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Technical Memorandum

Date: May 2, 2014

To: Scott Creer, City of Morgan Hill Public Works Department
Karl Bjarke, City of Morgan Hill Public Works Department

From: Leo Trujillo, PE, TE, Hatch Mott MacDonald
Jeff Waller, TE, Hatch Mott MacDonald

Re: Morgan Hill Baseball Fields, Morgan Hill, California

This technical memorandum summarizes our analysis associated with the proposed baseball fields and retail project at Tennant Avenue and US 101 in Morgan Hill, California. **Exhibit 1A** depicts the project location, while **Exhibit 1B** depicts the project site plan.

The project applicant for this project is proposing to add a full-access driveway off of Tennant Avenue at Condit Road. You have asked Hatch Mott MacDonald (HMM) to evaluate four different access alternatives for the project and prepared and prepare conceptual designs of the preferred access. This technical memorandum summarizes that work.

A. Project Definition

The project consists of the following components:

- 2 baseball fields (with bleachers);
- 4 softball fields (with bleachers); and
- 23,750 square feet of retail.

Exhibit 1B depicts the project site plan. The baseball/softball fields would comprise the bulk of the property, with the retail situated at the northern portion of the project site (near Tennant Avenue). Parking spaces would surround both the baseball/softball fields and the retail buildings.

The project applicant proposes two project access points. The primary project access would be via a new south approach to the Condit Road / Tennant Avenue intersection, providing access to the on-site parking area and the retail space. A secondary access would be via Fisher Avenue, along the south frontage of the project site. Additional perpendicular parking spaces would be added on Fisher Avenue along the project frontage.

B. Existing Condition Analysis

A total of four access alternatives have been analyzed within this scope of work:

1. Full Access from Tennant Avenue (current site plan layout)
2. No Access off of Tennant Avenue (i.e. access only from Fisher Avenue)
3. Right-In Only from Tennant Avenue (with full access from Fisher)
4. Right-In Only from Tennant with Retail Exit (with full access from Fisher)

Each alternative was analyzed under two analysis scenarios –Existing plus Project and Cumulative Conditions. Existing Conditions (i.e. without the project) has also been analyzed. Each scenario was evaluated during both weekday PM and Saturday midday peak hours.

The following four intersections have been analyzed:

1. Southbound US 101 Ramps / Tennant Avenue;
2. Northbound US 101 Ramps / Tennant Avenue;
3. Condit Road / Tennant Avenue; and
4. Murphy Avenue / Tennant Avenue.

The latter three study intersections are located within relatively close proximity of each other, as indicated within **Exhibit 2**. While the Northbound and Southbound US 101 Ramp intersections with Tennant Avenue are over 1,300 feet apart, the Northbound US 101 Ramps and Condit Road are only 315 feet away from each other, while Condit Road and Murphy Avenue are a more modest 525 feet apart. The close intersection spacing along this section of Tennant Avenue limits the amount of vehicle queuing that can occur between intersections.

The Existing PM traffic volumes evaluated within this analysis are taken from *South-East Quadrant General Plan Amendment Final Transportation Impact Analysis*, Fehr & Peers, December 13, 2013. Weekend volumes were estimated based upon the ratio of existing weekend versus weekday PM traffic from the *Cochrane Road PUD* traffic impact analysis, Fehr & Peers, June 2005. Volumes along the Tennant Avenue corridor were balanced between study intersections in order to eliminate volume differences between adjacent intersections.

Exhibit 3 depicts the existing traffic volumes at the four study intersections under both the weekday PM and Saturday midday peak hours.

Exhibit 4A summarizes the intersection operations under Existing conditions, including levels of service and intersection delays. This analysis uses the 2000 Highway Capacity Manual methodologies and the VTA traffic study guidelines, except that the analysis software Synchro 8 was utilized instead of Traffix. This substitution of analysis software was made in order to more fully evaluate the traffic operations between study intersections and the study corridor as a whole.

All four of the study intersections currently operate at or better than the City of Morgan Hill level of service standards of LOS D (Murphy / Tennant) and LOS E (all other study intersections). Level of service calculations can be found within **Appendix A**.

A queuing analysis was also performed at the study intersections, in order to determine if any exclusive turn lanes would overflow into adjacent lanes or if vehicle queues would extend far enough back to affect the operations of upstream intersections. **Exhibit 4B** summarizes the vehicle queues of the turn and through lanes at the study intersections, while the actual queuing calculations can be found within **Appendix B**. Under Existing conditions, the vehicle queues in all turn lanes are far less than the provided storage lengths and no vehicle queues would extend far enough back to affect traffic operations at adjacent intersections.

C. Project Trip Generation, Distribution and Assignment

A trip generation estimate has been prepared for the study project, using primarily trip generation rates from *Trip Generation Manual*, Institute of Transportation Engineering, 9th Edition. The *Trip Generation Manual* does not include trip rates for baseball fields; the baseball field trip rates used in this analysis are cited from the report *Traffic Study for the Sepulveda Basin Sports Complex*, Kaku Associates, February 2006. This analysis assumes that there is no difference in trip generation activity between baseball fields and softball fields.

The site plan has split the retail space into four different retail "pads," or individual pieces, ranging in size between approximately 7,100 to 16,700 square feet in size. The exact uses of these retail spaces are uncertain at this time. For the purposes of this analysis, it is assumed that the uses include a fast-food restaurant without a drive-through, a high-turn-over sit-down restaurant, and general retail.

Exhibit 5A summarizes the trip generation estimate for the project. The project is estimated to generate a total of 3,382 weekday daily trips, with 242 trip during the weekday PM peak hour (164 in, 78 out), and 4,336 Saturday daily trips, with 481 trips during the Saturday midday peak hour (244 in, 237 out).

Note: The project trip generation estimate includes trip reductions for both internal traffic and pedestrian/bicycle traffic. First, the retail trip generation has been reduced by 50% to account for patronization by attendees of events at the baseball and softball fields. Second, an overall trip reduction of 10% was applied for pedestrian and bicycle traffic traveling to and from the project site. The pedestrian activity will be most pronounced surrounding events at the baseball and softball fields.

Exhibit 5B depicts the projected project trip distribution. The overall trip distribution is split between trips remaining within the greater Morgan Hill area (25%) and regional trips traveling via the US 101 freeway (75%). This split reflects the assumption that the retail uses will be open to the public outside of the normal operating hours of the baseball and softball fields, and thus would attract patrons from both the baseball/softball fields and the surrounding area. Also, a small number of attendees for the baseball and softball events would be from the greater Morgan Hill area. Finally, some attendees will be visitors to the area who are staying at local hotels but drive to the site during events. For these reasons, the project trip distribution incorporates a wide variety of destinations, such as the US 101 freeway, Tennant Avenue and Condit Road.

The directional split of traffic via US 101 incorporates a considerably higher trip distribution percentage to/from the north compared to the south due to the baseball and softball fields. This is consistent with other sports facilities within Morgan Hill, which experience average freeway trip distributions of about 85% to/from the north and 15% to/from the south, according to City of Morgan Hill staff.

Exhibits 6A through 6D depict the project trip assignment under all four access alternatives. They represent the traffic activity for all components of the project, including the retail uses.

Note: The project site plan does not provide for the fast-food restaurant to have a drive-through. Due to this and the fact the restaurant would be offset from the street, no pass-by traffic is anticipated to be generated by the restaurant. (For clarification, "pass-by" traffic is defined as existing traffic already on the surrounding streets that makes a small diversion into the project site prior to continuing onto its ultimate destination. Fast-food restaurants with drive-through windows and that front roadways typically generate pass-by traffic.)

The trip assignments within **Exhibits 6A** through **6D** vary due to the differences in site access between the four access alternatives. For example, **Exhibit 6A** contains the trip assignment for Alternative #1, which allows full access at a new access at the Condit / Tennant intersection, while **Exhibit 6B** contains the trip assignment for Alternative #2, which provides no access off of Tennant Avenue.

Also note that some attendees to the baseball and softball fields will be walking from the hotels located along Condit Road north of the project site. An estimated 20 pedestrians (weekday PM peak hour) and 50 pedestrians (Saturday midday peak hour) are anticipated to cross Tennant Avenue at Condit Road in a one-hour period while traveling to and from the project site. This projected pedestrian traffic has been incorporated into the analysis at the Condit / Tennant intersection, assumed to cross only the east approach of Tennant Avenue so as to minimize the effect upon intersection operations.

D. Existing plus Project Condition Analysis

The project trip assignments depicted within **Exhibits 6A** through **6D** were added to the Existing volumes to create the Existing Plus Project volumes contained within **Exhibits 7A** through **7D**. Level of service calculations can be found within **Appendix A**.

Most of the study intersections will continue to operate at acceptable levels of service with addition of the project traffic. The intersections that would operate deficiently are the following, organized by access alternative:

- Alternative #1:
  - Condit / Tennant – LOS F (overall and side-street, Saturday midday only)
- Alternative #2: None
- Alternative #3: None
- Alternative #4:
  - Condit / Tennant – LOS F (side-street, Saturday midday only)

The Caltrans signal warrant is met at the Condit/Tennant intersection during the Saturday midday peak hour. Signalization of this intersection is recommended under Alternatives #1 and #4, both of which would have traffic exiting the project site onto Tennant Avenue. (Signal warrants can be found within **Appendix C**.)

Exhibit 4B summarizes the vehicle queues of the turn and through lanes at the study intersections under all four access alternatives. (See **Appendix B** for the queuing calculations.) Under Existing plus Project conditions with all four access alternatives, the vehicle queues in all turn lanes are far less than the provided storage

lengths and no vehicle queues would extend far enough back to affect traffic operations at adjacent intersections. However, queues of vehicles leaving the site would extend beyond the 100-foot long driveway throat proposed by the project applicant, potentially blocking some on-site parking spaces.

Pedestrian activity crossing Tenant Avenue at Condit Road is not anticipated to have a major effect on vehicle operations under Existing conditions, assuming (as previously noted) that pedestrians cross Tennant across the east approach to the intersection. This crossing should be established as an enhanced crosswalk with appropriate pedestrian crossing warning signs, in order to increase pedestrian visibility. Additional signs should also be added to discourage pedestrian crossings of the west approach of Tennant Avenue as well as direct pedestrians to use the east crossing.

E. Cumulative plus Project Conditions Analysis

Cumulative plus Project conditions represent Year 2030 conditions with buildout of both the city General Plan and the South-East Quadrant uses. Cumulative traffic at the study intersections was derived from volumes depicted within the aforementioned Fehr & Peers traffic impact analysis for the South-East Quadrant area, with the proposed site uses under that study replaced with the project trip assignment projected within **Exhibits 6A** through **6D**. The Cumulative Plus Project traffic volumes are depicted within **Exhibits 8A** through **8D**.

Operations of the study intersections under Cumulative Conditions (see **Exhibit 4A and Appendix A**) are generally poor, operating below city standards in many cases. The intersections that would operate deficiently under Cumulative Conditions are the following, organized by access alternative:

- Alternative #1:
  - Southbound US 101 Ramps / Tennant Avenue – LOS F (Weekday PM and Saturday Midday);
  - Condit / Tennant – LOS F (overall and side-street, Weekday PM and Saturday midday); and
  - Murphy Avenue / Tennant Avenue – LOS F (Weekday PM and Saturday midday).
- Alternative #2:
  - Southbound US 101 Ramps / Tennant Avenue – LOS F (Weekday PM and Saturday Midday);
  - Condit / Tennant – LOS F (overall and side-street, Weekday PM and Saturday midday); and
  - Murphy Avenue / Tennant Avenue – LOS F (Weekday PM and Saturday midday).
- Alternative #3:
  - Southbound US 101 Ramps / Tennant Avenue – LOS F (Weekday PM and Saturday Midday);
  - Condit / Tennant – LOS F (overall and side-street, Weekday PM and Saturday midday); and
  - Murphy Avenue / Tennant Avenue – LOS F (Weekday PM and Saturday midday).

(continued on the following page)

- Alternative #4:
    - Southbound US 101 Ramps / Tennant Avenue – LOS F (Weekday PM and Saturday Midday);
    - Condit / Tennant – LOS F (overall and side-street, Weekday PM and Saturday midday); and
    - Murphy Avenue / Tennant Avenue – LOS F (Weekday PM and Saturday midday).

