	Marion	Salem	No	2	44.88212	-123.03		6/6/2017	6 1P	24	SALEM-KZ	U PR-ART		125	3			
1738953	KUEBLER	COMMERC	BS-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/INATTENT	No	Possible Inj	Yes	Neither	1-Oct-17	2017	Marion	Salem	No	2	44.88213	-123.028		#####	5 4P	24	SALEM-KZ	U PR-ART		475	3			
1866673	COMMERC	KUEBLER	BS-STRGHT	REAR	UNK	UNK	DAY	TRF SIGNA F AVOID	No	PDO	Yes	Neither	4-Aug-19	2019	Marion	Salem	No	2	44.88211	-123.03		8/8/2019	8 12P	24	SALEM-KZ	U PR-ART		0	8			
1863729	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	PDO	Yes	Neither	16-Jun-19	2019	Marion	Salem	No	2	44.88211	-123.03		#####	19 3P	24	SALEM-KZ	U PR-ART		0	4			
1907666	COMMERC	KUEBLER	BANGL-OH ANGL	CLD	WET	DLIT	TRF SIGNA DIS SIG	No	PDO	Yes	Neither	15-Nov-20	2020	Marion	Salem	No	2	44.88211	-123.03		#####	19 5A	24	SALEM-KZ	U PR-ART		0	9				
1791783	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	YIELD	VIEW OBS	No	Possible Inj	Yes	Neither	2-Sep-18	2018	Marion	Salem	No	2	44.88208	-123.031		9/6/2018	6 6A	24	SALEM-KZ	U PR-ART		0	4		
1811685	KUEBLER	COMMERC	BS-1STOP	REAR	RAIN	WET	DAY	UNKNOWN/F AVOID	No	PDO	Yes	Neither	9-Sep-18	2018	Marion	Salem	No	2	44.88209	-123.031		#####	13 4P	24	SALEM-KZ	U PR-ART		59	7			
1797461	KUEBLER	COMMERC	BS-1STOP	REAR	RAIN	WET	DAY	UNKNOWN/TOO-CLOS	No	Possible Inj	Yes	Neither	9-Dec-18	2018	Marion	Salem	No	2	44.88209	-123.031		#####	14 4P	24	SALEM-KZ	U PR-ART		57	7			
1809227	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	PDO	Yes	Neither	19-Aug-18	2018	Marion	Salem	No	2	44.88242	-123.031		#####	20 7P	24	SALEM-KZ	U PR-ART		64	8			
1857714	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	PDO	Yes	Neither	3-Mar-19	2019	Marion	Salem	No	2	44.88169	-123.03		3/4/2019	4 2P	24	SALEM-KZ	U PR-ART		86	4			
1805724	COMMERC	KUEBLER	BS-STRGHT SS-O	CLR	DRY	DLIT	TRF SIGNA RECKLESS	No	PDO	Yes	Neither	15-Apr-18	2018	Marion	Salem	No	2	44.88211	-123.03		#####	20 2A	24	SALEM-KZ	U PR-ART		0	0				
1779631	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	4-Mar-18	2018	Marion	Salem	No	2	44.88211	-123.03		3/6/2018	6 5P	24	SALEM-KZ	U PR-ART		0	7			
1797893	COMMERC	KUEBLER	BO-1 L-TUR TURN	CLR	DRY	DLIT	TRF SIGNA NO-YIELD	No	Minor Inju	Yes	Neither	16-Dec-18	2018	Marion	Salem	No	2	44.88211	-123.03		#####	21 9P	24	SALEM-KZ	U PR-ART		0	9				
1795882	COMMERC	KUEBLER	BS-PED	PED	RAIN	WET	DLIT	TRF SIGNA NO-YIELD	No	Minor Inju	Yes	Pedestrian	11-Nov-18	2018	Marion	Salem	No	2	44.88211	-123.03		#####	14 5P	24	SALEM-KZ	U PR-ART		0	1			
1830660	KUEBLER	COMMERC	BS-1STOP	REAR	CLD	WET	DAY	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	24-Feb-19	2019	Marion	Salem	No	2	44.88212	-123.029		#####	28 4P	24	SALEM-KZ	U PR-ART		193	3			
1776576	COMMERC	KUEBLER	BS-1STOP	REAR	RAIN	WET	DAY	TRF SIGNA TOO-CLOS	No	Possible Inj	Yes	Neither	21-Jan-18	2018	Marion	Salem	No	2	44.88211	-123.03		#####	23 1P	24	SALEM-KZ	U PR-ART		0	7			
1803647	COMMERC	KUEBLER	BS-1STOP	REAR	CLD	DRY	DLIT	TRF SIGNA INATTENT	No	PDO	Yes	Neither	28-Jan-18	2018	Marion	Salem	No	2	44.88211	-123.03		2/2/2018	2 9P	24	SALEM-KZ	U PR-ART		0	8			
1776501	COMMERC	KUEBLER	BS-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	31-Dec-17	2018	Marion	Salem	No	2	44.88211	-123.03		1/3/2018	3 2P	24	SALEM-KZ	U PR-ART		0	4			
1776880	COMMERC	KUEBLER	BANGL-OH ANGL	RAIN	WET	DAY	TRF SIGNA INATTENT	No	Possible Inj	Yes	Neither	21-Jan-18	2018	Marion	Salem	No	2	44.88211	-123.03		#####	22 11A	24	SALEM-KZ	U PR-ART		0	9				
1806786	COMMERC	KUEBLER	BS-1STOP	REAR	RAIN	WET	DAY	UNKNOWN/F AVOID	No	PDO	Yes	Neither	3-Jun-18	2018	Marion	Salem	No	2	44.88173	-123.03		6/8/2018	8 7P	24	SALEM-KZ	U PR-ART		70	4			
1660222	KUEBLER	BATTLE CR	BS-1STOP	REAR	CLD	WET	DAY	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	14-Feb-16	2016	Marion	Salem	No	2	44.88358	-123.014		#####	19 7A	24	SALEM-KZ	U PR-ART		456	6			
1889800	KUEBLER	BATTLE CR	BS-1STOP	REAR	CLR	DRY	DAY	L-GRN-SIG INATTENT	No	Possible Inj	Yes	Neither	27-Sep-20	2020	Marion	Salem	No	2	44.88396	-123.013		#####	3 12P	24	SALEM-KZ	U PR-ART		162	6			
1880860	KUEBLER	BATTLE CR	BS-1STOP	REAR	CLD	DRY	DAY	UNKNOWN/CARELESS	No	Possible Inj	Yes	Neither	1-Mar-20	2020	Marion	Salem	No	2	44.884	-123.013		3/2/2020	2 3P	24	SALEM-KZ	U PR-ART		134	6			
1714657	BATTLE CR	KUEBLER	BS-1STOP	REAR	RAIN	WET	DLIT	UNKNOWN/F AVOID	No	PDO	Yes	Neither	20-Nov-16	2016	Marion	Salem	No	2	44.88453	-123.013		#####	22 5P	24	SALEM-KZ	U MN-ART		51	8			
1880687	BATTLE CR	KUEBLER	BO-1 L-TUR TURN	CLR	DRY	DLIT	TRF SIGNA NO-YIELD	No	Possible Inj	Yes	Neither	23-Feb-20	2020	Marion	Salem	No	2	44.88424	-123.012		#####	27 7P	24	SALEM-KZ	U PR-ART		0	9				
1846781	BATTLE CR	KUEBLER	BO-1 L-TUR TURN	CLR	DRY	DAY	TRF SIGNA NO-YIELD	No	Possible Inj	Yes	Neither	3-Nov-19	2019	Marion	Salem	No	2	44.88424	-123.012		#####	4 4P	24	SALEM-KZ	U PR-ART		0	9				
1840733	BATTLE CR	KUEBLER	BANGL-STP	TURN	CLR	DRY	DAY	TRF SIGNA CARELESS	No	Possible Inj	Yes	Neither	4-Aug-19	2019	Marion	Salem	No	2	4													

000 Crash	015 Street	016 Inters	028 Crash	029 Collisi	031 Weat	032 Road	033 Lightir	034 Traffic	036 Crash	114 Road	117 Sever	118 Inters	126 Bike /	Week of 00	002 Year	007 Count	008 Jurisd	119 State	005 Region	011 Hwy N	013 Lat	014 Long	019 Mp N	001 CRASH	003 Crash	004 Crash	006 Cnty	009 Urban	010 Functi	012 Hwy N	017 From	018 Cmpss
1892415	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DLIT	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	6-Dec-20	2020	Marion	Salem	No		2	44.8855	-123.007		#####	8	5P	24	SALEM-KZ	U PR-ART		342	7	
1659200	KUEBLER	E 27TH AVE	S-STRGHT	REAR	CLD	WET	DAY	UNKNOWN/INATTENT	No	Possible Inj	Yes	Neither	17-Jan-16	2016	Marion	Salem	No		2	44.88549	-123.006		#####	19	2P	24	SALEM-KZ	U PR-ART		258	7	
1833173	KUEBLER	E 27TH AVE	S-1STOP	REAR	RAIN	WET	DAY	UNKNOWN/TOO-CLOS	No	Minor Inju	Yes	Neither	7-Apr-19	2019	Marion	Salem	No		2	44.88549	-123.006		#####	11	2P	24	SALEM-KZ	U PR-ART		186	7	
1790179	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/TOO-CLOS	No	Minor Inju	Yes	Neither	12-Aug-18	2018	Marion	Salem	No		2	44.88548	-123.006		#####	15	2P	24	SALEM-KZ	U PR-ART		146	7	
1829073	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	27-Jan-19	2019	Marion	Salem	No		2	44.88548	-123.006		#####	30	7A	24	SALEM-KZ	U PR-ART		86	7	
1819372	KUEBLER	E 27TH AVE	S-1TURN	TURN	UNK	UNK	DAY	TRF SIGNA IMP-OVER	No	PDO	Yes	Neither	11-Nov-18	2018	Marion	Salem	No		2	44.88546	-123.005		#####	16	UNK	24	SALEM-KZ	U PR-ART		0	9	
1898325	KUEBLER	E 27TH AVE	S-STRGHT	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	1-Mar-20	2020	Marion	Salem	No		2	44.88547	-123.005	3/2/2020	2	10A	24	SALEM-KZ	U PR-ART		0	7		
1835080	KUEBLER	E 27TH AVE	ANGL-OTH	ANGL	CLD	WET	DAY	TRF SIGNA DIS SIG	No	Minor Inju	Yes	Neither	12-May-19	2019	Marion	Salem	No		2	44.88546	-123.005	#####	15	8A	24	SALEM-KZ	U PR-ART		0	9		
1846947	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	3-Nov-19	2019	Marion	Salem	No		2	44.88547	-123.005		#####	8	12P	24	SALEM-KZ	U PR-ART		0	3	
1889491	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Minor Inju	Yes	Neither	27-Sep-20	2020	Marion	Salem	No		2	44.88547	-123.005		#####	30	3P	24	SALEM-KZ	U PR-ART		0	3	
1771508	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DUSK	TRF SIGNA F AVOID	No	PDO	Yes	Neither	3-Dec-17	2017	Marion	Salem	No		2	44.88546	-123.005	#####	7	5P	24	SALEM-KZ	U MJ-COL		0	1		
1805849	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	PDO	Yes	Neither	15-Apr-18	2018	Marion	Salem	No		2	44.88546	-123.005	#####	19	2P	24	SALEM-KZ	U PR-ART		0	7		
1715473	KUEBLER	E 27TH AVE	S-OTHER	TURN	RAIN	WET	DAY	TRF SIGNA IMP-TURN	No	PDO	Yes	Neither	30-Oct-16	2016	Marion	Salem	No		2	44.88546	-123.005	#####	5	1P	24	SALEM-KZ	U PR-ART		0	1		
1738306	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA VIEW OBS	No	Possible Inj	Yes	Neither	24-Sep-17	2017	Marion	Salem	No		2	44.88546	-123.005	#####	28	7A	24	SALEM-KZ	U PR-ART		0	7		
1735242	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	13-Aug-17	2017	Marion	Salem	No		2	44.88546	-123.005	#####	18	7P	24	SALEM-KZ	U PR-ART		0	3		
1794026	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	14-Oct-18	2018	Marion	Salem	No		2	44.88546	-123.005	#####	19	6P	24	SALEM-KZ	U PR-ART		0	7		
1804435	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	PDO	Yes	Neither	25-Feb-18	2018	Marion	Salem	No		2	44.88547	-123.005	#####	26	8A	24	SALEM-KZ	U MJ-COL		0	5		
1711591	KUEBLER	E 27TH AVE	S-1STOP	REAR	RAIN	WET	DAY	UNKNOWN/F AVOID	No	PDO	Yes	Neither	16-Oct-16	2016	Marion	Salem	No		2	44.88544	-123.005	#####	16	12P	24	SALEM-KZ	U PR-ART		89	3		
1849065	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DUSK	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	15-Dec-19	2019	Marion	Salem	No		2	44.88545	-123.005	#####	17	5P	24	SALEM-KZ	U PR-ART		121	3		
1709465	KUEBLER	E 27TH AVE	S-STRGHT	SS-O	CLR	DRY	DLIT	UNKNOWN/IMP LN C	No	PDO	Yes	Neither	18-Sep-16	2016	Marion	Salem	No		2	44.88543	-123.004	#####	24	9P	24	SALEM-KZ	U PR-ART		223	7		
1675679	KUEBLER	E 27TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	14-Aug-16	2016	Marion	Salem	No		2	44.88541	-123.004	#####	16	5P	24	SALEM-KZ	U PR-ART		334	3		
1733608	KUEBLER	ES EF KUE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	23-Jul-17	2017	Marion	Salem	No		2	44.88537	-123.003	#####	23	7P	24	SALEM-KZ	U PR-ART		143	7		
1664614	KUEBLER	ESB EF KUE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN/F AVOID	No	Possible Inj	Yes	Neither	10-Apr-16	2016	Marion	Salem	Yes		2	1	44.88533	-123.001	251.31	#####	15	1P	24	SALEM-KZ	U PR-ART	PACIFIC	7	
1856660	KUEBLER	ESB EX KUE	S-1STOP	REAR	RAIN	WET	DLIT	TRF SIGNA INATTENT	No	PDO	Yes	Neither	10-Feb-19	2019	Marion	Salem	Yes		2	1	44.88533	-123.001	251.34	#####	12	9P	24	SALEM-KZ	U PR-ART	PACIFIC	7	
1844240	KUEBLER	ESB EX KUE	S-1STOP	REAR	CLR	DRY	DLIT	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	29-Sep-19	2019	Marion	Salem	Yes		2	1	44.88531	-123.001	252.56	#####	30	8P	24	SALEM-KZ	U INTRST	PACIFIC	1	
1777258	KUEBLER	ESB EX KUE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	Possible Inj	Yes	Neither	31-Dec-17	2018	Marion	Salem	Yes		2	1	44.8853	-123.001	252.56	1/5/2018	5	1P	24	SALEM-KZ	U INTRST	PACIFIC	1	
1809548	KUEBLER	ESB EX KUE	S-OTHER	TURN	CLR	DRY	DAY	TRF SIGNA IMP-TURN	No	PDO	Yes	Neither	26-Aug-18	2018	Marion	Salem	Yes		2	1	44.8853	-123.001	251.34	#####	29	6P	24	SALEM-KZ	U INTRST	PACIFIC	9	
1808410	KUEBLER	ESB EX KUE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID	No	PDO	Yes	Neither	29-Jul-18	2018	Marion	Salem	Yes		2	1	44.88531	-123.001	252.56	#####	30	1P	24	SALEM-KZ	U INTRST	PACIFIC	1	
1890004	KUEBLER	ESB EX KUE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA F AVOID																								

000 Crash	015 Street	016 Inters	028 Crash	029 Collisi	031 Weat	032 Road	033 Lightir	034 Traffic	036 Crash	114 Road	117 Sever	118 Inters	126 Bike /	Week of 00	002 Year	007 Count	008 Jurisd	119 State	005 Regio	011 Hwy N	013 Lat	014 Long	019 Mp N	001 CRASH	003 Crash	004 Crash	006 Cnty	009 Urban	010 Functi	012 Hwy N	017 From	018 Cmpss
1728145	KUEBLER	BNB EX KUE	S-1STOP	REAR	CLR	DRY	DLIT	TRF SIGNA	F AVOID	No	Possible Inj	Yes	Neither	18-Jun-17	2017	Marion	Salem	Yes	2	1	44.88513	-122.996	251.55	#####	20	1A	24	SALEM-KZ	U PR-ART	PACIFIC		3
1745333	KUEBLER	BNB EF KUE	S-1STOP	REAR	CLR	DRY	DLIT	TRF SIGNA	F AVOID	No	Possible Inj	Yes	Neither	10-Dec-17	2017	Marion	Salem	Yes	2	1	44.88513	-122.996	251.55	#####	11	8P	24	SALEM-KZ	U PR-ART	PACIFIC		3
1782392	KUEBLER	BNB EX KUE	ANGL-OTH	TURN	CLR	DRY	DUSK	TRF SIGNA	DIS SIG	No	Possible Inj	Yes	Neither	22-Apr-18	2018	Marion	Salem	Yes	2	1	44.88513	-122.996	251.55	#####	25	7P	24	SALEM-KZ	U INTRST	PACIFIC		9
1762420	KUEBLER	BNB EF KUE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	27-Aug-17	2017	Marion	Salem	Yes	2	1	44.88513	-122.996	251.55	#####	30	7P	24	SALEM-KZ	U PR-ART	PACIFIC		3
1817458	KUEBLER	B36TH AVE	S-1STOP	REAR	UNK	WET	DAY	UNKNOWN	F AVOID	No	PDO	Yes	Neither	30-Sep-18	2018	Marion	Salem	No	2		44.88489	-122.991	#####	5	10A	24	SALEM-KZ	U PR-ART			446	7
1813281	KUEBLER	B36TH AVE	S-1STOP	REAR	RAIN	WET	DAY	UNKNOWN	INATTENT	No	PDO	Yes	Neither	25-Nov-18	2018	Marion	Salem	No	2		44.88489	-122.991	#####	30	4P	24	SALEM-KZ	U PR-ART			435	7
1796531	KUEBLER	B36TH AVE	S-1STOP	REAR	RAIN	WET	DAY	UNKNOWN	TOO-CLOS	No	Minor Inju	Yes	Neither	25-Nov-18	2018	Marion	Salem	No	2		44.88487	-122.99	#####	30	4P	24	SALEM-KZ	U PR-ART			496	7
1696437	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	PDO	Yes	Neither	15-May-16	2016	Marion	Salem	No	2		44.88486	-122.99	#####	16	4P	24	SALEM-KZ	U PR-ART			257	7
1777222	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	Possible Inj	Yes	Neither	28-Jan-18	2018	Marion	Salem	No	2		44.88486	-122.99	#####	28	12P	24	SALEM-KZ	U PR-ART			215	7
1683931	KUEBLER	B36TH AVE	S-1STOP	REAR	RAIN	WET	DAY	UNKNOWN	F AVOID	No	Minor Inju	Yes	Neither	13-Nov-16	2016	Marion	Salem	No	2		44.88485	-122.99	#####	14	4P	24	SALEM-KZ	U PR-ART			187	7
1833550	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	Possible Inj	Yes	Neither	14-Apr-19	2019	Marion	Salem	No	2		44.88483	-122.989	#####	19	7A	24	SALEM-KZ	U PR-ART			65	7
1859561	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	UNKNOWN	F AVOID	No	PDO	Yes	Neither	14-Apr-19	2019	Marion	Salem	No	2		44.88484	-122.989	#####	17	5P	24	SALEM-KZ	U PR-ART			61	7
1867232	KUEBLER	B36TH AVE	FIX OBJ	FIX	CLR	DRY	DAY	TRF SIGNA	DEF STER	No	PDO	Yes	Neither	18-Aug-19	2019	Marion	Salem	No	2		44.88481	-122.989	#####	22	1P	24	SALEM-KZ	U MJ-COL			0	5
1880083	KUEBLER	B36TH AVE	S-1STOP	REAR	RAIN	WET	DUSK	TRF SIGNA	F AVOID	No	Possible Inj	Yes	Neither	9-Feb-20	2020	Marion	Salem	No	2		44.88482	-122.989	#####	15	5P	24	SALEM-KZ	U PR-ART			0	3
1870911	KUEBLER	B36TH AVE	O-1 L-TUR	TURN	CLR	DRY	DLIT	OFCR/FLAG	DIS TCD	No	PDO	Yes	Neither	20-Oct-19	2019	Marion	Salem	No	2		44.88482	-122.989	#####	25	10P	24	SALEM-KZ	U PR-ART			0	9
1845549	KUEBLER	B36TH AVE	ANGL-OTH	TURN	RAIN	WET	DUSK	TRF SIGNA	NO-YIELD	No	Possible Inj	Yes	Neither	13-Oct-19	2019	Marion	Salem	No	2		44.88481	-122.989	#####	18	5P	24	SALEM-KZ	U PR-ART			0	9
1675541	KUEBLER	B36TH AVE	ANGL-STP	TURN	CLR	DRY	DLIT	TRF SIGNA	IMP-TURN	No	Possible Inj	Yes	Neither	7-Aug-16	2016	Marion	Salem	No	2		44.88481	-122.989	#####	12	1A	24	SALEM-KZ	U MN-ART			0	1
1750760	KUEBLER	B36TH AVE	O-1 L-TUR	TURN	CLR	DRY	DAY	TRF SIGNA	NO-YIELD	No	PDO	Yes	Neither	29-Jan-17	2017	Marion	Salem	No	2		44.88481	-122.989	#####	31	8A	24	SALEM-KZ	U PR-ART			0	9
1755768	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	INATTENT	No	PDO	Yes	Neither	21-May-17	2017	Marion	Salem	No	2		44.88481	-122.989	#####	22	5P	24	SALEM-KZ	U PR-ART			0	7
170903	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	PDO	Yes	Neither	26-Jun-16	2016	Marion	Salem	No	2		44.88481	-122.989	#####	27	1P	24	SALEM-KZ	U PR-ART			0	0
1779896	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Possible Inj	Yes	Neither	4-Mar-18	2018	Marion	Salem	No	2		44.88481	-122.989	#####	10	8A	24	SALEM-KZ	U PR-ART			0	3
1729476	KUEBLER	B36TH AVE	O-1 L-TUR	TURN	CLR	DRY	DAY	TRF SIGNA	NO-YIELD	No	Minor Inju	Yes	Neither	25-Jun-17	2017	Marion	Salem	No	2		44.88481	-122.989	#####	27	10A	24	SALEM-KZ	U PR-ART			0	9
1783711	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	TOO-CLOS	No	Possible Inj	Yes	Neither	29-Apr-18	2018	Marion	Salem	No	2		44.88481	-122.989	5/1/2018	1	10A	24	SALEM-KZ	U PR-ART			0	0
1717765	KUEBLER	B36TH AVE	O-1 L-TUR	TURN	CLR	DRY	DAY	TRF SIGNA	NO-YIELD	No	Minor Inju	Yes	Neither	22-Jan-17	2017	Marion	Salem	No	2		44.88481	-122.989	#####	24	2P	24	SALEM-KZ	U PR-ART			0	9
1738986	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Minor Inju	Yes	Neither	1-Oct-17	2017	Marion	Salem	No	2		44.88481	-122.989	#####	3	4P	24	SALEM-KZ	U PR-ART			0	0
1798390	KUEBLER	B36TH AVE	ANGL-OTH	ANGL	RAIN	WET	DARK	UNKNOWN	INATTENT	No	Possible Inj	Yes	Neither	23-Dec-18	2018	Marion	Salem	No	2		44.88481	-122.989	#####	26	9P	24	SALEM-KZ	U PR-ART			0	9
1688717	KUEBLER	B36TH AVE	O-1 L-TUR	TURN	RAIN	WET	DUSK	TRF SIGNA	NO-YIELD	No	PDO	Yes	Neither	17-Jan-16	2016	Marion	Salem	No	2		44.88481	-122.989	#####	21	4P	24	SALEM-KZ	U PR-ART			0	9
1733715	KUEBLER	B36TH AVE	S-1STOP	REAR	CLR	DRY	DAY	TRF SIGNA	F AVOID	No	Possible Inj	Yes	Neither	23-Jul-17	2017	Marion	Salem	No	2		44.88481	-122.989</td										

