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SUBJECT: US Route 395 North Spokane Corridor Project – Revised Air Quality Update Memorandum

Background

The *US 395, North Spokane Corridor Project Interstate 90 to Carlisle Avenue (Formerly Phase II) Air Quality, Greenhouse Gas Emissions, and Energy Discipline Report* was completed in April 2020. The project is in air quality maintenance areas for two National Ambient Air Quality Standards (NAAQS): the 1971 8-hour carbon monoxide (CO) and the 1987 24-hour particulate matter for particles 10 microns or less (PM10). The project-level transportation conformity determination is required through August 2025, when the areas reach the end of the first 20 years in maintenance status for both standards. There have been some minor design changes since the 2020 report was completed, including a substantially reduced footprint which reduces overall vehicles miles travelled (VMT) and emissions of PM10 for the project despite additional auxiliary lanes being added to I-90. However, due to the reduced footprint of the overall project there is a worsening in level of service (LOS) for some intersections within the project area that could impact CO.

For PM10 we would like to request your concurrence that the April 2020 Air Quality Report is still valid primarily due to that the lower VMT associated with the project would result in reduced PM10 concentrations, and no further project-level conformity analysis for PM10 is needed to comply with 40 CFR 93.104. For CO, we have conducted a CO hot-spot analysis at 5 intersections that are predicted to operate at LOS D or worse. Details of that analysis are discussed in the attached *US Route 395 North Spokane Corridor Project Carbon Monoxide Screening Technical Memorandum* (**Attachment 1**).

Discussion

Design Changes

As shown in **Attachment 2**, the North Spokane Corridor (NSC) connection to I-90 has changed since the 2020 report was completed. Minor design changes include (1) a substantially reduced footprint despite additional auxiliary lanes being added to I-90 and (2) using a roundabout instead of a signalized intersection at the Trent Ave (SR290) interchange.

These design changes are minor and it is anticipated that these changes will reduce overall emissions due to lower traffic volumes. The additional auxiliary lanes on I-90 are further away from sensitive receptors, resulting in lower PM10 emissions at these locations. Additionally, roundabouts result in lower CO emissions compared to a signalized intersection due to less idling; thus, it is anticipated that emissions at the Trent Ave (SR290) interchange will be lower due to this design change.

April 2020 Report PM Hotspot Analysis

Previous Areas of Concern

For the April 2020 Air Quality Report, MOtor Vehicle Emission Simulator (MOVES) 2014a and AERMOD version 19191 were used to model PM10 concentrations for the PM10 hot-spot analysis.

As demonstrated in the April 2020 Air Quality Report, the 6th highest modeled PM10 concentration was 55.8 micrograms per cubic meter which occurred at a roadside receptor on the Northbound Freya overpass of I-90. The background concentration of PM10 for the project is 74 micrograms per cubic meter. The total concentration when adding background to the modeled concentration equals 129.8 micrograms per cubic meter. Following the EPA PM10 Hot-Spot Guidance, the design value calculation is rounded to the nearest 10 microgram per cubic meter. Therefore, the design value of the build scenario for the project is 130 micrograms per cubic meter which is the below the PM10 NAAQS of 150 microgram per cubic meter.

MOVES Model Update

The April 2020 report relied on MOVES2014a outputs for the AERMOD air dispersion PM10 hotspot analysis. MOVES2014a, whose grace period ended on January 9, 2023, was the approved model at the time when the analysis began. There have been three MOVES model updates since the 2020 project analysis. There have been a number of updates from MOVES2014a to MOVES3, including:

- Incorporating the latest data on vehicle populations, travel activity, and emission rates as well as updated fuel supply information at the county level.
- Adjusting modeling to better account for vehicle starts, long-haul truck hoteling, and off-network idling.
- Incorporating the impacts of the Heavy-Duty Greenhouse Gas Phase 2 rule and the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule.
- Improving the user interface to make the model easier to use and updating the platform for compatibility with newer software.

In addition to the updates mentioned above, MOVES4, released on September 12, 2023, is an update to the MOVES3 model that addresses the following:

- The emission impacts of the EPA heavy-duty (HD) low NOx rule for model years 2027 and later (HD2027 rule) and the light-duty (LD) greenhouse gas rule for model years 2023 and later (LD GHG 2023 rule).
- The ability to model HD battery-electric and fuel-cell vehicles, as well as compressed natural gas (CNG) long-haul combination trucks.
- Improved modeling of LD electric vehicles.
- Updated data and forecasts on vehicle populations (including electric vehicle fractions), travel activity, and emission rates, as well as updated fuel supply information at the county level.
- Future year NOx and PM emissions are notably lower due to the HD2027 rule.

