KITTELSON & ASSOCIATES
155 Grand Avenue, Suite 505
Oakland, CA 94612
P 510.839.1742

Technical Memorandum

November 9, 2021 Project# 248460.001

To: Gail Payne, Senior Transportation Coordinator
City of Alameda

From: Mike Alston, RSP; Laurence Lewis, AICP

CC: Robert Vance, City Engineer

RE: Mecartney Road/Island Drive Improvement Project

SUMMARY

This memorandum summarizes findings of an intersection evaluation at the Mecartney Road/Island Drive intersection ("Mecartney/Island") in the City of Alameda, California ("City"). The existing intersection is an all-way stop. Kittelson & Associates, Inc. ("Kittelson") has evaluated roundabout, signal, and a reduced footprint (i.e., fewer lanes) all-way stop alternatives.

Based on the quantitative and qualitative evaluation criteria presented in this memorandum, Kittelson recommends that the City of Alameda advance the roundabout and reduced footprint all-way stop alternatives for community engagement and for further design and evaluation. Kittelson recommends the City remove a signal alternative from further consideration. A signal alternative creates more travel delay for motor vehicles and does not provide a safety advantage compared to alternatives. Alternatively, the roundabout and reduced footprint all-way stop alternatives provide adequate vehicle operations and mobility and would improve safety and quality of service for all road users. The roundabout and reduced footprint all-way stop also provide the City with flexibility to use additional space within existing right-of-way such as for additional flood control such as bioswales that also could include landscaping.

Roundabouts include geometric features that physically induce slower travel speeds compared to stop- or signal-controlled intersections. Speed is the primary factor in many fatal and severe injury collisions.

INTRODUCTION AND PURPOSE

The City of Alameda is assessing options for a potential improvement project at Mecartney/Island. Kittelson is supporting the City in developing and evaluating intersection strategies by evaluating roundabout, signal, and reduced footprint all-way stop intersection concepts in comparison to the existing all-way stop.

The intent of this analysis is to revisit a previous intersection improvement alternatives memo and to apply qualitative and quantitative performance measures in alignment with intended project

outcomes to compare intersection alternatives. The comparison and evaluation will enable the City to engage the public and to select a preferred alternative.

For any project at Mecartney/Island, the City seeks to:

- Promote safety by prioritizing Vision Zero, which the City Council approved as a policy in 2019 to reduce traffic deaths and life-changing injuries to zero.
- Be consistent with the Draft 2040 General Plan goal to *Eliminate fatalities and severe injuries on Alameda's streets, avenues, sidewalks, crosswalks, paths, and trails.*
- Be accordant with the Draft 2040 General Plan as follows:
  - ***Intersection Safety***. *To improve safety at a stop-controlled or signalized intersections, consider a roundabout design.*
  - ***Roundabouts and Traffic Circles***. *When considering modification to an intersection, prioritize roundabouts and traffic circles for consideration.*
- Provide adequate mobility for all modes, including AC Transit lines that pass through the intersection.
- Be compatible with existing plans, which include the draft 2040 General Plan (including the land use element) and recommended bikeways in the City's draft Active Transportation Plan.

EXISTING INTERSECTION AND SETTING

The Mecartney/Island intersection is on Bay Farm Island within the City of Alameda. The intersection is a four-way, stop-controlled intersection (see Figure 1). Island Drive is an arterial roadway north of the intersection and a collector south of it; Mecartney Road is an arterial west of the intersection and a collector east of it. Arterials carry the heaviest volumes of traffic and connect to key destinations whereas collectors carry less traffic volume and typically funnel local traffic onto arterials.

Island Drive runs north-south, connecting to Doolittle Drive to the north and providing access to the main island; to the south, it connects to a residential area of multi-family and single-family homes. To the north, Island Drive is a four-lane, median-separated roadway with an off-street Class I shared-use path along its west side. Southbound approaching the intersection, Island Drive reduces a prima facie 35 mph speed limit to a posted 25 mph speed limit approximately 400 feet north of the intersection. Northbound, Island Drive has a posted speed limit of 35 mph beginning approximately 200 feet north of the intersection.

Mecartney Road is a four-lane divided roadway between Fontana Drive and Island Drive with Class II bicycle lanes, a parking lane on the south side of the street in the eastbound direction, and a separated Class I multi-use path on its north side. Mecartney Road reduces from four to two lanes with left-turn pockets between Adelphian Way and Fontana Drive, which is further west, and has Class II bicycle lanes. There are parking lanes between Aughinbaugh Way and Fontana Drive on the north and south sides, and a separated Class I multi-use path on its north side. Mecartney Road provides access to the west end of Bay Farm Island. To the east, Mecartney Road reduces to a single lane in each direction and merges with Maitland Drive, which heads into Harbor Bay Parkway on the west end of the Oakland International Airport.

Figure 1: Mecartney/Island Intersection

Source: Google

The Harbor Bay Landing shopping center is on the northwest corner of the intersection. Full access to the shopping center is provided along Mecartney Drive, right-in / right-out access is provided on Island Drive within the intersection influence area, and full access is provided further north along Island Drive. A drive-thru coffee shop occupies the northeast corner. Its site circulation allows entering vehicles along Island Drive, right-turn exiting vehicles along Island Drive, and exiting vehicles onto Mecartney Road. Mecartney/Island serves four AC Transit bus lines – one all-day local route (Line 21), two school routes (Lines 631 and 687), and one Transbay route (Line OX).

Weekday AM and PM peak hour multimodal traffic counts from January 1, 2015, were obtained for this evaluation (refer to Appendix A). These counts were taken before the COVID-19 pandemic and therefore represent a pre-pandemic (and future "return-to-normal") traffic scenario. The vehicle turning movement counts for the AM and PM weekday peak periods are shown in Table 1. The eastbound left (EBL) turns toward Island Drive and the main island, as well as the southbound right (SBR) turn toward the Harbor Bay Ferry Terminal area, carry the highest volumes of any movement in both peak hours.

As shown in Table 1, the most frequent bicycle movements in the AM peak hour are southbound right turns and westbound through movements. In the PM peak hour, the most frequent movements are southbound through and eastbound left and through movements.

Table 1: Peak Period Vehicle Turning Movement Counts, Mecartney/Island, Pre-COVID Conditions

Travel Mode	Peak Hour	Island Dr						Mecartney Rd						Total
		Northbound			Southbound			Eastbound			Westbound			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
Motor Vehicle	AM	23	177	15	43	78	232	380	152	10	1	52	78	**1,241**
	PM	22	100	9	96	147	378	365	77	30	18	118	41	**1,401**
Bicycle	AM	0	1	0	0	0	3	1	1	0	0	3	0	**9**
	PM	0	0	0	0	3	0	2	4	1	0	1	0	**11**

Source: City of Alameda

Table 2 presets peak hour pedestrian crossing volumes at the intersection. The AM peak hour includes 63 crossing pedestrians, and the PM peak hour includes 44. In both peak hours, the south and west legs

Table 2: Peak Period Pedestrian Counts, Mecartney/Island, Pre-COVID Conditions

Peak Hour	Intersection Leg Crossed				Total
	Island Dr		Mecartney Rd		
	North Leg	South Leg	East Leg	West Leg	
AM	1	19	1	42	**63**
PM	5	11	2	26	**44**

Source: City of Alameda

Crash History

The City provided crash data for January 2010 through July 2021 (11.5 years), presented in Table 3. The total reported crashes do not show a prevailing crash pattern, with two injury crashes and zero fatalities spanning the 11.5-year period.

Table 3: Reported Crash History, Mecartney/Island, 2010-July 2021

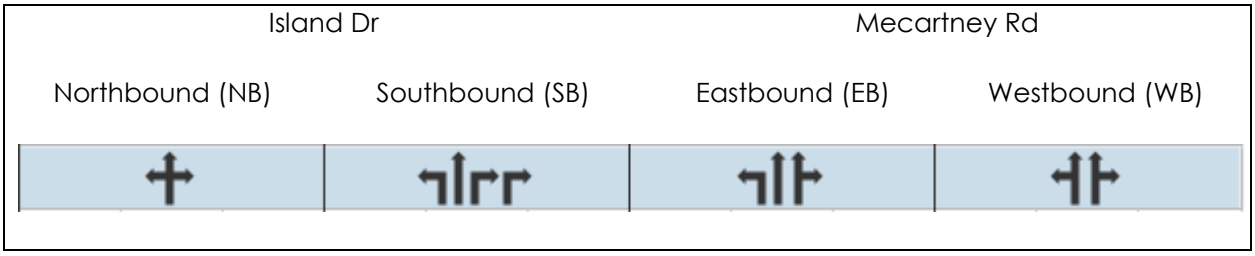
Modes Involved	Severity	
	Injury	Property Damage Only
Vehicle-vehicle or vehicle alone	0	5
Pedestrian	1	0
Bicyclist	1	0
Total Reported	**2**	**5**

Source: City of Alameda

Operations

Figure 2 illustrates the existing lane configuration. The intersection includes four vehicle lanes on the southbound approach (including two right-turn lanes) and a single lane on the northbound approach. The eastbound approach includes three lanes (including a dedicated left-turn lane), and the westbound approach includes two lanes, both of which share a through and turn movement.

Figure 2: Existing Lane Configuration



Kittelson analyzed the existing traffic volumes using *Highway Capacity Manual* (HCM) 6th edition methods to evaluate motor vehicle delay and queue lengths. The results are provided in Table 3 (refer to Appendix B for analysis worksheets). The intersection operates at a level-of-service (LOS) C in the weekday PM peak hour, indicating that more than adequate vehicle mobility is provided during the peak hours and throughout the day.

Table 4: Existing Conditions Traffic Operations

Peak Hour	Level of Service	Average Delay (s/veh)	Volume-to-Capacity Ratio (V/C)[1]	95th Percentile Queue (ft)
AM	D	35.0	1.04	370 (EBL)
PM	C	23.2	0.92	260 (EBL)

1: V/C is reported for the worst movement, eastbound left (EBL)

Source: Kittelson & Associates, Inc.

Signal Warrant Analysis

Kittelson evaluated the existing intersection against traffic signal warrants from the 2021 California Revision 6 to the *Manual of Uniform Traffic Control Devices* (CA-MUTCD). Traffic signal warrants are standards that provide guidelines in the determination of the need for a traffic signal. There is no warrant for roundabout placement.

The CA-MUTCD states: "An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location…The investigation for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection near a Grade Crossing

…The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal."[1]

This evaluation used available data (peak hour turning movement volumes and crash history) to conduct an analysis with respect to Warrant 3 and 7. Additionally, typical assumptions about the distribution of traffic throughout the day, based on peak hour counts, allowed for Warrants 1 and 2 to be studied. Warrants 4, 5, 6, 8, and 9 were not applicable to this location and were not studied.[2]

[1] CA-MUTCD, Section 4C.01
[2] Warrants 4 and 5 are applicable for crossings without existing traffic control (i.e., STOP sign or traffic signal) to assist pedestrian crossings. Warrant 6 pertains to intersections that are part of a coordinated signal system, which Mecartney/Island is not. Warrants 8 and 9 are applicable to contexts not matching this site's context.

Warrants 1 and 2, the eight-hour and four-hour volume warrants, are computed based on approach geometry (number of lanes) and vehicle volumes. Warrant 3, the peak hour signal warrant, is a function of approach geometry, volume, and vehicle delay. The CA-MUTCD advises that Warrant 3 "shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time."[3]

Based on the available data, the intersection does not meet Warrants 1, 2, or 3 in the AM peak hour but does meet Warrants 2 and 3 in the PM peak hour (refer to Appendix C).

For an intersection to meet Warrant 7 (crash experience), the intersection needs to have observed at least five crashes "of types susceptible to correction by a traffic control signal" within a 12-month period.[4] Based on the reported crash history already presented, Mecartney/Island does not meet this warrant.

In conclusion, Mecartney/Island does meet two of the selected signal warrants – Warrant 2 (Four Hour Volume) and Warrant 3 (Peak Hour).

Pedestrian and Bicycle Environment

Pedestrians

The existing intersection includes the lane configuration presented in Figure 2 and skewed approaches. As a result, the pedestrian crossings at the intersection range in length from 80 to 125 feet. At an average walking speed of 3.5 feet per second, the north leg crossing of Island Dr., which is 125 feet, would take a person 36 seconds to cross.[5] The west and south legs, which serve the highest numbers of crossing pedestrians, are 117 feet and 83 feet long, respectively.

All crossings are single-stage crossings, meaning that a person must cross approach and departure legs continuously. For example, to cross the north leg, a person crosses seven lanes of traffic (four lanes approaching and three lanes departing) without a designated median refuge. Medians are provided on the west, north, and east legs; however, those medians intrude into the crossing area and do not provide fully accessible refuge areas that would be detectable by people with vision impairments.

A crossing guard is present at the intersection during school commute hours to assist schoolchildren traveling to and from Amelia Earhart School 0.6 miles north.

[3] CA-MUTCD, Section 4C.04, 02
[4] CA-MUTCD, Section 4C.08, 02B
[5] 3.5 feet per second is the walking speed used to time pedestrian signal phases per CA-MUTCD, Section 4E.06.

Bicyclists

Mecartney Road to the west of the intersection includes Class II bicycle lanes in both directions and a Class I multi-use path providing two-way travel on its north side. Because bicyclists can travel in either direction on the Class I path, conflicts are present for bicyclists exiting the facility westbound, where drivers may not expect them.

