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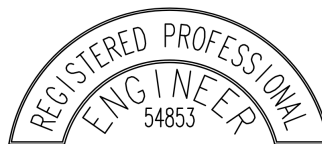
NW Bronson Road Zone Change

Traffic Impact Analysis Beaverton, Oregon

Date:
August 24, 2023

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Executive Summary

1. The approximately 1.88-acre property located at 16290 NW Bronson Lane in Beaverton, Oregon is currently zoned RMB (Mixed Residential B) and is proposed to be rezoned to GC (General Commercial). The property is located north of Highway 26, west of NW Bethany Boulevard, and south of NW Bronson Road. A specific development is not proposed at this time, only the change in zoning of the property.
2. The trip generation calculations show that with implementation of the proposed zone change, the trip generation potential of the site is projected to increase by 46 new morning peak hour trips, 20 new evening peak hour trips, and 357 new average weekday trips.
3. A detailed examination of the most recent five years of crash data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns.
4. Preliminary traffic signal warrants are not projected to be met at the NW Bronson Road & NW 163rd Terrace/Site Access intersection under the 2035 planning horizon with the zone change implemented.
5. Based on the results of the operational analysis, all study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2035 planning horizon.
6. No significant increases in queuing were identified as a result of the proposed zone change.
7. The proposed change in zoning will not significantly affect the transportation system as defined by the Transportation Planning Rule (TPR) and therefore the TPR is satisfied.



Project Description

The approximately 1.88 acre property located at 16290 NW Bronson Lane in Beaverton, Oregon is currently zoned RMB (Mixed Residential B) and is proposed to be rezoned to GC (General Commercial).

The proposed change in zoning will amend a land-use regulation, thus it will trigger the need to address the State Transportation Planning Rule (TPR). The TPR ensures that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land use regulations.

Since the proposed zoning could potentially generate more traffic than the existing zoning, a comparison of reasonable worst-case development scenarios will quantify the potential change in traffic volumes generated. An increase in traffic generated will require an analysis to determine whether the transportation system is capable of supporting changes to adopted plans and land use regulations, and whether modifications to the City's TSP are needed and if the conditions of the TPR are satisfied.

At this time, the specific development proposal for the zone is not certain. Site specific transportation concerns will need to be addressed at the time a specific building is proposed during the permitting approval process. This Traffic Impact Analysis (TIA) limits the scope of analysis specifically to the proposed zoning change.

Based on jurisdictional requirements for transportation impact studies and correspondence with City of Beaverton staff, this report conducts safety and capacity/level of service analyses at the following intersections:

1. NW Bethany Boulevard & NW Bronson Road
2. NW Bronson Road & NW 163rd Terrace/Site Access

Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The project site is located north of Highway 26, west of NW Bethany Boulevard, and south of NW Bronson Road in Beaverton, Oregon. The proposed development will take access via a driveway located across from NW 163rd Terrace. Several properties, which were recently consolidated as one lot, are proposed for a zone change from Residential to General Commercial.

Under the existing zoning (RMB), a variety of residential uses are permitted to occupy the site. This includes detached and attached housing, allowing for the second-highest number of units per acre per Beaverton's residential zones.

Under the proposed zoning (GC), a wider range of uses are permitted: including commercial, residential, and civic land uses. This includes expanded permission for developing residential uses, parking structures, and a wide variety of commercial and retail uses.

Vicinity Streets

There are three (3) primary roadways within the study area that are expected to carry traffic generated by the proposed development. The characteristics of these roadways are summarized in Table 1.



Table 1: Roadway Characteristics

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
NW Bronson Road	City of Beaverton	Collector	45	Yes	Prohibited	None
NW Bethany Boulevard	City of Beaverton	Arterial	35	Yes	Prohibited	Yes
NW 163rd Terrace	City of Beaverton	Local Street	25	Yes	Permitted	None

Study Intersections

Through coordination with the City of Beaverton, two (2) study intersections were identified for evaluation. The existing characteristics of these intersections are summarized in Table 2.

Table 2: Vicinity Intersection Descriptions

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	NW Bethany Boulevard & NW Bronson Road	Four-Legs	Signalized	All Approaches Protected Lefts, EB Right-Turn Overlap
2	NW Bronson Road & NW 163 rd Terrace	Three-Legs ¹	Stop-Controlled	SB Stop Controlled

Notes: ¹Fourth (southern) leg of intersection will be constructed by project at the time of development.

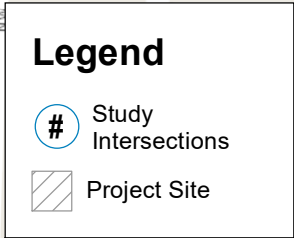
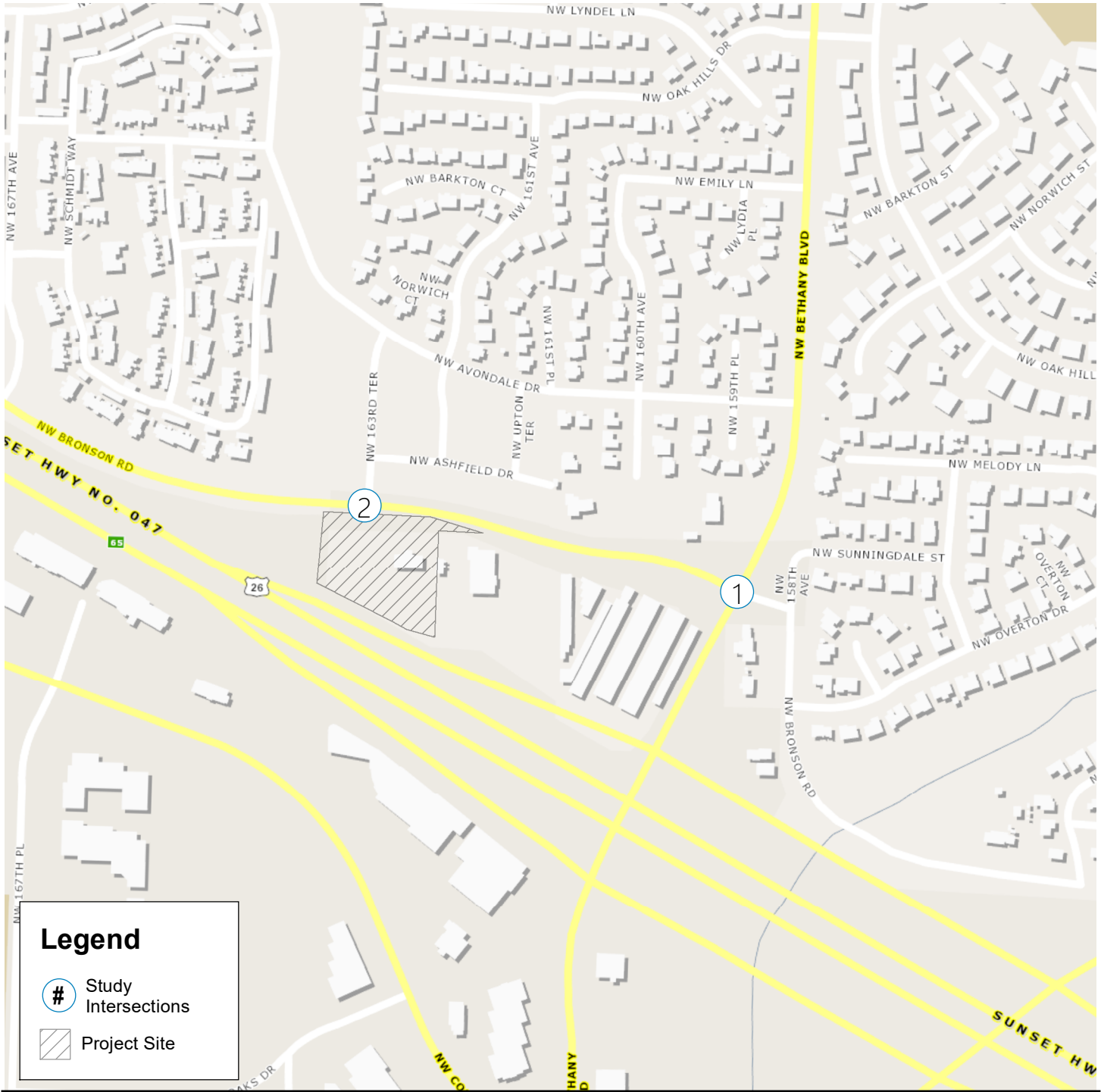
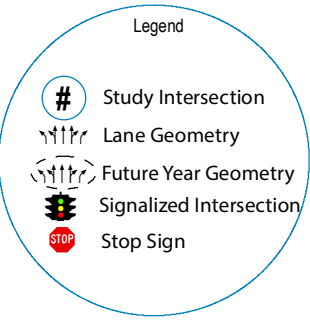
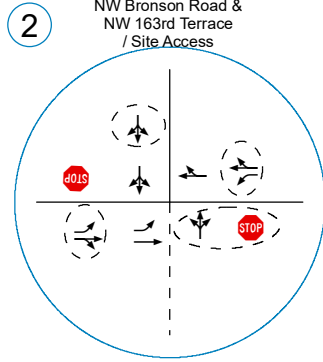
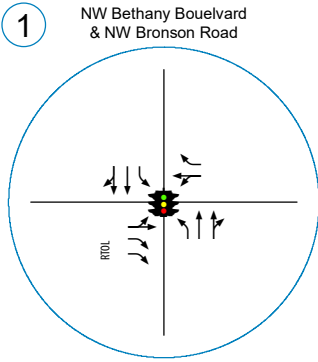
Public Transit

Within a quarter mile of the project site, there are two bus stops servicing one local transit line located on NW Bethany Boulevard north of NW Bronson Road. The bus stops service route 67: *Bethany/158th*.

67: *Bethany/158th* provides service between PCC Rock Creek and the Merlo MAX Station. Weekday service is scheduled from approximately 6:00 AM to 7:00 PM and has headways of approximately 60 minutes. Weekend service is scheduled from approximately 9:00 AM to 6:00 PM and has headways of approximately 60 minutes.

A vicinity map showing the project site, vicinity streets, and the study intersections with their associated lane configurations is displayed in Figure 1.





Trip Generation

The subject site is currently zoned as Residential and is proposed for a change in zoning to Commercial. To determine the impacts of the proposed rezone, reasonable worst-case development scenarios for the existing and proposed zones were determined utilizing data from the most traffic-intensive uses permitted within each zone.

Existing Zoning

To determine a reasonable worst-case development scenario under the existing RMB zoning, Beaverton Development Code *Section 20.05 – Residential Land Use Districts* was referenced. Land uses outright permitted within the zone were compared to land uses provided within the *Trip Generation Manual*¹. Under Residential Mixed B zoning, the minimum residential density is townhomes at 1,300 sf per unit. Based on the topography and size of the project site, an estimated 44 dwelling units of single-family attached could reasonably be constructed on the project site. Based on this assessment, data from land use code 215, *Single Family Attached*, was used to estimate trip generation based on the number of dwelling units.

Proposed Zoning

Based on conversations with Beaverton city staff, a reasonable worst-case development scenario was decided upon under the proposed zoning - General Commercial. The project site encompasses approximately 1.88 acres, however, the steep topography of the southern portion of the site nearest the freeway limits the development potential for retail uses, limiting the amount of developable area. However, the development of multi-family residential on the site would be less encumbered by the slopes and the need for arterial frontage.

Therefore, the projected trip generation of a 3,000 square foot fast-food restaurant and 81 units of low-rise multifamily housing were compared using the *Trip Generation Manual*. Specifically, data from land use codes 934, *Fast-Food Restaurant with Drive-Through*, and 220, *Multifamily Housing (Low-Rise)*, were used to estimate trip generation based on the square-footage of gross building floor area, and number of dwelling units, respectively.

The trip generation comparison for the proposed zoning is summarized in Table 3 and detailed trip generation calculations are included as an attachment to this memorandum.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Table 3: Trip Generation Summary, Proposed Zoning

Land Use	ITE Code	Size	AM Peak Hour			PM Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Fast-Food Restaurant with Drive-Through	934	3,000 SF	68	66	134	51	48	99	1,402
Pass-by Reduction (50% AM, 55% PM, 52% Weekday ¹)			-34	-33	-67	-28	-26	-54	-729
Total:			34	33	67	23	22	45	673
Multifamily Housing (Low-Rise)	220	81 DU	8	24	32	26	15	41	546

Notes: ¹Weekday pass-by rate is an average of the AM & PM pass-by rates.

The trip generation calculations show that under the proposed zoning, a fast-food restaurant is projected to generate 67 primary morning peak hour trips, 45 primary evening peak hour trips, and 673 average weekday trips. 81 dwelling units of multifamily housing is projected to generate 32 morning peak hour trips, 41 evening peak hour trips, and 546 average weekday trips. Based on the trip generation comparison, a fast-food restaurant is the worst-case development scenario and will be used for analysis.

Trip Generation Analysis

The trip generation calculations show that under the existing RMB zone, the subject site could reasonably generate up to 21 morning peak hour trip, 25 evening peak hour trips, and 316 average weekday trips. Under the proposed GC zone, the subject site could reasonably generate up to 67 primary morning peak hour trips, 45 primary evening peak hour trips, and 673 average weekday trips.

Accordingly, the net change in the trip generation potential of the site after the proposed rezone to General Commercial (GC) is projected to increase by 46 new morning peak hour trips, 20 new evening peak hour trips, and 357 new average weekday trips.

The trip generation estimates associated with the proposed zone change are summarized in Table 4, detailed trip generation calculations are included in the appendix.