MOVES5, released on December 11, 2024, is an update to the MOVES4 model that addresses the following:

- Accounting for EPA's Light- and Medium-Duty Multi-Pollutant Rule with higher projected electric vehicle fractions and more stringent standards for carbon dioxide, particulate matter, non-methane organic gases and oxides of nitrogen.
- Accounting for EPA's Heavy-Duty Greenhouse Gas Emissions-Phase 3 Rule with higher projected EV fractions and updated energy consumption estimates for heavy-duty EVs.
- Incorporating new data on light-duty and heavy-duty brake wear emissions.
- Expanding detailed calculations for a given analysis year to vehicles up to 40 years old, instead of 30.
- Updating onroad and nonroad fuel properties for calendar year 2021 and later.
- Updating historical and forecast default vehicle miles travelled, vehicle populations, age distributions, and fuel distributions.

Therefore, the PM10 hotspot analysis was conducted using conservative values obtained from running MOVES2014a as updates in MOVES3, MOVES4, and MOVES5 take into account policy changes and a more efficient fleet. An analysis using any of the updated models would result in lower emissions compared to the April 2020 report as the MOVES5 PM10 emissions rates are approximately 40% lower for exhaust, 50% lower brakewear, and 3% lower for tirewear compared to MOVES2014a.

Roadway Traffic Volumes

The April 2020 Air Quality Report was prepared based on the approved Interchange Justification Report (IJR) from 2017. Current traffic models show a decrease in traffic volumes compared to the traffic volumes used in the April 2020 Air Quality Report. Changes to the updated traffic modeling include:

- The regional model was calibrated and updated through peer review.
- The revised model included regional land uses updates, more development in the West Plains, more development to the east, updates to land uses based on City & County comprehensive plan updates. This changes the regional distribution of trips and impacts I-90 and the NSC.
- There were several roadway modifications in and around the NSC connection to I-90. This changed some of the distribution of traffic on I-90 and the NSC.
- The NSC connection to I-90 changed. There are no more collector-distributor roadways and changes to I-90 lanes/ configurations. These changes impacted I-90 and the NSC.

Table 1 below captures the 2040 truck and overall AADT traffic volume and percentage differences between the April 2020 Air Quality Report and the 2023 Preferred Alternative.

The updated traffic study has found an AADT reduction for all analyzed Build year 2040 segments in the 2023 Preferred Alternative compared to the April 2020 Air Quality Report. The updated traffic study also found that the Build year 2040 truck percentage for the 2023 Preferred Alternative and the April 2020 Air Quality Report were both 10%, but because the overall AADT is expected to be lower in the 2023 Preferred Alternative, the number of trucks is expected to be lower for all segments.

Since the amount of PM10 tailpipe, brakeware, and tireware emissions is directly related to the AADT and total truck traffic, the 2023 Preferred Alternative is expected to result in lower PM10 emissions. The lower traffic volumes will also reduce vehicle contributions of road dust, which is the most significant source of local PM10 concentrations. It is not anticipated to result in NAAQS exceedances at any of these roadway segments.

Table 1. North Spokane Corridor April 2020 Air Quality Report vs 2023 Preferred Alternative Truck and AADT Percent Differences

	Trucks				AADT			
Segment	**NSC April 2020 Air Quality Report- 2040 Build**	**NSC Preferred Alternative- 2040 Build**	**Difference (Preferred - 2020 AQ Report)**	**% Difference (Preferred to 2020 AQ Report)**	**NSC April 2020 Air Quality Report- 2040 Build**	**NSC Preferred Alternative- 2040 Build**	**Difference (Preferred - 2020 AQ Report)**	**% Difference (Preferred to 2020 AQ Report)**
NSC								
Wellesley to Trent	8,483 / 10%	8,319 / 10%	-164 / -1.94%	0%	84,833	78,278	-6,556	-7.73%
Trent to I-90	6,150 / 10%	5,806 / 10%	-345 / -5.60%	0%	61,500	54,278	-7,222	-11.74%
I-90								
Hamilton to NSC West Ramps	15,578 / 10%	15,200 / 10%	-378 / -2.43%	0%	155,778	152,000	-3,778	-2.43%
NSC West Ramps to Altamont West Ramps	15,761 / 10%	14,906 / 10%	-856 / -5.43%	0%	157,611	149,056	-8,556	-5.43%
Altamont West Ramps to Freya West Ramps	15,478 / 10%	14,833 / 10%	-644 / -4.16%	0%	154,778	148,333	-6,444	-4.16%
Freya West Ramps to Freya East Ramps	16,411 / 10%	16,128 / 10%	-283 / -1.73%	0%	164,111	161,278	-2,833	-1.73%
Freya East Ramps to NSC East Ramps	16,517 / 10%	16,217 / 10%	-300 / -1.82%	0%	165,167	162,167	-3,000	-1.82%
NSC East Ramps to Sprague Ramps	16,689 / 10%	16,172 / 10%	-517 / -3.10%	0%	166,889	161,722	-5,167	-3.10%
Sprague Ramps to Fancher Ramp	13,806 / 10%	13,694 / 10%	-111 / -0.80%	0%	138,056	136,944	-1,111	-0.80%

April 2020 Report CO Hotspot Analysis

Previous Areas of Concern

In the April 2020 Air Quality Report, the Washington State Intersection Screening Tool (WASIST) version 3.0 was used to calculate 1-hour and 8-hour CO levels at 8 different signalized intersections that are predicted to have a level of service (LOS) of D or worse under Build 2040 conditions.

