15 Appendix D: Traffic Analysis

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August 15, 2006

Steve Banham
Public Works Director
City of Blaine
1200 Yew Avenue
Blaine, WA 98230

RE: East Blaine Annexation – Response to CHS July 5, 2006 Roadway/Traffic Issues letter GTC-05-253

Introduction

GTC has been retained by the Connelly Company, LLC to respond to the July 5, 2006 roadway letter from CHS Engineering, LLC. GTC's November 16, 2005 traffic report was conducted based on the guidelines and detailed scoping provided by you. The 2005 GTC report covers both intersection and roadway link capacity based on the latest capacity methodology identified in the Highway Capacity Manual and determined by Whatcom County, per your instructions (October 6, 2005 email to Edward Koltonowski). GTC's 2005 study used new 2005 traffic counts, the prior accepted traffic distribution that had been discussed with you and a standard 6-year GMA based future forecast year using a high 3% growth factor (annually compounded). The levels of service for the intersections and arterials clearly shown that even with the high background growth there is capacity on the road system to accommodate the proposed East Maple Ridge development and still maintain acceptable levels of service.

The CHS review has not utilized the 2005 required traffic analysis, instead utilizing an outdated (methodology and counts) 1998 report to establish a full build out scenario of ± 3,350 residential units for the area that may never occur or be 30-40 years out. Note: Since the 1998 report there has been no significant development in this area at all and actual traffic counts on H street have actually fallen as alternate routes have become available and traffic patterns have changes.

CAPACITY OF H STREET

As stated, GTC's 1998 report relies on old methodologies and old counts rather than the Whatcom County methodology required by the City for GTC's 2005 traffic study. In 2005 H Street, east of SR-543, carries approximately 9,000 daily trips based on a 2005 WSDOT count and a 2006 3 day count, while a 2006 3 day count east of Odell Street reported approximately 2,800 ADT. Therefore, even if CHS still decided to use the old methodology at least the new 2005/2006 counts should be used for their future calculations.

AUG/28/2006/MON 06:28 AM GIBSON TRAFFIC FAX No. 425 258 2922 P. 002/010
Received: 8/28/06 7:35AM; 425 258 2922 -> ASSOCIATED PROJECT CONSULTANTS; Page 2

A 10 ADT per ERU is the most conservative planning level tool that should only be used for small developments that are all planned as single family detached units. For a larger area a the 2003 ITE regression equation should be used per the Institute of Transportation Engineers (ITE) guidelines and also a unit mix for townhome type development may be considered since townhomes generate approximately 40% less traffic than single family homes.

Also important in planning off-site roads is the need to determine where traffic is going. Based on both the 1998 and 2006 report, only 73% of the traffic from the annexation area would be destined west of Odell Street on H Street and only 60% would be destined west of the shopping center at the maximum load point of H Street where the WSDOT and 2006 counts show 9,000 daily trips. However, as a "worst case" GTC has utilized 70% on this critical link. CHS assuming 100% is unreasonable and inconsistent with the approved 1998 or 2005 reports it contends to base its assumptions on.

Using the recommended ITE trip generation regression equation methodology (26,000 ADT for 3,350 SFD units) with the 2006 data, and a worst case of 70% distribution on the maximum load point of H Street (18,410 ADT east of SR-543 and west of the shopping center) concludes that without additional roads, H Street would ultimately need to carry approximately 27,400 ADT based on the following components:

Existing	9,000 ADT
Future (3,350 SFD units with max 70%)	18,400 ADT
	27,400 ADT

This more realistic full build-out estimate actually lies close to or within the H Street 25,000 – 32,000 ADT capacity documented in CHS's July memo as City Staff and Mr. Kask recommended capacity for this section of H street even with the unrealistic estimate of full build-out within 20 years (more likely 30-40 years to reach build-out, if ever depending on environmental constrains or lower trip generating units)

As CHS concluded, a more realistic approach is to use the two major applications that are presently under discussion (353 + 1,000 new units= 11,400 ADT per ITE guidelines of which 70% max on H Street west of shopping center = approximately 8,000 ADT) and current background traffic (worst H Street segment) of 9,000 ADT. Based on this information, H Street will need to carry approximately 17,000 ADT within the next 20-year horizon which is well within the 24,000 capacity identified in the 1998 report or by CHS in their July 5 memo.

D/E STREET COLLECTOR (MOTT'S PARKWAY)

An extension of the existing D/E Street to act as a collector is only needed for future development beyond the present 1,353 units presently under application. The required capacity would be approximately 3,400 ADT (27,400 volume on H Street – 24,000 capacity) assuming all the units develop as single family detached rather than the lower generating townhouse type units. This would be less than the 12,000 ADT capacity for a 2-lane urban roadway.

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Based on this ADT, D/E Street should be a collector road with 2-12' lanes with some limited direct access. If on street parking is to be allowed an additional 8 foot parking strip should be constructed on the side of the parking. It is important to note that D Street only alleviates the need for H Street to be built beyond 4 lanes beyond the next 20-year planning horizon as H Street has capacity for the expected 20 year horizon.

20-YEAR HORIZON

As CHS pointed out, GTC's 1998 report is getting a little old to use at this point in time (mid-year 2006). The new 2005/6 counts, updated ITE recommended methodology and the approved distribution clearly show that H Street's 4 lane section has capacity for the foreseeable/realistic developments planned. CHS's use of 10 ADT for this subarea, 1998 counts and 100% distribution to H Street west of the shopping center is erroneous and only results in wasted capacity projections that are not realistic within the 20 year planning horizon.

CHS's analysis is also confusing in that at they determine 3,350 units is the full build-out in one part, but state that 1,353 is a realistic 20 year build-out in another section and then elsewhere use a 2,000 unit build-out for 20 years when the 1,353 figure based on their own calculation only requires a "worst case" analysis of a 2 lane D/E Street.

PROPORTIONATE SHARE OF H STREET CAPACITY

CHS's proportionate share calculation again uses the outdated 1998 methodology and counts as well as an unsupportable 100% load of the traffic onto H Street west of the development when there is an approved distribution that shows a maximum of 85% of the site traffic destined west of the site at the highest load point of H Street, which would be 2,600 project ADT. Based on the old methodology, a 2-lane road (H Street east of Odell Road) without shoulders has a carrying capacity of 8,000 ADT. The 2006 traffic count east of Odell Road report is approximately 2,800 ADT. Therefore, even with the East Maple Ridge development fully built-out (assuming EMR adds 2,600 ADT per the 2005 GTC report) there would still be a capacity of 2,600 ADT left for other development after East Maple Ridge

Based on the 85% westbound distribution, the remaining capacity of 2,600 ADT would allow for an additional 330 SFD units east of EMR (assuming the worst case ADT formula 10 ADT per unit X 0.85) before the 2-lane no shoulder section of H Street would be near capacity assuming no improvements to H Street or D/E Street.

CHS proportionate share calculation notes correctly that East Maple Ridge (EMR) is not the only project in the planning area, but also pointed out by CHS is the fact that there has been no development in this area in the last 7 years and a realistic 20 year projection is either 2,000 units or 1,353 units, depending on what part of the memo is being read. Using the worst case 2,000 units, the 20 year projection and the updated counts, CHS's proportionate share calculation should be corrected

Following equation is updated to do so:

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20 year Planning Area 2,000 new residences
EMR 353 new residences

EMR = 353 ÷2,000 = ± 17.7%

Based on the 2006 counts, 2,800 ADT is currently being used. This leaves capacity on H Street east of Odell Road at 8,000 – 2,800 = 5,200 ADT. Therefore, 17.7% of 5,200 ADT equals 920 ADT. Based on the 85% highest load point on the 2-lane section of H Street east of Odell Road, it equates to 35.2 % of the project trip projected on this section (920 ADT/2616 ADT-Figure 2 of 2005 report) or roughly 124 units as EMR's fair share of the existing H Street capacity (using the average rate calculations from the report).

Since approval of EMR as planned, will not exceed the capacity of H Street and would still allow development of about 330 additional units; assuming no widening whatsoever of H Street or connection to D/E Street there should be no restriction.

However, if the City determines they have to reserve H Street capacity for future yet unapplied for developments, as a very minimum the EMR development should be allowed to construct/occupy at least 124 units before the connection east of D/E street to Harvey Road is made. Once a 2-lane connection of E/D Street from SR-543 to Harvey Road is made the EMR development restriction if any should be lifted for the remaining 229 EMR units.

RECOMMENDED ROW

CHS recommends the equivalent of 100 foot ROW based on exaggerated ADT projections that go well beyond the typical 20 year planning horizon and beyond any existing city standards.

The suggested 6-lane future road section through this area is inconsistent with this neighborhood, I-5 is only 4 lanes and 5-lane road section or 4-lane section with turn lanes at intersections carries almost as much as a 6-lane roadway without the sea of pavement. However, CHS has analysis with the updated counts, appropriate distribution and ITE recommended methodology would not demonstrate even the need for a 4-lane section on H Street east of Odell Road. Based on CHS's 3-lane recommendation for C/D street and 6-lanes for H street, CHS is recommending a total of 9 east-west lanes where only 2 exist today (9 suburban type lanes would have a carrying capacity of over 70,000 ADT which is close to what 6 freeway lanes carry on I-5 near Everett).

It should be noted that 2,000 SFD units only generates about 16,400 ADT using the recommend ITE methodology. Based on the 85% distribution there would be approximately 14,0000+2,800 (existing ADT) along H Street west of EMR in the 20 year planning outlook assuming, no D/E street connection. A 3-lane roadway can carry 17,000-20,000 ADT, depending on access restrictions and traffic control. Note: even with just a 2-lane D/E Street connection (12,000 ADT capacity) through EMR there would be sufficient capacity for the 20 year projection.

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Even the worst case 3,300 total build-out of units in the entire planning area results in 26,000 ADT using the recommend ITE methodology. Based on the 85% distribution there would be approximately 22,100+2,800 (existing ADT) along H Street west of EMR in the 20 year planning outlook assuming no D/E Street connection A 4-lane roadway can carry approximately 25,000 ADT, depending on access restrictions and traffic control. Note: even with just a 2-lane D/E Street connection (12,000 ADT capacity) through EMR it would reduce the demand on H Street back towards the 3-lane capacity need levels (there would be sufficient capacity for the 30-40 year projection).

However, based on the direction of flow for the critical PM peak (this is accounted for in the newer Whatcom County methodology used in GTC's 2005 report) and the grades, the eastbound direction during the PM peak-hour would have capacity constraints at a full planning area build-out scenario. Therefore, GTC would recommend that the ultimate ROW provide for one westbound lane, one center left-turn lane and two eastbound lanes. Therefore based on 12 foot lanes, 49 feet of pavement and curb would be needed. A maximum of 15 feet of additional ROW or easements would be able to accommodate any multi use trail/sidewalk or planter strips/utilities that would be appropriate for this urban/suburban area. Therefore, either a maximum of 80 feet of ROW or 60 feet of ROW with 10 foot easements on both sides would be appropriate for the future build out of H street east of Odell.

Along D Street, the 20-year horizon suggests a 2/3-lane configuration (2-12' lanes with turn pockets at major intersections). This collector road should be encouraged to be more circuitous to calm traffic. Parking and planters actually calm traffic. A 62' ROW should be more than adequate to accommodate all pavement and pedestrian/bike facilities required on this collector road. (37'pavement and curb still leaves 12.5' for a combined bike/pedestrian/utility/planter treatment). Alternatively, a 15 foot lane is considered a shared car/bike lane (10 foot travel and 5 foot bike). In this residential area an 11 foot center lane is all that would ever be needed, leaving 10 foot for planter and sidewalk after the 0.5' curb. However, based this being a residential collector street rather than an arterial, it may be determined that a left-turn lane isn't appropriate, thus automatically calming traffic and only a 51 or 52 foot ROW would be needed.

SUMMARY

GTC's 2005 traffic report based on scoping with the city and county using the latest ITE methodology clearly shows there is existing capacity on the road system to accommodate the full build-out of the EMR development and still leave additional capacity for some other developments.

Even as a worst case 20 year build out forecast with a proportionate share reservation of capacity strategy, a minimum of 124 residential units of EMR development should be allowed to proceed unimpeded until the D/E Street collector across the property to SR-543 is made, at which time the remaining units should be allowed to proceed.

H Street (major arterial) needs to be developed to 3-lanes in order to accommodate the 20-year development horizon traffic. However, to ensure capacity

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30-40 years, ROW should be available for a 4-lane section. A total of 80' of ROW or combined easement/ROW should accommodate both motorized and non motorized needs. As properties develop, these ROW and easements should be dedicated/acquired.

Mott's Parkway only requires a 2-lane collector capacity with turn lanes at major intersections and should be designed as to calm east-west traffic through this residential neighborhood.

Lastly, both Mott's Parkway and H Street will need to be limited access streets. Driveways in the new developments should be oriented to secondary roads and not to these limited access streets. In addition, major developments should be required to provide public access to adjacent smaller parcels to limit their need for direct driveway access to H Street or Mott's Parkway.

Sincerely,

Edward Koltonowski

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Title1 : H Street e/o Odell Road
Title2 : Gibson Traffic
Title3 : 05-253 East Blaine

Site: HsteoOdellRD

Volume (2 Ch/pg., 60 Min., 7 Days)

Interval Begin	Mon 7/31/2006 WB	Mon EB	Tue 8/1/2006 WB	Tue EB	Wed 8/2/2006 WB	Wed EB	Thu 8/3/2006 WB	Thu EB	Fri 8/4/2006 WB	Fri EB	Sat 8/5/2006 WB	Sat EB	Sun 8/6/2006 WB	Sun EB	Weekday Average WB	Weekday Average EB	Week Average WB	Week Average EB
12:00 AM	*	*	*	*	5	11	8	18	11	14	10	23	*	*	8	14	8	16
2:00 AM	*	*	*	*	2	1	1	3	1	6	5	3	*	*	1	3	2	3
4:00 AM	*	*	*	*	10	1	7	2	9	3	3	1	*	*	8	2	7	1
6:00 AM	*	*	*	*	59	27	52	18	41	22	23	11	*	*	50	22	43	19
8:00 AM	*	*	*	*	106	81	109	74	107	70	46	18	*	*	107	75	92	60
10:00 AM	*	*	*	*	91	81	71	79	86	82	64	69	*	*	82	80	78	77
12:00 PM	*	*	*	*	101	105	91	110	84	92	81	92	*	*	92	102	89	99
2:00 PM	*	*	*	*	100	122	80	101	89	109	63	84	*	*	89	110	83	104
4:00 PM	*	*	*	*	91	158	89	147	76	128	57	87	*	*	85	144	78	130
6:00 PM	*	*	*	*	79	86	92	106	69	84	48	67	*	*	80	92	72	85
8:00 PM	*	*	21	36	44	60	28	52	42	54	*	*	*	*	33	50	33	50
10:00 PM	*	*	21	23	31	26	23	24	37	37	*	*	*	*	28	27	28	27
Totals	*	*	85	111	1457	1488	1379	1464	1303	1393	841	898	*	*	1364	1429	1259	1328
Combined	*	*	196		2945		2843		2696		1739		*	*	2793		2587	
Split (%)	*	*	43.4	56.6	49.5	50.5	48.5	51.5	48.3	51.7	48.4	51.6	*	*	48.8	51.2	48.7	51.3
AM Peak	*	*	*	*	11:00 AM	9:00 AM	8:00 AM	11:00 AM	8:00 AM	11:00 AM	11:00 AM	11:00 AM	*	*	8:00 AM	11:00 AM	11:00 AM	11:00 AM
Volume	*	*	*	*	111	90	109	92	107	96	85	71	*	*	107	90	99	85
PM Peak	*	*	9:00 PM	9:00 PM	3:00 PM	4:00 PM	3:00 PM	5:00 PM	1:00 PM	4:00 PM	5:00 PM	5:00 PM	*	*	3:00 PM	4:00 PM	3:00 PM	4:00 PM
Volume	*	*	27	44	119	158	103	150	95	128	83	103	*	*	103	144	95	130

File: C:\Program Files\TMWin\Data-JDF\HsteoOdellRd.rdf

Traffic Plus

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Description 1 : H Street e/o SR 543 Westbound
Description 2 : Gibson Traffic
Description 3 : 05-253 East Blaine

Site: HSteoSR543WB

Volume (1 Ch/pg., 60 Min., 7 Days)
Channel: Westbou nd

Interval Begin	Mon 7/31/2006	Tue 8/1/2006	Wed 8/2/2006	Thu 8/3/2006	Fri 8/4/2006	Sat 8/5/2006	Sun 8/6/2006	Weekday Avg	Week Avg
12:00 AM	*	*	25	27	27	37	*	26	29
1:00 AM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2:00 AM	*	*	19	15	22	16	*	18	18
3:00 AM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4:00 AM	*	*	24	24	16	18	*	21	20
5:00 AM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6:00 AM	*	*	109	94	114	90	*	105	101
7:00 AM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8:00 AM	*	*	251	250	262	135	*	254	224
9:00 AM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10:00 AM	*	*	287	292	301	270	*	293	287
11:00 AM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12:00 PM	*	*	386	393	398	338	*	392	378
1:00 PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2:00 PM	*	*	365	307	378	247	*	350	324
3:00 PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4:00 PM	*	*	341	330	370	292	*	347	333
5:00 PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6:00 PM	*	*	286	319	293	242	*	299	285
7:00 PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8:00 PM	*	2	188	178	226	45	*	148	127
9:00 PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10:00 PM	*	108	107	96	132	*	*	110	110
11:00 PM	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Totals	*	297	4706	4620	5181	3435	*	4767	4516
AM Peak	*	*	11:00 AM	11:00 AM	11:00 AM	11:00 AM	*	11:00 AM	11:00 AM
Volume	*	*	358	308	352	293	*	339	327
PM Peak	*	9:00 PM	12:00 PM	12:00 PM	5:00 PM	12:00 PM	*	12:00 PM	12:00 PM
Volume	*	140	386	393	419	338	*	392	378

File: C:\Program Files\TMWin\Data-JDF\HSteoSR543WB.rdf

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Description 1 : H Street e/o SR 543 Eastbound
Description 2 : Gibson Traffic
Description 3 : 05-253 East Blane

Site: HSteoSR543EB

Volume (1 Ch/pg., 60 Min., 7 Days)
Channel: Eastbou nd

Interval Begin	Mon 7/31/2006	Tue 8/1/2006	Wed 8/2/2006	Thu 8/3/2006	Fri 8/4/2006	Sat 8/5/2006	Sun 8/6/2006	Weekday Avg	Week Avg
12:00 AM	*	*	24	34	27	33	*	28	29
1:00 AM	*	*	15	16	16	7	*	15	13
2:00 AM	*	*	11	11	18	9	*	13	12
3:00 AM	*	*	51	65	62	53	*	59	57
4:00 AM	*	*	230	212	208	91	*	216	185
5:00 AM	*	*	298	261	316	222	*	291	274
6:00 AM	*	*	354	355	368	279	*	359	339
7:00 AM	*	*	351	326	343	236	*	340	314
8:00 AM	*	*	371	315	364	248	*	350	324
9:00 AM	*	*	234	249	232	208	*	238	230
10:00 AM	*	38	146	181	189	*	*	138	138
11:00 AM	*	62	67	66	113	*	*	77	77
Totals	*	268	4294	4206	4605	2755	*	4314	4023
AM Peak	*	*	11:00 AM	11:00 AM	11:00 AM	11:00 AM	*	11:00 AM	11:00 AM
Volume	*	*	329	284	363	244	*	325	305
PM Peak	*	9:00 PM	4:00 PM	12:00 PM	12:00 PM	12:00 PM	*	12:00 PM	12:00 PM
Volume	*	129	371	355	368	279	*	359	339

File: C:\Program Files\TMWin\Data-JDF\HSteoSR543EB.rdf

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Title1 : H Street e/o Odell Road
Title2 : Gibson Traffic
Title3 : 05-253 East Blaine

Site: HsteoOdellRD
Date: 8/2/2006
Wednesday

Daily Vehicle Classification (60 Min.)
Channel: WB

Time	Total	Bike	Cars Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Ax Doubl	5 Axle Doubl	>6 Ax Doubl	<6 Ax Multi	6 Axle Multi	>6 Ax Multi
12:00 AM	5	0	4	0	0	0	0	0	0	1	0	0	0	0
1:00 AM	8	0	6	2	0	0	0	0	0	0	0	0	0	0
2:00 AM	2	0	1	1	0	0	0	0	0	0	0	0	0	0
3:00 AM	5	0	1	4	0	0	0	0	0	0	0	0	0	0
4:00 AM	10	0	7	3	0	0	0	0	0	0	0	0	0	0
5:00 AM	21	0	12	5	0	1	0	0	1	0	2	0	0	0
6:00 AM	59	1	38	17	0	2	0	0	0	0	1	0	0	0
7:00 AM	105	0	70	18	1	4	1	0	3	2	6	0	0	0
8:00 AM	106	1	62	21	0	9	2	0	1	5	5	0	0	0
9:00 AM	88	1	49	22	0	1	1	0	0	6	8	0	0	0
10:00 AM	91	2	55	14	0	5	2	0	0	6	7	0	0	0
11:00 AM	111	3	65	20	0	8	1	0	1	5	8	0	0	0
12:00 PM	101	0	65	23	0	4	2	0	0	4	3	0	0	0
1:00 PM	99	1	57	18	1	5	1	0	0	7	9	0	0	0
2:00 PM	100	1	60	21	1	4	2	0	3	3	5	0	0	0
3:00 PM	119	1	74	25	2	6	0	1	1	5	4	0	0	0
4:00 PM	91	2	64	13	1	4	1	0	0	2	4	0	0	0
5:00 PM	92	0	74	14	0	4	0	0	0	0	0	0	0	0
6:00 PM	79	4	59	12	1	1	0	0	2	0	0	0	0	0
7:00 PM	53	1	41	10	0	1	0	0	0	0	0	0	0	0
8:00 PM	44	0	33	8	0	2	0	0	0	1	0	0	0	0
9:00 PM	31	0	22	7	0	1	0	0	0	0	1	0	0	0
10:00 PM	31	0	27	4	0	0	0	0	0	0	0	0	0	0
11:00 PM	6	0	5	1	0	0	0	0	0	0	0	0	0	0
Total	1457	18	951	283	7	62	13	1	12	47	63	0	0	0
%		1.2	65.3	19.4	0.5	4.3	0.9	0.1	0.8	3.2	4.3	0.0	0.0	0.0

mgtgl.
654-2605

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Title1 : H Street e/o Odell Road
Title2 : Gibson Traffic
Title3 : 05-253 East Blaine

Site: HsteoOdellRD
Date: 8/3/2006
Thursday

Daily Vehicle Classification (60 Min.)
Channel: WB

Time	Total	Bike	Cars Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Ax Doubl	5 Axle Doubl	>6 Ax Doubl	<6 Ax Multi	6 Axle Multi	>6 Ax Multi
12:00 AM	8	0	7	1	0	0	0	0	0	0	0	0	0	0
1:00 AM	2	0	0	1	1	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	4	0	1	3	0	0	0	0	0	0	0	0	0	0
4:00 AM	7	0	3	4	0	0	0	0	0	0	0	0	0	0
5:00 AM	17	0	10	5	0	1	0	0	0	1	0	0	0	0
6:00 AM	52	1	35	11	0	3	0	0	0	0	1	0	0	0
7:00 AM	105	1	59	29	2	3	1	0	3	3	4	0	0	0
8:00 AM	109	1	75	14	3	4	1	0	2	4	5	0	0	0
9:00 AM	99	0	58	26	0	1	1	0	4	5	4	0	0	0
10:00 AM	71	0	47	12	0	3	0	0	0	2	7	0	0	0
11:00 AM	102	1	73	14	1	4	1	0	1	3	4	0	0	0
12:00 PM	91	0	67	15	0	7	0	0	0	0	2	0	0	0
1:00 PM	97	1	68	13	0	7	1	0	0	3	4	0	0	0
2:00 PM	80	0	47	21	0	5	0	0	0	3	4	0	0	0
3:00 PM	103	1	74	19	0	6	0	0	1	1	1	0	0	0
4:00 PM	89	0	59	19	0	6	2	0	1	0	2	0	0	0
5:00 PM	88	1	57	22	0	6	0	0	2	0	0	0	0	0
6:00 PM	92	0	63	21	0	8	0	0	0	0	0	0	0	0
7:00 PM	54	2	34	15	0	2	0	0	1	0	0	0	0	0
8:00 PM	28	1	24	3	0	0	0	0	0	0	0	0	0	0
9:00 PM	41	1	34	5	0	1	0	0	0	0	0	0	0	0
10:00 PM	23	0	18	4	0	0	0	0	0	1	0	0	0	0
11:00 PM	16	0	12	2	0	0	1	0	1	0	0	0	0	0
Total	1379	11	926	279	7	67	8	0	16	26	38	0	1	0
%		0.8	67.2	20.2	0.5	4.9	0.6	0.0	1.2	1.9	2.8	0.0	0.1	0.0

File: C:\Program Files\TMWin\Data-JDF\HsteoOdellRd.rdf

GIBSON TRAFFIC CONSULTANTS
TRAFFIC ENGINEERING • TRANSPORTATION PLANNING
1712 PACIFIC AVENUE • SUITE 100 • EVERETT, WA 98201 • PH: (425) 339-8266 • FAX: (425) 258-2922

November 16, 2005

Mr. Steve Banham
City of Blaine Public Works
344 H Street
Blaine, WA 98230

Re: East Maple Ridge Development – 353 Residential unit and 12,000 square feet of office
City of Blaine - GTC #05-253

Mr. Banham:

Gibson Traffic Consultants (GTC) has been retained by The Connelly Company, LLC to provide a traffic impact analysis for the proposed East Maple Ridge mixed-use development to address the City of Blaine traffic impact analysis requirements. An analysis of the trip generation, trip distribution, intersection level of service, arterial volume-to-capacity ratio and mitigation fees has been included as part of this report. This report has been formatted to follow the Traffic Study Requirements Outline provided by the City of Blaine.

1. INTRODUCTION

The proposed East Maple Ridge development would include 237 single-family residential units, 116 condominium units, 12,000 square feet (SF) of general office space and 12,000 SF of community center as part of the residential units. The site is currently vacant. The development is generally located north of H Street and west of Harvey Road; a site vicinity map has been included in **Figure 1**. The development is proposing to have access to H Street, Harvey Road and Jerome Street. A site plan has been included in the attachments.

The commercial, educational and governmental areas in the development vicinity are primarily located along the SR-543 and H Street corridors. The intersection of SR-543 at H Street is the location of the primary retail and educational areas.

2. TRIP GENERATION

Trip generation estimates are based on national statistics for residential developments contained in the Institute of Transportation Engineer's (ITE) *Trip Generation, 7th Edition*. The following ITE Land Use Codes have been used for the trip generation calculations:

- Land Use Code 210 – Single-Family Detached Housing
- Land Use Code 230 – Residential Condominium/Townhouse
- Land Use Code 710 – General Office

The community center is not anticipated to generate any new trips since it will be for the residents of the development and could reduce off-site development trips. The community center will provide facilities on-site that residents would otherwise have to travel off-site to access, thereby reducing off-site development trips. However, as a "worst case" a reduction in trips for the community center has not been applied. The average ITE trip generation rates have been used for the trip generation calculations.

The development will contain two different uses, residential and office. There will be trips that will travel inside of the development between the residential and office uses and will not impact the surrounding roadway. These trips are considered internal crossover trips and are considered a reduction to the development's total trip generation. The internal crossover calculations were performed using standard ITE methodology that is documented in the ITE *Trip Generation Handbook*. The individual crossover rates have been applied to each of the uses since the trip generation and crossover rates are significantly different for the residential and office uses. The crossover rates for each of the uses are:

- Single-Family Residential – Less than 1% daily, 1% for the AM and PM peak-hours.
- Residential Condominiums – Less than 1% daily, 3% for the AM and PM peak-hours.
- General Office – 2% daily, 22% for the AM and PM peak-hours.

The trip generation for the East Maple Ridge development has been calculated using the ITE average trip generation rates and the internal crossover percentages. The development is anticipated to generate **3,077 Daily trips** with **240 AM peak-hour trips (65 inbound/175 outbound)** and **309 PM peak-hour trips (190 inbound/119 outbound)**. A summary of the trip generation has been included in **Table 1**. The development will generate approximately 30% more PM peak-hour trips than AM peak-hour trips. The trip generation and internal crossover calculations have been included in the attachments.

3. TRIP DISTRIBUTION

The development's distribution of trips is based on conversations with city residences, field observations, existing turning movement counts and locations of commercial, recreational and educational areas as well as prior annexation traffic studies performed for this area. The distribution was sent to city staff for review, but no comments have been received by the time of this report publication.

It is estimated that 85% of the development's trips will travel to and from the west of the development. It is estimated that thirty percent of the trips will travel to and from the south along I-5; fifteen percent will travel to and from the north along I-5 and forty percent will travel to and from local destinations in the City of Blaine. The remaining 15% of the development's trips will travel to and from the south and east of the development. A trip distribution showing the daily and PM peak-hour trips has been included in **Figure 2**. A trip distribution has not been included for the AM peak-hour since it does not represent the peak trip generation time for the development.

4. TRIP ASSIGNMENT

The trip assignments for the East Maple Ridge development have been applied to the city streets based on the development's trip distribution. The trip assignments for the daily and PM peak-hour trips at the study intersections and site accesses have been included in **Figure 3**.

The development trips have only been included at the 2 site access intersections to H Street. These two site access intersections are anticipated to be impacted by the highest number of development trips. The analysis at these intersections represents a conservative estimate of the level of service at the site access intersections. Additionally, GTC has recommendations, which are discussed in section 8, which would restrict the access to Harvey Road or E street until improvements are completed on Harvey Road or E Street. GTC has therefore assumed that 33% of the development trips will use the west site access to H Street and the remaining 67% of the development trips will use the east site access to H Street for this conservative distribution of trips. This distribution of trips to the site access intersections is based on the arrangement of the residential units and the office building.

5. EXISTING AND PROJECTED TRAFFIC VOLUMES

The 2005 existing turning movements for the study intersections are based on turning movement counts performed in October and November of 2005 by the independent count firms of All Traffic Data and Trafficplus. The existing turning movements at the study intersections have been shown in **Figure 4**. The existing turning movement volumes include truck traffic traveling in the northbound truck lane. The heavy vehicle percentage for the northbound traffic is approximately 28% for the two intersections with the northbound truck lane on SR-543, H Street and D Street. For both of these intersections it has been assumed that 25% of the total northbound traffic is trucks that travel in the northbound truck lane. The remaining 3% of the northbound heavy vehicles are assumed to be delivery trucks, busses and other trucks that are not in the northbound truck lane. The existing turning movement calculations have been included in the attachments.

5.1 PM Peak-Hour Site Traffic

The PM peak-hour site traffic has been distributed to the study intersections and site access intersections based on the overall development trip distribution. The development turning movements at the study and site access intersections have been previously shown in Figure 3.