Table 4: Trip Generation Comparison, Existing and Proposed Zoning

Land Use	ITE Code	Size	AM Peak Hour			PM Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
Existing Zoning									
Single Family Attached Housing	215	44 Dwelling Units	7	14	21	14	11	25	316
Proposed Zoning									
Fast-Food Restaurant with Drive-Through	934	3,000 SF	68	66	134	51	48	99	1,402
Pass-by Reduction (50% AM, 55% PM, 52% Weekday ¹)			-34	-33	-67	-28	-26	-54	-729
Net Change:			27	19	46	9	11	20	357



Trip Distribution

The project trip distribution was developed based on the geographical location of the project, proximity of residential, commercial, and office uses, and the existing and planned roadway network facilities. The following trip distribution is projected:

- Approximately 10 percent of site trips will travel to/from the north along NW Bethany Boulevard;
- Approximately 30 percent of trips will travel to/from the east along Highway 216;
- Approximately 20 percent of site trips will travel to/from the west along NW Bronson Road;
- Approximately 15 percent of trips will travel to/from the west along Highway 26; and
- Approximately 25 percent of site trips will travel to/from the south along NW Bethany Boulevard.

Impact Area Requirements

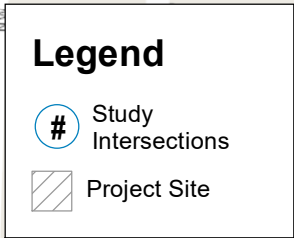
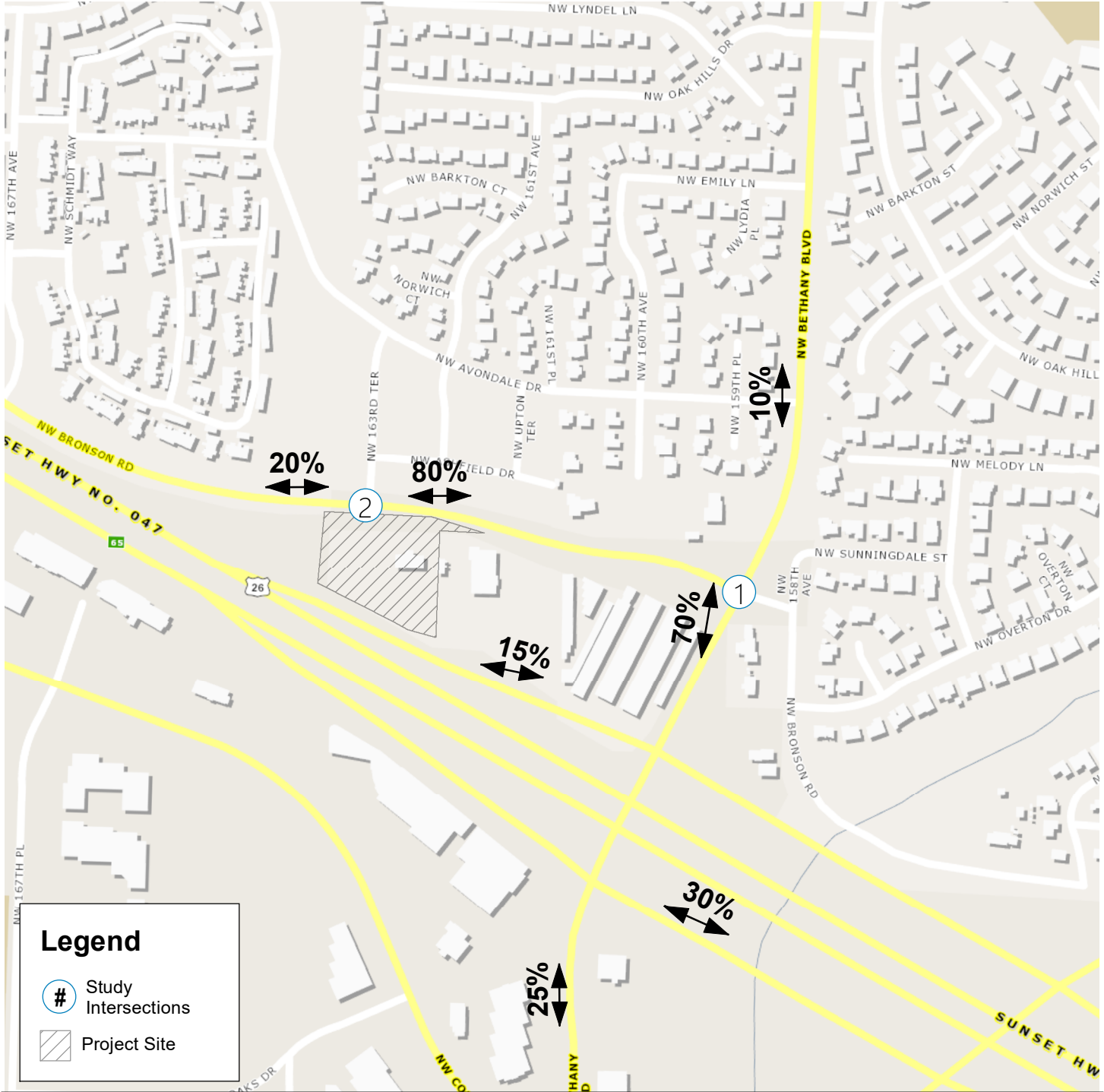
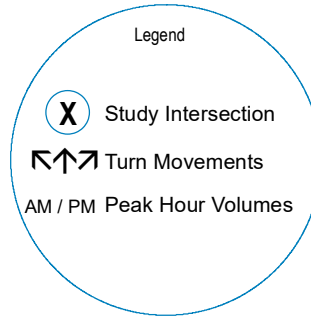
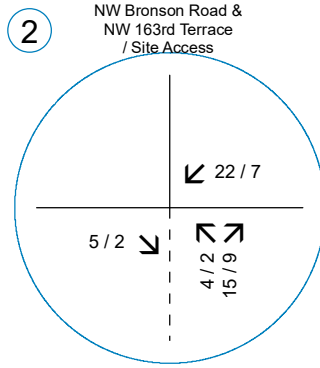
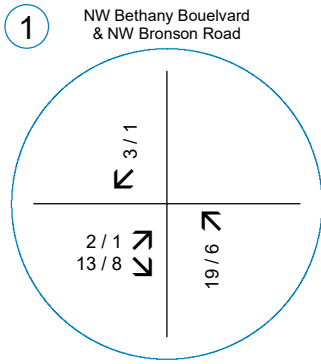
According to the City of Beaverton's Development Code section 66.55.20, a TIA must include an analysis of intersections that fall within the proposed development's "area of influence". The "area of influence" includes all points of access to the public street system, all intersections of regional significance (arterials, collectors, and neighborhood routes) within 1,000 linear feet from all points of access onto the public street system, and all intersections that experience an impact exceeding five percent of existing morning or evening peak hour traffic volume.

Per Table 3.2: TIA Threshold and Analysis Areas in ODOT's Development Review Guidelines, the area for analysis is defined as the area significantly affected by the development, within reason. Based on best practices, Table 3.2 recommends analysis at intersections where traffic is increased by 50 peak hour trips.

Based on the project site trip impacts and proximity to the site, the following two intersections were analyzed:

1. NW Bronson Road & Site Access
2. NW Bethany Boulevard & W Bronson Road

The trip distribution and assignment for the site trips generated during the evening peak hours are shown in Figure 2.



Traffic Volumes

Existing Conditions

Traffic counts were collected on Thursday, August 11, 2022 between 7:00 AM and 9:00 AM and between 4:00 PM and 6:00 PM in order to gather data for each intersection's morning and evening peak hours, respectively. Each intersection's peak hours were used for analysis.

Figure 3 shows the existing conditions traffic volumes at the study intersections during the morning and evening peak hours.

Planning Horizon Year 2035 Background Conditions

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. Planning Horizon Year 2035 data from the adopted Beaverton Transportation System Plan (TSP, adopted December 2009) was used to determine the analysis year base conditions.

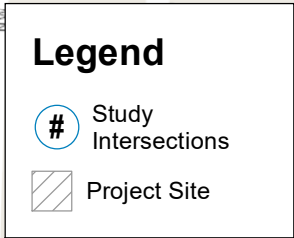
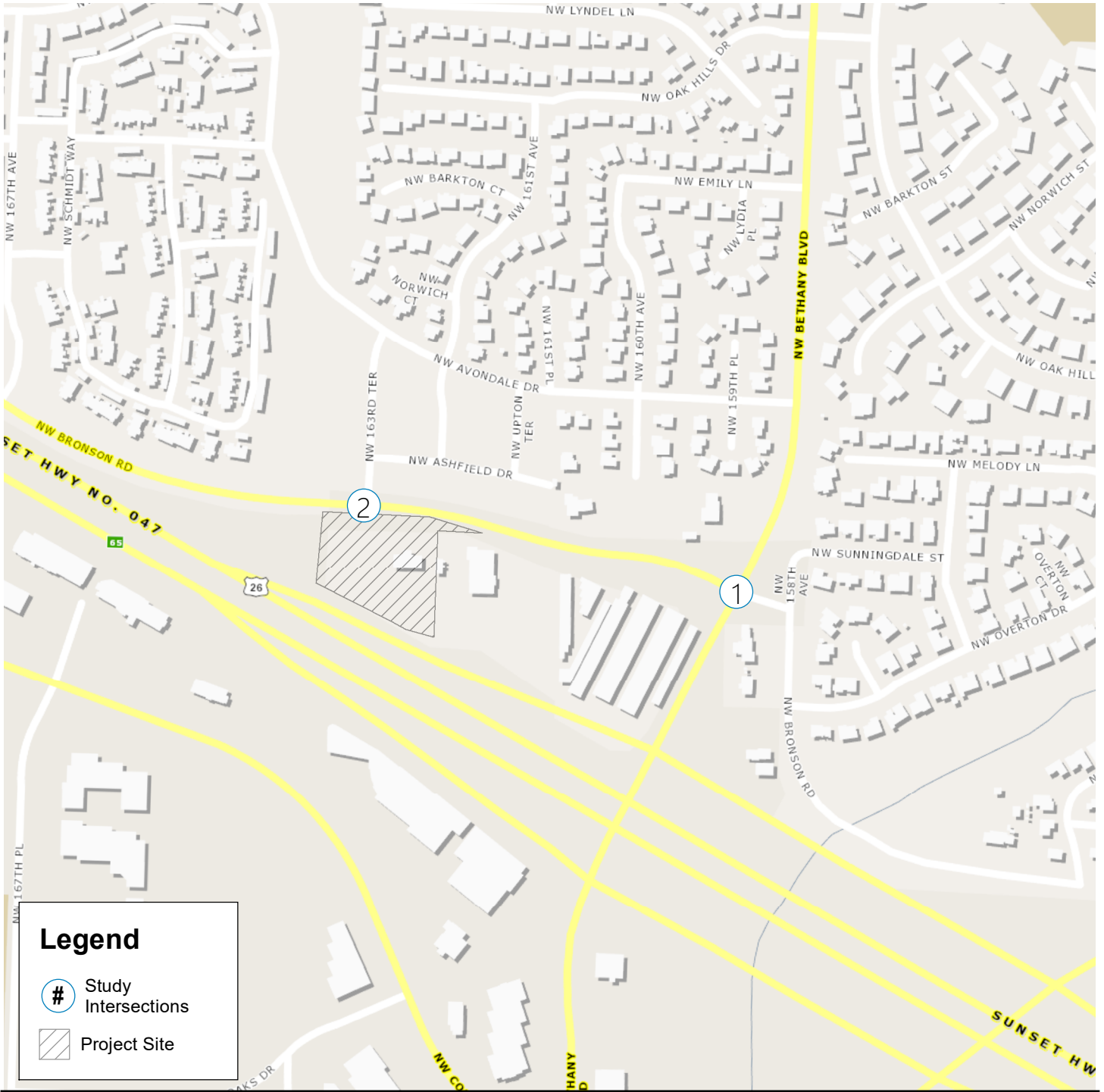
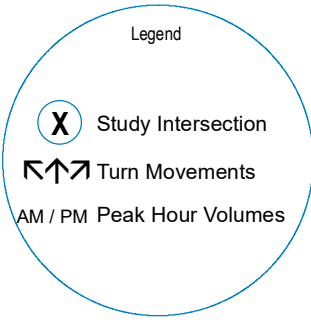
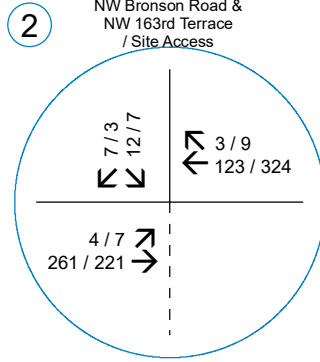
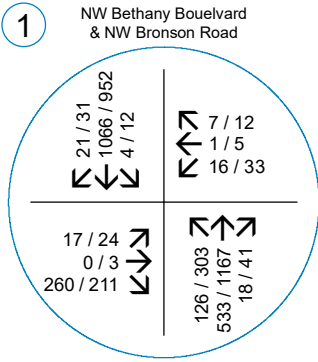
The study intersections were not analyzed in the TSP, therefore, intersection turning movement volumes for the study intersections were developed based on the nearby annual growth rate of 2.44% at the NW Bethany Boulevard & NW Cornell Road intersection.