The highest modeled 1-hour CO average concentration for the Build 2040 condition was at the S Thierman Rd and E Appleway Blvd intersection. This intersection had a 1- hour CO concentration of 3.4 ppm. The 1-hour CO NAAQS is 35 ppm. Therefore, the highest intersection of concern was substantially below the NAAQS. The highest modeled 8-hour CO average for the intersections of concern under the Build (2040) scenario was 3.2 ppm at 4 intersections (US 2 (S Division St) and E 3rd Ave, SR 290/N Hamilton St and E Trent Ave, S Havana St and E Sprague Ave, and S Thierman Rd and E Appleway Blvd), which is considerably below the 8-hour CO NAAQS is 9 ppm.

WASIST Model

WASIST version 3.0 is based on MOVES2014, whose grace period ended in January 2023. As previously mentioned, there have been three MOVES model updates (MOVES3, MOVES4, and MOVES5) since the project analysis was conducted.

Since these updates address revised emission factors that address policy changes, as well as a cleaner and newer fleet, CO emissions using WASIST version 3.0 are conservative. CO emissions are anticipated to be lower using an updated version of WASIST that relies on MOVES3, MOVES4, or MOVES5.

Intersection Approach Delay/ LOS

The same 8 signalized intersections that were predicted to have a level of service (LOS) of D or worse under build conditions analyzed in April 2020 Air Quality Report were updated with the traffic data for the 2023 Preferred Alternative.

Table 2 below compares the approach delay and LOS for the April 2020 Air Quality Report and the 2023 Preferred Alternative. 28 of the 58 analyzed 2023 Preferred Alternative intersection approaches had a worsened approach delay and/ or LOS compared to the April 2020 Air Quality Report.

Table 3 below compares the volumes (broken down by truck volumes) for the intersections with a LOS D, E, and F for the April 2020 Air Quality Report and the 2023 Preferred Alternative. Out of the 8 analyzed intersections, 6 are projected to have fewer PM peak trucks compared to the April 2020 Air Quality Report. The remaining two intersections, US2

(S Division St) and E 3rd Ave and S Havana St and E Sprague Ave, are projected to increase by 15 trucks (26%) and 12 trucks (13%), respectively, under PM peak conditions.

Due to the worsening in LOS for some intersections within the project area, CO could be impacted. Therefore, an updated CO hotspot analysis has been completed to demonstrate that the project is not expected to result in NAAQS exceedances at any of the intersections.

Table 2. North Spokane Corridor - April 2020 Air Quality Report vs 2023 Preferred Alternative Intersections Approach Delay and LOS

Intersection		April 2020 Air Quality Report (Build Year 2040)				2023 Preferred Alternative (Build Year 2040)			
		Approach Delay/ LOS				Approach Delay/ LOS			
		EB	WB	NB	SB	EB	WB	NB	SB
US 2 (S Division St) and E 3rd Ave	AM	30.3/C	N/A	88.8/F	N/A	**35.5/D**	N/A	28.2/C	N/A
	PM	32.3/C	N/A	40.6/D	N/A	**50.8/D**	N/A	29.9/C	N/A
SR 290/N Hamilton St and E Trent Ave	AM	55.6/E	101.9/F	68.8/E	136.4/F	**72.7/E**	**170.7/F**	39.3/D	84.2/F
	PM	82.3/F	72.8/E	42.0/D	74.9/E	**229.9/F**	**82.2/F**	37.6/D	56.0/E
S Freya St and E Sprague Ave	AM	47.5/D	48.9/D	41.3/D	25.7/C	24.9/C	28.5/C	26.3/C	**27.7/C**
	PM	78.0/E	53.0/D	83.0/F	82.7/F	**101.2/F**	**53.3/D**	39.1/D	75.4/E
S Havana St and E Sprague Ave	AM	32.6/C	45.8/D	21.9/C	17.5/B	22.2/C	27/C	**29.2/C**	**30.8/C**
	PM	42.3/D	32.8/C	29.3/C	31.4/C	39.2/D	31.2/C	**69.5/E**	**56.7/E**
S Fancher Rd and E Sprague Ave	AM	28.2/C	34.4/C	52.9/D	39.3/D	22.5/C	16.3/B	**122.4/F**	28.1/C
	PM	49.7/D	20.4/C	93.8/F	51.4/D	36.2/D	**45.4/D**	88.4/F	**56.5/E**
N Thierman Rd and E Broadway Ave	AM	63.8/E	8.8/A	64.9/E	65.0/E	**78.5/E**	**13.3/B**	64.3/E	**82.1/F**
	PM	79.3/E	9.9/A	73.0/E	79.2/E	**89.2/F**	7.7/A	58.6/E	**137.2/F**
I-90 WB Ramps and E Broadway Ave	AM	4.0/A	46.1/D	N/A	50.4/D	0.6/A	**52.6/D**	N/A	**58.4/E**
	PM	5.4/A	69.5/E	N/A	137.3/F	2.5/A	61.2/E	N/A	**160.2/F**
S Thierman Rd and E Appleway Blvd	AM	32.3/C	4.9/A (SEL)	40.9/D	16.7/B (SBT)	**35.7/D**	3.3/A (SEL)	35.1/D	**26.6/C (SBT)**
	PM	49.0/D	124.6/F (SEL)	54.4/D	20.8/C (SBT)	32.6/C	**297.8/F (SEL)**	39.9/D	**55.5/E (SBT)**