5.2 PM Peak-Hour Total Traffic

The 2011 baseline turning movements have been calculated by applying a 3% annually compounded growth factor to the existing turning movements. This growth factor has also been applied to the northbound trucks using the truck lane on SR-543 at H Street and D Street. The 2011 baseline turning movements have been included in **Figure 5** at the study intersections. The 2011 baseline turning movement calculations have been included in the attachments.

The 2011 future with development turning movements have been calculated by adding the East Maple Ridge development trips to the 2011 baseline turning movements. The development's turning movements are based the distribution contained in Figure 2. The 2011 future with development turning movements at the study intersections have been shown in **Figure 6**.

5.3 Other Peak-Hour Traffic

The development will generate the highest number of trips during the PM peak-hour, which is higher than the AM peak-hour by approximately 30%. Additionally, the PM peak-hour of the street is typically 30% higher during the PM peak-hour than during the AM peak-hour. The analysis contained in this report has therefore only been performed for the PM peak-hour.

6. CAPACITY ANALYSIS

The off-site intersections analyzed for level of service as part of this study are:

1. SR-543 at D Street
2. Mitchell Avenue at H Street
3. SR-543 at H Street
4. Odell Street at H Street
5. SR-543 at Boblett Street

There are 2 site access intersections that have been analyzed for level of service, both of which access H Street east of Odell Street.

In addition to intersection level of service, arterial capacity level of service has been performed for the PM peak-hour at the following locations:

1. SR-543 north of D Street
2. D Street west of SR-543
3. D Street east of SR-543
4. SR-543 between H Street and D Street
5. H Street west of Mitchell Avenue
6. Mitchell Avenue south of H Street
7. H Street between Mitchell Avenue and SR-543
8. H Street between SR-543 and Odell Street
9. Odell Street south of H Street
10. H Street east of Odell Street
11. H Street west of Harvey Road
12. SR-543 between Boblett Street and H Street
13. SR-543 south of Boblett Street

Congestion at intersections is generally measured in terms of level of service (LOS). In accordance with the 2000 Highway Capacity Manual (HCM), road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service at signalized and all-way stop-controlled intersections is based on the average delay of all approaches, while the level of service for two-way stop-controlled intersections is based on average delays for the critical stopped approach. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values.

The arterial capacity analysis has been performed based on the volume-to-capacity ratios. The City of Blaine's level of service thresholds have been applied for the arterial capacity analysis. The acceptable level of service at City of Blaine intersections and along City of Blaine arterials is LOS D and the acceptable level of service at WSDOT intersections is LOS E. A summary of the intersection and arterial level of service criteria has been included in **Table 2**.

The intersection level of service analysis has been performed using the existing lane configuration, intersection control, peak-hour factors and heavy vehicle percentages. The intersections of SR-543 at D Street and H Street have northbound truck lanes for trucks crossing the USA border. The intersection of SR-543 at D Street is a two-way stop-controlled intersection with D Street having to stop. Computer software does not allow for the modeling of a truck lane at unsignalized intersections. This intersection has therefore been analyzed without an additional truck lane, which is a conservative estimate of the intersection's level of service. The intersection of SR-543 at H Street is a signalized intersection and the northbound truck lane was able to be modeled as a separate approaching street, creating a 5-leg intersection. This is the

most accurate way to analyze the signal and reflects an accurate level of service for the intersection.

6.1 2005 Existing Intersection Level of Service Analysis

The 2005 existing level of service analysis has been performed using the volumes shown in Figure 4. All of the study intersections operate at acceptable LOS C or better under the existing conditions. A summary of the existing intersection level of service has been included in **Table 3**.

6.2 2011 Baseline Intersection Level of Service Analysis

The volumes shown in Figure 5 have been used to perform the 2011 baseline intersection level of service analysis. All of the study intersections will continue to operate at LOS C or better. The intersections of Mitchell Avenue at H Street and Odell Road at H Street are the only intersections that will experience a decrease in the level of service from the 2005 existing to 2011 baseline conditions. A summary of the baseline level of service analysis has been included in **Table 3**.

6.3 2011 Future with Development Intersection Level of Service Analysis

The 2011 future with development intersection level of service analysis has been performed using the turning movement volumes shown in Figure 6. The addition of the development will not change the level of service at any of the study intersections, but will cause an increase in the delay. A summary of the 2011 future with development intersection levels of service at the study intersections has been included in **Table 3**.

The development is proposed to have 4 site access intersections: two to H Street, one to Jerome Street and one to Harvey Road. GTC has performed a conservative analysis of the site access intersections by only analyzing the two site access intersections to H Street and by distributing all of the development's trips to these two intersections. H Street has a higher volume than Jerome Street or Harvey Road and distributing all of the development's trips to the two intersections will be a conservative calculation of the trips at the site access intersections. This conservative analysis resulted in both site access intersections operating at acceptable LOS B. A summary of the intersection level of service at the two site access intersections has been included in **Table 3**.

6.4 Arterial Volume-to-Capacity Ratio Analysis

Arterial volume-to-capacity (VC) ratio analysis was performed at the 11 study locations described earlier in this report. The VC ratio analysis was performed based on peak-hour capacities provided by the city. The VC ratio level of service was determined based on the

highest PM peak-hour volume on the approach or departure, except where the segment was bound by two study intersections. When a segment was bound by two study intersections the highest PM peak-hour volume in either approach or departure from the pair of adjacent intersections was used for the analysis. The arterial VC ratio level of service was only calculated for the future with development conditions since that will reflect the worst level of service. All of the study segment will have a 2011 future with development arterial VC ratio of LOS B or better. A summary of the arterial VC ratios was been included in **Figure 7**.

6.5 Site Access Intersection Channelization Analysis

Channelization analysis was performed at the two site access intersections to H Street that were analyzed as part of this report. Left-turn and right-turn channelization analysis has been performed using the conservative site access volumes shown in Figure 3. The channelization warrants are based on WSDOT design criteria for channelization. **The analysis shows that channelization will not be warranted at the site access intersections even with the conservative site access turning movements.** The channelization calculations have been included in the attachments.

GTC's field work indicates that both Harvey Road and E Street/Jerome Street are substandard off-site roads. Based on these existing conditions the Jerome Street and Harvey Road access points should be stub roads but not open for public vehicular traffic until the following improvements are made:

- A minimum of 20 feet of vehicular pavement on Harvey Road south of the access to H Street.
- A minimum of 20 feet of pavement and minimum safe stopping sight distances and curve radii along E Street/Jerome Street according to the American Association of State Highway and Transportation Official's (AASHTO) *A Policy on Geometric Design of Highways and Streets*. The stopping sight distances and curve radii should be appropriate for the posted speed limit.

7. MITIGATION

Mitigation fee calculations have been made for impacts to the City of Blaine street system. Mitigation fees are based on the number of PM peak-hour trips generated by development and are equal to $755 per PM peak-hour trip. The East Maple Ridge development generates 309 PM peak-hour trips and will be assessed mitigation fees of **$233,295**. The 237 single-family residential units will be responsible for $178,935, the 116 condominium units will be responsible for $43,790 and the 12,000 SF of general office will be responsible for $10,570. A summary of the mitigation fees has been included in **Table 4**.

8. CONCLUSION AND RECOMMENDATIONS

The East Maple Ridge development will consist of 237 single-family residential units, 116 condominium units, 12,000 SF of general office space and 12,000 SF of community center. The development will generate 3,077 daily trips and 309 PM peak-hour trips. The development will not impact any intersections or arterials operating at deficient levels of service and will not cause any intersections or arterials to operate at deficient levels of service. The total mitigation fees that the development will be required to pay the City of Blaine are $233,295.

The development is proposed to have one access to Jerome Street, two accesses to H Street and one access to Harvey Road. Harvey Road is currently a 1-lane roadway with a pavement width of approximately 12 to 16 feet. GTC recommends that this access point be restricted to emergency and non vehicular traffic until Harvey Road between H Street and the site access intersection is fully improved to a minimum of 20 feet of traveled way. Additionally, the Jerome Street access should be restricted to emergency and non vehicular traffic until E Street have been upgraded to meet minimum AASHTO standards for safe vehicular traffic for the posted speed limit and 20 foot pavement by the city.

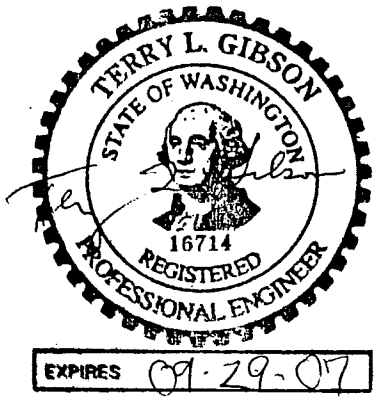
We trust that GTC's report, traffic analysis and attachments adequately address the traffic impacts of the proposed East Maple Ridge development, so that the City of Blaine can complete its review of the proposed development. If there are any questions concerning the analysis or findings, please call GTC at (425) 339-8266.

Sincerely,

GIBSON TRAFFIC CONSULTANTS, INC.

Edward T. Koltonowski
Senior Traffic Engineer

CC: Doug Connelly, The Connelly Group, LLC



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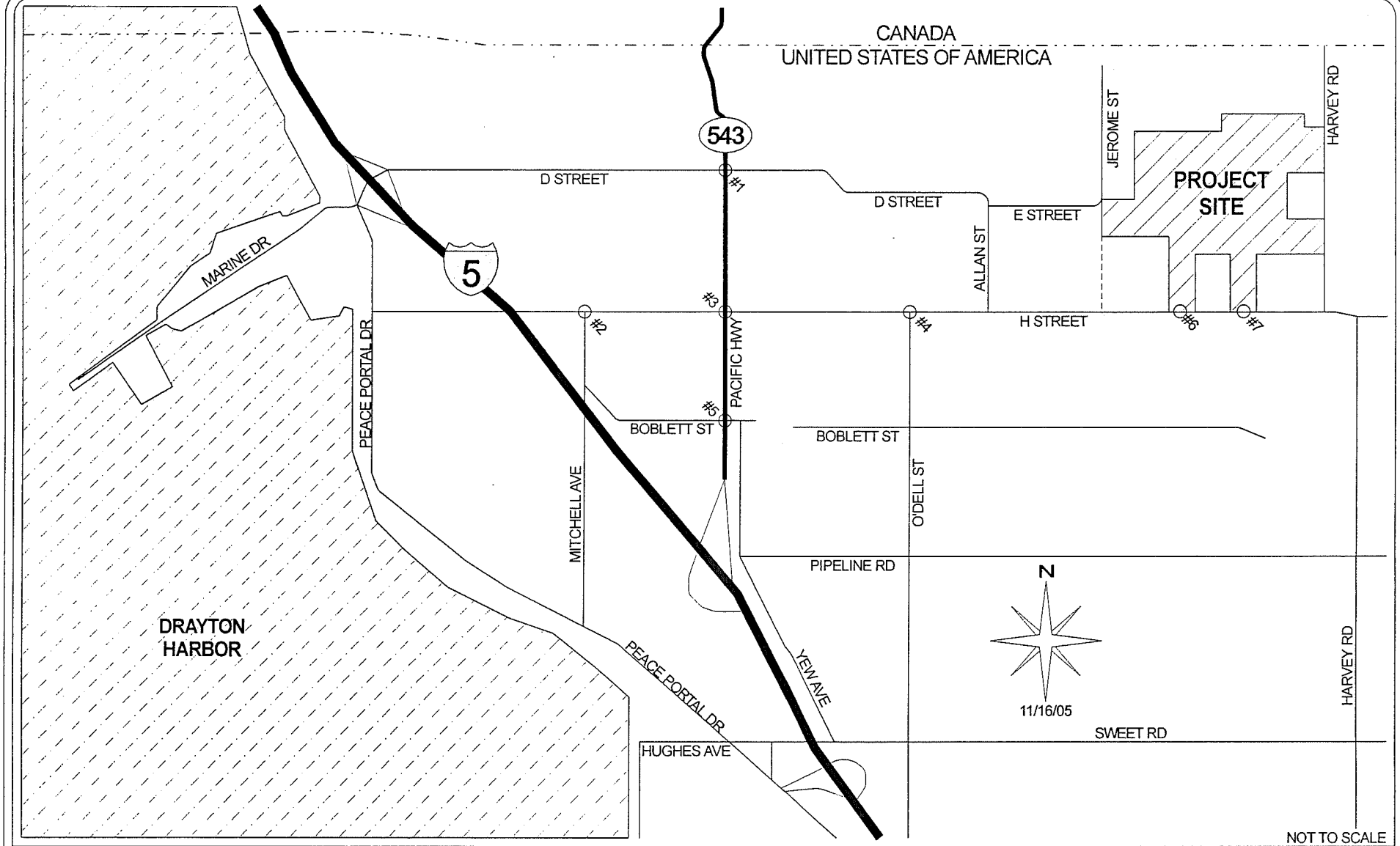

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TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

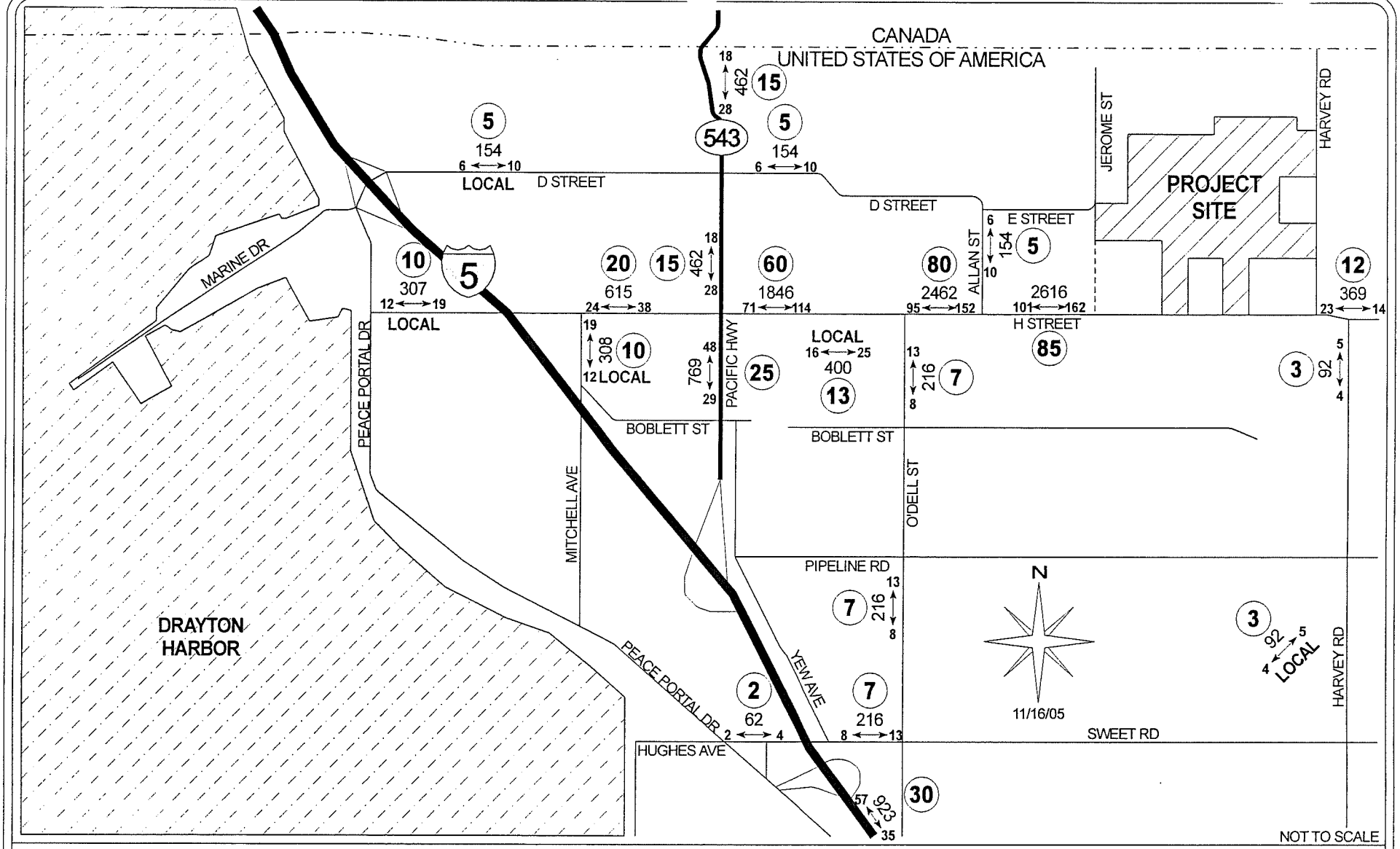
CITY OF BLAINE

LEGEND

PROJECT SITE

#1 STUDY INTERSECTION

FIGURE 1
SITE VICINITY MAP



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

CITY OF BLAINE

LEGEND

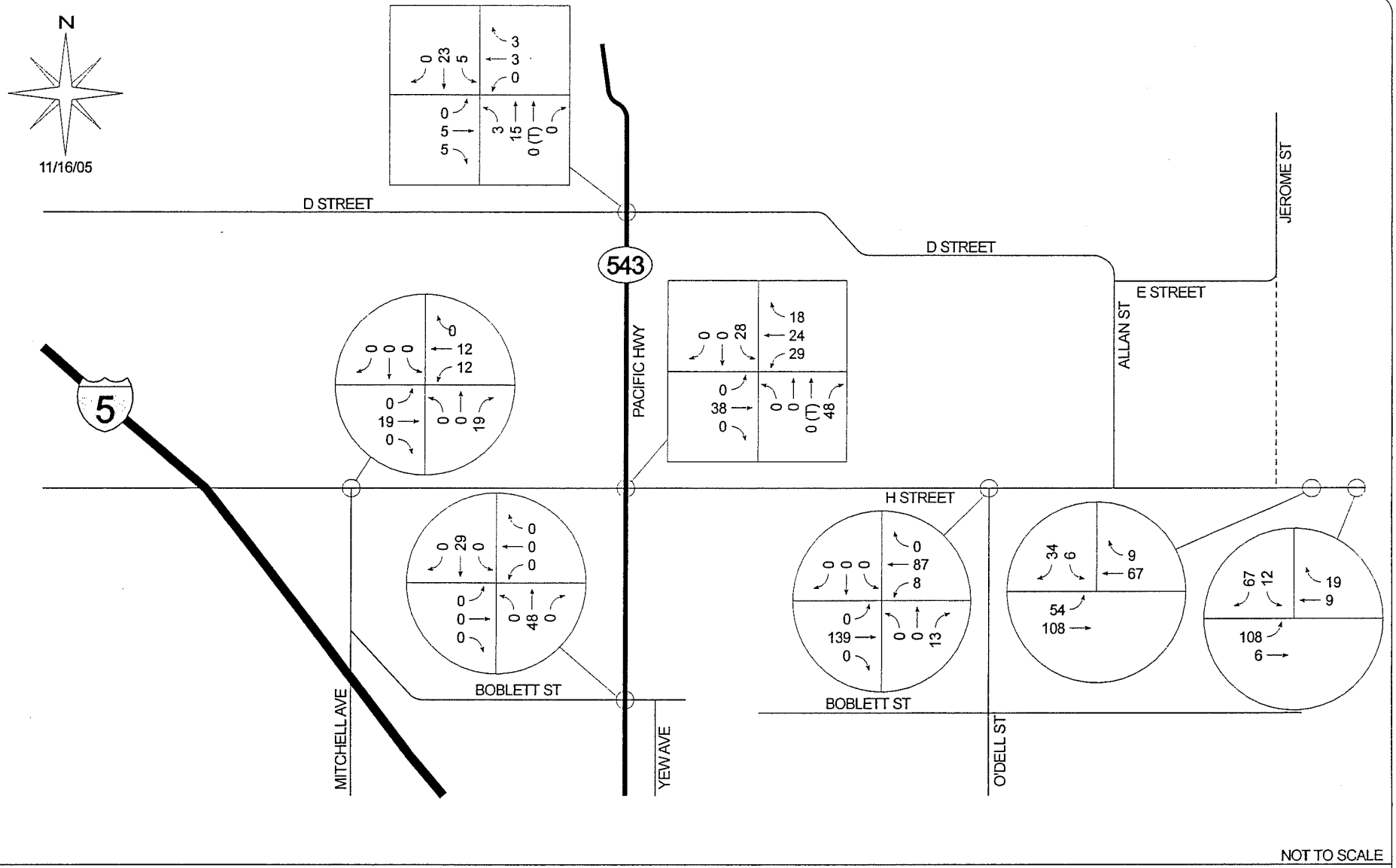
AWDT
PM ↔ PEAK — NEW SITE TRAFFIC (DAILY/PEAK HOUR)

25 — TRIP DISTRIBUTION %

FIGURE 2

DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR

2



NOT TO SCALE

GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

CITY OF BLAINE

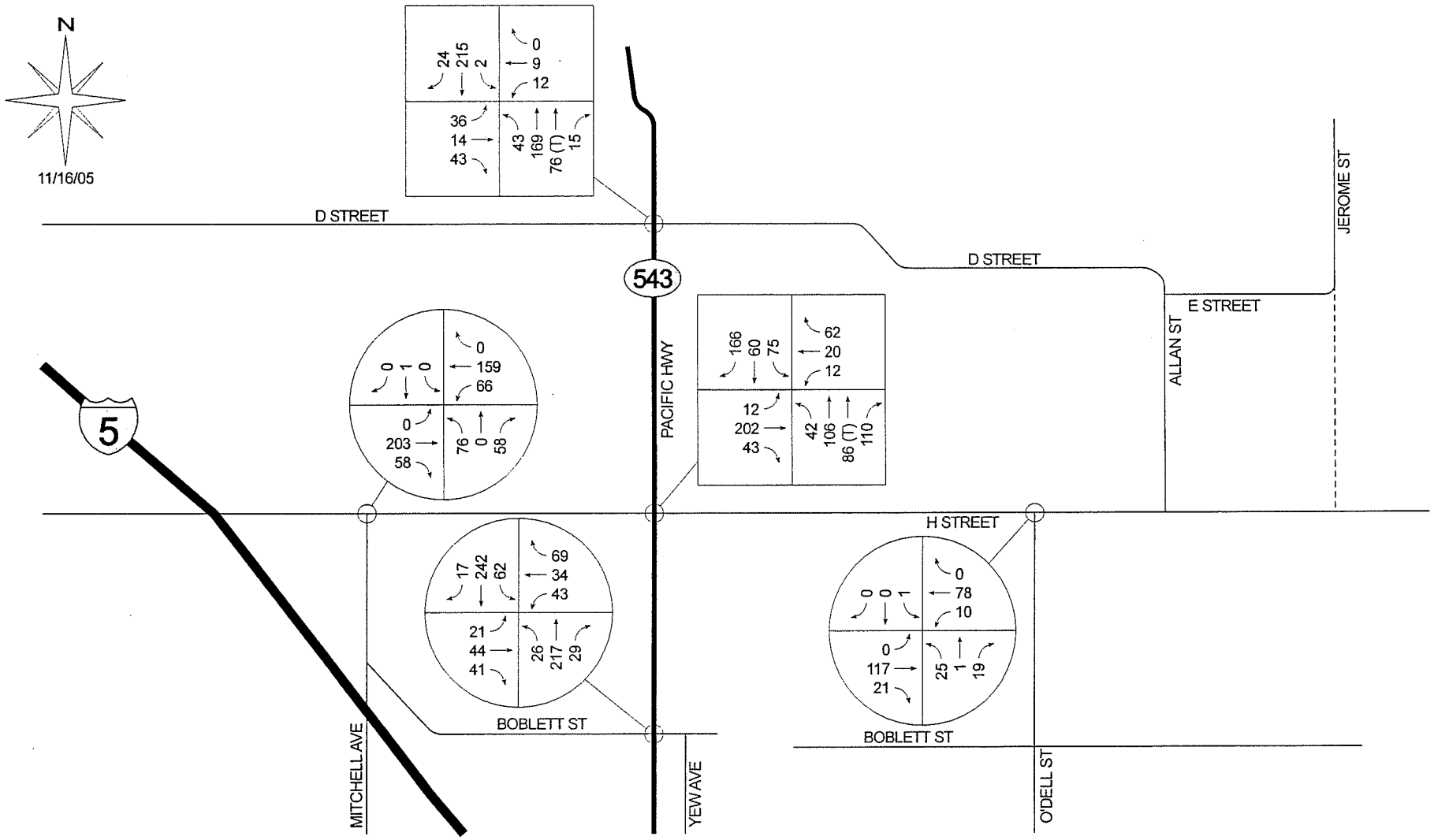
LEGEND

XXX→ PM PEAK-HOUR TURNING MOVEMENT VOLUMES

XXX (T)→ PM PEAK-HOUR VOLUME IN TRUCK LANE

FIGURE 3
DEVELOPEMENT TRAFFIC VOLUMES PM PEAK-HOUR

3



NOT TO SCALE

GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

CITY OF BLAINE

LEGEND

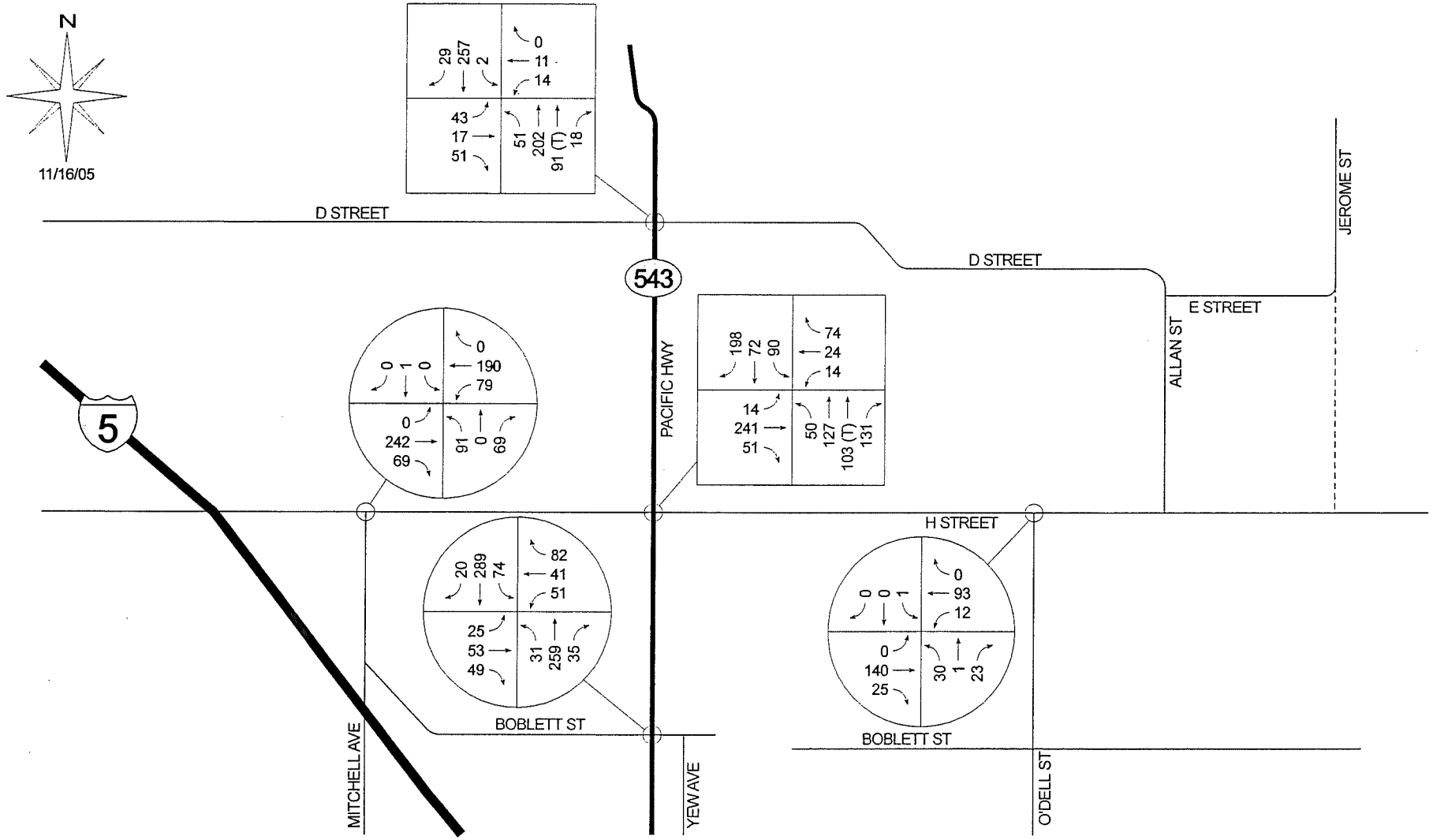
XXX→ PM PEAK-HOUR TURNING MOVEMENT VOLUMES