000 Crash	020 Posted	021 Road	022 Off Ro	023 Isect T	024 Isect R	025 Drvwy	026 Ln Qty	027 Medn	030 Crash	035 Crash	037 Schoo	038 Work	039 Alcohol	040 Drug I	041 Mariju	042 Speed	043 Tot Fa	044 Tot Inj	045 Tot Inj	046 Tot Inj	047 Tot Inj	048 Tot Pe	049 Tot Pe	050 Tot Dr	051 Lane R	052 Veh1	053 Veh1	054 Veh1	055 Veh1	056 Veh1	057 Veh1	058 Veh1
1658704		STRGHT	FALSE		TRUE	FALSE	3	NONE	INJ	FORCED	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	3	3	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE		
1711536	35	STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				TRUE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	W	E	NONE	
1696754		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	W	E	NONE	
1700534		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	W	E	NONE	
1881183		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	W	E	NONE	
1660964		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE		
1712683		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO			1	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE	
1712653		INTER	FALSE	CROSS	FALSE	FALSE			PDO		0	1	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	SEMI TOW TURN-L	E	S	NONE	
1682928		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE	
1704724		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1888287		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE		
1700920		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1664184		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	0	1	UNKNOWN STRGHT	W	E	NONE	
1674582		INTER	FALSE	CROSS	FALSE	FALSE			INJ			1	FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	E	W	NONE	
1686725		INTER	FALSE	CROSS	FALSE	FALSE			INJ	OTHR CRASH		1	FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	1	1	PSNGR CA STRGHT	SE	NW	NONE	
1686818		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1677154		INTER	FALSE	CROSS	FALSE	FALSE			INJ			1	FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	E	W	NONE	
1881826		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FORCED	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE	
1837224		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FIRE/EXP	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1846048		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1710416		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1714848		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	S	N	NONE	
1868525		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1908691		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1859142		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1841082		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FEL/JUMP			FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	W	E	NONE	
1878436		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	1	0	0	0	0	1	PSNGR CA TURN-R	W	SE	NONE	
1847508		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	2	1	3	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE	
1899567		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	SE	NW	NONE	
1840742		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FEL/JUMP			FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	MTRCYCLE TURN-L	E	SE	NONE	
1830842		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE	
1831488		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	2	1	3	0	0	0	0	1	PSNGR CA STRGHT	E	W	PREV COL	
1830116		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	0	1	PSNGR CA STRGHT	W	E	NONE	
1693892		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	0	1	PSNGR CA STRGHT	NW	SE	NONE	
1698147		INTER	FALSE	CROSS	FALSE	FALSE																										

000 Crash	020 Posted	021 Road	022 Off Ro	023 Isect T	024 Isect R	025 Drvwy	026 Ln Qty	027 Medn	030 Crash	035 Crash	037 Schoo	038 Work	039 Alcohol	040 Drug I	041 Mariju	042 Speed	043 Tot Fa	044 Tot Inj	045 Tot Inj	046 Tot Inj	047 Tot Inj	048 Tot Pe	049 Tot Pe	050 Tot Dr	051 Lane R	052 Veh1	053 Veh1	054 Veh1	055 Veh1	056 Veh1	057 Veh1	058 Veh1
1721390		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	O N	1	PSNGR CA STRGHT	SE	NW	NONE		
1739600		STRGHT	FALSE		TRUE	FALSE	5	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	O N	1	PSNGR CA STRGHT	E	W	NONE		
1761386		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	E	W	NONE		
1757700		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	E	W	NONE		
1738953		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ	FORCED		0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	1	PSNGR CA STRGHT	E	W	NONE	
1866673		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	UN	UN	NONE		
1863729		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	SE	NW	NONE		
1907666		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	NW	SE	NONE		
1791783		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	O N	1	PSNGR CA STRGHT	SW	NE	NONE		
1811685		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	W	E	NONE		
1797461		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	4	4	0	0	O N	1	PSNGR CA STRGHT	W	E	NONE		
1809227		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	NW	SE	NONE		
1857714		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	SE	NW	NONE		
1805724		INTER	FALSE	CROSS	FALSE	FALSE			PDO		0	0	TRUE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	UN	UN	NONE		
1779631		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	2 N	1	PSNGR CA STRGHT	W	E	NONE		
1797893		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FIRE/EXP	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	1	1	2	0	0	0	1 N	1	PSNGR CA TURN-L	W	NW	NONE	
1795882		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	1	0	1	0	0	O N	1	PSNGR CA TURN-R	E	N	NONE		
1830660		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	O N	1	PSNGR CA STRGHT	E	W	NONE		
1776576		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	O N	1	PSNGR CA STRGHT	W	E	NONE		
1803647		INTER	FALSE	CROSS	FALSE	FALSE			PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	NW	SE	NONE		
1776501		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	O N	1	PSNGR CA STRGHT	SE	NW	NONE		
1776880		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	1 N	1	PSNGR CA STRGHT	W	E	NONE	
1806786		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	PSNGR CA STRGHT	SE	NW	NONE		
1660222		STRGHT	FALSE		TRUE	FALSE	3	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	2	2	0	0	O N	1	PSNGR CA STRGHT	SW	NE	NONE		
1889800		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	1 N	1	PSNGR CA STRGHT	SW	NE	NONE	
1880860		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	1 N	1	PSNGR CA STRGHT	SW	NE	NONE	
1714657		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	O N	1	MTRCYCLE STRGHT	NW	SE	NONE		
1880687		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	O N	1	PSNGR CA TURN-L	NE	SE	NONE		
1846781		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	3	3	0	0	0	O N	1	PSNGR CA STRGHT	NE	SW	NONE		
1840733		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	O N	1	PSNGR CA TURN-L	NE	SE	NONE		
1795010		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	1 N	1	PSNGR CA STRGHT	SW	NE	NONE		
1878382		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	1 N	1	PSNGR CA STRGHT	NE	SW	NONE	
1881499		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	1 N	1	PSNGR CA STRGHT	SW	NE	NONE	
1826549		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FEL/JUMP	0	0	0	FALSE	FALSE	FALSE	FALSE	0	2	0	1	3	0	0	0	1 N	1	MTRCYCLE STRGHT	NE	SW	NONE	
1847960		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	1 N	1					

000 Crash	020 Posted	021 Road	022 Off Ro	023 Isect T	024 Isect R	025 Drvwy	026 Ln Qty	027 Medn	030 Crash	035 Crash	037 Schoo	038 Work	039 Alcohol	040 Drug I	041 Mariju	042 Speed	043 Tot Fa	044 Tot Inj	045 Tot Inj	046 Tot Inj	047 Tot Inj	048 Tot Pe	049 Tot Pe	050 Tot Dr	051 Lane R	052 Veh1	053 Veh1	054 Veh1	055 Veh1	056 Veh1	057 Veh1	058 Veh1
1892415		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE		
1659200		STRGHT	FALSE		TRUE	FALSE	3	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE		
1833173		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ	FORCED	0	0	0	FALSE	FALSE	FALSE	TRUE	0	0	1	1	2	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1790179		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	3	1	4	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1829073		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	2	2	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1819372		INTER	FALSE	CROSS	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA TURN-L	UN	UN	NONE	
1898325		INTER	FALSE	CROSS	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	1	N	1	PSNGR CA STRGHT	W	E	NONE	
1835080		INTER	FALSE	CROSS	FALSE	FALSE		INJ	FIRE/EXP	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	1	1	2	0	0	0	1	N	1	PSNGR CA STRGHT	W	E	NONE	
1846947		INTER	FALSE	CROSS	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	0	2	2	0	0	0	N	1	PSNGR CA STRGHT	E	W	NONE	
1889491		INTER	FALSE	CROSS	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	1	1	2	0	0	0	0	N	1	PSNGR CA STRGHT	E	W	NONE	
1771508		INTER	FALSE	CROSS	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1805849		INTER	FALSE	CROSS	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1715473		INTER	FALSE	CROSS	FALSE	FALSE		PDO					1	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA TURN-R	E	N	NONE	
1738306		INTER	FALSE	CROSS	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1735242		INTER	FALSE	CROSS	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	E	W	NONE	
1794026		INTER	FALSE	CROSS	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1804435		INTER	FALSE	CROSS	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	S	N	NONE	
1711591		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	E	W	NONE	
1849065		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	E	W	NONE	
1709465		STRGHT	FALSE		TRUE	FALSE	4	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	MOTRHON STRGHT	E	W	NONE	
1675679		STRGHT	FALSE		TRUE	FALSE	3	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	E	W	NONE	
1733608		STRGHT	FALSE		TRUE	FALSE	4	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1664614		STRGHT	FALSE		TRUE	FALSE	3	NONE	INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	0	0	2	2	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1856660		INTER	FALSE	3-LEG	FALSE	FALSE		PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	W	E	NONE	
1844240		INTER	FALSE	3-LEG	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1777258		INTER	FALSE	3-LEG	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1809548		INTER	FALSE	3-LEG	FALSE	FALSE		PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA TURN-R	N	W	NONE	
1808410		INTER	FALSE	3-LEG	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1890004		INTER	FALSE	3-LEG	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1771500		INTER	FALSE	3-LEG	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1755758		INTER	FALSE	3-LEG	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA TURN-R	N	W	NONE	
1769779		INTER	FALSE	3-LEG	FALSE	FALSE		PDO					FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1722198		INTER	FALSE	3-LEG	FALSE	FALSE		INJ	FEL/JUMP	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	1	1	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1806372		INTER	FALSE	3-LEG	FALSE	FALSE		PDO		0	0	0	FALSE	FALSE	FALSE	TRUE	0	0	0	0	0	0	0	0	0	N	1	PSNGR CA STRGHT	N	S	NONE	
1726535		INTER	FALSE	3-LEG	FALSE	FALSE		INJ					FALSE	FALSE	FALSE	FALSE																

000 Crash	020 Posted	021 Road	022 Off Ro	023 Isect T	024 Isect R	025 Drvwy	026 Ln Qty	027 Medn	030 Crash	035 Crash	037 Schoo	038 Work	039 Alcohol	040 Drug I	041 Mariju	042 Speed	043 Tot Fa	044 Tot Inj	045 Tot Inj	046 Tot Inj	047 Tot Inj	048 Tot Pe	049 Tot Pe	050 Tot Dr	051 Lane R	052 Veh1	053 Veh1	054 Veh1	055 Veh1	056 Veh1	057 Veh1	058 Veh1
1728145		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	UNKNOWN	STRGHT	E	W	NONE	
1745333		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	4	4	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1782392		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	0	0	0	1	N	1	PSNGR CA	TURN-L	S	W	NONE
1762420		INTER	FALSE	CROSS	FALSE	FALSE			PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1817458		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1813281	45	STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1796531		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ	FORCED	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	2	3	5	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE
1696437		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1777222		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	0	3	3	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE
1683931		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	1	1	2	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1833550		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1859561		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1867232		INTER	TRUE	3-LEG	FALSE	FALSE			PDO	DITCH	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	N	1	FARM TRC	TURN-L	E	S	NONE	
1880083		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE
1870911		INTER	FALSE	CROSS	FALSE	FALSE			PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1845549		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	PSNGR CA	TURN-R	N	W	NONE
1675541		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	TRUE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	PSNGR CA	TURN-R	E	N	NONE
1750760		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	TURN-L	E	S	NONE	
1755768		INTER	FALSE	CROSS	FALSE	FALSE			PDO	DSTRCT OTH			FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1709903		INTER	FALSE	CROSS	FALSE	FALSE			PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	UN	UN	NONE	
1779896		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1729476		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	2	0	2	0	0	0	N	1	PSNGR CA	TURN-L	W	N	NONE
1783711		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	3	3	0	0	0	N	1	PSNGR CA	STRGHT	UN	UN	NONE	
1717765		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	3	0	3	0	0	0	N	1	PSNGR CA	TURN-L	W	N	NONE
1738986		INTER	FALSE	CROSS	FALSE	FALSE			INJ	FORCED			FALSE	FALSE	FALSE	FALSE	0	0	1	0	1	0	0	0	N	1	PSNGR CA	STRGHT	UN	UN	NONE	
1798390		INTER	FALSE	CROSS	FALSE	FALSE			INJ		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	PSNGR CA	STRGHT	S	N	NONE
1688717		INTER	FALSE	CROSS	FALSE	FALSE			PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	N	1	PSNGR CA	TURN-L	N	E	NONE	
1733715		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	1	1	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1723936		INTER	FALSE	CROSS	FALSE	FALSE			INJ				FALSE	FALSE	FALSE	FALSE	0	0	0	2	2	0	0	0	N	1	PSNGR CA	STRGHT	W	E	NONE	
1849309		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ	FORCED	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	4	4	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE
1805840		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO		0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1693213		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1750632		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO				FALSE	FALSE	FALSE	FALSE	0	0	0	0	0	0	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1884773		STRGHT	FALSE		TRUE	FALSE	2	NONE	INJ	FORCED	0	0	0	FALSE	FALSE	FALSE	FALSE	0	0	1	0	1	0	0	N	1	PSNGR CA	STRGHT	E	W	NONE	
1807007		STRGHT	FALSE		TRUE	FALSE	2	NONE	PDO																							

000 Crash	059 Veh1	060 Veh1	061 Veh1	062 Veh2	063 Veh2	064 Veh2	065 Veh2	066 Veh2	067 Veh2	068 Veh2	069 Veh2	070 Veh2	071 Veh2	072 Driver	073 Driver	074 Driver	075 Driver	076 Drive	077 Drive	078 Driver	079 Driver	080 Driver	081 Partic	082 Driver	083 Driver	084 Driver	085 Driver	086 Driver	087 Driver	088 FirstO	089 FirstO	090 FirstO
1658704	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED	FORCED	FALSE	FALSE	1	DRVR	35	CARELESS	CARELESS	0	0	2	1	40	NONE	NO CODE	0	0						
1711536	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	1			2	1	0	NONE	NO CODE	0	0					
1696754	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1700534	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1881183	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	44	REAR-END	F AVOID				2	1	67	NONE	NO CODE							
1660964	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED	FORCED	FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID				2	1	76	NONE	NO CODE							
1712683	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0		2	1	0	NONE	NO CODE	0	0					
1712653	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	E	S	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0		2	1	0	NONE	NO CODE	0	0					
1682928	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SE	W	NONE		FALSE	FALSE	1	DRVR	37	UNA DIS T	NO CODE				2	1	81	UNA DIS T	NO CODE							
1704724	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1888287	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED	FORCED	FALSE	FALSE	1	DRVR	39	REAR-END	F AVOID				2	1	40	NONE	NO CODE							
1700920	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1664184	FALSE	TRUE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID				2	1	39	NONE	NO CODE							
1674582	FALSE	TRUE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID				2	1	46	NONE	NO CODE							
1686725	FALSE	TRUE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	19	RECKLESS	RECKLESS	0	0		2	1	43	NONE	NO CODE	0	0					
1686818	FALSE	TRUE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	19	REAR-END	F AVOID	0	0		2	1	43	NONE	NO CODE	0	0					
1677154	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	FALSE	1	DRVR	27	F/SLO MV	F AVOID	0	0		2	1	48	NONE	NO CODE	0	0					
1881826	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED	FORCED	FALSE	FALSE	1	DRVR	83	REAR-END	ILLNESS	0	0	3	2	1	38	NONE	NO CODE	0	0	3				
1837224	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	NW	E	NONE	FIRE/EXP	FALSE	FALSE	1	DRVR	38	DIS SGNL	DIS SIG				2	1	20	NONE	NO CODE							
1846048	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	22	REAR-END	F AVOID				2	1	33	NONE	NO CODE							
1710416	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1714848	FALSE	FALSE	TRUE		2 PSNR CA	STOP	S	N	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1868525	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1908691	FALSE	FALSE	TRUE		2 SEMI TO	STOP	SE	NW	STP/L TRN		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1859142	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1841082	FALSE	FALSE	TRUE		2 MTRCYCLE	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	53	REAR-END	F AVOID				2	1	21	NONE	NO CODE							
1878436	FALSE	FALSE	TRUE								FALSE	FALSE	1	DRVR	25	NONE	NO CODE	0	0	3								PED	30	INJC		
1847508	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SE	W	NONE		FALSE	FALSE	1	DRVR	31	DIS SGNL	DIS SIG	0	0	3	2	1	37	NONE	NO CODE	0	0	3				
1899567	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1840742	FALSE	FALSE	TRUE		2 UNKNOW	STRGHT	W	E	NONE		FALSE	FALSE	1	DRVR	59	UNA DIS T	NO CODE				2	1	0	UNA DIS T	NO CODE							
1830842	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SE	W	NONE		FALSE	FALSE	1	DRVR	42	INATTENT	DIS SIG	0	0	3	2	1	19	NONE	NO CODE	0	0	3				
1831488	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	W	N	NONE		FALSE	FALSE	1	DRVR	29	DIS SGNL	DIS SIG	9	9	2	1	31	NONE	NO CODE	0	0	3					
1830116	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STP/L TRN	FORCED	FALSE	FALSE	1	DRVR	59	INATTENT	INATTENT				2	1	42	NONE	NO CODE							
1693892	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SE	W	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0		2	1	0	NONE	NO CODE	0	0					
1698147	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SE	W	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0		2	1	0	NONE	NO CODE	0	0					
1714927	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1679944	FALSE	FALSE	TRUE</																													

000 Crash	059 Veh1	060 Veh1	061 Veh1	062 Veh2	063 Veh2	064 Veh2	065 Veh2	066 Veh2	067 Veh2	068 Veh2	069 Veh2	070 Veh2	071 Veh2	072 Driver	073 Driver	074 Driver	075 Driver	076 Drive	077 Drive	078 Driver	079 Driver	080 Driver	081 Partic	082 Driver	083 Driver	084 Driver	085 Driver	086 Driver	087 Driver	088 FirstO	089 FirstO	090 FirstO
1721390	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID						2	1	38	NONE	NO CODE					
1739600	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	30	REAR-END	F AVOID						2	1	36	NONE	NO CODE					
1761386	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1757700	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1738953	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED	FORCED	FALSE	FALSE	1	DRVR	29	INATTENT	INATTENT	0	0	3	2	1	22	NONE	NO CODE	0	0	3				
1866673	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	UN	UN	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1863729	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1907666	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	W	E	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1791783	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SW	NE	STOPPED		FALSE	FALSE	1	DRVR	56	REAR-END	VIEW OBS						2	1	51	NONE	NO CODE					
1811685	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1797461	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	24	TOO CLOS	TOO-CLOS	0	0	3	2	1	39	NONE	NO CODE	0	0	3				
1809227	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1857714	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1805724	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	UN	UN	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	1					2	1	0	NONE	NO CODE	0	0	3		
1779631	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	20	REAR-END	F AVOID						2	1	19	NONE	NO CODE					
1797893	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE	FIRE/EXP	FALSE	FALSE	1	DRVR	24	NO ROW	NO-YIELD	0	0	3	2	1	38	NONE	NO CODE	0	0	3				
1795882	FALSE	FALSE	TRUE							FALSE	FALSE	1	DRVR	63	PED ROW	NO-YIELD	0	0	3											PED	30	INJB
1830660	FALSE	TRUE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID	9	9	9	2	1	25	NONE	NO CODE	0	0	3				
1776576	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	75	TOO CLOS	TOO-CLOS						2	1	47	NONE	NO CODE					
1803647	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1776501	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	31	REAR-END	F AVOID						2	1	46	NONE	NO CODE					
1776880	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	NW	SE	NONE		FALSE	FALSE	1	DRVR	19	INATTENT	INATTENT	0	0	3	2	1	27	NONE	NO CODE	0	0	3				
1806786	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1660222	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SW	NE	STOPPED		FALSE	FALSE	1	DRVR	23	REAR-END	F AVOID						2	1	48	NONE	NO CODE					
1889800	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SW	NE	STOPPED		FALSE	FALSE	1	DRVR	17	INATTENT	INATTENT	0	0	3	2	1	65	NONE	NO CODE	0	0	3				
1880860	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SW	NE	STOPPED		FALSE	FALSE	1	DRVR	18	CARELESS	CARELESS	0	0	3	2	1	36	NONE	NO CODE	0	0	3				
1714657	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NW	SE	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE						2	1	0	NONE	NO CODE					
1880687	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	SW	NE	NONE		FALSE	FALSE	1	DRVR	29	NO ROW	NO-YIELD						2	1	21	NONE	NO CODE					
1846781	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SW	NW	NONE		FALSE	FALSE	1	DRVR	25	NONE	NO CODE	0	0	3	2	1	28	NO ROW	NO-YIELD	0	0	3				
1840733	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SE	NW	STOPPED		FALSE	FALSE	1	DRVR	45	CARELESS	CARELESS						2	1	65	NONE	NO CODE					
1795010	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SW	NE	STOPPED	FORCED	FALSE	FALSE	1	DRVR	18	REAR-END	F AVOID						2	1	29	NONE	NO CODE					
1878382	FALSE	FALSE	TRUE		2 PSNR CA	STOP	NE	SW	STOPPED		FALSE	FALSE	1	DRVR	27	REAR-END	F AVOID	0	0	3	2	1	19	NONE	NO CODE	0	0	3				
1881499	FALSE	FALSE	TRUE		2 PSNR CA	STOP	SW	NE	STOPPED		FALSE	FALSE	1	DRVR	33	REAR-END	F AVOID	0	0	3	2	1	29	NONE	NO CODE	0	0	3				
1826549	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	SW	NW	NONE		FALSE	FALSE	1	DRVR	30	NONE	NO CODE	0	0	3	2	1	72	NO ROW	NO-YIELD	0	0	3				
1847960	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	NE	SE	NONE		FALSE	FALSE	1	DRVR	25	NONE	NO CODE	0	0	3	2	1										