Note: Bold "2023 Preferred Alternative (Build Year 2040)" values indicate intersections with worsened approach delay and/or LOS.

Table 3. North Spokane Corridor - April 2020 Air Quality Report vs 2023 Preferred Alternative Intersections Volumes

Intersection		April 2020 AQ 2040 Build													Preferred Alternative 2040 Build														Difference	
		EB			WB			NB			SB			Total Int. Entering	EB			WB			NB			SB			Total Int. Entering		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
US2 (S Division St) and E 3rd Ave	AM Vol	240	395	0	*0*	*1,370*	*85*	0	855	110	0	0	0	3,055	275	530	0	*0*	*595*	*70*	0	1,320	75	0	0	0	2,865	-190	-6%
	AM T%	4%	4%	0%	*0%*	*6%*	*6%*	0%	2%	2%	0%	0%	0%		2%	4%	0%	*0%*	*3%*	*5%*	0%	3%	5%	0%	0%	0%			
	AM Trucks	10	16	0	*0*	*83*	*6*	0	18	3	0	0	0	136	6	22	0	*0*	*18*	*4*	0	40	4	0	0	0	94	-42	-31%
	PM Vol	395	715	0	*0*	*785*	*65*	0	1,300	219	0	0	0	3,479	355	940	0	*0*	*360*	*30*	0	1,490	185	0	0	0	3,360	-119	-3%
	PM T%	2%	2%	0%	*0%*	*2%*	*2%*	0%	1%	1%	0%	0%	0%		2%	2%	0%	*0%*	*3%*	*0%*	0%	2%	2%	0%	0%	0%			
	PM Trucks	8	15	0	*0*	*16*	*2*	0	13	3	0	0	0	57	8	19	0	0	11	0	0	30	4	0	0	0	72	15	**26%**
	ADT	4,389	7,944	0	*0*	*8,722*	*722*	0	14,444	2,433	0	0	0	38,656	3,944	10,444	0	0	4,000	333	0	16,556	2,056	0	0	0	37,333	-1,322	***-3%***
SR290/N Hamilton St and E Trent Ave	AM Vol	95	135	120	180	385	60	595	1,410	285	165	1,180	170	4,780	70	95	105	135	340	85	500	1,180	160	115	975	145	3,905	-875	-18%
	AM T%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%		18%	9%	2%	23%	8%	10%	1%	2%	6%	4%	3%	3%			
	AM Trucks	3	5	4	6	12	2	18	43	9	5	36	6	149	13	9	3	32	28	9	5	24	10	5	30	5	173	24	16%
	PM Vol	170	140	545	280	405	170	265	915	95	180	1,095	155	4,415	250	225	600	245	160	150	105	845	325	135	1,310	85	4,435	20	0%
	PM T%	2%	2%	2%	2%	2%	2%	4%	4%	4%	2%	2%	2%		3%	2%	0%	4%	1%	0%	2%	2%	4%	1%	0%	7%			
	PM Trucks	4	3	11	6	9	4	11	37	4	4	22	4	119	8	5	0	10	2	0	3	17	13	2	0	6	66	-53	-45%
	ADT	1,889	1,556	6,056	3,111	4,500	1,889	2,944	10,167	1,056	2,000	12,167	1,722	49,056	2,778	2,500	6,667	2,722	1,778	1,667	1,167	9,389	3,611	1,500	14,556	944	49,278	222	***0%***
S Freya St and E Sprague Ave	AM Vol	55	275	55	170	485	115	200	1,080	190	160	560	50	3,395	100	290	60	165	700	110	145	670	90	155	755	105	3,345	-50	-1%
	AM T%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%			
	AM Trucks	2	9	2	6	15	4	6	33	6	5	17	2	107	3	9	2	5	21	4	5	21	3	5	23	4	105	-2	-2%
	PM Vol	110	630	140	410	625	205	145	700	320	175	1,055	55	4,570	95	590	175	390	695	175	115	515	170	235	1,095	130	4,380	-190	-4%
	PM T%	4%	4%	4%	2%	2%	2%	6%	6%	6%	3%	3%	3%		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%			
	PM Trucks	5	26	6	9	13	5	9	42	20	6	32	2	175	3	18	6	12	21	6	4	16	6	8	33	4	137	-38	-22%
	ADT	1,222	7,000	1,556	4,556	6,944	2,278	1,611	7,778	3,556	1,944	11,722	611	50,778	1,056	6,556	1,944	4,333	7,722	1,944	1,278	5,722	1,889	2,611	12,167	1,444	48,667	-2,111	***-4%***
S Havana St and E Sprague Ave	AM Vol	35	415	10	20	785	130	60	345	150	55	30	50	2,085	20	425	50	50	800	75	110	255	215	30	100	30	2,160	75	4%
	AM T%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%			
	AM Trucks	2	13	1	1	24	4	2	11	5	2	1	2	68	1	13	2	2	24	3	4	8	7	1	3	1	69	1	1%
	PM Vol	65	1,030	60	170	1,025	120	50	130	285	120	195	60	3,310	35	1,000	115	235	970	85	90	105	265	40	175	40	3,155	-155	-5%
	PM T%	3%	3%	3%	2%	2%	2%	3%	3%	3%	3%	3%	3%		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%			
	PM Trucks	2	31	2	4	21	3	2	4	9	4	6	2	90	2	30	4	8	30	3	3	4	8	2	6	2	102	12	**13%**
	ADT	722	11,444	667	1,889	11,389	1,333	556	1,444	3,167	1,333	2,167	667	36,778	389	11,111	1,278	2,611	10,778	944	1,000	1,167	2,944	444	1,944	444	35,056	-1,722	***-5%***
S Fancher Rd and E Sprague Ave	AM Vol	75	190	105	155	830	200	200	40	10	100	155	150	2,210	110	275	65	100	800	240	200	15	10	145	195	105	2,260	50	2%
	AM T%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%		9%	7%	15%	8%	4%	4%	4%	16%	13%	7%	18%	14%			
	AM Trucks	3	6	4	5	25	6	6	2	1	3	5	5	71	10	20	10	8	32	10	8	3	2	11	36	15	165	94	132%
	PM Vol	180	815	370	80	810	140	225	20	35	365	320	135	3,495	195	740	270	90	690	220	240	30	55	380	355	130	3,395	-100	-3%
	PM T%	12%	12%	12%	8%	8%	8%	12%	12%	12%	13%	13%	13%		6%	1%	3%	3%	2%	5%	2%	6%	2%	1%	4%	3%			
	PM Trucks	22	98	45	7	65	12	27	3	5	48	42	18	392	12	8	9	3	14	11	5	2	2	4	15	4	89	-303	-77%