XXX (T)→ PM PEAK-HOUR VOLUME IN TRUCK LANE

FIGURE 4

EXISTING TRAFFIC VOLUMES PM PEAK-HOUR

4



NOT TO SCALE

GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

CITY OF BLAINE

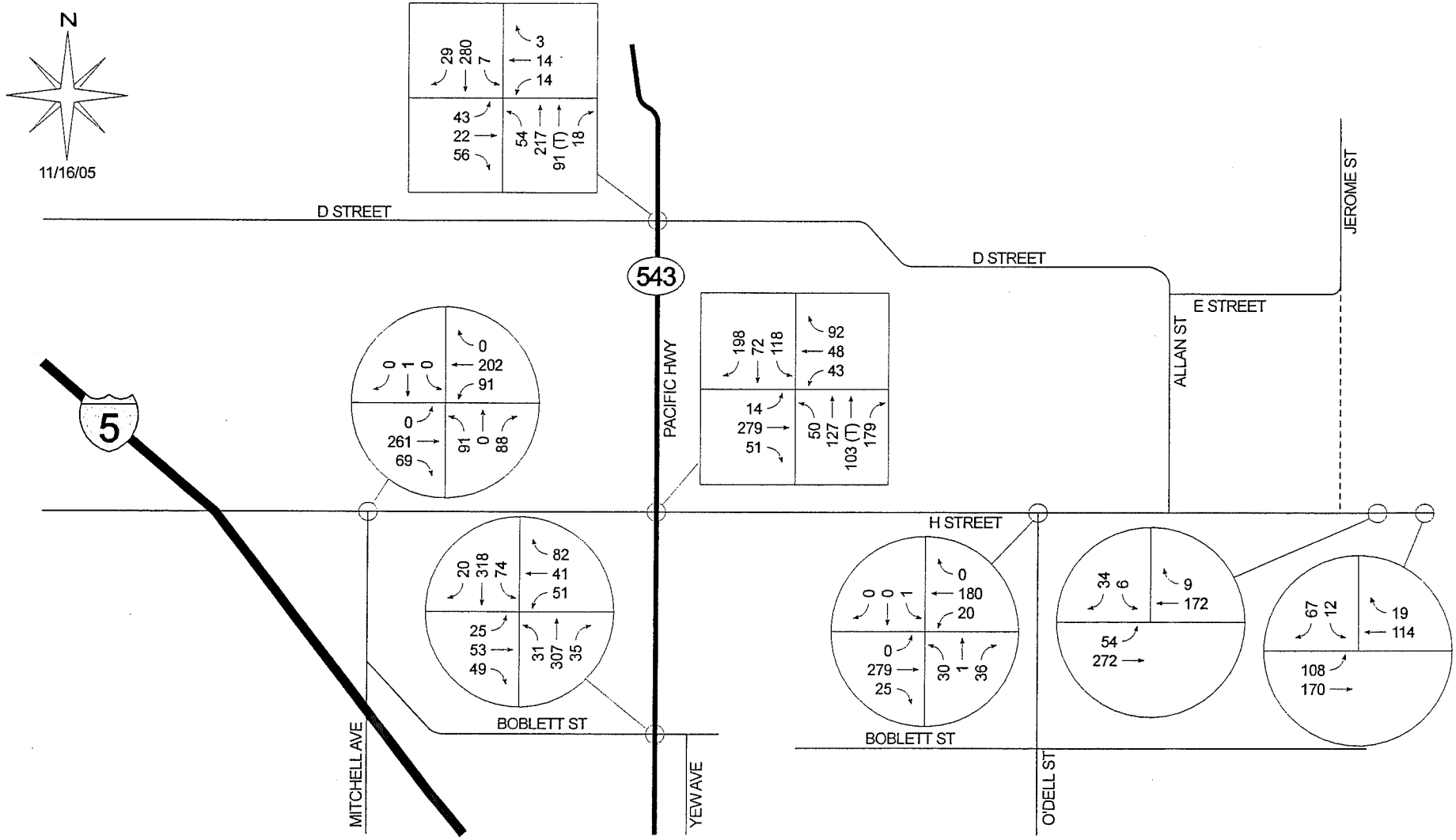
LEGEND

XXX→ PM PEAK-HOUR TURNING MOVEMENT VOLUMES

XXX (T)→ PM PEAK-HOUR VOLUME IN TRUCK LANE

FIGURE 5

2011 BASELINE TRAFFIC VOLUMES PM PEAK-HOUR



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

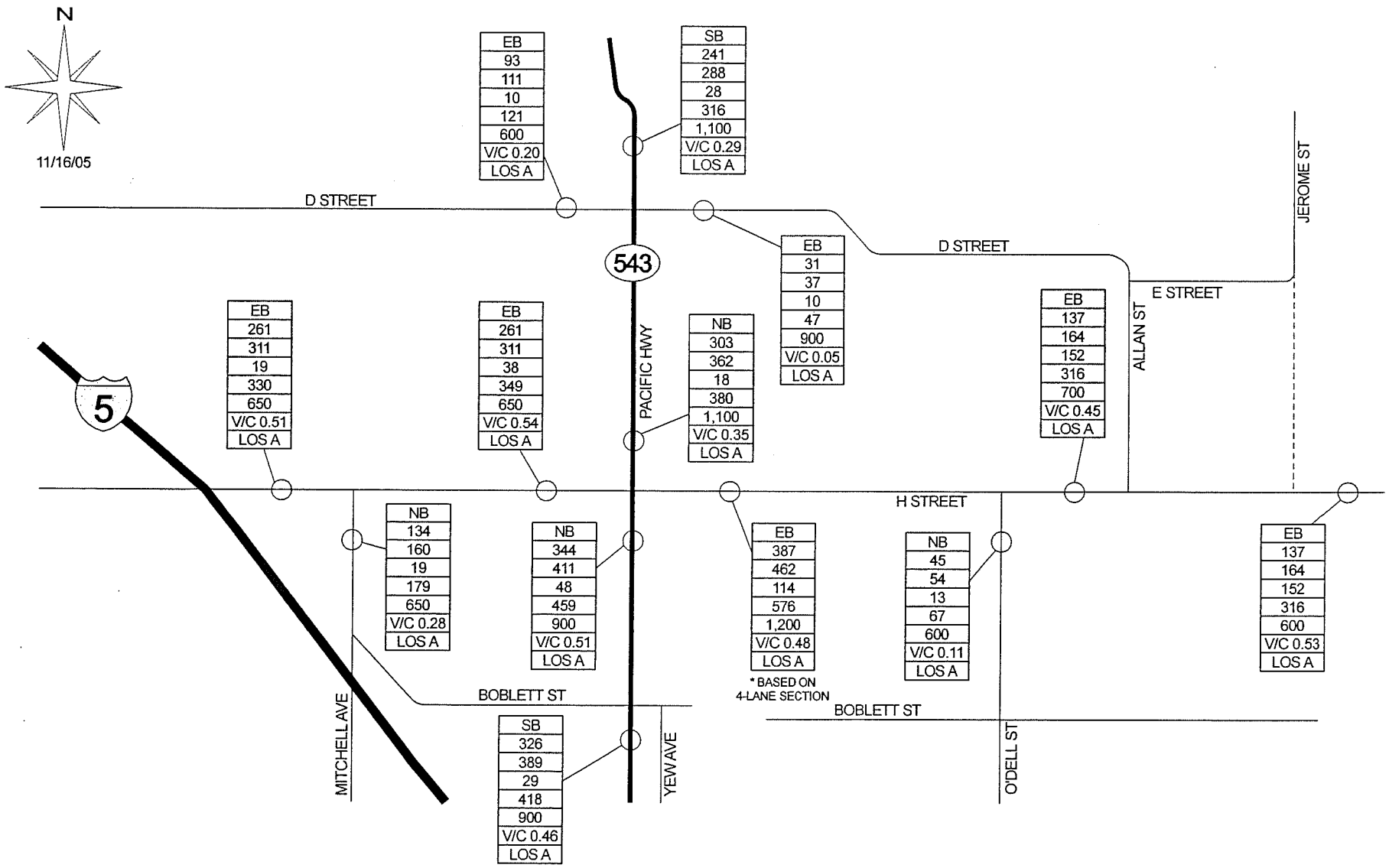
CITY OF BLAINE

LEGEND

XXX→ PM PEAK-HOUR TURNING MOVEMENT VOLUMES

XXX (T)→ PM PEAK-HOUR VOLUME IN TRUCK LANE

FIGURE 6
2011 FUTURE WITH DEVELOPEMENT TRAFFIC VOLUMES PM PEAK-HOUR



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TRAFFIC IMPACT STUDY
GTC #05-253

EAST MAPLE RIDGE

CITY OF BLAINE

LEGEND

XX	DIRECTION OF HIGHEST VOLUME
XXX	2005 EXISTING VOLUMES
XXX	2011 BASELINE VOLUMES
XXX	DEVELOPMENT TRIPS
XXX	2011 WITH DEVELOPMENT VOLUME
XXX	CAPACITY
V/C X.XX	V/C RATIO
LOS X	LEVEL OF SERVICE

FIGURE 7

EXISTING AND FUTURE DIRECTIONAL ARTERIAL VOLUMES, V/C RATIOS AND LEVEL OF SERVICE

TABLE 1

TRIP GENERATION SUMMARY

Proposed Land Use	Size	Average Daily Trips	AM Peak-Hour			PM Peak-Hour Trips		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Single Family Housing	237 Units	2,268	176	44	132	237	149	88
Condominium	116 Units	680	49	8	41	58	39	19
General Office	12,000 SF	129	15	13	2	14	2	12
TOTAL		**3,077**	**240**	**65**	**175**	**309**	**190**	**119**

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TABLE 2

LEVEL OF SERVICE (LOS) CRITERIA
INTERSECTION AND V/C RATIO

Level of Service [1]	Expected Delay	Intersection Control Delay (Seconds per Vehicle)		V/C Ratio
		Unsignalized Intersections	**Signalized** Intersections	
A	Little/No Delay	≤10	≤10	0.00 to 0.59
B	Short Delays	>10 and ≤15	>10 and ≤20	0.60 to 0.69
C	Average Delays	>15 and ≤25	>20 and ≤35	0.70 to 0.79
D	Long Delays	>25 and ≤35	>35 and ≤55	0.80 to 0.89
E	Very Long Delays	>35 and ≤50	>55 and ≤80	0.90 to 0.99
F	*	>50	>80	≥1.0

* When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

Source: *Highway Capacity Manual* 2000.

1 LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).

LOS B: Generally stable traffic flow conditions.

LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.

LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).

LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.

LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

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TABLE 3

LEVEL OF SERVICE
Weekday PM Peak-Hour

Intersection	2005 Existing Conditions		2011 Future Conditions[1]			
			Baseline		With Development	
	LOS	Delay	LOS	Delay	LOS	Delay
1. SR-543 @ D Street	C	16.6 sec	C	20.0 sec	C	21.3 sec
2. Mitchell Avenue @ H Street	B	13.6 sec	C	16.3 sec	C	17.7 sec
3. SR-543 @ H Street	C	26.7 sec	C	28.6 sec	C	33.1 sec
4. Odell Road @ H Street	A	9.9 sec	B	10.3 sec	B	12.4 sec
5. SR-543 @ Boblett Street	A	5.1 sec	A	5.4 sec	A	5.6 sec
6. West Site Access @ H Street					B	10.6 sec
7. East Site Access @ H Street					B	10.6 sec

[1] Includes an annually compounded growth rate of 3.0%.

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TABLE 4

ARTERIAL LEVEL OF SERVICE
Weekday PM Peak-Hour

Arterial	Direction	2005 Existing Volume	2011 Baseline Volume	Development Trips	2011 Future w Development Volume	Capacity	V/C Ratio	Level of Service
1. SR-543 North of D Street	Southbound	241	288	28	316	1,100	0.29	A
2. D Street West of SR-543	Eastbound	93	111	10	121	600	0.20	A
3. D Street East of SR-543	Eastbound	31	37	10	47	900	0.05	A
4. SR-543 Between H Street & D Street	Northbound	303	362	18	380	1,100	0.35	A
5. H Street West of Mitchell Avenue	Eastbound	261	311	19	330	650	0.51	A
6. Mitchell Avenue South of H Street	Northbound	134	160	19	179	650	0.28	A
7. H Street Between Mitchell Avenue & SR-543	Eastbound	261	311	38	349	650	0.54	A
8. H Street Between SR-543 & Odell Street	Eastbound	387	462	114	576	1,200	0.48	A
9. Odell Street South of H Street	Northbound	45	54	13	67	600	0.11	A
10. H Street East of Odell Street	Eastbound	137	164	152	316	700	0.45	A
11. H Street East of Harvey Road	Eastbound	137	164	18	192	600	0.32	A
12. SR-543 Between Boblett Street & H Street	Northbound	344	411	48	459	900	0.51	A
13. SR-543 South of Boblett Street	Southbound	326	389	29	418	900	0.46	A

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TABLE 5

SUMMARY OF MITIGATION FEES

Mitigation Type	Cost Per Trip Type	Trip Type	Trips	Total Mitigation Fee	Single-Family Mitigation Fees	Condominium Mitigation Fees	General Office Mitigation Fees
City of Blaine	$755	PM Peak-Hour	309	$233,295	$178,935	$43,790	$10,570
Single-Family Residential Mitigation Fees per Unit (237)					$755		
Condominium Mitigation Fees per Unit (116)						$377.50	
General Office Mitigation Fees per Square Foot (12,000)							$0.88

GIBSON TRAFFIC CONSULTANTS

East Maple Ridge
GTC #05-253

Trip Generation for: Weekday
(a.k.a.): Average Weekday Daily Trips (AWDT)

			Gross Trips				Internal Crossover		NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
									TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single Family Housing	237 units	210	9.57	50%	50%	2268	0%	0	2268	0%	0	0%	0	2268	0	0	0	0	1134	1134
Condominium	116 units	230	5.86	50%	50%	680	0%	0	680	0%	0	0%	0	680	0	0	0	0	340	340
General Office	12.000 ksqft	710	11.01	50%	50%	132	2%	3	129	0%	0	0%	0	129	0	0	0	0	65	64
Totals						3080		3	3077		0		0	3077	0	0	0	0	1539	1538

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East Maple Ridge
GTC #05-253

Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM
(a.k.a.): Weekday AM Peak Hour

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single Family Housing	237 units	210	0.75	25%	75%	178	1%	2	176	0%	0	0%	0	176	0	0	0	0	44	132
Condominium	116 units	230	0.44	17%	83%	51	3%	2	49	0%	0	0%	0	49	0	0	0	0	8	41
General Office	12.000 ksqft	710	1.55	88%	12%	19	22%	4	15	0%	0	0%	0	15	0	0	0	0	13	2
Totals						248		8	240		0		0	240	0	0	0	0	65	175

Specialty Retail Trip Rate was calculated from Shopping Center ratio of PM peak-hour trips multiplied by the Shopping Center AM Trip Rate.

East Maple Ridge
GTC #05-253

Trip Generation for: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM**
(a.k.a.): **Weekday PM Peak Hour**

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single Family Housing	237 units	210	1.01	63%	37%	239	1%	2	237	0%	0	0%	0	237	0	0	0	0	149	88
Condominium	116 units	230	0.52	67%	33%	60	3%	2	58	0%	0	0%	0	58	0	0	0	0	39	19
General Office	12.000 ksqft	710	1.49	17%	83%	18	22%	4	14	0%	0	0%	0	14	0	0	0	0	2	12
Totals						317		8	309		0		0	309	0	0	0	0	190	119

MULTI-USE DEVELOPMENT
TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Analyst: BJL Time Period: Daily
Date: 11/4/2005
Project: Meadow Ridge Park (05-209)

	Land Use A	Residential		
	ITE LU Code	210		
	Size	237		
Exit to Ext		Total	Internal	External
1134	Enter	1134	1	1133
Ent from Ext	Exit	1134	0	1134
1133	Total	2268	1	2267
	%	100%	0%	100%

0%	0	3%	34	0	0%	0	0%
Demand			Demand	Demand		Demand	
0		1			0		0
Balanced		Balanced			Balanced		Balanced

0%	0	2%	1			0	0%	0	0%
Demand		Demand				Demand		Demand	

	Land Use B	Office		
	ITE LU Code	710		
	Size	12,000		
Exit to Ext		Total	Internal	External
64	Enter	66	0	66
Ent from Ext	Exit	66	2	64
66	Total	132	2	130
	%	100%	2%	98%

	Demand	Balanced	Demand	
0%	0	0	0	0%
2%	1	1	10	3%
	Demand	Balanced	Demand	

	Land Use C	Residential		
	ITE LU Code	230		
	Size	116		
		Total	Internal	External	Ent from Ext
	Enter	340	1	339	339
	Exit	340	0	340	Exit to Ext
	Total	680	1	679	340
	%	100%	0%	100%	

Net External Trips for Multi-Use Development

	Land Use A	Land Use B	Land Use C	Total	
Enter	1133	66	339	1538	
Exit	1134	64	340	1538	
Total	2267	130	679	3076	Internal Capture
Single-Use Trip Gen. Est.	2268	132	680	3080	0%

MULTI-USE DEVELOPMENT
TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Analyst: BJL
Date: 11/4/2005
Project: Meadow Ridge Park (05-209)

Time Period: PM Peak Hour of Adj St

		Land Use A	Residential	
		ITE LU Code	210	
		Size	237	
Exit to Ext		Total	Internal	External
88	Enter	151	2	149
Ent from Ext	Exit	88	0	88
149	Total	239	2	237
	%	100%	1%	99%

53%	47	31%	47	0	0%	0	0%
	Demand		Demand	Demand		Demand	
0		2			0		0
Balanced		Balanced			Balanced		Balanced

9%	0	12%	2	0	0%	0	0%
	Demand		Demand			Demand	

		Land Use B	Retail									Land Use C	Residential		
		ITE LU Code	710									ITE LU Code	230		
		Size	12000									Size	116		
Exit to Ext		Total	Internal	External		Demand	Balanced	Demand				Total	Internal	External	Ent from Ext
11	Enter	3	0	3	9%	0	0	11	53%		Enter	40	2	38	38
Ent from Ext	Exit	15	4	11	12%	2	2	12	31%		Exit	20	0	20	Exit to Ext
3	Total	18	4	14		Demand	Balanced	Demand			Total	60	2	58	20
	%	100%	22%	78%							%	100%	3%	97%	

Net External Trips for Multi-Use Development					
	Land Use A	Land Use B	Land Use C	Total	
Enter	149	3	38	190	
Exit	88	11	20	119	
Total	237	14	58	309	Internal Capture
Single-Use Trip Gen. Est.	239	18	60	317	3%

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East Maple Ridge
GTC #05-253

AM Version

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	3077	65	175	240
1%	30.77	0.65	1.75	2.40
2%	61.54	1.30	3.50	4.80
3%	92.31	1.95	5.25	7.20
4%	123.08	2.60	7.00	9.60
5%	**153.85**	**3.25**	**8.75**	**12.00**
6%	184.62	3.90	10.50	14.40
7%	215.39	4.55	12.25	16.80
8%	246.16	5.20	14.00	19.20
9%	276.93	5.85	15.75	21.60
10%	**307.70**	**6.50**	**17.50**	**24.00**
11%	338.47	7.15	19.25	26.40
12%	369.24	7.80	21.00	28.80
13%	400.01	8.45	22.75	31.20
14%	430.78	9.10	24.50	33.60
15%	**461.55**	**9.75**	**26.25**	**36.00**
16%	492.32	10.40	28.00	38.40
17%	523.09	11.05	29.75	40.80
18%	553.86	11.70	31.50	43.20
19%	584.63	12.35	33.25	45.60
20%	**615.40**	**13.00**	**35.00**	**48.00**
21%	646.17	13.65	36.75	50.40
22%	676.94	14.30	38.50	52.80
23%	707.71	14.95	40.25	55.20
24%	738.48	15.60	42.00	57.60
25%	**769.25**	**16.25**	**43.75**	**60.00**
26%	800.02	16.90	45.50	62.40
27%	830.79	17.55	47.25	64.80
28%	861.56	18.20	49.00	67.20
29%	892.33	18.85	50.75	69.60
30%	**923.10**	**19.50**	**52.50**	**72.00**
31%	953.87	20.15	54.25	74.40
32%	984.64	20.80	56.00	76.80
33%	1015.41	21.45	57.75	79.20
34%	1046.18	22.10	59.50	81.60
35%	**1076.95**	**22.75**	**61.25**	**84.00**
36%	1107.72	23.40	63.00	86.40
37%	1138.49	24.05	64.75	88.80
38%	1169.26	24.70	66.50	91.20
39%	1200.03	25.35	68.25	93.60
40%	**1230.80**	**26.00**	**70.00**	**96.00**
41%	1261.57	26.65	71.75	98.40
42%	1292.34	27.30	73.50	100.80
43%	1323.11	27.95	75.25	103.20
44%	1353.88	28.60	77.00	105.60
45%	**1384.65**	**29.25**	**78.75**	**108.00**
46%	1415.42	29.90	80.50	110.40
47%	1446.19	30.55	82.25	112.80
48%	1476.96	31.20	84.00	115.20
49%	1507.73	31.85	85.75	117.60
50%	**1538.50**	**32.50**	**87.50**	**120.00**

%	New ADT	New AM Peak Hour Trips		
		In	Out	Total
100%	3077	65	175	240
51%	1569.27	33.15	89.25	122.40
52%	1600.04	33.80	91.00	124.80
53%	1630.81	34.45	92.75	127.20
54%	1661.58	35.10	94.50	129.60
55%	**1692.35**	**35.75**	**96.25**	**132.00**
56%	1723.12	36.40	98.00	134.40
57%	1753.89	37.05	99.75	136.80
58%	1784.66	37.70	101.50	139.20
59%	1815.43	38.35	103.25	141.60
60%	**1846.20**	**39.00**	**105.00**	**144.00**
61%	1876.97	39.65	106.75	146.40
62%	1907.74	40.30	108.50	148.80
63%	1938.51	40.95	110.25	151.20
64%	1969.28	41.60	112.00	153.60
65%	**2000.05**	**42.25**	**113.75**	**156.00**
66%	2030.82	42.90	115.50	158.40
67%	2061.59	43.55	117.25	160.80
68%	2092.36	44.20	119.00	163.20
69%	2123.13	44.85	120.75	165.60
70%	**2153.90**	**45.50**	**122.50**	**168.00**
71%	2184.67	46.15	124.25	170.40
72%	2215.44	46.80	126.00	172.80
73%	2246.21	47.45	127.75	175.20
74%	2276.98	48.10	129.50	177.60
75%	**2307.75**	**48.75**	**131.25**	**180.00**
76%	2338.52	49.40	133.00	182.40
77%	2369.29	50.05	134.75	184.80
78%	2400.06	50.70	136.50	187.20
79%	2430.83	51.35	138.25	189.60
80%	**2461.60**	**52.00**	**140.00**	**192.00**
81%	2492.37	52.65	141.75	194.40
82%	2523.14	53.30	143.50	196.80
83%	2553.91	53.95	145.25	199.20
84%	2584.68	54.60	147.00	201.60
85%	**2615.45**	**55.25**	**148.75**	**204.00**
86%	2646.22	55.90	150.50	206.40
87%	2676.99	56.55	152.25	208.80
88%	2707.76	57.20	154.00	211.20
89%	2738.53	57.85	155.75	213.60
90%	**2769.30**	**58.50**	**157.50**	**216.00**
91%	2800.07	59.15	159.25	218.40
92%	2830.84	59.80	161.00	220.80
93%	2861.61	60.45	162.75	223.20
94%	2892.38	61.10	164.50	225.60
95%	**2923.15**	**61.75**	**166.25**	**228.00**
96%	2953.92	62.40	168.00	230.40
97%	2984.69	63.05	169.75	232.80
98%	3015.46	63.70	171.50	235.20
99%	3046.23	64.35	173.25	237.60
100%	**3077.00**	**65.00**	**175.00**	**240.00**

East Maple Ridge
GTC #05-253

PM Version

%	New ADT	New PM Peak Hour Trips In	Out	Total
100%	3077	190	119	309
1%	30.77	1.90	1.19	3.09
2%	62 61.54	3.80	1 2.38	6.18
3%	92.31	5.70	3.57	9.27
4%	123.08	7.60	4.76	12.36
5%	**153.85**	**9.50**	**5.95**	**15.45**
6%	184.62	11.40	7.14	18.54
7%	215.39	13.30	8.33	21.63
8%	246.16	15.20	9.52	24.72
9%	276.93	17.10	10.71	27.81
10%	**307.70**	**19.00**	**11.90**	**30.90**
11%	338.47	20.90	13.09	33.99
12%	369.24	22.80	14.28	37.08
13%	400.01	24.70	15.47	40.17
14%	430.78	26.60	16.66	43.26
15%	**461.55**	**28.50**	**17.85**	**46.35**
16%	492.32	30.40	19.04	49.44
17%	523.09	32.30	20.23	52.53
18%	553.86	34.20	21.42	55.62
19%	584.63	36.10	22.61	58.71
20%	**615.40**	**38.00**	**23.80**	**61.80**
21%	646.17	39.90	24.99	64.89
22%	676.94	41.80	26.18	67.98
23%	707.71	43.70	27.37	71.07
24%	738.48	45.60	28.56	74.16
25%	**769.25**	**47.50**	**29.75**	**77.25**
26%	800.02	49.40	30.94	80.34
27%	830.79	51.30	32.13	83.43
28%	861.56	53.20	33.32	86.52
29%	892.33	55.10	34.51	89.61
30%	**923.10**	**57.00**	35 **35.70**	**92.70**
31%	953.87	58.90	36.89	95.79
32%	984.64	60.80	38.08	98.88
33%	1015.41	62.70	39.27	101.97
34%	1046.18	64.60	40.46	105.06
35%	**1076.95**	**66.50**	**41.65**	**108.15**
36%	1107.72	68.40	42.84	111.24
37%	1138.49	70.30	44.03	114.33
38%	1169.26	72.20	45.22	117.42
39%	1200.03	74.10	46.41	120.51
40%	**1230.80**	**76.00**	**47.60**	**123.60**
41%	1261.57	77.90	48.79	126.69
42%	1292.34	79.80	49.98	129.78
43%	1323.11	81.70	51.17	132.87
44%	1353.88	83.60	52.36	135.96
45%	**1384.65**	**85.50**	**53.55**	**139.05**
46%	1415.42	87.40	54.74	142.14
47%	1446.19	89.30	55.93	145.23
48%	1476.96	91.20	57.12	148.32
49%	1507.73	93.10	58.31	151.41
50%	**1538.50**	**95.00**	**59.50**	**154.50**

%	New ADT	New PM Peak Hour Trips In	Out	Total
100%	3077	190	119	309
51%	1569.27	96.90	60.69	157.59
52%	1600.04	98.80	61.88	160.68
53%	1630.81	100.70	63.07	163.77
54%	1661.58	102.60	64.26	166.86
55%	**1692.35**	**104.50**	**65.45**	**169.95**
56%	1723.12	106.40	66.64	173.04
57%	1753.89	108.30	67.83	176.13
58%	1784.66	110.20	69.02	179.22
59%	1815.43	112.10	70.21	182.31
60%	**1846.20**	**114.00**	**71.40**	**185.40**
61%	1876.97	115.90	72.59	188.49
62%	1907.74	117.80	73.78	191.58
63%	1938.51	119.70	74.97	194.67
64%	1969.28	121.60	76.16	197.76
65%	**2000.05**	**123.50**	**77.35**	**200.85**
66%	2030.82	125.40	78.54	203.94
67%	2061.59	127.30	79.73	207.03
68%	2092.36	129.20	80.92	210.12
69%	2123.13	131.10	82.11	213.21
70%	**2153.90**	**133.00**	**83.30**	**216.30**
71%	2184.67	134.90	84.49	219.39
72%	2215.44	136.80	85.68	222.48
73%	2246.21	138.70	86.87	225.57
74%	2276.98	140.60	88.06	228.66
75%	**2307.75**	**142.50**	**89.25**	**231.75**
76%	2338.52	144.40	90.44	234.84
77%	2369.29	146.30	91.63	237.93
78%	2400.06	148.20	92.82	241.02
79%	2430.83	150.10	94.01	244.11
80%	**2461.60**	**152.00**	**95.20**	**247.20**
81%	2492.37	153.90	96.39	250.29
82%	2523.14	155.80	97.58	253.38
83%	2553.91	157.70	98.77	256.47
84%	2584.68	159.60	99.96	259.56
85%	**2615.45**	**161.50**	**101.15**	**262.65**
86%	2646.22	163.40	102.34	265.74
87%	2676.99	165.30	103.53	268.83
88%	2707.76	167.20	104.72	271.92
89%	2738.53	169.10	105.91	275.01
90%	**2769.30**	**171.00**	**107.10**	**278.10**
91%	2800.07	172.90	108.29	281.19
92%	2830.84	174.80	109.48	284.28
93%	2861.61	176.70	110.67	287.37
94%	2892.38	178.60	111.86	290.46
95%	**2923.15**	**180.50**	**113.05**	**293.55**
96%	2953.92	182.40	114.24	296.64
97%	2984.69	184.30	115.43	299.73
98%	3015.46	186.20	116.62	302.82
99%	3046.23	188.10	117.81	305.91
100%	**3077.00**	**190.00**	**119.00**	**309.00**

Project No.: 05-253
Project Name: East Maple Ridge
Prepared by: BJL
Checked by:
Location: SR-543 at D Street

Day & Date: Tuesday, 11/8/05
Time Start: 4:00 PM
Time End: 6:00 PM
Weather:

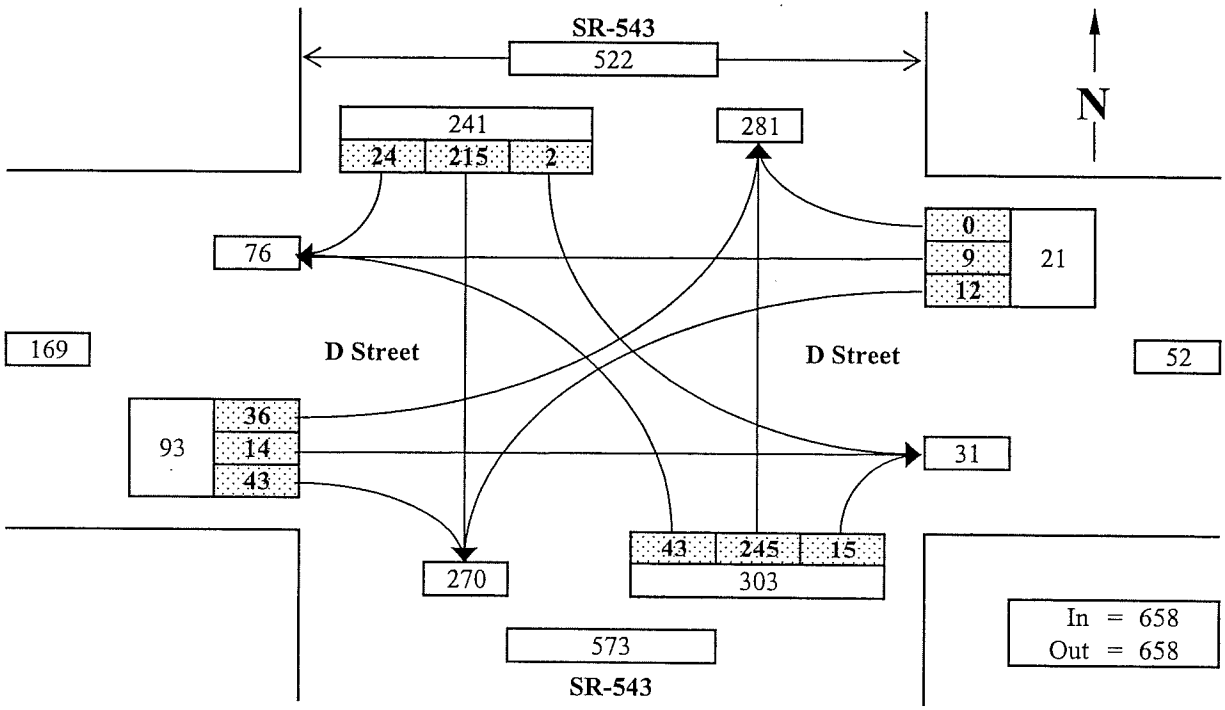
Time Interval Ending At	D Street Eastbound				D Street Westbound				SR-543 Northbound				SR-543 Southbound				Total ALL APP
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
15 Minute Cumulative Volumes																	
4:15 PM																	0
4:30 PM																	0
4:45 PM																	0
5:00 PM																	0
5:15 PM																	0
5:30 PM																	0
5:45 PM																	0
6:00 PM																	0
15 Minute Interval Volumes																	
4:15 PM	0	6	3	7	0	7	2	0	27	8	57	2	13	1	77	11	181
4:30 PM	1	9	4	5	0	1	0	0	32	11	77	5	15	0	47	6	165
4:45 PM	2	5	4	9	1	5	4	0	18	9	51	5	15	2	61	7	162
5:00 PM	1	11	1	11	0	2	4	0	15	13	51	3	13	0	42	5	143
5:15 PM	3	11	5	18	0	4	1	0	19	10	66	2	13	0	65	6	188
5:30 PM	0	4	3	6	0	6	3	0	15	10	42	4	17	0	45	5	128
5:45 PM	0	4	3	5	0	5	2	0	10	13	48	2	16	0	33	6	121
6:00 PM	0	1	2	11	0	2	3	0	3	5	42	7	13	0	33	7	113
Hourly Volumes																	
5:00 PM	4	31	12	32	1	15	10	0	92	41	236	15	56	3	227	29	651
5:15 PM	7	36	14	43	1	12	9	0	84	43	245	15	56	2	215	24	658
5:30 PM	6	31	13	44	1	17	12	0	67	42	210	14	58	2	213	23	621
5:45 PM	4	30	12	40	0	17	10	0	59	46	207	11	59	0	185	22	580
6:00 PM	3	20	13	40	0	17	9	0	47	38	198	15	59	0	176	24	550