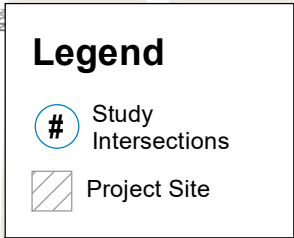
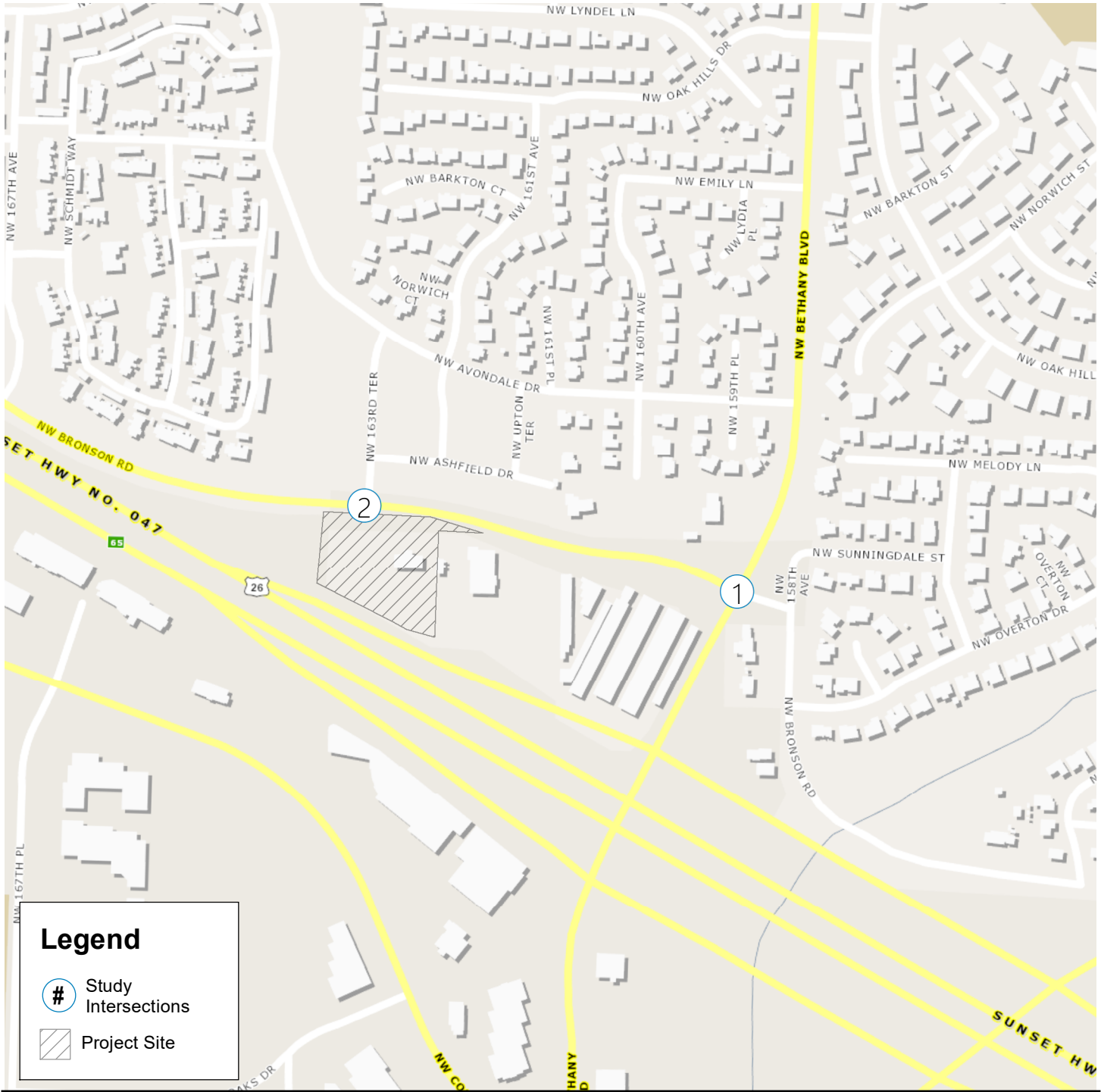
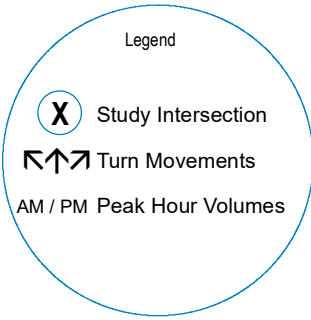
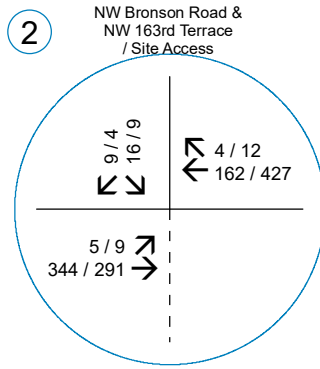
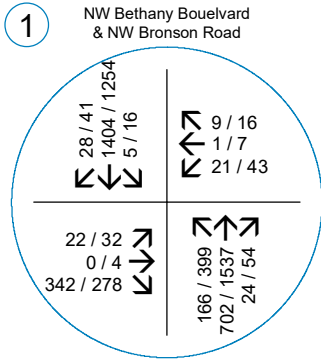
The year 2035 background traffic volumes during the evening peak hour are displayed in Figure 4.

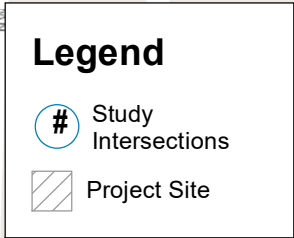
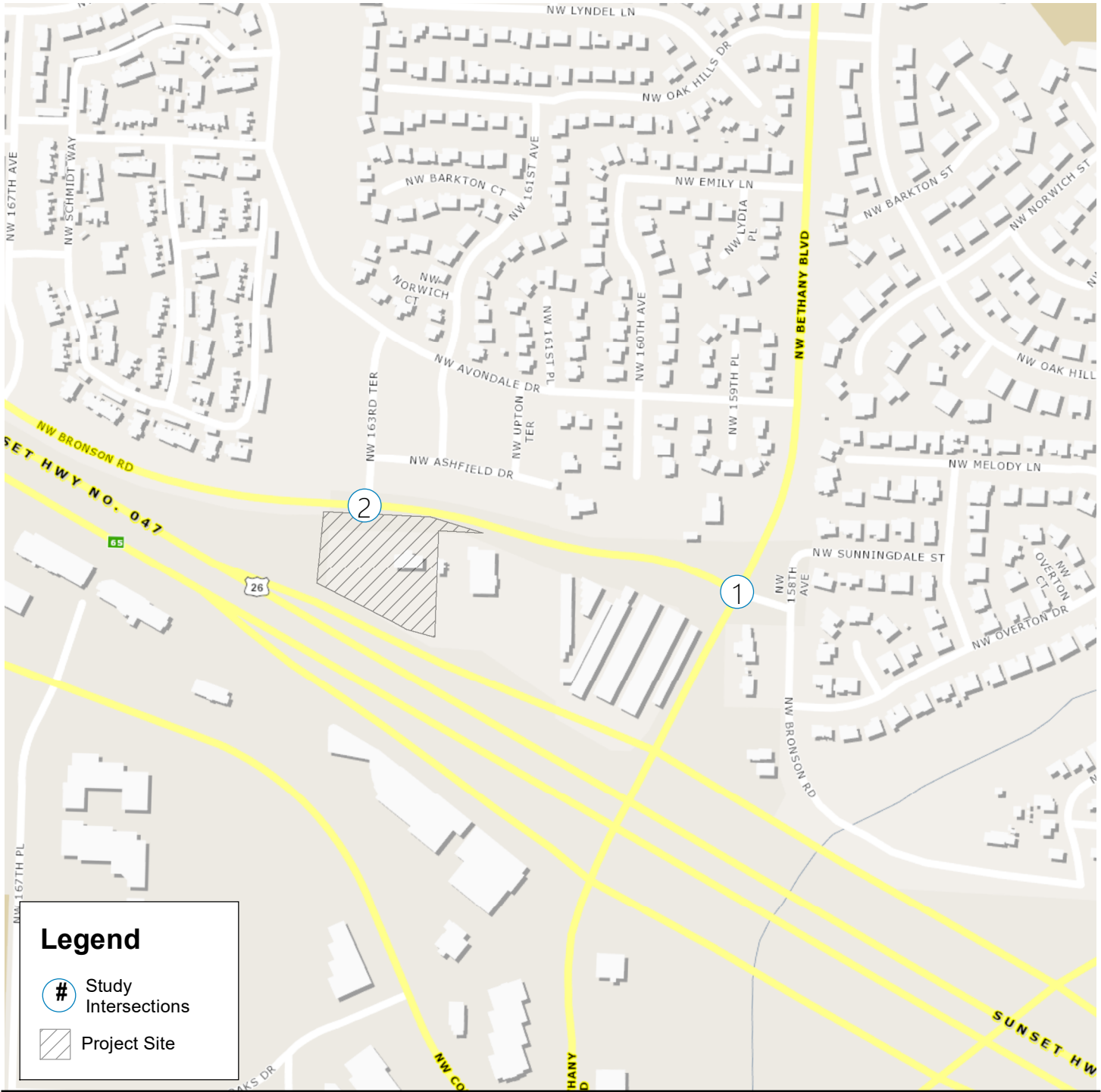
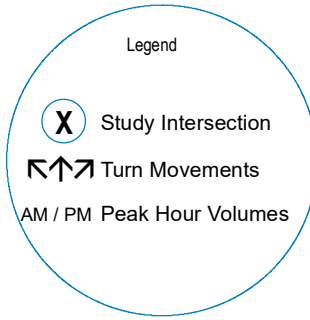
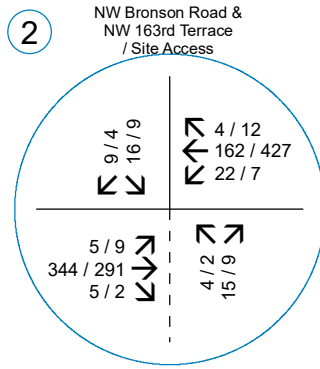
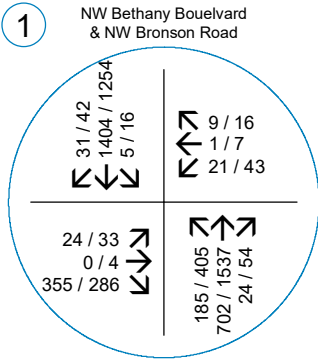
Planning Horizon Year 2035 Buildout Conditions

The net change in potential peak hour trips estimated to be generated by the proposed zone change, as described earlier in the Site Trips section, were added to the projected year 2035 planning horizon traffic volumes to obtain the expected 2035 planning horizon volumes with the zone change implemented.

The 2035 planning year volumes with the zone change implemented, during the morning and evening peak hours, are shown in Figure 5.







Safety Analysis

Crash History Review

Using data obtained from ODOT’s Crash Data System, a review of approximately five years of the most recent available crash history (January 2016 through December 2020) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- Property Damage Only (PDO)
- Possible Injury (Injury C)
- Non-Incapacitating Injury (Injury B)
- Incapacitating Injury (Injury A)
- Fatality or Fatal Injury

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the average daily traffic (ADT) at the intersection.

According to Exhibit 4- 1: Intersection Crash Rates per MEV by Land Type and Traffic Control of ODOT’s APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be “flagged for further analysis”. Crash rates in excess of 90th percentile crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation. For intersections in urban settings, the following 90th percentile rates are applicable to the study intersections:

- Unsignalized, three-leg intersection: 0.293 CMEV; and
- Signalized, four-leg intersection: 0.860 CMEV.

Table 5 provides a summary of crash types while Table 6 summarizes crash severities and rates for each of the study intersections. It should be noted that no crashes were identified at the NW Bronson Road & NW 163rd Terrace intersection within the 5-year study period. Detailed ODOT crash reports are included in the technical appendix to this report.

Table 5: Crash Type Summary

Intersection	Crash Type				Total Crashes
	Rear-End	Turning	Sideswipe	Backing	
1 NW Bethany Boulevard & NW Bronson Road	7	8	1	1	17



Table 6: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	PHV	Crash Rate	ODOT 90 th Threshold
		PDO	C	B	A	Fatal				
1	NW Bethany Boulevard & NW Bronson Road	5	11	1	0	0	17	2,794	0.333	0.860

Based on the most recent five years of crash data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns.

Preliminary Traffic Signal Warrant Analysis

Preliminary traffic signal warrants were examined for the NW Bronson Road & NW 163rd Terrace/Site Access intersection to determine whether the installation of a new traffic signal will be warranted by the Buildout Year 2035 scenario.

Based on the preliminary analysis, traffic signal warrants are not projected to be met for the NW Bronson Road & NW 163rd Terrace/Site Access intersection under the planning horizon year 2035 conditions with the zone change implemented. Accordingly, no signalization of the unsignalized study intersections is necessary or recommended.



Operational Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized intersection analysis methodologies in the *Highway Capacity Manual*² (HCM). Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

According to *Section 60.55.10 – General Provisions* of the City of Beaverton Development Code:

- At a minimum, the impacts of development on a signalized intersection shall be mitigated to peak hour average control delay no greater than 65 seconds per vehicle using a signal cycle length not the exceed 120 seconds. The volume-to-capacity (v/c) ratio for each lane group for each movement shall be identified and considered in the determination of intersection performance. The peak hour v/c ratio for each lane group shall be no greater than 0.98.
- At a minimum, the impacts of development on a two-way or an all-way stop-controlled intersection shall be mitigated to a peak hour average control delay of no greater than 45 seconds per vehicle. If the existing control delay or v/c ratio of an intersection is greater than the standards of this section, the impacts of development shall be mitigated to maintain or reduce the respective control delay or v/c ratio.