As noted earlier, the poor intersection operations are indicative of the projected growth in traffic in the area. The study project represents a relatively small proportion of that growth; this is reflected in the fact that operations under each of the four access alternatives are relatively similar. As such, there is no immediately obvious distinctions in either operations or necessary improvements between the four access alternatives under Cumulative conditions.

The large amount of traffic growth is also evident in the projected vehicle queues summarized in **Exhibit 4B**. (See **Appendix B** for the queuing calculations.) The lengths of some vehicle queues – specifically at the Condit / Tenant and Murphy / Tennant intersections – would lead to impacts at upstream intersections without implementation of improvements identified within the aforementioned Southeast Quadrant traffic study, such as widening Tennant Avenue to four lanes east of US 101 and signalization of the Condit / Tennant and Murphy / Tennant intersections. While the project would contribute to these vehicle queues, it would only be one of many projects contributing vehicle and pedestrian traffic to the Tennant Avenue corridor.

F. Recommendations

Overall, the study project's traffic impacts will be concentrated within a small portion of the Tennant Avenue corridor, specifically at its proposed access point off of Tennant Avenue. Based upon the operational analysis, if a full-access driveway into and out of the project site is established opposite the Condit / Tennant intersection (i.e. Alternatives 1 and 4), it will need to be signalized. However, if vehicular project access to Tennant Avenue is limited or prohibited (i.e. Alternatives 2 and 3), short-term traffic operations along Tennant Avenue will be within city standards.

Long term, various roadway and intersection improvements will need to be implemented along Tennant Avenue, for which the project will be responsible for a monetary contribution proportional to its share of the impact. Given the high traffic volumes and close intersection spacing along Tennant Avenue near the project site, providing full vehicular access to the project site (i.e. Alternatives 1 and 4) is not recommended in the long-term.

The sole difference between Alternatives 2 and 3 is that Alternative 3 allows vehicles on eastbound Tennant Avenue to turn into the project site, while Alternative 2 does not provide any vehicular access from Tennant Avenue. Alternative 3 is therefore preferable to Alternative 2, as allowing eastbound Tennant traffic into the site will reduce the amount of project traffic that would pass through the Murphy / Tennant intersection. This will reduce the overall intersection delay at the Murphy / Tennant intersection, although not appreciably enough to change the necessary long-term improvements at that intersection. In addition, allowing eastbound Tennant traffic to

enter the site will benefit the retail uses within the project, as it minimizes the travel time and distance between the street and these businesses for the majority of traffic bound for the site. Alternative 2 would require all patrons of the retail space to use Murphy Avenue en route the Fisher Avenue access, which would be a more indirect route into the site.

With Alternatives 2 and 3, the City should consider adding a direct access into the project site from Murphy Avenue. This would shorten the distance that vehicles would have to travel along Murphy when traveling to and from the project site. As this access would not be located on the study property, it would require the acceptance of the adjacent properties (i.e. those between the project site and Murphy Avenue) prior to adoption and construction. However, such a connection would also provide additional access points to said adjacent properties that would not otherwise be available. The preferred alignment of the Murphy Avenue access would be along the property line between the northern and southern adjacent properties, located approximately half-way between Tennant and Fisher Avenues. Currently, this is a private dirt road that provides access to both properties.

Pedestrian crossings of Tennant Avenue at Condit Road would be most easily facilitated by the establishment of a traffic signal at this intersection. While a traffic signal would improve pedestrian crossing capacity at the intersection, it would be at the expense of increased vehicle delays along Tennant Avenue. Given the close intersection spacing along Tennant Avenue, this additional intersection delay could increase vehicle queuing and harm vehicle progression between the traffic signals. Vehicle progression would be most acutely affected in the long term, given the projected high traffic activity along Tennant Avenue. The City of Morgan Hill may want to consider establishing a grade-separated pedestrian crossing, such as an underground path that crosses underneath Tennant Avenue. A number of factors will affect the feasibility and viability of such a facility, including the following:

1) Location – The exact location of the pedestrian undercrossing will need to be finalized. The preferable location would be to the west of Condit Road, as the southern end of the undercrossing would be within the study project site. However, this could prove challenging to construct because the northwest corner of the Condit / Tennant intersection is already developed. Placing the undercrossing to the east of Condit Road would have its own set of challenges, as the southern end of the pedestrian undercrossing would be outside of the study project's boundary. A feasibility analysis is recommended to determine the best location for the pedestrian undercrossing.

2) Visibility – The pedestrian undercrossing would need to be close enough to the Tennant / Condit intersection that pedestrians can easily see it and how to access it, in order to ensure that pedestrians do not attempt to cross Tennant at grade (i.e. at the intersection itself). This is because there will be few visual cues to the location of the undercrossing relative to the intersection; thus, if not easily identifiable, pedestrians will default to crossing Tennant Avenue at grade. Wayfinding signs and distinct pathways are recommended in order to help pedestrians navigate to and from the pedestrian undercrossing.

3) Footprint – The pedestrian undercrossing will require pedestrians to decrease in elevation below Tennant Avenue and its underground utilities, then return to ground level at the other side. This will require the use of ramps (at grades consistent with Americans With Disabilities Act requirements) or elevators to ensure full access for all users. Sufficient property will need to be dedicated for these facilities at either end of the pedestrian undercrossing.

G. Improvement Conceptual Layouts

Appendix D contains the conceptual layouts of the Tennant Avenue corridor with Access Alternatives 2 and 3, along with the current layout. Each conceptual design is summarized below.

Alternative 2 provides no vehicular access to the site off of Tennant Avenue, but does maintains pedestrian access via the pedestrian undercrossing and existing sidewalk network along Tennant Avenue. This maintains the existing intersection lane configuration.

Alternative 3 provides only inbound access to the project site via eastbound Tennant Avenue, plus pedestrian access identical to that of Alternative 2. Access from eastbound Tennant is via an extension of the existing outermost through lane, which converts into a right turn only lane into the project site at Condit Road. This lane configuration will minimize the effect of entering project traffic on the flow of eastbound Tennant Avenue traffic, and can be converted into a second through lane when Tennant Avenue is eventually widened to two lanes in each direction along the project frontage.

H. Closing

In summary, a total of four access alternatives have been analyzed for a proposed baseball/softball park on Tennant Avenue in Morgan Hill. The analyzed access alternatives are:

1. Full Access from Tennant Avenue (current site plan layout)
2. No Access off of Tennant Avenue (i.e. access only from Murphy Avenue)
3. Right-In Only from Tennant Avenue (with full access from Murphy)
4. Right-In Only from Tennant with Retail Exit (with full access from Murphy)

The analysis found that Alternatives 2 and 3 are the two most preferable alternatives, because they minimize vehicle delays along the Tennant Avenue corridor compared to the other access alternatives. Alternatives 2 and 3 also minimize the amount of roadway and intersection improvements at the Tennant Avenue / Condit Road intersection.

Although signalizing the Tennant / Condit intersection under short-term conditions will facilitate anticipated at-grade pedestrian crossings of Tennant Avenue to and from the project site, it is not a long-term solution, due to the increased delays and queuing that it will add to the closely-spaced intersections along the Tennant Avenue corridor. Construction of a pedestrian undercrossing should be considered at the Tennant / Condit intersection to facilitate pedestrian crossings of Tennant Avenue. A feasibility study should be performed for the pedestrian undercrossing, in order to determine its best location with respect to Condit Road. Wayfinding signs and

distinct pathways are recommended in order to help pedestrians navigate to and from the pedestrian undercrossing. Sufficient property will also need to be dedicated at either end of the pedestrian undercrossing for Americans With Disabilities Act-compliant ramps or elevators to ensure full access to the pedestrian undercrossing for all users.

As to the conceptual designs, Alternative 2 provides no vehicular access to the site off of Tennant Avenue, and thus maintains the existing intersection lane configuration. Pedestrian access is maintained via the pedestrian undercrossing and existing sidewalk network along Tennant Avenue.

The conceptual design for Alternative 3 provides only inbound access to the project site via eastbound Tennant Avenue, plus identical pedestrian access to Alternative 2. Access from eastbound Tennant is via an extension of the existing outermost through lane as a right turn only lane into the project site. This configuration minimizes the effect of entering project traffic on eastbound Tennant Avenue traffic, and can be converted into a second through lane when Tennant Avenue is eventually widened to two lanes in each direction along the project frontage.

Let us know if you have any questions.

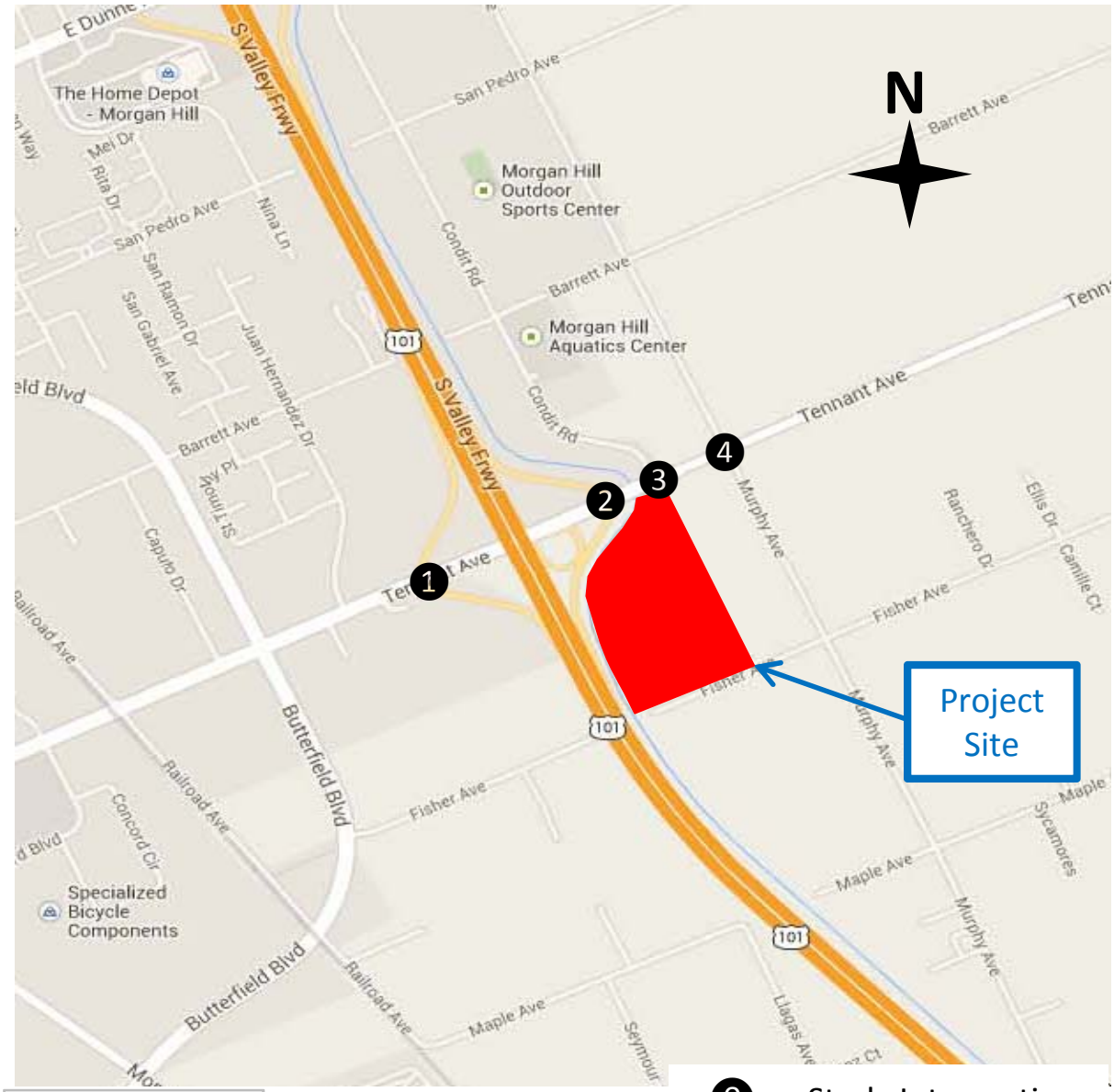
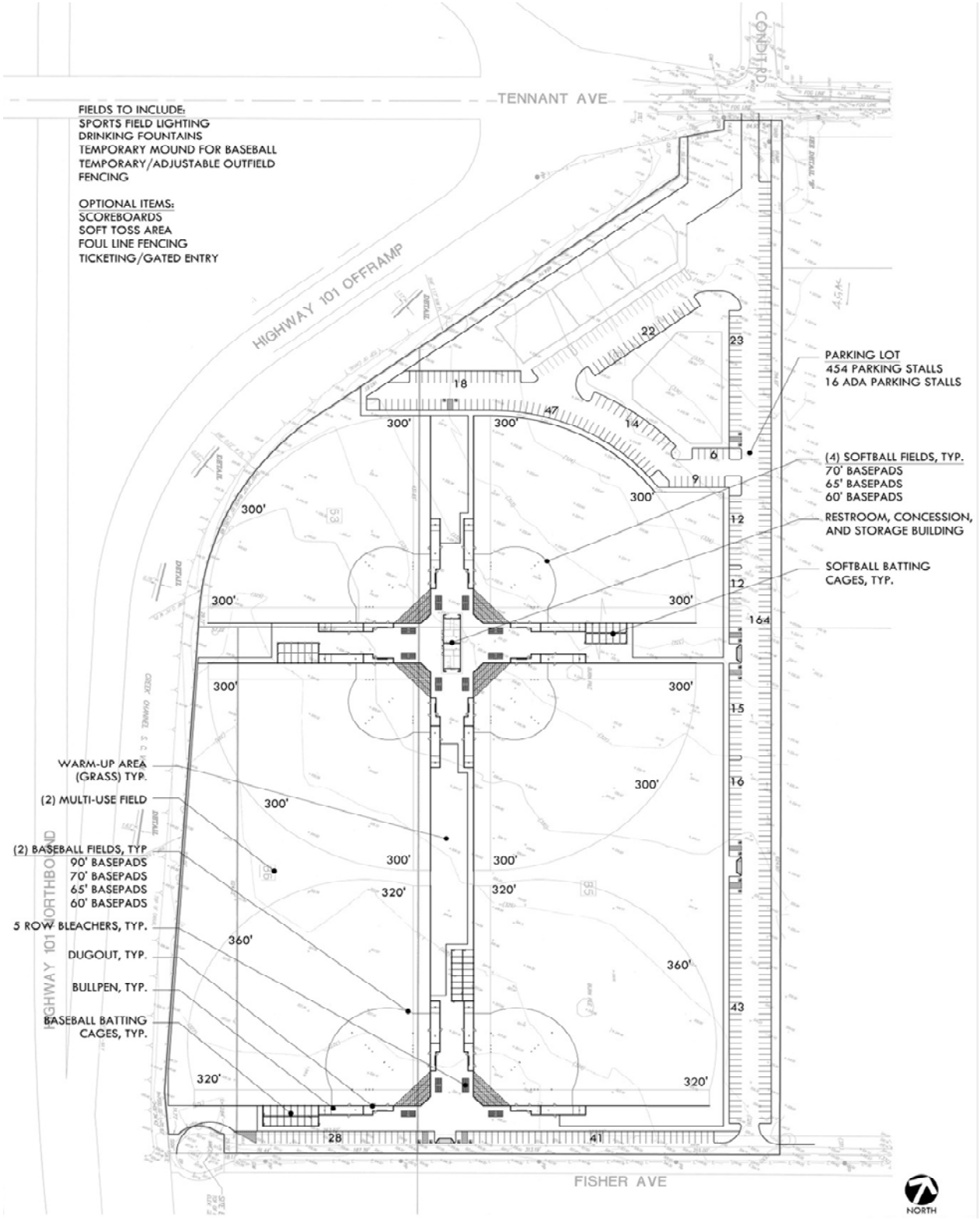