EXISTING PEAK HOUR: 4:15 PM — 5:15 PM, Tuesday, 11/8/05

Peak Hour	Eastbound				Westbound				Northbound				Southbound				Total
4:15 PM	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
- 5:15 PM	7	36	14	43	1	12	9	0	84	43	245	15	56	2	215	24	658
Approach	7	93			1	21			84	303			56	241			658
PHF	0.68				0.58				0.81				0.85				0.88
% HV	7.5%				4.8%				27.7%				23.2%				

GIBSON TRAFFIC CONSULTANTS

EXISTING PEAK HOUR: 4:15 PM to 5:15 PM, Tuesday, 11/8/05					
Intersection	**Eastbound**	**Westbound**	**Northbound**	**Southbound**	**Total**
Approach Name	D Street	D Street	SR-543	SR-543	
Peak Hour Factor (PHF)	0.68	0.58	0.81	0.85	**0.88**
% of Heavy Vehicles	7.5%	4.8%	27.7%	23.2%	



Traffic Plus

360 391 9047

trafficplus@verizon.net

ɔcation : SR-543 @ D Street

Count For : Gibson Traffic

Project : 05-253 GTC

Site: Peak Hour

Date: 11/08/05

Combined

**Peds not included in table data*

Begin Time	Total	SR-543 North Rt	SR-543 North Thru	SR-543 North Lt	D Street East Rt	D Street East Thru	D Street East Lt	SR-543 South Rt	SR-543 South Thru	SR-543 South Lt	D Street West Rt	D Street West Thru	D Street West Lt
16:15:00	165	6	47	0	0	0	1	8	77	11	5	4	9
16:30:00	162	7	61	2	0	4	5	5	51	9	9	4	5
16:45:00	143	5	42	0	0	4	2	3	51	13	11	1	11
17:00:00	188	6	65	0	0	1	4	2	66	10	18	5	11
	658	24	215	2	0	9	12	15	245	43	43	14	36

Peak Volume Periods *(1 hour Res 15 min.)*

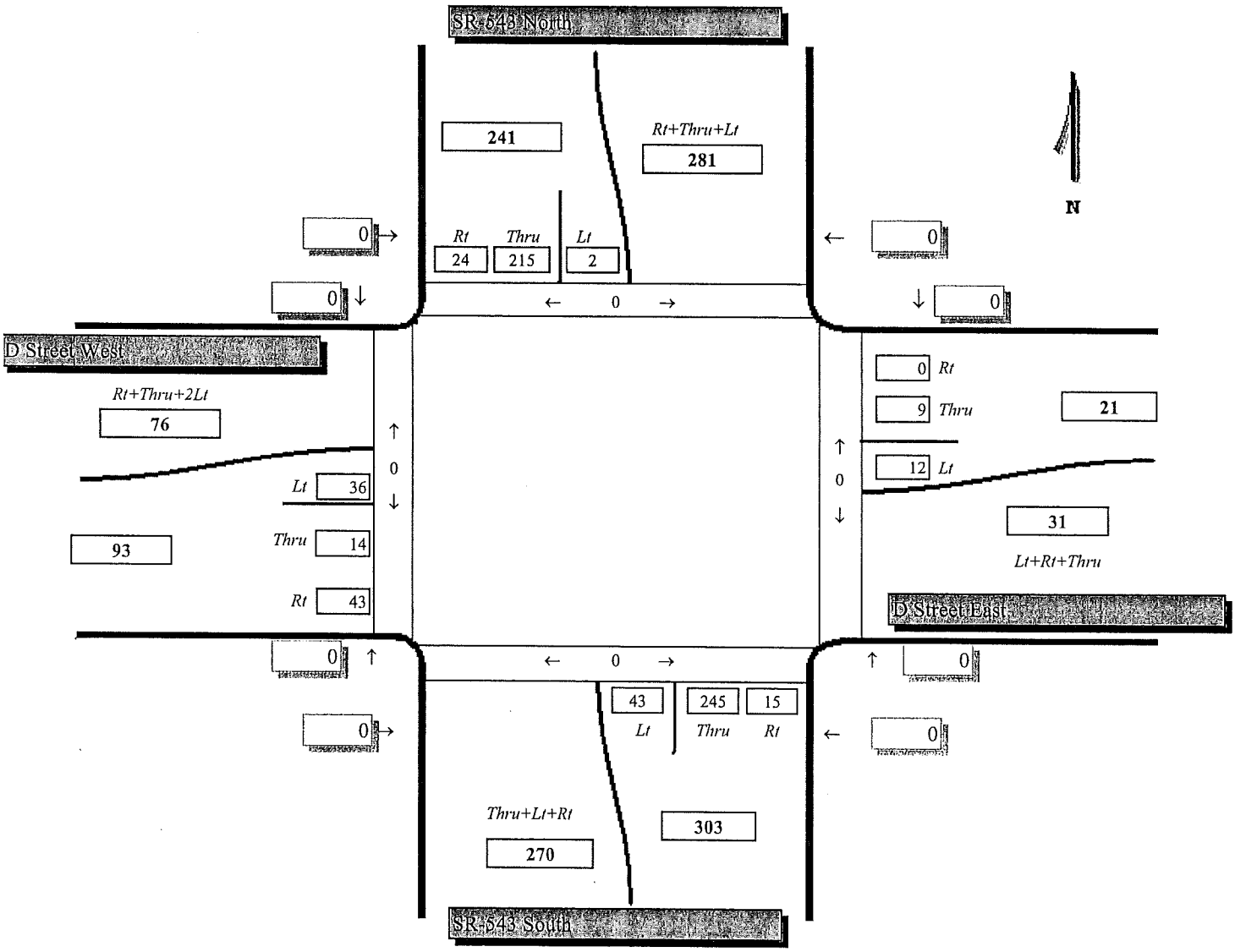
Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:15:00	To 17:15:00	658

Traffic Plus
360 391 9047
trafficplus@verizon.net

Location : SR-543 @ D Street
Count For : Gibson Traffic
Project : 05-253 GTC

Site: Peak Hour
Date: 11/08/05

Combined
**Peds not included in table data*



Traffic Plus

360 391 9047
trafficplus@verizon.net

ocation : SR-543 @ D Street
Count For : Gibson Traffic
Project : 05-253 GTC

Site: DStreet
Date: 11/08/05

Combined
**Peds not included in table data*

Begin Time	Total	SR 543 North Rt	SR 543 North Thru	SR 543 North Lt	D Street East Rt	D Street East Thru	D Street East Lt	SR 543 South Rt	SR 543 South Thru	SR 543 South Lt	D Street West Rt	D Street West Thru	D Street West Lt
16:00:00	181	11	77	1	0	2	7	2	57	8	7	3	6
16:15:00	165	8	47	0	0	0	1	5	71	11	5	4	9
16:30:00	162	7	61	2	0	4	5	3	51	9	9	4	5
16:45:00	143	5	42	0	0	4	2	3	51	13	11	1	11
17:00:00	188	6	65	0	0	1	4	2	66	10	18	5	11
17:15:00	128	5	45	0	0	3	6	4	42	10	6	3	4
17:30:00	121	6	33	0	0	2	5	2	48	13	5	3	4
17:45:00	113	7	33	0	0	3	2	7	42	5	11	2	1
	1,201	53	403	3	0	19	32	30	434	79	72	25	51

Peak Volume Periods *(1 hour Res 15 min)*

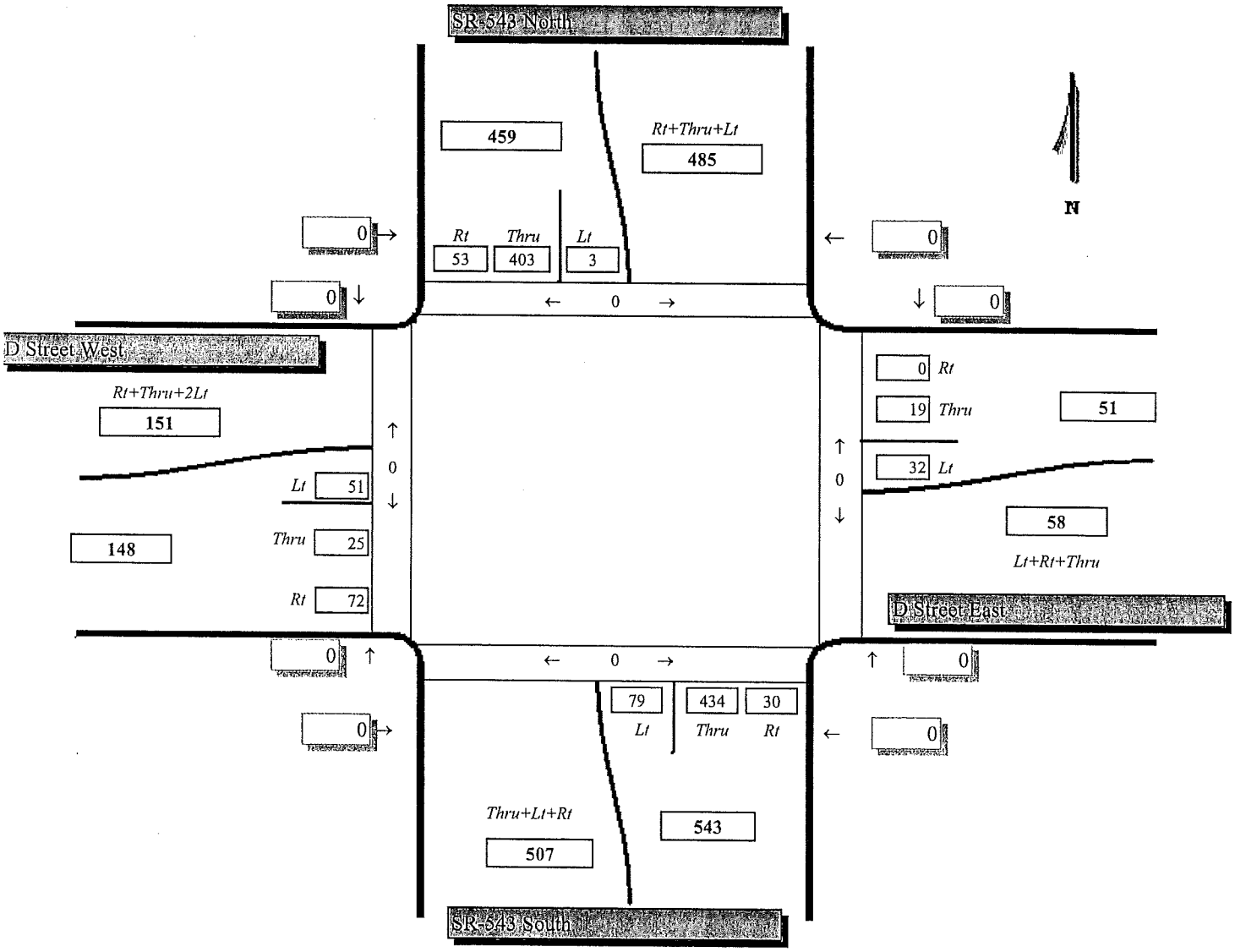
Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:15:00	To 17:15:00	658

Traffic Plus
360 391 9047
trafficplus@verizon.net

Location : SR-543 @ D Street
Count For : Gibson Traffic
Project : 05-253 GTC

Site: DStreet
Date: 11/08/05

Combined
**Peds not included in table data*



Traffic Plus

360 391 9047
trafficplus@verizon.net

ocation : SR-543 @ D Street
Count For : Gibson Traffic
Project : 05-253 GTC

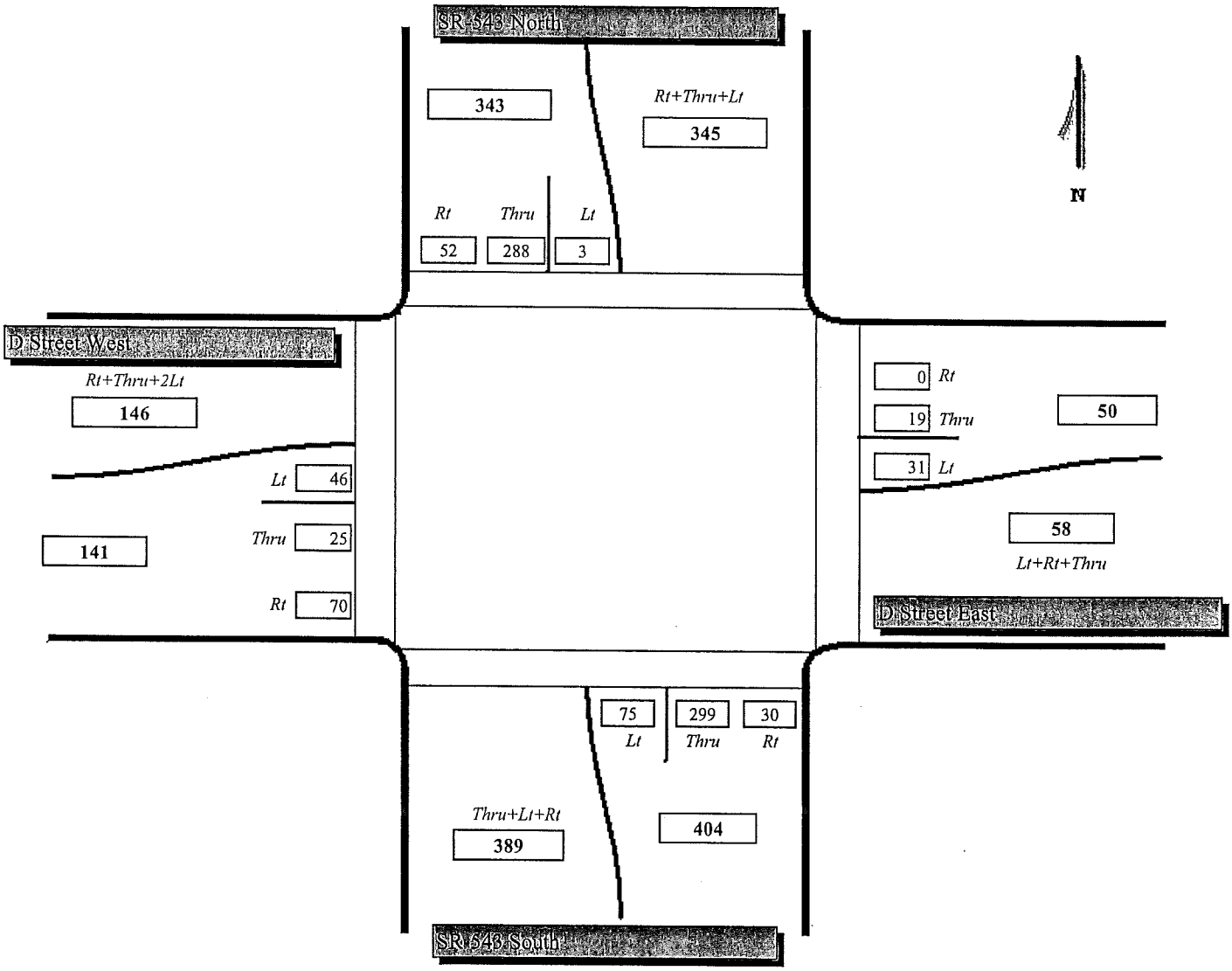
Site: D Street
Date: 11/08/05

No shift vehicles only

Begin Time	Total	SR-543 North Rt	SR-543 North Thru	SR-543 North Lt	D Street East Rt	D Street East Thru	D Street East Lt	SR-543 South Rt	SR-543 South Thru	SR-543 South Lt	D Street West Rt	D Street West Thru	D Street West Lt
16:00:00	141	11	64	1	0	2	7	2	31	7	7	3	6
16:15:00	117	6	32	0	0	0	1	5	45	11	5	4	8
16:30:00	126	7	46	2	0	4	4	5	34	8	8	4	4
16:45:00	114	5	29	0	0	4	2	3	38	11	11	1	10
17:00:00	153	6	52	0	0	1	4	2	47	10	17	5	9
17:15:00	95	4	28	0	0	3	6	4	27	10	6	3	4
17:30:00	95	6	17	0	0	2	5	2	38	13	5	3	4
17:45:00	97	7	20	0	0	3	2	7	39	5	11	2	1
	938	52	288	3	0	19	31	30	299	75	70	25	46

Peak Volume Periods (1hour Res.15min)

Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:15:00	To 17:15:00	510



Traffic Plus

360 391 9047
trafficplus@verizon.net

ocation : SR-543 @ D Street
Count For : Gibson Traffic
Project : 05-253 GTC

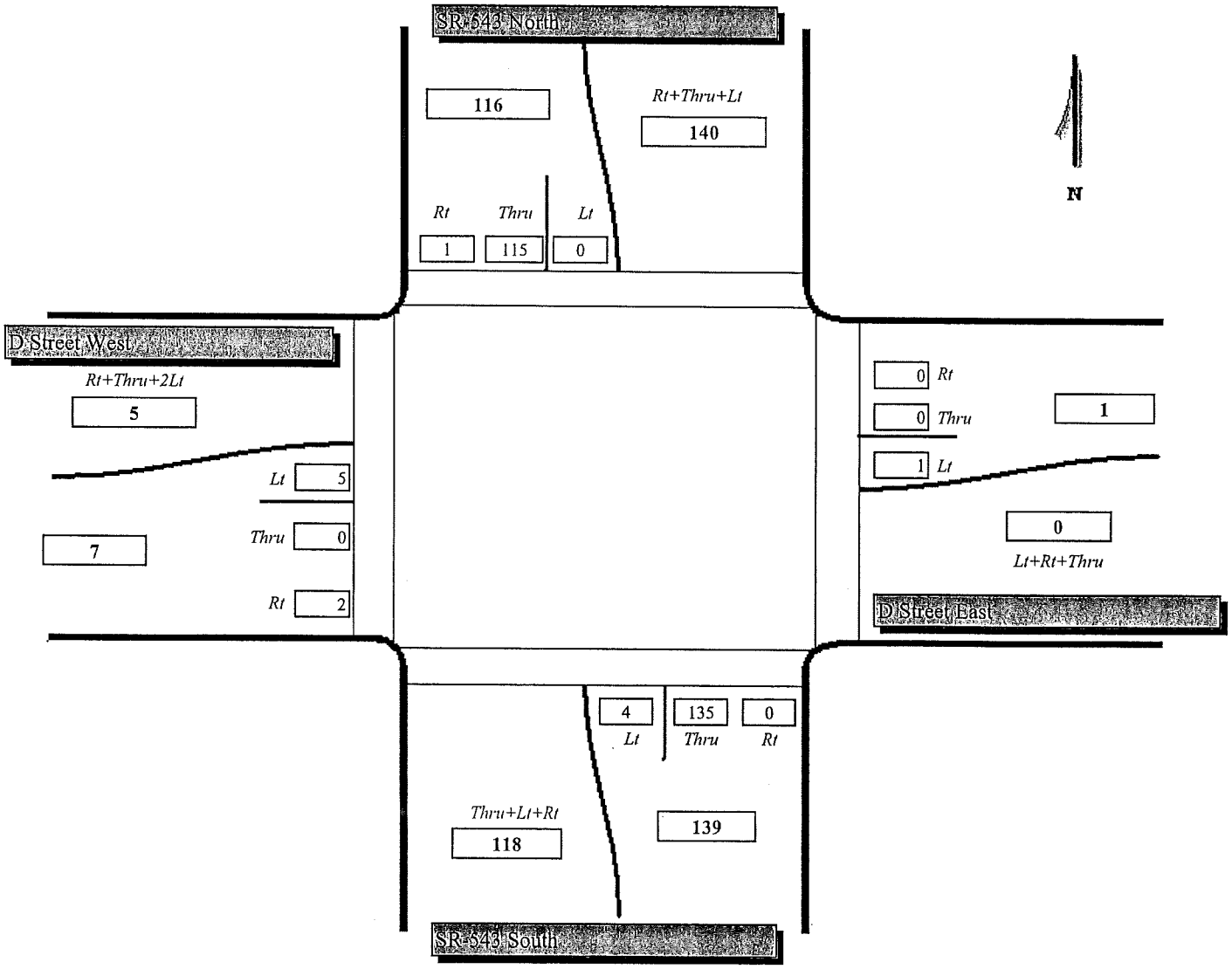
Site: DStreet
Date: 11/08/05

Trucks only

Begin Time	Total	SR-543 North Rt	SR-543 North Thru	SR-543 North Lt	D Street East Rt	D Street East Thru	D Street East Lt	SR-543 South Rt	SR-543 South Thru	SR-543 South Lt	D Street West Rt	D Street West Thru	D Street West Lt
16:00:00	40	0	13	0	0	0	0	0	26	1	0	0	0
16:15:00	48	0	15	0	0	0	0	0	32	0	0	0	1
16:30:00	36	0	15	0	0	0	1	0	17	1	1	0	1
16:45:00	29	0	13	0	0	0	0	0	13	2	0	0	1
17:00:00	35	0	13	0	0	0	0	0	19	0	1	0	2
17:15:00	33	1	17	0	0	0	0	0	15	0	0	0	0
17:30:00	26	0	16	0	0	0	0	0	10	0	0	0	0
17:45:00	16	0	13	0	0	0	0	0	3	0	0	0	0
	263	1	115	0	0	0	1	0	135	4	2	0	5

Peak Volume Periods (1 hour Res 15 min)

Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:00:00	To 17:00:00	153



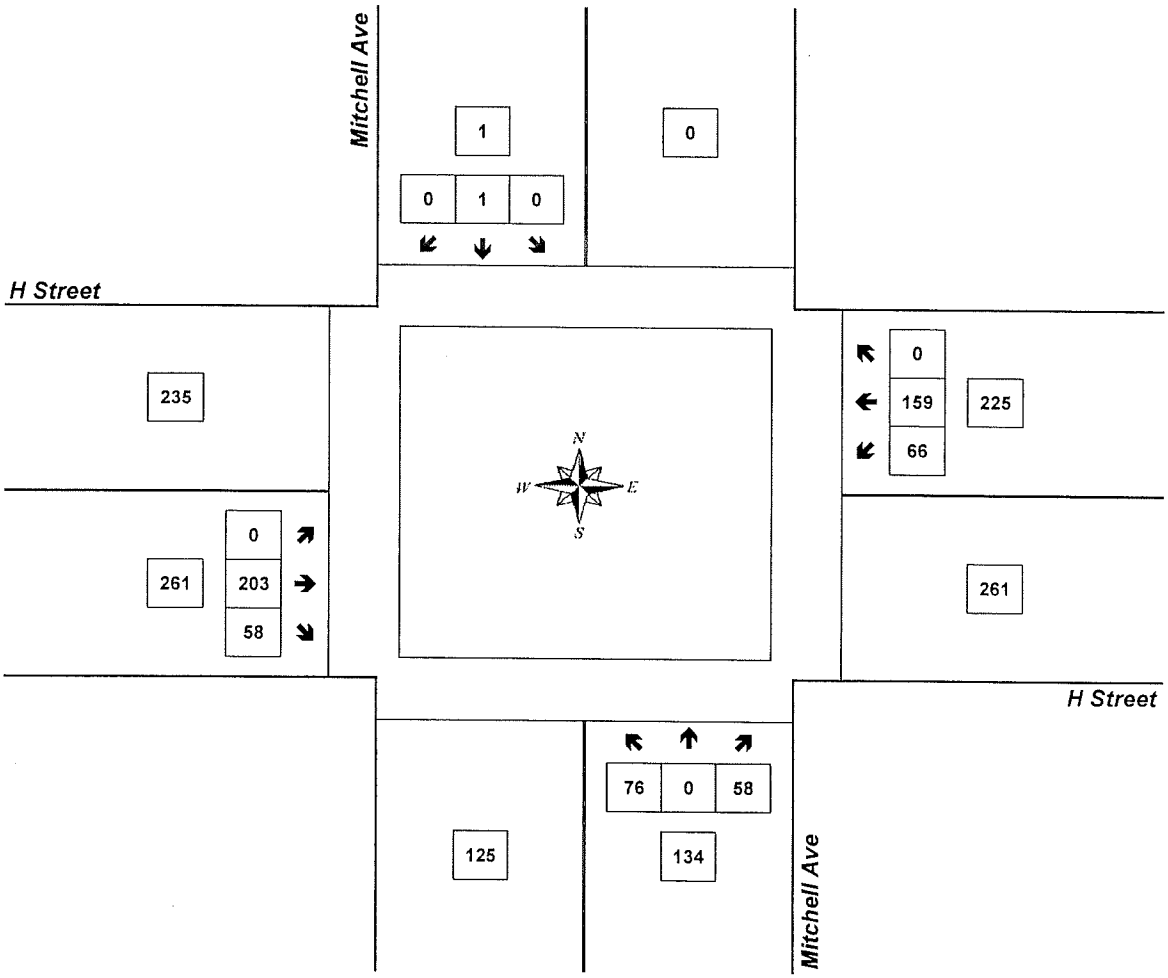
Peak Hour Summary

All Traffic Data Services Inc.

Mark Skaggs
(206) 251-0300

Mitchell Ave & H Street

4:00 PM to 5:00 PM
Thursday, October 06, 2005



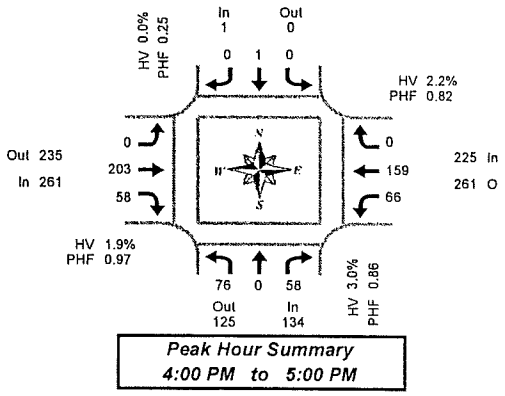
Approach	PHF	HV%	Volume
EB	0.97	1.9%	261
WB	0.82	2.2%	225
NB	0.86	3.0%	134
SB	0.25	0.0%	1
Intersection	0.93	2.3%	621

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Mark Skaggs
(206) 251-0300



Mitchell Ave & H Street

Thursday, October 06, 2005
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Mitchell Ave				Southbound Mitchell Ave				Eastbound H Street				Westbound H Street				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
04:00 PM	19	0	13	1	0	0	0	0	0	49	15	1	16	32	0	1	144
04:15 PM	18	0	12	1	0	0	0	0	0	50	17	1	17	45	0	1	159
04:30 PM	20	0	19	1	0	0	0	0	0	52	14	2	11	35	0	2	151
04:45 PM	19	0	14	1	0	1	0	0	0	52	12	1	22	47	0	1	167
05:00 PM	13	0	13	0	0	0	1	1	1	39	12	2	24	32	0	1	135
05:15 PM	8	0	15	0	1	0	0	0	0	54	19	3	14	23	0	3	134
05:30 PM	11	0	20	1	0	0	0	0	0	23	7	1	16	23	0	0	100
05:45 PM	12	0	10	1	0	0	0	0	0	26	14	2	14	30	0	2	106
Total Survey	120	0	116	6	1	1	1	1	1	345	110	13	134	267	0	11	1,096

Peak Hour Summary
4:00 PM to 5:00 PM

By Approach	Northbound Mitchell Ave				Southbound Mitchell Ave				Eastbound H Street				Westbound H Street				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	134	125	259	4	1	0	1	0	261	235	496	5	225	261	486	5	621
%HV	3.0%				0.0%				1.9%				2.2%				2.3%
PHF	0.86				0.25				0.97				0.82				0.93

By Movement	Northbound Mitchell Ave				Southbound Mitchell Ave				Eastbound H Street				Westbound H Street				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	76	0	58	134	0	1	0	1	0	203	58	261	66	159	0	225	621
PHF	0.95	0.00	0.76	0.86	0.00	0.25	0.00	0.25	0.00	0.98	0.85	0.97	0.75	0.85	0.00	0.82	0.93

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Mitchell Ave				Southbound Mitchell Ave				Eastbound H Street				Westbound H Street				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
04:00 PM	76	0	58	4	0	1	0	0	0	203	58	5	66	159	0	5	621
04:15 PM	70	0	58	3	0	1	1	1	1	193	55	6	74	159	0	5	612
04:30 PM	60	0	61	2	1	1	1	1	1	197	57	8	71	137	0	7	587
04:45 PM	51	0	62	2	1	1	1	1	1	168	50	7	76	125	0	5	536

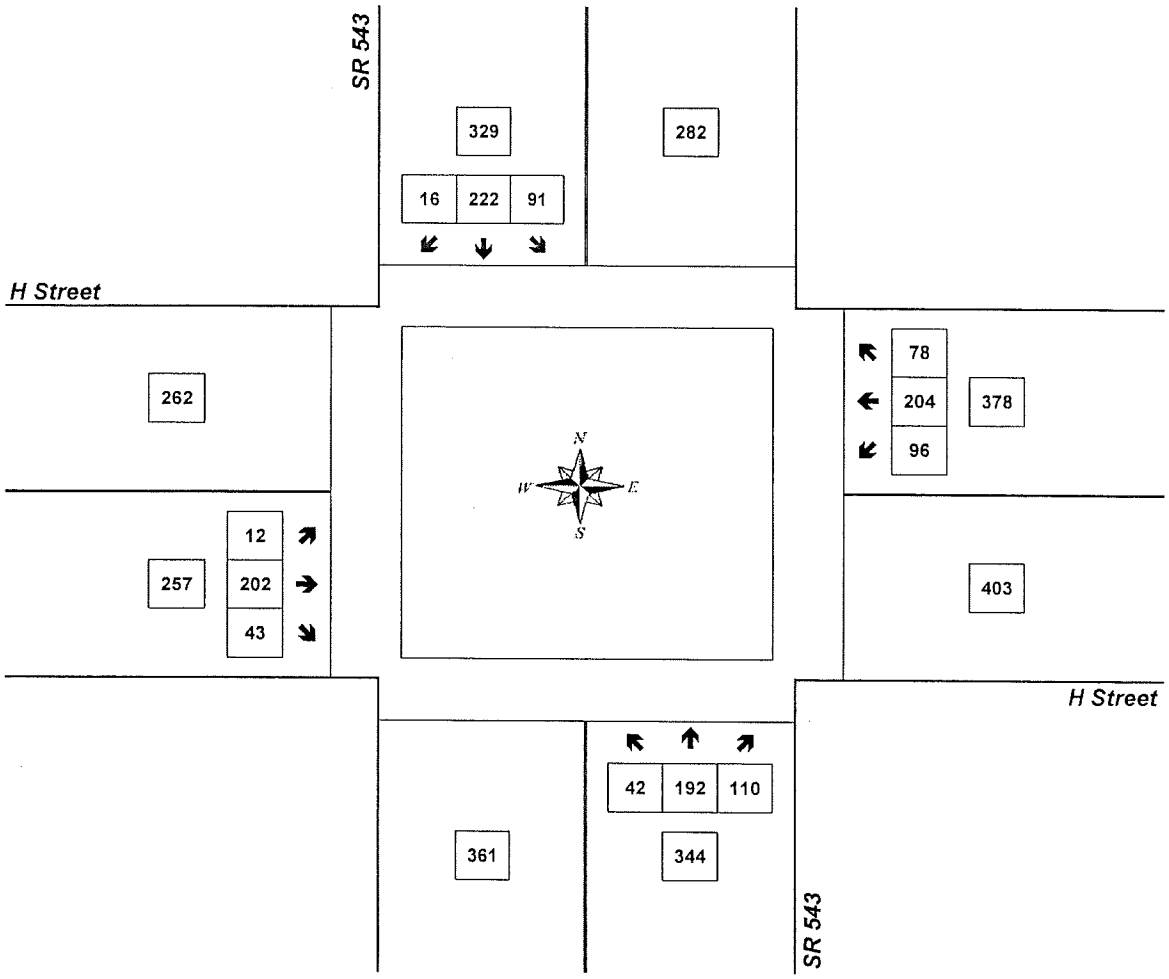
Peak Hour Summary

All Traffic Data Services Inc.