Along Island Drive, the City's draft Active Transportation Plan proposes Class II buffered bicycle lanes south of the intersection and Class II bicycle lanes north of the intersection. The plan also proposes Class II bicycle lanes along Mecartney Road east of the intersection.

Planning Environment

Planned Safety Improvements

The City has a planned safety improvement project along Maitland Drive east of the intersection between Mecartney Road and Harbor Island Parkway. The project includes installation of edge lines, bicycle sharrow pavement markings, and more. The project details are available at the City's website.[6]

Emergency Evacuation

Bay Farm Island is a tsunami evacuation zone for a tsunami threat from an Aleutian-Alaska earthquake. Emergency modeling indicates that the island would have a 4-hour evacuation time in such an event. Research tested Bay Farm Island's evacuation ability and noted the following findings in relation to Mecartney/Island[7]:

- Mecartney/Island is not an evacuation bottleneck.
- Several strategies can improve evacuation times. The strategy with the greatest potential is to reduce car demand on the island.

Intersection Concepts

Kittelson worked with the City to develop concept alternatives for analysis. As previously described, a key goal of any project at the intersection is to promote safety for all users. The size and number of lanes, (and consequently, the relative size of the overall intersection footprint) generally presents a balance between safety (benefits from a smaller size) and mobility (benefits from a larger size). A smaller footprint reduces exposure for vulnerable road users: it provides people walking with shorter crossing distances and allows people biking to clear the intersection

[6] https://www.alamedaca.gov/Departments/Public-Works-Department/City-Projects/Maitland-Drive-Traffic-Safety-Improvements
[7] Wood, Nathan, et al. "Variations in community evacuation potential related to average return periods in probabilistic tsunami hazard analysis." *International Journal of Disaster Risk Reduction* 50 (2020): 101871.

more quickly. A smaller footprint will generally provide tighter movements through the intersection and will visually narrow the roadway, resulting in lower vehicle driving speeds.

Therefore, Kittelson iteratively revised the proposed lane configurations to match the intersection size to its mobility needs and to avoid "overbuilding." The concepts also incorporate planned bicycle facilities and do not change residential or commercial driveway access along approaching roadways.

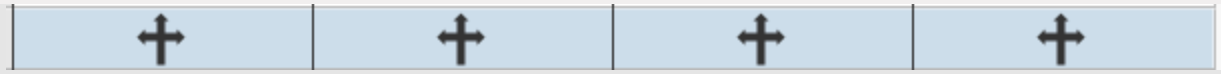
The concepts developed include:

- Roundabout
- Signal
- Reduced footprint all-way stop

Concept Lane Configuration and Bicycle Facilities

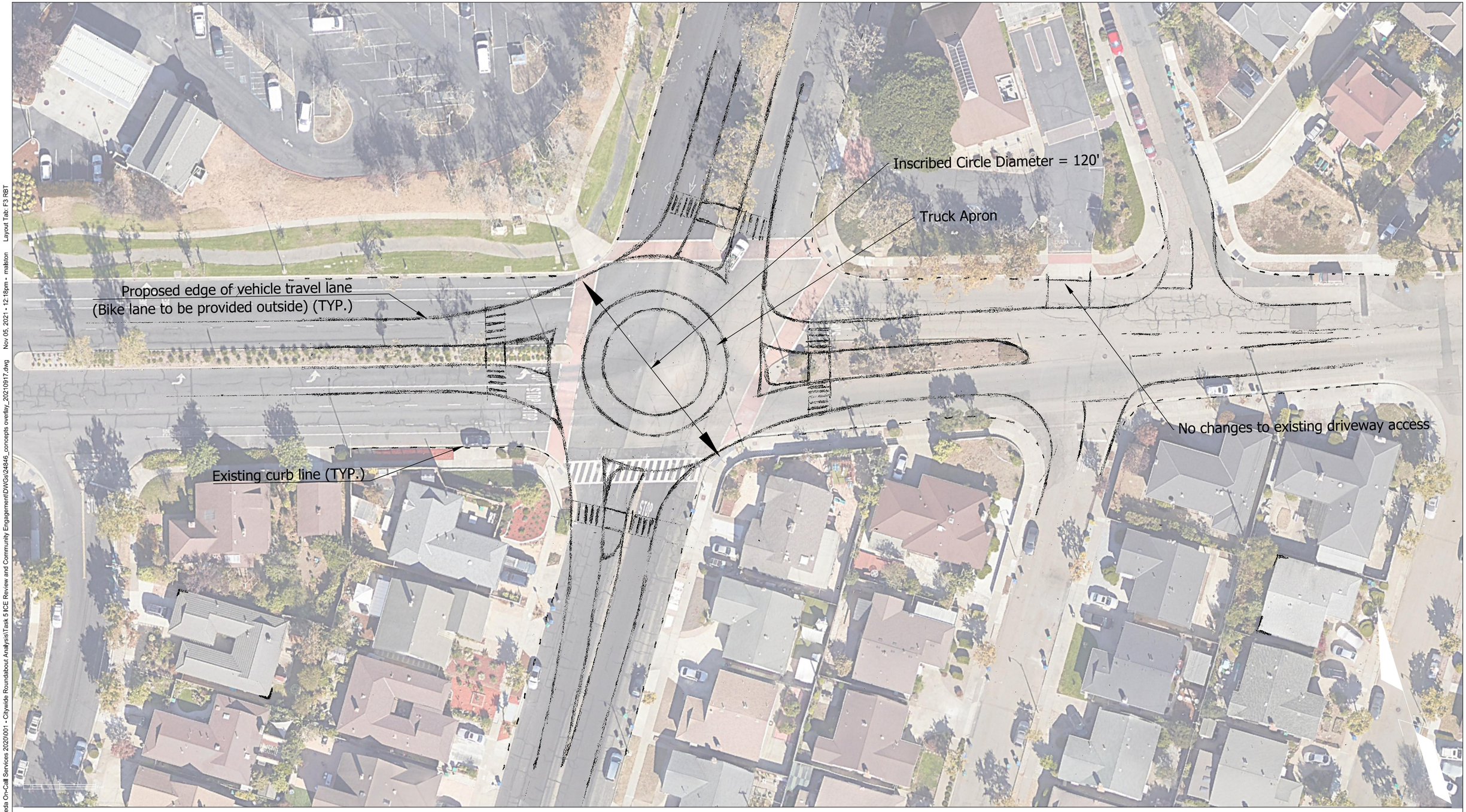
The existing and proposed lane configurations are shown in Table 5.

Table 5: Concept Lane Configurations

	Island Dr		Mecartney Rd	
Existing	Northbound (NB)	Southbound (SB)	Eastbound (EB)	Westbound (WB)
				
Roundabout	Northbound (NB)	Southbound (SB)	Eastbound (EB)	Westbound (WB)
				
Signal	Northbound (NB)	Southbound (SB)	Eastbound (EB)	Westbound (WB)
				
Reduced Footprint All-way Stop	Northbound (NB)	Southbound (SB)	Eastbound (EB)	Westbound (WB)
				

Intersection Footprint Sketch

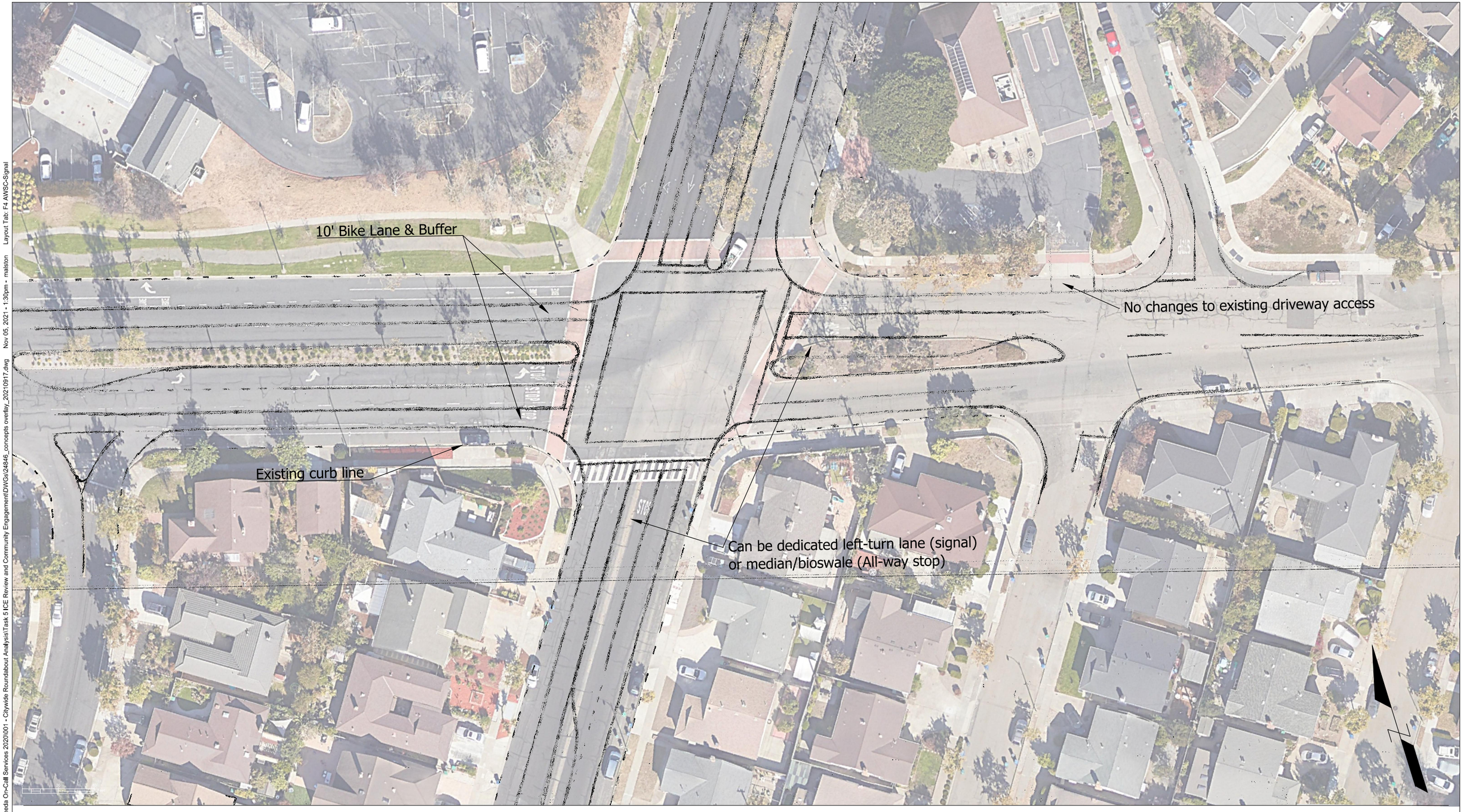
With basic lane geometry and bicycle facilities established, Kittelson sketched preliminary concepts for each alternative to assess feasibility. The following sections describe considerations for each concept sketch. The sketches are presented in Figure 3 and Figure 4.



KITTELSON & ASSOCIATES

Island Drive & Mecartney Road Roundabout Concept
Preliminary Draft - Subject to Change
Alameda, CA

Figure
03



KITTELSON & ASSOCIATES

Island Drive & Mecartney Road All-Way Stop/Signal Concept
Preliminary Draft - Subject to Change
Alameda, CA

Figure 04

Roundabout

The roundabout concept, as shown in Figure 3, is a single-lane design with an inscribed circle diameter of 120 feet. The design reflects an intent to remain within existing curb lines or minimally impact them. Some observations about the impact of the intersection footprint include:

- Because a single-lane roundabout is sufficient to serve expected traffic volumes, the roadways approaching and departing the intersections could all be reduced in width.
- The concept sketch shows a new edge of traveled way with existing curb lines as dashed lines. The difference in the lateral width indicates the excess pavement. It could be used for landscaping, flood reduction with bioswales, or similar elements. The space also provides room for diagonal ramps to and from Class II bike lanes on each road.[8] In a least-cost approach, curbing could be provided with sidewalk and driveway connections until a long-term plan is developed.
- A 10-foot-wide combined bicycle lane and buffer strip could be provided on all approaches. The concept could provide for bicyclists to share the circulatory roadway or to use bicycle ramps to leave the roadway and cross adjacent to pedestrian crossings. The concept could provide both options, as well. Further concept development would define the treatment.
- No changes to existing commercial or residential access driveways would be required.
- The anticipated design vehicle movement and associated performance checks may result in some modifications to the eventual intersection layout, possibly reducing the medians and splitter islands on approaches to support large truck movements through the intersection. Should the City carry the roundabout forward, Kittelson and the City would identify the design vehicle (STAA or California Legal) and required movements to refine the design and verify performance checks.
- Existing bus stops along Mecartney Road (at the northeast and southeast corners) could be retained in approximately their existing locations. If the roundabout is advanced, the City may coordinate with AC Transit to determine if in-lane or pullout stops are preferred.
- The City is considering complementary traffic calming treatments along Maitland Drive to the east to further the speed reductions and safety improvements on Bay Farm Island as shown on the City's website.[9]
- The roundabout could provide the opportunity for a gateway feature (within the central island). One such feature could be a tree, consistent with the tree lined median from the north along Island Drive and with the character of the corridor and Bay Farm Island.