Intersection Capacity Analysis

The v/c, delay, and LOS results of the capacity analysis are shown in Table 7 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

² Transportation Research Board, *Highway Capacity Manual*, 6th Edition, 2016.

Table 7: Intersection Capacity Analysis Summary

Intersection & Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. NW Bethany Boulevard & NW Bronson Road						
2022 Existing Conditions	B	14	0.62	B	19	0.65
2035 Background Conditions	C	22	0.77	C	25	0.82
2035 Buildout Conditions	C	23	0.79	C	25	0.83
2. NW Bronson Road & MW 163rd Terrace/Site Access						
2022 Existing Conditions	B	11	0.04	B	12	0.02
2035 Background Conditions	B	12	0.05	B	13	0.03
2035 Buildout Conditions	B	14	0.07	C	16	0.04

BOLDED text indicates intersection operation above jurisdictional standards.

Based on the results of the operational analysis, all study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2035 planning horizon. No operational mitigation is necessary or recommended at these intersections.

Queuing Analysis

An analysis of queuing was conducted for key study intersections. The analysis was conducted using the Synchro/SimTraffic software, with the reported values representing 95th percentile queue lengths. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may not be frequently observed in the field. Note, this analysis does not account for upstream congestion outside of the study area.

The resulting 95th percentile queue estimates are summarized in Table 8.

Table 8: Queuing Analysis Summary

Movement	Available Storage (ft)	AM/PM Peak Hour – 95 th Percentile Queue	
		2035 Background	2035 Buildout
1. NW Bethany Boulevard & NW Bronson Road			
NBL	350	125/300	175/300
EBR 1	260	225/225	200/200
EBR 2	260	150/175	125/150
SBL	160	50/50	25/75
WBR	80	25/50	25/50
2. NW Bronson Road & MW 163rd Terrace/Site Access			
NBLTR	100	DNE	50/50
EBL	130	25/25	25/25
SBLTR	100	50/50	50/50
WBL	130	DNE	25/25

Transportation Planning Rule

Given the planned project will include a change in zoning of the project site, the Transportation Planning Rule (TPR) needs to be evaluated. The TPR is in place to ensure that the transportation system is capable of supporting possible increases in traffic intensity that could result from changes to adopted plans and land use regulations. The applicable elements of the TPR are each quoted directly in italics below, with responses following.

660-012-0060

- (1) *If an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) would significantly affect an existing or planned transportation facility, then the local government must put in place measures as provided in section (2) of this rule, unless the amendment is allowed under section (3), (9) or (10) of this rule. A plan or land use regulation amendment significantly affects a transportation facility if it would:*
- (a) *Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);*
 - (b) *Change standards implementing a functional classification system; or*
 - (c) *Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of*

the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

- (A) *Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;*
- (B) *Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or*
- (C) *Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan.*

Subsections (a) and (b) are not triggered since the planned zone change will not impact or alter the functional classification of any existing or planned facility and the proposal does not include a change to any functional classification standards.

Regarding subsection (c), as described in the *Operational Analysis* section the two study intersections are projected to operate within acceptable jurisdictional standards through the 2035 Planning Horizon, regardless of whether the planned zone change is implemented. Therefore, sufficient capacity to accommodate the planned zone change is expected at these study intersections whereby the TPR is satisfied.

Conclusions

Key findings from this analysis include:

- A detailed examination of the most recent five years of crash data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns.
- Preliminary traffic signal warrants are not projected to be met at the NW Bronson Road & NW 163rd Terrace/Site Access intersection under the 2035 planning horizon with the zone change implemented.
- Based on the results of the operational analysis, all study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2035 planning horizon.
- No significant increases in queuing were identified as a result of the proposed zone change.
- The proposed change in zoning will not significantly affect the transportation system as defined by the Transportation Planning Rule (TPR) and therefore the TPR is satisfied.

Appendix



Appendix A – Site Data

Trip Generation Calculations





TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use: Single-Family Attached Housing
Land Use Code: 215
Land Use Subcategory: All Sites
Setting/Location: General Urban/Suburban
Variable: Dwelling Units
Trip Type: Vehicle
Formula Type: Rate
Variable Quantity: **44**

AM PEAK HOUR

Trip Rate: 0.48

	Enter	Exit	Total
Directional Split	31%	69%	
Trip Ends	7	14	21

PM PEAK HOUR

Trip Rate: 0.57

	Enter	Exit	Total
Directional Split	57%	43%	
Trip Ends	14	11	25

WEEKDAY

Trip Rate: 7.2

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	158	158	316

SATURDAY

Trip Rate: 8.76

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	193	193	386



TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use: Fast-Food Restaurant with Drive-Through Window
Land Use Code: 934
Land Use Subcategory: All Sites
Setting/Location: General Urban/Suburban
Variable: 1000 SF GFA
Trip Type: Vehicle
Variable Quantity: 3

AM PEAK HOUR

Trip Rate: 44.61

	Enter	Exit	Total
Directional Split	51%	49%	
Trip Ends	68	66	134

PM PEAK HOUR

Trip Rate: 33.03

	Enter	Exit	Total
Directional Split	52%	48%	
Trip Ends	51	48	99

WEEKDAY

Trip Rate: 467.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	701	701	1,402

SATURDAY

Trip Rate: 616.12

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	924	924	1,848



TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use: Multifamily Housing (Low-Rise)
Land Use Code: 220
Land Use Subcategory: Not Close to Rail Transit
Setting/Location: General Urban/Suburban
Variable: Dwelling Units
Trip Type: Vehicle
Variable Quantity: **81**

AM PEAK HOUR

Trip Rate: 0.4

	Enter	Exit	Total
Directional Split	24%	76%	
Trip Ends	8	24	32

PM PEAK HOUR

Trip Rate: 0.51

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	26	15	41

WEEKDAY

Trip Rate: 6.74

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	273	273	546

SATURDAY

Trip Rate: 4.55

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	184	184	368

Caution: Small Sample Size

Appendix B – Traffic Data

Traffic Counts





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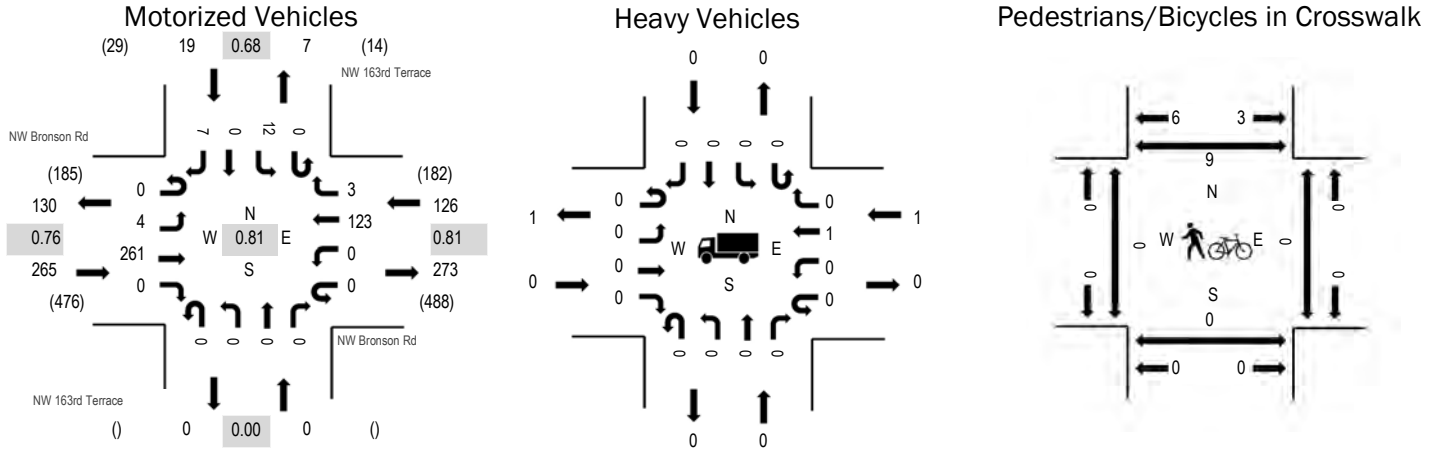
Location: 2 NW 163rd Terrace & NW Bronson Rd AM

Date: Thursday, August 11, 2022

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

Peak 15-Minutes in Study Peak Hour: 08:45 AM - 09:00 AM

Study Peak Hour (for all study intersections)



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.76
WB	0.8%	0.81
NB	0.0%	0.00
SB	0.0%	0.68
All	0.2%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	NW Bronson Rd Eastbound				NW Bronson Rd Westbound				NW 163rd Terrace Northbound				NW 163rd Terrace Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	14	0	0	0	4	0	0	0	0	0	0	0	0	0	18	277
7:05 AM	0	1	14	0	0	0	2	1	0	0	0	0	0	0	0	0	18	288
7:10 AM	0	0	23	0	0	0	0	0	0	0	0	0	0	1	0	0	24	291
7:15 AM	0	0	17	0	0	0	8	0	0	0	0	0	0	0	0	0	25	294
7:20 AM	0	0	14	0	0	0	5	0	0	0	0	0	0	0	0	0	19	308
7:25 AM	0	1	27	0	0	0	5	0	0	0	0	0	0	1	0	1	35	328
7:30 AM	0	1	17	0	0	0	2	0	0	0	0	0	0	0	0	0	20	341
7:35 AM	0	0	15	0	0	0	4	0	0	0	0	0	0	2	0	1	22	353
7:40 AM	0	0	10	0	0	0	3	0	0	0	0	0	0	1	0	0	14	361
7:45 AM	0	0	21	0	0	0	7	2	0	0	0	0	0	1	0	0	31	390
7:50 AM	0	0	18	0	0	0	7	1	0	0	0	0	0	0	0	1	27	392
7:55 AM	0	0	18	0	0	0	5	0	0	0	0	0	0	1	0	0	24	399
8:00 AM	0	1	15	0	0	0	10	0	0	0	0	0	0	1	0	2	29	410
8:05 AM	0	0	16	0	0	0	5	0	0	0	0	0	0	0	0	0	21	
8:10 AM	0	2	13	0	0	0	9	0	0	0	0	0	0	1	0	2	27	
8:15 AM	0	0	21	0	0	0	16	0	0	0	0	0	0	1	0	1	39	
8:20 AM	0	1	32	0	0	0	5	0	0	0	0	0	0	1	0	0	39	
8:25 AM	0	0	29	0	0	0	17	1	0	0	0	0	0	1	0	0	48	
8:30 AM	0	0	25	0	0	0	7	0	0	0	0	0	0	0	0	0	32	
8:35 AM	0	0	21	0	0	0	7	1	0	0	0	0	0	1	0	0	30	
8:40 AM	0	0	27	0	0	0	13	1	0	0	0	0	0	2	0	0	43	
8:45 AM	0	0	21	0	0	0	9	0	0	0	0	0	0	2	0	1	33	
8:50 AM	0	0	20	0	0	0	12	0	0	0	0	0	0	1	0	1	34	
8:55 AM	0	0	21	0	0	0	13	0	0	0	0	0	0	1	0	0	35	
Count Total	0	7	469	0	0	0	175	7	0	0	0	0	0	19	0	10	687	
Peak Hour	0	4	261	0	0	0	123	3	0	0	0	0	0	12	0	7	410	

Location: 2 NW 163rd Terrace & NW Bronson Rd AM

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
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	1	1
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	1	1
7:25 AM	0	0	0	0	0	7:25 AM	1	0	0	0	1	7:25 AM	0	0	0	1	1
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	1	1
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	1	1
7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	1	1	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	1	1	7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	2	2
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	2	2
8:15 AM	0	0	1	0	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM	1	0	0	0	1	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	3	3
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	2	2
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	0	0	1	0	1	Count Total	3	0	0	3	6	Count Total	0	0	0	14	14
Peak Hour	0	0	1	0	1	Peak Hour	1	0	0	0	1	Peak Hour	0	0	0	9	9

Location: 1 NW Bethany Blvd & NW Bronson Rd AM



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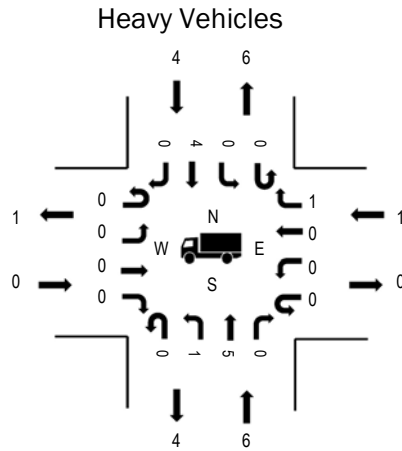
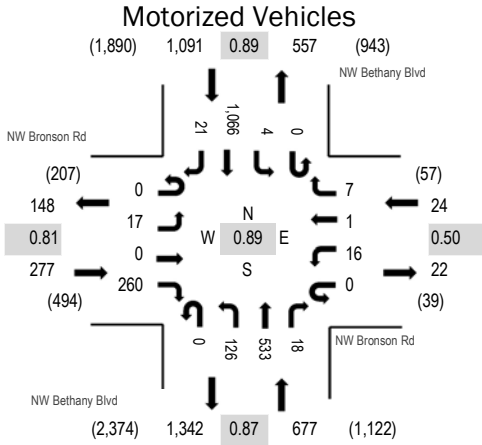
Location: 1 NW Bethany Blvd & NW Bronson Rd AM