Mark Skaggs
(206) 251-0300

SR 543 & H Street

4:15 PM to 5:15 PM
Thursday, October 06, 2005



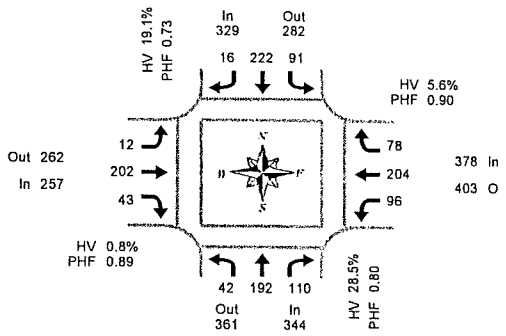
Approach	PHF	HV%	Volume
EB	0.89	0.8%	257
WB	0.90	5.6%	378
NB	0.80	28.5%	344
SB	0.73	19.1%	329
Intersection	0.95	14.1%	1,308

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Mark Skaggs
(206) 251-0300



Peak Hour Summary
4:15 PM to 5:15 PM

SR 543 & H Street

Thursday, October 06, 2005
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SR 543				Southbound SR 543				Eastbound H Street				Westbound H Street				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
04:00 PM	8	43	19	29	19	64	6	18	4	44	9	1	26	42	12	7	296
04:15 PM	9	47	21	30	30	75	8	22	4	43	10	1	36	49	13	7	345
04:30 PM	11	64	33	31	16	45	1	12	3	50	10	1	14	43	19	7	309
04:45 PM	10	40	29	14	22	60	6	18	2	55	15	0	21	54	24	5	338
05:00 PM	12	41	27	23	23	42	1	11	3	54	8	0	25	58	22	2	316
05:15 PM	19	60	32	34	12	52	1	9	3	47	17	4	26	34	17	4	320
05:30 PM	9	34	14	10	18	41	1	13	2	32	9	2	19	44	19	2	242
05:45 PM	7	50	20	12	14	31	0	11	2	24	7	0	26	32	19	5	232
Total Survey	85	379	195	183	154	410	24	114	23	349	85	9	193	356	145	39	2,398

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound SR 543				Southbound SR 543				Eastbound H Street				Westbound H Street				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	344	361	705	98	329	282	611	63	257	262	519	2	378	403	781	21	1,308
%HV	28.5%				19.1%				0.8%				5.6%				14.1%
PHF	0.80				0.73				0.89				0.90				0.95

By Movement	Northbound SR 543				Southbound SR 543				Eastbound H Street				Westbound H Street				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	42	192	110	344	91	222	16	329	12	202	43	257	96	204	78	378	1,308
PHF	0.88	0.75	0.83	0.80	0.76	0.74	0.50	0.73	0.75	0.92	0.72	0.89	0.67	0.88	0.81	0.90	0.95

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SR 543				Southbound SR 543				Eastbound H Street				Westbound H Street				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
04:00 PM	38	194	102	104	87	244	21	70	13	192	44	3	97	188	68	26	1,288
04:15 PM	42	192	110	98	91	222	16	63	12	202	43	2	96	204	78	21	1,308
04:30 PM	52	205	121	102	73	199	9	50	11	206	50	5	86	189	82	18	1,283
04:45 PM	50	175	102	81	75	195	9	51	10	188	49	6	91	190	82	13	1,216

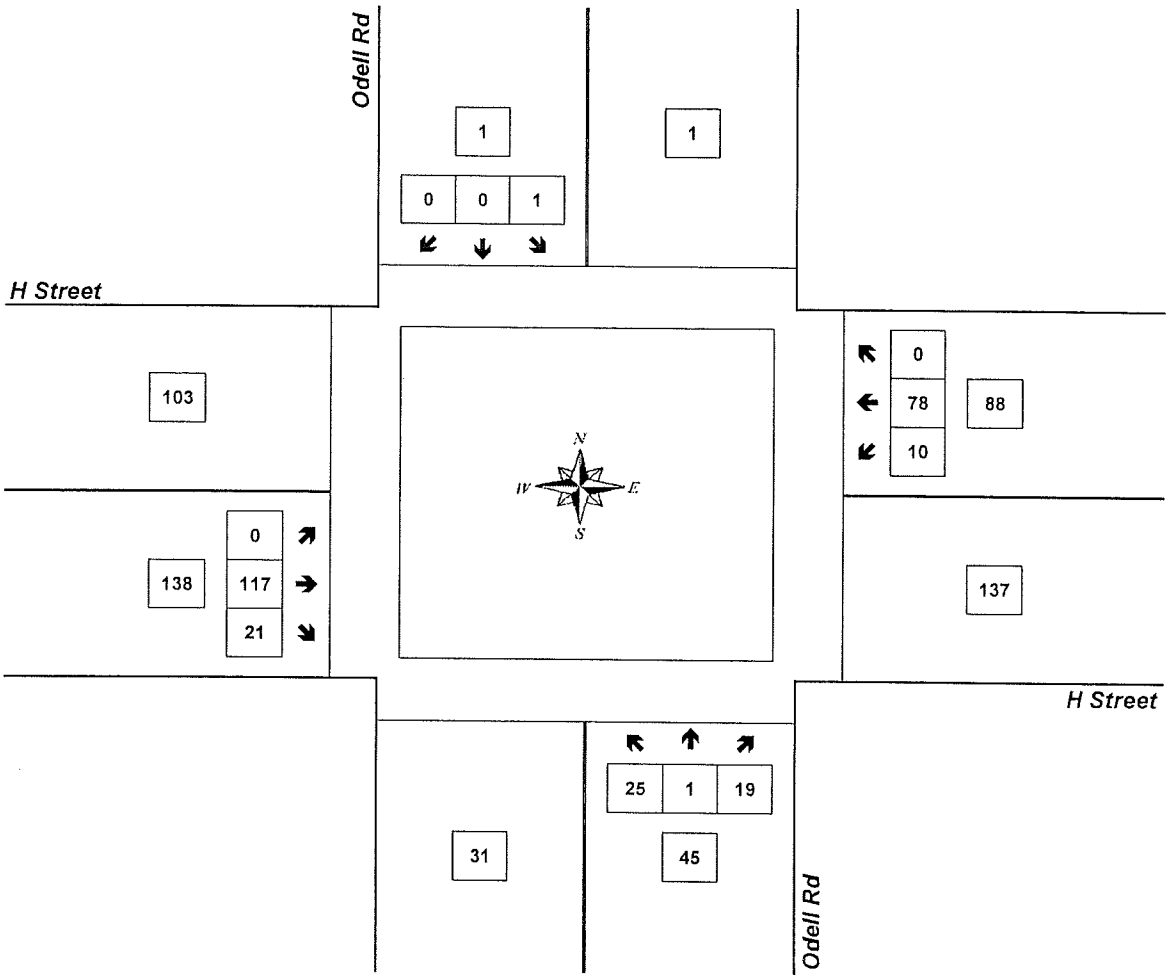
Peak Hour Summary

All Traffic Data Services Inc.

Mark Skaggs
(206) 251-0300

Odell Rd & H Street

4:15 PM to 5:15 PM
Thursday, October 06, 2005



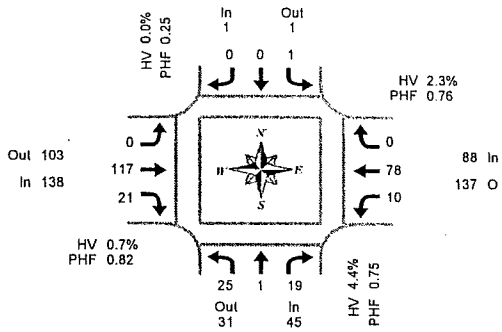
Approach	PHF	HV%	Volume
EB	0.82	0.7%	138
WB	0.76	2.3%	88
NB	0.75	4.4%	45
SB	0.25	0.0%	1
Intersection	0.79	1.8%	272

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Mark Skaggs
(206) 251-0300



Peak Hour Summary
4:15 PM to 5:15 PM

Odell Rd & H Street

Thursday, October 06, 2005
4:00 PM to 6:00 PM

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Odell Rd				Southbound Odell Rd				Eastbound H Street				Westbound H Street				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
04:00 PM	3	0	2	0	0	0	0	0	0	29	2	0	1	14	0	1	51
04:15 PM	2	1	3	0	1	0	0	0	0	35	3	0	1	15	0	0	61
04:30 PM	5	0	7	1	0	0	0	0	0	24	6	0	3	19	0	2	64
04:45 PM	11	0	4	0	0	0	0	0	0	36	6	1	2	27	0	0	86
05:00 PM	7	0	5	1	0	0	0	0	0	22	6	0	4	17	0	0	61
05:15 PM	4	0	1	0	0	0	0	0	0	34	3	1	0	8	0	0	50
05:30 PM	4	0	1	0	0	0	0	0	0	20	6	0	1	26	0	1	58
05:45 PM	2	0	2	0	0	0	0	0	0	16	4	0	1	15	0	1	40
Total Survey	38	1	25	2	1	0	0	0	0	216	36	2	13	141	0	5	471

Peak Hour Summary
4:15 PM to 5:15 PM

By Approach	Northbound Odell Rd				Southbound Odell Rd				Eastbound H Street				Westbound H Street				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	45	31	76	2	1	1	2	0	138	103	241	1	88	137	225	2	272
%HV	4.4%				0.0%				0.7%				2.3%				1.8%
PHF	0.75				0.25				0.82				0.76				0.79

By Movement	Northbound Odell Rd				Southbound Odell Rd				Eastbound H Street				Westbound H Street				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	25	1	19	45	1	0	0	1	0	117	21	138	10	78	0	88	272
PHF	0.57	0.25	0.68	0.75	0.25	0.00	0.00	0.25	0.00	0.81	0.88	0.82	0.63	0.72	0.00	0.76	0.79

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Odell Rd				Southbound Odell Rd				Eastbound H Street				Westbound H Street				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
04:00 PM	21	1	16	1	1	0	0	0	0	124	17	1	7	75	0	3	262
04:15 PM	25	1	19	2	1	0	0	0	0	117	21	1	10	78	0	2	272
04:30 PM	27	0	17	2	0	0	0	0	0	116	21	2	9	71	0	2	261
04:45 PM	26	0	11	1	0	0	0	0	0	112	21	2	7	78	0	1	255

Project No.: 05-253
Project Name: East Maple Ridge
Prepared by: BJL
Checked by:
Location: SR-543 at Boblett Road

Day & Date: Tuesday, 11/8/05
Time Start: 4:00 PM
Time End: 6:00 PM
Weather:

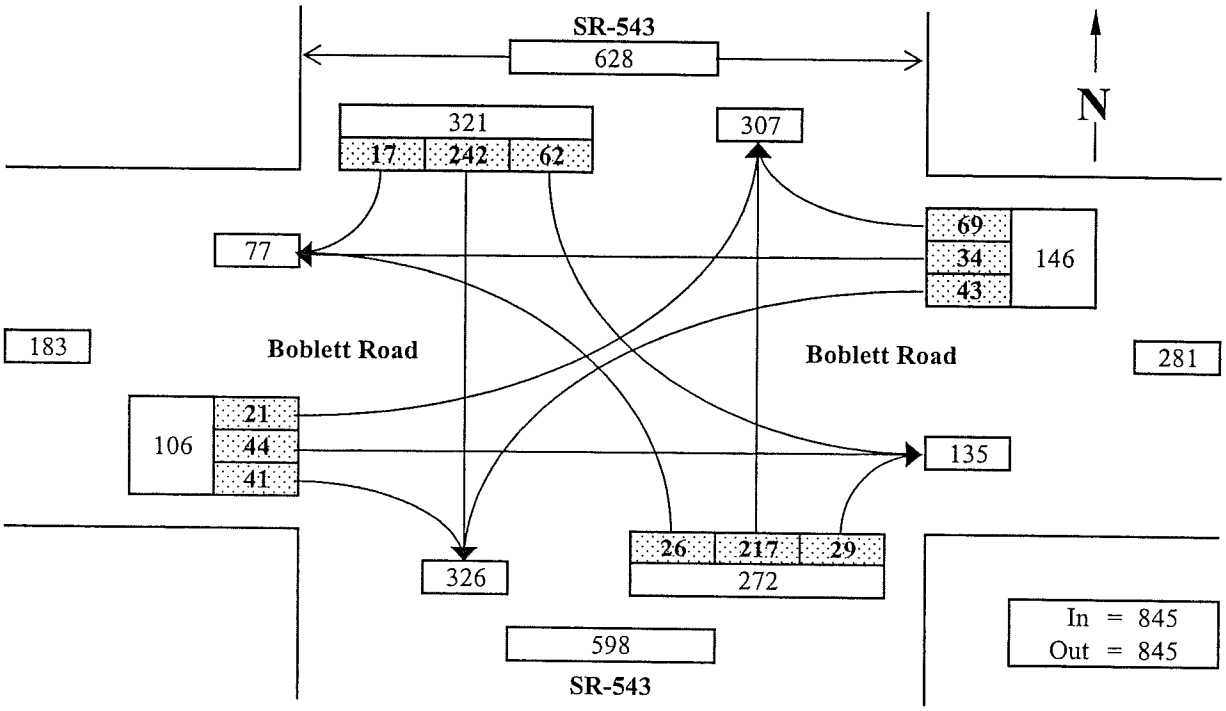
Time Interval Ending At	Boblett Road Eastbound				Boblett Road Westbound				SR-543 Northbound				SR-543 Southbound				Total ALL APP
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
15 Minute Cumulative Volumes																	
4:15 PM																	0
4:30 PM																	0
4:45 PM																	0
5:00 PM																	0
5:15 PM																	0
5:30 PM																	0
5:45 PM																	0
6:00 PM																	0
15 Minute Interval Volumes																	
4:15 PM	7	6	17	11	6	10	6	20	23	6	49	9	15	26	77	7	244
4:30 PM	4	3	9	6	10	5	6	17	22	4	56	6	16	11	53	3	179
4:45 PM	4	4	7	16	9	19	12	18	18	10	50	6	19	15	61	3	221
5:00 PM	4	8	11	8	3	9	10	14	18	6	62	8	11	10	51	4	201
5:15 PM	1	7	7	9	8	4	10	13	17	3	72	4	10	15	67	8	219
5:30 PM	6	11	9	12	5	6	15	7	12	5	48	3	16	16	53	6	191
5:45 PM	1	5	6	7	5	4	2	8	11	6	60	4	21	11	60	6	179
6:00 PM	2	2	3	5	1	2	5	8	13	6	76	2	12	9	42	0	160
Hourly Volumes																	
5:00 PM	19	21	44	41	28	43	34	69	81	26	217	29	61	62	242	17	845
5:15 PM	13	22	34	39	30	37	38	62	75	23	240	24	56	51	232	18	820
5:30 PM	15	30	34	45	25	38	47	52	65	24	232	21	56	56	232	21	832
5:45 PM	12	31	33	36	21	23	37	42	58	20	242	19	58	52	231	24	790
6:00 PM	10	25	25	33	19	16	32	36	53	20	256	13	59	51	222	20	749

EXISTING PEAK HOUR: 4:00 PM — 5:00 PM, Tuesday, 11/8/05

Peak Hour	Eastbound				Westbound				Northbound				Southbound				Total
4:00 PM	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
- 5:00 PM	19	21	44	41	28	43	34	69	81	26	217	29	61	62	242	17	845
Approach	19	106			28	146			81	272			61	321			845
PHF	0.78				0.74				0.89				0.73				0.87
% HV	17.9%				19.2%				29.8%				19.0%				

GIBSON TRAFFIC CONSULTANTS

EXISTING PEAK HOUR: 4:00 PM to 5:00 PM, Tuesday, 11/8/05					
Intersection	**Eastbound**	**Westbound**	**Northbound**	**Southbound**	**Total**
Approach Name	Boblett Road	Boblett Road	SR-543	SR-543	
Peak Hour Factor (PHF)	0.78	0.74	0.89	0.73	**0.87**
% of Heavy Vehicles	17.9%	19.2%	29.8%	19.0%	



Traffic Plus

360 391 9047

trafficplus@verizon.net

ocation : SR-543 @ Boblett Road

Count For : Gibson Traffic

Project : 05-253 GTC

Site: Peak Hour

Date: 11/08/05

Combined

**Peds not included in table data*

Begin Time	Total	SR-543 North Rt	SR-543 North Thru	SR-543 North Lt	Boblett Rd East Rt	Boblett Rd East Thru	Boblett Rd East Lt	SR-543 South Rt	SR-543 South Thru	SR-543 South Lt	Boblett Rd West Rt	Boblett Rd West Thru	Boblett Rd West Lt
16:00:00	244	7	77	28	20	6	10	9	49	8	11	17	6
16:15:00	179	3	53	11	17	6	5	6	56	4	6	9	3
16:30:00	221	3	61	15	18	12	19	6	50	10	16	7	4
16:45:00	201	4	51	10	14	10	9	8	62	6	8	11	8
	845	17	242	62	69	34	43	29	217	26	41	44	21

Peak Volume Periods (1-hour Rest 15-min)

Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:00:00	To 17:00:00	845

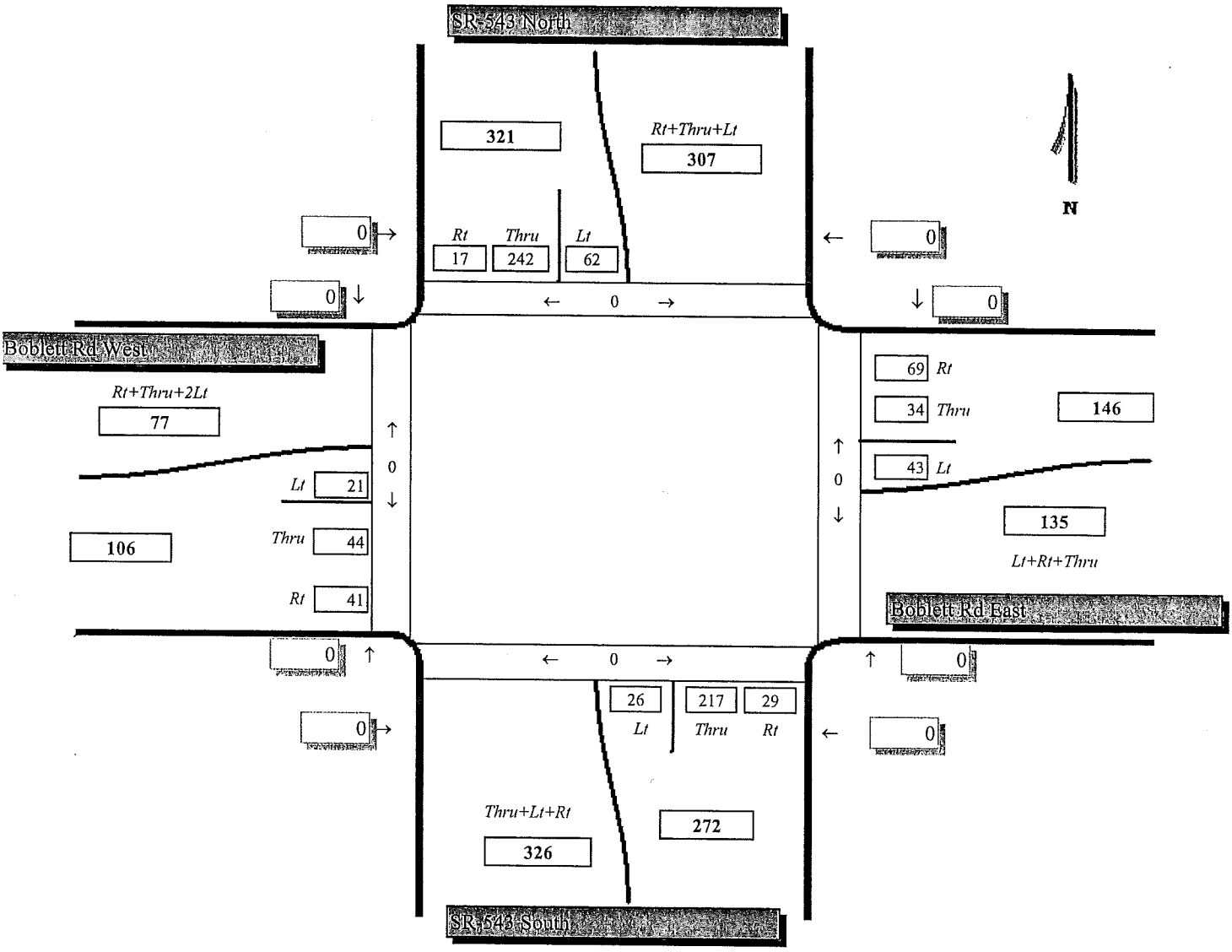
Traffic Plus

360 391 9047
trafficplus@verizon.net

Location : SR-543 @ Boblett Road
Count For : Gibson Traffic
Project : 05-253 GTC

Site: Peak Hour
Date: 11/08/05

Combined
**Peds not included in table data*



Traffic Plus

360 391 9047
trafficplus@verizon.net

ocation : SR-543 @ Boblett Road
Count For : Gibson Traffic
Project : 05-253 GTC

Site: Boblett Road
Date: 11/08/05

Combined
**Peds not included in table data*

Begin Time	Total	SR-543 North			Boblett Rd East			SR-543 South			Boblett Rd West		
		Rt	Thru	Lt	Rt	Thru	Lt	Rt	Thru	Lt	Rt	Thru	Lt
16:00:00	244	7	77	28	20	6	10	9	49	6	11	17	6
16:15:00	179	3	53	11	17	6	5	6	56	4	6	9	3
16:30:00	221	3	61	15	18	12	19	6	50	10	16	7	4
16:45:00	201	4	51	10	14	10	9	8	62	6	8	11	8
17:00:00	219	8	67	15	13	10	4	4	72	3	9	7	7
17:15:00	191	6	53	16	7	15	6	3	48	5	12	9	11
17:30:00	179	6	60	11	8	2	4	4	60	6	7	6	5
17:45:00	160	0	42	9	8	5	2	2	76	6	5	3	2
	1,594	37	464	113	105	66	59	42	473	46	74	69	46

Peak Volume Periods (1 hour Res: 15 min)

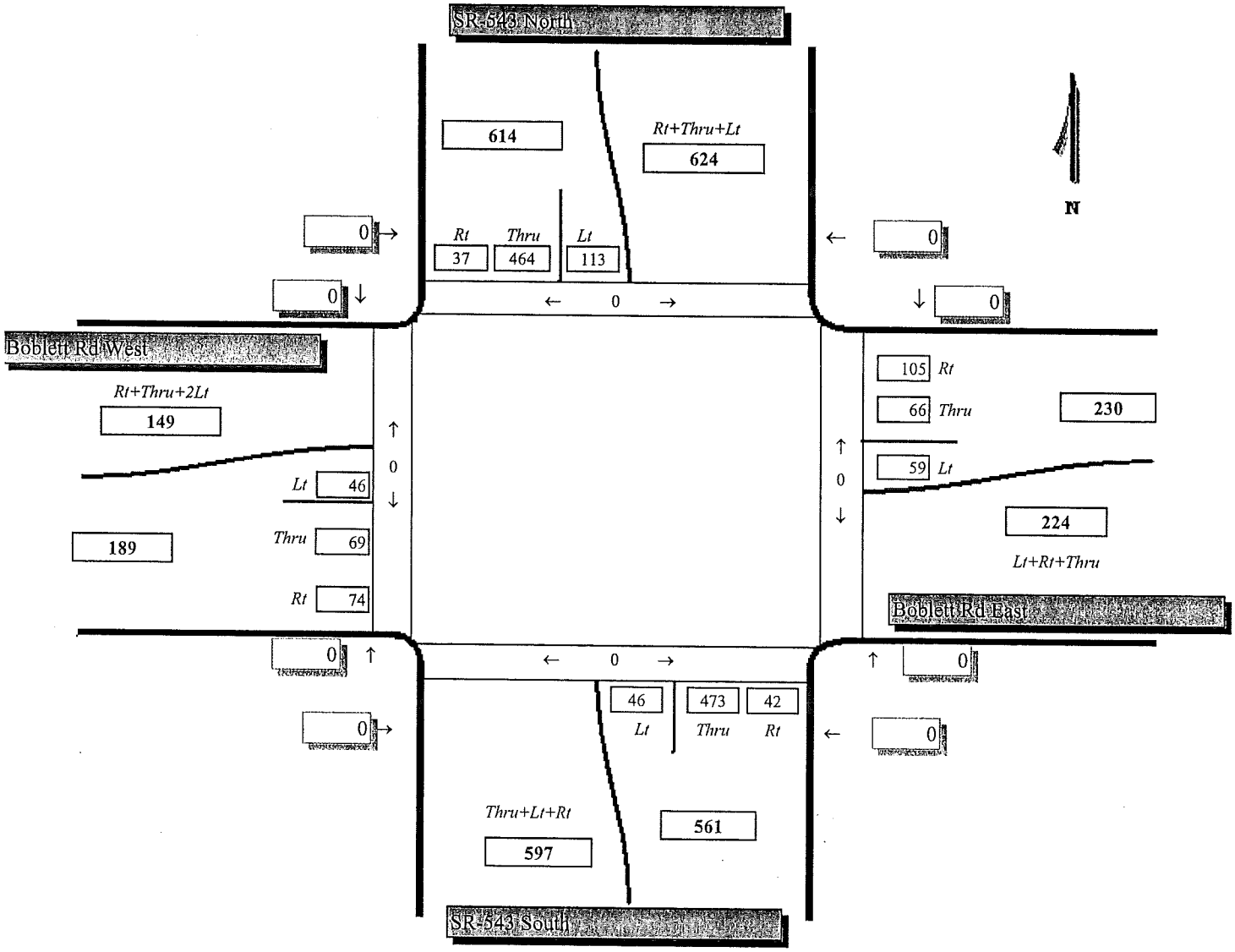
Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:00:00	To 17:00:00	845

Traffic Plus
360 391 9047
trafficplus@verizon.net

Location : SR-543 @ Boblett Road
Count For : Gibson Traffic
Project : 05-253 GTC

Site: Boblett Road
Date: 11/08/05

Combined
**Peds not included in table data*



Traffic Plus

360 391 9047
trafficplus@verizon.net

ocation : SR-543 @ Boblett Road
Count For : Gibson Traffic
Project : 05-253 GTC

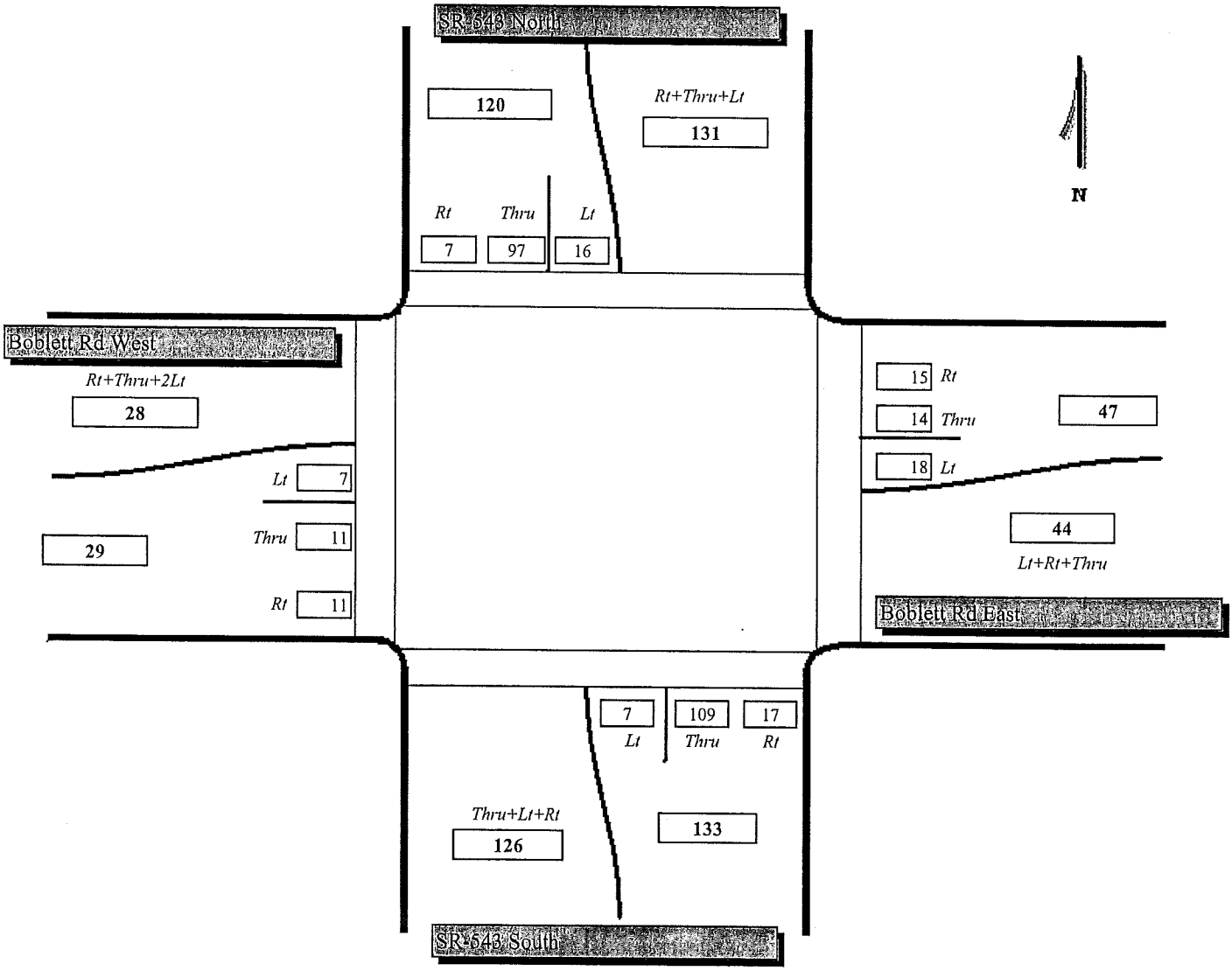
Trucks only

Site: Boblett Road
Date: 11/08/05

Begin Time	Total	SR-543 North Rt	SR-543 North Thru	SR-543 North Lt	Boblett Rd East Rt	Boblett Rd East Thru	Boblett Rd East Lt	SR-543 South Rt	SR-543 South Thru	SR-543 South Lt	Boblett Rd West Rt	Boblett Rd West Thru	Boblett Rd West Lt
16:00:00	50	1	18	1	3	1	2	4	17	1	2	3	2
16:15:00	52	0	15	1	6	2	2	3	17	2	1	3	0
16:30:00	50	3	16	0	1	4	4	2	15	1	2	2	0
16:45:00	36	1	7	3	1	0	2	4	14	0	2	0	2
17:00:00	36	0	8	2	2	4	2	3	14	0	1	0	0
17:15:00	39	1	9	6	1	1	3	1	9	2	3	0	3
17:30:00	38	1	19	1	1	1	3	0	10	1	0	1	0
17:45:00	28	0	10	2	0	1	0	0	13	0	0	2	0
	329	7	97	16	15	14	18	17	109	7	11	11	7