EXHIBIT 1A
Project Location Map



Source: Verde Design, October 2013.

EXHIBIT 1B

Project Site Plan

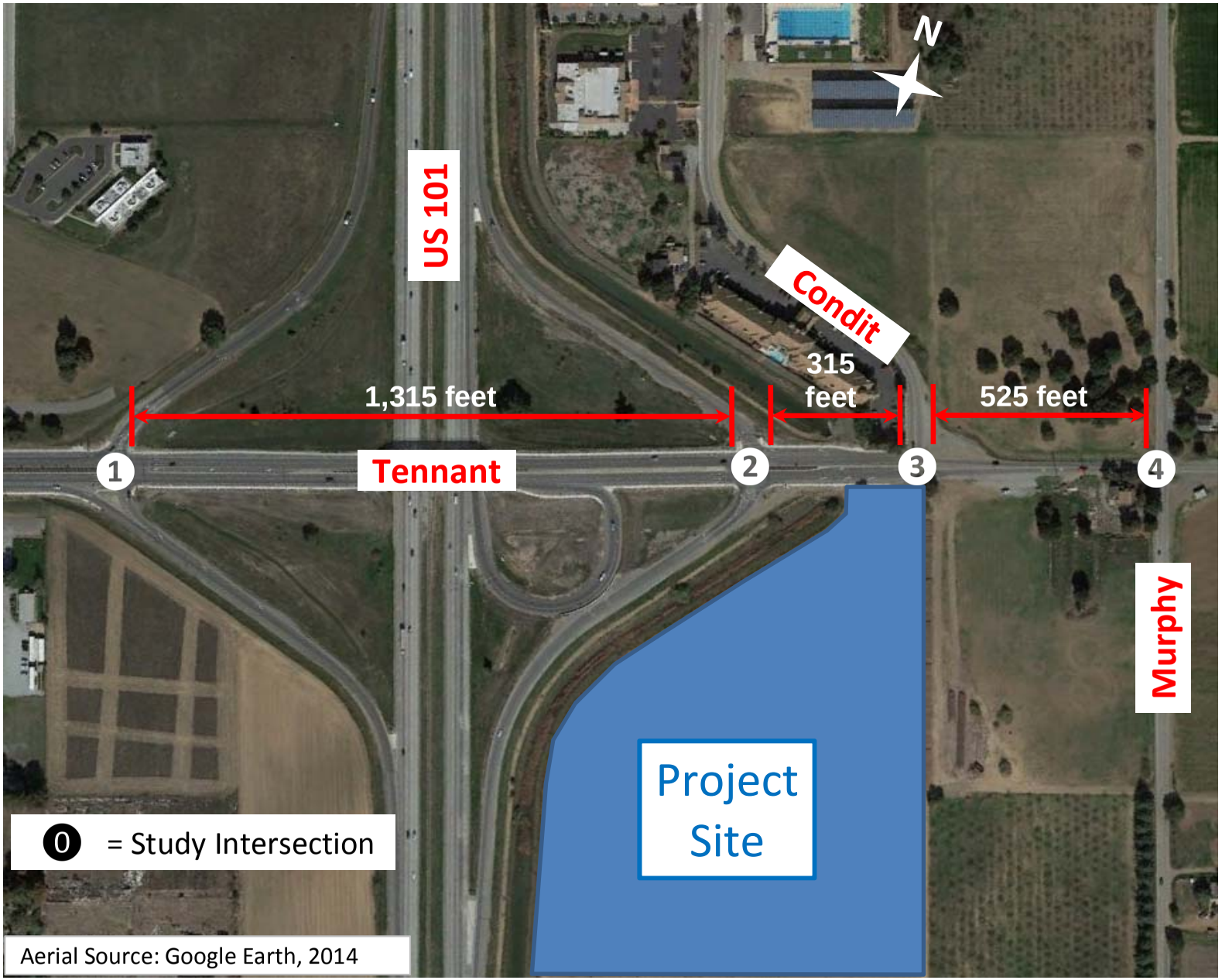
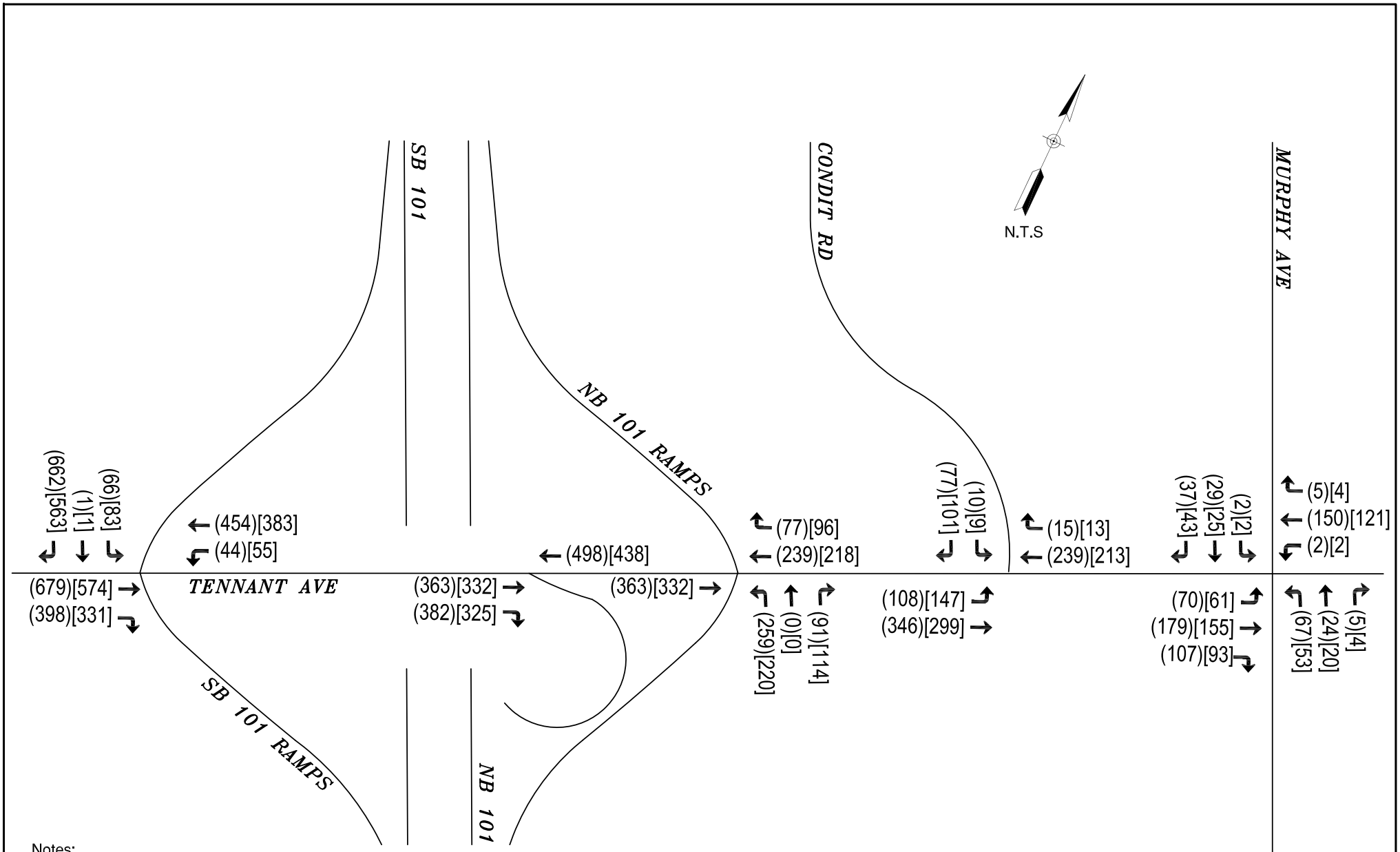


EXHIBIT 2
Study Intersection Location Map



Notes:
1. (XX)[(YY] = (PM) [SAT]
2. Not to Scale

Hatch Mott MacDonald

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EXHIBIT 3
Existing Volumes-
Weekday PM and Saturday Midday Peak Hours