Date: Thursday, August 11, 2022

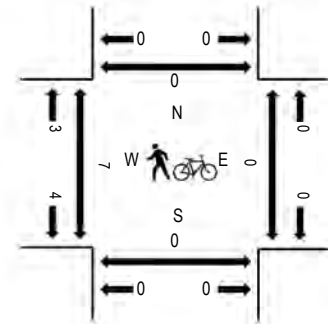
Study Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes in Study Peak Hour: 08:45 AM - 09:00 AM

Study Peak Hour (for all study intersections)



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.81
WB	4.2%	0.50
NB	0.9%	0.87
SB	0.4%	0.89
All	0.5%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	NW Bronson Rd Eastbound				NW Bronson Rd Westbound				NW Bethany Blvd Northbound				NW Bethany Blvd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	0	14	0	1	0	0	0	4	27	4	0	0	59	0	109	1,494
7:05 AM	0	0	0	14	0	4	0	0	0	4	20	0	0	0	41	0	83	1,530
7:10 AM	0	1	0	21	0	0	0	0	0	0	27	1	0	0	68	0	118	1,580
7:15 AM	0	0	0	18	0	2	0	0	0	8	24	2	0	0	57	0	111	1,620
7:20 AM	0	0	0	17	0	1	0	0	0	5	28	0	0	0	73	0	124	1,677
7:25 AM	0	1	0	20	0	1	0	0	0	5	32	0	0	0	54	0	113	1,731
7:30 AM	0	1	0	21	0	8	0	0	0	3	34	2	0	0	71	0	140	1,798
7:35 AM	0	2	0	15	0	2	0	0	0	4	35	1	0	0	75	0	134	1,835
7:40 AM	0	0	0	10	0	2	0	1	0	3	29	0	0	0	78	0	123	1,867
7:45 AM	0	3	0	17	0	2	0	0	0	7	38	2	0	0	67	3	139	1,929
7:50 AM	0	0	0	17	0	3	0	1	0	8	50	3	0	0	61	0	143	1,988
7:55 AM	0	1	0	24	0	4	0	1	0	3	30	2	0	0	90	2	157	2,033
8:00 AM	0	0	0	14	0	0	1	2	0	10	36	3	0	0	79	0	145	2,069
8:05 AM	0	2	0	15	0	1	0	0	0	5	40	1	0	0	69	0	133	
8:10 AM	0	1	0	12	0	1	0	0	0	11	43	1	0	0	88	1	158	
8:15 AM	0	1	0	22	0	1	0	0	0	15	34	2	0	0	92	1	168	
8:20 AM	0	1	0	26	0	1	0	0	0	4	50	2	0	0	94	0	178	
8:25 AM	0	2	0	31	0	3	0	0	0	13	56	1	0	0	69	5	180	
8:30 AM	0	2	0	23	0	2	0	0	0	6	53	1	0	0	87	3	177	
8:35 AM	0	2	0	20	0	3	0	4	0	6	30	1	0	0	97	3	166	
8:40 AM	0	1	0	26	0	1	0	0	0	17	41	1	0	1	96	1	185	
8:45 AM	0	1	0	24	0	1	0	1	0	11	51	2	0	0	106	1	198	
8:50 AM	0	2	0	18	0	0	0	0	0	13	58	1	0	0	92	4	188	
8:55 AM	0	2	0	29	0	2	0	0	0	15	41	2	0	3	97	2	193	
Count Total	0	26	0	468	0	46	1	10	0	180	907	35	0	4	1,860	26	3,563	
Peak Hour	0	17	0	260	0	16	1	7	0	126	533	18	0	4	1,066	21	2,069	

Location: 1 NW Bethany Blvd & NW Bronson Rd AM

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
7:00 AM	0	1	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	1	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	1	0	0	1	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	1	0	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	1	1	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	1	1	7:30 AM	2	0	0	0	2	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	1	1	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	1	0	0	0	1	7:40 AM	0	0	0	0	0
7:45 AM	0	2	1	0	3	7:45 AM	1	0	0	1	2	7:45 AM	0	0	0	0	0
7:50 AM	0	1	0	0	1	7:50 AM	1	0	0	0	1	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	1	0	1	2	7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	1	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0	8:05 AM	1	0	0	0	1
8:10 AM	0	2	0	0	2	8:10 AM	0	0	0	0	0	8:10 AM	4	0	0	0	4
8:15 AM	0	1	0	0	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	1	0	1	2	8:25 AM	1	0	0	0	1	8:25 AM	0	0	0	0	0
8:30 AM	0	1	0	0	1	8:30 AM	0	0	0	0	0	8:30 AM	2	0	0	0	2
8:35 AM	0	0	1	1	2	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	1	1	8:40 AM	0	0	1	0	1	8:40 AM	0	0	0	0	0
8:45 AM	0	1	0	0	1	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	0	13	2	6	21	Count Total	6	1	1	3	11	Count Total	7	0	0	0	7
Peak Hour	0	6	1	4	11	Peak Hour	1	0	1	0	2	Peak Hour	7	0	0	0	7



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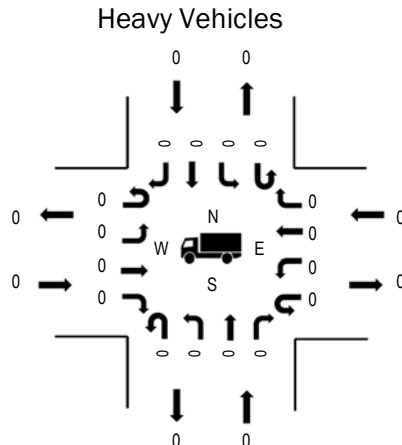
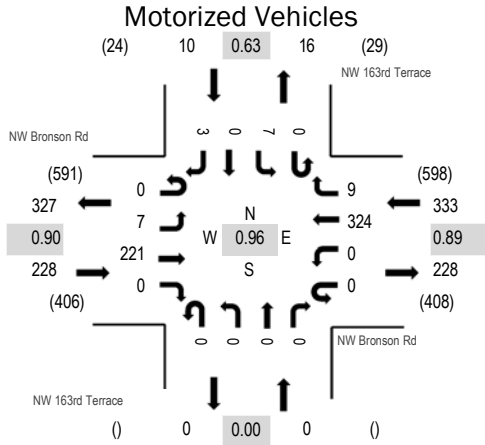
Location: 2 NW 163rd Terrace & NW Bronson Rd PM

Date: Thursday, August 11, 2022

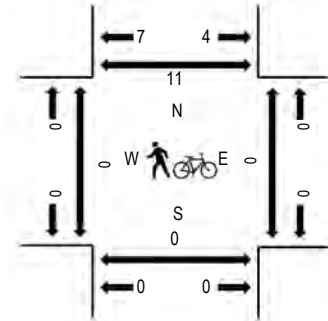
Study Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes in Study Peak Hour: 05:15 PM - 05:30 PM

Study Peak Hour (for all study intersections)



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.90
WB	0.0%	0.89
NB	0.0%	0.00
SB	0.0%	0.63
All	0.0%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	NW Bronson Rd Eastbound				NW Bronson Rd Westbound				NW 163rd Terrace Northbound				NW 163rd Terrace 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	0	14	0	0	0	15	0	0	0	0	0	0	0	0	0	29	464
4:05 PM	0	0	13	0	0	0	13	0	0	0	0	0	0	1	0	0	27	487
4:10 PM	0	0	13	0	0	0	21	1	0	0	0	0	0	0	0	0	35	505
4:15 PM	0	1	17	0	0	0	17	0	0	0	0	0	0	0	0	1	36	522
4:20 PM	0	0	12	0	0	0	25	0	0	0	0	0	0	0	0	1	38	537
4:25 PM	0	1	13	0	0	0	24	2	0	0	0	0	0	3	0	0	43	533
4:30 PM	0	1	11	0	0	0	23	2	0	0	0	0	0	1	0	0	38	547
4:35 PM	1	1	13	0	0	0	24	0	0	0	0	0	0	0	0	0	39	557
4:40 PM	0	0	15	0	0	0	31	1	0	0	0	0	0	1	0	0	48	559
4:45 PM	0	1	25	0	0	0	21	0	0	0	0	0	0	0	0	0	47	571
4:50 PM	0	0	22	0	0	0	30	0	0	0	0	0	0	2	0	0	54	560
4:55 PM	0	0	15	0	0	0	13	1	0	0	0	0	0	0	0	1	30	552
5:00 PM	0	1	17	0	0	0	33	1	0	0	0	0	0	0	0	0	52	564
5:05 PM	0	1	16	0	0	0	26	0	0	0	0	0	0	2	0	0	45	
5:10 PM	0	0	17	0	0	0	33	1	0	0	0	0	0	1	0	0	52	
5:15 PM	0	2	18	0	0	0	30	0	0	0	0	0	0	1	0	0	51	
5:20 PM	0	0	17	0	0	0	16	1	0	0	0	0	0	0	0	0	34	
5:25 PM	0	1	18	0	0	0	36	1	0	0	0	0	0	0	0	1	57	
5:30 PM	0	1	17	0	0	0	29	1	0	0	0	0	0	0	0	0	48	
5:35 PM	0	0	20	0	0	0	20	1	0	0	0	0	0	0	0	0	41	
5:40 PM	0	0	19	0	0	0	37	2	0	0	0	0	0	1	0	1	60	
5:45 PM	0	0	15	0	0	0	19	1	0	0	0	0	0	0	0	1	36	
5:50 PM	0	1	22	0	0	0	21	1	0	0	0	0	0	0	0	1	46	
5:55 PM	0	0	14	0	0	0	24	0	0	0	0	0	0	2	0	2	42	
Count Total	1	12	393	0	0	0	581	17	0	0	0	0	0	15	0	9	1,028	
Peak Hour	0	7	221	0	0	0	324	9	0	0	0	0	0	7	0	3	571	

Location: 2 NW 163rd Terrace & NW Bronson Rd PM

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	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	1	1
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	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	0	0	4:20 PM	1	0	0	0	1	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	5	5
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	5	5
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	0	0	0	0	0	4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	1	1
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	2	2
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	1	0	1	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	1	1
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	1	1
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	1	1	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	0	0	0	2	2
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	1	1
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	3	3
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	1	1
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	0	0	0	0	0	Count Total	3	0	2	1	6	Count Total	0	0	0	23	23
Peak Hour	0	0	0	0	0	Peak Hour	1	0	1	1	3	Peak Hour	0	0	0	11	11

Location: 1 NW Bethany Blvd & NW Bronson Rd PM



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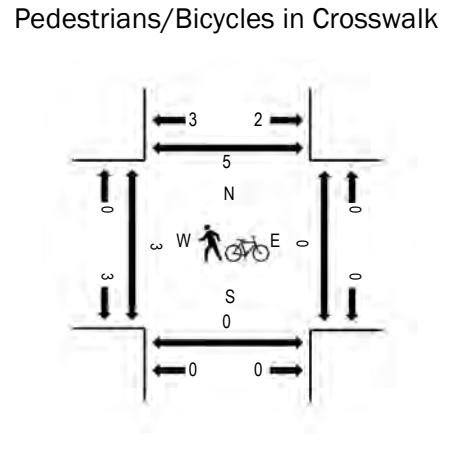
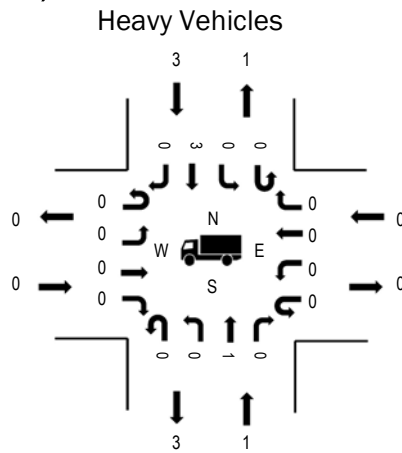
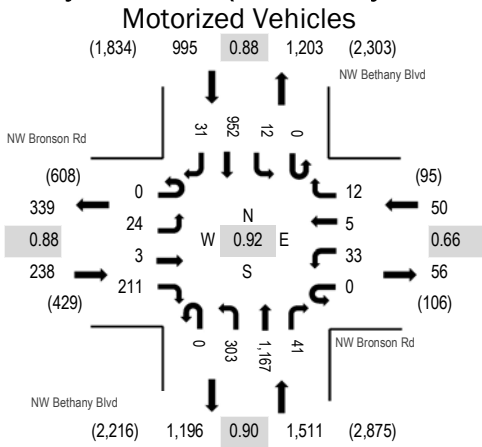
Location: 1 NW Bethany Blvd & NW Bronson Rd PM

Date: Thursday, August 11, 2022

Study Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes in Study Peak Hour: 05:15 PM - 05:30 PM

Study Peak Hour (for all study intersections)