000 Crash	059 Veh1	060 Veh1	061 Veh1	062 Veh2	063 Veh2	064 Veh2	065 Veh2	066 Veh2	067 Veh2	068 Veh2	069 Veh2	070 Veh2	071 Veh2	072 Driver	073 Driver	074 Driver	075 Driver	076 Drive	077 Drive	078 Driver	079 Driver	080 Driver	081 Partic	082 Driver	083 Driver	084 Driver	085 Driver	086 Driver	087 Driver	088 FirstO	089 FirstO	090 FirstO
1892415	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	44	REAR-END	F AVOID					2	1	42	NONE	NO CODE						
1659200	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	W	E	SLOW DN		FALSE	FALSE	1	DRVR	44	INATTENT	INATTENT					2	1	64	NONE	NO CODE						
1833173	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED	FORCED	FALSE	FALSE	1	DRVR	30	TOO CLOS	TOO-CLOS	0	0	3	2	1	63	NONE	NO CODE	0	0	3				
1790179	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	33	TOO CLOS	TOO-CLOS	0	0	3	2	1	68	NONE	NO CODE	0	0	3				
1829073	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	59	REAR-END	F AVOID					2	1	44	NONE	NO CODE						
1819372	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	UN	UN	PASSING		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1898325	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	W	E	NONE		FALSE	FALSE	1	DRVR	19	F/SLO MV	F AVOID					2	1	49	NONE	NO CODE						
1835080	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	N	S	NONE		FALSE	FALSE	1	DRVR	20	DIS SGNL	DIS SIG	0	0	3	2	1	22	NONE	NO CODE	0	0	3				
1846947	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	32	REAR-END	F AVOID					2	1	61	NONE	NO CODE						
1889491	FALSE	FALSE	TRUE		2 OTH BUS	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	30	REAR-END	F AVOID					2	1	57	NONE	NO CODE						
1771508	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1805849	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1715473	FALSE	FALSE	TRUE		2 PSNR CA	TURN-R	E	N	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1738306	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	20	REAR-END	VIEW OBS					2	1	56	NONE	NO CODE						
1735242	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	17	REAR-END	F AVOID					2	1	18	NONE	NO CODE						
1794026	FALSE	FALSE	TRUE		2 UNKNOWN	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID					2	1	22	NONE	NO CODE						
1804435	FALSE	FALSE	TRUE		2 PSNR CA	STOP	S	N	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1711591	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1849065	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED	FORCED	FALSE	FALSE	1	DRVR	28	REAR-END	F AVOID					2	1	42	NONE	NO CODE						
1709465	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1675679	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	74	REAR-END	F AVOID					2	1	29	NONE	NO CODE						
1733608	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	27	REAR-END	F AVOID					2	1	24	NONE	NO CODE						
1664614	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED	FORCED	FALSE	FALSE	1	DRVR	24	REAR-END	F AVOID					2	1	23	NONE	NO CODE						
1856660	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1844240	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	28	REAR-END	F AVOID					2	1	58	NONE	NO CODE						
1777258	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	24	REAR-END	F AVOID					2	1	0	NONE	NO CODE						
1809548	FALSE	FALSE	TRUE		2 PSNR CA	TURN-R	N	W	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1808410	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1890004	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	23	REAR-END	F AVOID					2	1	50	NONE	NO CODE						
1771500	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1755758	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1769779	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE					2	1	0	NONE	NO CODE						
1722198	FALSE	FALSE	TRUE		2 MTRCYCLE	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID	9	9	9	2	1	22	NONE	NO CODE	0	0	3				
1806372	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1726535	FALSE	FALSE	TRUE		2 PSNR CA	TURN-R	N	W	NONE		FALSE	FALSE	1	DRVR	56	F/SLO MV	F AVOID					2	1	30	NONE	NO CODE						
1786106	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	53	REAR-END	F AVOID					2	1	32	N							

000 Crash	059 Veh1	060 Veh1	061 Veh1	062 Veh2	063 Veh2	064 Veh2	065 Veh2	066 Veh2	067 Veh2	068 Veh2	069 Veh2	070 Veh2	071 Veh2	072 Driver	073 Driver	074 Driver	075 Driver	076 Drive	077 Drive	078 Driver	079 Driver	080 Driver	081 Partic	082 Driver	083 Driver	084 Driver	085 Driver	086 Driver	087 Driver	088 FirstO	089 FirstO	090 FirstO
1728145	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID				2	1	46	NONE	NO CODE							
1745333	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	REAR-END	F AVOID				2	1	38	NONE	NO CODE							
1782392	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	W	E	NONE		FALSE	FALSE	1	DRVR	18	NONE	NO CODE	0	0	3	2	1	56	DIS SGNL	DIS SIG	0	0	3				
1762420	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE	0	0	3				
1817458	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1813281	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1796531	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED	FORCED	FALSE	FALSE	1	DRVR	34	TOO CLOSE	TOO-CLOS				2	1	36	NONE	NO CODE							
1696437	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1777222	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	21	REAR-END	F AVOID				2	1	34	NONE	NO CODE							
1683931	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	42	REAR-END	F AVOID				2	1	41	NONE	NO CODE							
1833550	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	30	REAR-END	F AVOID				2	1	55	NONE	NO CODE							
1859561	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1867232	FALSE	FALSE	TRUE								FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3												
1880083	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	82	REAR-END	F AVOID	0	0	3	2	1	67	NONE	NO CODE	0	0	3				
1870911	FALSE	FALSE	TRUE		2 PSNR CA	TURN-L	E	S	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1845549	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	FALSE	1	DRVR	62	NO ROW	NO-YIELD	0	0	3	2	1	71	NONE	NO CODE	0	0	3				
1675541	FALSE	FALSE	TRUE		2 PSNR CA	STOP	N	S	STOPPED		FALSE	FALSE	1	DRVR	21	WIDE TRN	IMP-TURN	1			2	1	58	NONE	NO CODE	0	0					
1750760	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	W	E	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1755768	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1709903	FALSE	FALSE	TRUE		2 PSNR CA	STOP	UN	UN	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1779896	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	68	REAR-END	F AVOID				2	1	37	NONE	NO CODE							
1729476	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	FALSE	1	DRVR	59	NO ROW	NO-YIELD	0	0	3	2	1	30	NONE	NO CODE	0	0	3				
1783711	FALSE	FALSE	TRUE		2 PSNR CA	STOP	UN	UN	STOPPED		FALSE	FALSE	1	DRVR	30	TOO CLOSE	TOO-CLOS				2	1	43	NONE	NO CODE							
1717765	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	FALSE	1	DRVR	58	NO ROW	NO-YIELD	0	0		2	1	33	NONE	NO CODE	0	0					
1738986	FALSE	FALSE	TRUE		2 PSNR CA	STOP	UN	UN	STOPPED	FORCED	FALSE	FALSE	1	DRVR	54	REAR-END	F AVOID				2	1	46	NONE	NO CODE							
1798390	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	E	W	NONE		FALSE	TRUE	1	DRVR	62	NONE	NO CODE	0	0	3	2	1	0	DIS SGNL	DIS SIG	9	9	9				
1688717	FALSE	FALSE	TRUE		2 PSNR CA	STRGHT	S	N	NONE		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1733715	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	19	REAR-END	F AVOID				2	1	19	NONE	NO CODE							
1723936	FALSE	FALSE	TRUE		2 PSNR CA	STOP	W	E	STOPPED		FALSE	FALSE	1	DRVR	53	REAR-END	F AVOID				2	1	19	NONE	NO CODE							
1849309	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED	FORCED	FALSE	FALSE	1	DRVR	19	INATTENT	INATTENT	0	0	3	2	1	36	NONE	NO CODE	0	0	3				
1805840	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE	0	0	3	2	1	0	NONE	NO CODE	0	0	3				
1693213	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1750632	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1884773	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED	FORCED	FALSE	FALSE	1	DRVR	81	TOO CLOSE	TOO-CLOS	0	0	3	2	1	33	NONE	NO CODE	0	0	3				
1807007	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1	DRVR	0	NONE	NO CODE				2	1	0	NONE	NO CODE							
1752936	FALSE	FALSE	TRUE		2 PSNR CA	STOP	E	W	STOPPED		FALSE	FALSE	1																			

000 Crash	091 FirstO	092 FirstO	093 FirstO	094 FirstO	095 FirstO	096 FirstO	097 FirstO	098 FirstO	099 FirstO	100 FirstO	101 Bike P	102 Bike A	103 Inj Svr	104 Bike M	105 Partic	106 Partic	107 Non M	108 Bike A	109 Bike P	110 Bike P	111 Bike A	112 Bike D	113 Bike M	115 Pedes	116 Bike F	120 Bike U	121 Driver	122 Pedes	123 Bike O	124 Driver	125 Pedes
1658704																									No	No	No	No	No	No	No
1711536																									No	No	No	Yes	No	No	No
1696754																									No	No	No	Yes	No	No	No
1700534																									No	No	No	Yes	No	No	No
1881183																									No	No	No	No	No	Yes	No
1660964																									No	No	No	Yes	No	Yes	No
1712683																									No	No	No	Yes	No	No	No
1712653																									No	No	No	Yes	No	No	No
1682928																									No	No	No	No	No	Yes	No
1704724																									No	No	No	Yes	No	No	No
1888287																									No	No	No	No	No	No	No
1700920																									No	No	No	Yes	No	No	No
1664184																									No	No	No	Yes	No	No	No
1674582																									No	No	No	Yes	No	No	No
1686725																									No	No	No	Yes	No	No	No
1686818																									No	No	No	Yes	No	No	No
1677154																									No	No	No	No	No	No	No
1881826																									No	No	No	No	No	No	Yes
1837224																									No	No	No	Yes	No	No	No
1846048																									No	No	No	No	No	No	No
1710416																									No	No	No	Yes	No	No	No
1714848																									No	No	No	Yes	No	No	No
1868525																									No	No	No	Yes	No	No	No
1908691																									No	No	No	Yes	No	No	No
1859142																									No	No	No	Yes	No	No	No
1841082																									No	No	No	No	No	No	No
1878436	STRGHT	W	E	I XWLK	NONE	DIS SGNL	NT VISBL																		Yes	No	No	No	No	No	No
1847508																									No	No	No	No	No	No	No
1899567																									No	No	No	Yes	No	No	No
1840742																									No	No	No	Yes	No	No	No
1830842																									No	No	No	Yes	No	No	No
1831488																									No	No	No	No	No	No	No
1830116																									No	No	No	No	No	No	No
1693892																									No	No	No	Yes	No	No	No
1698147																									No	No	No	Yes	No	No	No
1714927																									No	No	No	Yes	No	No	No
1679944																									No	No	No	Yes	No	No	No
1704268																									No	No	No	Yes	No	No	No
1676319																									No	No	No	No	No	No	No
1677039																									No	No	No	No	No	No	No
1708128																									No	No	No	Yes	No	No	No
1682594																									No	No	No	No	No	Yes	No
1686850																									No	No	No	Yes	No	No	Yes
1739746																									No	No	No	No	No	No	Yes
1732802																									No	No	No	Yes	No	No	No
1754820																									No	No	No	Yes	No	No	No
1725452																									No	No	No	Yes	No	No	No
1769627																									No	No	No	Yes	No	No	No
1758062																									No	No	No	Yes	No	No	No
1759788																									No	No	No	Yes	No	No	No
1766728																									No	No	No	Yes	No	No	No
1771540																									No	No	No	Yes	No	No	No
1755480																									No	No	No	Yes	No	No	No
1763116																									No	No	No	Yes	No	No	No
1766721																									No	No	No	Yes	No	No	No
1751115																									No	No	No	Yes	No	No	No
17																															

APPENDIX C: IN-PROCESS DEVELOPMENT VOLUMES

Import Counts		Export		Northbound		Southbound			Eastbound			Westbound		
Intersection		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
In-Process Trips - COMBINED														
1 COMMERCIAL ST SE & KUEBLER BLVD PM		0	21	6	16	36	0	0	90	0	4	63	10	
2 BATTLE CREEK RD SE & KUEBLER BLVD PM		41	69	41	47	71	28	47	35	30	61	8	54	
3 27TH AVE SE & KUEBLER BLVD PM		15	13	47	13	10	11	19	60	0	48	97	22	
4 I-5 SB RAMPS & KUEBLER BLVD PM		0	0	0	0	0	80	0	97	23	0	87	0	
5 I-5 NB RAMPS & KUEBLER BLVD PM		28	0	0	0	0	0	0	59	38	0	59	0	
6 36TH AVE SE & KUEBLER BLVD PM		0	0	0	0	0	0	0	59	0	0	59	0	
7 BATTLE CREEK RD SE & BOONE RD SE PM		0	107	34	4	158	0	0	4	0	47	3	44	
8 27TH AVE SE & BOONE RD SE PM		0	0	0	0	0	0	37	0	0	0	0	0	
9 COSTCO DWY 1 & KUEBLER BLVD PM		0	0	0	0	0	0	0	79	44	0	123	0	
10 COSTCO DWY 2 & 27TH AVE SE PM		0	37	0	0	0	58	38	0	0	0	0	0	
11 COSTCO DWY 3 & BOONE RD SE PM		0	0	0	37	0	87	38	4	0	0	7	0	
12 COSTCO DWY 3 & BOONE RD SE PM		0	0	0	0	0	7	4	37	0	0	0	0	

APPENDIX D: LOS DESCRIPTION

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Levels of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The Highway Capacity Manual provides level of service calculation methodology for both intersections and arterials¹. The following two sections provide interpretations of the analysis approaches.

¹ 2000 *Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapter 16 and 17.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 2010 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level-of-Service Criteria: Automobile Mode

Control Delay (s/vehicle)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street.

LOS is not calculated for major-street approaches or for the intersection as a whole

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The 2000 Highway Capacity Manual provides the basis for these calculations.

Level of Service	Delay (secs.)	Description
A	<10.00	Free Flow/Insignificant Delays: No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	Stable Operation/Minimal Delays: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	20.1-35.0	Stable Operation/Acceptable Delays: Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	35.1-55.0	Approaching Unstable/Tolerable Delays: The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	55.1-80.0	Unstable Operation/Significant Delays: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	>80.0	Forced Flow/Excessive Delays: Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C.

APPENDIX E: HCM REPORTS – EXISTING 2022

HCM 6th Signalized Intersection Summary
1: Commercial St & Kuebler Blvd

Kuebler Boone TPR (2022)
Existing 2022 - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	143	679	233	336	1017	379	269	790	248	328	1042	106
Future Volume (veh/h)	143	679	233	336	1017	379	269	790	248	328	1042	106
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00		0.98	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	1730	1758	1758	1786	1786	1730	1772	1772	1744	1786	1786	1730
Adj Flow Rate, veh/h	147	700	158	346	1048	363	277	814	0	338	1074	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	3	3	1	1	5	2	2	4	1	1	5
Cap, veh/h	172	995	579	392	1231	690	323	1106		384	1175	
Arrive On Green	0.05	0.30	0.30	0.12	0.36	0.36	0.10	0.33	0.00	0.12	0.35	0.00
Sat Flow, veh/h	3196	3340	1452	3300	3393	1432	3274	3367	1478	3300	3393	1466
Grp Volume(v), veh/h	147	700	158	346	1048	363	277	814	0	338	1074	0
Grp Sat Flow(s), veh/h/ln	1598	1670	1452	1650	1697	1432	1637	1683	1478	1650	1697	1466
Q Serve(g_s), s	5.9	24.2	9.6	13.4	37.0	23.0	10.8	27.8	0.0	13.1	39.4	0.0
Cycle Q Clear(g_c), s	5.9	24.2	9.6	13.4	37.0	23.0	10.8	27.8	0.0	13.1	39.4	0.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	172	995	579	392	1231	690	323	1106		384	1175	
V/C Ratio(X)	0.85	0.70	0.27	0.88	0.85	0.53	0.86	0.74		0.88	0.91	
Avail Cap(c_a), veh/h	172	995	579	432	1231	690	327	1106		406	1175	
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)	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.0	40.5	26.6	56.4	38.2	23.6	57.7	38.7	0.0	56.5	40.7	0.0
Incr Delay (d2), s/veh	30.6	4.2	1.2	6.4	2.7	1.0	18.6	4.4	0.0	17.9	12.4	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(50%), veh/ln	3.1	10.5	3.4	5.8	15.2	7.6	5.2	11.8	0.0	6.3	17.8	0.0
Unsig. Movement Delay, s/veh									0.30			0.10
LnGrp Delay(d), s/veh	91.6	44.7	27.7	62.8	40.8	24.6	76.3	43.0	0.3	74.4	53.0	0.1
LnGrp LOS	F	D	C	E	D	C	E	D	A	E	D	A
Approach Vol, veh/h	1005				1757			1347	A		1521	A
Approach Delay, s/veh	48.9				41.8			41.7			54.0	
Approach LOS	D				D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	43.7	19.1	47.7	11.0	52.2	16.8	50.0				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0				
Max Green Setting (Gmax), s	17.0	37.0	16.0	42.0	7.0	47.0	13.0	45.0				
Max Q Clear Time (g_c+l1), s	15.4	26.2	15.1	29.8	7.9	39.0	12.8	41.4				
Green Ext Time (p_c), s	0.0	1.2	0.0	1.1	0.0	1.4	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay				46.4								
HCM 6th LOS				D								
Notes												
Unsignalized Delay for [NBR, SBR] is included in calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary
2: Battle Creek Rd & Kuebler Blvd

Kuebler Boone TPR (2022)
Existing 2022 - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (veh/h)	69	1057	129	212	1526	199	150	196	172	168	235	56
Future Volume (veh/h)	69	1057	129	212	1526	199	150	196	172	168	235	56
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	0.98	1.00		0.99
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	1491	1772	1688	1758	1786	1660	1786	1589	1674	1702	1772	1772
Adj Flow Rate, veh/h	76	1162	78	233	1677	142	165	215	134	185	258	9
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	22	2	8	3	1	10	1	15	9	7	2	2
Cap, veh/h	87	1495	728	253	1811	930	213	245	429	207	384	414
Arrive On Green	0.06	0.44	0.44	0.30	1.00	1.00	0.06	0.15	0.15	0.13	0.22	0.22
Sat Flow, veh/h	1420	3367	1430	1674	3393	1406	3300	1589	1393	1621	1772	1483
Grp Volume(v), veh/h	76	1162	78	233	1677	142	165	215	134	185	258	9
Grp Sat Flow(s), veh/h/ln	1420	1683	1430	1674	1697	1406	1650	1589	1393	1621	1772	1483
Q Serve(g_s), s	6.9	38.1	3.7	17.5	0.0	0.0	6.4	17.2	9.6	14.6	17.3	0.6
Cycle Q Clear(g_c), s	6.9	38.1	3.7	17.5	0.0	0.0	6.4	17.2	9.6	14.6	17.3	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	87	1495	728	253	1811	930	213	245	429	207	384	414
V/C Ratio(X)	0.87	0.78	0.11	0.92	0.93	0.15	0.77	0.88	0.31	0.89	0.67	0.02
Avail Cap(c_a), veh/h	87	1495	728	283	1811	930	228	245	429	212	384	414
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.71	0.71	0.71	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	30.7	16.6	44.6	0.0	0.0	59.9	53.8	34.7	55.8	46.6	34.0
Incr Delay (d2), s/veh	44.2	2.9	0.2	31.6	9.6	0.3	13.1	31.0	1.7	34.1	9.0	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(50%), veh/ln	3.5	15.2	1.2	8.1	2.4	0.1	3.0	8.9	3.4	7.8	8.5	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	104.7	33.6	16.8	76.2	9.6	0.3	72.9	84.9	36.5	89.9	55.7	34.1
LnGrp LOS	F	C	B	E	A	A	E	F	D	F	E	C
Approach Vol, veh/h	1316			2052			514			452		
Approach Delay, s/veh	36.7			16.6			68.4			69.3		
Approach LOS	D			B			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	23.6	61.7	12.4	32.2	12.0	73.4	20.6	24.0				
Change Period (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	22.0	55.0	9.0	28.0	8.0	69.0	17.0	20.0				
Max Q Clear Time (g _{c+l1}), s	19.5	40.1	8.4	19.3	8.9	2.0	16.6	19.2				
Green Ext Time (p _c), s	0.2	6.9	0.0	0.9	0.0	21.8	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay		34.3										
HCM 6th LOS			C									
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
3: 27th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Existing 2022 - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑↑	
Traffic Volume (veh/h)	19	1178	69	377	1738	39	113	21	431	57	61	86
Future Volume (veh/h)	19	1178	69	377	1738	39	113	21	431	57	61	86
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.98
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		No
Adj Sat Flow, veh/h/ln	1800	1772	1800	1800	1786	1800	1786	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	20	1214	30	389	1792	22	116	22	178	59	63	48
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	2	0	0	1	0	1	0	0	0	0	0
Cap, veh/h	24	1482	777	429	1884	903	118	462	587	75	217	165
Arrive On Green	0.01	0.30	0.30	0.26	1.00	1.00	0.07	0.26	0.26	0.04	0.23	0.23
Sat Flow, veh/h	1714	3367	1525	3326	3393	1507	1701	1800	1524	1714	941	717
Grp Volume(v), veh/h	20	1214	30	389	1792	22	116	22	178	59	0	111
Grp Sat Flow(s), veh/h/ln	1714	1683	1525	1663	1697	1507	1701	1800	1524	1714	0	1658
Q Serve(g_s), s	1.5	43.6	1.6	14.7	0.0	0.0	8.9	1.2	10.6	4.4	0.0	7.2
Cycle Q Clear(g_c), s	1.5	43.6	1.6	14.7	0.0	0.0	8.9	1.2	10.6	4.4	0.0	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	24	1482	777	429	1884	903	118	462	587	75	0	383
V/C Ratio(X)	0.84	0.82	0.04	0.91	0.95	0.02	0.99	0.05	0.30	0.79	0.00	0.29
Avail Cap(c_a), veh/h	40	1482	777	460	1884	903	118	462	587	92	0	383
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.2	41.0	20.2	47.5	0.0	0.0	60.4	36.4	27.8	61.6	0.0	41.2
Incr Delay (d2), s/veh	26.1	5.2	0.1	18.2	11.0	0.0	77.9	0.2	1.3	24.2	0.0	1.9
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(50%), veh/ln	0.8	19.5	0.6	6.2	2.9	0.0	6.3	0.6	4.1	2.4	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	90.4	46.2	20.3	65.7	11.0	0.0	138.3	36.6	29.1	85.7	0.0	43.1
LnGrp LOS	F	D	C	E	B	A	F	D	C	F	A	D
Approach Vol, veh/h		1264			2203			316			170	
Approach Delay, s/veh		46.3			20.5			69.7			57.9	
Approach LOS		D			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	20.8	62.2	9.7	37.3	5.8	77.2	13.0	34.0				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	18.0	56.0	7.0	32.0	3.0	71.0	9.0	30.0				
Max Q Clear Time (g _{c+l1}), s	16.7	45.6	6.4	12.6	3.5	2.0	10.9	9.2				
Green Ext Time (p _c), s	0.0	1.7	0.0	0.1	0.0	3.5	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			34.3									
HCM 6th LOS			C									

HCM Signalized Intersection Capacity Analysis
4: Kuebler Blvd & I5 Southbound Ramp

Kuebler Boone TPR (2022)

Existing 2022 - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑				↑	↑↑	
Traffic Volume (vph)	0	1518	148	0	849	231	0	0	0	118	0	1305
Future Volume (vph)	0	1518	148	0	849	231	0	0	0	118	0	1305
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.0	4.0		5.0	4.0				4.0		4.0
Lane Util. Factor	0.95	1.00		0.95	1.00					1.00		0.88
Frt	1.00	0.85		1.00	0.85					1.00		0.85
Flt Protected	1.00	1.00		1.00	1.00					0.95		1.00
Satd. Flow (prot)	3353	1500		3386	1485					1555		2666
Flt Permitted	1.00	1.00		1.00	1.00					0.95		1.00
Satd. Flow (perm)	3353	1500		3386	1485					1555		2666
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1581	154	0	884	241	0	0	0	123	0	1359
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1581	154	0	884	241	0	0	0	123	0	1359
Heavy Vehicles (%)	0%	2%	2%	0%	1%	3%	0%	0%	0%	10%	0%	1%
Turn Type	NA	Free		NA	Free					Prot		custom
Protected Phases	2			6						3		8
Permitted Phases		Free			Free							2
Actuated Green, G (s)	89.0	130.0		89.0	130.0					32.0		121.0
Effective Green, g (s)	89.0	130.0		89.0	130.0					32.0		121.0
Actuated g/C Ratio	0.68	1.00		0.68	1.00					0.25		0.93
Clearance Time (s)	5.0			5.0						4.0		4.0
Vehicle Extension (s)	0.5			0.5						0.5		0.5
Lane Grp Cap (vph)	2295	1500		2318	1485					382		2563
v/s Ratio Prot	c0.47			0.26						0.08		c0.13
v/s Ratio Perm		0.10			0.16							0.38
v/c Ratio	0.69	0.10		0.38	0.16					0.32		0.53
Uniform Delay, d1	12.2	0.0		8.7	0.0					40.1		0.6
Progression Factor	1.59	1.00		0.60	1.00					1.00		1.00
Incremental Delay, d2	1.0	0.1		0.4	0.2					2.2		0.8
Delay (s)	20.5	0.1		5.6	0.2					42.3		1.4
Level of Service	C	A		A	A					D		A
Approach Delay (s)	18.7			4.5			0.0				4.8	
Approach LOS	B			A			A				A	
Intersection Summary												
HCM 2000 Control Delay	10.3			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.65											
Actuated Cycle Length (s)	130.0			Sum of lost time (s)			9.0					
Intersection Capacity Utilization	80.5%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
5: I5 Northbound Ramp & Kuebler Blvd