	N-S Street	E-W Street	Existing Lane Configuration	Existing Intersection Control	LOS Standard	Existing Conditions				Existing Plus Project Conditions												Cumulative Conditions											
										Alternative #1				Alternative #2				Alternative #3				Alternative #4				Alternative #1				Alternative #2			
						Wkdy PM Pk Hr		Sat Mid Pk Hr		Wkdy PM Pk Hr		Sat Mid Pk Hr		Wkdy PM Pk Hr		Sat Mid Pk Hr		Wkdy PM Pk Hr		Sat Mid Pk Hr		Wkdy PM Pk Hr		Sat Mid Pk Hr		Wkdy PM Pk Hr		Sat Mid Pk Hr		Wkdy PM Pk Hr		Sat Mid Pk Hr	
						Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Southbound US 101 Ramps	Tennant Avenue	SB 1-L/T, 1-R EB 2-T, 1-R WB 1-L, 2-T	Signal *With Improvement*	**E**	15.8	B	13.1	B	20.0	B-	15.2	B	20.0	B-	15.2	B	20.0	B-	15.2	B	20.0	B-	15.2	B	205.7	F	235.2	F	205.7	F	235.2	F
2	Northbound US 101 Ramps	Tennant Avenue	NB 1-L/T, 1-R EB 2-T WB 2-T, 1-R	Signal *With Improvement*	**E**	18.2	B-	6.6	A	16.4	B	6.9	A	16.4	B	6.9	A	16.4	B	6.9	A	16.4	B	6.9	A	29.5	C	51.8	D-	29.5	C	51.8	D-
3	Condit Road	Tennant Avenue	SB 1-L/R EB 1-L, 1-T WB 1-T/R	One-Way Stop (Side Street) *With Improvement*	**E** E	2.3 11.2	A B	3.2 11.5	A B	4.9 36.6	A E	**126.3** **671.1**	**F** **F**	2.2 13.9	A B	3.6 24.6	A C	2.2 13.6	A B	3.2 21.4	A C	4.0 31.1	A D	25.1 **238.6**	D **F**	* *	F F	* *	F F	667.8 *	F F	808.9 *	F F	667.8 *	F F	808.9 *	F F	* *	F F	* *	F F
4	Murphy Avenue	Tennant Avenue	NB 1-L/T/R SB 1-L/T/R EB 1-L/T/R WB 1-L/T/R	All-Way Stop *With Improvement*	**D**	11.4	B	9.8	A	11.7	B	10.2	B	19.8	C	27.4	D	12.9	B	13.9	B	12.0	B	11.6	B	926.2	F	919.2	F	1042.7	F	1097.4	F	927.1	F	935.8	F	933.4	F	926.3	F

NOTES:
1. L, T, R = Left, Through, Right.
2. NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound.
3. Analysis performed using 2000 Highway Capacity Manual and Santa Clara Valley Transportation Authority (VTA) methodologies.
4. * = Delay is over 1,100 seconds (18.3 minutes)
5. Level of service calcuations can be found within **Appendix A**.
6. Operations in **bold** exceed City of Morgan Hill level of service standards.
7. Summary of Access Alternatives:
   Alternative #1 -- Full access to/from Tennant Avenue
   Alternative #2 -- No access to/from Tennant Avenue
   Alternative #3 -- Inbound only from eastbound Tennant Avenue; no outbound to Tennant Avenue
   Alternative #4 -- Inbound only from eastbound Tennant Avenue; outbound to Tennant Avenue only from retail traffic

Location	Vehicle Queues by Lane (feet)																	
	Existing		*Existing + Alt 1*		*Existing + Alt 2*		*Existing + Alt 3*		*Existing + Alt 4*		*Cumulative + Alt 1*		*Cumulative + Alt 2*		*Cumulative + Alt 3*		*Cumulative + Alt 4*	
	PM	Sat	PM	Sat	PM	Sat	PM	Sat	PM	Sat	PM	Sat	PM	Sat	PM	Sat	PM	Sat
SB 101/Tennant																		
EB T	72	65	100	153	102	119	118	159	69	111	**700**	**702**	**715**	**702**	**688**	**637**	**676**	**649**
EB T	95	52	82	66	107	116	58	161	84	68	**733**	**725**	**713**	**731**	**713**	**706**	**697**	**728**
EB R	17	15	9	9	9	12	35	9	0	51	**401**	**399**	**399**	**416**	**401**	**401**	246	**343**
WB L	104	43	56	72	60	97	114	49	125	60	**323**	**324**	**323**	**326**	**320**	**335**	**321**	**321**
WB T	122	93	147	115	158	107	244	60	133	77	1117	545	827	979	1272	**1283**	**1288**	1212
WB T	111	56	146	113	149	78	251	88	131	71	1074	416	809	888	**1337**	**1290**	1131	872
SB LT	126	53	174	95	158	143	168	219	128	144	387	398	416	387	387	384	389	398
SB R	341	88	129	174	279	205	328	194	183	130	**444**	**392**	**384**	**381**	**537**	**398**	**519**	**398**
NB 101/Tennant																		
EB T	81	139	177	172	119	85	65	133	148	86	302	319	296	303	304	301	299	305
EB T[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WB T	96	88	51	45	45	74	66	48	55	61	181	82	198	82	198	89	187	96
WB T	87	39	33	52	31	39	52	33	24	38	117	58	115	94	120	51	112	71
WB R	30	46	36	55	22	69	31	67	20	69	94	69	53	82	57	58	55	78
NB L	237	95	241	111	238	72	307	173	187	89	446	430	430	447	453	568	459	472
NB TR	48	68	55	57	56	46	57	71	98	52	430	447	430	430	**462**	**570**	**481**	466
Condit/Tennant																		
EB L	58	50	43	49	31	75	33	72	56	43	134	134	**202**	139	**178**	**195**	134	134
EB T[4]	0	0	0	28	0	26	0	45	0	26	224	235	211	257	222	244	245	241
WB TR[4]	0	0	0	55	0	45	0	48	18	42	42	161	55	72	84	62	26	70
NB LTR			57	**127**					45	**145**	**203**	**278**					**353**	**265**
SB LTR	31	60	53	62	28	56	138	60	31	59	**200**	**199**	**214**	**209**	**236**	**245**	**211**	**243**
Murphy/Tennant																		
EB LTR	99	100	79	57	160	121	64	110	105	113	**513**	**508**	**507**	**509**	**527**	**524**	**511**	**514**
WB LTR	91	66	58	50	66	60	57	79	64	51	556	549	562	109	384	289	374	151
NB LTR	51	44	55	32	51	97	59	81	52	61	853	606	856	849	853	826	919	925
SB LTR	57	71	32	45	48	51	48	65	43	81	143	83	103	112	164	124	77	103

Notes:
1. See **Appendix B** for queue calculations. Queues represent 95th percentile (i.e. design) queues with existing lane configurations.
2. Queue lengths in **bold** exceed available storage (+/- 1 vehicle).
3. Queues of zero vehicles in this lane confirmed during field visit in February 2014.
4. Queuing due to increased pedestrian crossings
5. Summary of Access Alternatives:
   - Alternative #1 -- Full access to/from Tennant Avenue
   - Alternative #2 -- No access to/from Tennant Avenue
   - Alternative #3 -- Inbound only from eastbound Tennant Avenue; no outbound to Tennant Avenue
   - Alternative #4 -- Inbound only from eastbound Tennant Avenue; outbound to Tennant Avenue only from retail traffic

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EXHIBIT 4B
Intersection
Vehicle Queues

Project Trip Generation

TRIP GENERATION RATES	ITE LAND USE CODE	WEEKDAY DAILY TRIP RATE	WEEKDAY PM PEAK HOUR PEAK HOUR RATE	% OF ADT	% IN	% OUT	SATURDAY DAILY TRIP RATE	SATURDAY MIDDAY PEAK HOUR PEAK HOUR RATE	% OF ADT	% IN	% OUT
Baseball Fields[3]	N/A	80.00	20.00	25%	88%	12%	240.00	40.00	50%	50%	50%
Specialty Retail Center (per 1,000 sq. ft.)[4]	826	44.32	2.71	3%	44%	56%	42.04	4.82	11%	52%	48%
High-Turnover (Sit-Down) Restaurant (per 1,000 sq. ft.)	932	127.15	9.85	8%	60%	40%	158.37	14.07	11%	53%	47%
Fast-Food Restaurant without Drive-Through Window (per 1,000 sq. ft.)[5]	933	716.00	26.15	3%	51%	49%	722.03	59.00	8%	51%	49%

GENERATED TRIPS	PROJECT SIZE	WEEKDAY DAILY TRIPS	WEEKDAY PM PEAK HOUR PEAK HOUR TRIPS	% OF ADT	TRIPS IN	TRIPS OUT	SATURDAY DAILY TRIPS	SATURDAY MIDDAY PEAK HOUR PEAK HOUR TRIPS	% OF ADT	TRIPS IN	TRIPS OUT
Proposed Uses											
Baseball Fields	6 fields	480	120	25%	106	14	1,440	240	17%	120	120
Retail	23,750 sq. ft.	1,053	64	6%	28	36	998	114	11%	59	55
Restaurant (High-Turnover Sit-Down)	7,500 sq. ft.	954	74	8%	44	30	1,188	106	9%	56	50
Restaurant (Fast Food)	7,500 sq. ft.	5,370	196	4%	100	96	5,415	443	8%	226	217
Subtotal (Proposed Uses):		**7,857**	**454**		**278**	**176**	**9,041**	**903**		**461**	**442**
Pedestrian/Bicycle Trip Reduction (10%):[6]		-786	-45		-28	-17	-904	-90		-46	-44
Internal Capture (50%):[7]		-3,689	-167		-86	-81	-3,801	-332		-171	-161
Total Net Project Trip Generation:		**3,382**	**242**		**164**	**78**	**4,336**	**481**		**244**	**237**

Notes:

1. Trip generation rates from Institute of Transportation Engineers, "Trip Generation Manual," 9th Edition, 2012, unless otherwise noted.
2. sq. ft. = square feet.
3. Trip generation rates for Baseball Field are cited from *Traffic Study for the Sepulveda Basin Sports Complex*, Kaku Associates, February 2006.
4. "Trip Generation Manual" does not provide trip rates for Specialty Retail Center during Saturday midday peak hour. Cited trip rates are from Shopping Center (ITE Land Use #820).
5. "Trip Generation Manual" does not provide trip rates for Fast-Food Restaurant without Drive-Through Window during Saturday midday peak hour. Cited trip rates are from Fast-Food Restaurant with Drive-Through Window (ITE Land Use #934).
6. Pedestrian/Bicycle Trip Reduction accounts for the estimated portion of projec site traffic being made on foot or on a bicycle (10%).
7. Internal Capture reflects the estimated portion of retail/restaurant project site traffic that would be served by patrons of the baseball fields (50%).