All-Way Stop / Signal

One sketch concept was developed to convey both an all-way stop and signal footprint and implications, as shown in Figure 4. A few notes about the concept include:

[8] An example of bicycle ramps to and from Class II bike lanes is provided in CA-MUTCD Figure 9C-107

[9]Recommendations for Maitland Drive can be found at https://www.alamedaca.gov/Departments/Public-Works-Department/City-Projects/Maitland-Drive-Traffic-Safety-Improvements

- The same basic form could be used for all-way stop or signal alternatives. For the reduced footprint all-way stop concept, the westbound and northbound left-turn lanes could instead be painted extensions of the landscaped medians, replaced with constructed medians, or modified into bioswales to reduce the impact of flooding.
- The concept shows excess available existing pavement. As with the roundabout, the excess lateral width could be constructed as curbing and could include other features as part of a long-term plan to reduce flooding and improve aesthetics.
- A 10-foot-wide bicycle lane and buffer strip is provided on all approaches. As currently sketched, each bicycle lane results in a potential right-hook conflict with right-turning vehicle movements. Further concept development would include defining a treatment to address this issue (e.g., advanced stop bar / bicycle box, concrete islands in the buffer to protect people bicycling, or similar).
- No changes to existing commercial or residential access driveways would be required.
- The anticipated design vehicle movement and associated performance checks may result in some modifications to the eventual intersection layout, but the approximate size and layout would not change substantially. Should the City carry either alternative forward, Kittelson and the City would identify the design vehicle (STAA or California Legal) and required movements to refine the design and verify performance checks.
- Existing bus stops along Mecartney Road (at the northeast and southeast corners) could be retained in approximately their existing locations. The City may coordinate with AC Transit to determine if in-lane or pullout stops are preferred.

ASSESSMENT

The assessment presents safety and mobility considerations, including:

- Safety
  - Motor vehicles
  - Pedestrians
  - Bicyclists
- Mobility – motor vehicle operations
  - Motor vehicle operations
  - Pedestrian comfort and quality of service
  - Bicyclist comfort and quality of service
  - Trucks/design vehicle considerations
- Transit access and mobility

Safety

This section presents a general safety comparison among the concepts considered. First, the general comparative safety record of the three intersection types considered is discussed. Then, the characteristics of the site and concepts are qualitatively evaluated.

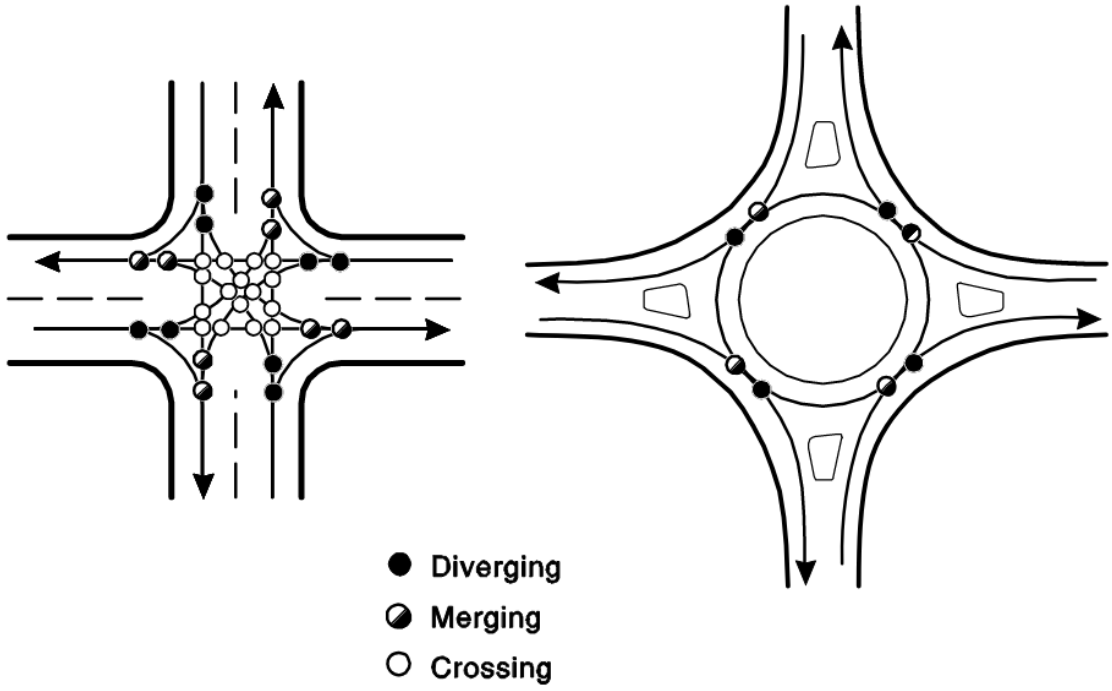
General Characteristics

Safety research has compared intersection types and produced documented crash reduction factors (CRFs) associated with intersection types. Roundabouts have been shown to reduce crash frequency compared to two-way stop control and signalized intersections for all crash types and especially for injury and fatal crashes. There is limited US-based research on bicyclist and pedestrian crash history at roundabouts, in part because these users make up a very small portion of reported crash history which makes establishing statistical significance difficult.

In terms of overall crashes, NCHRP Report 672 – *Roundabouts: An Informational Guide* explains a few reasons for roundabouts' demonstrated crash reduction and safety benefit:

- Roundabouts include fewer vehicle conflict points than non-roundabout intersections (see Figure 5). The design reduces the likelihood of high-severity crashes like right-angle and left-turn head-on crashes. Of note is the elimination of *crossing conflicts*, which occur where two traffic streams intersect. Crossing conflicts are typically the most severe of all conflict types.
- Roundabouts include low speeds, which increases reaction time and lowers the potential severity of crashes.
- Pedestrian crossings are typically two-stage crossings, meaning that people walking only cross one direction of traffic at a time, which reduces exposure and simplifies the task for people walking.

Figure 5: Vehicle Conflict Points for Intersections with Single-Lane Approaches



Source: NCHRP Report 672

CRFs are typically established from before-and-after studies. CRFs for roundabouts show a reduction of up to 82% of injury crashes when converting from two-way stop intersections, and up to 78% of injury crashes when converting from signalized intersections.[10] There are no documented CRFs for conversions from all-way stop intersections to roundabouts.

Some safety principles do indicate that a roundabout could provide safety benefits compared to an all-way stop control, notably:

- Roundabouts reduce the severity of potential conflicts with horizontal design that requires drivers to slow. The relative speeds are a determining factor in the severity of a conflict.
- Roundabouts replace head-on and angle conflicts with merge/sideswipe conflicts, for which the angles and relative velocities are less likely to result in severe conflicts.
- Roundabouts generally simplify user tasks at conflict points. Rather than a driver being required to, for example, simultaneously judge a gap in traffic and search for crossing pedestrians, they complete each task separately and sequentially.

Therefore, the roundabout and all-way stop control options would be expected to result in fewer and less severe crashes overall compared to a traffic signal. Additionally, the roundabout would reduce the number of conflict points compared to the all-way stop and signal alternatives and provide geometric design changes that require drivers to slow.

[10] American Association of State Highway and Transportation Officials (AASHTO). Highway Safety Manual, 1st Edition. AASHTO, Washington, D.C., 2010.

Motor Vehicles

The motor vehicle safety considerations are as follows:

- The roundabout, as described above, also reduces the most severe potential conflicts by reducing speeds and altering vehicle paths (removing left-turn conflicts). The roundabout slows speeds with use of traffic control devices (YIELD signs) and geometric design that requires drivers to slow to stay in the roadway.
- For the signal, timing details would need to be determined as part of concept development. Protected left-turn phases should likely be provided on the eastbound phase to accommodate the high volume of left turns. Protected left-turn phases would improve safety on all approaches and reduce the risk of turning movement crashes.
- The reduced footprint all-way stop would promote low vehicle speeds by bringing all drivers to a stop.

Evaluation: The roundabout and all-way stop alternatives provide a benefit relative to the signal through reduced speeds, but the roundabout eliminates the most severe conflict types and reinforces slow speeds through geometric design elements.

Pedestrians

All concepts would reduce crossing distances relative to the existing conditions, thereby reducing exposure.

- The roundabout alternative would include two-stage crossings with median refuges. The roundabout would also remove left-turns across the intersection and concurrent conflicts with other motor vehicles. For example, drivers assess when it is their turn to proceed while they yield to pedestrians at all-way stop intersections. The roundabout design offsets these decision and conflict points by pulling the crossings back from the corner to sequence the driver decision points.
- The signal alternative could include median refuges for two-stage crossings on all approaches except for the northbound approach (south leg). For the signal, protected left-turn phases would improve safety for people walking by separating pedestrian crossing phases in time from vehicle left-turn phases. The signal could also include leading pedestrian intervals, which provide pedestrians with a 3- to 7-second head start to pedestrians before drivers are allowed to proceed.
- The all-way stop control alternative could include medians wide enough to accommodate median refuges on all approaches.

The roundabout and all-way stop alternatives would slow vehicle speeds and provide two-stage pedestrian crossings, conferring an advantage relative to the signal alternative. Depending on signal timing, the signal may also include concurrent pedestrian-vehicle conflicts (left and right turns) that are controlled in the other alternatives. Motor vehicle yields are required at all crossings for both roundabout and all-way stop alternatives.

Evaluation: The roundabout provides improved pedestrian safety to the alternatives. Both the roundabout and all-way stop control promote slower speeds compared to a signal, but the roundabout would include two-stage crossings, design elements that reinforce slow speeds, and reduced conflict complexity (removing left turns).

Bicyclists

All concepts provide dedicated bicycle lanes on intersection entry and departure, which is consistent with the Draft Active Transportation Plan and could provide physical separation from motor vehicle traffic. Roundabouts would provide reduced vehicle speeds and would benefit people biking by reducing the relative speed difference between vehicles and bicycles. All vehicle-bicycle conflicts at the roundabout or reduced footprint all-way stop control intersection would be less severe than bicycle-related collisions at higher speeds.

Evaluation: All concepts allow for bicycle lanes on intersection entry and departure. The roundabout would reduce the speed at vehicle-bicycle conflict points relative to other alternatives.

Overall

At this level of concept design, the roundabout presents clear safety advantages. Further design details could bring alternatives closer in performance. The roundabout and all-way stop alternatives provide safety benefits described in the sections above, notably reduced motor vehicle speeds relative to the signal alternative. The roundabout provides self-reinforcing design elements to reduce speed: the use of horizontal deflection to travel through the intersection. It also simplifies pedestrian crossings and provides bicycle travel options on par with any alternatives, with elements that reduce vehicle speeds and simplify conflicts.

Evaluation: As proposed, the roundabout is the top-ranked alternative for safety criteria. Table 6 provides a ranking among alternatives based on the qualitative safety evaluation presented above.

Table 6: Concept Ranking based on Qualitative Safety Evaluation (1=best)

	Roundabout	Signal	Reduced Footprint All-way Stop
Motor Vehicles	1	3	2
Pedestrians	1	3	2
Bicyclists	1	3	2

Note: Green shaded cells indicate highest-ranked alternatives.

Mobility

Motor Vehicle Operations

This section compares the intersection alternatives using the Highway Capacity Manual methods to evaluate motor vehicle delay and queue lengths for each alternative. The results are presented in Table 7 (refer to Appendix B for analysis worksheets). As previously noted, the analysis traffic volumes used were collected in 2015 and present a pre-pandemic / "return to normal" condition. No future year turning movement volumes were developed for this analysis, which simply provides a comparative performance.

Table 7: Operations Analysis, Proposed Concepts, Mecartney/Island

Alternative	Peak Hour	Level of Service	Average Delay (s/veh)	Volume-to-Capacity Ratio	95th Percentile Queue (ft)[1]
Existing All-way Stop	AM	D	35.0	1.04[2]	370 (EBL)
	PM	C	23.2	0.92[2]	260 (EBL)
Roundabout	AM	A	9.7	0.6[2]	106 (EBL)
	PM	B	10.8	0.7[3]	125 (SB)
Signal[1]	AM	D	42.7	0.66	664 (EBL)
	PM	D	41.4	0.76	560 (EBL)
Reduced Footprint All-way Stop	AM	E	42.0	1.08[2]	402 (EBL)
	PM	E	36.3	0.97[2]	297 (EBL)

1: The longest queue in all analyzed scenarios was the eastbound left (EBL) movement.

2: The HCM methodology provides volume-to-capacity (V/C) ratios on a per-approach basis for roundabouts rather than for the intersection overall. This value represents the eastbound approach, which has the highest V/C ratio.

3: The southbound approach has the highest V/C ratio in this scenario.

The analysis results indicate:

- The proposed roundabout would reduce average vehicle delay and reduce average queue lengths compared to existing conditions.
- The signal concept performs similarly to the all-way stop alternative, with a slightly higher average delay. The signal's poor relative performance is a result of serving the relatively high proportion of eastbound left turns, which requires holding other movements and increasing the average delay for all movements.
- The proposed all-way stop would increase vehicle delay compared to existing conditions because of the reduced number of lanes on some approaches. Through and turning

movements on the same approach can proceed at the same time under existing conditions but would queue behind one another with the reduced footprint.

Evaluation: Overall, the roundabout provides the best vehicle mobility in the weekday peak hours. The roundabout alternative demonstrates resilience to any future traffic volume increases as well, given that it is well below capacity.