Kuebler Boone TPR (2022)
Existing 2022 - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	692	944	0	974	212	106	0	105	0	0	0
Future Volume (veh/h)	0	692	944	0	974	212	106	0	105	0	0	0
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1758	1772	0	1786	1744	1632	1800	1632			
Adj Flow Rate, veh/h	0	728	0	0	1025	208	112	0	23			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	3	2	0	1	4	12	0	12			
Cap, veh/h	0	2287	0	1925	390	422	0	340				
Arrive On Green	0.00	1.00	0.00	0.00	1.00	1.00	0.25	0.00	0.25			
Sat Flow, veh/h	0	3428	1502	0	2900	569	1714	0	1383			
Grp Volume(v), veh/h	0	728	0	0	618	615	112	0	23			
Grp Sat Flow(s), veh/h/ln	0	1670	1502	0	1697	1684	1714	0	1383			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	1.7			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	1.7			
Prop In Lane	0.00		1.00	0.00		0.34	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2287		0	1162	1153	422	0	340			
V/C Ratio(X)	0.00	0.32		0.00	0.53	0.53	0.27	0.00	0.07			
Avail Cap(c_a), veh/h	0	2287		0	1162	1153	422	0	340			
HCM Platoon Ratio	1.00	1.67	1.67	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(l)	0.00	0.70	0.00	0.00	0.59	0.59	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	39.5	0.0	37.6			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	1.0	1.1	1.5	0.0	0.4			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.0	0.1	0.0	0.0	0.3	0.3	3.0	0.0	0.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.3	0.0	0.0	1.0	1.1	41.1	0.0	37.9			
LnGrp LOS	A	A		A	A	A	D	A	D			
Approach Vol, veh/h	728	A		1233			135					
Approach Delay, s/veh	0.3			1.0			40.5					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	94.0			94.0			36.0					
Change Period (Y+Rc), s	5.0			5.0			4.0					
Max Green Setting (Gmax), s	89.0			89.0			32.0					
Max Q Clear Time (g_c+l1), s	2.0			2.0			8.9					
Green Ext Time (p_c), s	1.1			1.4			0.1					
Intersection Summary												
HCM 6th Ctrl Delay			3.3									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary
6: 36th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Existing 2022 - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	56	671	70	45	840	57	130	27	84	123	28	216
Future Volume (veh/h)	56	671	70	45	840	57	130	27	84	123	28	216
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00		0.98	1.00		1.00	1.00	0.98
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	1505	1730	1674	1547	1772	1800	1786	1800	1772	1772	1744	1758
Adj Flow Rate, veh/h	60	714	48	48	894	59	138	29	6	131	30	15
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	21	5	9	18	2	0	1	0	2	2	4	3
Cap, veh/h	227	1154	927	502	1092	72	305	178	37	304	228	190
Arrive On Green	0.05	1.00	1.00	0.03	0.67	0.67	0.05	0.12	0.12	0.06	0.13	0.13
Sat Flow, veh/h	1433	1730	1389	1474	1641	108	1701	1447	299	1688	1744	1456
Grp Volume(v), veh/h	60	714	48	48	0	953	138	0	35	131	30	15
Grp Sat Flow(s), veh/h/ln	1433	1730	1389	1474	0	1750	1701	0	1746	1688	1744	1456
Q Serve(g_s), s	1.8	0.0	0.0	1.4	0.0	52.1	7.0	0.0	2.3	8.0	2.0	1.2
Cycle Q Clear(g_c), s	1.8	0.0	0.0	1.4	0.0	52.1	7.0	0.0	2.3	8.0	2.0	1.2
Prop In Lane	1.00			1.00		0.06	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	227	1154	927	502	0	1164	305	0	215	304	228	190
V/C Ratio(X)	0.26	0.62	0.05	0.10	0.00	0.82	0.45	0.00	0.16	0.43	0.13	0.08
Avail Cap(c_a), veh/h	232	1154	927	510	0	1164	305	0	215	304	228	190
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.96	0.96	0.96	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.7	0.0	0.0	6.4	0.0	16.0	48.2	0.0	51.0	47.1	50.0	49.6
Incr Delay (d2), s/veh	0.6	2.4	0.1	0.1	0.0	6.5	1.0	0.0	0.4	1.0	1.2	0.8
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(50%), veh/ln	0.8	0.8	0.0	0.4	0.0	20.0	4.1	0.0	1.0	3.8	0.9	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.3	2.4	0.1	6.5	0.0	22.5	49.3	0.0	51.4	48.1	51.2	50.4
LnGrp LOS	B	A	A	A	A	C	D	A	D	D	D	D
Approach Vol, veh/h						1001			173			176
Approach Delay, s/veh						21.7			49.7			48.8
Approach LOS						C			D			D
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	12.0	20.0	7.3	90.7	11.0	21.0	7.5	90.5				
Change Period (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	16.0	4.0	86.0	7.0	17.0	4.0	86.0				
Max Q Clear Time (g_c+l1), s	10.0	4.3	3.4	2.0	9.0	4.0	3.8	54.1				
Green Ext Time (p_c), s	0.0	0.1	0.0	5.5	0.0	0.1	0.0	8.2				
Intersection Summary												
HCM 6th Ctrl Delay				19.2								
HCM 6th LOS				B								

HCM 6th Signalized Intersection Summary
7: Battle Creek Rd & Boone Rd

Kuebler Boone TPR (2022)
Existing 2022 - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑	↑	↑		↑	↓	
Traffic Volume (veh/h)	101	51	21	56	83	183	17	234	25	101	303	172
Future Volume (veh/h)	101	51	21	56	83	183	17	234	25	101	303	172
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.98			0.97	1.00		1.00	1.00	0.98
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	1744	1800	1800	1800	1800	1786	1716	1758	1800	1800	1772	1786
Adj Flow Rate, veh/h	107	54	22	60	88	195	18	249	27	107	322	183
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	0	0	0	0	1	6	3	0	0	2	1
Cap, veh/h	285	217	89	312	277	227	601	951	103	722	670	381
Arrive On Green	0.07	0.18	0.18	0.04	0.15	0.15	0.01	0.61	0.61	0.08	1.00	1.00
Sat Flow, veh/h	1661	1200	489	1714	1800	1474	1634	1558	169	1714	1051	597
Grp Volume(v), veh/h	107	0	76	60	88	195	18	0	276	107	0	505
Grp Sat Flow(s), veh/h/ln	1661	0	1689	1714	1800	1474	1634	0	1727	1714	0	1649
Q Serve(g_s), s	6.9	0.0	5.0	3.8	5.7	16.8	0.5	0.0	9.6	3.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	0.0	5.0	3.8	5.7	16.8	0.5	0.0	9.6	3.0	0.0	0.0
Prop In Lane	1.00			0.29	1.00		1.00	1.00		0.10	1.00	0.36
Lane Grp Cap(c), veh/h	285	0	306	312	277	227	601	0	1054	722	0	1051
V/C Ratio(X)	0.38	0.00	0.25	0.19	0.32	0.86	0.03	0.00	0.26	0.15	0.00	0.48
Avail Cap(c_a), veh/h	289	0	377	349	388	317	659	0	1054	761	0	1051
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.73	0.00	0.73
Uniform Delay (d), s/veh	41.1	0.0	45.6	43.8	48.9	53.6	9.4	0.0	11.8	8.2	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.4	0.3	0.7	15.4	0.0	0.0	0.6	0.1	0.0	1.2
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(50%), veh/ln	2.9	0.0	2.2	1.7	2.6	7.2	0.2	0.0	3.7	1.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	41.9	0.0	46.0	44.1	49.6	69.0	9.5	0.0	12.4	8.3	0.0	1.2
LnGrp LOS	D	A	D	D	D	E	A	A	B	A	A	A
Approach Vol, veh/h						343			294			612
Approach Delay, s/veh						59.6			12.2			2.4
Approach LOS			D			E			B			A
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	5.4	87.9	12.7	24.0	9.0	84.3	9.2	27.6				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	70.0	9.0	28.0	8.0	68.0	8.0	29.0				
Max Q Clear Time (g_c+l1), s	2.5	2.0	8.9	18.8	5.0	11.6	5.8	7.0				
Green Ext Time (p_c), s	0.0	3.6	0.0	0.8	0.1	1.7	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay				23.4								
HCM 6th LOS				C								

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Commercial St & Kuebler Blvd	Signal	D	46	0.88
2	Synchro HCM 6th Signal	Battle Creek Rd & Kuebler Blvd	Signal	C	34	0.91
3	Synchro HCM 6th Signal	27th Ave & Kuebler Blvd	Signal	C	34	0.82
5	Synchro HCM 6th Signal	I5 Northbound Ramp & Kuebler Blvd	Signal	A	3	0.41
6	Synchro HCM 6th Signal	36th Ave & Kuebler Blvd	Signal	B	19	0.78
7	Synchro HCM 6th Signal	Battle Creek Rd & Boone Rd	Signal	C	23	0.60

Intersection

Intersection Delay, s/veh 7.9
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖ ↗			↖ ↗			↖ ↗		↖ ↗	↖ ↗	↖ ↗
Traffic Vol, veh/h	79	13	7	1	13	21	3	3	1	5	5	139
Future Vol, veh/h	79	13	7	1	13	21	3	3	1	5	5	139
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	93	15	8	1	15	25	4	4	1	6	6	164
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			2			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	2			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			2			1			1		
HCM Control Delay	8.2			7.3			7.6			7.8		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	43%	80%	3%	50%	0%
Vol Thru, %	43%	13%	37%	50%	0%
Vol Right, %	14%	7%	60%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	99	35	10	139
LT Vol	3	79	1	5	0
Through Vol	3	13	13	5	0
RT Vol	1	7	21	0	139
Lane Flow Rate	8	116	41	12	164
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.01	0.145	0.047	0.016	0.185
Departure Headway (Hd)	4.545	4.48	4.078	5.131	4.078
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	790	805	883	702	863
Service Time	2.555	2.48	2.08	2.831	1.878
HCM Lane V/C Ratio	0.01	0.144	0.046	0.017	0.19
HCM Control Delay	7.6	8.2	7.3	7.9	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0.5	0.1	0	0.7

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

All Movement Classes

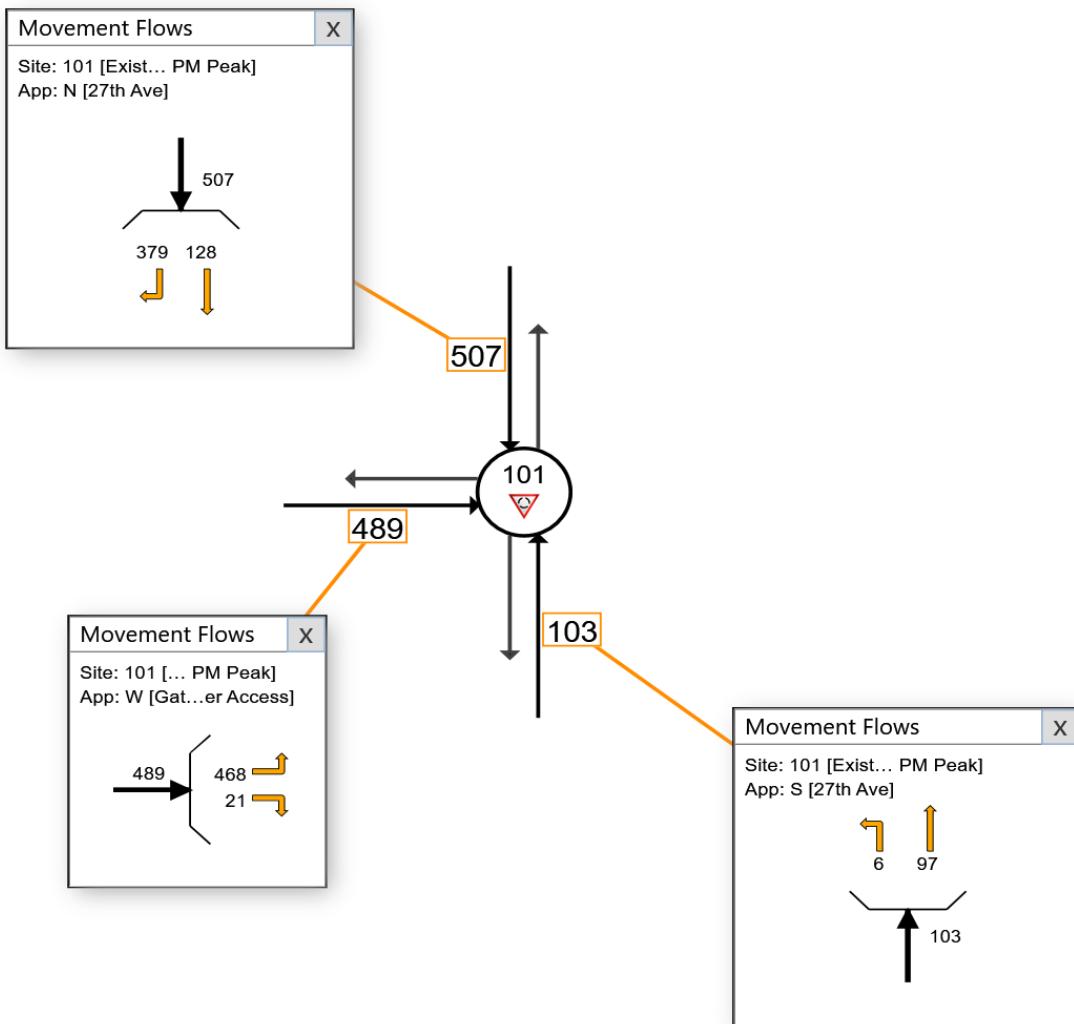
Site: 101 [Existing 2022 PM Peak (Site Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

[Close All Popups](#)



MOVEMENT SUMMARY

▼ Site: 101 [Existing 2022 PM Peak (Site Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Vehicle Movement Performance													
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	HV %	[Total veh/h]	HV %	v/c	sec		[Veh. veh]	Dist ft			
South: 27th Ave													
3	L2	6	0.0	6	0.0	0.136	5.8	LOS A	0.6	14.3	0.55	0.48	0.55 31.9
8	T1	97	1.0	104	1.0	0.136	5.8	LOS A	0.6	14.3	0.55	0.48	0.55 27.9
Approach		103	0.9	111	0.9	0.136	5.8	LOS A	0.6	14.3	0.55	0.48	0.55 28.2
North: 27th Ave													
4	T1	128	1.0	138	1.0	0.098	3.3	LOS A	0.4	10.5	0.04	0.01	0.04 32.2
14	R2	379	0.0	408	0.0	0.289	5.0	LOS A	1.6	39.0	0.06	0.01	0.06 29.3
Approach		507	0.3	545	0.3	0.289	4.6	LOS A	1.6	39.0	0.05	0.01	0.05 30.0
West: Gateway Shopping Center Access													
5	L2	468	1.0	503	1.0	0.443	7.6	LOS A	2.9	73.5	0.43	0.26	0.43 16.4
12	R2	21	0.0	23	0.0	0.443	7.6	LOS A	2.9	73.5	0.43	0.26	0.43 28.2
Approach		489	1.0	526	1.0	0.443	7.6	LOS A	2.9	73.5	0.43	0.26	0.43 16.9
All Vehicles		1099	0.6	1182	0.6	0.443	6.1	LOS A	2.9	73.5	0.26	0.17	0.26 21.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

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

APPENDIX F: HCM REPORTS – FUTURE 2037 - CURRENT ZONING

HCM 6th Signalized Intersection Summary
1: Commercial St & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	175	899	285	416	1279	480	330	989	305	416	1312	130
Future Volume (veh/h)	175	899	285	416	1279	480	330	989	305	416	1312	130
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00		0.98	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	1730	1758	1758	1786	1786	1730	1772	1772	1744	1786	1786	1730
Adj Flow Rate, veh/h	180	927	220	429	1319	469	340	1020	0	429	1353	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	3	3	1	1	5	2	2	4	1	1	5
Cap, veh/h	148	976	562	406	1253	732	302	1036		457	1201	
Arrive On Green	0.05	0.29	0.29	0.12	0.37	0.37	0.09	0.31	0.00	0.14	0.35	0.00
Sat Flow, veh/h	3196	3340	1451	3300	3393	1432	3274	3367	1478	3300	3393	1466
Grp Volume(v), veh/h	180	927	220	429	1319	469	340	1020	0	429	1353	0
Grp Sat Flow(s), veh/h/ln	1598	1670	1451	1650	1697	1432	1637	1683	1478	1650	1697	1466
Q Serve(g_s), s	6.0	35.3	14.3	16.0	48.0	31.2	12.0	39.1	0.0	16.7	46.0	0.0
Cycle Q Clear(g_c), s	6.0	35.3	14.3	16.0	48.0	31.2	12.0	39.1	0.0	16.7	46.0	0.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	976	562	406	1253	732	302	1036		457	1201	
V/C Ratio(X)	1.22	0.95	0.39	1.06	1.05	0.64	1.13	0.98		0.94	1.13	
Avail Cap(c_a), veh/h	148	976	562	406	1253	732	302	1036		457	1201	
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)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	62.0	45.1	29.0	57.0	41.0	23.4	59.0	44.7	0.0	55.5	42.0	0.0
Incr Delay (d2), s/veh	145.3	18.9	2.0	31.4	26.1	0.4	89.8	24.5	0.0	27.1	68.2	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(50%), veh/ln	5.4	17.1	5.2	8.3	23.6	10.0	8.6	19.2	0.0	8.5	29.7	0.0
Unsig. Movement Delay, s/veh									0.30			0.10
LnGrp Delay(d), s/veh	207.3	64.0	31.1	88.4	67.1	23.8	148.8	69.2	0.3	82.5	110.2	0.1
LnGrp LOS	F	E	C	F	F	C	F	E	A	F	F	A
Approach Vol, veh/h	1327				2217			1674	A		1916	A
Approach Delay, s/veh	78.0				62.1			72.5			96.3	
Approach LOS	E				E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	43.0	22.0	45.0	10.0	53.0	16.0	51.0				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0				
Max Green Setting (Gmax), s	16.0	38.0	18.0	40.0	6.0	48.0	12.0	46.0				
Max Q Clear Time (g_c+l1), s	18.0	37.3	18.7	41.1	8.0	50.0	14.0	48.0				
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				76.7								
HCM 6th LOS				E								
Notes												
Unsignalized Delay for [NBR, SBR] is included in calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary
2: Battle Creek Rd & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (veh/h)	132	1302	186	321	1862	298	216	305	252	253	363	97
Future Volume (veh/h)	132	1302	186	321	1862	298	216	305	252	253	363	97
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
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	1491	1772	1688	1758	1786	1660	1786	1589	1674	1702	1772	1772
Adj Flow Rate, veh/h	139	1371	137	338	1960	275	227	321	212	266	382	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	22	2	8	3	1	10	1	15	9	7	2	2
Cap, veh/h	109	1373	693	270	1671	876	254	281	476	212	409	458
Arrive On Green	0.08	0.41	0.41	0.32	0.98	0.98	0.05	0.12	0.12	0.13	0.23	0.23
Sat Flow, veh/h	1420	3367	1430	1674	3393	1406	3300	1589	1397	1621	1772	1484
Grp Volume(v), veh/h	139	1371	137	338	1960	275	227	321	212	266	382	46
Grp Sat Flow(s), veh/h/ln	1420	1683	1430	1674	1697	1406	1650	1589	1397	1621	1772	1484
Q Serve(g_s), s	10.0	52.9	7.1	21.0	64.0	0.5	8.9	23.0	15.6	17.0	27.5	2.9
Cycle Q Clear(g_c), s	10.0	52.9	7.1	21.0	64.0	0.5	8.9	23.0	15.6	17.0	27.5	2.9
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	109	1373	693	270	1671	876	254	281	476	212	409	458
V/C Ratio(X)	1.27	1.00	0.20	1.25	1.17	0.31	0.89	1.14	0.45	1.26	0.93	0.10
Avail Cap(c_a), veh/h	109	1373	693	270	1671	876	254	281	476	212	409	458
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(l)	0.47	0.47	0.47	1.00	1.00	1.00	0.81	0.81	0.81	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	38.5	19.1	44.0	1.0	0.3	61.1	57.3	36.0	56.5	49.0	32.2
Incr Delay (d2), s/veh	151.8	16.4	0.3	139.3	84.7	0.9	26.2	92.5	2.4	147.3	30.7	0.4
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(50%), veh/ln	8.1	23.7	2.4	17.4	20.0	0.3	4.7	16.7	5.8	15.5	15.4	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	211.8	54.9	19.4	183.3	85.7	1.2	87.3	149.8	38.4	203.8	79.7	32.6
LnGrp LOS	F	D	B	F	F	A	F	F	D	F	E	C
Approach Vol, veh/h		1647			2573			760			694	
Approach Delay, s/veh		65.2			89.5			100.0			124.2	
Approach LOS		E			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.0	57.0	14.0	34.0	14.0	68.0	21.0	27.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	21.0	53.0	10.0	30.0	10.0	64.0	17.0	23.0				
Max Q Clear Time (g_c+l1), s	23.0	54.9	10.9	29.5	12.0	66.0	19.0	25.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				88.1								
HCM 6th LOS				F								
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
3: 27th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑↑	
Traffic Volume (veh/h)	42	1503	87	504	2226	70	139	64	540	83	107	116
Future Volume (veh/h)	42	1503	87	504	2226	70	139	64	540	83	107	116
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.98
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	1800	1772	1800	1800	1786	1800	1786	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	43	1549	51	520	2295	56	143	66	525	86	110	89
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	2	0	0	1	0	1	0	0	0	0	0
Cap, veh/h	40	1476	763	460	1879	917	105	429	575	92	211	171
Arrive On Green	0.01	0.14	0.14	0.28	1.00	1.00	0.06	0.24	0.24	0.05	0.23	0.23
Sat Flow, veh/h	1714	3367	1525	3326	3393	1507	1701	1800	1524	1714	914	739
Grp Volume(v), veh/h	43	1549	51	520	2295	56	143	66	525	86	0	199
Grp Sat Flow(s), veh/h/ln	1714	1683	1525	1663	1697	1507	1701	1800	1524	1714	0	1653
Q Serve(g_s), s	3.0	57.0	3.3	18.0	72.0	0.0	8.0	3.8	31.0	6.5	0.0	13.7
Cycle Q Clear(g_c), s	3.0	57.0	3.3	18.0	72.0	0.0	8.0	3.8	31.0	6.5	0.0	13.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	40	1476	763	460	1879	917	105	429	575	92	0	382
V/C Ratio(X)	1.09	1.05	0.07	1.13	1.22	0.06	1.37	0.15	0.91	0.93	0.00	0.52
Avail Cap(c_a), veh/h	40	1476	763	460	1879	917	105	429	575	92	0	382
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.5	55.6	26.0	47.0	0.0	0.0	61.0	39.1	38.5	61.3	0.0	43.7
Incr Delay (d2), s/veh	170.0	37.5	0.2	78.0	103.5	0.1	214.1	0.8	21.4	70.6	0.0	5.0
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(50%), veh/ln	3.2	33.3	1.3	11.0	27.0	0.0	9.7	1.8	18.9	4.6	0.0	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	234.5	93.1	26.2	125.0	103.5	0.1	275.1	39.9	59.9	131.8	0.0	48.7
LnGrp LOS	F	F	C	F	F	A	F	D	E	F	A	D
Approach Vol, veh/h		1643			2871			734			285	
Approach Delay, s/veh		94.8			105.4			100.0			73.8	
Approach LOS		F			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	22.0	62.0	11.0	35.0	7.0	77.0	12.0	34.0				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	18.0	57.0	7.0	31.0	3.0	72.0	8.0	30.0				
Max Q Clear Time (g_c+l1), s	20.0	59.0	8.5	33.0	5.0	74.0	10.0	15.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			99.9									
HCM 6th LOS			F									