EXHIBIT 5A
Project
Trip Generation

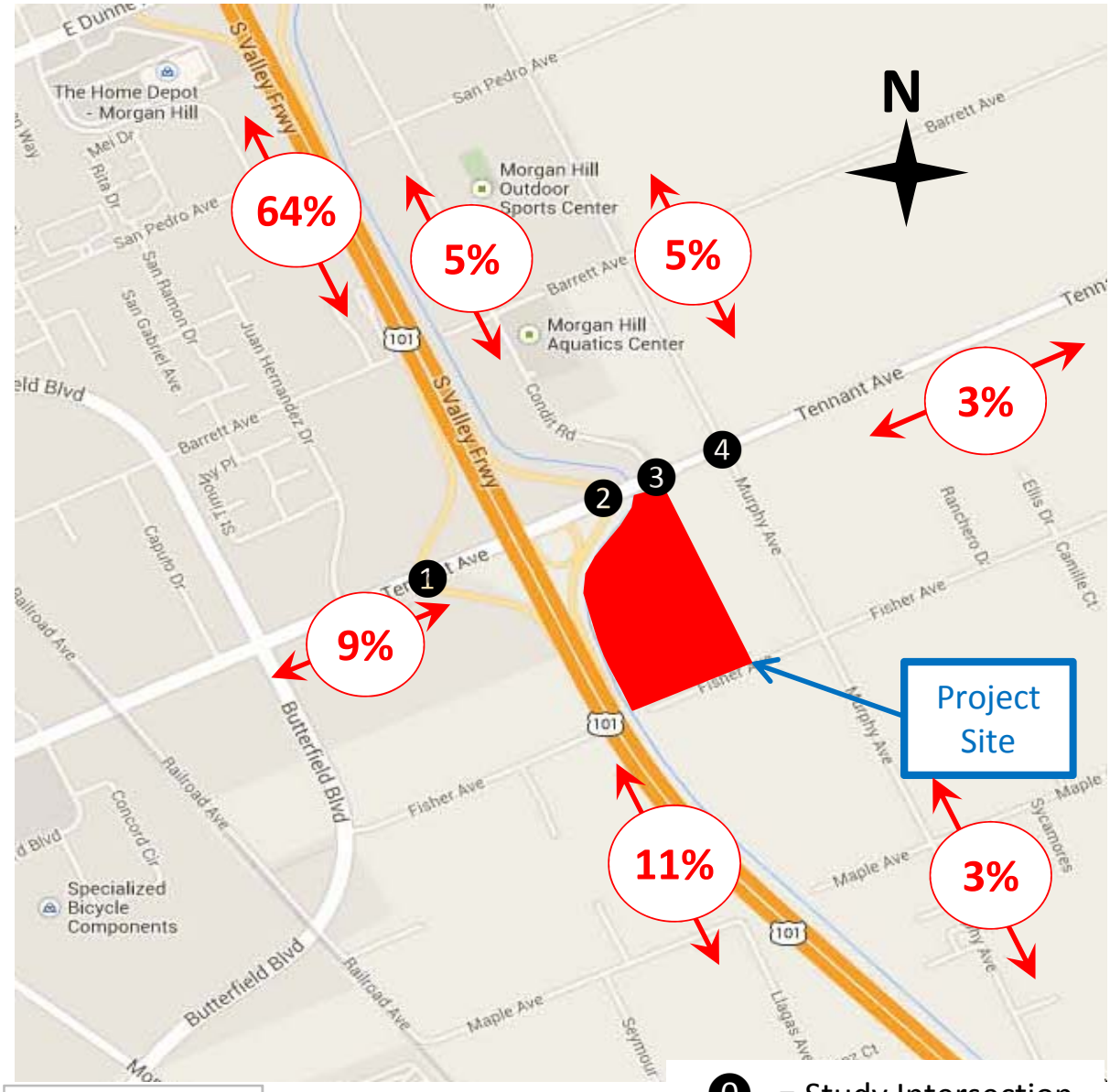
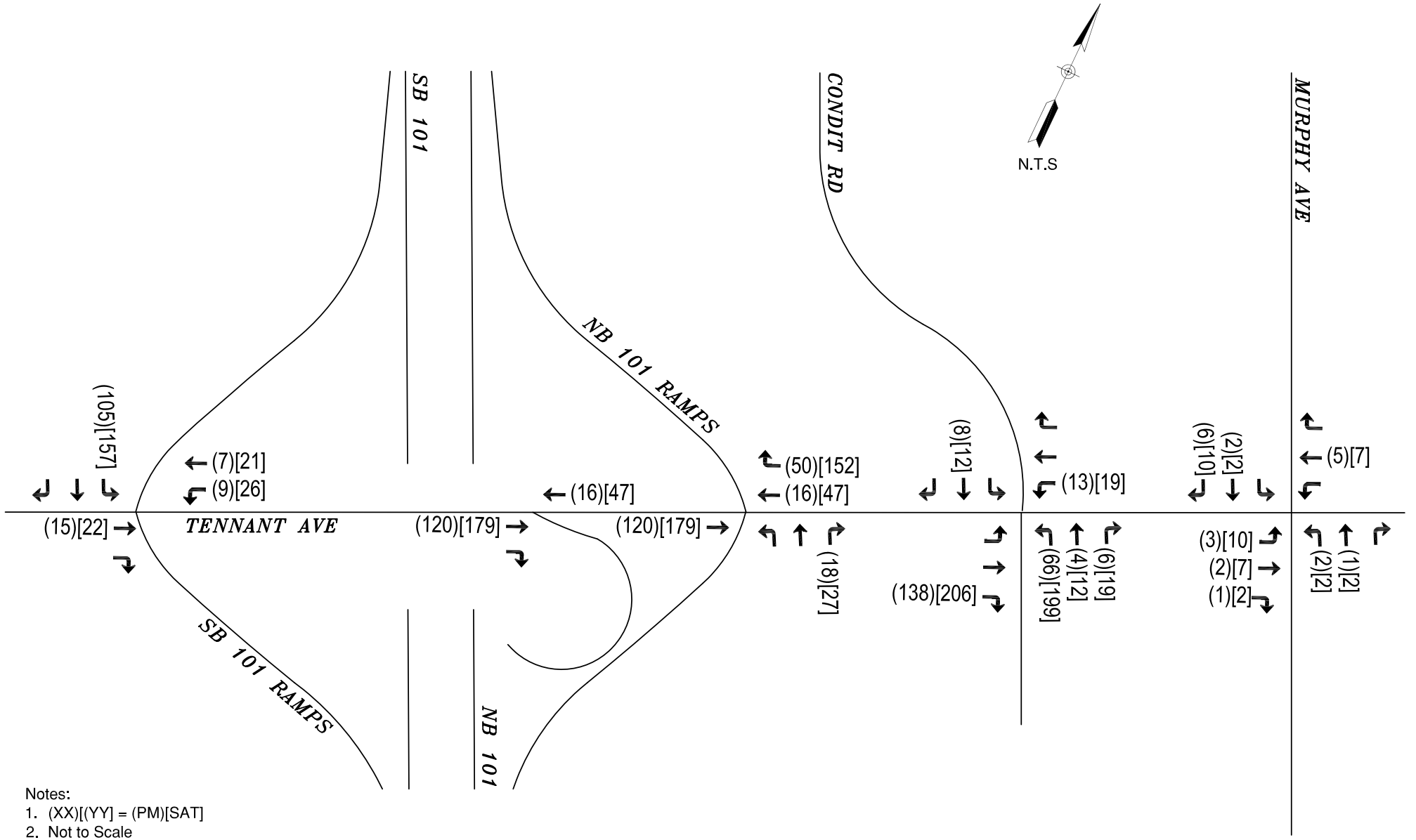


EXHIBIT 5B
Project Trip Distribution



Notes:
1. (XX)[(YY] = (PM)[SAT]
2. Not to Scale

EXHIBIT 6A
Project Trip Assignment-Alternative #1
Weekday PM and Saturday Midday Peak Hour Volumes

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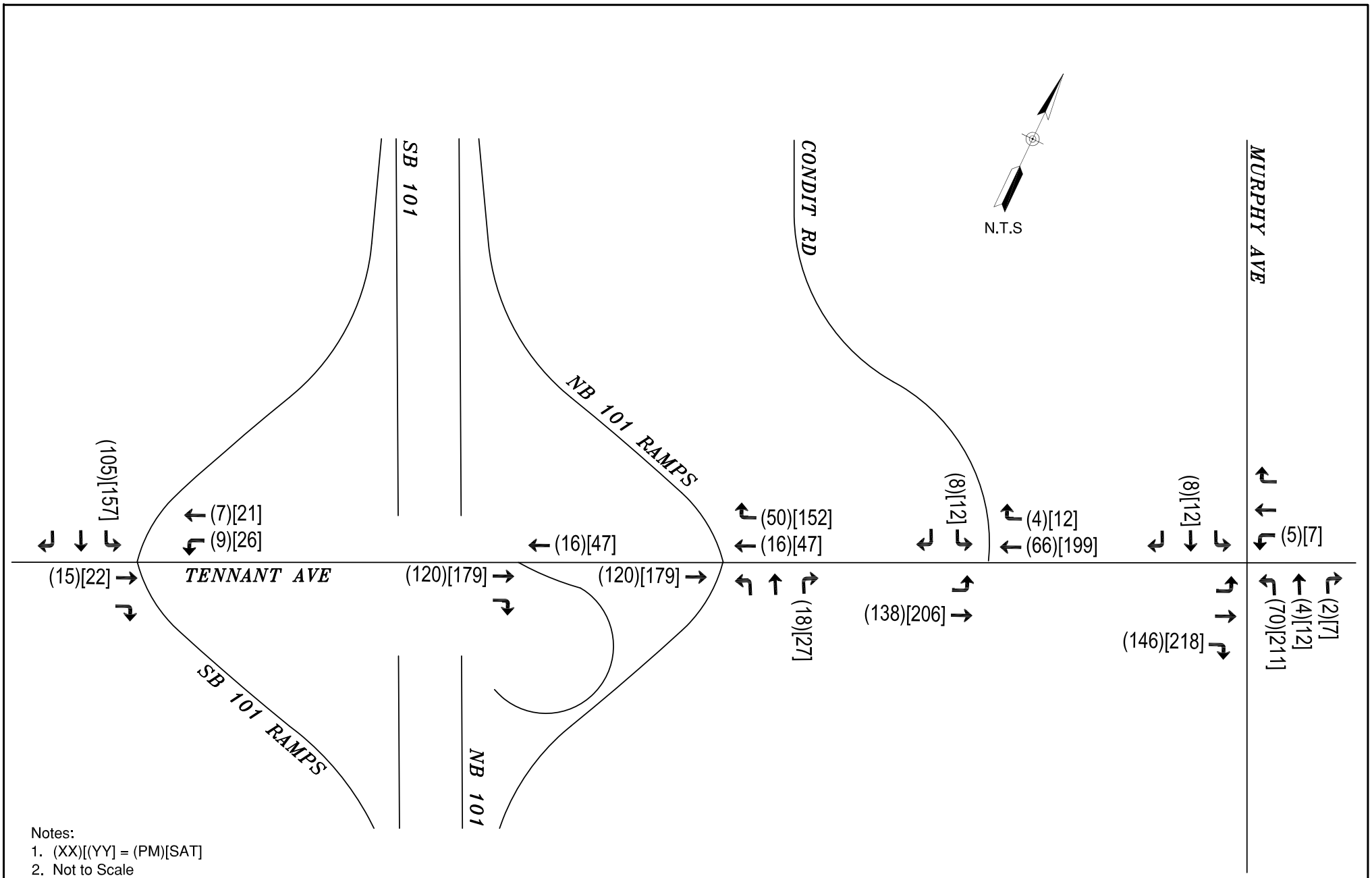

EXHIBIT 6B
Project Trip Assignment-Alternative #2
Weekday PM and Saturday Midday Peak Hour Volumes

Hatch Mott MacDonald

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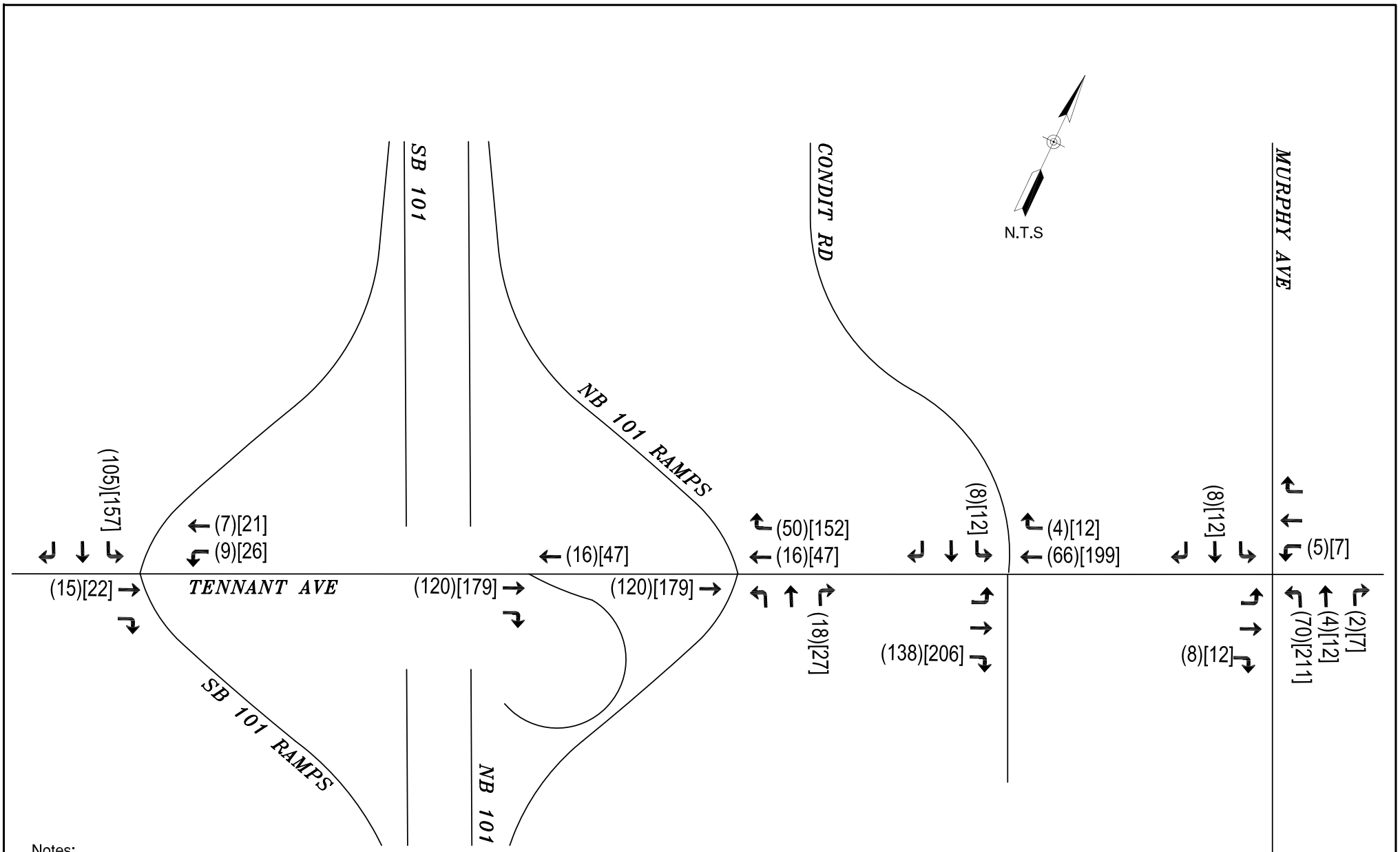