	ADT	2,000	9,056	4,111	889	9,000	1,556	2,500	222	389	4,056	3,556	1,500	38,833	2,167	8,222	3,000	1,000	7,667	2,444	2,667	333	611	4,222	3,944	1,444	37,722	-1,111	***-3%***
N Thierman Rd and E Broadway Ave	AM Vol	15	275	0	25	1,105	200	15	0	15	45	0	30	1,725	15	310	10	20	1,125	245	10	0	20	70	5	35	1,865	140	8%
	AM T%	11%	11%	0%	11%	11%	11%	11%	0%	11%	11%	0%	11%		44%	26%	100%	35%	6%	12%	25%	0%	44%	48%	80%	48%			
	AM Trucks	2	31	0	3	122	22	2	0	2	5	0	4	193	7	81	10	7	68	30	3	0	9	34	4	17	270	77	40%
	PM Vol	30	985	10	15	590	105	10	0	30	225	0	40	2,040	10	1,075	0	20	530	95	10	0	25	240	5	30	2,040	0	0%
	PM T%	11%	11%	11%	11%	11%	11%	11%	0%	11%	11%	0%	11%		14%	4%	0%	64%	13%	36%	25%	0%	4%	9%	0%	15%			
	PM Trucks	4	109	2	2	65	12	2	0	4	25	0	5	230	2	43	0	13	69	35	3	0	1	22	0	5	193	-37	-16%
	ADT	333	10,944	111	167	6,556	1,167	111	0	333	2,500	0	444	22,667	111	11,944	0	222	5,889	1,056	111	0	278	2,667	56	333	22,667	0	***0%***
I-90 WB Ramps and E Broadway Ave	AM Vol	0	295	40	210	620	0	0	0	0	115	0	710	1,990	0	345	55	170	700	0	0	0	0	125	5	690	2,090	100	5%
	AM T%	0%	11%	11%	11%	11%	0%	0%	0%	0%	11%	0%	11%		0%	22%	47%	6%	6%	0%	0%	0%	0%	4%	0%	8%			
	AM Trucks	0	33	5	24	69	0	0	0	0	13	0	79	223	0	76	26	11	42	0	0	0	0	5	0	56	216	-7	-3%
	PM Vol	0	1,075	165	180	365	0	0	0	0	160	0	345	2,290	0	1,075	265	145	315	0	0	0	0	200	0	330	2,330	40	2%
	PM T%	0%	9%	9%	9%	9%	0%	0%	0%	0%	9%	0%	9%		0%	4%	10%	2%	21%	0%	0%	0%	0%	3%	0%	15%			
	PM Trucks	0	97	15	17	33	0	0	0	0	15	0	32	209	0	43	27	3	67	0	0	0	0	6	0	50	196	-13	-6%
	ADT	0	11,944	1,833	2,000	4,056	0	0	0	0	1,778	0	3,833	25,444	0	11,944	2,944	1,611	3,500	0	0	0	0	2,222	0	3,667	25,889	444	***2%***
S Thierman Rd and E Appleway Blvd	AM Vol	405	1,125	10	*10*	*260*	*30*	0	230	40	25	80	0	2,215	120	925	55	*15*	*375*	*40*	0	440	155	5	85	0	2,215	0	0%
	AM T%	3%	3%	3%	*3%*	*3%*	*3%*	0%	3%	3%	3%	3%	0%		4%	3%	13%	*100%*	*9%*	*2%*	0%	2%	0%	0%	0%	0%			
	AM Trucks	13	34	1	*1*	*8*	*1*	0	7	2	1	3	0	71	5	28	8	*15*	*34*	*1*	0	9	0	0	0	0	100	29	41%
	PM Vol	185	1,435	10	*50*	*1,055*	*110*	0	250	150	10	215	0	3,470	105	1,245	120	*50*	*1,020*	*105*	0	310	100	15	245	0	3,315	-155	-4%
	PM T%	6%	6%	6%	*7%*	*7%*	*7%*	0%	6%	6%	6%	6%	0%		3%	2%	6%	*0%*	*1%*	*2%*	0%	6%	2%	3%	2%	0%			
	PM Trucks	12	87	1	*4*	*74*	*8*	0	15	9	1	13	0	224	4	25	8	*0*	*11*	*3*	0	19	2	1	5	0	78	-146	-65%
	ADT	2,056	15,944	111	*556*	*11,722*	*1,222*	0	2,778	1,667	111	2,389	0	38,556	1,167	13,833	1,333	*556*	*11,333*	*1,167*	0	3,444	1,111	167	2,722	0	36,833	-1,722	***-4%***