HCM Signalized Intersection Capacity Analysis
4: Kuebler Blvd & I5 Southbound Ramp

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑				↑	↑↑	
Traffic Volume (vph)	0	1926	200	0	1147	283	0	0	0	145	0	1653
Future Volume (vph)	0	1926	200	0	1147	283	0	0	0	145	0	1653
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.0	4.0		5.0	4.0				4.0		4.0
Lane Util. Factor	0.95	1.00		0.95	1.00					1.00		0.88
Frt	1.00	0.85		1.00	0.85					1.00		0.85
Flt Protected	1.00	1.00		1.00	1.00					0.95		1.00
Satd. Flow (prot)	3353	1500		3386	1485					1555		2666
Flt Permitted	1.00	1.00		1.00	1.00					0.95		1.00
Satd. Flow (perm)	3353	1500		3386	1485					1555		2666
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	2006	208	0	1195	295	0	0	0	151	0	1722
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2006	208	0	1195	295	0	0	0	151	0	1722
Heavy Vehicles (%)	0%	2%	2%	0%	1%	3%	0%	0%	0%	10%	0%	1%
Turn Type	NA	Free		NA	Free					Prot		custom
Protected Phases	2			6						3		8
Permitted Phases		Free			Free							2
Actuated Green, G (s)	91.0	130.0		91.0	130.0					30.0		121.0
Effective Green, g (s)	91.0	130.0		91.0	130.0					30.0		121.0
Actuated g/C Ratio	0.70	1.00		0.70	1.00					0.23		0.93
Clearance Time (s)	5.0			5.0						4.0		4.0
Vehicle Extension (s)	0.5			0.5						0.5		0.5
Lane Grp Cap (vph)	2347	1500		2370	1485					358		2563
v/s Ratio Prot	c0.60			0.35						0.10		c0.16
v/s Ratio Perm		0.14			0.20							0.49
v/c Ratio	0.85	0.14		0.50	0.20					0.42		0.67
Uniform Delay, d1	14.6	0.0		9.0	0.0					42.6		0.8
Progression Factor	1.57	1.00		0.56	1.00					1.00		1.00
Incremental Delay, d2	0.4	0.0		0.6	0.2					3.6		1.4
Delay (s)	23.3	0.0		5.6	0.2					46.2		2.3
Level of Service	C	A		A	A					D		A
Approach Delay (s)	21.1			4.5			0.0				5.8	
Approach LOS	C			A			A				A	
Intersection Summary												
HCM 2000 Control Delay	11.5			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	130.0			Sum of lost time (s)			9.0					
Intersection Capacity Utilization	102.0%			ICU Level of Service			G					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
5: I-15 Northbound Ramp & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑↓		↑	↑			
Traffic Volume (veh/h)	0	902	1169	0	1264	260	166	0	129	0	0	0
Future Volume (veh/h)	0	902	1169	0	1264	260	166	0	129	0	0	0
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1758	1772	0	1786	1744	1632	1800	1632			
Adj Flow Rate, veh/h	0	949	0	0	1331	260	175	0	41			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	3	2	0	1	4	12	0	12			
Cap, veh/h	0	2287		0	1942	374	422	0	340			
Arrive On Green	0.00	1.00	0.00	0.00	1.00	1.00	0.25	0.00	0.25			
Sat Flow, veh/h	0	3428	1502	0	2927	547	1714	0	1383			
Grp Volume(v), veh/h	0	949	0	0	789	802	175	0	41			
Grp Sat Flow(s), veh/h/ln	0	1670	1502	0	1697	1688	1714	0	1383			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	3.0			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	3.0			
Prop In Lane	0.00		1.00	0.00		0.32	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2287		0	1162	1155	422	0	340			
V/C Ratio(X)	0.00	0.42		0.00	0.68	0.69	0.41	0.00	0.12			
Avail Cap(c_a), veh/h	0	2287		0	1162	1155	422	0	340			
HCM Platoon Ratio	1.00	1.67	1.67	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(l)	0.00	0.46	0.00	0.00	0.15	0.15	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	41.1	0.0	38.1			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.5	0.5	3.0	0.0	0.7			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.0	0.1	0.0	0.0	0.2	0.2	5.0	0.0	1.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.3	0.0	0.0	0.5	0.5	44.1	0.0	38.8			
LnGrp LOS	A	A		A	A	A	D	A	D			
Approach Vol, veh/h	949	A		1591			216					
Approach Delay, s/veh	0.3			0.5			43.1					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	94.0			94.0			36.0					
Change Period (Y+Rc), s	5.0			5.0			4.0					
Max Green Setting (Gmax), s	89.0			89.0			32.0					
Max Q Clear Time (g_c+l1), s	2.0			2.0			13.1					
Green Ext Time (p_c), s	1.4			2.0			0.2					
Intersection Summary												
HCM 6th Ctrl Delay			3.8									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary
6: 36th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	69	870	92	55	1092	70	167	33	103	151	34	265
Future Volume (veh/h)	69	870	92	55	1092	70	167	33	103	151	34	265
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			0.98	1.00		0.98	1.00		1.00	1.00	0.98
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	1505	1730	1674	1547	1772	1800	1786	1800	1772	1772	1744	1758
Adj Flow Rate, veh/h	73	916	64	58	1149	72	176	35	19	159	36	133
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	21	5	9	18	2	0	1	0	2	2	4	3
Cap, veh/h	97	1177	946	351	1118	70	259	135	73	260	228	190
Arrive On Green	0.04	0.91	0.91	0.03	0.68	0.68	0.04	0.12	0.12	0.05	0.13	0.13
Sat Flow, veh/h	1433	1730	1389	1474	1647	103	1701	1097	596	1688	1744	1456
Grp Volume(v), veh/h	73	916	64	58	0	1221	176	0	54	159	36	133
Grp Sat Flow(s), veh/h/ln	1433	1730	1389	1474	0	1751	1701	0	1693	1688	1744	1456
Q Serve(g_s), s	2.1	22.0	0.6	1.6	0.0	88.2	5.0	0.0	3.8	6.0	2.4	11.4
Cycle Q Clear(g_c), s	2.1	22.0	0.6	1.6	0.0	88.2	5.0	0.0	3.8	6.0	2.4	11.4
Prop In Lane	1.00			1.00			0.06	1.00		0.35	1.00	1.00
Lane Grp Cap(c), veh/h	97	1177	946	351	0	1188	259	0	208	260	228	190
V/C Ratio(X)	0.75	0.78	0.07	0.17	0.00	1.03	0.68	0.00	0.26	0.61	0.16	0.70
Avail Cap(c_a), veh/h	99	1177	946	357	0	1188	259	0	208	260	228	190
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	3.0	2.0	7.9	0.0	20.9	52.7	0.0	51.6	51.5	50.1	54.0
Incr Delay (d2), s/veh	24.8	4.7	0.1	0.2	0.0	33.4	7.0	0.0	0.7	4.1	1.5	19.2
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(50%), veh/ln	2.2	4.1	0.2	0.4	0.0	40.8	3.6	0.0	1.6	2.4	1.1	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	60.3	7.7	2.1	8.1	0.0	54.3	59.7	0.0	52.3	55.6	51.6	73.3
LnGrp LOS	E	A	A	A	A	F	E	A	D	E	D	E
Approach Vol, veh/h	1053				1279			230			328	
Approach Delay, s/veh	11.0				52.2			58.0			62.3	
Approach LOS	B				D			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	10.0	20.0	7.5	92.5	9.0	21.0	7.8	92.2				
Change Period (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	16.0	4.0	88.0	5.0	17.0	4.0	88.0				
Max Q Clear Time (g_c+l1), s	8.0	5.8	3.6	24.0	7.0	13.4	4.1	90.2				
Green Ext Time (p_c), s	0.0	0.1	0.0	8.5	0.0	0.2	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				38.8								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary
7: Battle Creek Rd & Boone Rd

Kuebler Boone TPR (2022)
Future 2037 - Current RA Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑	↑	↑	↑		↑	↑	
Traffic Volume (veh/h)	124	69	26	128	101	255	21	394	89	130	529	211
Future Volume (veh/h)	124	69	26	128	101	255	21	394	89	130	529	211
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.98			0.96	1.00		1.00	1.00	0.98
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	1744	1800	1800	1800	1800	1786	1716	1758	1800	1800	1772	1786
Adj Flow Rate, veh/h	131	73	15	135	106	14	22	415	88	137	557	213
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	0	0	0	0	1	6	3	0	0	2	1
Cap, veh/h	203	123	25	222	169	137	532	947	201	613	850	325
Arrive On Green	0.06	0.09	0.09	0.07	0.09	0.09	0.01	0.67	0.67	0.08	1.00	1.00
Sat Flow, veh/h	1661	1431	294	1714	1800	1460	1634	1406	298	1714	1213	464
Grp Volume(v), veh/h	131	0	88	135	106	14	22	0	503	137	0	770
Grp Sat Flow(s), veh/h/ln	1661	0	1726	1714	1800	1460	1634	0	1704	1714	0	1676
Q Serve(g_s), s	8.0	0.0	6.4	9.0	7.4	1.1	0.6	0.0	17.8	3.2	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	6.4	9.0	7.4	1.1	0.6	0.0	17.8	3.2	0.0	0.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.17	1.00		0.28
Lane Grp Cap(c), veh/h	203	0	149	222	169	137	532	0	1148	613	0	1176
V/C Ratio(X)	0.64	0.00	0.59	0.61	0.63	0.10	0.04	0.00	0.44	0.22	0.00	0.66
Avail Cap(c_a), veh/h	203	0	279	222	305	247	587	0	1148	636	0	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.29	0.00	0.29
Uniform Delay (d), s/veh	52.4	0.0	57.2	50.8	56.7	53.9	6.5	0.0	9.8	6.7	0.0	0.0
Incr Delay (d2), s/veh	6.8	0.0	3.7	4.7	3.8	0.3	0.0	0.0	1.2	0.1	0.0	0.8
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(50%), veh/ln	0.9	0.0	2.9	4.3	3.5	0.4	0.2	0.0	6.4	0.9	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	59.2	0.0	60.9	55.5	60.5	54.2	6.5	0.0	11.0	6.8	0.0	0.8
LnGrp LOS	E	A	E	E	E	D	A	A	B	A	A	A
Approach Vol, veh/h		219			255			525			907	
Approach Delay, s/veh		59.9			57.5			10.9			1.7	
Approach LOS		E			E			B			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	5.6	96.2	12.0	16.2	9.3	92.6	13.0	15.2				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	77.0	8.0	22.0	7.0	76.0	9.0	21.0				
Max Q Clear Time (g_c+l1), s	2.6	2.0	10.0	9.4	5.2	19.8	11.0	8.4				
Green Ext Time (p_c), s	0.0	6.6	0.0	0.4	0.1	3.4	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			18.4									
HCM 6th LOS			B									

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Commercial St & Kuebler Blvd	Signal	E	76.7	1.10
2	Synchro HCM 6th Signal	Battle Creek Rd & Kuebler Blvd	Signal	F	88.1	1.19
3	Synchro HCM 6th Signal	27th Ave & Kuebler Blvd	Signal	F	99.9	1.27
5	Synchro HCM 6th Signal	I5 Northbound Ramp & Kuebler Blvd	Signal	A	3.8	0.54
6	Synchro HCM 6th Signal	36th Ave & Kuebler Blvd	Signal	D	38.8	1.08
7	Synchro HCM 6th Signal	Battle Creek Rd & Boone Rd	Signal	B	18.4	0.71

Intersection

Intersection Delay, s/veh 8.7
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	↑
Traffic Vol, veh/h	139	56	9	1	47	26	4	5	1	6	6	172
Future Vol, veh/h	139	56	9	1	47	26	4	5	1	6	6	172
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	146	59	9	1	49	27	4	5	1	6	6	181
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			2			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	2			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			2			1			1		
HCM Control Delay	9.3			7.9			8			8.5		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	40%	68%	1%	50%	0%
Vol Thru, %	50%	27%	64%	50%	0%
Vol Right, %	10%	4%	35%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	204	74	12	172
LT Vol	4	139	1	6	0
Through Vol	5	56	47	6	0
RT Vol	1	9	26	0	172
Lane Flow Rate	11	215	78	13	181
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.014	0.274	0.096	0.019	0.226
Departure Headway (Hd)	4.939	4.586	4.414	5.447	4.491
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	724	784	812	658	800
Service Time	2.976	2.609	2.442	3.174	2.218
HCM Lane V/C Ratio	0.015	0.274	0.096	0.02	0.226
HCM Control Delay	8	9.3	7.9	8.3	8.5
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	1.1	0.3	0.1	0.9

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

All Movement Classes

Site: 101 [Build 2037 Current Zoning PM Peak (Site Folder: General)]

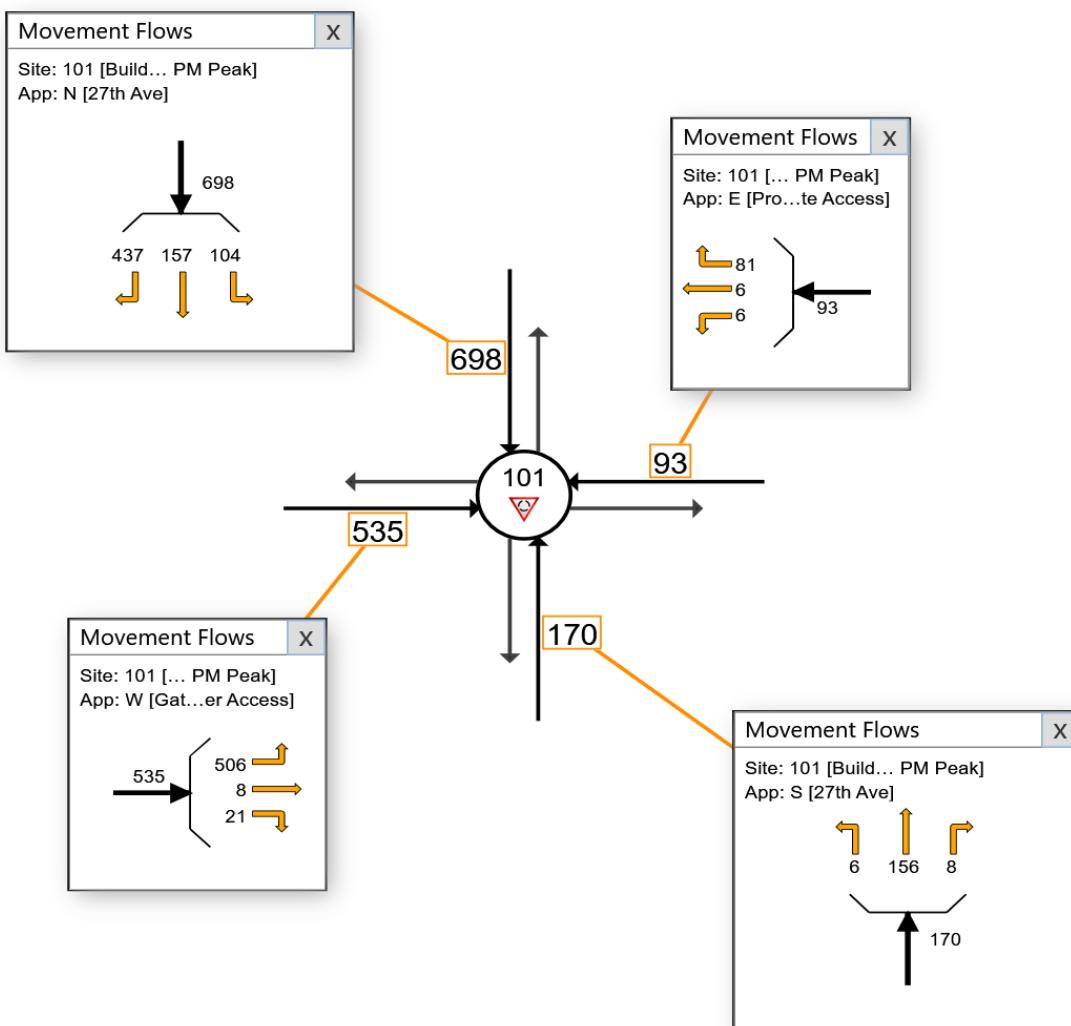
Site Access at 27th Ave

Site Category: -
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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MOVEMENT SUMMARY

▼ Site: 101 [Build 2037 Current Zoning PM Peak (Site Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	HV %	[Total veh/h]	HV %	v/c	sec		[Veh. veh]	Dist ft				
South: 27th Ave														
3	L2	6	0.0	6	0.0	0.255	8.1	LOS A	1.1	27.7	0.64	0.64	0.64	31.0
8	T1	156	1.0	164	1.0	0.255	8.2	LOS A	1.1	27.7	0.64	0.64	0.64	17.3
18	R2	8	0.0	8	0.0	0.255	8.1	LOS A	1.1	27.7	0.64	0.64	0.64	29.9
Approach		170	0.9	179	0.9	0.255	8.2	LOS A	1.1	27.7	0.64	0.64	0.64	18.3
East: Project Site Access														
1	L2	6	0.0	6	0.0	0.146	7.0	LOS A	0.6	14.8	0.62	0.61	0.62	31.2
6	T1	6	0.0	6	0.0	0.146	7.0	LOS A	0.6	14.8	0.62	0.61	0.62	31.0
16	R2	81	0.0	85	0.0	0.146	7.0	LOS A	0.6	14.8	0.62	0.61	0.62	18.0
Approach		93	0.0	98	0.0	0.146	7.0	LOS A	0.6	14.8	0.62	0.61	0.62	19.8
North: 27th Ave														
7	L2	104	0.0	109	0.0	0.198	4.2	LOS A	0.9	23.6	0.09	0.02	0.09	30.4
4	T1	157	1.0	165	1.0	0.198	4.2	LOS A	0.9	23.6	0.09	0.02	0.09	30.0
14	R2	437	0.0	460	0.0	0.328	5.4	LOS A	1.9	46.6	0.09	0.02	0.09	29.0
Approach		698	0.2	735	0.2	0.328	5.0	LOS A	1.9	46.6	0.09	0.02	0.09	29.4
West: Gateway Shopping Center Access														
5	L2	506	1.0	533	1.0	0.550	10.5	LOS B	4.6	115.8	0.65	0.59	0.76	16.0
2	T1	8	0.0	8	0.0	0.550	10.4	LOS B	4.6	115.8	0.65	0.59	0.76	28.0
12	R2	21	0.0	22	0.0	0.550	10.4	LOS B	4.6	115.8	0.65	0.59	0.76	27.3
Approach		535	0.9	563	0.9	0.550	10.5	LOS B	4.6	115.8	0.65	0.59	0.76	16.6
All Vehicles		1496	0.5	1575	0.5	0.550	7.4	LOS A	4.6	115.8	0.38	0.33	0.43	21.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

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

QUEUE DISTANCE (AVERAGE)

Largest Average Back of Queue Distance for any lane used by the vehicle movement (feet)

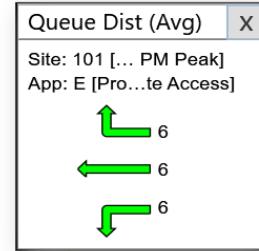
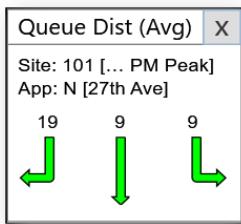
Site: 101 [Build 2037 Current Zoning PM Peak (Site Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

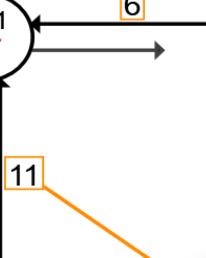
Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

[Close All Popups](#)



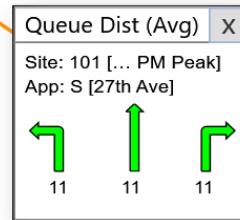
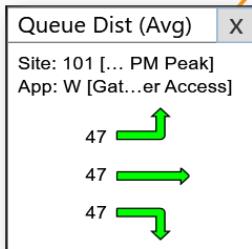
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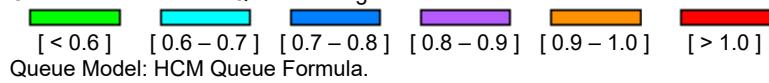


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Colour code based on Queue Storage Ratio



Queue Model: HCM Queue Formula.