Pedestrian Comfort and Quality of Service

Pedestrian quality of service describes the experience of walking through the intersection, including presence and quality of sidewalks and crossings and any travel delay from traffic control devices or waiting for drivers to yield. All concepts as currently proposed would shorten pedestrian crossings compared to existing conditions. A qualitative evaluation of concepts is described below.

- The roundabout provides separate crossings for each direction of traffic, with a median refuge for waiting between crossings.
- The roundabout crossings would be offset from the intersection corners by at least 20 feet, which would require minor diversion for people walking straight through the intersection.
- The intersection includes a crossing guard during school commute hours. All the proposed concepts would reduce the footprint and corner-to-corner distance of the intersection, allowing the crossing guard to assist crossings more effectively on any intersection leg in either direction, which would represent a benefit compared to existing conditions.
- Compared to the signal, people walking would be able to cross at the intersection more quickly on average with the roundabout or all-way stop concept because all vehicles are required to yield the right-of-way. With the signal concept, pedestrians attempting to cross would need to wait for the dedicated signal phase that allows them to cross, which could be up to two minutes depending on the signal timing.

Evaluation: All proposed concepts would reduce crossing distances and improve pedestrian comfort compared to existing conditions. Overall, the roundabout provides the highest quality of service for pedestrians traveling through the intersection.

Bicyclist Comfort and Quality of Service

All concepts would provide physically separated bike lanes on all approaches where feasible. The roundabout could provide a bicycle ramp to a separated path, allowing bicyclist travel through the intersection or in an adjacent path with crossings. All concepts could adequately connect bicyclists to and from the Class I multi-use path on the west side of Island Drive and on the north side of Mecartney Road.

- For confident bicyclists operating like drivers through the roundabout (i.e., taking the lane), the roundabout provides superior mobility and quality of service and moves them through the intersection with less delay than the alternatives. The option to ramp to a separated path reduces the complexity of making left turns or confronting "right-hook" conflicts with motor vehicles.
- The signal and reduced-footprint all-way stop alternatives would include further refined treatments to mitigate any conflicts with turning vehicles. They would otherwise provide similar levels of mobility for bicyclists as for drivers.
- The signal could include two-stage left turn queue boxes, which would allow bicyclists to make left turns in two sequential signal phases but would increase their delay.

Evaluation: The roundabout would provide the best mobility for confident bicyclists traveling through the intersection and could accommodate movements on a separated path with crossings without additional signal delay. All alternatives could provide separated bicycle lanes on approach and departure.

Trucks / Design Vehicle Considerations

All the concepts presented could serve the design vehicle. The roundabout design would adapt depending on the truck size and turning movements through the intersection but still could be expected to serve traffic demand and meet performance checks for a roundabout. Existing turning movement counts show truck percentages between 1% and 3% on each intersection approach in the AM peak hour and between 0% and 3% in the PM peak hour.

Evaluation: All concepts would be able to serve design vehicles.

Transit Access and Mobility

The Mecartney/Island intersection includes AC Transit bus stops along Mecartney Road on the northeast and southeast corners of the intersection.

These bus stops include the following routes:

- 21: This is a route that provides service to Bay Farm Island, the Oakland International Airport, and City of Oakland. It operates with approximately 30-minute headways throughout the day.

- 631: This is a school route that operates two buses on weekday mornings (between 7:00 and 8:00 a.m.) and two buses in the afternoons (between 3:30 and 4:30 p.m.).
- 687: This is a school route that operates one bus on weekday mornings (between 8:00 and 8:30 a.m.) and one bus on weekday afternoons (between 3:00 and 4:00 p.m.).
- OX: This is a Transbay line that runs two buses on weekday mornings (between 7:30 and 9:00 a.m.) and six buses on weekday evenings (between 5:30 and 7:00 p.m.).

Line 21 operates through the intersection throughout the day, and the other lines pass through the intersection during off-peak times.

Access to the transit stops is provided on the east side of the intersection—within 100 feet of the east leg crosswalk. All the proposed concepts could be designed to provide a similar level of access to the intersection.

Transit vehicles would travel through the intersection in general purpose lanes in all concepts. Therefore, as demonstrated in the Mobility discussion, the roundabout provides better mobility for transit vehicles and riders compared to reduced footprint all-way stop and the signal alternative. The roundabout would have the lowest delay, which would improve bus operations during peak hours.

Evaluation: All options retain existing transit access. The roundabout provides the best transit mobility.

Overall Evaluation

The evaluation categories and alternative rankings are presented in Table 8.

Table 8: Evaluation Criteria

Evaluation Criteria	Roundabout	Signal	Reduced Footprint All-way Stop
Safety (Motor Vehicles)			
Safety (Pedestrians)			
Safety (Bicyclists)			
Motor Vehicle Operations			
Pedestrian Comfort and Quality of Service			
Bicyclist Comfort and Quality of Service			
Truck/Design Vehicle Considerations			
Transit Access			
Transit Mobility			

Note: Green shaded cells indicate highest-ranked alternatives. Cells are not shaded when no alternative is ranked above the others.

The roundabout provides an advantage compared to evaluated alternatives in all criteria except for two (for which all concepts are comparable). Based on this comparison among evaluation criteria, Kittelson recommends proceeding with the roundabout and all-way stop alternatives for further evaluation and removing the signal alternative from further consideration. Community engagement and input is critical to help advance the alternatives and select a preferred alternatives.

Next Steps

Kittelson and the City will confirm the approach and schedule for community engagement to solicit input on concept alternatives. The City will consider community input before determining a preferred alternative.

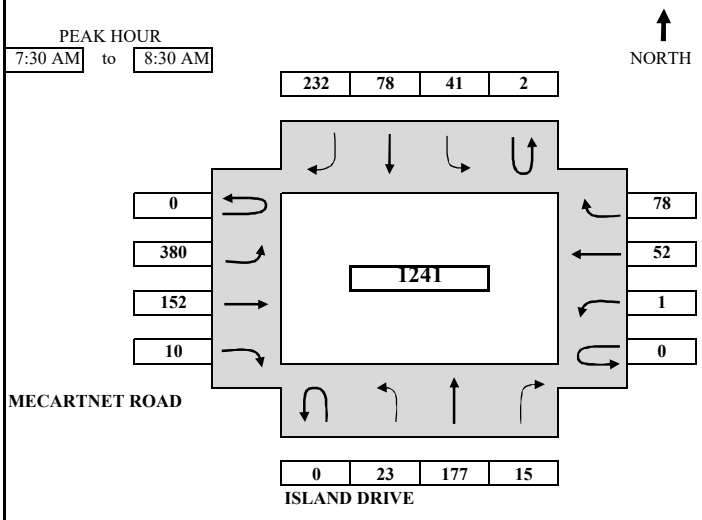
Appendix A
Turning Movement Counts

B.A.Y.M.E.T.R.I.C.S.

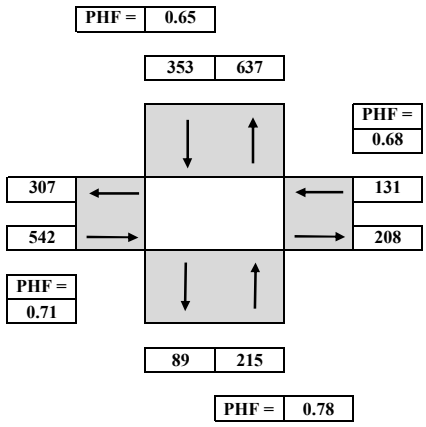
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**ISLAND DRIVE**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**	**FILE:**	**3501001-12R (AM)**

PEAK HOUR 7:30 AM to 8:30 AM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
7:00 AM	7:15 AM		6	33	4	0	6	18	25	0	57	18	1		1	7	10	**186**
7:15 AM	7:30 AM		21	72	8	0	13	21	64	0	157	48	5		4	23	29	**465**
7:30 AM	7:45 AM		23	130	8	0	23	28	93	0	257	135	9		4	32	68	**810**
7:45 AM	8:00 AM		26	165	15	0	31	46	131	0	348	162	10		5	43	85	**1067**
8:00 AM	8:15 AM		38	216	21	0	39	75	201	0	440	186	11		5	59	100	**1391**
8:15 AM	8:30 AM		44	249	23	2	54	99	296	0	537	200	15		5	75	107	**1706**
8:30 AM	8:45 AM		52	280	28	2	67	116	376	0	621	217	18		5	86	115	**1983**
8:45 AM	9:00 AM		57	304	34	3	77	128	436	1	706	236	21		6	105	119	**2233**
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	6	33	4	0	6	18	25	0	57	18	1	0	1	7	10	**186**
7:15 AM	7:30 AM	0	15	39	4	0	7	3	39	0	100	30	4	0	3	16	19	**279**
7:30 AM	7:45 AM	0	2	58	0	0	10	7	29	0	100	87	4	0	0	9	39	**345**
7:45 AM	8:00 AM	0	3	35	7	0	8	18	38	0	91	27	1	0	1	11	17	**257**
8:00 AM	8:15 AM	0	12	51	6	0	8	29	70	0	92	24	1	0	0	16	15	**324**
8:15 AM	8:30 AM	0	6	33	2	2	15	24	95	0	97	14	4	0	0	16	7	**315**
8:30 AM	8:45 AM	0	8	31	5	0	13	17	80	0	84	17	3	0	0	11	8	**277**
8:45 AM	9:00 AM	0	5	24	6	1	10	12	60	1	85	19	3	0	1	19	4	**250**
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	26	165	15	0	31	46	131	0	348	162	10	0	5	43	85	**1067**
7:15 AM	8:15 AM	0	32	183	17	0	33	57	176	0	383	168	10	0	4	52	90	**1205**
7:30 AM	8:30 AM	0	23	177	15	2	41	78	232	0	380	152	10	0	1	52	78	**1241**
7:45 AM	8:45 AM	0	29	150	20	2	44	88	283	0	364	82	9	0	1	54	47	**1173**
8:00 AM	9:00 AM	0	31	139	19	3	46	82	305	1	358	74	11	0	1	62	34	**1166**

PEAK HOUR SUMMARY

7:30 AM to 8:30 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	23	177	15	2	41	78	232	0	380	152	10	0	1	52	78	**1241**
PHF BY MOVEMENT	0.00	0.48	0.76	0.54	0.25	0.68	0.67	0.61	0.00	0.95	0.44	0.63	0.00	0.25	0.81	0.50	OVERALL
PHF BY APPROACH	0.78				0.65				0.71				0.68				0.90
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	3		7		8		2		10		5		2		9		**23**
TRUCK PERCENTAGE	1.4%		1.1%		2.3%		2.2%		1.8%		2.4%		1.5%		2.9%		**1.9%**
PEDESTRIAN	37				6				2				18				**63**
BICYCLE	1				3				2				3				**9**

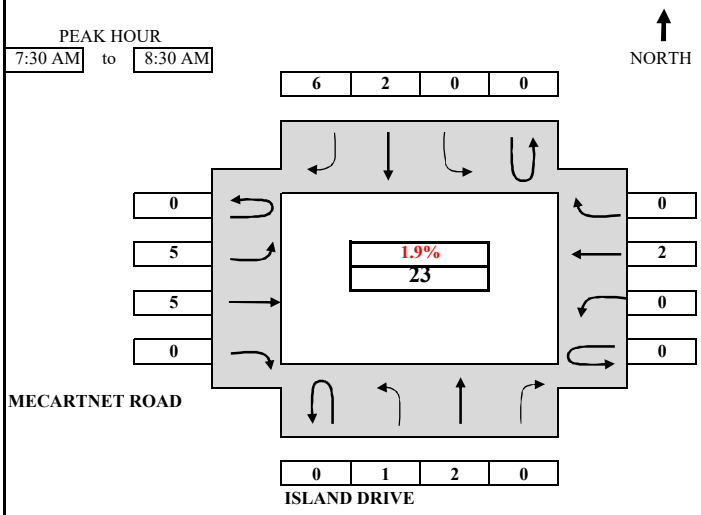
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

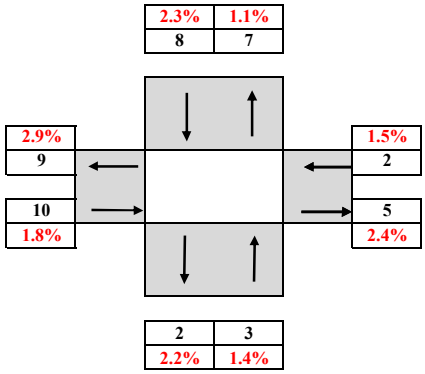
INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**ISLAND DRIVE**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**	**FILE:**	**3501001-12R (AM)**