Conclusion

The April 2020 Air Quality Report included a worst-case scenario hotspot analysis for both CO and PM_{10} that demonstrated that both pollutants would stay well within the NAAQS. The 2023 Preferred Alternative minor design changes and updated traffic data demonstrate that the substantially reduced footprint reduces overall VMT and emissions of PM10, but the reduced footprint of the overall project results in a worsening LOS for some intersections within the project area that could impact CO.

For PM10 we would like to request your concurrence that the April 2020 Air Quality Report is still valid due to that the lower VMT associated with the project would result in reduced PM10 concentrations, and no further project-level conformity analysis for PM10 is needed to comply with 40 CFR 93.104. For CO, we have conducted a CO hotspot analysis at 5 intersections with the highest traffic volumes and the with the worst level of service (LOS). The updated CO hotspot analysis demonstrated that the project is not expected to result in NAAQS exceedances at any of the intersections.

If you have any questions, please call me at (206) 440-4549.

Sincerely,

Lindsay Taylor

Lindsay Taylor
Air Quality & Acoustics Policy and Technical Supervisor
Lindsay.Taylor@wsdot.wa.gov

Attachment 1: *US Route 395 North Spokane Corridor Project Carbon Monoxide Screening Technical Memorandum*

Attachment 2: Final Alignment

Attachment 1: *US Route 395 North Spokane Corridor Project Carbon Monoxide Screening Technical Memorandum*

Washington State
Department of Transportation

Northwest Region
15700 Dayton Avenue North
P.O. Box 330310
Seattle, WA 98133-9710

(206) 440-4000
TTY: 1-800-833-6388
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April 23, 2025

TO: Robyn Lashbrook

FROM: Ben Bloom

SUBJECT: US Route 395 North Spokane Corridor Project Carbon Monoxide Screening Technical Memorandum

Background

In the *US 395, North Spokane Corridor Project Interstate 90 to Carlisle Avenue (Formerly Phase II) Air Quality, Greenhouse Gas Emissions, and Energy Discipline Report* (April 2020), the Washington State Intersection Screening Tool (WASIST) version 3.0 was used to calculate 1-hour and 8-hour carbon monoxide (CO) levels at 8 different signalized intersections that were predicted to have a level of service (LOS) of D or worse under Build 2040 conditions. All modeled intersections were below National Ambient Air Quality Standards (NAAQS). Therefore, the project met air quality conformity based on WASIST screening analysis.

It has been over three years since the April 2020 Air Quality report was completed. There have also been some minor design changes since the 2020 report was completed, including (1) a substantially reduced footprint despite additional auxiliary lanes being added to I-90 and (2) using a roundabout instead of a signalized intersection at the Trent Ave (SR 290) interchange.

