

WCE No. 13-1166
February 17, 2017



City of Spokane Valley
11707 E Sprague Avenue Suite 106
Spokane Valley WA 99206

Attn: Gabe Gallinger, P.E.
Sean Messner, P.E.

Re: Painted Hills TIA – Addendum Letter

Dear Gabe and Sean;

As discussed, we waited to finalize this letter and the TIA, until WSDOT approved the WSDOT addendum letter and the TIA in an email dated February 14, 2017 from Greg Figg. This letter is intended to provide additional information requested by the comments attached to an email from Sean Messner dated December 20, 2016.

After a review of the comments it was determined that most of the comments were address in the WSDOT addendum letter dated January 12th. The WSDOT addendum, which was approved by the email dated February 14, 2017. The addendum updated the signal timing at the intersections of 16th Avenue and 32nd Avenue with State Route 27 per WSDOT changes, A more detailed description of the intersection improvements at 16th Avenue & Pines Road was included, and the addendum included a simtraffic queue analysis and added two Figures (13A0 & 13A1) that show the proposed improvement as described and the Anticipated queue lengths given the proposed signal timing. A revision to the addendum reported your analysis and timing scheme as well as created Figure 13A2, which incorporated the queue analysis from your calculations.

The two remaining comments to be addressed:

1. For the Southbound left turn lane warrant at the intersection of Dishman-Mica Road & Thorpe Road, the turn lane is warranted. A copy of the WSDOT Exhibit 1310-7a has been attached. On the attached the exhibit, the values have been plotted.

We request that the City of Spokane Valley make the turn lane a condition of the project.

2. In regard to the confusion of pedestrians within the model. The busiest intersection (32nd Avenue & Pines Road) was reviewed.

For the year 2025 PM with the project, @ 32nd Ave & Pines Rd. the number of Pedestrian calls for phases 2, 4, 6, & 8 had 18, 25, 20, & 13 Calls per hour to match the number of pedestrians that crossed in that hour. Per our review this was an inappropriate entry, for two reasons. Per the Syncro manual, first groups of pedestrians when being counted are to have 1 (one) call per group. Second the number of calls exceeds the number of times the phases can be completed within the hour. This method of placing the pedestrian count within the pedestrian call box of the

model effects the calculations by increasing the delay as shown on the two attached calculation sheets. The sheet in color from the TIA shows a delay of 26.0 seconds, whereas the sheet in black and white utilized the guidance provided below and reported 24.8 seconds.

Syncro Studio 9 User Guide page 11-2

Pedestrian Calls

This is the number of pedestrian push button calls for this phase. This value is only needed if this phase has a pedestrian push button.

Do not confuse this field with the Conflicting Pedestrians setting in the **VOLUME** settings. Conflicting Pedestrians is the number of pedestrians that right turning traffic must yield to. **Pedestrian Calls** are the number of pedestrians activating this phase. Normally the two values will be the same.

When counting pedestrians, people traveling in groups can be counted as a single pedestrian call. This value is used to determine how many cycles per hour will need to have a pedestrian phase.



Collecting data about the numbers of pedestrians can be quite time consuming. The following paragraphs give some guidance on when pedestrian numbers can be estimated.

If you know there are 100 or more pedestrian calls per hour, the walk phase will almost always be called and exact pedestrian counts are not needed. Set the pedestrian calls setting to 100.

If there are between 1 and 15 pedestrians per hour, the walk phase may only be called for the 90th percentile. If you know there are some pedestrians, but less than 15 per hour, enter 5 in place of better data. If there are less than 10 pedestrians per day, set pedestrian calls to 0.

If the phase has pedestrian recall, this field can be ignored.

Given this review it is concluded that at the intersection with the most pedestrians within the TIA that the average delay of the intersection was reported to be greater than it should have been (26.0 seconds vs. 24.8 seconds). As this information demonstrates a more conservative analysis it is our decision to leave the analysis in place and proceed through the SEPA process. We therefore request that the City of Spokane Valley accept this addendum letter and the TIA.

If you have any questions or comments in regard to this letter, please feel free to contact us at (509) 893-2617

Thank you

Todd R. Whipple, P.E.