EXHIBIT 6C
Project Trip Assignment-Alternative #3
Weekday PM and Saturday Midday Peak Hour Volumes

Hatch Mott MacDonald

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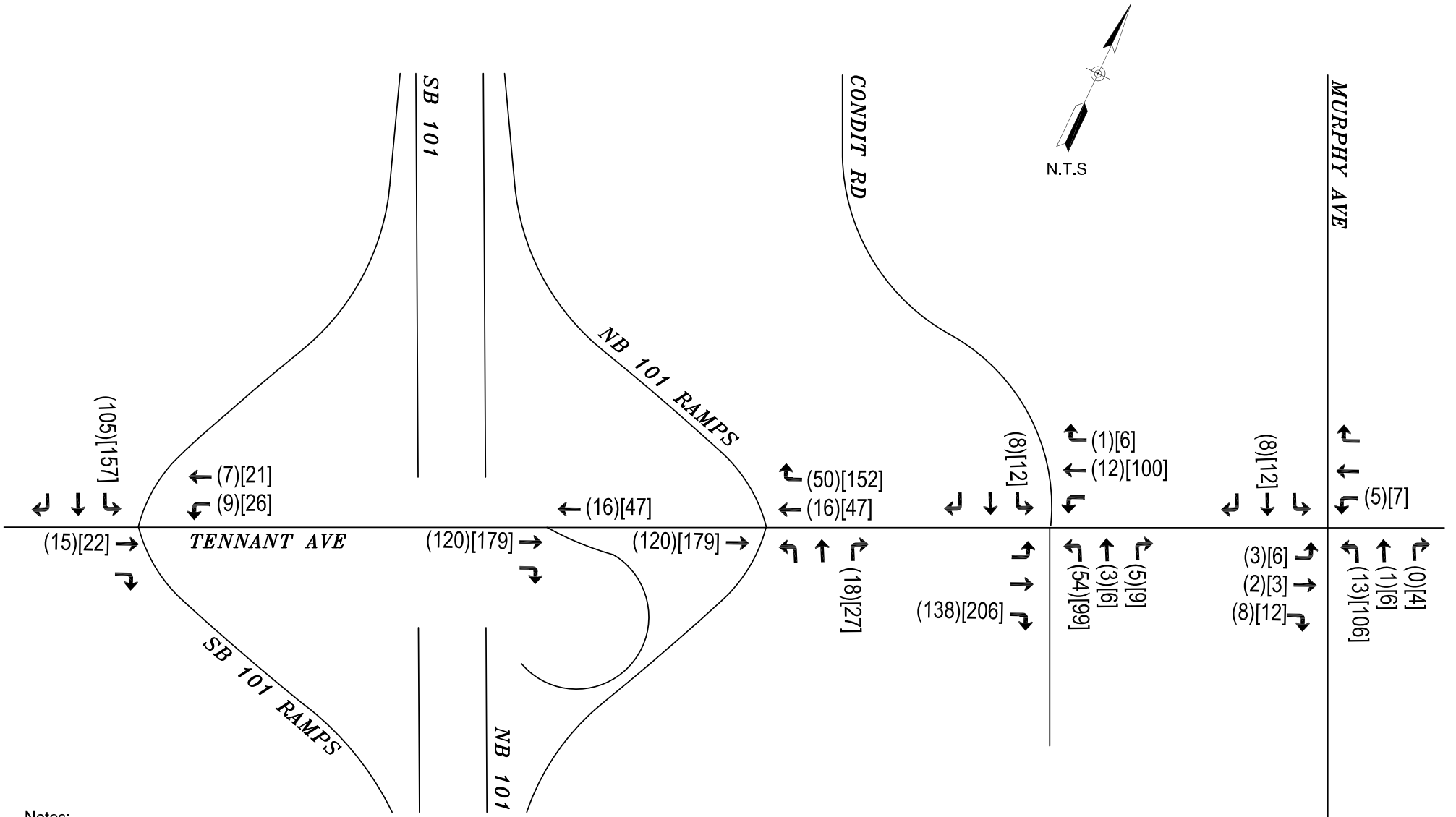

Notes:
1. (XX)[(YY) = (PM)[SAT]
2. Not to Scale

Hatch Mott MacDonald

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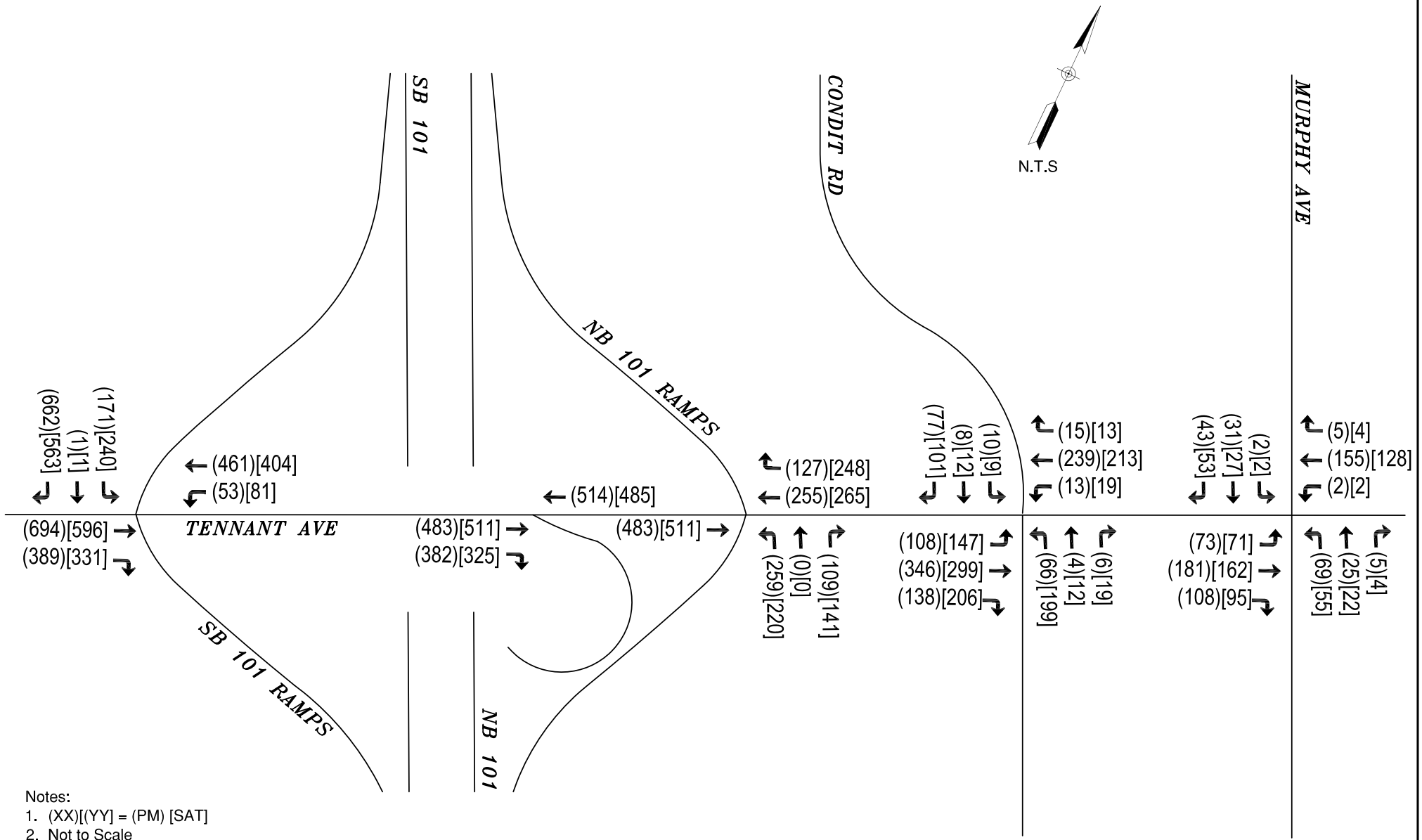
EXHIBIT 6D
Project Trip Assignment-Alternative #4
Weekday PM and Saturday Midday Peak Hour Volumes



Notes:
1. (XX)[(YY] = (PM) [SAT]
2. Not to Scale

Hatch Mott MacDonald

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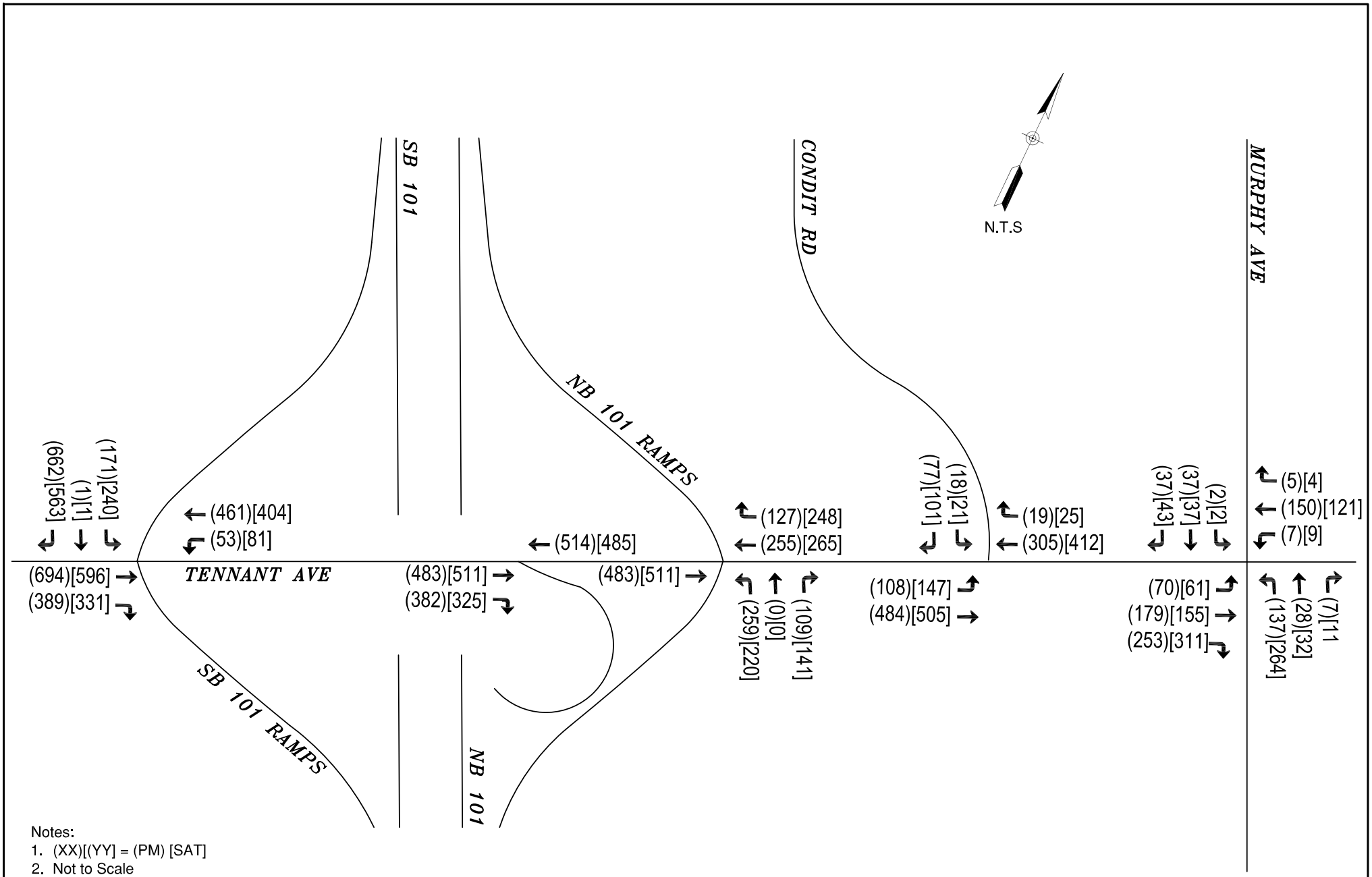
EXHIBIT 7A
Existing Plus Project Alternative #1
Weekday PM and Saturday Midday Peak Hour Volumes