PEAK HOUR
7:30 AM to 8:30 AM



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
7:00 AM	to	7:15 AM		0	0	0		0	0	0		0	1	0		0	1	1	**3**
7:15 AM	to	7:30 AM		0	0	0		0	0	1		2	5	1		0	2	1	**12**
7:30 AM	to	7:45 AM		0	0	0		0	2	1		3	8	1		0	3	1	**19**
7:45 AM	to	8:00 AM		1	2	0		0	2	1		3	9	1		0	3	1	**23**
8:00 AM	to	8:15 AM		1	2	0		0	2	3		4	10	1		0	4	1	**28**
8:15 AM	to	8:30 AM		1	2	0		0	2	7		7	10	1		0	4	1	**35**
8:30 AM	to	8:45 AM		1	2	0		0	2	12		10	11	1		0	5	1	**45**
8:45 AM	to	9:00 AM		1	2	0		0	3	12		10	12	1		0	5	1	**47**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	**3**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	1	0	2	4	1	0	0	1	0	**9**
7:30 AM	to	7:45 AM	0	0	0	0	0	0	2	0	0	1	3	0	0	0	1	0	**7**
7:45 AM	to	8:00 AM	0	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	**4**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	2	0	1	1	0	0	0	1	0	**5**
8:15 AM	to	8:30 AM	0	0	0	0	0	0	0	4	0	3	0	0	0	0	0	0	**7**
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	5	0	3	1	0	0	0	1	0	**10**
8:45 AM	to	9:00 AM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	**2**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	1	2	0	0	0	2	1	0	3	9	1	0	0	3	1	**23**
7:15 AM	to	8:15 AM	0	1	2	0	0	0	2	3	0	4	9	1	0	0	3	0	**25**
7:30 AM	to	8:30 AM	0	1	2	0	0	0	2	6	0	5	5	0	0	0	2	0	**23**
7:45 AM	to	8:45 AM	0	1	2	0	0	0	0	11	0	7	3	0	0	0	2	0	**26**
8:00 AM	to	9:00 AM	0	0	0	0	0	0	1	11	0	7	3	0	0	0	2	0	**24**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

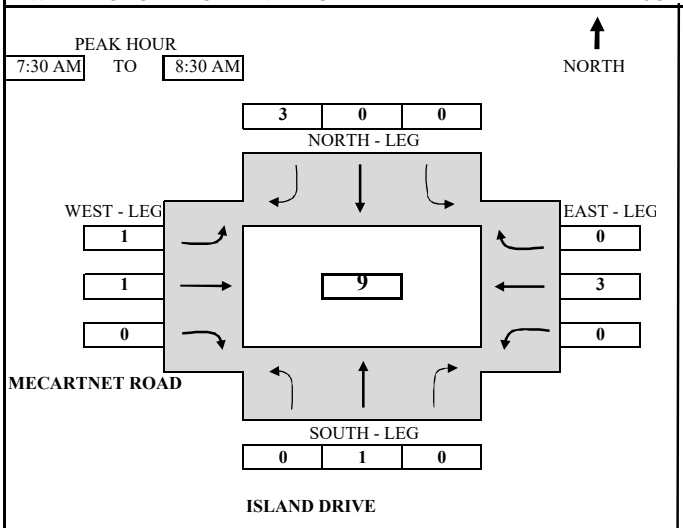
7:30 AM to 8:30 AM

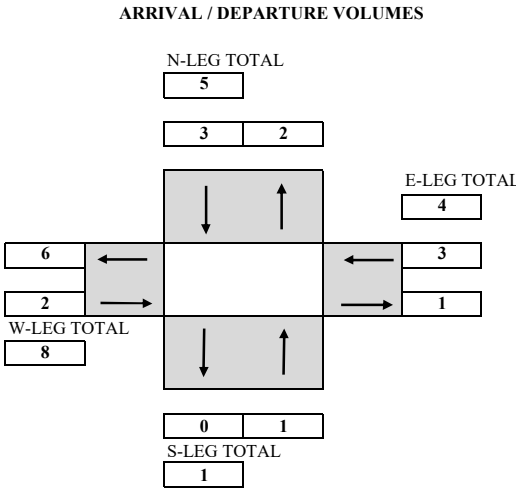
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	3	7	8	2	10	5	2	9	23
TRUCK PERCENTAGE	1.4%	1.1%	2.3%	2.2%	1.8%	2.4%	1.5%	2.9%	1.9%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**ISLAND DRIVE**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**	**FILE:**	**3501001-12R (AM)**





TIME	PERIOD		NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From		To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA															
7:00 AM	to	7:15 AM	0	1	0	0	0	0	1	1	0	0	0	0	**3**
7:15 AM	to	7:30 AM	0	1	0	0	0	0	1	2	0	0	1	0	**5**
7:30 AM	to	7:45 AM	0	1	0	0	0	1	2	2	0	0	1	0	**7**
7:45 AM	to	8:00 AM	0	1	0	0	0	2	2	2	0	0	2	0	**9**
8:00 AM	to	8:15 AM	0	1	0	0	0	2	2	3	0	0	4	0	**12**
8:15 AM	to	8:30 AM	0	2	0	0	0	3	2	3	0	0	4	0	**14**
8:30 AM	to	8:45 AM	0	3	0	0	0	3	2	3	0	0	4	0	**15**
8:45 AM	to	9:00 AM	0	4	0	0	0	3	2	3	0	0	4	0	**16**
TOTAL BY PERIOD															
7:00 AM	to	7:15 AM	0	1	0	0	0	0	1	1	0	0	0	0	**3**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	1	0	0	1	0	**2**
7:30 AM	to	7:45 AM	0	0	0	0	0	1	1	0	0	0	0	0	**2**
7:45 AM	to	8:00 AM	0	0	0	0	0	1	0	0	0	0	1	0	**2**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	**3**
8:15 AM	to	8:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	**2**
8:30 AM	to	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
8:45 AM	to	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	**1**
HOURLY TOTALS															
7:00 AM	to	8:00 AM	0	1	0	0	0	2	2	2	0	0	2	0	**9**
7:15 AM	to	8:15 AM	0	0	0	0	0	2	1	2	0	0	4	0	**9**
7:30 AM	to	8:30 AM	0	1	0	0	0	3	1	1	0	0	3	0	**9**
7:45 AM	to	8:45 AM	0	2	0	0	0	2	0	1	0	0	3	0	**8**
8:00 AM	to	9:00 AM	0	3	0	0	0	1	0	1	0	0	2	0	**7**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

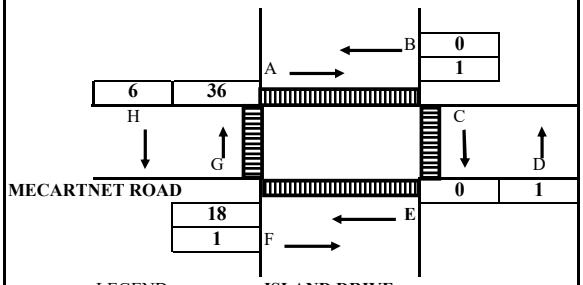
7:30 AM	to	8:30 AM					
VOLUME BY APPROACH			NBT	SBT	EBT	WBT	TOTAL
BICYCLE			1	3	2	3	**9**

B . A . Y . M . E . T . R . I . C . S .

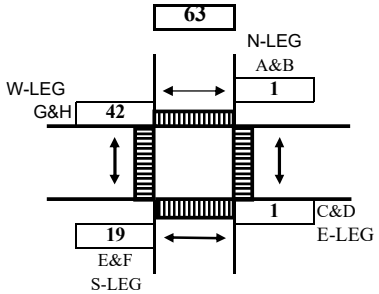
PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**
N-S APPROACH:	**ISLAND DRIVE**	**DAY:**	**TUESDAY**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**
SURVEY PERIOD	**7:00 AM TO 9:00 AM**	**FILE:**	**3501001-12R (AM**

PEAK HOUR
07:30 AM TO 08:30 AM



PEAK HOUR
TOTAL PEDESTRIAN VOLUMES



NB(D+G)	37
SB(C+H)	6
EB(A+F)	2
WB(B+E)	18

TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
07:00 AM	---	07:15 AM	0	0	1	1	0	0	1	0	***3***
07:15 AM	---	07:30 AM	0	0	1	1	2	2	7	0	***13***
07:30 AM	---	07:45 AM	0	0	1	2	5	2	16	2	***28***
07:45 AM	---	08:00 AM	0	0	1	2	14	2	32	2	***53***
08:00 AM	---	08:15 AM	0	0	1	2	20	2	43	3	***71***
08:15 AM	---	08:30 AM	1	0	1	2	20	3	43	6	***76***
08:30 AM	---	08:45 AM	1	0	1	5	21	5	45	8	***86***
08:45 AM	---	09:00 AM	2	0	2	6	21	5	45	8	***89***
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	0	1	1	0	0	1	0	***3***
07:15 AM	---	07:30 AM	0	0	0	0	2	2	6	0	***10***
07:30 AM	---	07:45 AM	0	0	0	1	3	0	9	2	***15***
07:45 AM	---	08:00 AM	0	0	0	0	9	0	16	0	***25***
08:00 AM	---	08:15 AM	0	0	0	0	6	0	11	1	***18***
08:15 AM	---	08:30 AM	1	0	0	0	0	1	0	3	***5***
08:30 AM	---	08:45 AM	0	0	0	3	1	2	2	2	***10***
08:45 AM	---	09:00 AM	1	0	1	1	0	0	0	0	***3***
HOURLY TOTALS											
07:00 AM	---	08:00 AM	0	0	1	2	14	2	32	2	***53***
07:15 AM	---	08:15 AM	0	0	0	1	20	2	42	3	***68***
07:30 AM	---	08:30 AM	1	0	0	1	18	1	36	6	***63***
07:45 AM	---	08:45 AM	1	0	0	3	16	3	29	6	***58***
08:00 AM	---	09:00 AM	2	0	1	4	7	3	13	6	***36***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

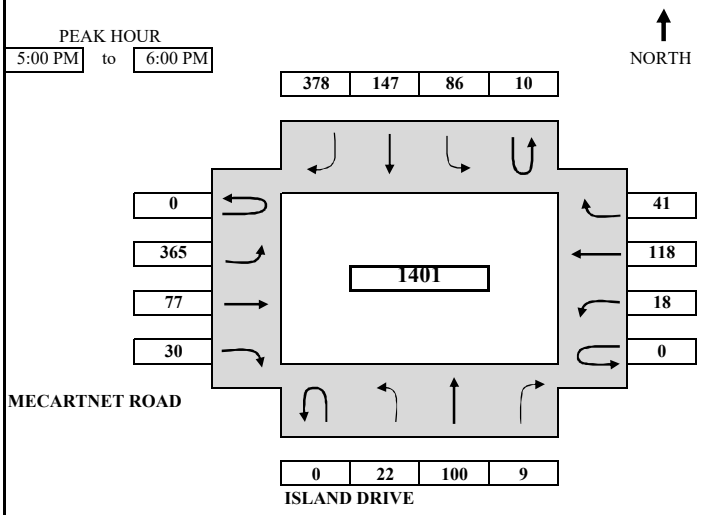
7:30 AM to 8:30 AM	NB	SB	EB	WB	TOTAL
VOLUME BY LEG	(D+G)	(C+H)	(A+F)	(B+E)	
PEDESTRIAN	37	6	2	18	**63**

B.A.Y.M.E.T.R.I.C.S.

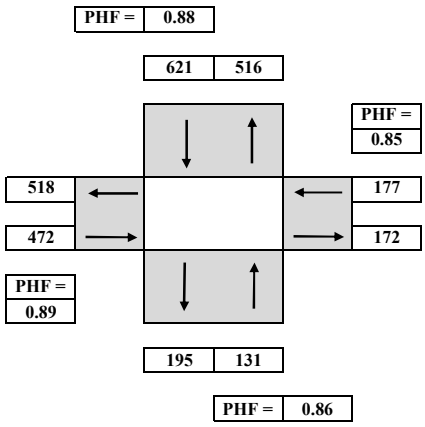
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**ISLAND DRIVE**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**	**FILE:**	**3501001-12R (PM)**

PEAK HOUR 5:00 PM to 6:00 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM		3	13	3	0	16	22	58		53	10	2		2	19	6	**207**
4:15 PM	to	4:30 PM		5	40	4	6	32	49	134		106	17	5		3	41	14	**456**
4:30 PM	to	4:45 PM		12	55	6	9	55	81	199		159	28	7		7	55	24	**697**
4:45 PM	to	5:00 PM		16	71	8	12	73	115	287		225	41	12		9	77	32	**978**
5:00 PM	to	5:15 PM		23	91	12	14	93	151	385		319	59	20		14	105	43	**1329**
5:15 PM	to	5:30 PM		27	114	14	16	113	194	489		414	85	32		18	134	55	**1705**
5:30 PM	to	5:45 PM		32	146	15	19	135	223	555		507	99	38		23	168	68	**2028**
5:45 PM	to	6:00 PM		38	171	17	22	159	262	665		590	118	42		27	195	73	**2379**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	3	13	3	0	16	22	58	0	53	10	2	0	2	19	6	**207**
4:15 PM	to	4:30 PM	0	2	27	1	6	16	27	76	0	53	7	3	0	1	22	8	**249**
4:30 PM	to	4:45 PM	0	7	15	2	3	23	32	65	0	53	11	2	0	4	14	10	**241**
4:45 PM	to	5:00 PM	0	4	16	2	3	18	34	88	0	66	13	5	0	2	22	8	**281**
5:00 PM	to	5:15 PM	0	7	20	4	2	20	36	98	0	94	18	8	0	5	28	11	**351**
5:15 PM	to	5:30 PM	0	4	23	2	2	20	43	104	0	95	26	12	0	4	29	12	**376**
5:30 PM	to	5:45 PM	0	5	32	1	3	22	29	66	0	93	14	6	0	5	34	13	**323**
5:45 PM	to	6:00 PM	0	6	25	2	3	24	39	110	0	83	19	4	0	4	27	5	**351**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	16	71	8	12	73	115	287	0	225	41	12	0	9	77	32	**978**
4:15 PM	to	5:15 PM	0	20	78	9	14	77	129	327	0	266	49	18	0	12	86	37	**1122**
4:30 PM	to	5:30 PM	0	22	74	10	10	81	145	355	0	308	68	27	0	15	93	41	**1249**
4:45 PM	to	5:45 PM	0	20	91	9	10	80	142	356	0	348	71	31	0	16	113	44	**1331**
5:00 PM	to	6:00 PM	0	22	100	9	10	86	147	378	0	365	77	30	0	18	118	41	**1401**