TRW/bng

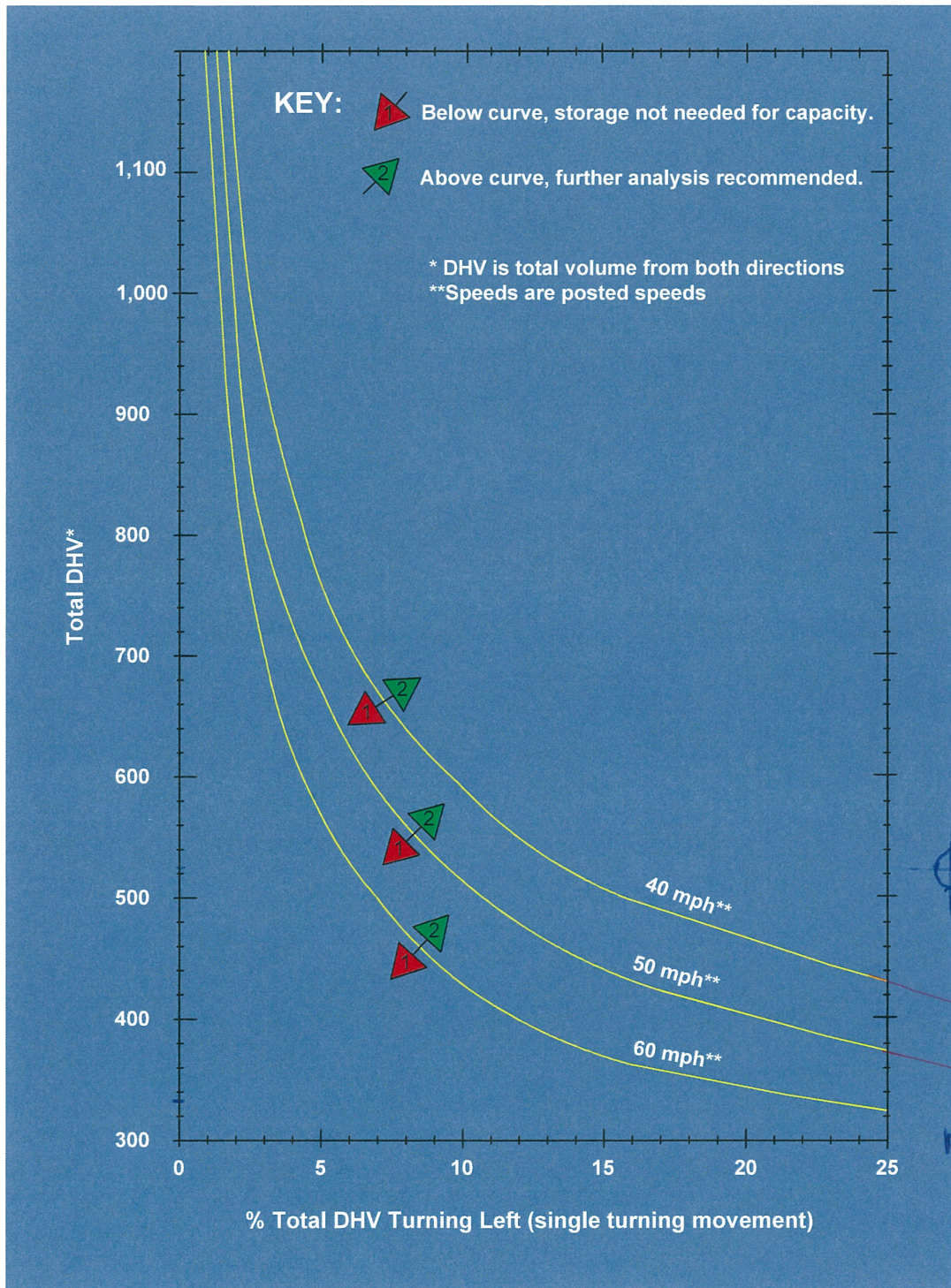
Encl: (Exhibit 1310-7a, Syncro Calculations)