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.88
WB	0.0%	0.66
NB	0.1%	0.90
SB	0.3%	0.88
All	0.1%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	NW Bronson Rd Eastbound				NW Bronson Rd Westbound				NW Bethany Blvd Northbound				NW Bethany Blvd 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	2	1	13	0	1	0	1	0	16	84	5	0	0	70	0	193	2,480
4:05 PM	0	3	0	14	0	2	0	1	0	13	82	2	0	0	63	2	182	2,527
4:10 PM	0	0	1	15	0	2	0	1	0	22	75	6	0	2	80	1	205	2,560
4:15 PM	0	0	1	15	0	1	1	0	0	15	94	2	0	0	85	0	214	2,570
4:20 PM	0	0	0	13	0	2	0	1	0	23	104	4	0	0	79	3	229	2,587
4:25 PM	0	2	1	14	0	2	1	0	0	26	89	6	0	1	60	1	203	2,618
4:30 PM	0	0	0	15	0	3	1	2	0	21	90	3	0	0	51	3	189	2,682
4:35 PM	0	2	0	14	0	6	0	0	0	20	94	3	0	1	62	3	205	2,711
4:40 PM	0	1	0	12	0	4	0	0	0	30	94	2	0	0	58	2	203	2,750
4:45 PM	0	4	2	17	0	1	0	1	0	20	91	2	0	2	88	0	228	2,794
4:50 PM	0	0	0	25	0	7	1	1	0	29	98	3	0	2	73	1	240	2,749
4:55 PM	0	3	0	17	0	4	0	1	0	12	83	6	0	0	62	1	189	2,716
5:00 PM	0	2	0	11	0	3	1	1	0	32	101	0	0	2	83	4	240	2,753
5:05 PM	0	2	0	21	0	2	0	0	0	21	78	3	0	1	82	5	215	
5:10 PM	0	2	0	15	0	3	1	1	0	31	70	4	0	1	85	2	215	
5:15 PM	0	2	0	17	0	4	0	1	0	27	91	9	0	1	75	4	231	
5:20 PM	0	3	0	16	0	2	0	0	0	16	116	2	0	0	103	2	260	
5:25 PM	0	2	0	18	0	2	0	2	0	32	111	3	0	1	91	5	267	
5:30 PM	0	2	0	16	0	2	1	2	0	26	96	3	0	0	67	3	218	
5:35 PM	0	1	1	12	0	1	1	0	0	21	124	3	0	0	78	2	244	
5:40 PM	0	1	0	26	0	2	0	2	0	36	108	3	0	2	65	2	247	
5:45 PM	0	0	2	13	0	5	0	1	0	18	74	2	0	0	66	2	183	
5:50 PM	0	3	0	16	0	5	0	1	0	22	95	2	0	1	62	0	207	
5:55 PM	0	1	0	17	0	1	0	0	0	21	103	2	0	0	79	2	226	
Count Total	0	38	9	382	0	67	8	20	0	550	2,245	80	0	17	1,767	50	5,233	
Peak Hour	0	24	3	211	0	33	5	12	0	303	1,167	41	0	12	952	31	2,794	

Location: 1 NW Bethany Blvd & NW Bronson Rd PM

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	0	0	0	0	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	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	0	3	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	1	1	4:20 PM	0	1	0	0	1	4:20 PM	0	0	0	1	1
4:25 PM	0	1	0	1	2	4:25 PM	1	0	0	0	1	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	1	0	1	4:30 PM	6	0	0	0	6
4:35 PM	0	0	1	0	1	4:35 PM	0	0	0	4	4	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	1	1	2
4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0	4:50 PM	2	0	0	0	2
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	1	0	1	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	0	0	0	0	0	5:15 PM	0	4	0	1	5	5:15 PM	1	0	0	0	1
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	2	2
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	2	2	5:30 PM	0	0	0	2	2
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	1	1
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	1	0	1
5:55 PM	0	0	0	1	1	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	2	1	9	12	Count Total	1	5	2	7	15	Count Total	9	0	2	7	18
Peak Hour	0	1	0	3	4	Peak Hour	0	4	1	3	8	Peak Hour	3	0	0	5	8

Appendix C - Safety

Crash History Data

Preliminary Signal Warrants



Traffic Signal Warrant Analysis



Project: 16290 NW Bronson Lane
 Date: 8/24/2023
 Scenario: 2035 Buildout Conditions

Major Street:	NW Bronson Road	Minor Street:	NW 163rd Terrace/Site Access
Number of Lanes:	2	Number of Lanes:	2
PM Peak Hour Volumes:	748	PM Peak Hour Volumes:	12

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
WARRANT 1, CONDITION A					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	7,480	7,400	
Minor Street*	120	2,500	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	7,480	11,100	
Minor Street*	120	1,250	No
<i>Combination Warrant</i>			
Major Street	7,480	8,880	
Minor Street*	120	2,000	No

Note: Minor street right-turning traffic volumes reduced by 25%.

Appendix D – Operations

Capacity Reports

Queuing Reports



HCM 6th TWSC
 1: NW Bronson Road & NW 163rd Terrace

08/23/2022

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	261	123	3	12	7
Future Vol, veh/h	4	261	123	3	12	7
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	5	322	152	4	15	9

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	167	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1423	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1408	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1408	-	-	-	672
HCM Lane V/C Ratio	0.004	-	-	-	0.035
HCM Control Delay (s)	7.6	-	-	-	10.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM Signalized Intersection Capacity Analysis

2: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Volume (vph)	17	0	260	16	1	7	126	533	18	4	1066	21
Future Volume (vph)	17	0	260	16	1	7	126	533	18	4	1066	21
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	0.88		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1795	2780		1728	1518	1787	3557		1787	3561	
Flt Permitted		0.75	1.00		0.81	1.00	0.10	1.00		0.42	1.00	
Satd. Flow (perm)		1407	2780		1462	1518	197	3557		785	3561	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	19	0	292	18	1	8	142	599	20	4	1198	24
RTOR Reduction (vph)	0	0	0	0	0	6	0	2	0	0	2	0
Lane Group Flow (vph)	0	19	292	0	19	2	142	617	0	4	1220	0
Confl. Peds. (#/hr)	5					5	7					7
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		13.5	13.5		13.5	19.3	48.8	38.5		39.6	33.8	
Effective Green, g (s)		13.5	13.5		13.5	19.3	48.8	38.5		39.6	33.8	
Actuated g/C Ratio		0.19	0.19		0.19	0.27	0.68	0.54		0.56	0.47	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		266	526		276	506	368	1920		517	1688	
v/s Ratio Prot						0.00	c0.06	0.17		0.00	c0.34	
v/s Ratio Perm		0.01	c0.11		0.01	0.00	0.21			0.00		
v/c Ratio		0.07	0.56		0.07	0.00	0.39	0.32		0.01	0.72	
Uniform Delay, d1		23.7	26.2		23.7	19.0	8.4	9.1		7.1	15.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	1.3		0.1	0.0	0.7	0.1		0.0	1.6	
Delay (s)		23.9	27.5		23.8	19.0	9.1	9.2		7.1	16.6	
Level of Service		C	C		C	B	A	A		A	B	
Approach Delay (s)		27.2			22.4			9.2			16.5	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
 2: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔↔		↔	↔	↔	↕↔		↔	↕↔	
Traffic Volume (veh/h)	17	0	260	16	1	7	126	533	18	4	1066	21
Future Volume (veh/h)	17	0	260	16	1	7	126	533	18	4	1066	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	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	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1826	1826	1826	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	19	0	292	18	1	8	142	599	20	4	1198	24
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	5	5	5	1	1	1	1	1	1
Cap, veh/h	182	0	630	162	6	476	360	1647	55	555	1673	34
Arrive On Green	0.23	0.00	0.23	0.23	0.23	0.23	0.08	0.47	0.47	0.08	0.47	0.47
Sat Flow, veh/h	277	0	2742	202	26	1517	1795	3536	118	1795	3591	72
Grp Volume(v), veh/h	19	0	292	19	0	8	142	303	316	4	597	625
Grp Sat Flow(s),veh/h/ln	277	0	1371	227	0	1517	1795	1791	1863	1795	1791	1872
Q Serve(g_s), s	0.8	0.0	5.6	0.8	0.0	0.2	2.4	6.6	6.6	0.1	16.2	16.3
Cycle Q Clear(g_c), s	12.0	0.0	5.6	12.0	0.0	0.2	2.4	6.6	6.6	0.1	16.2	16.3
Prop In Lane	1.00		1.00	0.95		1.00	1.00		0.06	1.00		0.04
Lane Grp Cap(c), veh/h	182	0	630	168	0	476	360	834	868	555	834	872
V/C Ratio(X)	0.10	0.00	0.46	0.11	0.00	0.02	0.39	0.36	0.36	0.01	0.72	0.72
Avail Cap(c_a), veh/h	453	0	1151	373	0	764	670	2226	2316	569	1931	2018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	20.2	26.1	0.0	14.5	9.8	10.4	10.4	6.6	13.0	13.0
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.3	0.0	0.0	0.7	0.3	0.3	0.0	1.2	1.1
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	0.3	0.0	1.7	0.3	0.0	0.1	0.8	2.2	2.3	0.0	5.6	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	0.0	20.7	26.4	0.0	14.5	10.5	10.7	10.7	6.6	14.2	14.1
LnGrp LOS	C	A	C	C	A	B	B	B	B	A	B	B
Approach Vol, veh/h		311			27			761			1226	
Approach Delay, s/veh		21.2			22.8			10.6			14.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	33.1		19.1	9.5	33.1		19.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	75.5		25.5	15.5	65.5		25.5				
Max Q Clear Time (g_c+I1), s	2.1	8.6		14.0	4.4	18.3		14.0				
Green Ext Time (p_c), s	0.0	4.1		0.9	0.2	10.6		0.0				

Intersection Summary

HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

User approved changes to right turn type.

HCM Signalized Intersection Capacity Analysis

1: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗↘		↕	↗↘	↗	↕↗		↗	↕↗	
Traffic Volume (vph)	24	3	211	33	5	12	303	1167	41	12	952	31
Future Volume (vph)	24	3	211	33	5	12	303	1167	41	12	952	31
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	0.88		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1809	2779		1820	1595	1787	3553		1787	3554	
Flt Permitted		0.77	1.00		0.77	1.00	0.12	1.00		0.18	1.00	
Satd. Flow (perm)		1463	2779		1455	1595	227	3553		339	3554	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	3	229	36	5	13	329	1268	45	13	1035	34
RTOR Reduction (vph)	0	0	0	0	0	10	0	3	0	0	2	0
Lane Group Flow (vph)	0	29	229	0	41	3	329	1310	0	13	1067	0
Confl. Peds. (#/hr)	5					5	3					3
Confl. Bikes (#/hr)			1						4			3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		12.4	12.4		12.4	18.3	52.4	42.0		36.9	31.0	
Effective Green, g (s)		12.4	12.4		12.4	18.3	52.4	42.0		36.9	31.0	
Actuated g/C Ratio		0.17	0.17		0.17	0.25	0.71	0.57		0.50	0.42	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		245	466		244	492	518	2022		285	1492	
v/s Ratio Prot						0.00	c0.15	0.37		0.00	c0.30	
v/s Ratio Perm		0.02	c0.08		0.03	0.00	0.30			0.02		
v/c Ratio		0.12	0.49		0.17	0.01	0.64	0.65		0.05	0.72	
Uniform Delay, d1		26.1	27.8		26.3	20.9	13.8	10.9		9.4	17.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	0.8		0.3	0.0	2.5	0.7		0.1	1.7	
Delay (s)		26.3	28.7		26.6	20.9	16.3	11.6		9.5	19.4	
Level of Service		C	C		C	C	B	B		A	B	
Approach Delay (s)		28.4			25.2			12.5			19.3	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary

1: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗↘		↕	↗	↘	↕↗		↘	↕↗	
Traffic Volume (veh/h)	24	3	211	33	5	12	303	1167	41	12	952	31
Future Volume (veh/h)	24	3	211	33	5	12	303	1167	41	12	952	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.97	1.00		0.97
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	26	3	229	36	5	13	329	1268	45	13	1035	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	91	6	748	90	7	543	428	1699	60	295	1464	48
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.13	0.48	0.48	0.07	0.41	0.41
Sat Flow, veh/h	1	21	2748	0	26	1601	1795	3525	125	1795	3535	116
Grp Volume(v), veh/h	29	0	229	41	0	13	329	644	669	13	524	545
Grp Sat Flow(s),veh/h/ln	22	0	1374	26	0	1601	1795	1791	1859	1795	1791	1861
Q Serve(g_s), s	0.0	0.0	5.0	0.0	0.0	0.4	7.2	21.9	21.9	0.3	18.3	18.3
Cycle Q Clear(g_c), s	20.5	0.0	5.0	20.5	0.0	0.4	7.2	21.9	21.9	0.3	18.3	18.3
Prop In Lane	0.90		1.00	0.88		1.00	1.00		0.07	1.00		0.06
Lane Grp Cap(c), veh/h	97	0	748	97	0	543	428	863	896	295	741	770
V/C Ratio(X)	0.30	0.00	0.31	0.42	0.00	0.02	0.77	0.75	0.75	0.04	0.71	0.71
Avail Cap(c_a), veh/h	97	0	748	97	0	543	962	1915	1987	307	1272	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	0.0	21.8	34.2	0.0	16.6	13.8	15.8	15.8	12.2	18.3	18.3
Incr Delay (d2), s/veh	1.7	0.0	0.2	2.9	0.0	0.0	2.9	1.3	1.3	0.1	1.3	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	0.5	0.0	1.6	0.8	0.0	0.1	2.7	8.1	8.4	0.1	7.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.3	0.0	22.0	37.1	0.0	16.6	16.8	17.1	17.0	12.2	19.5	19.5
LnGrp LOS	D	A	C	D	A	B	B	B	B	B	B	B
Approach Vol, veh/h		258			54			1642			1082	
Approach Delay, s/veh		23.5			32.2			17.0			19.4	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	40.8		25.0	14.6	35.7		25.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	80.5		20.5	32.5	53.5		20.5				
Max Q Clear Time (g_c+I1), s	2.3	23.9		22.5	9.2	20.3		22.5				
Green Ext Time (p_c), s	0.0	12.4		0.0	1.0	8.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved changes to right turn type.