PEAK HOUR SUMMARY

5:00 PM to 6:00 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	22	100	9	10	86	147	378	0	365	77	30	0	18	118	41	**1401**
PHF BY MOVEMENT	0.00	0.79	0.78	0.56	0.83	0.90	0.85	0.86	0.00	0.96	0.74	0.63	0.00	0.90	0.87	0.79	OVERALL
PHF BY APPROACH	0.86				0.88				0.89				0.85				0.93
TRUCK	IN		OUT		IN		OUT		IN		OUT		IN		OUT		OVERALL
TRUCK VOLUMES	1		0		2		1		5		5		3		5		**11**
TRUCK PERCENTAGE	0.8%		0.0%		0.3%		0.5%		1.1%		2.9%		1.7%		1.0%		**0.8%**
PEDESTRIAN	15				13				7				9				**44**
BICYCLE	0				3				7				1				**11**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

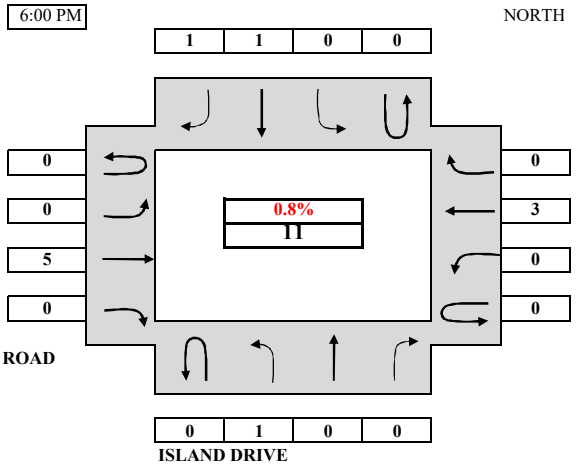
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TRUCK TURNING MOVEMENT SUMMARY

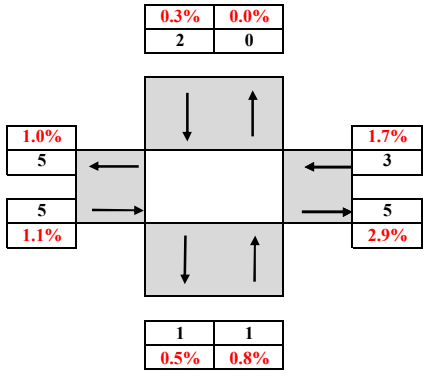
PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**ISLAND DRIVE**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**	**FILE:**	**3501001-12R (PM)**

PEAK HOUR
5:00 PM to 6:00 PM

NORTH



TRUCK ARRIVAL / DEPARTURE VOLUMES & PERCENTAGE (TOTAL TRUCK PERCENTAGE IN RED)



TIME PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From	To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																		
4:00 PM	4:15 PM		0	0	0		0	0	0		0	1	0		0	1	0	**2**
4:15 PM	4:30 PM		0	0	0		1	0	1		1	1	0		0	1	0	**5**
4:30 PM	4:45 PM		0	1	0		1	0	2		1	2	0		0	2	0	**9**
4:45 PM	5:00 PM		0	1	0		1	0	2		2	3	0		0	2	0	**11**
5:00 PM	5:15 PM		1	1	0		1	0	3		2	4	0		0	3	0	**15**
5:15 PM	5:30 PM		1	1	0		1	0	3		2	6	0		0	4	0	**18**
5:30 PM	5:45 PM		1	1	0		1	0	3		2	7	0		0	5	0	**20**
5:45 PM	6:00 PM		1	1	0		1	1	3		2	8	0		0	5	0	**22**
TOTAL BY PERIOD																		
4:00 PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	**2**
4:15 PM	4:30 PM	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	**3**
4:30 PM	4:45 PM	0	0	1	0	0	0	0	1	0	0	1	0	0	0	1	0	**4**
4:45 PM	5:00 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	**2**
5:00 PM	5:15 PM	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	**4**
5:15 PM	5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	**3**
5:30 PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	**2**
5:45 PM	6:00 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	**2**
HOURLY TOTALS																		
4:00 PM	5:00 PM	0	0	1	0	0	1	0	2	0	2	3	0	0	0	2	0	**11**
4:15 PM	5:15 PM	0	1	1	0	0	1	0	3	0	2	3	0	0	0	2	0	**13**
4:30 PM	5:30 PM	0	1	1	0	0	0	0	2	0	1	5	0	0	0	3	0	**13**
4:45 PM	5:45 PM	0	1	0	0	0	0	0	1	0	1	5	0	0	0	3	0	**11**
5:00 PM	6:00 PM	0	1	0	0	0	0	1	1	0	0	5	0	0	0	3	0	**11**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

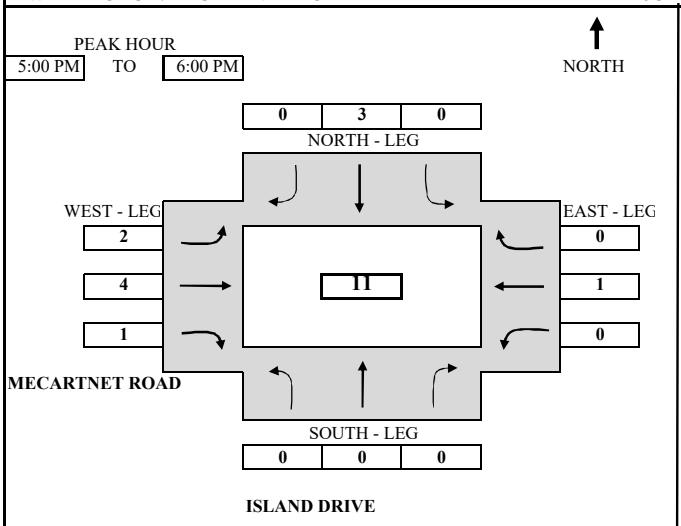
5:00 PM to 6:00 PM

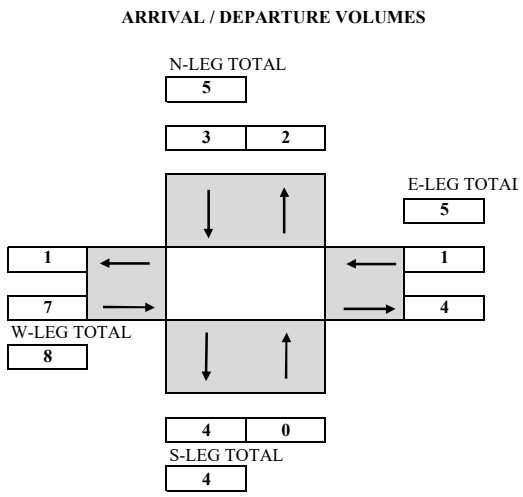
DIRECTION	NB		SB		EB		WB		OVERALL
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	INTERSECTION
TRUCK VOLUMES	1	0	2	1	5	5	3	5	11
TRUCK PERCENTAGE	0.8%	0.0%	0.3%	0.5%	1.1%	2.9%	1.7%	1.0%	0.8%

B.A.Y.M.E.T.R.I.C.S.

BICYCLE MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**ISLAND DRIVE**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**	**FILE:**	**3501001-12R (PM)**





TIME PERIOD			NB (SOUTH - LEG)			SB (NORTH - LEG)			EB (WEST - LEG)			WB (EAST - LEG)			TOTAL
From		To	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	
SURVEY DATA															
4:00 PM	to	4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
4:30 PM	to	4:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	**2**
4:45 PM	to	5:00 PM	0	0	0	0	1	0	1	1	0	0	1	0	**4**
5:00 PM	to	5:15 PM	0	0	0	0	2	0	1	3	0	0	1	0	**7**
5:15 PM	to	5:30 PM	0	0	0	0	2	0	3	4	0	0	1	0	**10**
5:30 PM	to	5:45 PM	0	0	0	0	4	0	3	4	0	0	2	0	**13**
5:45 PM	to	6:00 PM	0	0	0	0	4	0	3	5	1	0	2	0	**15**
TOTAL BY PERIOD															
4:00 PM	to	4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	**1**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	to	4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	**1**
4:45 PM	to	5:00 PM	0	0	0	0	1	0	0	0	0	0	1	0	**2**
5:00 PM	to	5:15 PM	0	0	0	0	1	0	0	2	0	0	0	0	**3**
5:15 PM	to	5:30 PM	0	0	0	0	0	0	2	1	0	0	0	0	**3**
5:30 PM	to	5:45 PM	0	0	0	0	2	0	0	0	0	0	1	0	**3**
5:45 PM	to	6:00 PM	0	0	0	0	0	0	0	1	1	0	0	0	**2**
HOURLY TOTALS															
4:00 PM	to	5:00 PM	0	0	0	0	1	0	1	1	0	0	1	0	**4**
4:15 PM	to	5:15 PM	0	0	0	0	2	0	1	2	0	0	1	0	**6**
4:30 PM	to	5:30 PM	0	0	0	0	2	0	3	3	0	0	1	0	**9**
4:45 PM	to	5:45 PM	0	0	0	0	4	0	2	3	0	0	2	0	**11**
5:00 PM	to	6:00 PM	0	0	0	0	3	0	2	4	1	0	1	0	**11**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

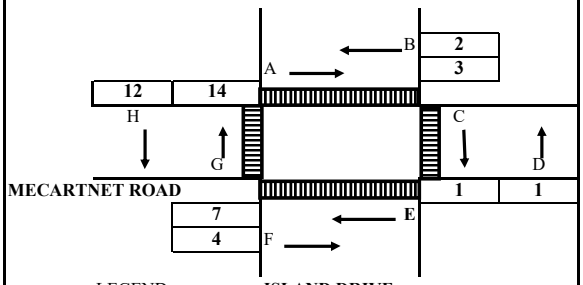
5:00 PM to 6:00 PM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	0	3	7	1	**11**

B.A.Y.M.E.T.R.I.C.S.

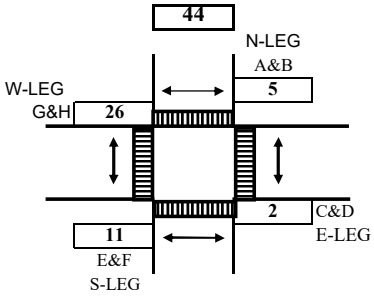
PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**ALAMEDA ON-CALL SERVICE - 1**	**SURVEY DATE:**	**1/13/2015**
N-S APPROACH:	**ISLAND DRIVE**	**DAY:**	**TUESDAY**
E-W APPROACH:	**MECARTNET ROAD**	**JURISDICTION:**	**ALAMEDA**
SURVEY PERIOD:	**4:00 PM TO 6:00 PM**	**FILE:**	**3501001-12R (PM)**

PEAK HOUR
05:00 PM TO 06:00 PM



PEAK HOUR
TOTAL PEDESTRIAN VOLUMES



NB(D+G)	**15**
SB(C+H)	**13**
EB(A+F)	**7**
WB(B+E)	**9**

TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
04:00 PM	---	04:15 PM	1	1	0	0	1	0	1	0	***4***
04:15 PM	---	04:30 PM	1	4	0	1	1	1	4	6	***18***
04:30 PM	---	04:45 PM	4	6	0	1	4	1	4	6	***26***
04:45 PM	---	05:00 PM	4	11	0	2	8	5	5	12	***47***
05:00 PM	---	05:15 PM	4	11	0	2	8	6	7	15	***53***
05:15 PM	---	05:30 PM	5	11	0	3	12	8	12	15	***66***
05:30 PM	---	05:45 PM	6	11	0	3	15	8	18	20	***81***
05:45 PM	---	06:00 PM	7	13	1	3	15	9	19	24	***91***
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	1	1	0	0	1	0	1	0	***4***
04:15 PM	---	04:30 PM	0	3	0	1	0	1	3	6	***14***
04:30 PM	---	04:45 PM	3	2	0	0	3	0	0	0	***8***
04:45 PM	---	05:00 PM	0	5	0	1	4	4	1	6	***21***
05:00 PM	---	05:15 PM	0	0	0	0	0	1	2	3	***6***
05:15 PM	---	05:30 PM	1	0	0	1	4	2	5	0	***13***
05:30 PM	---	05:45 PM	1	0	0	0	3	0	6	5	***15***
05:45 PM	---	06:00 PM	1	2	1	0	0	1	1	4	***10***
HOURLY TOTALS											
04:00 PM	---	05:00 PM	4	11	0	2	8	5	5	12	***47***
04:15 PM	---	05:15 PM	3	10	0	2	7	6	6	15	***49***
04:30 PM	---	05:30 PM	4	7	0	2	11	7	8	9	***48***
04:45 PM	---	05:45 PM	2	5	0	2	11	7	14	14	***55***
05:00 PM	---	06:00 PM	3	2	1	1	7	4	14	12	***44***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