Dishman-Mica & Thorpe Road

Year 2025
w/proj

SBL 139
DHV 522

% DHV Left
 $\frac{139}{522} = 27\%$























Left-Turn Storage Guidelines: Two-Lane, Unsignalized

Exhibit 1310-7a

HCM 2010 Signalized Intersection Summary
 13: Pines Rd & 32nd Ave

2025 PM W- PROJ
 1/17/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	516	71	133	392	44	64	75	83	60	127	32
Future Volume (veh/h)	37	516	71	133	392	44	64	75	83	60	127	32
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1883	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	47	662	91	171	503	56	82	96	106	77	163	41
Adj No. of Lanes	1	1	0	1	1	0	1	1	1	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	1	1	0	0	0	0	0	0	0	0	0
Cap, veh/h	432	816	112	322	921	103	244	311	262	314	236	59
Arrive On Green	0.02	0.50	0.50	0.07	0.55	0.55	0.05	0.16	0.16	0.05	0.16	0.16
Sat Flow, veh/h	1810	1620	223	1810	1680	187	1810	1900	1600	1810	1466	369
Grp Volume(v), veh/h	47	0	753	171	0	559	82	96	106	77	0	204
Grp Sat Flow(s), veh/h/ln	1810	0	1842	1810	0	1867	1810	1900	1600	1810	0	1835
Q Serve(g_s), s	1.1	0.0	30.6	3.8	0.0	17.2	3.3	4.0	5.3	3.1	0.0	9.4
Cycle Q Clear(g_c), s	1.1	0.0	30.6	3.8	0.0	17.2	3.3	4.0	5.3	3.1	0.0	9.4
Prop In Lane	1.00		0.12	1.00		0.10	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	432	0	928	322	0	1024	244	311	262	314	0	295
V/C Ratio(X)	0.11	0.00	0.81	0.53	0.00	0.55	0.34	0.31	0.40	0.25	0.00	0.69
Avail Cap(c_a), veh/h	793	0	928	805	0	1024	553	681	573	729	0	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.2	0.0	18.6	15.9	0.0	13.0	29.4	32.9	33.4	29.1	0.0	35.4
Incr Delay (d2), s/veh	0.1	0.0	7.6	1.4	0.0	2.1	0.8	1.2	2.1	0.4	0.0	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	17.4	2.1	0.0	9.4	1.7	2.2	2.5	1.6	0.0	5.3
LnGrp Delay(d),s/veh	11.3	0.0	26.2	17.2	0.0	15.1	30.2	34.1	35.6	29.5	0.0	41.4
LnGrp LOS	B		C	B		B	C	C	D	C		D
Approach Vol, veh/h		800			730			284			281	
Approach Delay, s/veh		25.4			15.6			33.5			38.1	
Approach LOS		C			B			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	54.0	9.0	19.6	10.7	50.0	9.3	19.4				
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0				
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0				
Max Q Clear Time (g_c+I1), s	3.1	19.2	5.1	7.3	5.8	32.6	5.3	11.4				
Green Ext Time (p_c), s	0.1	8.6	0.1	4.1	0.4	9.7	0.1	3.1				
Intersection Summary												
HCM 2010 Ctrl Delay			24.8									
HCM 2010 LOS			C									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	516	71	133	392	44	64	75	83	60	127	32
Future Volume (veh/h)	37	516	71	133	392	44	64	75	83	60	127	32
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1883	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	47	662	91	171	503	56	82	96	106	77	163	41
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	1	1	0	0	0	0	0	0	0	0	0
Cap, veh/h	421	804	110	312	908	101	258	145	160	250	253	64
Arrive On Green	0.02	0.50	0.50	0.07	0.54	0.54	0.05	0.18	0.18	0.05	0.17	0.17
Sat Flow, veh/h	1810	1621	223	1810	1680	187	1810	826	913	1810	1466	369
Grp Volume(v), veh/h	47	0	753	171	0	559	82	0	202	77	0	204
Grp Sat Flow(s), veh/h/ln	1810	0	1844	1810	0	1867	1810	0	1739	1810	0	1835
Q Serve(g_s), s	1.2	0.0	31.6	4.0	0.0	17.8	3.3	0.0	9.8	3.1	0.0	9.4
Cycle Q Clear(g_c), s	1.2	0.0	31.6	4.0	0.0	17.8	3.3	0.0	9.8	3.1	0.0	9.4
Prop In Lane	1.00		0.12	1.00		0.10	1.00		0.52	1.00		0.20
Lane Grp Cap(c), veh/h	421	0	914	312	0	1009	258	0	305	250	0	317
V/C Ratio(X)	0.11	0.00	0.82	0.55	0.00	0.55	0.32	0.00	0.66	0.31	0.00	0.64
Avail Cap(c_a), veh/h	775	0	914	784	0	1009	561	0	613	658	0	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	0.0	19.5	16.7	0.0	13.7	29.0	0.0	34.9	29.2	0.0	34.9
Incr Delay (d2), s/veh	0.1	0.0	8.3	1.5	0.0	2.2	0.7	0.0	5.2	0.7	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	18.0	2.2	0.0	9.8	1.7	0.0	5.2	1.6	0.0	5.2
LnGrp Delay(d),s/veh	11.9	0.0	27.8	18.2	0.0	15.9	29.7	0.0	40.1	29.9	0.0	39.6
LnGrp LOS	B		C	B		B	C		D	C		D
Approach Vol, veh/h		800			730			284			281	
Approach Delay, s/veh		26.9			16.4			37.1			36.9	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	54.1	9.0	20.9	10.8	50.0	9.3	20.7				
Change Period (Y+Rc), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0				
Max Green Setting (Gmax), s	20.0	30.0	25.0	32.0	30.0	45.0	20.0	25.0				
Max Q Clear Time (g_c+I1), s	3.2	19.8	5.1	11.8	6.0	33.6	5.3	11.4				
Green Ext Time (p_c), s	0.1	8.2	0.1	4.2	0.4	9.0	0.1	3.4				
Intersection Summary												
HCM 2010 Ctrl Delay			26.0									
HCM 2010 LOS			C									