Notes:
1. (XX)[(YY] = (PM) [SAT]
2. Not to Scale

EXHIBIT 7B
Existing Plus Project Alternative #2
Weekday PM and Saturday Midday Peak Hour Volumes

Hatch Mott MacDonald

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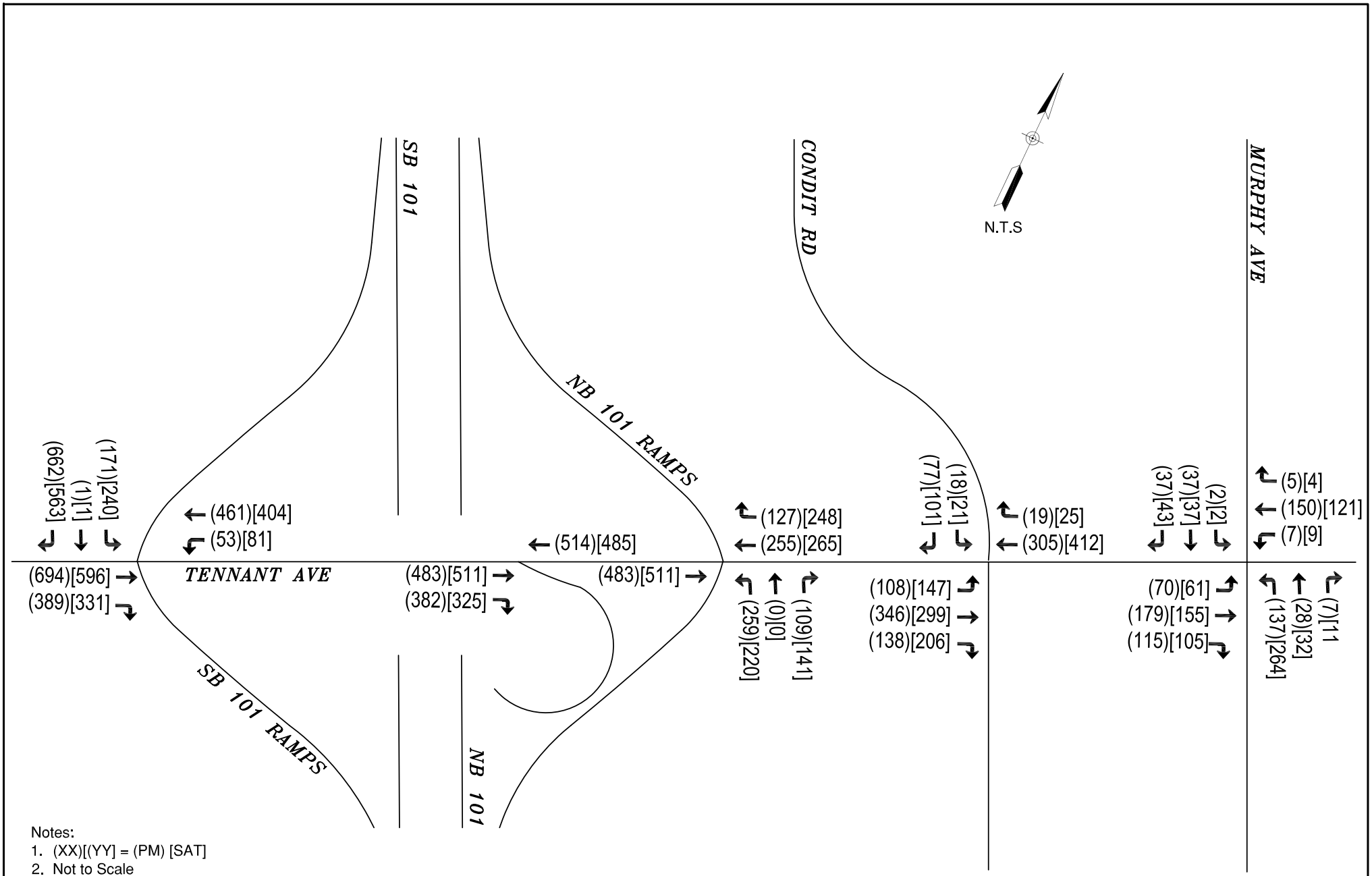

Notes:
1. (XX)[(YY] = (PM) [SAT]
2. Not to Scale

Hatch Mott MacDonald

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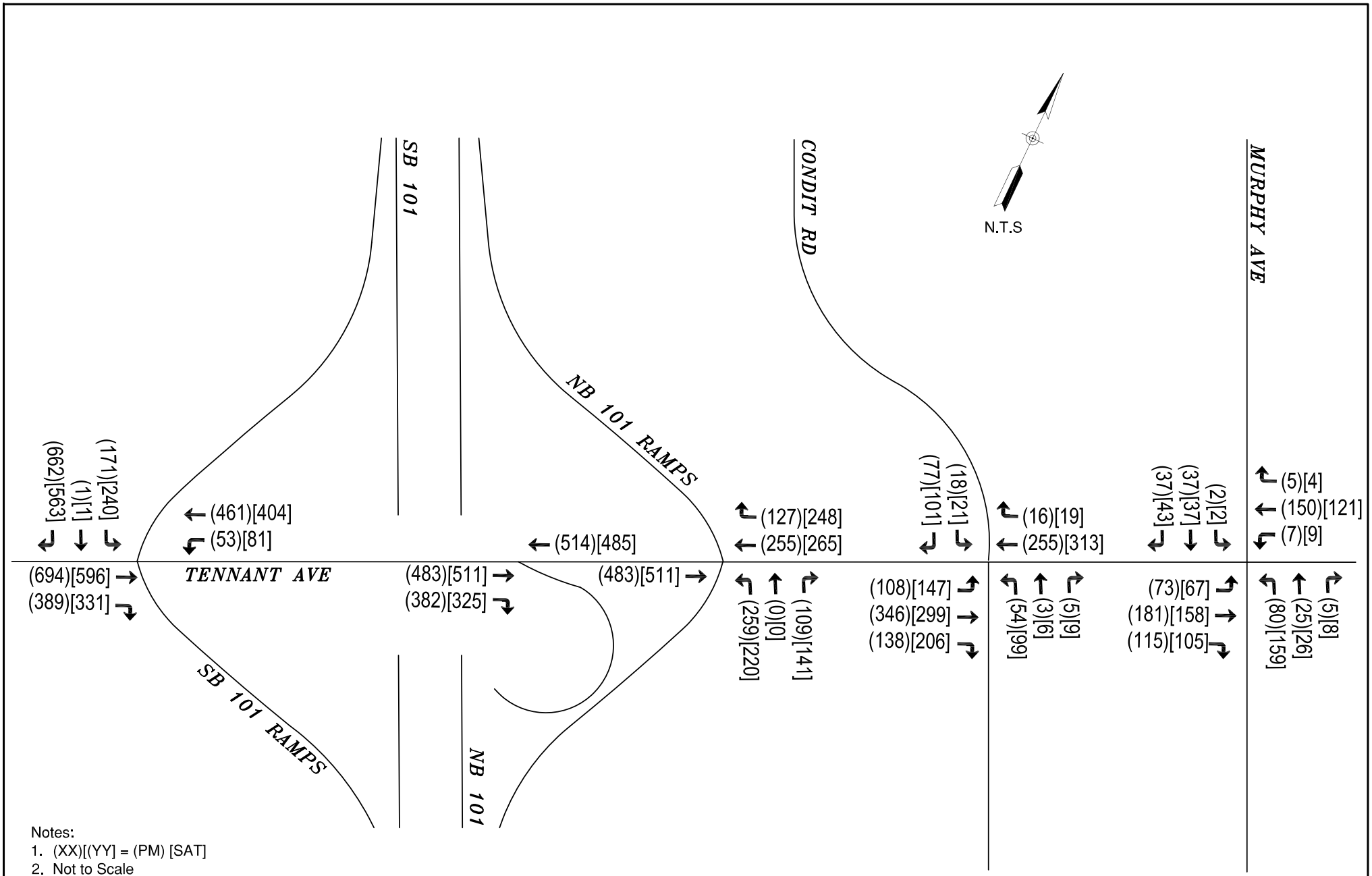
EXHIBIT 7C
Existing Plus Project Alternative #3
Weekday PM and Saturday Midday Peak Hour Volumes



Notes:
1. (XX)[(YY] = (PM) [SAT]
2. Not to Scale

Hatch Mott MacDonald

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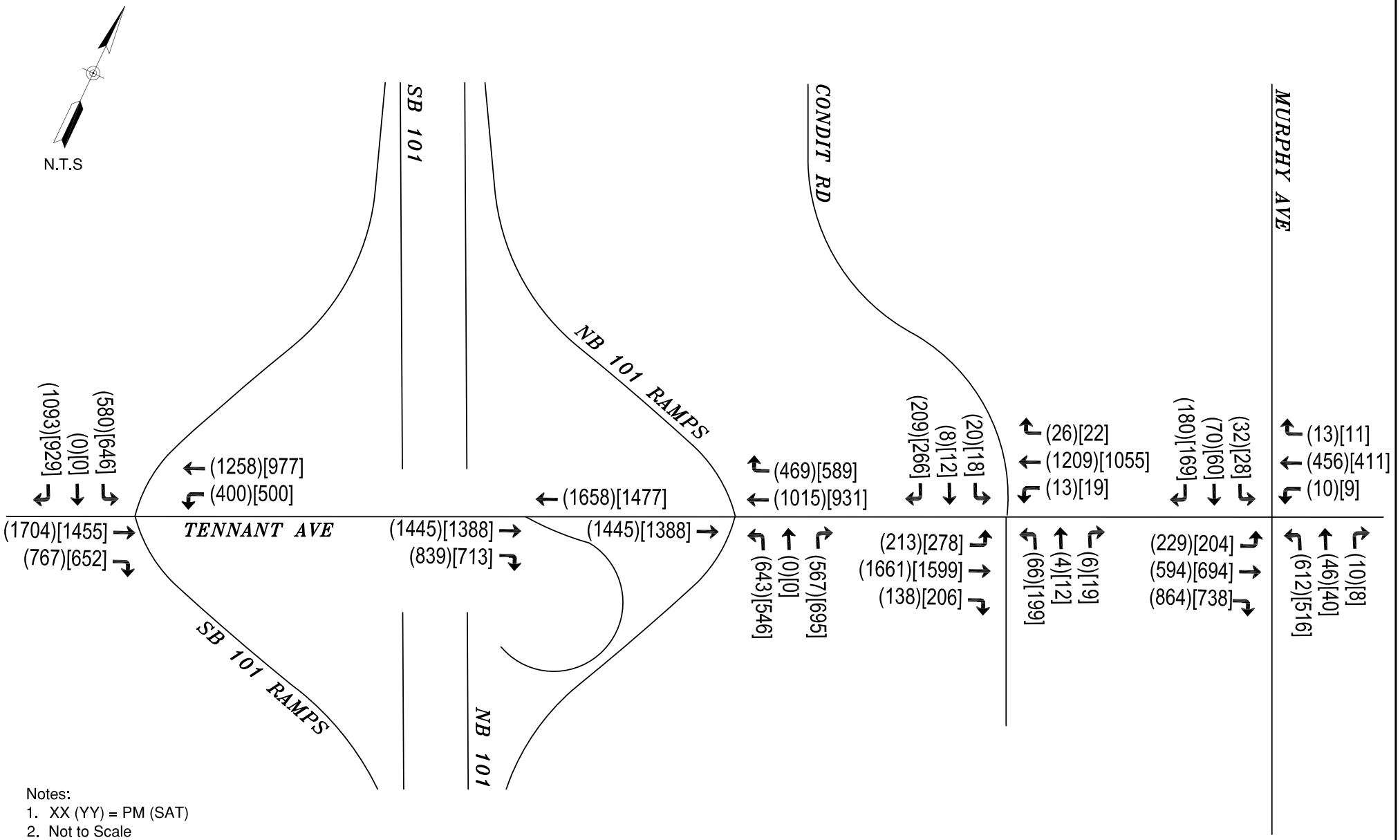
EXHIBIT 7D
Existing Plus Project Alternative #4
Weekday PM and Saturday Midday Peak Hour Volumes