After consulting with Federal Highway Administration (FHWA) Headquarters and FHWA Washington State division, it has been determined that the project has significantly changed, thus requiring a CO hotspot reanalysis to evaluate if the updated worst case peak hour traffic volumes would exceed the NAAQS.

Carbon Monoxide Hotspot Methodology

The previous CO hotspot analysis used WASIST version 3.0, which is based on MOVES2014, whose grace period ended in January 2023. There have been three MOVES model updates (MOVES3, MOVES4, and MOVES5) since the project analysis was conducted. Since WASIST version 3.0 has not been updated with revised emission factors from newer, approved versions of MOVES, the reanalysis used MOVES5 and CAL3QHC. This analysis follows the guidance found in the U.S. Environmental Protection Agency (EPA)'s *Using MOVES3 in Project-Level Carbon Monoxide Analyses*, EPA's *User's Guide to CAL3QHC Version 2.0*, EPA's *Guideline For Modeling Carbon Monoxide from Roadway Intersections*, and FHWA's *2023 Carbon Monoxide Categorical Hot-Spot Finding Technical Report*.

MOVES5 was used to generate CO emission rates for CAL3QHC, which was used to calculate 1-hour and 8-hour CO levels at five different signalized intersections affected by the project. The CO concentration levels are measured at receivers sited approximately 10 feet from the edge of roadway, at each corner and along each leg of the intersection. Per 40 CFR 93.123(a), the five intersections selected are the three with the highest traffic volumes and the three with the worst level of service (LOS) (with one intersection included in both categories). Following the EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, it is assumed that if these intersections do not show an exceedance of the NAAQS, none of the other intersections affected by the project will.

Following the guidance in the *Using MOVES3 in Project-Level Carbon Monoxide Analyses* document, the intersections were modeled to reflect worst-case conditions. Emission rates were generated for the opening year (2028) and in CAL3QHC, concentrations were calculated using Build and No Build traffic volumes for 2040. Because emission rates decrease over time and traffic volumes are highest in 2040, the modeled results are an upper estimate of CO concentration levels.

The emission rates and concentrations were generated using intersection specific inputs provided by CivTech on 12/9/2024: truck percentages, traffic volumes, signal cycle times, and grades. For an overview of MOVES5 and CAL3QHC inputs and their data sources, see the tables included in the Appendix.

Carbon Monoxide Hotspot Results

The receivers with the highest concentrations at each intersection are presented in Table 1. The concentrations account for the Spokane region 1-hour background concentration of 4.1 ppm and 8-hour background concentration of 2.9 ppm (see Appendix, Table 3). Following EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, 1-hour CO modeled concentrations were converted to 8-hour concentrations using the default 0.7 persistence factor.

Table 1: Modeled Carbon Monoxide Results Compared to NAAQS

Intersection	No Build (2040) CO Concentration (ppm)		Build (2040) CO Concentration (ppm)		NAAQS CO Concentration (ppm)		Exceed NAAQS?
	1-hour average	8-hour average	1-hour average	8-hour average	1-hour average	8-hour average	
SR 290/N Hamilton St and E Trent Ave	5.1	3.6	4.9	3.5	35	9	No
N Thierman Rd and E Broadway Ave	4.7	3.3	4.7	3.3	35	9	No
S Thierman Rd and E Appleway Blvd	4.8	3.4	4.9	3.5	35	9	No
E Trent Rd and Freya Way	5.1	3.6	5.0	3.5	35	9	No
E Mission Ave and Freya Way	5.4	3.8	5.3	3.7	35	9	No

Notes: *Displayed concentration for each intersection is the receiver with the highest modeled concentration.*

As demonstrated in Table 1, all modeled intersections are below NAAQS. Therefore, the project meets air quality conformity and will not cause or contribute to any new violation of any NAAQS, increase the frequency or severity of any existing NAAQS violations, or delay timely attainment of the NAAQS. Furthermore, the project is included in the Transportation Improvement Program (TIP).

If you have any questions, please call me at (425) 395-0195.

Sincerely,

Ben Bloom
Air Quality Acoustic and Energy Specialist
Ben.Bloom@wsdot.wa.gov

Appendix

The tables below present the inputs and assumptions used in the CO hotspot analysis.