APPENDIX G: HCM REPORTS – FUTURE 2037 – PROPOSED ZONING

HCM 6th Signalized Intersection Summary
1: Commercial St & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Volume (veh/h)	175	917	285	416	1303	504	330	989	305	434	1312	130
Future Volume (veh/h)	175	917	285	416	1303	504	330	989	305	434	1312	130
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00		0.98	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	1730	1758	1758	1786	1786	1730	1772	1772	1744	1786	1786	1730
Adj Flow Rate, veh/h	180	945	220	429	1343	520	340	1020	0	447	1353	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	3	3	1	1	5	2	2	4	1	1	5
Cap, veh/h	148	976	562	406	1253	732	302	1036		457	1201	
Arrive On Green	0.05	0.29	0.29	0.12	0.37	0.37	0.09	0.31	0.00	0.14	0.35	0.00
Sat Flow, veh/h	3196	3340	1451	3300	3393	1432	3274	3367	1478	3300	3393	1466
Grp Volume(v), veh/h	180	945	220	429	1343	520	340	1020	0	447	1353	0
Grp Sat Flow(s), veh/h/ln	1598	1670	1451	1650	1697	1432	1637	1683	1478	1650	1697	1466
Q Serve(g_s), s	6.0	36.3	14.3	16.0	48.0	36.5	12.0	39.1	0.0	17.5	46.0	0.0
Cycle Q Clear(g_c), s	6.0	36.3	14.3	16.0	48.0	36.5	12.0	39.1	0.0	17.5	46.0	0.0
Prop In Lane	1.00			1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	976	562	406	1253	732	302	1036		457	1201	
V/C Ratio(X)	1.22	0.97	0.39	1.06	1.07	0.71	1.13	0.98		0.98	1.13	
Avail Cap(c_a), veh/h	148	976	562	406	1253	732	302	1036		457	1201	
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)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	62.0	45.4	29.0	57.0	41.0	24.7	59.0	44.7	0.0	55.8	42.0	0.0
Incr Delay (d2), s/veh	145.3	22.0	2.0	31.4	34.2	0.5	89.8	24.5	0.0	36.2	68.2	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(50%), veh/ln	5.4	17.9	5.2	8.3	25.0	11.7	8.6	19.2	0.0	9.4	29.7	0.0
Unsig. Movement Delay, s/veh									0.30			0.10
LnGrp Delay(d), s/veh	207.3	67.4	31.1	88.4	75.2	25.3	148.8	69.2	0.3	92.0	110.2	0.1
LnGrp LOS	F	E	C	F	F	C	F	E	A	F	F	A
Approach Vol, veh/h	1345				2292			1674	A		1934	A
Approach Delay, s/veh	80.2				66.3			72.5			98.4	
Approach LOS	F				E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	43.0	22.0	45.0	10.0	53.0	16.0	51.0				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0				
Max Green Setting (Gmax), s	16.0	38.0	18.0	40.0	6.0	48.0	12.0	46.0				
Max Q Clear Time (g_c+l1), s	18.0	38.3	19.5	41.1	8.0	50.0	14.0	48.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				78.9								
HCM 6th LOS				E								
Notes												
Unsignalized Delay for [NBR, SBR] is included in calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary
2: Battle Creek Rd & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑↑	↑
Traffic Volume (veh/h)	132	1320	204	321	1886	298	240	329	252	253	381	97
Future Volume (veh/h)	132	1320	204	321	1886	298	240	329	252	253	381	97
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
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	1491	1772	1688	1758	1786	1660	1786	1589	1674	1702	1772	1772
Adj Flow Rate, veh/h	139	1389	157	338	1985	277	253	346	212	266	401	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	22	2	8	3	1	10	1	15	9	7	2	2
Cap, veh/h	109	1398	704	258	1671	866	254	293	476	199	409	458
Arrive On Green	0.08	0.42	0.42	0.31	0.98	0.98	0.10	0.25	0.25	0.12	0.23	0.23
Sat Flow, veh/h	1420	3367	1430	1674	3393	1406	3300	1589	1398	1621	1772	1484
Grp Volume(v), veh/h	139	1389	157	338	1985	277	253	346	212	266	401	46
Grp Sat Flow(s), veh/h/ln	1420	1683	1430	1674	1697	1406	1650	1589	1398	1621	1772	1484
Q Serve(g_s), s	10.0	53.4	8.1	20.0	64.0	0.5	10.0	24.0	15.1	16.0	29.3	2.9
Cycle Q Clear(g_c), s	10.0	53.4	8.1	20.0	64.0	0.5	10.0	24.0	15.1	16.0	29.3	2.9
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	109	1398	704	258	1671	866	254	293	476	199	409	458
V/C Ratio(X)	1.27	0.99	0.22	1.31	1.19	0.32	1.00	1.18	0.45	1.33	0.98	0.10
Avail Cap(c_a), veh/h	109	1398	704	258	1671	866	254	293	476	199	409	458
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(l)	0.43	0.43	0.43	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	37.8	18.8	45.0	1.0	0.3	58.3	49.0	30.9	57.0	49.7	32.2
Incr Delay (d2), s/veh	149.7	14.3	0.3	165.5	91.0	1.0	48.3	104.3	2.3	180.2	39.9	0.4
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(50%), veh/ln	8.1	23.5	2.7	18.5	21.5	0.3	5.7	17.4	5.0	16.4	17.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	209.7	52.1	19.1	210.5	92.0	1.3	106.6	153.4	33.2	237.2	89.7	32.6
LnGrp LOS	F	D	B	F	F	A	F	F	C	F	F	C
Approach Vol, veh/h		1685			2600			811			713	
Approach Delay, s/veh		62.0			97.8			107.4			141.0	
Approach LOS		E			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	24.0	58.0	14.0	34.0	14.0	68.0	20.0	28.0				
Change Period (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	20.0	54.0	10.0	30.0	10.0	64.0	16.0	24.0				
Max Q Clear Time (g_c+l1), s	22.0	55.4	12.0	31.3	12.0	66.0	18.0	26.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay		94.0										
HCM 6th LOS			F									
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
3: 27th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑↑	
Traffic Volume (veh/h)	42	1386	222	823	2051	70	338	158	845	83	178	116
Future Volume (veh/h)	42	1386	222	823	2051	70	338	158	845	83	178	116
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.98
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	1800	1772	1800	1800	1786	1800	1786	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	43	1429	144	848	2114	52	348	163	825	86	184	102
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	2	0	0	1	0	1	0	0	0	0	0
Cap, veh/h	40	1139	716	563	1644	825	222	539	715	106	250	138
Arrive On Green	0.01	0.11	0.11	0.23	0.64	0.64	0.13	0.30	0.30	0.06	0.23	0.23
Sat Flow, veh/h	1714	3367	1525	3326	3393	1506	1701	1800	1524	1714	1082	600
Grp Volume(v), veh/h	43	1429	144	848	2114	52	348	163	825	86	0	286
Grp Sat Flow(s), veh/h/ln	1714	1683	1525	1663	1697	1506	1701	1800	1524	1714	0	1681
Q Serve(g_s), s	3.0	44.0	9.0	22.0	63.0	1.5	17.0	9.1	38.9	6.4	0.0	20.5
Cycle Q Clear(g_c), s	3.0	44.0	9.0	22.0	63.0	1.5	17.0	9.1	38.9	6.4	0.0	20.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	40	1139	716	563	1644	825	222	539	715	106	0	388
V/C Ratio(X)	1.09	1.25	0.20	1.51	1.29	0.06	1.56	0.30	1.15	0.81	0.00	0.74
Avail Cap(c_a), veh/h	40	1139	716	563	1644	825	222	539	715	171	0	388
HCM Platoon Ratio	0.33	0.33	0.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.5	57.7	27.8	50.4	23.1	9.4	56.5	35.1	34.5	60.2	0.0	46.3
Incr Delay (d2), s/veh	170.0	121.7	0.6	235.0	132.1	0.1	274.8	1.4	85.0	5.6	0.0	11.8
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(50%), veh/ln	3.2	39.0	3.7	26.8	48.9	0.5	24.2	4.2	38.5	2.9	0.0	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	234.5	179.4	28.4	285.4	155.2	9.6	331.3	36.5	119.5	65.8	0.0	58.2
LnGrp LOS	F	F	C	F	F	A	F	D	F	E	A	E
Approach Vol, veh/h		1616			3014			1336			372	
Approach Delay, s/veh		167.4			189.3			164.6			59.9	
Approach LOS		F			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	26.0	49.0	12.1	42.9	7.0	68.0	21.0	34.0				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	22.0	44.0	13.0	34.0	3.0	63.0	17.0	30.0				
Max Q Clear Time (g_c+l1), s	24.0	46.0	8.4	40.9	5.0	65.0	19.0	22.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			170.9									
HCM 6th LOS			F									

HCM Signalized Intersection Capacity Analysis
4: Kuebler Blvd & I5 Southbound Ramp

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑				↑	↑↑	
Traffic Volume (vph)	0	2090	224	0	1237	283	0	0	0	145	0	1707
Future Volume (vph)	0	2090	224	0	1237	283	0	0	0	145	0	1707
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		5.0	4.0		5.0	4.0				4.0		4.0
Lane Util. Factor		0.95	1.00		0.95	1.00				1.00		0.88
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		3353	1500		3386	1485				1555		2666
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		3353	1500		3386	1485				1555		2666
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	2177	233	0	1289	295	0	0	0	151	0	1778
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2177	233	0	1289	295	0	0	0	151	0	1778
Heavy Vehicles (%)	0%	2%	2%	0%	1%	3%	0%	0%	0%	10%	0%	1%
Turn Type		NA	Free		NA	Free				Prot		custom
Protected Phases		2			6					3		8
Permitted Phases			Free			Free						2
Actuated Green, G (s)	96.0	130.0		96.0	130.0					25.0		121.0
Effective Green, g (s)	96.0	130.0		96.0	130.0					25.0		121.0
Actuated g/C Ratio	0.74	1.00		0.74	1.00					0.19		0.93
Clearance Time (s)		5.0			5.0					4.0		4.0
Vehicle Extension (s)		0.5			0.5					0.5		0.5
Lane Grp Cap (vph)	2476	1500		2500	1485					299		2563
v/s Ratio Prot	c0.65			0.38						0.10		c0.13
v/s Ratio Perm		0.16			0.20							0.53
v/c Ratio	0.88	0.16		0.52	0.20					0.51		0.69
Uniform Delay, d1	12.7	0.0		7.2	0.0					47.0		0.9
Progression Factor	2.01	1.00		0.57	1.00					1.00		1.00
Incremental Delay, d2	0.5	0.0		0.5	0.2					6.0		1.6
Delay (s)	26.0	0.0		4.6	0.2					52.9		2.5
Level of Service	C	A		A	A					D		A
Approach Delay (s)	23.5			3.8			0.0				6.4	
Approach LOS	C			A			A				A	
Intersection Summary												
HCM 2000 Control Delay	12.7				HCM 2000 Level of Service		B					
HCM 2000 Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	130.0				Sum of lost time (s)		9.0					
Intersection Capacity Utilization	106.6%				ICU Level of Service		G					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
5: I5 Northbound Ramp & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑↓		↑	↑			
Traffic Volume (veh/h)	0	996	1239	0	1336	260	184	0	129	0	0	0
Future Volume (veh/h)	0	996	1239	0	1336	260	184	0	129	0	0	0
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	0	1758	1772	0	1786	1744	1632	1800	1632			
Adj Flow Rate, veh/h	0	1048		0	1406	261	194	0	51			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	3	2	0	1	4	12	0	12			
Cap, veh/h	0	2287		0	1961	358	422	0	340			
Arrive On Green	0.00	1.00	0.00	0.00	1.00	1.00	0.25	0.00	0.25			
Sat Flow, veh/h	0	3428	1502	0	2954	523	1714	0	1383			
Grp Volume(v), veh/h	0	1048	0	0	823	844	194	0	51			
Grp Sat Flow(s), veh/h/ln	0	1670	1502	0	1697	1692	1714	0	1383			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	3.8			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	3.8			
Prop In Lane	0.00		1.00	0.00		0.31	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2287		0	1162	1158	422	0	340			
V/C Ratio(X)	0.00	0.46		0.00	0.71	0.73	0.46	0.00	0.15			
Avail Cap(c_a), veh/h	0	2287		0	1162	1158	422	0	340			
HCM Platoon Ratio	1.00	1.67	1.67	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(l)	0.00	0.37	0.00	0.00	0.09	0.09	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	41.7	0.0	38.4			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.3	0.4	3.6	0.0	0.9			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.0	0.1	0.0	0.0	0.1	0.1	5.6	0.0	1.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	0.2	0.0	0.0	0.3	0.4	45.2	0.0	39.3			
LnGrp LOS	A	A		A	A	A	D	A	D			
Approach Vol, veh/h	1048	A		1667			245					
Approach Delay, s/veh	0.2			0.4			44.0					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			6			8					
Phs Duration (G+Y+Rc), s	94.0			94.0			36.0					
Change Period (Y+Rc), s	5.0			5.0			4.0					
Max Green Setting (Gmax), s	89.0			89.0			32.0					
Max Q Clear Time (g_c+l1), s	2.0			2.0			14.5					
Green Ext Time (p_c), s	1.6			2.2			0.2					
Intersection Summary												
HCM 6th Ctrl Delay			3.9									
HCM 6th LOS			A									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th Signalized Intersection Summary
6: 36th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	69	940	116	55	1146	70	185	33	103	151	34	265
Future Volume (veh/h)	69	940	116	55	1146	70	185	33	103	151	34	265
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00		0.98	1.00		1.00	1.00		0.98
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	1505	1730	1674	1547	1772	1800	1786	1800	1772	1772	1744	1758
Adj Flow Rate, veh/h	73	989	83	58	1206	72	195	35	19	159	36	145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	21	5	9	18	2	0	1	0	2	2	4	3
Cap, veh/h	97	1177	946	304	1122	67	257	135	73	260	228	190
Arrive On Green	0.04	0.91	0.91	0.03	0.68	0.68	0.04	0.12	0.12	0.05	0.13	0.13
Sat Flow, veh/h	1433	1730	1389	1474	1653	99	1701	1097	596	1688	1744	1456
Grp Volume(v), veh/h	73	989	83	58	0	1278	195	0	54	159	36	145
Grp Sat Flow(s), veh/h/ln	1433	1730	1389	1474	0	1752	1701	0	1693	1688	1744	1456
Q Serve(g_s), s	2.1	29.4	0.8	1.6	0.0	88.2	5.0	0.0	3.8	6.0	2.4	12.5
Cycle Q Clear(g_c), s	2.1	29.4	0.8	1.6	0.0	88.2	5.0	0.0	3.8	6.0	2.4	12.5
Prop In Lane	1.00			1.00		0.06	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	97	1177	946	304	0	1189	257	0	208	260	228	190
V/C Ratio(X)	0.75	0.84	0.09	0.19	0.00	1.07	0.76	0.00	0.26	0.61	0.16	0.76
Avail Cap(c_a), veh/h	99	1177	946	310	0	1189	257	0	208	260	228	190
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	3.4	2.0	9.6	0.0	20.9	53.7	0.0	51.6	51.5	50.1	54.5
Incr Delay (d2), s/veh	24.4	6.6	0.2	0.3	0.0	48.8	12.3	0.0	0.7	4.1	1.5	24.6
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(50%), veh/ln	2.2	5.0	0.2	0.4	0.0	45.9	4.7	0.0	1.6	2.4	1.1	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	59.8	10.0	2.2	9.9	0.0	69.6	66.0	0.0	52.3	55.6	51.6	79.1
LnGrp LOS	E	A	A	A	A	F	E	A	D	E	D	E
Approach Vol, veh/h	1145				1336			249			340	
Approach Delay, s/veh	12.6				67.1			63.0			65.2	
Approach LOS	B				E			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	10.0	20.0	7.5	92.5	9.0	21.0	7.8	92.2				
Change Period (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	16.0	4.0	88.0	5.0	17.0	4.0	88.0				
Max Q Clear Time (g_c+l1), s	8.0	5.8	3.6	31.4	7.0	14.5	4.1	90.2				
Green Ext Time (p_c), s	0.0	0.1	0.0	10.0	0.0	0.1	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				46.2								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary
7: Battle Creek Rd & Boone Rd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑	↑	↑	↑		↑	↑	
Traffic Volume (veh/h)	124	87	26	198	125	303	21	394	143	166	529	211
Future Volume (veh/h)	124	87	26	198	125	303	21	394	143	166	529	211
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99			0.94	0.98		0.97	1.00		1.00	1.00	0.98
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	1744	1800	1800	1800	1800	1786	1716	1758	1800	1800	1772	1786
Adj Flow Rate, veh/h	131	92	18	208	132	33	22	415	142	175	557	211
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	0	0	0	0	1	6	3	0	0	2	1
Cap, veh/h	243	136	27	282	253	206	491	766	262	513	796	302
Arrive On Green	0.06	0.09	0.09	0.11	0.14	0.14	0.01	0.61	0.61	0.11	1.00	1.00
Sat Flow, veh/h	1661	1447	283	1714	1800	1472	1634	1252	428	1714	1216	461
Grp Volume(v), veh/h	131	0	110	208	132	33	22	0	557	175	0	768
Grp Sat Flow(s), veh/h/ln	1661	0	1730	1714	1800	1472	1634	0	1680	1714	0	1677
Q Serve(g_s), s	8.0	0.0	8.0	14.0	8.8	2.6	0.7	0.0	25.0	5.0	0.0	0.0
Cycle Q Clear(g_c), s	8.0	0.0	8.0	14.0	8.8	2.6	0.7	0.0	25.0	5.0	0.0	0.0
Prop In Lane	1.00			0.16	1.00		1.00	1.00		0.25	1.00	0.27
Lane Grp Cap(c), veh/h	243	0	163	282	253	206	491	0	1029	513	0	1098
V/C Ratio(X)	0.54	0.00	0.68	0.74	0.52	0.16	0.04	0.00	0.54	0.34	0.00	0.70
Avail Cap(c_a), veh/h	243	0	266	282	360	294	546	0	1029	590	0	1098
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.22	0.00	0.22
Uniform Delay (d), s/veh	50.8	0.0	57.0	45.8	51.8	49.1	9.3	0.0	14.6	10.2	0.0	0.0
Incr Delay (d2), s/veh	2.4	0.0	4.8	9.8	1.7	0.4	0.0	0.0	2.0	0.1	0.0	0.8
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(50%), veh/ln	4.2	0.0	3.7	6.8	4.1	1.0	0.2	0.0	9.5	1.5	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.1	0.0	61.8	55.6	53.5	49.5	9.3	0.0	16.7	10.2	0.0	0.8
LnGrp LOS	D	A	E	E	D	D	A	A	B	B	A	A
Approach Vol, veh/h		241				373			579			943
Approach Delay, s/veh		57.1				54.3			16.4			2.6
Approach LOS		E				D			B			A
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	5.6	90.1	12.0	22.2	11.2	84.6	18.0	16.2				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	73.0	8.0	26.0	13.0	66.0	14.0	20.0				
Max Q Clear Time (g_c+l1), s	2.7	2.0	10.0	10.8	7.0	27.0	16.0	10.0				
Green Ext Time (p_c), s	0.0	6.6	0.0	0.6	0.2	3.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			21.5									
HCM 6th LOS			C									

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Commercial St & Kuebler Blvd	Signal	E	78.9	1.11
2	Synchro HCM 6th Signal	Battle Creek Rd & Kuebler Blvd	Signal	F	94	1.21
3	Synchro HCM 6th Signal	27th Ave & Kuebler Blvd	Signal	F	170.9	1.57
5	Synchro HCM 6th Signal	I5 Northbound Ramp & Kuebler Blvd	Signal	A	3.9	0.58
6	Synchro HCM 6th Signal	36th Ave & Kuebler Blvd	Signal	D	46.2	1.13
7	Synchro HCM 6th Signal	Battle Creek Rd & Boone Rd	Signal	C	21.5	0.76

Intersection

Intersection Delay, s/veh 10.6
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	↑
Traffic Vol, veh/h	157	146	9	1	165	26	4	5	1	6	6	196
Future Vol, veh/h	157	146	9	1	165	26	4	5	1	6	6	196
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	165	154	9	1	174	27	4	5	1	6	6	206
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			2			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	2			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			2			1			1		
HCM Control Delay	11.7			9.7			8.8			9.8		
HCM LOS	B			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	40%	50%	1%	50%	0%
Vol Thru, %	50%	47%	86%	50%	0%
Vol Right, %	10%	3%	14%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	312	192	12	196
LT Vol	4	157	1	6	0
Through Vol	5	146	165	6	0
RT Vol	1	9	26	0	196
Lane Flow Rate	11	328	202	13	206
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.017	0.44	0.269	0.021	0.289
Departure Headway (Hd)	5.719	4.82	4.799	6.01	5.049
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	630	742	742	592	706
Service Time	3.719	2.884	2.87	3.786	2.825
HCM Lane V/C Ratio	0.017	0.442	0.272	0.022	0.292
HCM Control Delay	8.8	11.7	9.7	8.9	9.9
HCM Lane LOS	A	B	A	A	A
HCM 95th-tile Q	0.1	2.3	1.1	0.1	1.2

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

All Movement Classes

Site: 101 [Build 2037 Proposed Zoning PM Peak (Site Folder: General)]

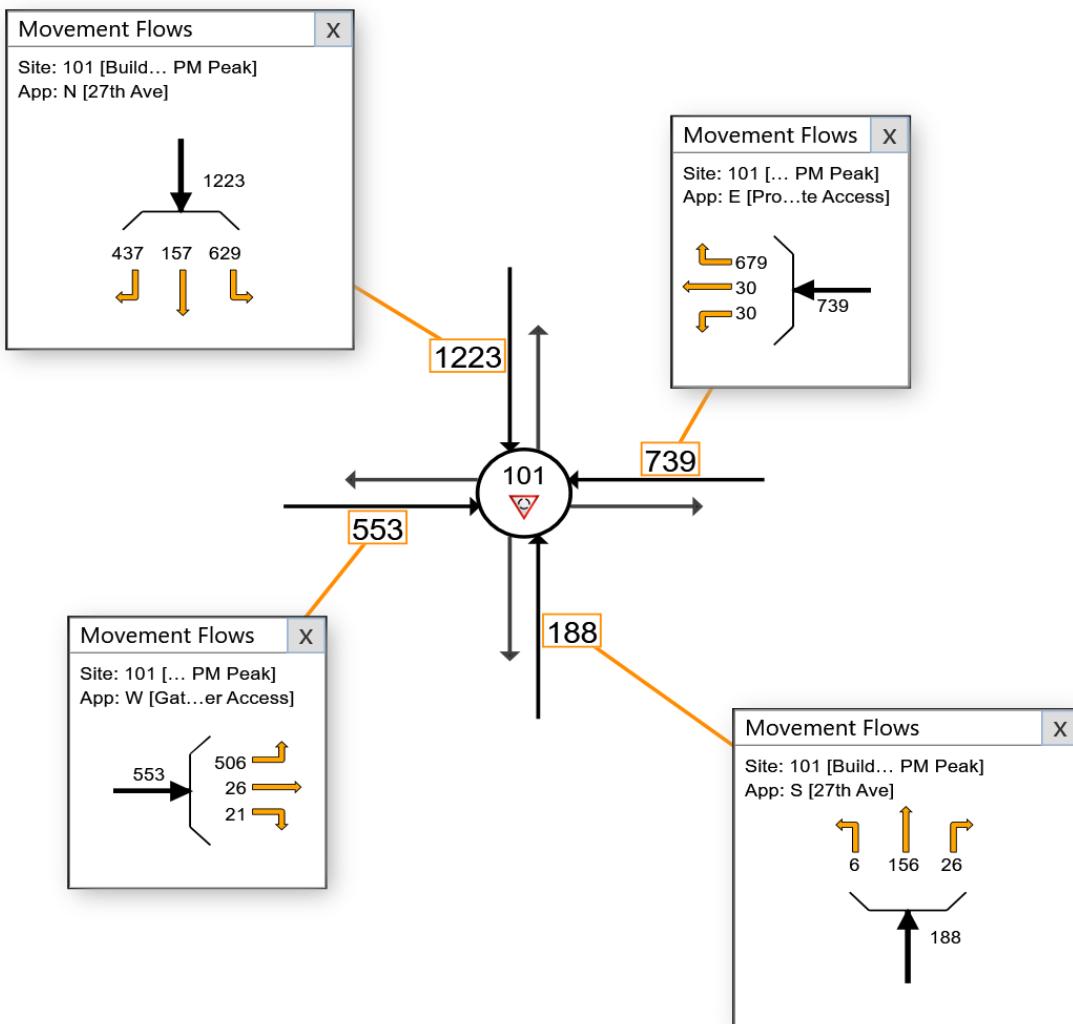
Site Access at 27th Ave

Site Category: -
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

[Close All Popups](#)

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MOVEMENT SUMMARY

▼ Site: 101 [Build 2037 Proposed Zoning PM Peak (Site Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay v/c	Level of Service sec	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	HV %	[Total veh/h]	HV %				[Veh. veh]	Dist ft				
South: 27th Ave														
3	L2	6	0.0	6	0.0	0.502	20.5	LOS C	2.5	62.4	0.83	0.97	1.28	26.5
8	T1	156	1.0	164	1.0	0.502	20.6	LOS C	2.5	62.4	0.83	0.97	1.28	14.8
18	R2	26	0.0	27	0.0	0.502	20.5	LOS C	2.5	62.4	0.83	0.97	1.28	25.7
Approach		188	0.8	198	0.8	0.502	20.6	LOS C	2.5	62.4	0.83	0.97	1.28	16.7
East: Project Site Access														
1	L2	30	0.0	32	0.0	1.156	108.7	LOS F	52.4	1310.8	1.00	3.29	7.22	12.9
6	T1	30	0.0	32	0.0	1.156	108.7	LOS F	52.4	1310.8	1.00	3.29	7.22	12.8
16	R2	679	0.0	715	0.0	1.156	108.7	LOS F	52.4	1310.8	1.00	3.29	7.22	7.3
Approach		739	0.0	778	0.0	1.156	108.7	LOS F	52.4	1310.8	1.00	3.29	7.22	7.7
North: 27th Ave														
7	L2	629	0.0	662	0.0	0.619	10.1	LOS B	5.6	141.5	0.36	0.16	0.36	25.8
4	T1	157	1.0	165	1.0	0.619	10.1	LOS B	5.6	141.5	0.36	0.16	0.36	25.5
14	R2	437	0.0	460	0.0	0.335	5.6	LOS A	1.9	47.4	0.16	0.05	0.16	28.9
Approach		1223	0.1	1287	0.1	0.619	8.5	LOS A	5.6	141.5	0.29	0.12	0.29	26.7
West: Gateway Shopping Center Access														
5	L2	506	1.0	533	1.0	1.022	70.3	LOS F	24.6	619.9	1.00	2.27	4.69	9.3
2	T1	26	0.0	27	0.0	1.022	70.3	LOS F	24.6	619.9	1.00	2.27	4.69	16.3
12	R2	21	0.0	22	0.0	1.022	70.3	LOS F	24.6	619.9	1.00	2.27	4.69	16.1
Approach		553	0.9	582	0.9	1.022	70.3	LOS F	24.6	619.9	1.00	2.27	4.69	9.9
All Vehicles		2703	0.3	2845	0.3	1.156	49.4	LOS E	52.4	1310.8	0.66	1.49	3.15	12.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