Peak Volume Periods (1 hour Res. 15 min)

Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:00:00	To 17:00:00	188



Traffic Plus

360 391 9047
trafficplus@verizon.net

ocation : SR-543 @ Boblett Road
Count For : Gibson Traffic
Project : 05-253 GTC

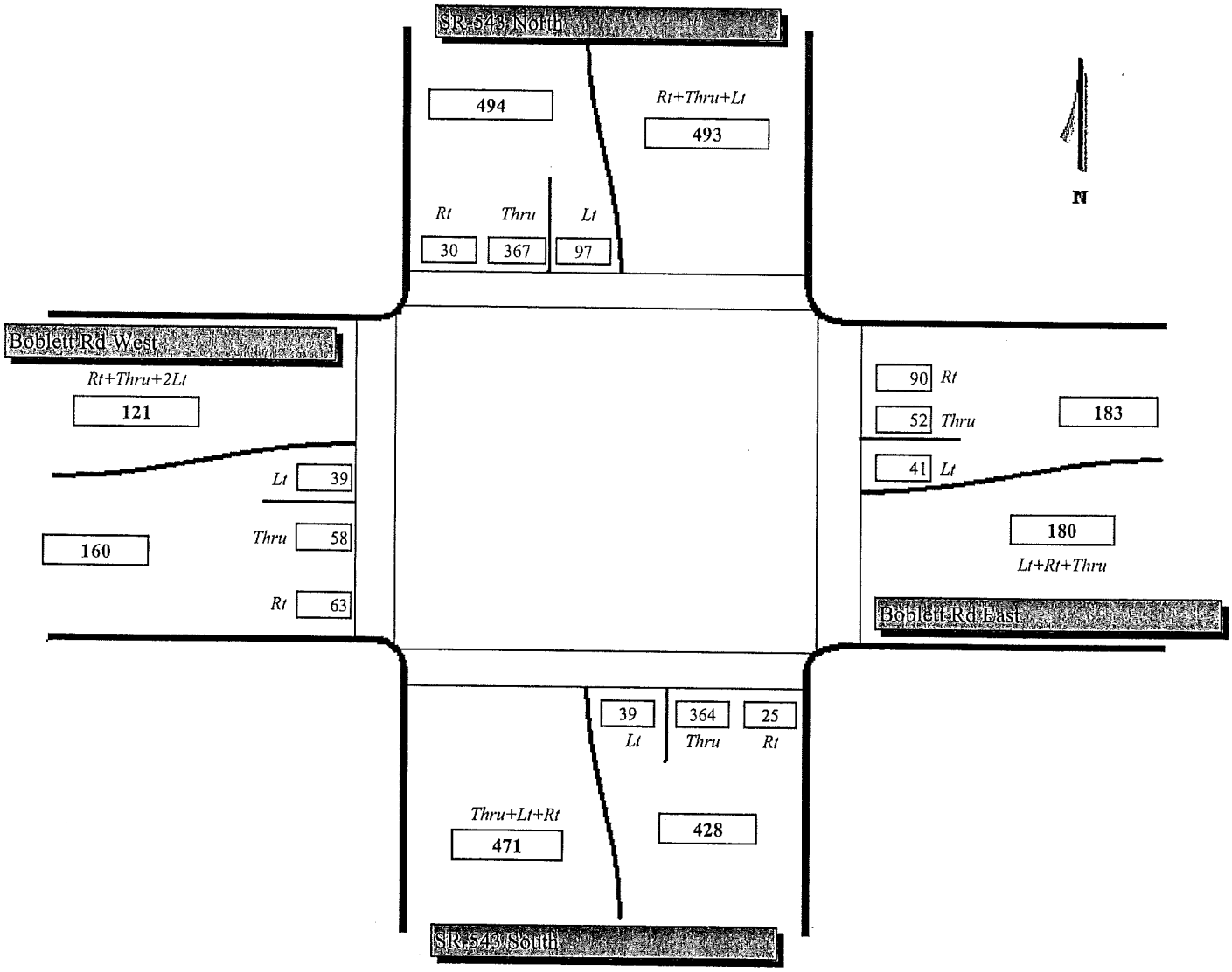
Site: Boblett Road
Date: 11/08/05

No shift *vehicles only*

Begin		SR-543 North			Boblett Rd East			SR-543 South			Boblett Rd West		
Time	Total	Rt	Thru	Lt	Rt	Thru	Lt	Rt	Thru	Lt	Rt	Thru	Lt
16:00:00	194	6	64	25	17	5	8	5	32	5	9	14	4
16:15:00	127	3	38	10	11	4	3	3	39	2	5	6	3
16:30:00	171	0	45	15	17	8	15	4	35	9	14	5	4
16:45:00	165	3	44	7	13	10	7	4	48	6	6	11	6
17:00:00	188	8	59	13	11	6	2	1	58	3	8	7	7
17:15:00	152	5	44	10	6	14	3	2	39	3	9	9	8
17:30:00	141	5	41	10	7	1	1	4	50	5	7	5	5
17:45:00	132	0	32	7	8	4	2	2	63	6	5	1	2
	1,265	30	367	97	90	52	41	25	364	39	68	58	39

Peak Volume Periods (1 hour Res 15 min)

Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	NA	To NA	0
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	16:30:00	To 17:30:00	671



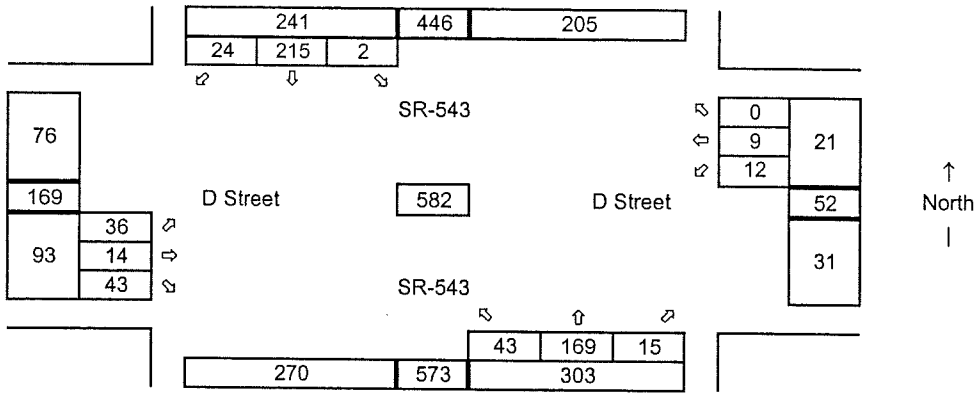
Synchro ID: 1

Existing
Average Weekday
PM Peak Hour

Year: **11/8/05**

Data Source: **Trafficplus**

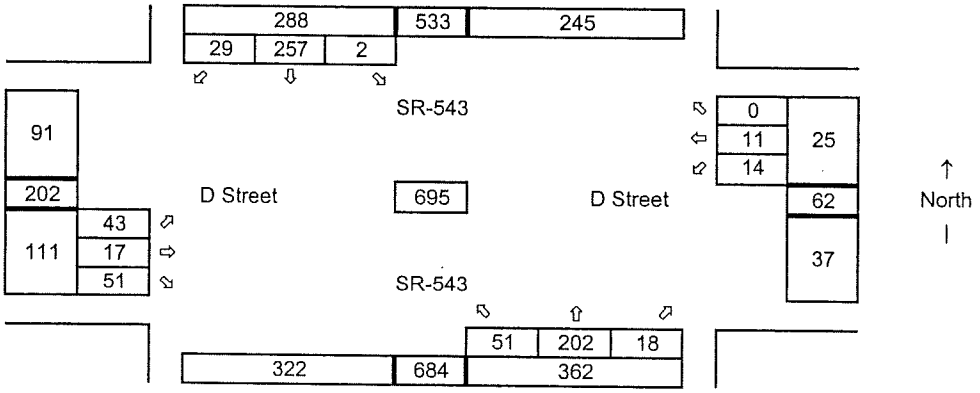
NBT Vehicles 245
NB Trucks (25%) 76



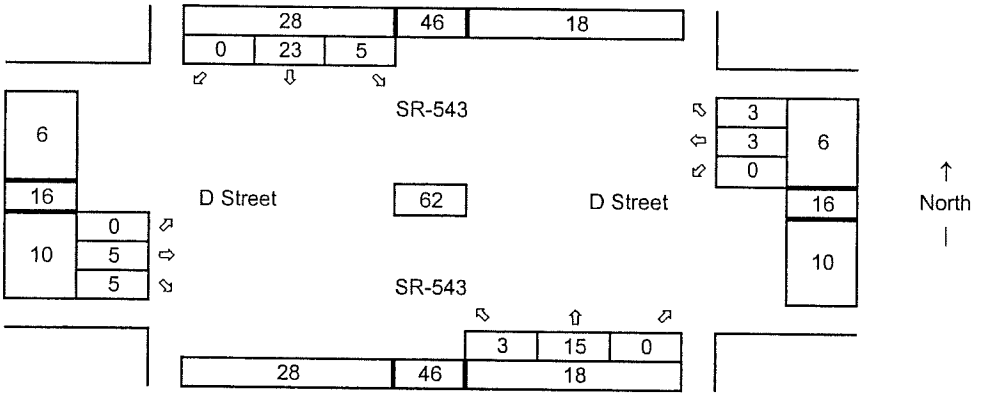
Future without Project
Average Weekday
PM Peak Hour

Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941

NBT Vehicles 293
NB Trucks (25%) 91

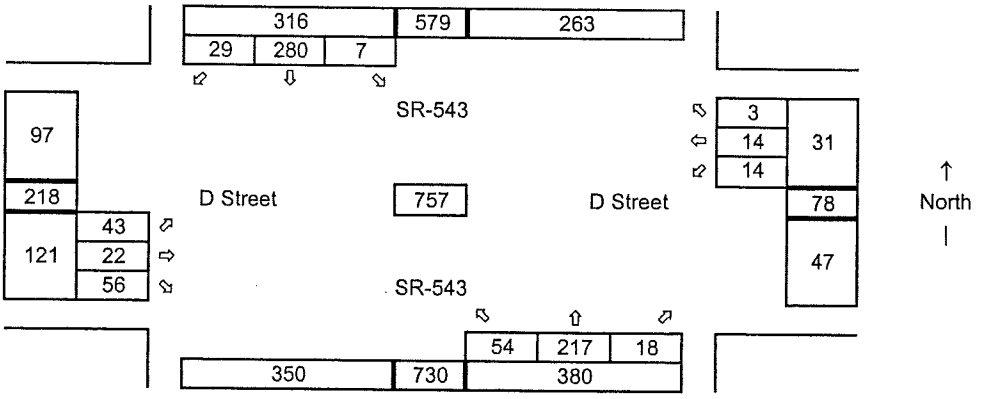


Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

NB Trucks (25%) 91
Same as Baseline Volume

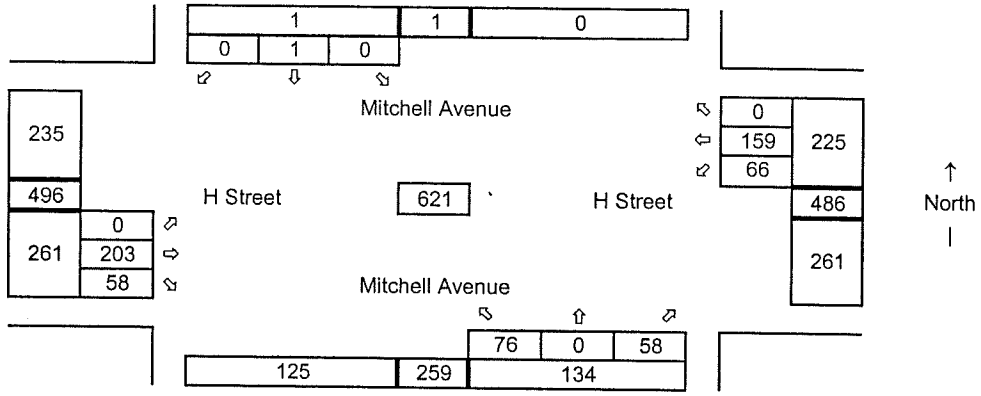


Synchro ID: 2

Existing
Average Weekday
PM Peak Hour

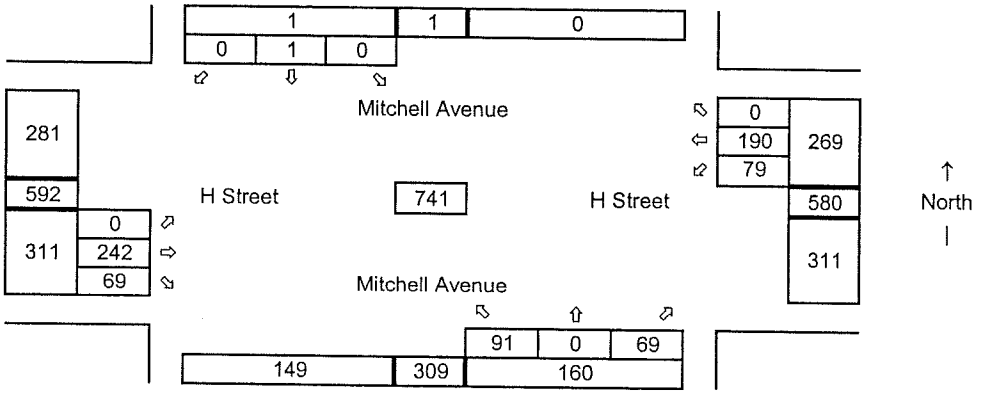
Year: **10/6/05**

Data Source: **ATD**

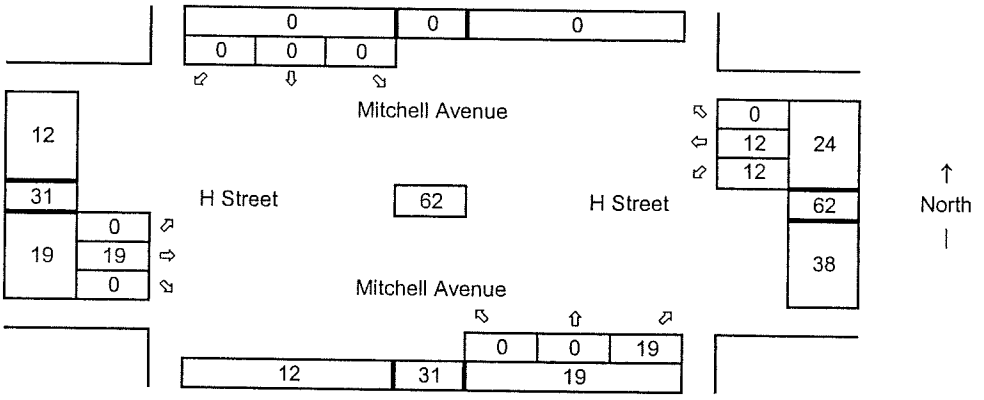


Future without Project
Average Weekday
PM Peak Hour

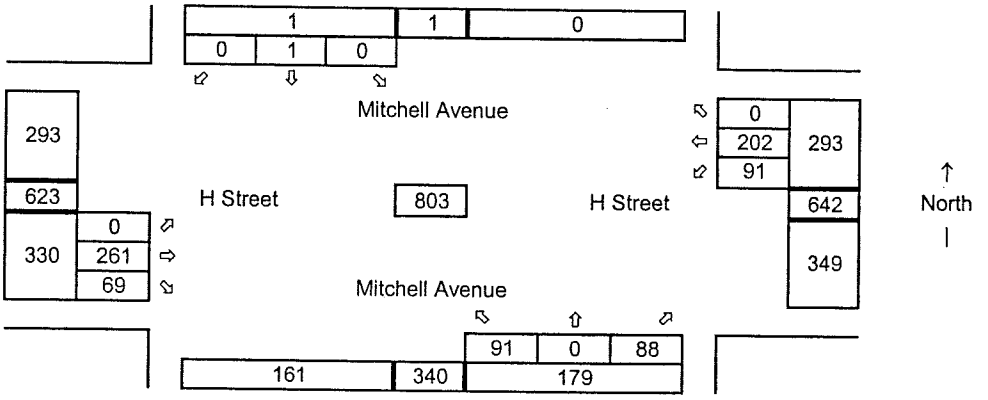
Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour



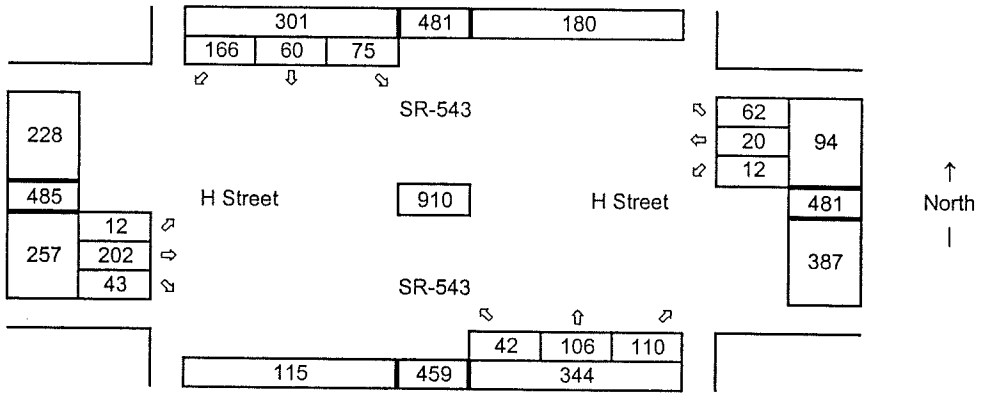
Synchro ID: 3

Existing
Average Weekday
PM Peak Hour

Year: **10/6/05**

Data Source: **ATD**

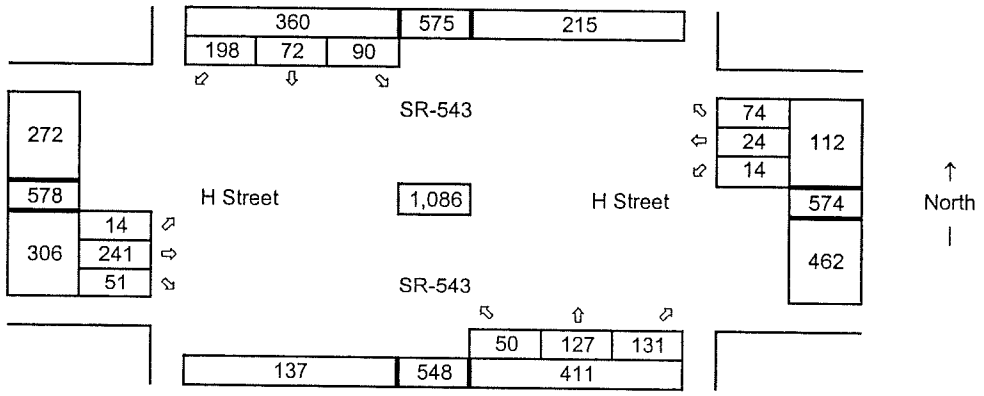
NBT Vehicles 192
NB Trucks (25%) 86



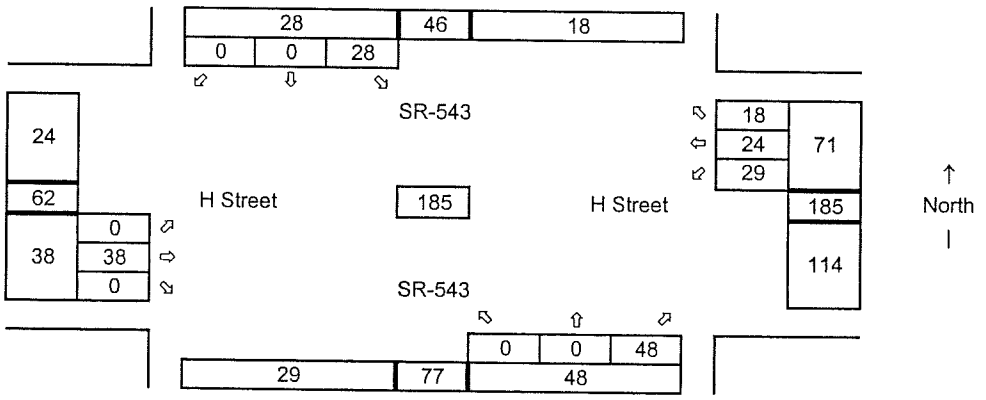
Future without Project
Average Weekday
PM Peak Hour

Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941

NBT Vehicles 229
NB Trucks (25%) 103

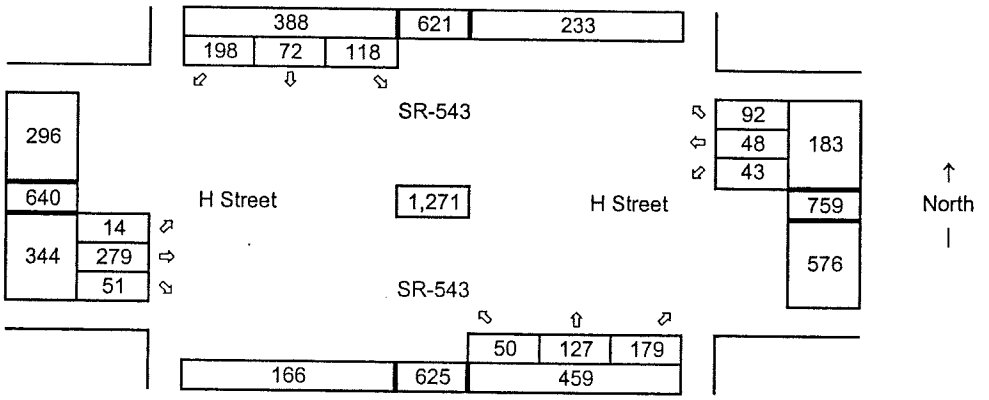


Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

NB Trucks (25%) 103
Same as Baseline Volume

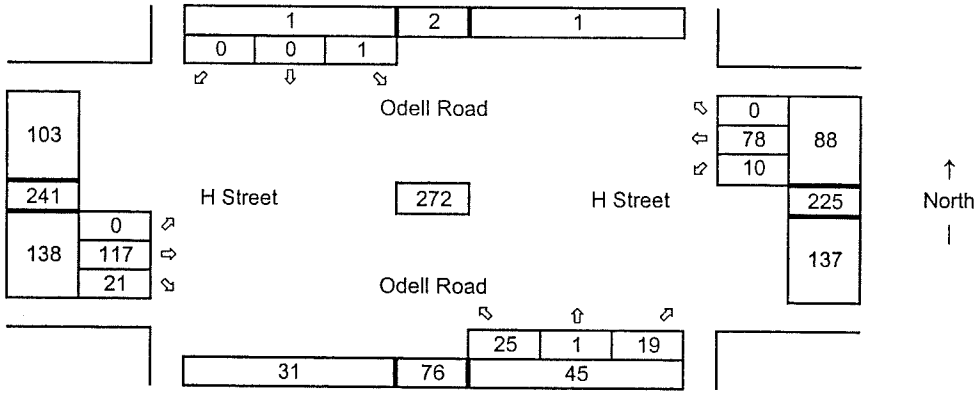


Synchro ID: 4

Existing
Average Weekday
PM Peak Hour

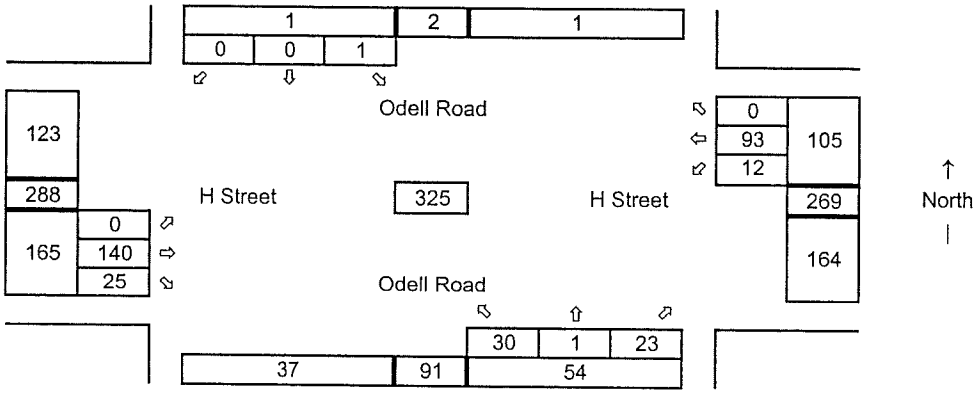
Year: **10/6/05**

Data Source: **ATD**

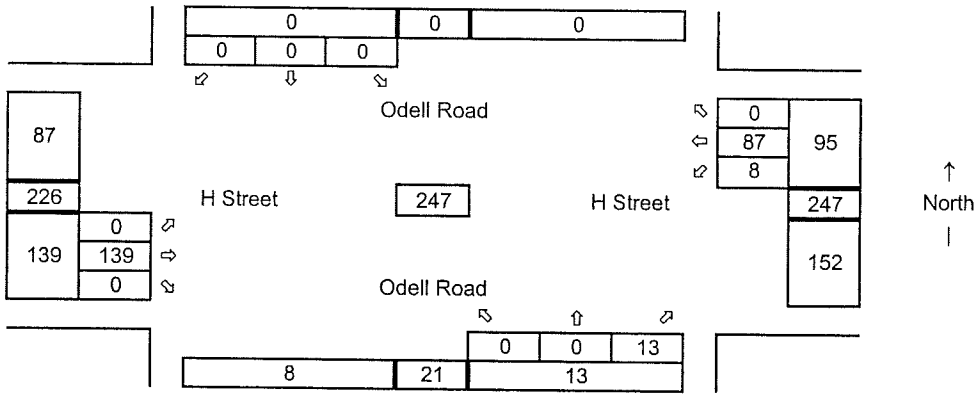


Future without Project
Average Weekday
PM Peak Hour

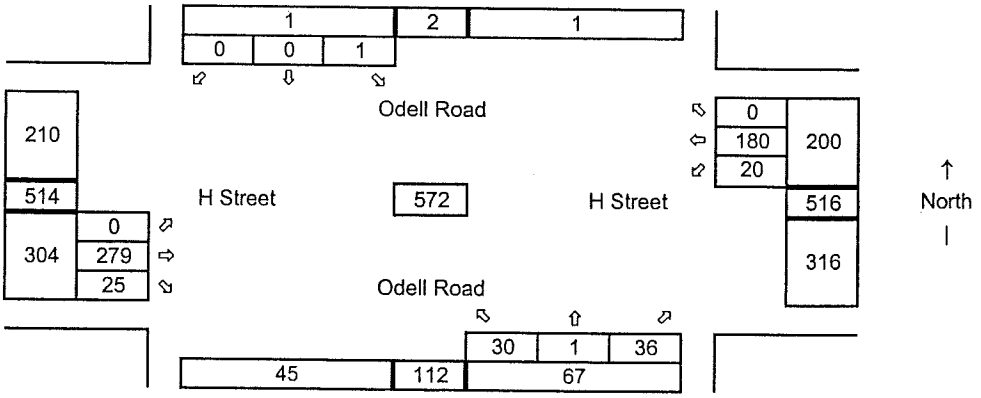
Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour



Synchro ID: 5

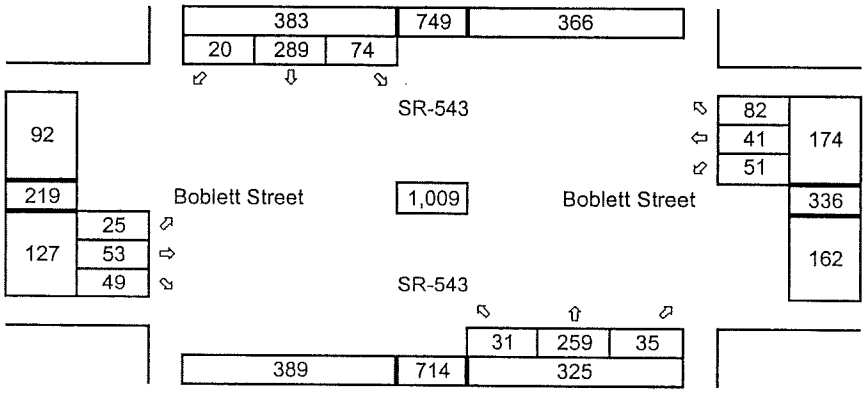
Existing
Average Weekday
PM Peak Hour

Year: **11/8/05**

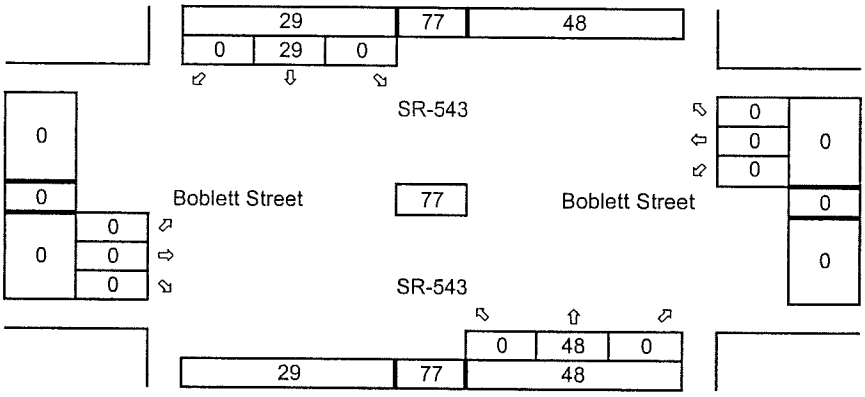
Data Source: **Trafficplus**

Future without Project
Average Weekday
PM Peak Hour

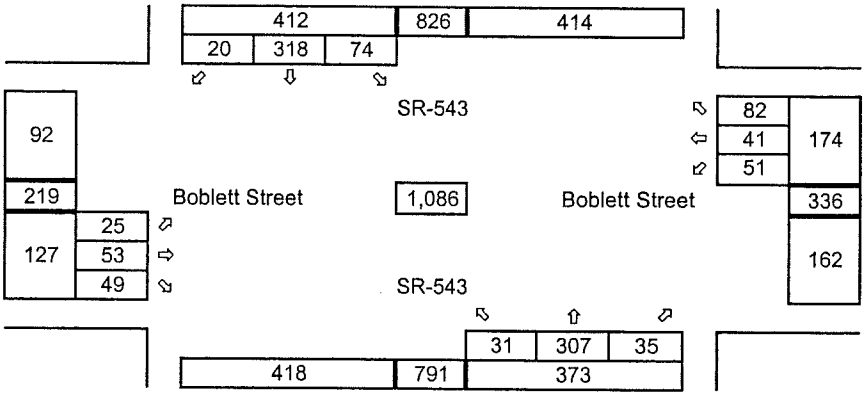
Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

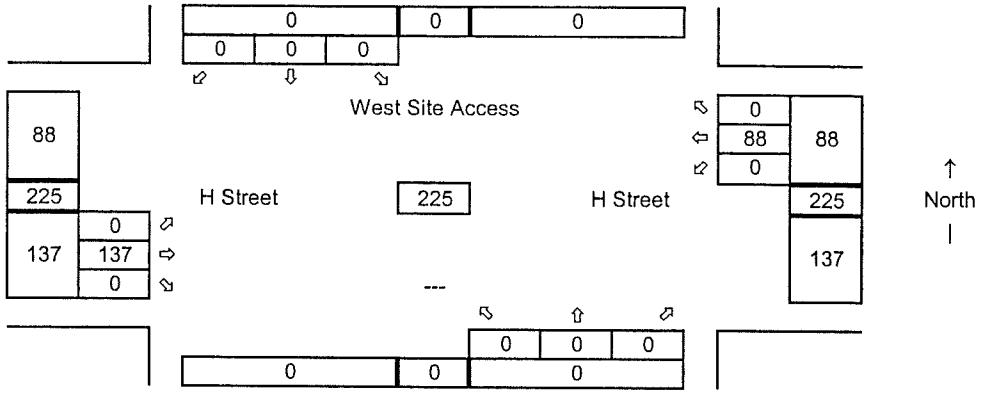


Synchro ID: 6

Existing
Average Weekday
PM Peak Hour

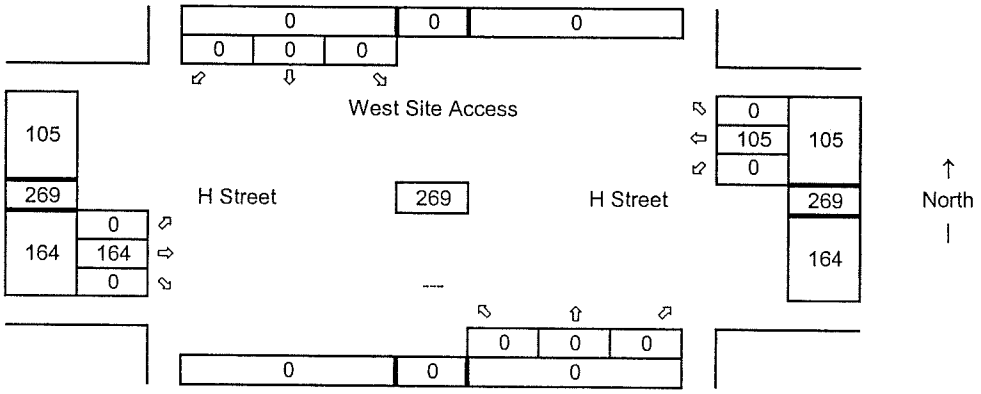
Year: **10/6/05**

Data Source: **ATD**

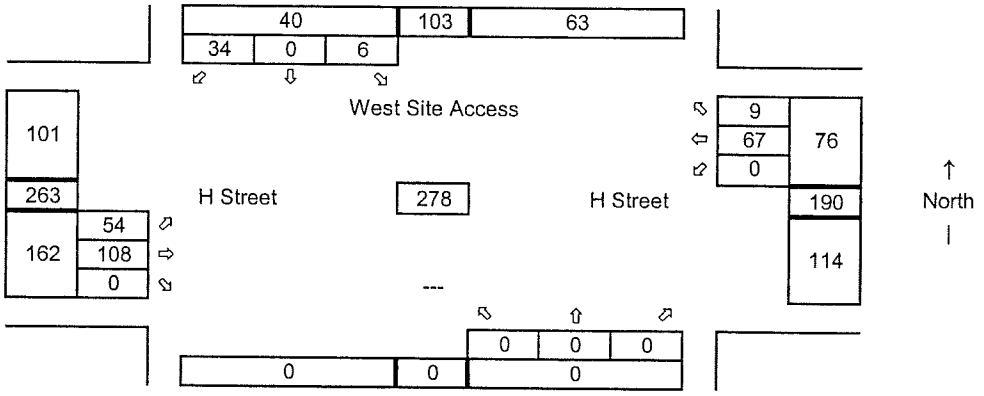


Future without Project
Average Weekday
PM Peak Hour

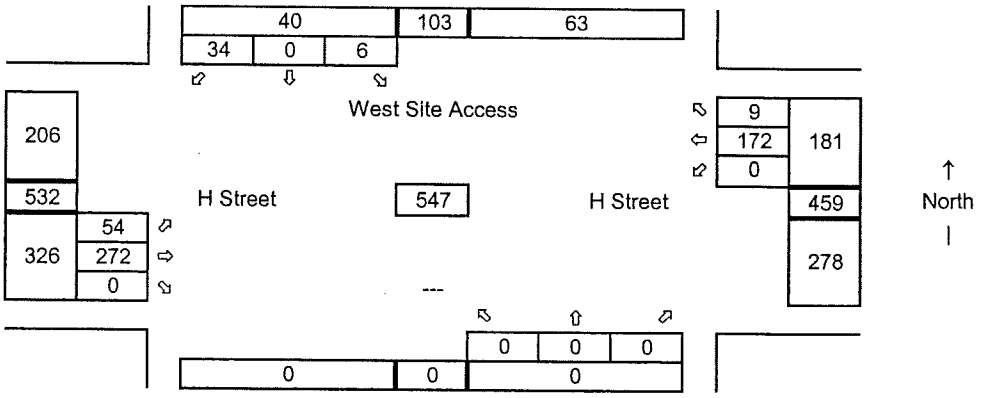
Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

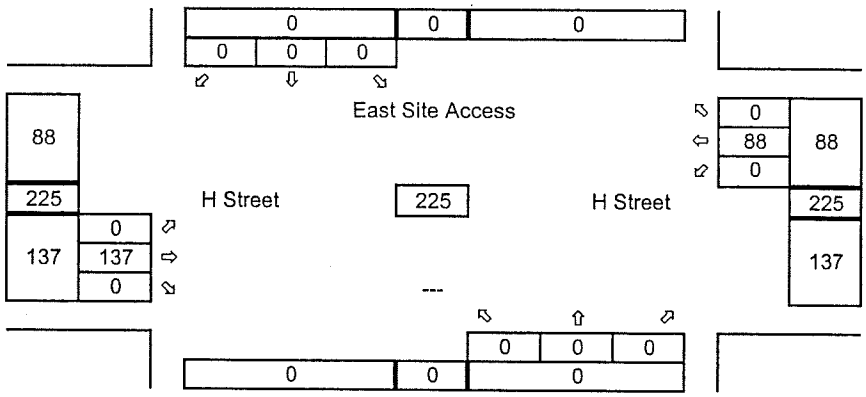


Synchro ID: 7

Existing
Average Weekday
PM Peak Hour

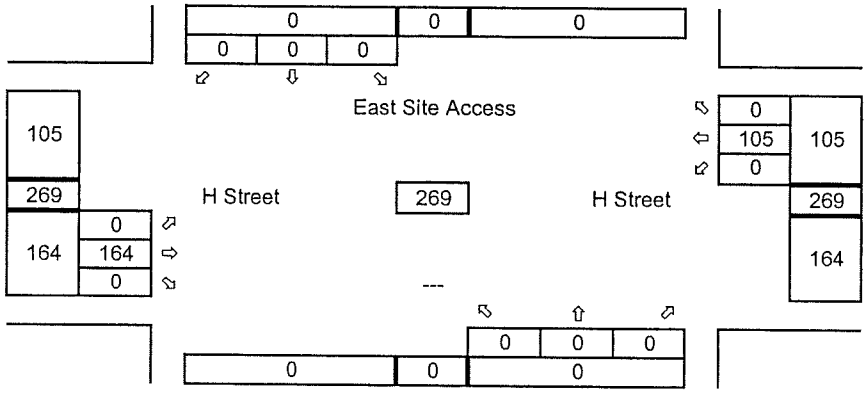
Year: **10/6/05**

Data Source: **ATD**

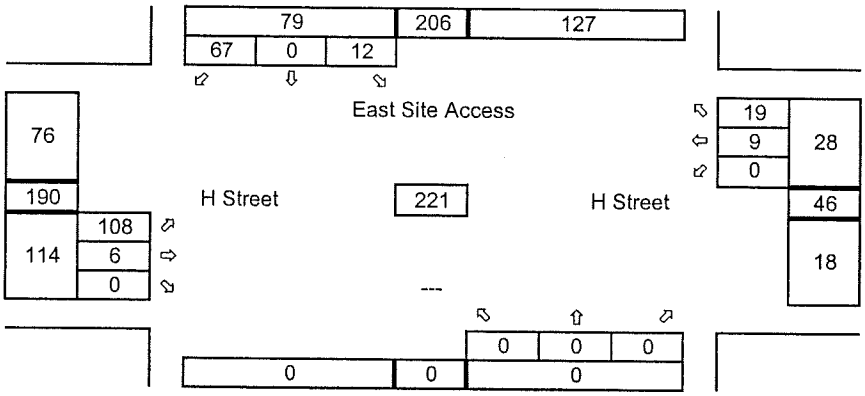


Future without Project
Average Weekday
PM Peak Hour

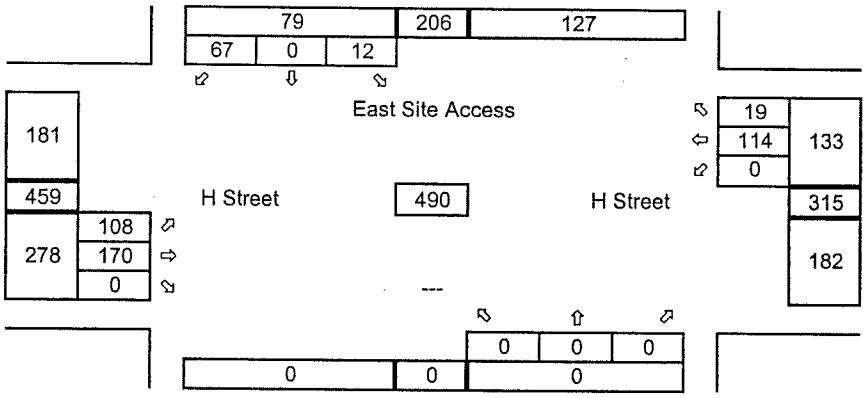
Year: 2011
Growth Rate = 3.0%
Years of Growth = 6
Total Growth = 1.1941



Total Project Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	36	14	43	12	9	0	43	245	15	2	215	24
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	41	16	49	14	10	0	49	278	17	2	244	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	652	656	258	680	661	287	272			295		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	652	656	258	680	661	287	272			295		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.2	4.4			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.5			2.4		
p0 queue free %	88	96	94	96	97	100	96			100		
cM capacity (veh/h)	352	361	766	316	362	745	1156			1155		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	106	24	344	274
Volume Left	41	14	49	2
Volume Right	49	0	17	27
cSH	660	334	1156	1155
Volume to Capacity	0.16	0.07	0.04	0.00
Queue Length 95th (ft)	14	6	3	0
Control Delay (s)	13.8	16.6	1.5	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	13.8	16.6	1.5	0.1
Approach LOS	B	C		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	203	58	66	159	76	58
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	218	62	71	171	82	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			281		562	249
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			281		562	249
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		82	92
cM capacity (veh/h)			1282		459	787

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	281	242	144
Volume Left	0	71	82
Volume Right	62	0	62
cSH	1700	1282	560
Volume to Capacity	0.17	0.06	0.26
Queue Length 95th (ft)	0	4	25
Control Delay (s)	0.0	2.7	13.6
Lane LOS		A	B
Approach Delay (s)	0.0	2.7	13.6
Approach LOS			B

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			150		150	150		0			0
Storage Lanes	1			1		1	1		0			0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. 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
Ped Bike Factor	0.98		0.95	0.98		0.95	0.98	0.98		0.98	0.97	
Frt			0.850			0.850		0.924			0.890	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1881	1599	1703	1792	1524	1736	1647	0	1736	1511	0
Flt Permitted	0.486			0.489			0.950			0.950		
Satd. Flow (perm)	898	1881	1523	861	1792	1451	1701	1647	0	1700	1511	0
Right Turn on Red			Yes			Yes						Yes
Satd. Flow (RTOR)			45			82					175	
Headway 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
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1625			2160			1215			1490	
Travel Time (s)		44.3			58.9			20.7			25.4	
Volume (vph)	12	202	43	96	204	78	42	106	110	75	60	166
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	6%	6%	6%	4%	4%	4%	4%	19%	4%
Adj. Flow (vph)	13	213	45	101	215	82	44	112	116	79	63	175
Lane Group Flow (vph)	13	213	45	101	215	82	44	228	0	79	238	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Detector Phases	4	4	4	8	8	8	1	6		5	2	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0		8.0	20.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	26.0	0.0	13.0	53.0	0.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	11.1%	28.9%	0.0%	14.4%	58.9%	0.0%
Maximum Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	6.0	22.0		9.0	49.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Walk Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0			5.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effct Green (s)	14.9	14.9	14.9	14.9	14.9	14.9	5.9	22.3		8.0	51.4	
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.07	0.28		0.10	0.64	
v/c Ratio	0.08	0.61	0.14	0.63	0.64	0.24	0.36	0.50		0.47	0.23	
Control Delay	27.1	32.9	9.1	37.3	33.6	7.8	47.0	31.0		43.5	3.5	

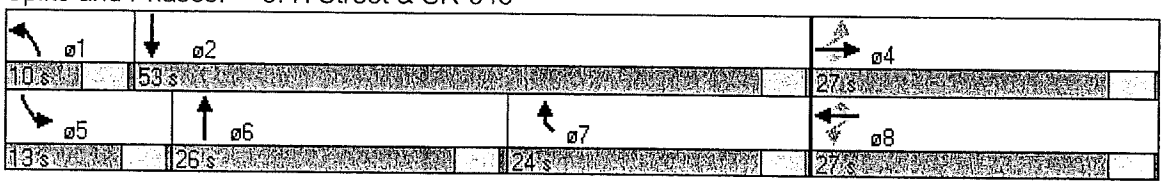
Lane Group	NWR
Lane Configurations	↱
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Total Lost Time (s)	4.0
Leading Detector (ft)	50
Trailing Detector (ft)	0
Turning Speed (mph)	9
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	0.865
Flt Protected	
Satd. Flow (prot)	822
Flt Permitted	
Satd. Flow (perm)	822
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	1.00
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	86
Confl. Peds. (#/hr)	
Peak Hour Factor	0.95
Heavy Vehicles (%)	100%
Adj. Flow (vph)	91
Lane Group Flow (vph)	91
Turn Type	custom
Protected Phases	7
Permitted Phases	
Detector Phases	7
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	26.7%
Maximum Green (s)	20.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	21.0
Actuated g/C Ratio	0.26
v/c Ratio	0.42
Control Delay	35.7

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	27.1	32.9	9.1	37.3	33.6	7.8	47.0	31.0		43.5	3.5	
LOS	C	C	A	D	C	A	D	C		D	A	
Approach Delay		28.6			29.2			33.5			13.5	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	6	102	0	49	104	0	22	99		38	12	
Queue Length 95th (ft)	21	169	26	100	172	34	59	189		88	51	
Internal Link Dist (ft)		1545			2080			1135			1410	
Turn Bay Length (ft)	150		150	150		150	150			150		
Base Capacity (vph)	236	495	434	226	471	442	125	458		189	1032	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.06	0.43	0.10	0.45	0.46	0.19	0.35	0.50		0.42	0.23	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 80
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 26.7 Intersection LOS: C
Intersection Capacity Utilization 56.2% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: H Street & SR-543



Lane Group	NWR
Queue Delay	0.0
Total Delay	35.7
LOS	D
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	40
Queue Length 95th (ft)	96
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	216
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.42

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	117	21	10	78	25	20
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	148	27	13	99	32	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			175		285	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			175		285	161
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	97
cM capacity (veh/h)			1402		694	878

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	175	111	32	25
Volume Left	0	13	32	0
Volume Right	27	0	0	25
cSH	1700	1402	694	878
Volume to Capacity	0.10	0.01	0.05	0.03
Queue Length 95th (ft)	0	1	4	2
Control Delay (s)	0.0	0.9	10.4	9.2
Lane LOS		A	B	A
Approach Delay (s)	0.0	0.9	9.9	
Approach LOS			A	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		

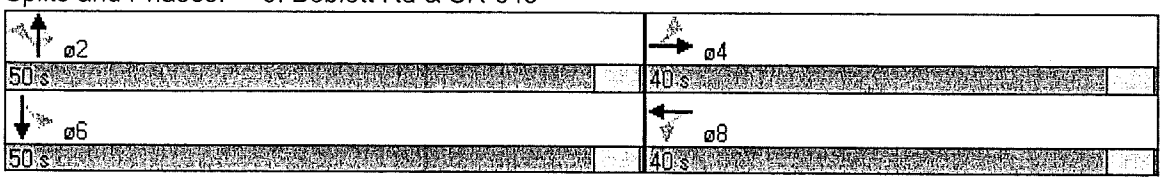
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	150		150	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. 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
Frt		0.928			0.900				0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	1494	0	1517	1437	0	1388	1462	1242	1517	1581	0
Flt Permitted	0.681			0.694			0.519			0.564		
Satd. Flow (perm)	1097	1494	0	1108	1437	0	759	1462	1242	901	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		47			79				33		6	
Headway 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
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			1000			1215	
Travel Time (s)		27.3			27.3			17.0			20.7	
Volume (vph)	21	44	41	43	34	69	26	217	29	62	242	17
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	18%	18%	18%	19%	19%	19%	30%	30%	30%	19%	19%	19%
Adj. Flow (vph)	24	51	47	49	39	79	30	249	33	71	278	20
Lane Group Flow (vph)	24	98	0	49	118	0	30	249	33	71	298	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	40.0	40.0	0.0	40.0	40.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0
Total Split (%)	44.4%	44.4%	0.0%	44.4%	44.4%	0.0%	55.6%	55.6%	55.6%	55.6%	55.6%	0.0%
Maximum Green (s)	36.0	36.0		36.0	36.0		46.0	46.0	46.0	46.0	46.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	10.2	10.2		10.2	10.2		30.0	30.0	30.0	30.0	30.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.66	0.66	0.66	0.66	0.66	
v/c Ratio	0.11	0.28		0.21	0.33		0.06	0.26	0.04	0.12	0.29	
Control Delay	8.3	5.3		8.5	4.4		5.0	4.9	2.4	5.0	4.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	8.3	5.3		8.5	4.4		5.0	4.9	2.4	5.0	4.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A		A	A	A	A	A	
Approach Delay		5.9			5.6			4.6			4.9	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)	2	4		4	3		2	18	0	5	21	
Queue Length 95th (ft)	12	24		19	24		9	48	6	17	55	
Internal Link Dist (ft)		920			920			920			1135	
Turn Bay Length (ft)	150			150			150		150	150		
Base Capacity (vph)	595	832		601	816		644	1239	1058	764	1341	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.04	0.12		0.08	0.14		0.05	0.20	0.03	0.09	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 45.6
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.33
Intersection Signal Delay: 5.1 Intersection LOS: A
Intersection Capacity Utilization 36.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Boblett Rd & SR-543



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	43	17	51	14	11	0	51	293	18	2	257	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	49	19	58	16	12	0	58	333	20	2	292	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	778	782	309	811	789	343	325			353		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	778	782	309	811	789	343	325			353		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.2	4.4			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.5			2.4		
p0 queue free %	83	94	92	94	96	100	95			100		
cM capacity (veh/h)	284	301	718	247	302	693	1102			1098		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	126	28	411	327
Volume Left	49	16	58	2
Volume Right	58	0	20	33
cSH	535	269	1102	1098
Volume to Capacity	0.24	0.11	0.05	0.00
Queue Length 95th (ft)	23	9	4	0
Control Delay (s)	16.3	20.0	1.7	0.1
Lane LOS	C	C	A	A
Approach Delay (s)	16.3	20.0	1.7	0.1
Approach LOS	C	C		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	242	69	79	190	91	69
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	260	74	85	204	98	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			334		672	297
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			334		672	297
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		75	90
cM capacity (veh/h)			1225		391	740

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	334	289	172
Volume Left	0	85	98
Volume Right	74	0	74
cSH	1700	1225	491
Volume to Capacity	0.20	0.07	0.35
Queue Length 95th (ft)	0	6	39
Control Delay (s)	0.0	2.8	16.3
Lane LOS		A	C
Approach Delay (s)	0.0	2.8	16.3
Approach LOS			C

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			150		150	150		0			0
Storage Lanes	1			1		1	1		0			0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. 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
Ped Bike Factor	0.97		0.95	0.98		0.95	0.98	0.98		0.98	0.97	
Frt			0.850			0.850		0.924			0.890	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1881	1599	1703	1792	1524	1736	1647	0	1736	1511	0
Flt Permitted	0.741			0.418			0.950			0.950		
Satd. Flow (perm)	1356	1881	1523	738	1792	1451	1703	1647	0	1702	1511	0
Right Turn on Red			Yes			Yes						Yes
Satd. Flow (RTOR)			54			78					208	
Headway 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
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1625			2160			1215			1490	
Travel Time (s)		44.3			58.9			20.7			25.4	
Volume (vph)	14	241	51	14	24	74	50	127	131	90	72	198
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	6%	6%	6%	4%	4%	4%	4%	19%	4%
Adj. Flow (vph)	15	254	54	15	25	78	53	134	138	95	76	208
Lane Group Flow (vph)	15	254	54	15	25	78	53	272	0	95	284	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0		8.0	20.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	26.0	0.0	13.0	53.0	0.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	11.1%	28.9%	0.0%	14.4%	58.9%	0.0%
Maximum Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	6.0	22.0		9.0	49.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Walk Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0			5.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effct Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	6.0	22.0		9.0	49.0	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.24		0.10	0.54	
v/c Ratio	0.04	0.53	0.13	0.08	0.05	0.18	0.46	0.67		0.55	0.31	
Control Delay	25.8	33.6	8.5	26.9	25.8	7.7	53.5	40.4		51.1	4.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	25.8	33.6	8.5	26.9	25.8	7.7	53.5	40.4		51.1	4.2	
LOS	C	C	A	C	C	A	D	D		D	A	
Approach Delay		29.0			14.0			42.5			15.9	
Approach LOS		C			B			D			B	
Queue Length 50th (ft)	6	125	0	6	11	0	30	140		52	19	

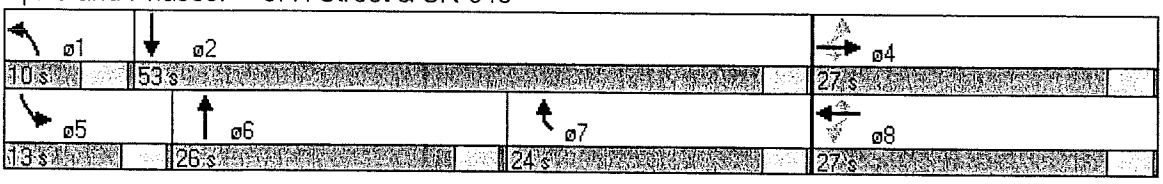
Lane Group	NWR
Lane Configurations	↱
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Total Lost Time (s)	4.0
Turning Speed (mph)	9
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	0.865
Flt Protected	
Satd. Flow (prot)	822
Flt Permitted	
Satd. Flow (perm)	822
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	1.00
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	103
Confl. Peds. (#/hr)	
Peak Hour Factor	0.95
Heavy Vehicles (%)	100%
Adj. Flow (vph)	108
Lane Group Flow (vph)	108
Turn Type	custom
Protected Phases	7
Permitted Phases	
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	26.7%
Maximum Green (s)	20.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lead/Lag	
Lead-Lag Optimize?	
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	20.0
Actuated g/C Ratio	0.22
v/c Ratio	0.59
Control Delay	46.3
Queue Delay	0.0
Total Delay	46.3
LOS	D
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	55

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	SBR
Queue Length 95th (ft)	22	200	28	23	30	34	#68	228		#104	58	
Internal Link Dist (ft)		1545			2080			1135			1410	
Turn Bay Length (ft)	150		150	150		150	150			150		
Base Capacity (vph)	347	481	429	189	458	429	116	403		174	917	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.53	0.13	0.08	0.05	0.18	0.46	0.67		0.55	0.31	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 13 (14%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 28.6 Intersection LOS: C
Intersection Capacity Utilization 53.3% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: H Street & SR-543



Lane Group	NWR
Queue Length 95th (ft)	#123
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	183
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.59

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	140	25	12	93	30	23
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	177	32	15	118	38	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			209		341	193
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			209		341	193
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	97
cM capacity (veh/h)			1362		644	843

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	209	133	38	29
Volume Left	0	15	38	0
Volume Right	32	0	0	29
cSH	1700	1362	644	843
Volume to Capacity	0.12	0.01	0.06	0.03
Queue Length 95th (ft)	0	1	5	3
Control Delay (s)	0.0	1.0	10.9	9.4
Lane LOS		A	B	A
Approach Delay (s)	0.0	1.0	10.3	
Approach LOS			B	

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

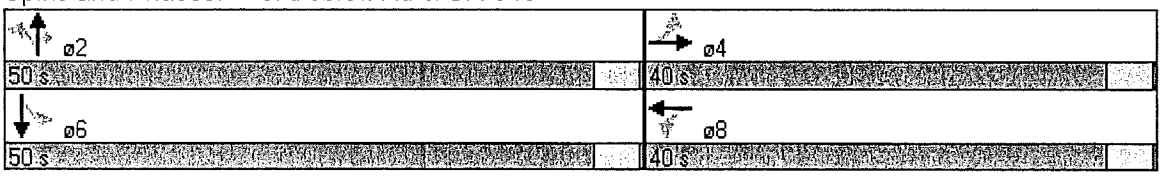
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	150		150	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. 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
Frt		0.928			0.900				0.850		0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	1494	0	1517	1437	0	1388	1462	1242	1517	1581	0
Flt Permitted	0.656			0.682			0.467			0.519		
Satd. Flow (perm)	1056	1494	0	1089	1437	0	683	1462	1242	829	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			94				40		6	
Headway 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
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			1000			1215	
Travel Time (s)		27.3			27.3			17.0			20.7	
Volume (vph)	25	53	49	51	41	82	31	259	35	74	289	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	18%	18%	18%	19%	19%	19%	30%	30%	30%	19%	19%	19%
Adj. Flow (vph)	29	61	56	59	47	94	36	298	40	85	332	23
Lane Group Flow (vph)	29	117	0	59	141	0	36	298	40	85	355	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	40.0	40.0	0.0	40.0	40.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0
Total Split (%)	44.4%	44.4%	0.0%	44.4%	44.4%	0.0%	55.6%	55.6%	55.6%	55.6%	55.6%	0.0%
Maximum Green (s)	36.0	36.0		36.0	36.0		46.0	46.0	46.0	46.0	46.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	10.4	10.4		10.5	10.5		31.2	31.2	31.2	31.2	31.2	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.68	0.68	0.68	0.68	0.68	
v/c Ratio	0.13	0.33		0.26	0.38		0.08	0.30	0.05	0.15	0.33	
Control Delay	9.4	5.9		9.6	4.8		5.1	5.1	2.2	5.1	5.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	9.4	5.9		9.6	4.8		5.1	5.1	2.2	5.1	5.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A		A	A	A	A	A	
Approach Delay		6.6			6.2			4.8			5.1	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)	3	6		5	4		2	23	0	6	27	
Queue Length 95th (ft)	16	33		27	32		12	64	7	22	74	
Internal Link Dist (ft)		920			920			920			1135	
Turn Bay Length (ft)	150			150			150		150	150		
Base Capacity (vph)	568	830		586	816		576	1234	1054	699	1335	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.05	0.14		0.10	0.17		0.06	0.24	0.04	0.12	0.27	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 46.2
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 5.4 Intersection LOS: A
Intersection Capacity Utilization 43.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Boblett Rd & SR-543



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	43	22	56	14	14	3	54	308	18	7	280	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	49	25	64	16	16	3	61	350	20	8	318	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			6									
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	845	844	335	878	850	360	351			370		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	845	844	335	878	850	360	351			370		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.2	4.4			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.5			2.4		
p0 queue free %	80	91	91	93	94	99	94			99		
cM capacity (veh/h)	250	275	694	213	275	678	1077			1081		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	138	35	432	359
Volume Left	49	16	61	8
Volume Right	64	3	20	33
cSH	481	257	1077	1081
Volume to Capacity	0.29	0.14	0.06	0.01
Queue Length 95th (ft)	29	12	5	1
Control Delay (s)	18.1	21.3	1.7	0.3
Lane LOS	C	C	A	A
Approach Delay (s)	18.1	21.3	1.7	0.3
Approach LOS	C	C		