Ben Goodmansen

From: Sean Messner <smessner@spokanevalley.org>
Sent: Wednesday, February 15, 2017 8:38 AM
To: Figg, Greg
Cc: Ben Goodmansen; Bjordahl, Mike; Engle, Kathy
Subject: RE: 13-1166 Painted Hills - WSDOT Addendum Letter - Revised

Thank you Greg,
Sean

Sean Messner, P.E.
Phone: 509.720.5011

From: Figg, Greg [mailto:FiggG@wsdot.wa.gov]
Sent: Tuesday, February 14, 2017 10:36 AM
To: Sean Messner
Cc: Ben Goodmansen (bgoodmansen@whipplece.com); Bjordahl, Mike; Engle, Kathy
Subject: FW: 13-1166 Painted Hills - WSDOT Addendum Letter - Revised

Sean,

After reviewing the attached "Revised Addendum" the Washington State Department of Transportation (WSDOT) finds the traffic analysis acceptable as it relates to SR 27. It should be noted that the signal timing and phasing depicted in the study may be different from what is implemented by WSDOT.

Please let me know if you should have any questions.
Thanks again,

Greg Figg
WSDOT Eastern Region
Development Services Manager
figgg@wsdot.wa.gov
Phone (509) 324-6199

From: Ben Goodmansen [mailto:bgoodmansen@whipplece.com]
Sent: Friday, February 03, 2017 1:45 PM
To: Figg, Greg <FiggG@wsdot.wa.gov>
Cc: Todd Whipple <toddw@whipplece.com>; Save <save@whipplece.com>
Subject: 13-1166 Painted Hills - WSDOT Addendum Letter - Revised

Greg

Attached is a copy of the revised Addendum Letter Part 1 of 3

Thank you

Ben Goodmansen, E.I.T

Engineer Technician

[Whipple Consulting Engineers, Inc.](#)

Phone: 509.893.2617 | Fax: 509.926.0227



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2528 North Sullivan Road • Spokane Valley, WA 99216
WhippleCE.com