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

APPENDIX H: HCM REPORTS – FUTURE 2037 – PROPOSED ZONING MITIGATIONS

HCM 6th Signalized Intersection Summary
2: Battle Creek Rd & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak - Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑	↑
Traffic Volume (veh/h)	132	1320	204	321	1886	298	240	329	252	253	381	97
Future Volume (veh/h)	132	1320	204	321	1886	298	240	329	252	253	381	97
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
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	1491	1772	1688	1758	1786	1660	1786	1589	1674	1702	1772	1772
Adj Flow Rate, veh/h	139	1389	172	338	1985	273	253	346	238	266	401	44
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	22	2	8	3	1	10	1	15	9	7	2	2
Cap, veh/h	109	1450	704	309	1827	855	203	306	531	218	354	412
Arrive On Green	0.08	0.43	0.43	0.18	0.54	0.54	0.10	0.32	0.32	0.07	0.20	0.20
Sat Flow, veh/h	1420	3367	1430	1674	3393	1406	3300	1589	1398	3144	1772	1481
Grp Volume(v), veh/h	139	1389	172	338	1985	273	253	346	238	266	401	44
Grp Sat Flow(s), veh/h/ln	1420	1683	1430	1674	1697	1406	1650	1589	1398	1572	1772	1481
Q Serve(g_s), s	10.0	52.0	9.0	24.0	70.0	12.3	8.0	25.0	16.2	9.0	26.0	2.9
Cycle Q Clear(g_c), s	10.0	52.0	9.0	24.0	70.0	12.3	8.0	25.0	16.2	9.0	26.0	2.9
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	109	1450	704	309	1827	855	203	306	531	218	354	412
V/C Ratio(X)	1.27	0.96	0.24	1.09	1.09	0.32	1.25	1.13	0.45	1.22	1.13	0.11
Avail Cap(c_a), veh/h	109	1450	704	309	1827	855	203	306	531	218	354	412
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(l)	0.43	0.43	0.43	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	35.9	19.0	53.0	30.0	12.4	58.3	44.1	25.4	60.5	52.0	35.0
Incr Delay (d2), s/veh	149.7	8.4	0.4	78.6	48.7	1.0	138.0	85.9	2.1	133.9	88.4	0.5
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(50%), veh/ln	8.1	21.8	3.0	16.6	38.3	3.9	7.0	15.8	4.8	7.6	20.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	209.7	44.2	19.4	131.6	78.7	13.4	196.3	130.1	27.5	194.4	140.4	35.5
LnGrp LOS	F	D	B	F	F	B	F	F	C	F	F	D
Approach Vol, veh/h	1700				2596			837			711	
Approach Delay, s/veh	55.3				78.8			120.9			154.1	
Approach LOS	E				E			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.0	60.0	12.0	30.0	14.0	74.0	13.0	29.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	24.0	56.0	8.0	26.0	10.0	70.0	9.0	25.0				
Max Q Clear Time (g_c+l1), s	26.0	54.0	10.0	28.0	12.0	72.0	11.0	27.0				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				87.1								
HCM 6th LOS				F								
Notes												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
3: 27th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak - Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑	↑↑	↑	↑↑	
Traffic Volume (veh/h)	42	1386	222	823	2051	70	338	158	845	83	178	116
Future Volume (veh/h)	42	1386	222	823	2051	70	338	158	845	83	178	116
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.98
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	1800	1772	1800	1800	1786	1800	1786	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	43	1429	150	848	2114	54	348	163	832	86	184	101
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	2	0	0	1	0	1	0	0	0	0	0
Cap, veh/h	40	1243	681	640	1827	905	279	443	1176	119	251	138
Arrive On Green	0.02	0.25	0.24	0.26	0.72	0.71	0.08	0.25	0.25	0.07	0.23	0.23
Sat Flow, veh/h	1714	3367	1525	3326	3393	1506	3300	1800	2679	1714	1086	596
Grp Volume(v), veh/h	43	1429	150	848	2114	54	348	163	832	86	0	285
Grp Sat Flow(s), veh/h/ln	1714	1683	1525	1663	1697	1506	1650	1800	1340	1714	0	1682
Q Serve(g_s), s	3.0	48.0	3.6	25.0	70.0	0.2	11.0	9.8	23.4	6.4	0.0	20.4
Cycle Q Clear(g_c), s	3.0	48.0	3.6	25.0	70.0	0.2	11.0	9.8	23.4	6.4	0.0	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	40	1243	681	640	1827	905	279	443	1176	119	0	388
V/C Ratio(X)	1.09	1.15	0.22	1.33	1.16	0.06	1.25	0.37	0.71	0.72	0.00	0.73
Avail Cap(c_a), veh/h	40	1243	681	640	1827	905	279	443	1176	119	0	388
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.0	48.9	10.3	48.4	18.5	3.3	59.5	40.6	16.0	59.3	0.0	46.3
Incr Delay (d2), s/veh	170.0	77.0	0.7	155.0	75.8	0.1	137.2	2.3	3.6	17.3	0.0	11.7
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(50%), veh/ln	3.2	33.8	1.6	23.3	37.0	0.3	9.9	4.6	7.4	3.3	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	234.0	126.0	11.0	203.4	94.3	3.4	196.7	43.0	19.6	76.6	0.0	58.0
LnGrp LOS	F	F	B	F	F	A	F	D	B	E	A	E
Approach Vol, veh/h		1622			3016			1343			371	
Approach Delay, s/veh		118.2			123.3			68.3			62.3	
Approach LOS		F			F			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.0	52.0	13.0	36.0	7.0	74.0	15.0	34.0				
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	25.0	47.0	9.0	32.0	3.0	69.0	11.0	30.0				
Max Q Clear Time (g_c+l1), s	27.0	50.0	8.4	25.4	5.0	72.0	13.0	22.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			106.8									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved changes to right turn type.												

HCM 6th Signalized Intersection Summary
6: 36th Ave & Kuebler Blvd

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak - Mitigation

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	69	940	116	55	1146	70	185	33	103	151	34	265
Future Volume (veh/h)	69	940	116	55	1146	70	185	33	103	151	34	265
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00		0.98	1.00		1.00	1.00		0.98
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	1505	1730	1674	1547	1772	1800	1786	1800	1772	1772	1744	1758
Adj Flow Rate, veh/h	73	989	84	58	1206	49	195	35	19	159	36	148
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	21	5	9	18	2	0	1	0	2	2	4	3
Cap, veh/h	97	1177	946	304	1203	1013	257	135	73	260	228	190
Arrive On Green	0.04	0.91	0.91	0.03	0.68	0.68	0.04	0.12	0.12	0.05	0.13	0.13
Sat Flow, veh/h	1433	1730	1389	1474	1772	1492	1701	1097	596	1688	1744	1456
Grp Volume(v), veh/h	73	989	84	58	1206	49	195	0	54	159	36	148
Grp Sat Flow(s), veh/h/ln	1433	1730	1389	1474	1772	1492	1701	0	1693	1688	1744	1456
Q Serve(g_s), s	2.1	29.4	0.8	1.6	88.2	1.4	5.0	0.0	3.8	6.0	2.4	12.8
Cycle Q Clear(g_c), s	2.1	29.4	0.8	1.6	88.2	1.4	5.0	0.0	3.8	6.0	2.4	12.8
Prop In Lane	1.00			1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	97	1177	946	304	1203	1013	257	0	208	260	228	190
V/C Ratio(X)	0.75	0.84	0.09	0.19	1.00	0.05	0.76	0.00	0.26	0.61	0.16	0.78
Avail Cap(c_a), veh/h	99	1177	946	310	1203	1013	257	0	208	260	228	190
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	3.4	2.0	9.6	20.9	6.9	53.7	0.0	51.6	51.5	50.1	54.7
Incr Delay (d2), s/veh	24.4	6.6	0.2	0.3	26.6	0.1	12.4	0.0	0.7	4.1	1.5	26.2
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(50%), veh/ln	2.2	5.0	0.2	0.4	39.0	0.4	4.7	0.0	1.6	2.4	1.1	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	59.8	10.0	2.2	9.9	47.5	7.0	66.1	0.0	52.3	55.6	51.6	80.9
LnGrp LOS	E	A	A	A	F	A	E	A	D	E	D	F
Approach Vol, veh/h	1146				1313			249			343	
Approach Delay, s/veh	12.6				44.3			63.1			66.1	
Approach LOS	B				D			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	10.0	20.0	7.5	92.5	9.0	21.0	7.8	92.2				
Change Period (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	16.0	4.0	88.0	5.0	17.0	4.0	88.0				
Max Q Clear Time (g_c+l1), s	8.0	5.8	3.6	31.4	7.0	14.8	4.1	90.2				
Green Ext Time (p_c), s	0.0	0.1	0.0	10.0	0.0	0.1	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				36.4								
HCM 6th LOS				D								

Inputs in yellow		Summary Table				
ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
2	Synchro HCM 6th Signal	Battle Creek Rd & Kuebler Blvd	Signal	F	87.2	1.12
3	Synchro HCM 6th Signal	27th Ave & Kuebler Blvd	Signal	F	106.9	1.18
6	Synchro HCM 6th Signal	36th Ave & Kuebler Blvd	Signal	D	36.4	1.08

Queuing and Blocking Report

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak - Mitigation

Intersection: 2: Battle Creek Rd & Kuebler Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	515	1834	1828	320	500	1661	1667	360	324	1016	1032	250
Average Queue (ft)	498	1259	1241	206	476	1601	1599	258	269	927	980	199
95th Queue (ft)	579	1970	1955	417	584	1790	1782	479	387	1206	1088	354
Link Distance (ft)		1948	1948			1603	1603			966	966	
Upstream Blk Time (%)		7	6			33	29			34	71	
Queuing Penalty (veh)		0	0			0	0			0	0	
Storage Bay Dist (ft)	415			220	400			260	225			150
Storage Blk Time (%)	82	16	40	0	43	20	30	0	51	64	73	4
Queuing Penalty (veh)	537	22	81	1	398	63	90	3	61	76	185	14

Intersection: 2: Battle Creek Rd & Kuebler Blvd

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	293	380	1418	380
Average Queue (ft)	203	342	1290	176
95th Queue (ft)	350	484	1631	453
Link Distance (ft)		1360		
Upstream Blk Time (%)		55		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	280	280		280
Storage Blk Time (%)	10	20	70	
Queuing Penalty (veh)	48	93	245	

Intersection: 6: 36th Ave & Kuebler Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	357	895	486	299	2250	300	305	784	229	939	230
Average Queue (ft)	160	428	65	77	1807	57	302	766	146	816	227
95th Queue (ft)	389	1096	433	227	2766	228	312	857	253	1093	241
Link Distance (ft)		2255	2255		2198			759		883	
Upstream Blk Time (%)					21			95		53	
Queuing Penalty (veh)					0			0		0	
Storage Bay Dist (ft)	325			200		200	205		130		130
Storage Blk Time (%)	14	7			27		100		37	1	83
Queuing Penalty (veh)	127	5			34		135		110	4	153

Network Summary

Network wide Queuing Penalty: 2486

Queuing and Blocking Report

Kuebler Boone TPR (2022)
Future 2037 - Proposed Zoning - PM Peak - Mitigation

Intersection: 3: 27th Ave & Kuebler Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	459	1223	1215	300	530	580	1125	1154	270	224	258	348
Average Queue (ft)	115	969	1009	257	519	565	980	845	37	154	174	106
95th Queue (ft)	369	1512	1500	410	570	638	1398	1415	185	230	257	237
Link Distance (ft)		1188	1188				1104	1104				387
Upstream Blk Time (%)		12	21				17	3				0
Queuing Penalty (veh)		100	172				250	49				1
Storage Bay Dist (ft)	360			200	480	480			170	200	200	
Storage Blk Time (%)	0	39	63		70	62	1	22		3	9	1
Queuing Penalty (veh)	0	17	140		713	637	8	16		5	13	3

Intersection: 3: 27th Ave & Kuebler Blvd

Movement	NB	NB	SB	SB
Directions Served	R	R	L	TR
Maximum Queue (ft)	364	271	268	379
Average Queue (ft)	140	176	79	200
95th Queue (ft)	247	245	174	316
Link Distance (ft)	387		652	
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	1			
Storage Bay Dist (ft)		200	195	
Storage Blk Time (%)	1	4	1	12
Queuing Penalty (veh)	3	17	2	10

MOVEMENT SUMMARY

▼ Site: 101 [Build 2307 Proposed Zoning PM Peak - Mitigation
 (Site Folder: General)]

■ Network: N102 [Network2
 (Network Folder: General)]

Site Access at 27th Ave

Site Category: -
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	HV %	[Total veh/h]	HV %	v/c	sec	[Veh. veh]	Dist ft					
South: 27th Ave														
3	L2	6	0.0	6	0.0	0.442	15.7	LOS C	0.8	19.2	0.75	0.86	1.09	28.0
8	T1	164	1.0	164	1.0	0.442	15.8	LOS C	0.8	19.2	0.75	0.86	1.09	22.5
18	R2	27	0.0	27	0.0	0.442	15.7	LOS C	0.8	19.2	0.75	0.86	1.09	27.1
Approach		198	0.8	198	0.8	0.442	15.8	LOS C	0.8	19.2	0.75	0.86	1.09	23.7
East: Project Site Access														
1	L2	32	0.0	32	0.0	0.501	12.6	LOS B	1.1	28.6	0.70	0.83	1.05	29.0
6	T1	32	0.0	32	0.0	0.501	12.6	LOS B	1.1	28.6	0.70	0.83	1.05	28.8
16	R2	715	0.0	715	0.0	0.501	4.9	LOS A	1.1	28.6	0.27	0.32	0.41	28.0
Approach		778	0.0	778	0.0	0.501	5.8	LOS A	1.1	28.6	0.31	0.37	0.46	28.2
North: 27th Ave														
7	L2	662	0.0	535	0.0	0.673	11.5	LOS B	2.7	68.0	0.43	0.21	0.43	25.6
4	T1	165	1.0	134	1.2	0.673	11.6	LOS B	2.7	68.0	0.43	0.21	0.43	25.3
14	R2	460	0.0	372	0.0	0.673	8.5	LOS A	2.7	68.0	0.39	0.22	0.39	26.3
Approach		1287	0.1	1041 ^N 1	0.2	0.673	10.5	LOS B	2.7	68.0	0.41	0.21	0.41	25.8
West: Gateway Shopping Center Access														
5	L2	533	1.0	533	1.0	0.858	32.6	LOS D	4.6	117.0	0.88	1.49	2.53	16.3
2	T1	27	0.0	27	0.0	0.858	32.6	LOS D	4.6	117.0	0.88	1.49	2.53	22.1
12	R2	22	0.0	22	0.0	0.858	32.6	LOS D	4.6	117.0	0.88	1.49	2.53	21.7
Approach		582	0.9	582	0.9	0.858	32.6	LOS D	4.6	117.0	0.88	1.49	2.53	16.9
All Vehicles		2845	0.3	2598 ^N 1	0.3	0.858	14.3	LOS B	4.6	117.0	0.51	0.59	0.95	23.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
 Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Gap-Acceptance Capacity: Traditional M1.

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

QUEUE DISTANCE (AVERAGE)

Largest Average Back of Queue Distance for any lane used by the vehicle movement (feet)

▼ Site: 101 [Build 2307 Proposed Zoning PM Peak - Mitigation
(Site Folder: General)]

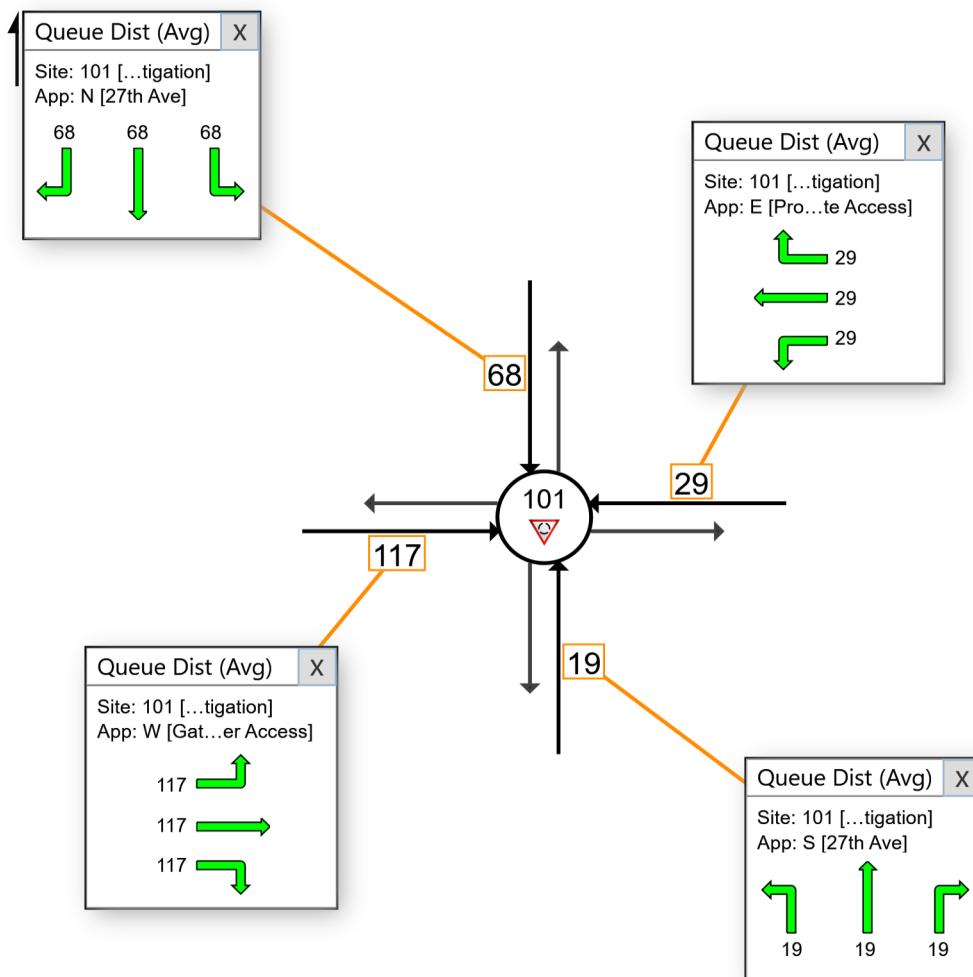
■ Network: N102 [Network2
(Network Folder: General)]

Site Access at 27th Ave

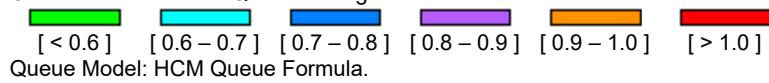
Site Category: -
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

[Close All Popups](#)



Colour code based on Queue Storage Ratio



Queue Model: HCM Queue Formula.

APPENDIX I: WEEKDAY PM PEAK HOUR WEAVING REPORT

HCS7 Freeway Weaving Report

Project Information

Analyst	DKS Associates	Date	8/1/2022
Agency		Analysis Year	2037
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Transportaiton Planning Rule (TPR) Analysis for Kuebler-Boone Property	Unit	United States Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Freeway
Segment Length (Ls), ft	815	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	0
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	0
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	0.25	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	661	380	465	808
Peak Hour Factor (PHF)	0.97	0.97	0.97	0.97
Total Trucks, %	0.02	0.02	0.02	0.02
Heavy Vehicle Adjustment Factor (fHV)	1.000	1.000	1.000	1.000
Flow Rate (vi), pc/h	681	392	479	833
Weaving Flow Rate (vw), pc/h	1225	Freeway Max Capacity (cFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1160	Density-Based Capacity (cWL), pc/h/ln		1651
Total Flow Rate (v), pc/h	2385	Demand Flow-Based Capacity (cIW), pc/h		4669
Volume Ratio (VR)	0.514	Weaving Segment Capacity (cW), veh/h		3302
Minimum Lane Change Rate (LCMIN), lc/h	0	Adjusted Weaving Area Capacity, pc/h		3101
Maximum Weaving Length (LMAX), ft	7991	Volume-to-Capacity Ratio (v/c)		0.77

Speed and Density

Non-Weaving Vehicle Index (INW)	24	Average Weaving Speed (Sw), mi/h	44.2
Non-Weaving Lane Change Rate (LCNW), lc/h	295	Average Non-Weaving Speed (SNW), mi/h	41.8
Weaving Lane Change Rate (LCW), lc/h	42	Average Speed (S), mi/h	43.0
Weaving Lane Change Rate (LCAll), lc/h	337	Density (D), pc/mi/ln	27.7
Weaving Intensity Factor (W)	0.113	Level of Service (LOS)	C

HCS7 Freeway Weaving Report

Project Information

Analyst	DKS Associates	Date	8/1/2022
Agency		Analysis Year	2037
Jurisdiction		Time Period Analyzed	PM Peak Hour
Project Description	Transportaiton Planning Rule (TPR) Analysis for Kuebler-Boone Property	Unit	United States Customary

Geometric Data

Number of Lanes (N), ln	2	Segment Type	Freeway
Segment Length (Ls), ft	815	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	0.25	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	661	380	465	808
Peak Hour Factor (PHF)	0.97	0.97	0.97	0.97
Total Trucks, %	0.02	0.02	0.02	0.02
Heavy Vehicle Adjustment Factor (fHV)	1.000	1.000	1.000	1.000
Flow Rate (vi), pc/h	681	392	479	833
Weaving Flow Rate (vw), pc/h	1225	Freeway Max Capacity (cFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1160	Density-Based Capacity (cWL), pc/h/ln		1651
Total Flow Rate (v), pc/h	2385	Demand Flow-Based Capacity (cIW), pc/h		4669
Volume Ratio (VR)	0.514	Weaving Segment Capacity (cW), veh/h		3302
Minimum Lane Change Rate (LCMIN), lc/h	1225	Adjusted Weaving Area Capacity, pc/h		3101
Maximum Weaving Length (LMAX), ft	7991	Volume-to-Capacity Ratio (v/c)		0.77

Speed and Density

Non-Weaving Vehicle Index (INW)	24	Average Weaving Speed (Sw), mi/h	38.6
Non-Weaving Lane Change Rate (LCNW), lc/h	295	Average Non-Weaving Speed (SNW), mi/h	33.0
Weaving Lane Change Rate (LCW), lc/h	1267	Average Speed (S), mi/h	35.7
Weaving Lane Change Rate (LCAll), lc/h	1562	Density (D), pc/mi/ln	33.4
Weaving Intensity Factor (W)	0.378	Level of Service (LOS)	D

APPENDIX J: SATURDAY ANALYSIS (TRAFFIC VOLUMES & HCM REPORTS)