Notes:
1. XX (YY) = PM (SAT)
2. Not to Scale

EXHIBIT 8A
Cumulative Plus Alt #1
PM & Saturday Peak Hour Volumes

Hatch Mott MacDonald

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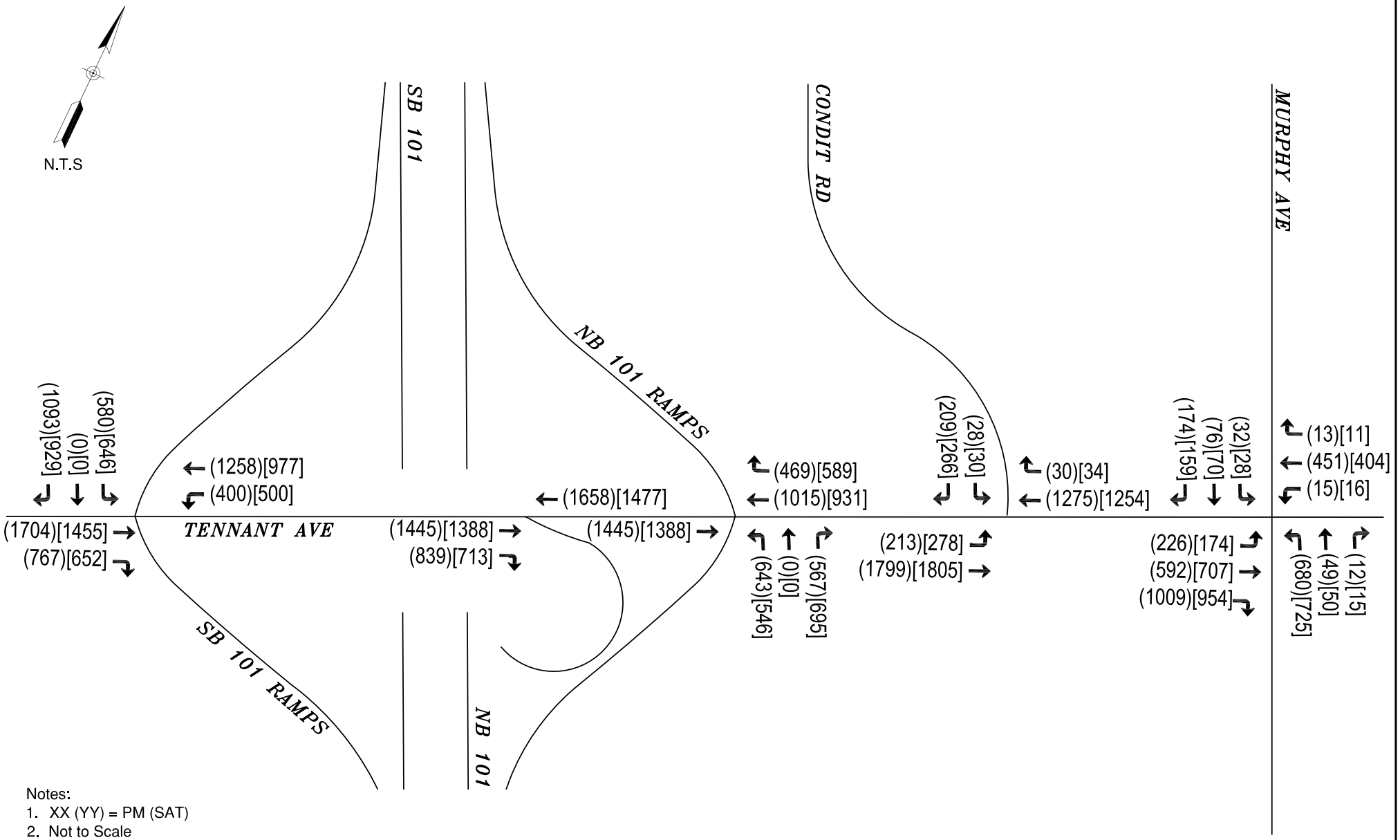

Notes:
1. XX (YY) = PM (SAT)
2. Not to Scale

Hatch Mott MacDonald

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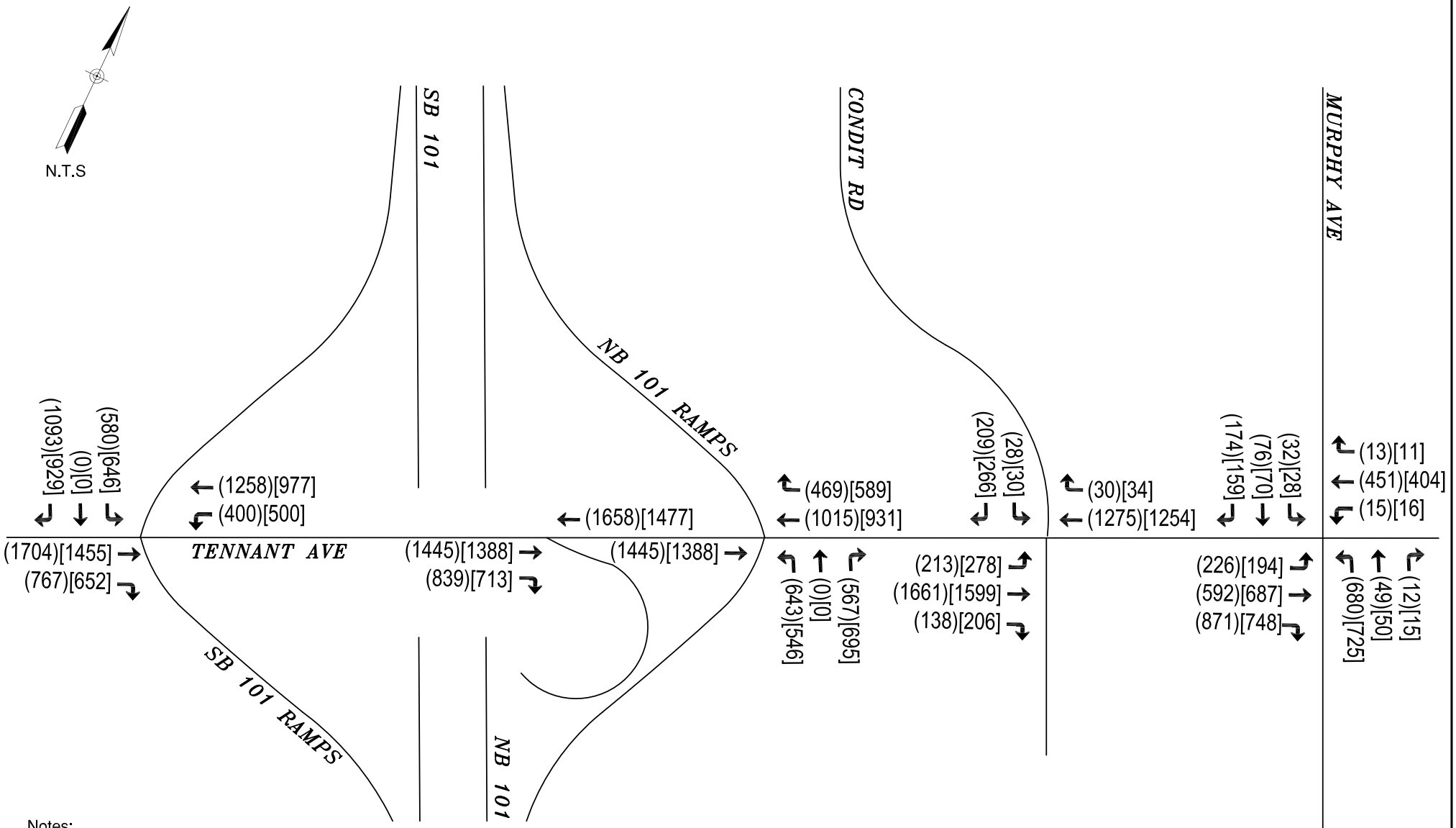
EXHIBIT 8B
Cumulative Plus Alt #2
PM & Saturday Peak Hour Volumes



Notes:
1. XX (YY) = PM (SAT)
2. Not to Scale

Hatch Mott MacDonald

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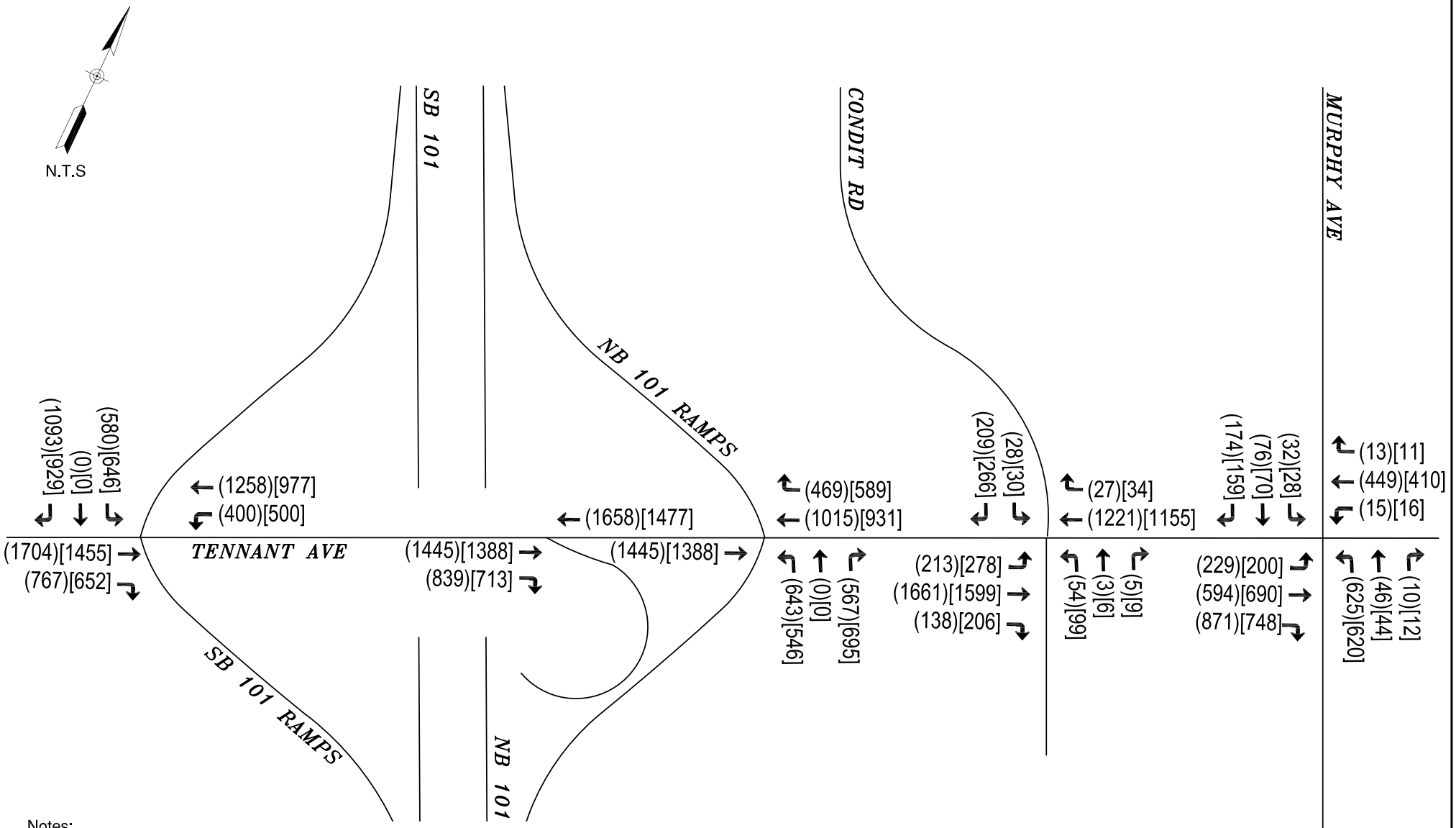
EXHIBIT 8C
Cumulative Plus Alt #3
PM & Saturday Peak Hour Volumes



Notes:
1. XX (YY) = PM (SAT)
2. Not to Scale

Hatch Mott MacDonald

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EXHIBIT 8D
Cumulative Plus Alt #4
PM & Saturday Peak Hour Volumes