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	261	69	91	202	91	88
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	281	74	98	217	98	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			355		731	318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			355		731	318
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		73	87
cM capacity (veh/h)			1204		356	721

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	355	315	192
Volume Left	0	98	98
Volume Right	74	0	95
cSH	1700	1204	474
Volume to Capacity	0.21	0.08	0.41
Queue Length 95th (ft)	0	7	49
Control Delay (s)	0.0	3.1	17.7
Lane LOS		A	C
Approach Delay (s)	0.0	3.1	17.7
Approach LOS			C

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			150		150	150		0			0
Storage Lanes	1			1		1	1		0			0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. 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
Ped Bike Factor	0.97		0.95	0.99		0.95	0.98	0.97		0.98	0.97	
Frt			0.850			0.850		0.912			0.890	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1881	1599	1703	1792	1524	1736	1620	0	1736	1511	0
Flt Permitted	0.724			0.351			0.950			0.950		
Satd. Flow (perm)	1326	1881	1523	621	1792	1451	1703	1620	0	1704	1511	0
Right Turn on Red			Yes			Yes						Yes
Satd. Flow (RTOR)			54			97					208	
Headway 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
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1625			2160			1215			1490	
Travel Time (s)		44.3			58.9			20.7			25.4	
Volume (vph)	14	279	51	43	48	92	50	127	179	118	72	198
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	6%	6%	6%	4%	4%	4%	4%	19%	4%
Adj. Flow (vph)	15	294	54	45	51	97	53	134	188	124	76	208
Lane Group Flow (vph)	15	294	54	45	51	97	53	322	0	124	284	0
Turn Type	Perm		Perm	Perm		Perm	Prot			Prot		
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4		4	8		8						
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	8.0	20.0		8.0	20.0	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	10.0	26.0	0.0	13.0	53.0	0.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	11.1%	28.9%	0.0%	14.4%	58.9%	0.0%
Maximum Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	6.0	22.0		9.0	49.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Walk Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0			5.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0			0	
Act Effct Green (s)	23.0	23.0	23.0	23.0	23.0	23.0	6.0	22.0		9.0	49.0	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.24		0.10	0.54	
v/c Ratio	0.04	0.61	0.13	0.28	0.11	0.22	0.46	0.81		0.71	0.31	
Control Delay	25.9	35.9	8.5	32.7	26.6	7.2	53.5	50.1		62.9	4.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	25.9	35.9	8.5	32.7	26.6	7.2	53.5	50.1		62.9	4.2	
LOS	C	D	A	C	C	A	D	D		E	A	
Approach Delay		31.4			18.3			50.6			22.0	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	6	148	0	21	22	0	30	173		70	19	

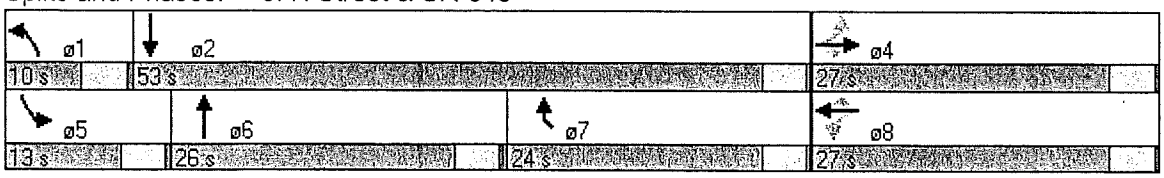
Lane Group	NWR
Lane Configurations	↱
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Total Lost Time (s)	4.0
Turning Speed (mph)	9
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	0.865
Flt Protected	
Satd. Flow (prot)	822
Flt Permitted	
Satd. Flow (perm)	822
Right Turn on Red	
Satd. Flow (RTOR)	
Headway Factor	1.00
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	103
Confl. Peds. (#/hr)	
Peak Hour Factor	0.95
Heavy Vehicles (%)	100%
Adj. Flow (vph)	108
Lane Group Flow (vph)	108
Turn Type	custom
Protected Phases	7
Permitted Phases	
Minimum Split (s)	20.0
Total Split (s)	24.0
Total Split (%)	26.7%
Maximum Green (s)	20.0
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lead/Lag	
Lead-Lag Optimize?	
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	20.0
Actuated g/C Ratio	0.22
v/c Ratio	0.59
Control Delay	46.3
Queue Delay	0.0
Total Delay	46.3
LOS	D
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	55

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL2	SBT	SBR
Queue Length 95th (ft)	22	233	28	53	51	37	#68	#311		#154	58	
Internal Link Dist (ft)		1545			2080			1135			1410	
Turn Bay Length (ft)	150		150	150		150	150			150		
Base Capacity (vph)	339	481	429	159	458	443	116	396		174	917	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.61	0.13	0.28	0.11	0.22	0.46	0.81		0.71	0.31	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 13 (14%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 33.1 Intersection LOS: C
Intersection Capacity Utilization 65.9% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: H Street & SR-543



Lane Group	NWR
Queue Length 95th (ft)	#123
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	183
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.59

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	279	25	20	180	30	36
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	353	32	25	228	38	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			385		647	369
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			385		647	369
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		91	93
cM capacity (veh/h)			1174		423	672

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	385	253	38	46
Volume Left	0	25	38	0
Volume Right	32	0	0	46
cSH	1700	1174	423	672
Volume to Capacity	0.23	0.02	0.09	0.07
Queue Length 95th (ft)	0	2	7	5
Control Delay (s)	0.0	1.0	14.4	10.7
Lane LOS		A	B	B
Approach Delay (s)	0.0	1.0	12.4	
Approach LOS			B	

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

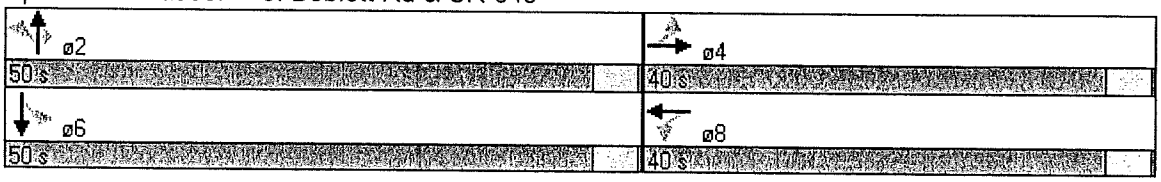
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	150		150	150		0
Storage Lanes	1		0	1		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. 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
Frt		0.928			0.900				0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1530	1494	0	1517	1437	0	1388	1462	1242	1517	1582	0
Flt Permitted	0.656			0.682			0.438			0.469		
Satd. Flow (perm)	1056	1494	0	1089	1437	0	640	1462	1242	749	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			94				40		5	
Headway 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
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		1000			1000			1000			1215	
Travel Time (s)		27.3			27.3			17.0			20.7	
Volume (vph)	25	53	49	51	41	82	31	307	35	74	318	20
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	18%	18%	18%	19%	19%	19%	30%	30%	30%	19%	19%	19%
Adj. Flow (vph)	29	61	56	59	47	94	36	353	40	85	366	23
Lane Group Flow (vph)	29	117	0	59	141	0	36	353	40	85	389	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phases	4	4		8	8		2	2	2	6	6	
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	20.0	20.0	20.0	
Total Split (s)	40.0	40.0	0.0	40.0	40.0	0.0	50.0	50.0	50.0	50.0	50.0	0.0
Total Split (%)	44.4%	44.4%	0.0%	44.4%	44.4%	0.0%	55.6%	55.6%	55.6%	55.6%	55.6%	0.0%
Maximum Green (s)	36.0	36.0		36.0	36.0		46.0	46.0	46.0	46.0	46.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	10.4	10.4		10.5	10.5		32.2	32.2	32.2	32.2	32.2	
Actuated g/C Ratio	0.20	0.20		0.21	0.21		0.69	0.69	0.69	0.69	0.69	
v/c Ratio	0.13	0.34		0.26	0.38		0.08	0.35	0.05	0.17	0.36	
Control Delay	10.0	6.3		10.2	5.2		5.1	5.4	2.1	5.2	5.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	10.0	6.3		10.2	5.2		5.1	5.4	2.1	5.2	5.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A		B	A		A	A	A	A	A	
Approach Delay		7.1			6.7			5.0			5.2	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)	3	6		6	4		2	28	0	6	31	
Queue Length 95th (ft)	17	35		29	35		12	80	8	24	85	
Internal Link Dist (ft)		920			920			920			1135	
Turn Bay Length (ft)	150			150			150		150	150		
Base Capacity (vph)	560	819		578	806		539	1232	1053	631	1334	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.05	0.14		0.10	0.17		0.07	0.29	0.04	0.13	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 47
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 5.6 Intersection LOS: A
Intersection Capacity Utilization 45.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Boblett Rd & SR-543



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	54	272	172	9	6	34
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	68	344	218	11	8	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229				704	223
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229				704	223
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				98	95
cM capacity (veh/h)	1339				382	816

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	413	229	51
Volume Left	68	0	8
Volume Right	0	11	43
cSH	1339	1700	697
Volume to Capacity	0.05	0.13	0.07
Queue Length 95th (ft)	4	0	6
Control Delay (s)	1.7	0.0	10.6
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	108	170	114	19	12	67
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	137	215	144	24	15	85
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	168				645	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168				645	156
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				96	90
cM capacity (veh/h)	1409				394	889

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	352	168	100
Volume Left	137	0	15
Volume Right	0	24	85
cSH	1409	1700	747
Volume to Capacity	0.10	0.10	0.13
Queue Length 95th (ft)	8	0	12
Control Delay (s)	3.6	0.0	10.6
Lane LOS	A		B
Approach Delay (s)	3.6	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Ridgeland Estates
GTC #04-003

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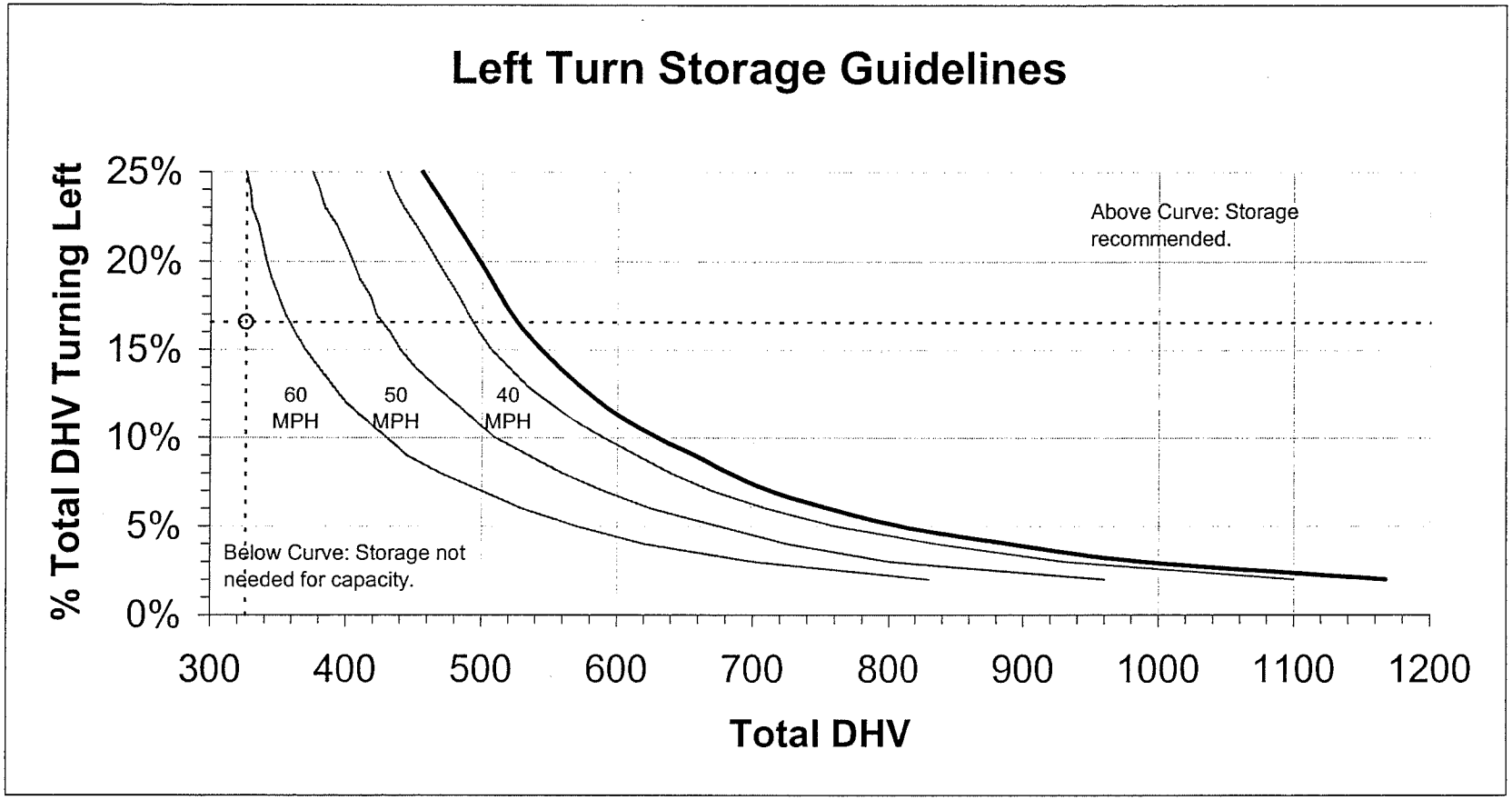
H Street @ West Site Access



Total DHV:	326
Left Turns:	54
% Left:	16.6%

Posted Speed Limit 35 MPH

Based on WSDOT January 2005 Design Manual: Figure 910-8a, Page 910-19.

DL

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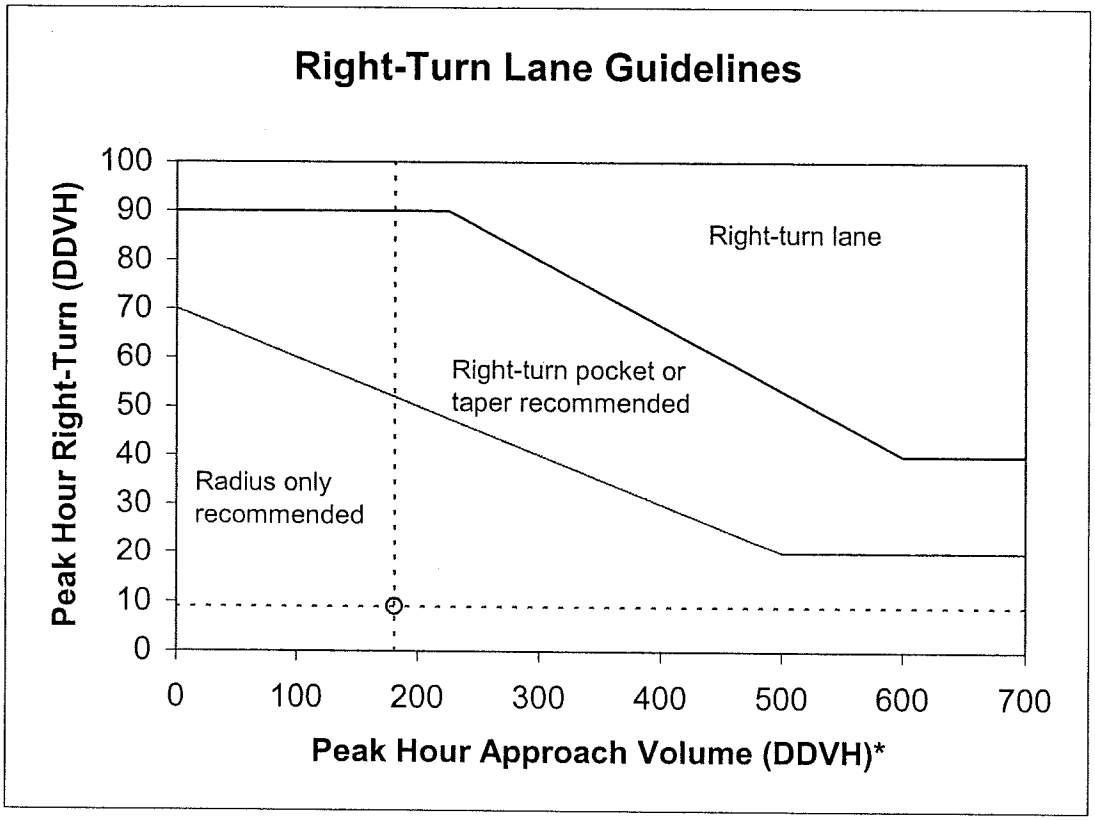
H Street at West Site Access



Posted Speed 35

Right Turn Volume:	9	[DDHV]
Adjusted Right Turn Volume:	9	[DDHV]
Pk Hr Curb Ln Approach Vol:	181	[DDHV]

* For two-lane highways, use the peak hour approach volume (through + right turn)

For multilane, high speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right turn).

For Multilane, low speed highways (posted speed is less than 45 mph), no right-turn lane or taper is required.

Based on WSDOT January 2005 Design Manual: Figure 910-11, Page 910-30.

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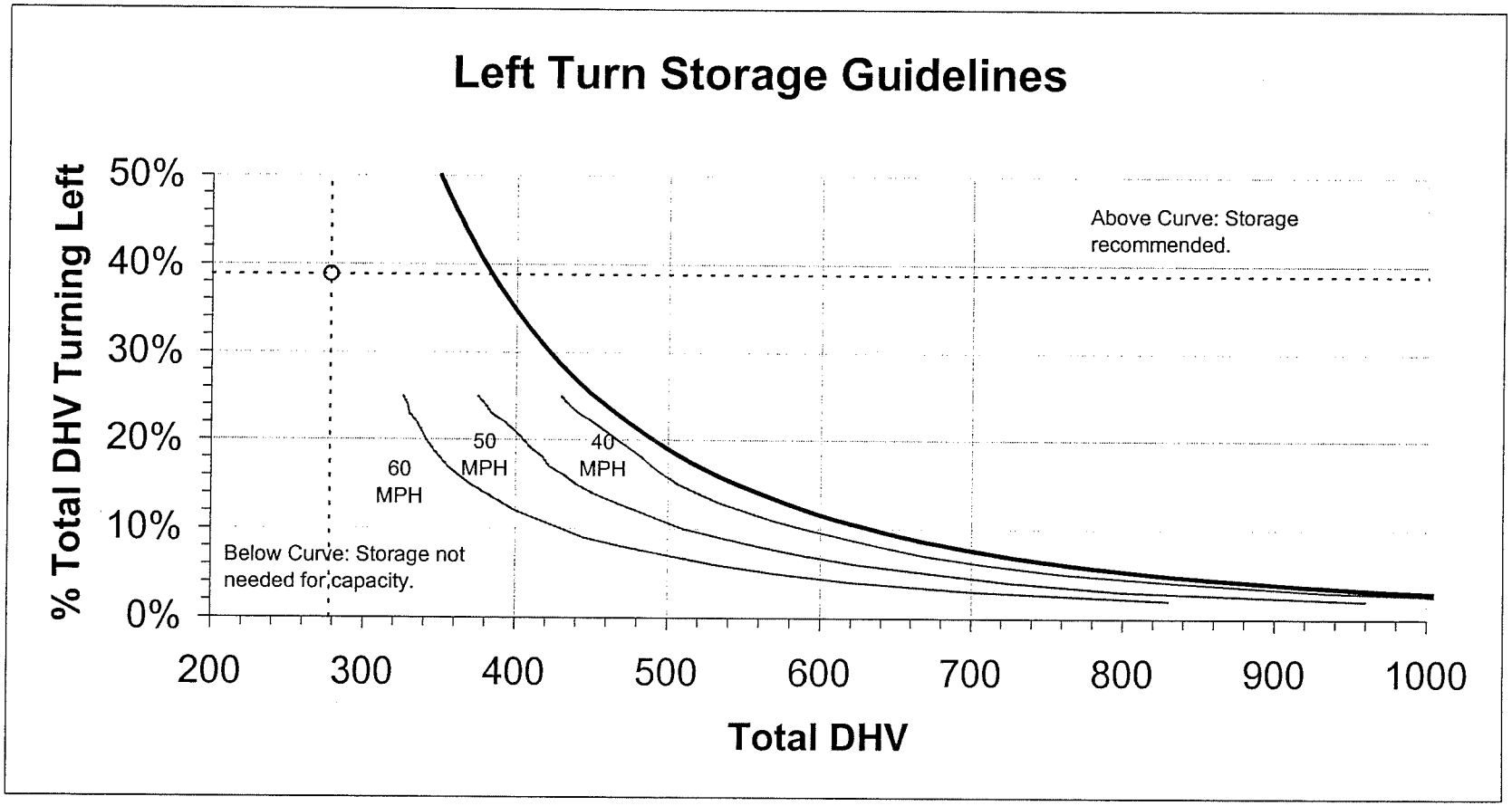
H Street @ East Site Access



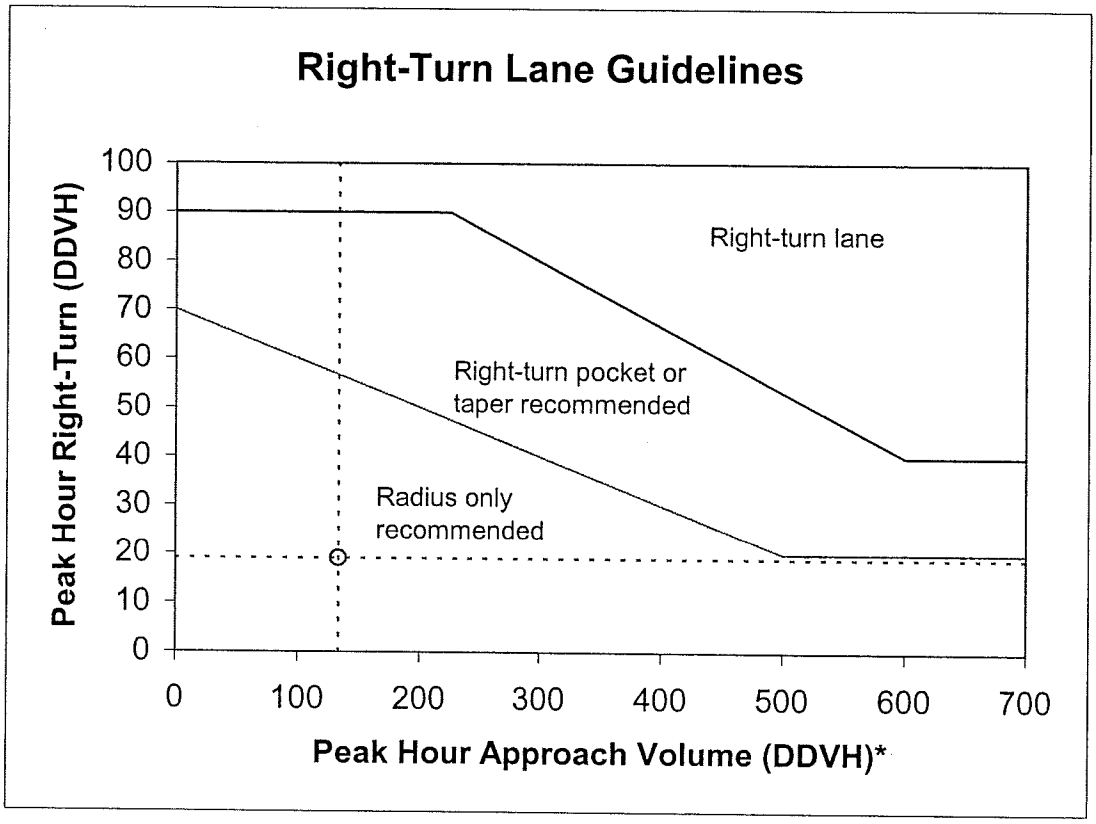
Total DHV:	278
Left Turns:	108
% Left:	38.8%

Posted Speed Limit 35 MPH

Based on WSDOT January 2005 Design Manual: Figure 910-8a, Page 910-19.

GIBSON TRAFFIC CONSULTANTS

H Street at East Site Access



Posted Speed 35

Right Turn Volume:	19	[DDHV]
Adjusted Right Turn Volume:	19	[DDHV]
Pk Hr Curb Ln Approach Vol:	133	[DDHV]

* For two-lane highways, use the peak hour approach volume (through + right turn)

For multilane, high speed highways (posted speed 45 mph or above), use the right-lane peak hour approach volume (through + right turn).

For Multilane, low speed highways (posted speed is less than 45 mph), no right-turn lane or taper is required.

Based on WSDOT January 2005 Design Manual: Figure 910-11, Page 910-30.

Washington State Department of Transportation

Six Year Transportation Improvement Program

From 2006 to 2011

Agency: Blaine

Co. No.: 37 **Co. Name:** Whatcom Co.

City No.: 0100 **MPO/RTPO:** NON/WCoG

Hearing Date: 5/23/2005 **Adoption Date:** 6/27/2005

Amend Date: **Resolution No.:** 1398-05

Functional Class	Priority Number	Project Identification A. Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or road - Ending MP or road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs In Thousands of Dollars: Project Phase	Phase Start (mm/dd/yyyy)	Fund Source Information: Federal Funding: Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency): 1st	2nd	3rd	4th Thru 6th	Federally Funded Projects Only: Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
07	1	Marine Drive Reconstruction (Phase I) Marine Drive from: Peace Portal Drive to: Lift Station No. 1 Reconstruction and widening, add bike path and sidewalks.	03 06 05	S	.72	P S W	PE	2/15/2006			SCP	1240	660	1900	1900				CE	No
							Totals					1240	660	1900	1900					
01	2	I-5 Exit 276 Interchange Environmental Review and Design I-5 from: Exit 276 to: Peace Portal Drive Environmental documentation and preliminary engineering for relocation of the existing interchange required because of planned reconstruction of the Peace Arch border facility	02	S			PE	7/1/2005			WSDOT	2300		2300	700	800	800		EIS	Yes
							Totals					2300		2300	700	800	800			
08	3	Cherry Street Reconstruction Cherry Street from: Peace Portal Drive to: Mitchell Avenue Reconstruction, widening and adding sidewalks and stormwater improvements.	03 06 05	S	.43	W P	CN	4/1/2006					700	700	700				CE	No
							Totals						700	700	700					
06	4	Semiahmoo Parkway Overlay Semiahmoo Parkway from: WWTP to: City Limit Resurfacing funded by Street Maintenance Levy	07	S	2.44		PE CN	10/1/2005 5/1/2006					50 500	50 500	50 500				CE	No
							Totals						550	550	550					

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Six Year Transportation Improvement Program

From 2006 to 2011

Agency: Blaine

Co. No.: 37 **Co. Name:** Whatcom Co.

City No.: 0100 **MPO/RTPO:** NON/WCoG

Hearing Date: 5/23/2005 **Adoption Date:** 6/27/2005

Amend Date: **Resolution No.:** 1398-05

Functional Class	Priority Number	Project Identification A. Federal Aid No. B. Bridge No. C. Project Title D. Street/Road Name or Number E. Beginning MP or road - Ending MP or road F. Describe Work to be Done	Improvement Type(s)	Status	Total Length	Utility Codes	Project Costs in Thousands of Dollars: Project Phase	Phase Start (mm/dd/yyyy)	Fund Source Information: Federal Funding: Federal Fund Code	Federal Cost by Phase	State Fund Code	State Funds	Local Funds	Total Funds	Expenditure Schedule (Local Agency): 1st	2nd	3rd	4th Thru 6th	Federally Funded Projects Only: Envir. Type	R/W Required Date (MM/YY)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
07	5	Marine Drive Reconstruction (Phase II) from: Lift Station No. 1 to: Fishing Pier Reconstruction and shoreline stabilization to stop erosion. Includes pedestrian boardwalk on north side.	03 06 12 05	P	.23	P S W	PE CN	9/1/2005			 SCP	 500	200 1500	200 2000	200			 2000	CE	No
							Totals					500	1700	2200	200			2000		
01	6	I-5 Exit 274 Interchange Environmental Review & Design I-5 from: Exit 274 to: Peace Portal Way Environmental documentation and preliminary engineering to modify the existing interchange to a full interchange by adding a southbound off-ramp and northbound on-ramp	02	P		P	PE	10/1/2007	NHS	400		150	50	600		600			EA	Yes
							Totals			400		150	50	600		600				
06	7	H Street Reconstruction H Street from: Ludwick Avenue to: Vista Terrace Reconstruction, extension of pedestrian and bike access, and stormwater improvements	03 04 06	S	.45	P S	PE CN	10/1/2008			 SCP	 500	80 300	80 800			80	 800	CE	No
							Totals					500	380	880			80	800		
00	8	Pedestrian Railroad Overpass from: Boardwalk at H Street to: public boat launch Construct pedestrian bridge from Central Business District over Burlington Northern Railway to marina area	06 14 32	P	.12		PE CN	10/1/2005 4/1/2009	STP(E) STP(E)	 600	 OTHER	60 150	20 50	80 800	20			60 800	CE	No
							Totals			600		210	70	880	20			860		

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
06	9	H Street Reconstruct to CBD Turn-of-Century Standard H Street from: Peace Portal Drive to: Harrison Avenue Resurface street and reconstruct roadside features to meet Turn-of-Century and ADA standards.	07 06 12	P		P W S	PE CN				SCP	400	45 50	45 450				45 450	CE	No
							Totals					400	95	495				495		
00	10	Scenic Harbor Bike/Pedestrian Pathway Peace Portal Drive from: 3rd Street to: Hughes Avenue Construction of Class 1 bike path (Millennium Trail) from 3rd Street to Hughes Avenue. Gateway lighting may be done concurrently.	32 05	P	.9	P	ALL		STP(E)	120			30	150				150	CE	No
							Totals			120			30	150				150		
08	11	Bayview Avenue Reconstruction Bayview Avenue from: Clyde Street to: Peace Portal Way Reconstruction, widening and adding sidewalks and stormwater improvement: residential street levy dependent.	03 05	P	.16	P S W	PE CN						45 450	45 450				45 450	CE	No
							Totals						495	495				495		
09	12	Boblett Street Reconstruction Boblett Street from: Mitchell Avenue to: Peace Portal Reconstruction, widening and adding sidewalks and stormwater improvement: residential street levy dependent	03 06 05	P	.43	W P S	PE CN						65 650	65 650		65		650	CE	No
							Totals						715	715		65		650		

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
09	13	E Street Reconstruction E Street from: 6th Street to: 12th Street Reconstruction, widening and adding sidewalks and stormwater improvement: residential street levy dependent.	03 06 05	P	.38	W P	PE CN						60 600	60 600		60		600	CE	No
							Totals						660	660		60		600		
				Grand Totals for																

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