HCM 6th TWSC
2: NW Bronson Road & NW 163rd Terrace

08/23/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	221	324	9	7	3
Future Vol, veh/h	7	221	324	9	7	3
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	230	338	9	7	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	358	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1212	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1199	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1199	-	-	-	583
HCM Lane V/C Ratio	0.006	-	-	-	0.018
HCM Control Delay (s)	8	-	-	-	11.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM Signalized Intersection Capacity Analysis

1: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↖	↗		↖	↗	↖	↗	↖	↗	↖	↗	
Traffic Volume (vph)	22	0	342	21	1	9	166	702	24	5	1404	28	
Future Volume (vph)	22	0	342	21	1	9	166	702	24	5	1404	28	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5		
Lane Util. Factor		1.00	0.88		1.00	1.00	1.00	0.95		1.00	0.95		
Frbp, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00		
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00		
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00		
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1790	2780		1727	1513	1787	3557		1787	3561		
Flt Permitted		0.74	1.00		0.80	1.00	0.07	1.00		0.34	1.00		
Satd. Flow (perm)		1396	2780		1440	1513	128	3557		647	3561		
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
Adj. Flow (vph)	25	0	384	24	1	10	187	789	27	6	1578	31	
RTOR Reduction (vph)	0	0	0	0	0	8	0	2	0	0	1	0	
Lane Group Flow (vph)	0	25	384	0	25	2	187	814	0	6	1608	0	
Confl. Peds. (#/hr)	5					5	7					7	
Confl. Bikes (#/hr)			1			1							
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	1%	1%	1%	1%	1%	1%	
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA		
Protected Phases		4			8	1	5	2		1	6		
Permitted Phases	4		4	8		8	2			6			
Actuated Green, G (s)		19.4	19.4		19.4	25.1	72.2	62.0		59.9	54.2		
Effective Green, g (s)		19.4	19.4		19.4	25.1	72.2	62.0		59.9	54.2		
Actuated g/C Ratio		0.19	0.19		0.19	0.25	0.72	0.62		0.60	0.54		
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5		
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)		269	536		277	445	314	2192		449	1918		
v/s Ratio Prot						0.00	c0.08	0.23		0.00	c0.45		
v/s Ratio Perm		0.02	c0.14		0.02	0.00	0.35			0.01			
v/c Ratio		0.09	0.72		0.09	0.01	0.60	0.37		0.01	0.84		
Uniform Delay, d1		33.4	38.0		33.4	28.4	24.1	9.6		8.3	19.5		
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2		0.2	4.5		0.1	0.0	3.0	0.1		0.0	3.4		
Delay (s)		33.5	42.6		33.5	28.4	27.1	9.7		8.3	22.9		
Level of Service		C	D		C	C	C	A		A	C		
Approach Delay (s)		42.0			32.0			13.0			22.8		
Approach LOS		D			C			B			C		
Intersection Summary													
HCM 2000 Control Delay			22.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.77										
Actuated Cycle Length (s)			100.6									Sum of lost time (s)	13.5
Intersection Capacity Utilization			69.1%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th Signalized Intersection Summary

1: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔↔		↔	↔	↔	↕↔		↔	↕↔	
Traffic Volume (veh/h)	22	0	342	21	1	9	166	702	24	5	1404	28
Future Volume (veh/h)	22	0	342	21	1	9	166	702	24	5	1404	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	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	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1826	1826	1826	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	25	0	384	24	1	10	187	789	27	6	1578	31
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	5	5	5	1	1	1	1	1	1
Cap, veh/h	74	0	716	73	2	475	251	1943	66	448	1908	37
Arrive On Green	0.26	0.00	0.26	0.26	0.26	0.26	0.07	0.55	0.55	0.05	0.53	0.53
Sat Flow, veh/h	3	0	2747	2	6	1519	1795	3533	121	1795	3592	70
Grp Volume(v), veh/h	25	0	384	25	0	10	187	400	416	6	785	824
Grp Sat Flow(s),veh/h/ln	3	0	1373	8	0	1519	1795	1791	1863	1795	1791	1872
Q Serve(g_s), s	0.0	0.0	11.7	0.0	0.0	0.4	4.5	12.6	12.7	0.1	35.8	36.0
Cycle Q Clear(g_c), s	25.5	0.0	11.7	25.5	0.0	0.4	4.5	12.6	12.7	0.1	35.8	36.0
Prop In Lane	1.00		1.00	0.96		1.00	1.00		0.06	1.00		0.04
Lane Grp Cap(c), veh/h	74	0	716	74	0	475	251	985	1024	448	951	994
V/C Ratio(X)	0.34	0.00	0.54	0.34	0.00	0.02	0.75	0.41	0.41	0.01	0.83	0.83
Avail Cap(c_a), veh/h	75	0	717	74	0	475	410	1384	1439	457	1200	1255
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	0.0	31.0	47.3	0.0	23.3	20.3	12.7	12.7	9.2	19.1	19.2
Incr Delay (d2), s/veh	2.6	0.0	0.8	2.6	0.0	0.0	4.4	0.3	0.3	0.0	3.9	3.8
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	0.6	0.0	4.0	0.7	0.0	0.2	2.4	4.8	5.0	0.1	14.5	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	0.0	31.8	49.9	0.0	23.3	24.6	13.0	13.0	9.2	23.1	23.0
LnGrp LOS	D	A	C	D	A	C	C	B	B	A	C	C
Approach Vol, veh/h		409			35			1003			1615	
Approach Delay, s/veh		33.0			42.3			15.2			23.0	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	58.3		30.0	11.3	56.4		30.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	75.5		25.5	15.5	65.5		25.5				
Max Q Clear Time (g_c+I1), s	2.1	14.7		27.5	6.5	38.0		27.5				
Green Ext Time (p_c), s	0.0	5.8		0.0	0.3	14.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Notes

User approved changes to right turn type.

HCM 6th TWSC
2: NW Bronson Road & NW 163rd Terrace

08/23/2022

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	344	162	4	16	9
Future Vol, veh/h	5	344	162	4	16	9
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	6	425	200	5	20	11

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	216	0	-	0	651
Stage 1	-	-	-	-	214
Stage 2	-	-	-	-	437
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1366	-	-	-	436
Stage 1	-	-	-	-	826
Stage 2	-	-	-	-	655
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1352	-	-	-	426
Mov Cap-2 Maneuver	-	-	-	-	518
Stage 1	-	-	-	-	814
Stage 2	-	-	-	-	648

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1352	-	-	-	598
HCM Lane V/C Ratio	0.005	-	-	-	0.052
HCM Control Delay (s)	7.7	-	-	-	11.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

HCM Signalized Intersection Capacity Analysis

1: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↖↗		↖	↖	↖	↖↗		↖	↖↗	
Traffic Volume (vph)	32	4	278	43	7	16	399	1537	54	16	1254	41
Future Volume (vph)	32	4	278	43	7	16	399	1537	54	16	1254	41
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	0.88		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805	2779		1822	1590	1787	3553		1787	3554	
Flt Permitted		0.75	1.00		0.75	1.00	0.08	1.00		0.11	1.00	
Satd. Flow (perm)		1411	2779		1421	1590	141	3553		210	3554	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	4	302	47	8	17	434	1671	59	17	1363	45
RTOR Reduction (vph)	0	0	0	0	0	14	0	2	0	0	2	0
Lane Group Flow (vph)	0	39	302	0	55	3	434	1728	0	17	1406	0
Confl. Peds. (#/hr)	5					5	3					3
Confl. Bikes (#/hr)			1						4			3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		16.0	16.0		16.0	21.3	80.6	70.8		54.0	48.7	
Effective Green, g (s)		16.0	16.0		16.0	21.3	80.6	70.8		54.0	48.7	
Actuated g/C Ratio		0.15	0.15		0.15	0.20	0.76	0.67		0.51	0.46	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		213	421		215	388	534	2382		186	1639	
v/s Ratio Prot						0.00	c0.21	0.49		0.00	c0.40	
v/s Ratio Perm		0.03	c0.11		0.04	0.00	0.41			0.04		
v/c Ratio		0.18	0.72		0.26	0.01	0.81	0.73		0.09	0.86	
Uniform Delay, d1		39.1	42.6		39.5	33.7	29.4	11.2		18.6	25.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4	5.8		0.6	0.0	9.2	1.1		0.2	4.7	
Delay (s)		39.5	48.4		40.2	33.7	38.6	12.3		18.8	30.1	
Level of Service		D	D		D	C	D	B		B	C	
Approach Delay (s)		47.4			38.7			17.6			29.9	
Approach LOS		D			D			B			C	

Intersection Summary		
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.82	C
Actuated Cycle Length (s)	105.6	Sum of lost time (s)
Intersection Capacity Utilization	79.6%	13.5
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

HCM 6th Signalized Intersection Summary

1: NW Bethany Boulevard & NW Bronson Road

08/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔↔		↔	↔	↔	↕↔		↔	↕↔	
Traffic Volume (veh/h)	32	4	278	43	7	16	399	1537	54	16	1254	41
Future Volume (veh/h)	32	4	278	43	7	16	399	1537	54	16	1254	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.98	1.00		0.97
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	35	4	302	47	8	17	434	1671	59	17	1363	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	72	5	537	70	7	398	480	2150	76	242	1642	54
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.61	0.61	0.05	0.46	0.46
Sat Flow, veh/h	0	23	2737	0	35	1598	1795	3526	124	1795	3535	117
Grp Volume(v), veh/h	39	0	302	55	0	17	434	845	885	17	690	718
Grp Sat Flow(s),veh/h/ln	23	0	1368	35	0	1598	1795	1791	1859	1795	1791	1861
Q Serve(g_s), s	0.0	0.0	9.5	0.0	0.0	0.8	15.6	33.2	33.8	0.4	32.0	32.1
Cycle Q Clear(g_c), s	18.7	0.0	9.5	18.7	0.0	0.8	15.6	33.2	33.8	0.4	32.0	32.1
Prop In Lane	0.90		1.00	0.85		1.00	1.00		0.07	1.00		0.06
Lane Grp Cap(c), veh/h	76	0	537	77	0	398	480	1092	1133	242	832	864
V/C Ratio(X)	0.51	0.00	0.56	0.72	0.00	0.04	0.90	0.77	0.78	0.07	0.83	0.83
Avail Cap(c_a), veh/h	76	0	537	77	0	398	737	1554	1613	244	1039	1080
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	0.0	34.6	45.4	0.0	27.2	25.3	13.7	13.9	13.4	22.2	22.3
Incr Delay (d2), s/veh	5.6	0.0	1.3	27.0	0.0	0.0	10.2	1.6	1.6	0.1	4.7	4.6
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	1.0	0.0	3.3	1.9	0.0	0.3	10.7	12.0	12.7	0.2	13.5	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	0.0	35.9	72.4	0.0	27.2	35.6	15.3	15.5	13.6	26.9	26.9
LnGrp LOS	D	A	D	E	A	C	D	B	B	B	C	C
Approach Vol, veh/h		341			72			2164			1425	
Approach Delay, s/veh		37.7			61.7			19.4			26.7	
Approach LOS		D			E			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	62.6		23.2	23.3	48.8		23.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	82.7		18.7	32.5	55.3		18.7				
Max Q Clear Time (g_c+I1), s	2.4	35.8		20.7	17.6	34.1		20.7				
Green Ext Time (p_c), s	0.0	20.2		0.0	1.2	10.2		0.0				

Intersection Summary

HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Notes

User approved changes to right turn type.

HCM 6th TWSC
2: NW Bronson Road & NW 163rd Terrace

08/23/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	291	427	12	9	4
Future Vol, veh/h	9	291	427	12	9	4
Conflicting Peds, #/hr	11	0	0	11	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	9	303	445	13	9	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	469	0	-	0	784
Stage 1	-	-	-	-	463
Stage 2	-	-	-	-	321
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1103	-	-	-	365
Stage 1	-	-	-	-	638
Stage 2	-	-	-	-	740
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1091	-	-	-	355
Mov Cap-2 Maneuver	-	-	-	-	468
Stage 1	-	-	-	-	627
Stage 2	-	-	-	-	733

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1091	-	-	-	501
HCM Lane V/C Ratio	0.009	-	-	-	0.027
HCM Control Delay (s)	8.3	-	-	-	12.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM Signalized Intersection Capacity Analysis

1: NW Bethany Boulevard & NW Bronson Road

08/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Volume (vph)	24	0	355	21	1	9	185	702	24	5	1404	31
Future Volume (vph)	24	0	355	21	1	9	185	702	24	5	1404	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	0.88		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1790	2780		1727	1513	1787	3557		1787	3560	
Flt Permitted		0.74	1.00		0.80	1.00	0.07	1.00		0.34	1.00	
Satd. Flow (perm)		1396	2780		1440	1513	126	3557		647	3560	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	27	0	399	24	1	10	208	789	27	6	1578	35
RTOR Reduction (vph)	0	0	0	0	0	7	0	2	0	0	1	0
Lane Group Flow (vph)	0	27	399	0	25	3	208	814	0	6	1612	0
Confl. Peds. (#/hr)	5					5	7					7
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4		8	8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		20.1	20.1		20.1	25.8	73.7	63.5		60.8	55.1	
Effective Green, g (s)		20.1	20.1		20.1	25.8	73.7	63.5		60.8	55.1	
Actuated g/C Ratio		0.20	0.20		0.20	0.25	0.72	0.62		0.59	0.54	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		272	543		281	445	318	2197		445	1908	
v/s Ratio Prot						0.00	c0.09	0.23		0.00	c0.45	
v/s Ratio Perm		0.02	c0.14		0.02	0.00	0.38			0.01		
v/c Ratio		0.10	0.73		0.09	0.01	0.65	0.37		0.01	0.84	
Uniform Delay, d1		33.9	38.8		33.9	28.9	26.8	9.7		8.6	20.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2	5.1		0.1	0.0	4.8	0.1		0.0	3.6	
Delay (s)		34.1	44.0		34.0	28.9	31.6	9.8		8.6	23.8	
Level of Service		C	D		C	C	C	A		A	C	
Approach Delay (s)		43.3			32.5			14.3			23.8	
Approach LOS		D			C			B			C	