5:00 PM to 6:00 PM	NB	SB	EB	WB	TOTAL
VOLUME BY LEG	(D+G)	(C+H)	(A+F)	(B+E)	
PEDESTRIAN	15	13	7	9	**44**

Appendix B
Operations Analysis Worksheets

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro
Report File: H:\...\Existing AM.pdf

Scenario 1 Existing AM
9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	All-way stop	HCM 6th Edition	EB Left	1.042	35.0	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Generated with PTV VISTRO

Version 2021 (SP 0-6)

Intersection Level Of Service Report

Intersection 1: Island Drive and Mecartney Road

Control Type:	All-way stop	Delay (sec / veh):	35.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.042

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Peak Hour Factor	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780	0.780
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	57	5	14	25	74	122	49	3	0	17	25
Total Analysis Volume [veh/h]	29	227	19	55	100	297	487	195	13	1	67	100
Pedestrian Volume [ped/h]	37			6			2			3		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	476	441	470	515	515	487	499	550	430	468
Degree of Utilization, x	0.58	0.12	0.21	0.29	0.29	1.04	0.39	0.02	0.16	0.21

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.59	0.42	0.80	1.18	1.18	14.81	1.84	0.07	0.56	0.80
95th-Percentile Queue Length [ft]	89.78	10.59	19.97	29.61	29.61	370.18	45.95	1.81	13.91	20.07
Approach Delay [s/veh]	20.40	12.42				60.86			12.55	
Approach LOS	C	B				F			B	
Intersection Delay [s/veh]	34.99									
Intersection LOS	D									

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 1 Existing AM

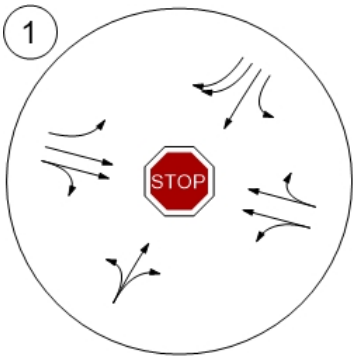
Report File: H:\...\Existing AM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	23	177	15	43	78	232	380	152	10	1	52	78	1241

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro
Report File: H:\...\Existing PM.pdf

Scenario 2 Existing PM
9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	All-way stop	HCM 6th Edition	EB Left	0.916	23.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Generated with PTV VISTRO

Version 2021 (SP 0-6)

Intersection Level Of Service Report

Intersection 1: Island Drive and Mecartney Road

Control Type:	All-way stop	Delay (sec / veh):	23.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.916

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Peak Hour Factor	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	6	29	3	28	43	110	106	22	9	5	34	12
Total Analysis Volume [veh/h]	26	116	10	112	171	440	424	90	35	21	137	48
Pedestrian Volume [ped/h]	15			13			7			9		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	454	464	496	549	549	463	493	543	435	458
Degree of Utilization, x	0.34	0.24	0.34	0.40	0.40	0.92	0.18	0.06	0.24	0.22

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.46	0.93	1.52	1.92	1.92	10.42	0.66	0.21	0.91	0.85
95th-Percentile Queue Length [ft]	36.42	23.37	38.06	48.02	48.02	260.38	16.53	5.15	22.75	21.34
Approach Delay [s/veh]	14.89	13.52				42.15			13.17	
Approach LOS	B	B				E			B	
Intersection Delay [s/veh]	23.25									
Intersection LOS	C									

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 2 Existing PM

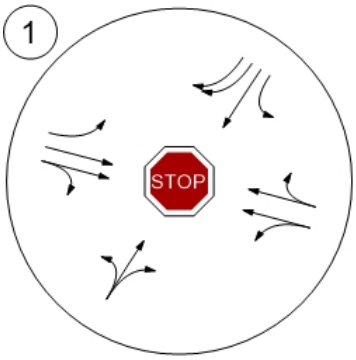
Report File: H:\...\Existing PM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	22	100	9	96	147	378	365	77	30	18	118	41	1401

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 3 Signal AM

Report File: H:\...\Signal AM.pdf

9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	Signalized	HCM 6th Edition	WB Left	0.655	42.7	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Island Drive and Mecartney Road

Control Type:	Signalized	Delay (sec / veh):	42.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	57	5	14	25	74	122	49	3	0	17	25
Total Analysis Volume [veh/h]	29	227	19	55	100	297	487	195	13	1	67	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	42	0	0	42	0	55	89	0	9	43	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	33	0	0	32	0	0	22	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		Yes			Yes		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	140	140	140	140	140	140	140	140
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	72	72	72	72	40	56	0	16
g / C, Green / Cycle	0.51	0.51	0.51	0.51	0.29	0.40	0.00	0.11
(v / s)_i Volume / Saturation Flow Rate	0.03	0.13	0.05	0.24	0.27	0.11	0.00	0.10
s, saturation flow rate [veh/h]	987	1845	1134	1652	1781	1850	1781	1691
c, Capacity [veh/h]	390	944	530	845	514	741	3	193
d1, Uniform Delay [s]	31.11	19.26	24.57	21.97	48.70	28.29	69.75	60.96
k, delay calibration	0.50	0.50	0.50	0.50	0.28	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.37	0.67	0.39	1.87	19.40	0.20	49.19	11.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.07	0.26	0.10	0.47	0.95	0.28	0.32	0.87
d, Delay for Lane Group [s/veh]	31.48	19.93	24.97	23.84	68.10	28.50	118.94	72.09
Lane Group LOS	C	B	C	C	E	C	F	E
Critical Lane Group	No	No	No	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.72	4.75	1.19	8.86	19.37	4.82	0.08	6.44
50th-Percentile Queue Length [ft/ln]	17.93	118.75	29.77	221.53	484.18	120.51	1.98	161.10
95th-Percentile Queue Length [veh/ln]	1.29	8.32	2.14	13.74	26.58	8.42	0.14	10.61
95th-Percentile Queue Length [ft/ln]	32.28	208.11	53.59	343.58	664.61	210.53	3.56	265.18

Movement, Approach, & Intersection Results

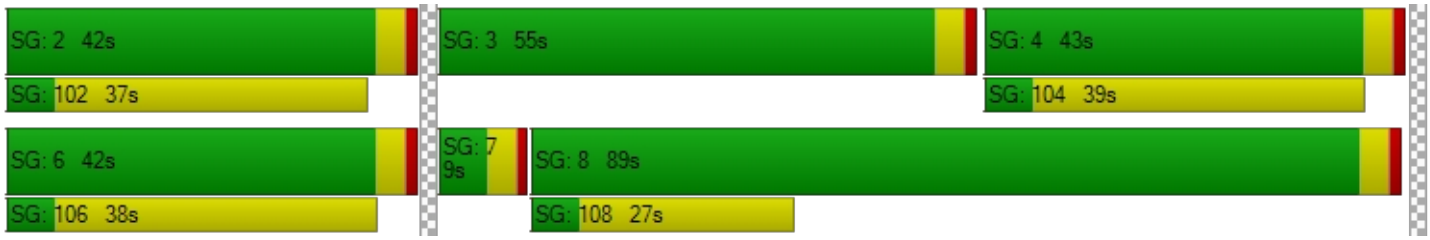
d_M, Delay for Movement [s/veh]	31.48	19.93	19.93	24.97	23.84	23.84	68.10	28.50	28.50	118.94	72.09	72.09
Movement LOS	C	B	B	C	C	C	E	C	C	F	E	E
d_A, Approach Delay [s/veh]	21.15			23.98			56.25			72.37		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	42.71											
Intersection LOS	D											
Intersection V/C	0.655											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	61.27	61.27	61.27	61.27
l_p,int, Pedestrian LOS Score for Intersection	2.089	2.462	2.460	2.338
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	543	543	1215	557
d_b, Bicycle Delay [s]	37.14	37.14	10.79	36.42
l_b,int, Bicycle LOS Score for Intersection	2.013	2.305	2.706	1.837
Bicycle LOS	B	B	B	A

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 3 Signal AM

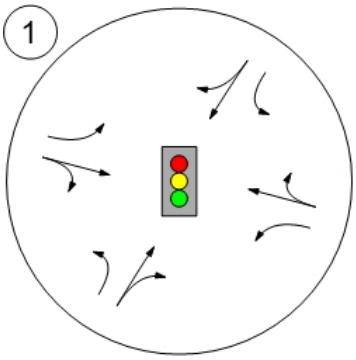
Report File: H:\...\Signal AM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	23	177	15	43	78	232	380	152	10	1	52	78	1241

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 4 Signal PM

Report File: H:\...\Signal PM.pdf

9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	Signalized	HCM 6th Edition	WB Left	0.763	41.4	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Island Drive and Mecartney Road

Control Type:	Signalized	Delay (sec / veh):	41.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Peak Hour Factor	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860	0.860
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	6	29	3	28	43	110	106	22	9	5	34	12
Total Analysis Volume [veh/h]	26	116	10	112	171	440	424	90	35	21	137	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	42	0	0	42	0	45	77	0	11	43	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	33	0	0	32	0	0	22	0	0	34	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		Yes			Yes		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	L	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	69	69	69	69	33	46	3	16
g / C, Green / Cycle	0.53	0.53	0.53	0.53	0.25	0.35	0.02	0.12
(v / s)_i Volume / Saturation Flow Rate	0.03	0.07	0.09	0.37	0.24	0.07	0.01	0.10
s, saturation flow rate [veh/h]	810	1844	1264	1659	1781	1782	1781	1788
c, Capacity [veh/h]	255	985	667	886	452	629	37	214
d1, Uniform Delay [s]	38.08	15.15	19.03	22.35	47.46	29.25	63.04	56.14
k, delay calibration	0.50	0.50	0.50	0.50	0.28	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.80	0.27	0.54	4.38	19.66	0.15	12.86	9.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	0.13	0.17	0.69	0.94	0.20	0.57	0.86
d, Delay for Lane Group [s/veh]	38.88	15.42	19.57	26.73	67.12	29.41	75.90	66.04
Lane Group LOS	D	B	B	C	E	C	E	E
Critical Lane Group	No	No	No	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.71	1.96	2.04	14.57	15.85	2.78	0.82	6.55
50th-Percentile Queue Length [ft/ln]	17.74	49.00	50.99	364.30	396.26	69.44	20.56	163.76
95th-Percentile Queue Length [veh/ln]	1.28	3.53	3.67	20.83	22.38	5.00	1.48	10.75
95th-Percentile Queue Length [ft/ln]	31.94	88.21	91.77	520.81	559.49	124.98	37.01	268.69

Movement, Approach, & Intersection Results

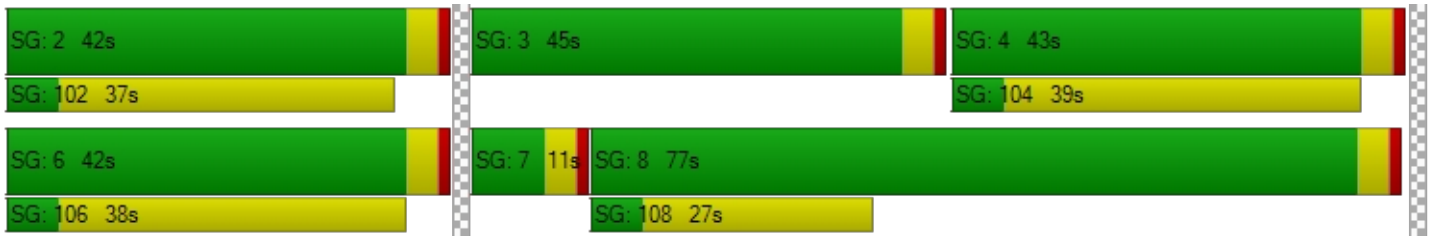
d_M, Delay for Movement [s/veh]	38.88	15.42	15.42	19.57	26.73	26.73	67.12	29.41	29.41	75.90	66.04	66.04
Movement LOS	D	B	B	B	C	C	E	C	C	E	E	E
d_A, Approach Delay [s/veh]	19.43			25.62			58.53			67.04		
Approach LOS	B			C			E			E		
d_I, Intersection Delay [s/veh]	41.36											
Intersection LOS	D											
Intersection V/C	0.763											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	56.30	56.30	56.30	56.30
l_p,int, Pedestrian LOS Score for Intersection	2.082	2.470	2.468	2.411
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	585	585	1123	600
d_b, Bicycle Delay [s]	32.54	32.54	12.49	31.84
l_b,int, Bicycle LOS Score for Intersection	1.810	2.753	2.465	1.900
Bicycle LOS	A	C	B	A

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 4 Signal PM

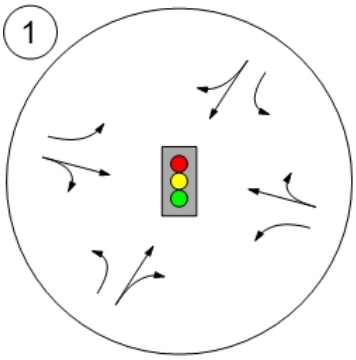
Report File: H:\...\Signal PM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	22	100	9	96	147	378	365	77	30	18	118	41	1401

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 5 Roundabout AM

Report File: H:\...\RBT AM.pdf

9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	Roundabout	HCM 6th Edition	NB Thru		9.7	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Island Drive and Mecartney Road