HCM 6th Signalized Intersection Summary
3: 27th Ave & Kuebler Blvd

Kuebler Boone TPR
Build 2025 Saturday Peak - Mitigation

Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑	↑↑	↑	↑↑	
Traffic Volume (veh/h)	18	1132	224	924	1117	16	346	136	847	15	139	19
Future Volume (veh/h)	18	1132	224	924	1117	16	346	136	847	15	139	19
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00		0.99	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	1800	1786	1800	1786	1786	1800	1800	1730	1800	1800	1800	1800
Adj Flow Rate, veh/h	18	1155	130	943	1140	16	353	139	864	15	142	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	1	0	1	1	0	0	5	0	0	0	0
Cap, veh/h	21	1096	611	761	1837	831	281	528	1439	17	369	39
Arrive On Green	0.01	0.22	0.22	0.46	1.00	1.00	0.08	0.31	0.31	0.01	0.23	0.23
Sat Flow, veh/h	1714	3393	1493	3300	3393	1506	3326	1730	2685	1714	1601	169
Grp Volume(v), veh/h	18	1155	130	943	1140	16	353	139	864	15	0	157
Grp Sat Flow(s), veh/h/ln	1714	1697	1493	1650	1697	1506	1663	1730	1342	1714	0	1770
Q Serve(g_s), s	1.4	42.0	8.2	30.0	0.0	0.0	11.0	7.9	28.6	1.1	0.0	9.7
Cycle Q Clear(g_c), s	1.4	42.0	8.2	30.0	0.0	0.0	11.0	7.9	28.6	1.1	0.0	9.7
Prop In Lane	1.00			1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	21	1096	611	761	1837	831	281	528	1439	17	0	408
V/C Ratio(X)	0.85	1.05	0.21	1.24	0.62	0.02	1.25	0.26	0.60	0.87	0.00	0.38
Avail Cap(c_a), veh/h	66	1096	611	761	1837	831	281	528	1439	66	0	408
HCM Platoon Ratio	0.67	0.67	0.67	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.3	50.9	29.2	35.0	0.0	0.0	59.5	34.1	20.6	64.3	0.0	42.2
Incr Delay (d2), s/veh	27.3	42.4	0.8	116.6	1.3	0.0	140.2	1.2	1.9	34.5	0.0	2.7
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(50%), veh/ln	0.7	24.6	3.2	21.1	0.3	0.0	10.1	3.5	9.1	0.7	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	91.6	93.4	30.0	151.6	1.3	0.0	199.7	35.3	22.5	98.7	0.0	44.9
LnGrp LOS	F	F	C	F	A	A	F	D	C	F	A	D
Approach Vol, veh/h	1303			2099			1356			172		
Approach Delay, s/veh	87.0			68.8			69.9			49.6		
Approach LOS	F			E			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R _c), s	34.0	47.0	5.3	43.7	5.6	75.4	15.0	34.0				
Change Period (Y+R _c), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	30.0	42.0	5.0	36.0	5.0	67.0	11.0	30.0				
Max Q Clear Time (g_c+l1), s	32.0	44.0	3.1	30.6	3.4	2.0	13.0	11.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	1.8	0.0	0.2				
Intersection Summary												
HCM 6th Ctrl Delay			73.3									
HCM 6th LOS			E									

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
3	Synchro HCM 6th Signal	27th Ave & Kuebler Blvd	Signal	E	73.3	0.86

Queuing and Blocking Report
Build 2025 Saturday Peak - Mitigation

06/23/2022

Intersection: 3: 27th Ave & Kuebler Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	459	1229	1233	300	530	580	1136	1109	5	276	281	261
Average Queue (ft)	69	1062	1094	258	513	559	990	341	0	151	166	85
95th Queue (ft)	315	1424	1394	421	613	682	1495	924	2	239	252	178
Link Distance (ft)		1196	1196				1113	1113				395
Upstream Blk Time (%)		24	31				21	0				
Queuing Penalty (veh)		152	192				217	1				
Storage Bay Dist (ft)	360		200	480	480				170	300	300	
Storage Blk Time (%)		59	76		55	56		6		0	0	0
Queuing Penalty (veh)		11	170		309	314		1		0	0	1

Intersection: 3: 27th Ave & Kuebler Blvd

Movement	NB	NB	SB	SB
Directions Served	R	R	L	TR
Maximum Queue (ft)	240	263	51	182
Average Queue (ft)	114	155	13	93
95th Queue (ft)	197	233	37	163
Link Distance (ft)	395		455	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	195		
Storage Blk Time (%)	0		0	
Queuing Penalty (veh)	0		0	

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

All Movement Classes

Site: 101 [Build 2025 Saturday Peak - Mitigation (Site Folder: General)]

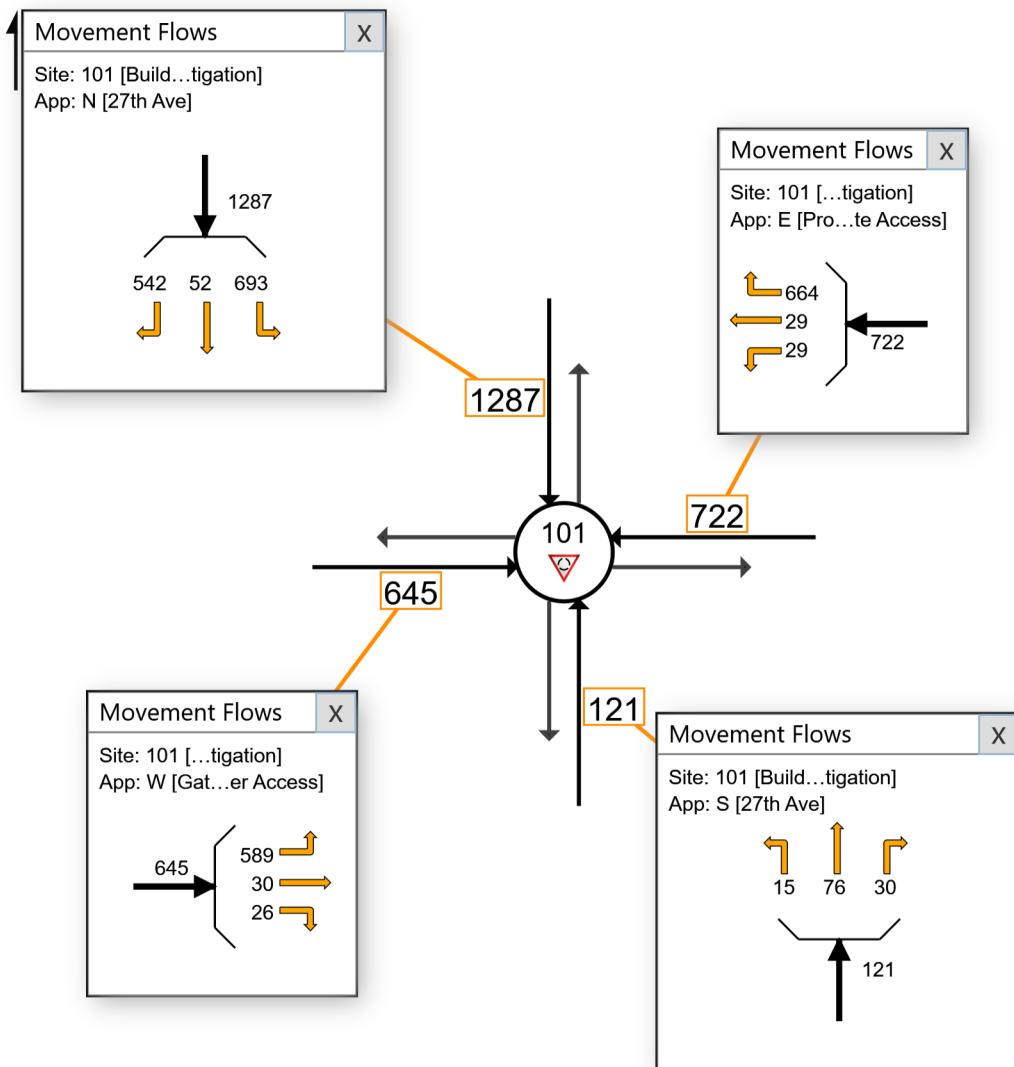
Network: N101 [Network1 (Network Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

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MOVEMENT SUMMARY

Site: 101 [Build 2025 Saturday Peak - Mitigation (Site Folder: General)] Network: N101 [Network1 (Network Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[Total veh/h]	HV %	[Total veh/h]	HV %	v/c	sec		[Veh. veh]	Dist ft				
South: 27th Ave														
3	L2	16	0.0	16	0.0	0.335	14.2	LOS B	0.4	11.2	0.74	0.79	0.91	28.4
8	T1	81	0.0	81	0.0	0.335	14.2	LOS B	0.4	11.2	0.74	0.79	0.91	22.9
18	R2	32	0.0	32	0.0	0.335	14.2	LOS B	0.4	11.2	0.74	0.79	0.91	27.5
Approach		129	0.0	129	0.0	0.335	14.2	LOS B	0.4	11.2	0.74	0.79	0.91	25.3
East: Project Site Access														
1	L2	31	0.0	31	0.0	0.591	14.7	LOS B	1.8	45.2	0.78	0.97	1.30	28.1
6	T1	31	0.0	31	0.0	0.591	14.7	LOS B	1.8	45.2	0.78	0.97	1.30	27.9
16	R2	706	0.0	706	0.0	0.591	15.6	LOS C	1.8	45.2	0.74	0.94	1.27	22.1
Approach		768	0.0	768	0.0	0.591	15.5	LOS C	1.8	45.2	0.75	0.94	1.27	22.8
North: 27th Ave														
7	L2	737	0.0	526	0.0	0.428	6.9	LOS A	1.1	27.3	0.29	0.14	0.29	27.1
4	T1	55	0.0	39	0.0	0.428	6.9	LOS A	1.1	27.3	0.29	0.14	0.29	26.8
14	R2	577	0.0	412	0.0	0.302	5.3	LOS A	0.7	16.4	0.18	0.07	0.18	28.9
Approach		1369	0.0	977 ^{N1}	0.0	0.428	6.2	LOS A	1.1	27.3	0.24	0.11	0.24	27.8
West: Gateway Shopping Center Access														
5	L2	627	0.0	627	0.0	0.820	24.7	LOS C	5.2	129.0	0.92	1.44	2.25	18.2
2	T1	32	0.0	32	0.0	0.820	24.7	LOS C	5.2	129.0	0.92	1.44	2.25	23.9
12	R2	28	0.0	28	0.0	0.820	24.7	LOS C	5.2	129.0	0.92	1.44	2.25	23.5
Approach		686	0.0	686	0.0	0.820	24.7	LOS C	5.2	129.0	0.92	1.44	2.25	18.8
All Vehicles		2952	0.0	2560 ^{N1}	0.0	0.820	14.4	LOS B	5.2	129.0	0.60	0.75	1.12	23.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab). Roundabout LOS Method: Same as Sign Control.

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

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Gap-Acceptance Capacity: Traditional M1.

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

^{N1} Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

QUEUE DISTANCE (AVERAGE)

Largest Average Back of Queue Distance for any lane used by the vehicle movement (feet)

Site: 101 [Build 2025 Saturday Peak - Mitigation (Site Folder: General)]

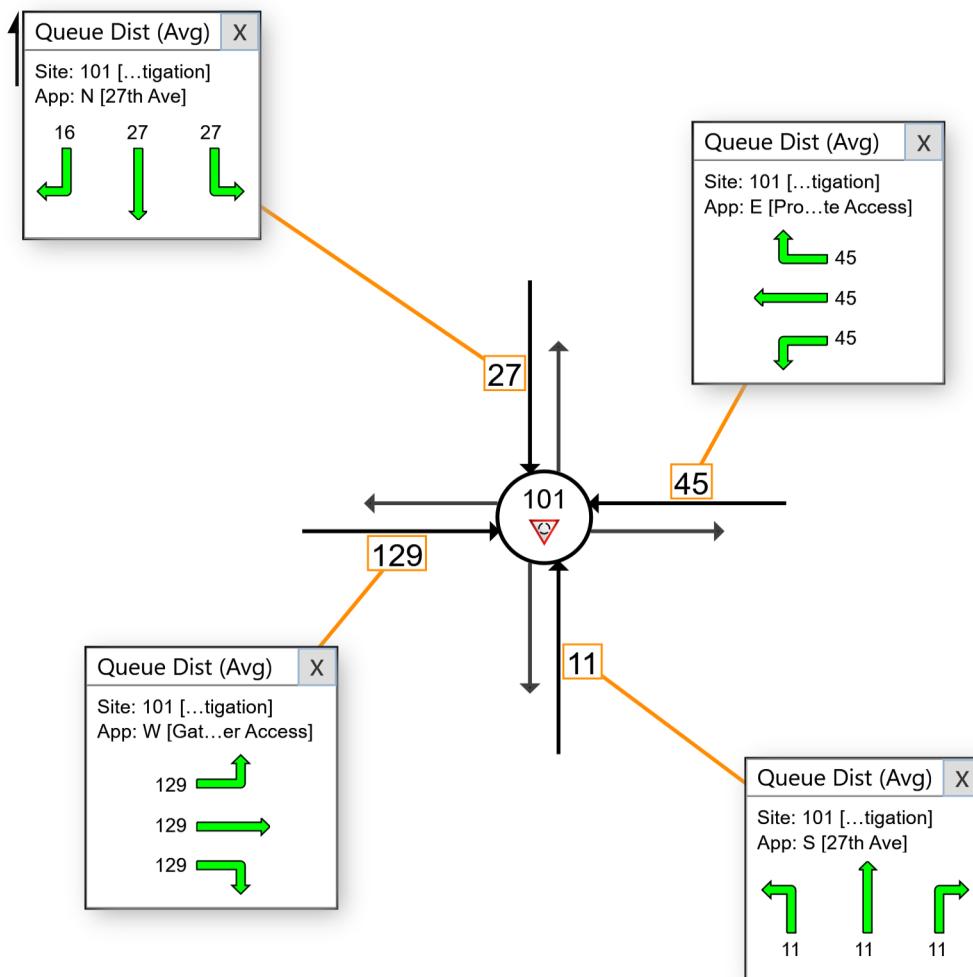
■ Network: N101 [Network1 (Network Folder: General)]

Site Access at 27th Ave

Site Category: -
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

[Close All Popups](#)



Colour code based on Queue Storage Ratio



Queue Model: HCM Queue Formula.

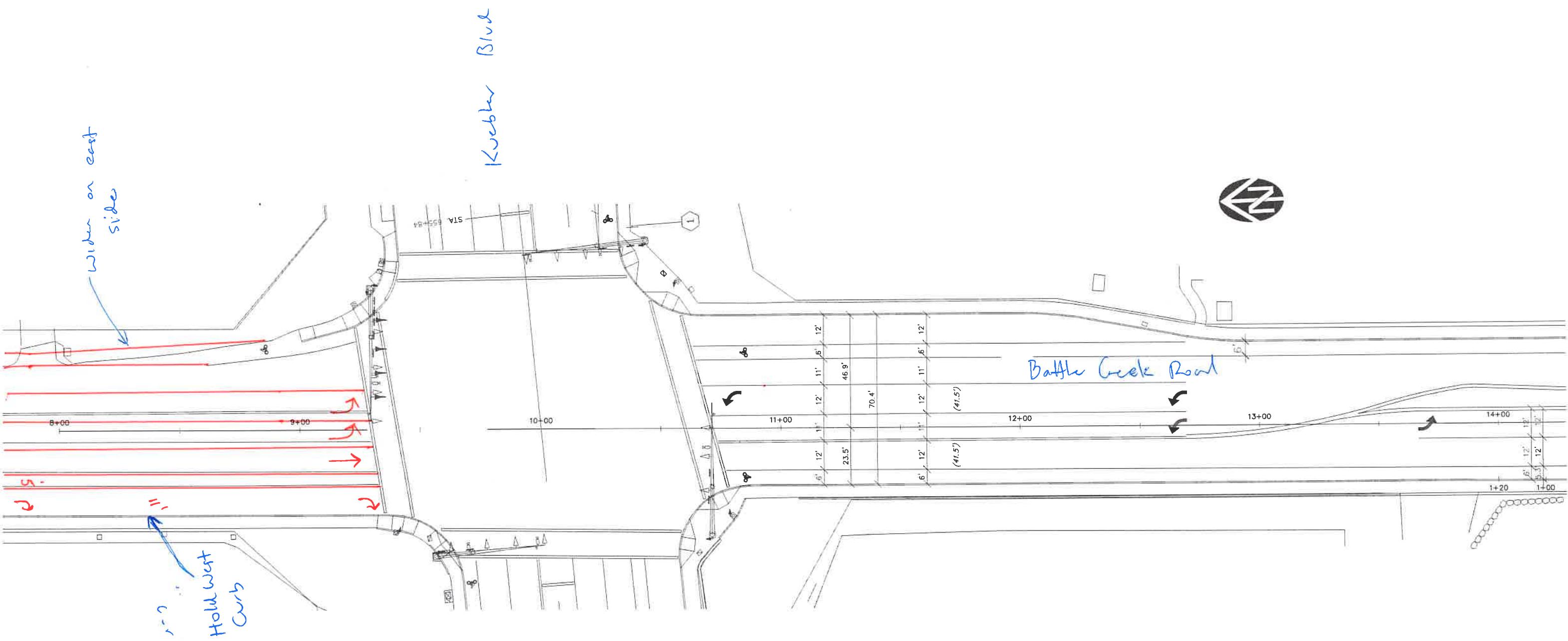
APPENDIX K: CONCEPT DESIGNS AND COST ESTIMATES

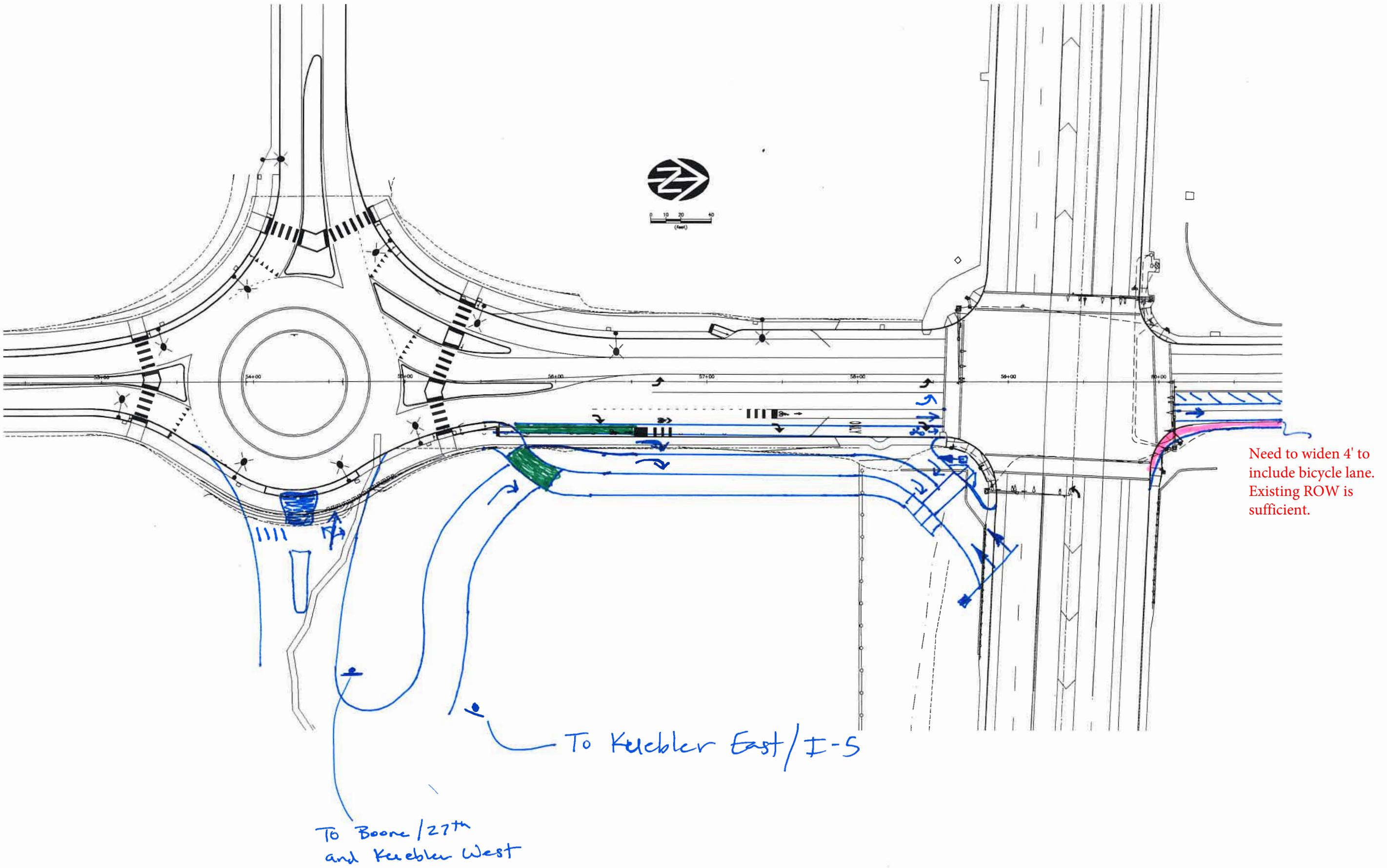
Google Maps



Imagery ©2021 Maxar Technologies, State of Oregon, U.S. Geological Survey, Map data ©2021

20 ft





Planning Level Engineers Estimate

Item No.	Description	Estimated Quantity	Unit	Unit Price	Lump Sum Value
----------	-------------	--------------------	------	------------	----------------

Kuebler & Battle Creek - Install Second SBL

1.	Excavation & Demolition	ALL	L.S.	Lump Sum	\$250,000.00
2.	Baserock, Paving & Concrete	ALL	L.S.	Lump Sum	\$500,000.00
3.	Retaining Walls	ALL	L.S.	Lump Sum	\$350,000.00
4.	Stormwater Improvements	ALL	L.S.	Lump Sum	\$100,000.00
Subtotal					\$1,200,000.00

Kuebler Blvd & 27th - Dual NBR & NBL and Update Phasing

1.	Excavation & Demolition	ALL	L.S.	Lump Sum	\$200,000.00
2.	New ADA Ramps	ALL	L.S.	Lump Sum	\$35,000.00
3.	Baserock, Paving & Concrete	ALL	L.S.	Lump Sum	\$800,000.00
4.	Retaining Walls	ALL	L.S.	Lump Sum	\$190,000.00
5.	Stormwater Improvements	ALL	L.S.	Lump Sum	\$175,000.00
6.	New Traffic Signal & Phasing	ALL	L.S.	Lump Sum	\$300,000.00
Subtotal					\$1,700,000.00

Kuebler Blvd & 36th - Separate WBR Lane

1.	Excavation & Demolition	ALL	L.S.	Lump Sum	\$70,000.00
2.	New ADA Ramps	ALL	L.S.	Lump Sum	\$15,000.00
3.	Baserock, Paving & Concrete	ALL	L.S.	Lump Sum	\$130,000.00
4.	Retaining Walls	ALL	L.S.	Lump Sum	\$60,000.00
5.	Guardrail	ALL	L.S.	Lump Sum	\$25,000.00
6.	Relocate Traffic Signal	ALL	L.S.	Lump Sum	\$200,000.00
Subtotal					\$500,000.00

27th Ave & Site Access - Add WBR Lane to Roundabout

1.	Excavation & Demolition	ALL	L.S.	Lump Sum	\$150,000.00
2.	New ADA Ramps	ALL	L.S.	Lump Sum	\$35,000.00
3.	Baserock, Paving & Concrete	ALL	L.S.	Lump Sum	\$365,000.00
4.	Retaining Walls	ALL	L.S.	Lump Sum	\$50,000.00
Subtotal					\$600,000.00

Mitigation Cost Estimate

Kuebler & Battle Creek - Install Second SBL	\$1,200,000.00
Kuebler Blvd & 27th - Dual NBR & NBL and Update Phasing	\$1,700,000.00
Kuebler Blvd & 36th - Separate WBR Lane	\$500,000.00
27th Ave & Site Access - Add WBR Lane to Roundabout	\$600,000.00
TOTAL	\$4,000,000.00