Intersection Summary

HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary

1: NW Bethany Boulevard & NW Bronson Road

08/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔↔		↔	↔	↔	↕↔		↔	↕↔	
Traffic Volume (veh/h)	24	0	355	21	1	9	185	702	24	5	1404	31
Future Volume (veh/h)	24	0	355	21	1	9	185	702	24	5	1404	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	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	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1826	1826	1826	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	27	0	399	24	1	10	208	789	27	6	1578	35
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	5	5	5	1	1	1	1	1	1
Cap, veh/h	73	0	707	71	2	469	259	1962	67	451	1901	42
Arrive On Green	0.26	0.00	0.26	0.26	0.26	0.26	0.08	0.56	0.56	0.05	0.53	0.53
Sat Flow, veh/h	1	0	2746	1	6	1519	1795	3533	121	1795	3582	79
Grp Volume(v), veh/h	27	0	399	25	0	10	208	400	416	6	788	825
Grp Sat Flow(s),veh/h/ln	1	0	1373	7	0	1519	1795	1791	1863	1795	1791	1870
Q Serve(g_s), s	0.0	0.0	12.5	0.0	0.0	0.5	5.1	12.7	12.7	0.1	36.5	36.7
Cycle Q Clear(g_c), s	25.5	0.0	12.5	25.5	0.0	0.5	5.1	12.7	12.7	0.1	36.5	36.7
Prop In Lane	1.00		1.00	0.96		1.00	1.00		0.06	1.00		0.04
Lane Grp Cap(c), veh/h	73	0	707	73	0	469	259	995	1035	451	950	992
V/C Ratio(X)	0.37	0.00	0.56	0.34	0.00	0.02	0.80	0.40	0.40	0.01	0.83	0.83
Avail Cap(c_a), veh/h	73	0	708	73	0	469	404	1366	1421	460	1185	1238
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	0.0	31.9	47.9	0.0	23.8	20.7	12.6	12.6	9.2	19.5	19.5
Incr Delay (d2), s/veh	3.1	0.0	1.0	2.7	0.0	0.0	6.4	0.3	0.3	0.0	4.1	4.1
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	0.7	0.0	4.2	0.7	0.0	0.2	2.8	4.8	4.9	0.1	14.9	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.6	0.0	32.9	50.7	0.0	23.9	27.1	12.9	12.8	9.3	23.6	23.6
LnGrp LOS	D	A	C	D	A	C	C	B	B	A	C	C
Approach Vol, veh/h		426			35			1024			1619	
Approach Delay, s/veh		34.2			43.0			15.7			23.5	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	59.5		30.0	12.0	57.0		30.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	75.5		25.5	15.5	65.5		25.5				
Max Q Clear Time (g_c+I1), s	2.1	14.7		27.5	7.1	38.7		27.5				
Green Ext Time (p_c), s	0.0	5.8		0.0	0.4	13.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Notes

User approved changes to right turn type.

HCM 6th TWSC
 2: NW Bronson Road & NW 163rd Terrace

08/17/2023

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	5	344	5	22	162	4	4	0	15	16	0	9
Future Vol, veh/h	5	344	5	22	162	4	4	0	15	16	0	9
Conflicting Peds, #/hr	11	0	0	0	0	11	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	0	0	1	1	1	0	0	0	0	0	0
Mvmt Flow	6	425	6	27	200	5	5	0	19	20	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	216	0	0	431	0	0	702	710	428	718	711	214
Stage 1	-	-	-	-	-	-	440	440	-	268	268	-
Stage 2	-	-	-	-	-	-	262	270	-	450	443	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1366	-	-	1134	-	-	355	361	631	347	361	831
Stage 1	-	-	-	-	-	-	600	581	-	742	691	-
Stage 2	-	-	-	-	-	-	747	690	-	592	579	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1352	-	-	1134	-	-	343	347	631	326	347	822
Mov Cap-2 Maneuver	-	-	-	-	-	-	343	347	-	326	347	-
Stage 1	-	-	-	-	-	-	598	579	-	731	668	-
Stage 2	-	-	-	-	-	-	719	667	-	572	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	12	14.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	536	1352	-	-	1134	-	-	416
HCM Lane V/C Ratio	0.044	0.005	-	-	0.024	-	-	0.074
HCM Control Delay (s)	12	7.7	-	-	8.3	-	-	14.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.2

HCM Signalized Intersection Capacity Analysis

1: NW Bethany Boulevard & NW Bronson Road

08/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Traffic Volume (vph)	33	4	286	43	7	16	405	1537	54	16	1254	42
Future Volume (vph)	33	4	286	43	7	16	405	1537	54	16	1254	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	0.88		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1805	2779		1822	1590	1787	3553		1787	3553	
Flt Permitted		0.75	1.00		0.75	1.00	0.07	1.00		0.11	1.00	
Satd. Flow (perm)		1408	2779		1421	1590	141	3553		211	3553	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	4	311	47	8	17	440	1671	59	17	1363	46
RTOR Reduction (vph)	0	0	0	0	0	14	0	2	0	0	2	0
Lane Group Flow (vph)	0	40	311	0	55	3	440	1728	0	17	1407	0
Confl. Peds. (#/hr)	5					5	3					3
Confl. Bikes (#/hr)			1						4			3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		16.3	16.3		16.3	21.6	81.3	71.5		54.2	48.9	
Effective Green, g (s)		16.3	16.3		16.3	21.6	81.3	71.5		54.2	48.9	
Actuated g/C Ratio		0.15	0.15		0.15	0.20	0.76	0.67		0.51	0.46	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		215	424		217	389	538	2383		185	1629	
v/s Ratio Prot						0.00	c0.21	0.49		0.00	c0.40	
v/s Ratio Perm		0.03	c0.11		0.04	0.00	0.41			0.04		
v/c Ratio		0.19	0.73		0.25	0.01	0.82	0.73		0.09	0.86	
Uniform Delay, d1		39.4	43.1		39.8	33.9	29.8	11.2		18.8	25.9	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4	6.5		0.6	0.0	9.4	1.1		0.2	5.0	
Delay (s)		39.8	49.5		40.4	34.0	39.1	12.4		19.0	30.9	
Level of Service		D	D		D	C	D	B		B	C	
Approach Delay (s)		48.4			38.9			17.8			30.7	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	106.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary

1: NW Bethany Boulevard & NW Bronson Road

08/17/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔↔		↔	↔	↔	↕↔		↔	↕↔	
Traffic Volume (veh/h)	33	4	286	43	7	16	405	1537	54	16	1254	42
Future Volume (veh/h)	33	4	286	43	7	16	405	1537	54	16	1254	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	1.00		0.98	1.00		0.97
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	1900	1900	1900	1900	1900	1900	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	36	4	311	47	8	17	440	1671	59	17	1363	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	1	1	1	1	1	1
Cap, veh/h	71	4	532	69	7	395	485	2162	76	242	1637	55
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.20	0.61	0.61	0.05	0.46	0.46
Sat Flow, veh/h	0	23	2736	0	35	1598	1795	3526	124	1795	3532	119
Grp Volume(v), veh/h	40	0	311	55	0	17	440	845	885	17	690	719
Grp Sat Flow(s),veh/h/ln	23	0	1368	35	0	1598	1795	1791	1859	1795	1791	1860
Q Serve(g_s), s	0.0	0.0	9.9	0.0	0.0	0.8	16.2	33.2	33.8	0.4	32.3	32.5
Cycle Q Clear(g_c), s	18.7	0.0	9.9	18.7	0.0	0.8	16.2	33.2	33.8	0.4	32.3	32.5
Prop In Lane	0.90		1.00	0.85		1.00	1.00		0.07	1.00		0.06
Lane Grp Cap(c), veh/h	76	0	532	76	0	395	485	1098	1140	242	830	862
V/C Ratio(X)	0.53	0.00	0.58	0.72	0.00	0.04	0.91	0.77	0.78	0.07	0.83	0.83
Avail Cap(c_a), veh/h	76	0	532	76	0	395	730	1541	1599	244	1030	1070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	35.2	45.8	0.0	27.6	25.7	13.6	13.7	13.5	22.5	22.6
Incr Delay (d2), s/veh	6.8	0.0	1.6	28.2	0.0	0.0	10.8	1.6	1.6	0.1	4.9	4.8
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	1.1	0.0	3.4	1.9	0.0	0.3	11.0	12.0	12.7	0.2	13.7	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	0.0	36.8	74.0	0.0	27.6	36.5	15.2	15.3	13.6	27.4	27.3
LnGrp LOS	D	A	D	E	A	C	D	B	B	B	C	C
Approach Vol, veh/h		351			72			2170			1426	
Approach Delay, s/veh		38.7			63.1			19.6			27.2	
Approach LOS		D			E			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	63.4		23.2	23.9	49.1		23.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	82.7		18.7	32.5	55.3		18.7				
Max Q Clear Time (g_c+I1), s	2.4	35.8		20.7	18.2	34.5		20.7				
Green Ext Time (p_c), s	0.0	20.2		0.0	1.2	10.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C

Notes

User approved changes to right turn type.

HCM 6th TWSC
2: NW Bronson Road & NW 163rd Terrace

08/17/2023

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑		↖	↗			↕			↕	
Traffic Vol, veh/h	9	291	2	7	427	12	2	0	9	9	0	4
Future Vol, veh/h	9	291	2	7	427	12	2	0	9	9	0	4
Conflicting Peds, #/hr	11	0	0	0	0	11	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	9	303	2	7	445	13	2	0	9	9	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	469	0	0	305	0	0	790	805	304	804	800	463
Stage 1	-	-	-	-	-	-	322	322	-	477	477	-
Stage 2	-	-	-	-	-	-	468	483	-	327	323	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1103	-	-	1267	-	-	310	318	740	304	320	603
Stage 1	-	-	-	-	-	-	694	655	-	573	559	-
Stage 2	-	-	-	-	-	-	579	556	-	690	654	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1091	-	-	1267	-	-	305	310	740	294	312	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	310	-	294	312	-
Stage 1	-	-	-	-	-	-	688	650	-	562	550	-
Stage 2	-	-	-	-	-	-	572	547	-	676	649	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			11.2			15.8		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	588	1091	-	-	1267	-	-	348
HCM Lane V/C Ratio	0.019	0.009	-	-	0.006	-	-	0.039
HCM Control Delay (s)	11.2	8.3	-	-	7.9	-	-	15.8
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Queuing and Blocking Report
Background AM

08/17/2023

Intersection: 1: NW Bethany Boulevard & NW Bronson Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	56	211	183	49	38	145	205	186	77	369	363
Average Queue (ft)	15	79	31	11	6	77	108	87	5	213	204
95th Queue (ft)	43	206	135	36	26	127	175	157	39	322	313
Link Distance (ft)		1014		489			1054	1054		1206	1206
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	255		255		80	300			150		
Storage Blk Time (%)		0		0						16	
Queuing Penalty (veh)		0		0						1	

Intersection: 2: NW Bronson Road & NW 163rd Terrace

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	16	39
Average Queue (ft)	1	16
95th Queue (ft)	7	41
Link Distance (ft)	520	300
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

Intersection: 1: NW Bethany Boulevard & NW Bronson Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	100	220	207	84	36	318	379	394	93	370	357
Average Queue (ft)	27	97	50	36	9	178	204	211	11	231	220
95th Queue (ft)	75	225	172	75	31	292	321	330	53	349	343
Link Distance (ft)		1014		489			1054	1054		1206	1206
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	255		255		80	300			150		
Storage Blk Time (%)		0	0	1		1	0			19	
Queuing Penalty (veh)		0	0	0		9	2			3	

Intersection: 2: NW Bronson Road & NW 163rd Terrace

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	27	10	38
Average Queue (ft)	3	0	11
95th Queue (ft)	17	7	36
Link Distance (ft)	520	1014	300
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 14

Intersection: 1: NW Bethany Boulevard & NW Bronson Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	62	187	162	63	28	190	169	173	15	382	374
Average Queue (ft)	17	66	27	15	5	94	105	84	2	229	217
95th Queue (ft)	48	186	121	45	22	161	162	149	11	335	327
Link Distance (ft)		1010		489			1054	1054		1206	1206
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	255		255		80	300			150		
Storage Blk Time (%)				0						17	
Queuing Penalty (veh)				0						1	

Intersection: 2: NW Bronson Road & NW 163rd Terrace

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	10	21	35	45
Average Queue (ft)	0	5	12	19
95th Queue (ft)	5	20	35	46
Link Distance (ft)	515		245	300
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1

Intersection: 1: NW Bethany Boulevard & NW Bronson Road

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	R	LT	R	L	T	TR	L	T	TR
Maximum Queue (ft)	79	196	174	88	56	316	377	320	143	386	365
Average Queue (ft)	26	76	35	32	10	190	193	187	13	234	227
95th Queue (ft)	61	201	140	72	40	296	308	278	71	351	341
Link Distance (ft)		1011		489			1054	1054		1206	1206
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	255		255		80	300			150		
Storage Blk Time (%)				1		2	0			20	
Queuing Penalty (veh)				0		13	1			3	

Intersection: 2: NW Bronson Road & NW 163rd Terrace

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	27	23	34	40
Average Queue (ft)	2	1	8	11
95th Queue (ft)	15	10	30	35
Link Distance (ft)	515		199	300
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 18