Control Type:	Roundabout	Delay (sec / veh):	9.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	57	5	14	25	74	122	49	3	0	17	25
Total Analysis Volume [veh/h]	29	227	19	55	100	297	487	195	13	1	67	100
Pedestrian Volume [ped/h]	37			6			2			18		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	752			99			159			758		
Exiting Flow Rate [veh/h]	116			830			401			274		
Demand Flow Rate [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Adjusted Demand Flow Rate [veh/h]	29	227	19	55	100	297	487	195	13	1	67	100

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	281	462	709	172
Capacity of Entry and Bypass Lanes [veh/h]	642	1248	1174	638
Pedestrian Impedance	0.99	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	626	1223	1150	624
X, volume / capacity	0.44	0.37	0.60	0.27

Movement, Approach, & Intersection Results

Lane LOS	B	A	B	A
95th-Percentile Queue Length [veh]	2.24	1.73	4.26	1.09
95th-Percentile Queue Length [ft]	56.02	43.25	106.59	27.17
Approach Delay [s/veh]	12.40	6.51	10.81	9.25
Approach LOS	B	A	B	A
Intersection Delay [s/veh]	9.70			
Intersection LOS	A			

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 5 Roundabout AM

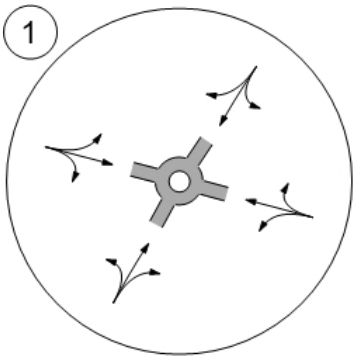
Report File: H:\...\RBT AM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	23	177	15	43	78	232	380	152	10	1	52	78	1241

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 6 Roundabout PM

Report File: H:\...\RBT PM.pdf

9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	Roundabout	HCM 6th Edition	SB Right		10.8	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Island Drive and Mecartney Road

Control Type:	Roundabout	Delay (sec / veh):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	29	3	28	43	110	106	22	9	5	34	12
Total Analysis Volume [veh/h]	26	116	10	112	171	440	424	90	35	21	137	48
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	639			188			310			577		
Exiting Flow Rate [veh/h]	232			600			615			216		
Demand Flow Rate [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Adjusted Demand Flow Rate [veh/h]	26	116	10	112	171	440	424	90	35	21	137	48

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	156	738	560	211
Capacity of Entry and Bypass Lanes [veh/h]	720	1140	1006	766
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	706	1118	987	751
X, volume / capacity	0.22	0.65	0.56	0.27

Movement, Approach, & Intersection Results

Lane LOS	A	B	B	A
95th-Percentile Queue Length [veh]	0.81	5.00	3.54	1.12
95th-Percentile Queue Length [ft]	20.36	124.89	88.47	27.90
Approach Delay [s/veh]	7.58	12.16	10.92	7.97
Approach LOS	A	B	B	A
Intersection Delay [s/veh]	10.79			
Intersection LOS	B			

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 6 Roundabout PM

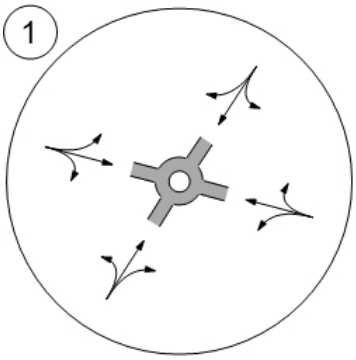
Report File: H:\...\RBT PM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	22	100	9	96	147	378	365	77	30	18	118	41	1401

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro
Report File: H:\...\AWSC AM.pdf

Scenario 7 AWSC AM
9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	All-way stop	HCM 6th Edition	EB Left	1.084	42.0	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Island Drive and Mecartney Road

Control Type:	All-way stop	Delay (sec / veh):	42.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.084

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	177	15	43	78	232	380	152	10	1	52	78
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	57	5	14	25	74	122	49	3	0	17	25
Total Analysis Volume [veh/h]	29	227	19	55	100	297	487	195	13	1	67	100
Pedestrian Volume [ped/h]	37			6			2			18		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	448	444	499	487	483	442
Degree of Utilization, x	0.61	0.35	0.60	1.08	0.43	0.38

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.01	1.54	3.84	16.09	2.14	1.75
95th-Percentile Queue Length [ft]	100.34	38.50	95.98	402.24	53.48	43.73
Approach Delay [s/veh]	22.94	18.32		71.32		16.05
Approach LOS	C	C		F		C
Intersection Delay [s/veh]	42.05					
Intersection LOS	E					

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 7 AWSC AM

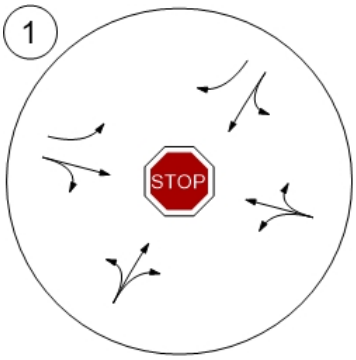
Report File: H:\...\AWSC AM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	23	177	15	43	78	232	380	152	10	1	52	78	1241

Lane Configuration and Traffic Control



Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro
Report File: H:\...\AWSC PM.pdf

Scenario 8 AWSC PM
9/20/2021

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Island Drive and Mecartney Road	All-way stop	HCM 6th Edition	EB Left	0.973	36.3	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Island Drive and Mecartney Road

Control Type:	All-way stop	Delay (sec / veh):	36.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.973

Intersection Setup

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Island Drive			Island Drive			Mecartney Road			Mecartney Road		
Base Volume Input [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	100	9	96	147	378	365	77	30	18	118	41
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	29	3	28	43	110	106	22	9	5	34	12
Total Analysis Volume [veh/h]	26	116	10	112	171	440	424	90	35	21	137	48
Pedestrian Volume [ped/h]	15			13			7			9		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	410	455	514	436	477	430
Degree of Utilization, x	0.37	0.62	0.86	0.97	0.26	0.48

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.68	4.15	9.02	11.89	1.04	2.53
95th-Percentile Queue Length [ft]	42.04	103.72	225.58	297.26	26.02	63.23
Approach Delay [s/veh]	16.88	32.36		53.36		18.82
Approach LOS	C	D		F		C
Intersection Delay [s/veh]	36.28					
Intersection LOS	E					

Vistro File: H:\...\IntersectionAnalysis_MGA_revd volumes.vistro

Scenario 8 AWSC PM

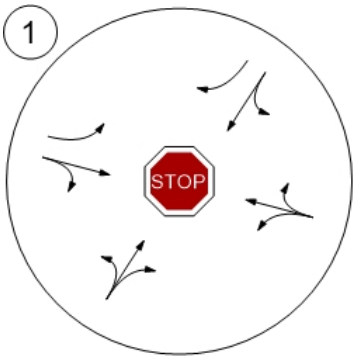
Report File: H:\...\AWSC PM.pdf

9/20/2021

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Island Drive and Mecartney Road	22	100	9	96	147	378	365	77	30	18	118	41	1401

Lane Configuration and Traffic Control



Appendix C
Signal Warrant Analysis

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 24846
Project Name: Island/Mecartney Evaluation
Analyst: MGA
Date: 9/21/2021
File: H:\24\24846 - City of Alameda On-Call Services 2020\001 - Citywide Roundabout Analysis\Task 5 ICE Review and Community
Intersection: Island/Mecartney
Scenario: 2021 EC - AM Peak Hour

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
7:30 AM	8:30 AM	542	131	215	353
2nd Highest Hour		513	124	192	315
3rd Highest Hour		506	122	166	273
4th Highest Hour		484	117	164	269
5th Highest Hour		477	115	146	239
6th Highest Hour		477	115	143	235
7th Highest Hour		455	110	139	228
8th Highest Hour		448	108	127	209
9th Highest Hour		434	105	120	197
10th Highest Hour		405	98	116	190
11th Highest Hour		390	94	113	186
12th Highest Hour		383	93	113	186
13th Highest Hour		369	89	111	182
14th Highest Hour		318	77	92	152
15th Highest Hour		253	61	90	148
16th Highest Hour		238	58	65	106
17th Highest Hour		166	40	65	106
18th Highest Hour		137	33	44	72
19th Highest Hour		72	17	28	46
20th Highest Hour		51	12	23	38
21st Highest Hour		43	10	12	19
22nd Highest Hour		29	7	9	15
23rd Highest Hour		14	3	9	15
24th Highest Hour		14	3	7	11

Warrant Summary

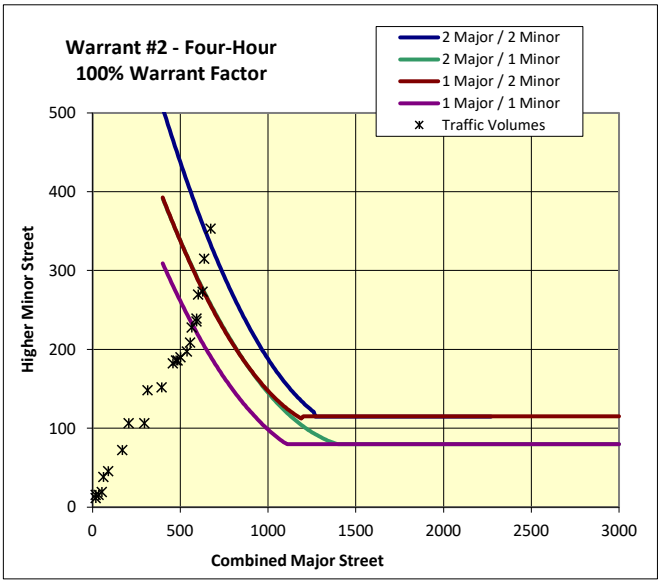
Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	Yes	No
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

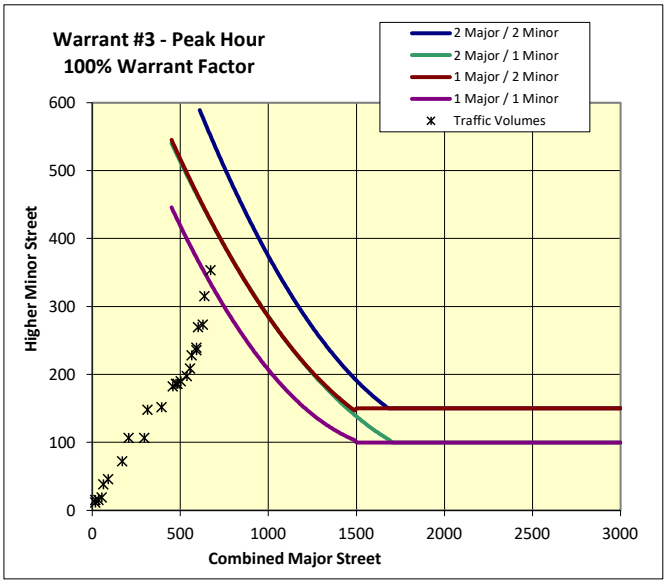
Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	2
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	76%
Minor Street: 8th-Highest Hour / Peak Hour	59%

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	200	4	No	**No**
	B	900	100	0	No	
80%	A	480	160	11	Yes	**Yes**
	B	720	80	0	No	
70%	A	420	140	13	Yes	**Yes**
	B	630	70	2	No	
56%	A	336	112	14	Yes	**Yes**
	B	504	56	9	Yes	





KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230

Project #: 24846
Project Name: Island/Mecartney Evaluation
Analyst: MGA
Date: 9/21/2021
File: H:\24\24846 - City of Alameda On-Call Services 2020\001 - Citywide Roundabout Analysis\Task 5 ICE Review and Community
Intersection: Island/Mecartney
Scenario: 2021 EC - PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	Yes	No
#8	Roadway Network	No	-
#9	Intersection Near a Grade Crossing	No	-

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	2
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	89%
Major Street: 8th-Highest Hour / Peak Hour	83%
Minor Street: 4th-Highest Hour / Peak Hour	76%
Minor Street: 8th-Highest Hour / Peak Hour	59%

Analysis Traffic Volumes

Hour Begin	Hour End	Major Street EB	Major Street WB	Minor Street NB	Minor Street SB
5:00 PM	6:00 PM	472	178	131	621
2nd Highest Hour		447	169	117	554
3rd Highest Hour		441	166	101	481
4th Highest Hour		422	159	100	474
5th Highest Hour		415	157	89	421
6th Highest Hour		415	157	87	414
7th Highest Hour		396	150	85	401
8th Highest Hour		390	147	77	367
9th Highest Hour		378	142	73	347
10th Highest Hour		352	133	70	334
11th Highest Hour		340	128	69	327
12th Highest Hour		334	126	69	327
13th Highest Hour		321	121	68	321
14th Highest Hour		277	104	56	267
15th Highest Hour		220	83	55	260
16th Highest Hour		208	78	39	187
17th Highest Hour		145	55	39	187
18th Highest Hour		120	45	27	127
19th Highest Hour		63	24	17	80
20th Highest Hour		44	17	14	67
21st Highest Hour		38	14	7	33
22nd Highest Hour		25	9	6	27
23rd Highest Hour		13	5	6	27
24th Highest Hour		13	5	4	20

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	600	200	3	No	**No**
	B	900	100	0	No	
80%	A	480	160	10	Yes	**Yes**
	B	720	80	0	No	
70%	A	420	140	13	Yes	**Yes**
	B	630	70	1	No	
56%	A	336	112	14	Yes	**Yes**
	B	504	56	9	Yes