Table 1 – MOVES Settings	
Time Span	2028 January Weekdays 5:00-5:59 PM (17:00-17:59)
Geographic Bounds	Spokane county
On-road Vehicles	All
Pollutants and Processes	Running, Crankcase running
Road Type	Urban Unrestricted
Post-Processing	CO_CAL3QHC_EF.sql script

Table 2 – MOVES Inputs	Data Source
Age Distribution	FHWA
Fuel (fuel supply, fuel formulation, fuel use fraction)	Default
Links	User defined speeds and volumes, link grade measured from Google Earth
Link Source Type	Developed from County level VMT data and project specific data
Meteorological Data	Default

Table 3 – CAL3QHC Inputs	Data Source
Link Volumes	Vehicle turning volumes for each intersection from traffic modeling
Link & Receiver Coordinates	ArcGIS mapping
Signal Times	Total cycle length and red-light length from Synchro modeling
Background Concentration	1-hour and 8-hour background concentrations (ppm) from most recent (2015-2016) AQS Data Mart data (accessed through EPA Air Data Map). It represents the higher 2nd Maximum Value over a 2-year period.
All others	Defaults, following CAL3QHC User Guide and Guidelines

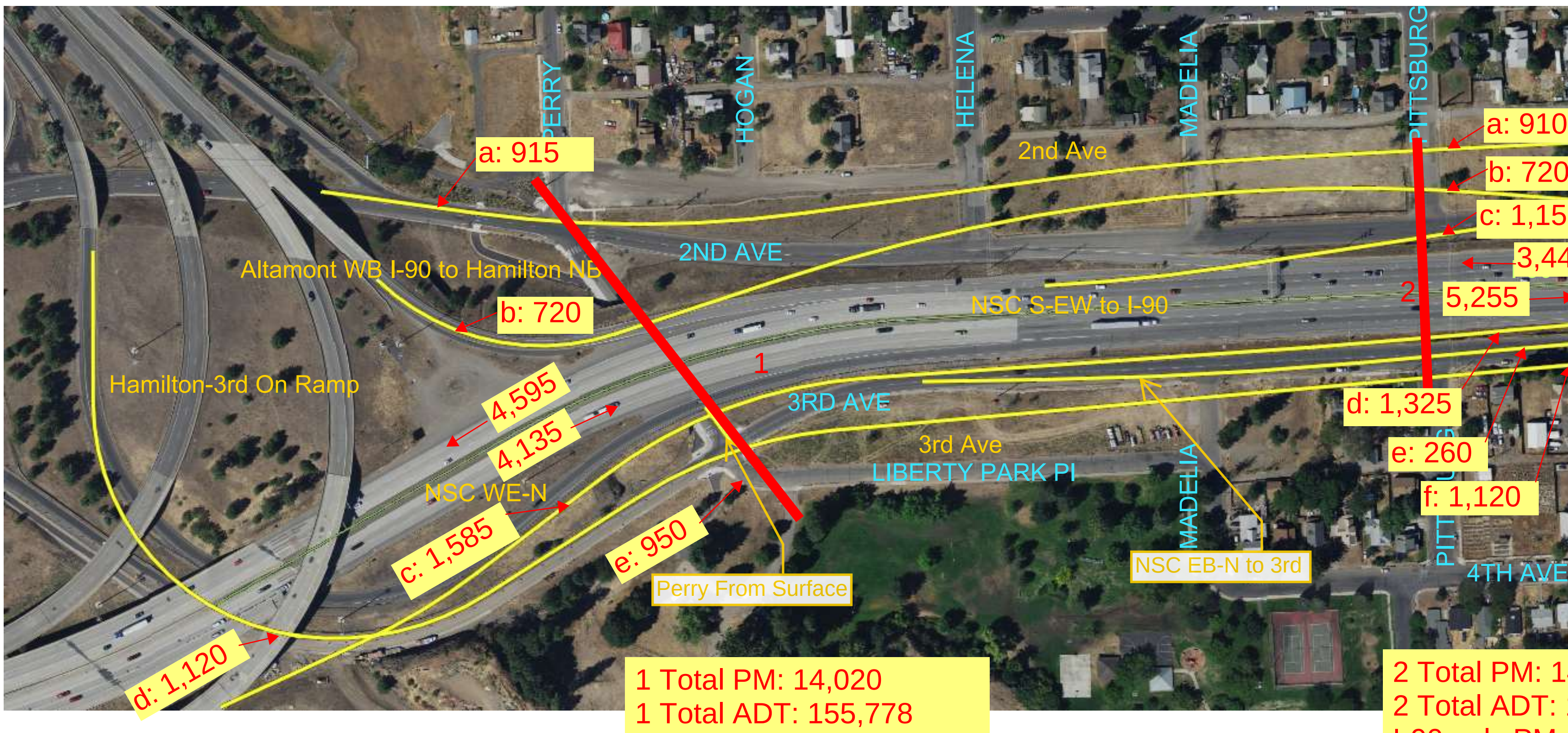
Attachment 2: Final Alignment

BUILD Network Comparison

XX,XXX = 2040 Post Processed PM volumes (NSC_2040_Build_Hybrid_PM_Balancing_2016-08-15.xlsm), provided by CH2M

XX,XXX = 2040 Post Processed PM volumes (NSC_2040_PM_Preferred_20230630_FINAL.xlsm), provided by CivTech/HDR

IJR 2017 ADTs calculated from volumes below, where PM peak is assumed to be 9% of ADT. I-90 IJR_ALG21419



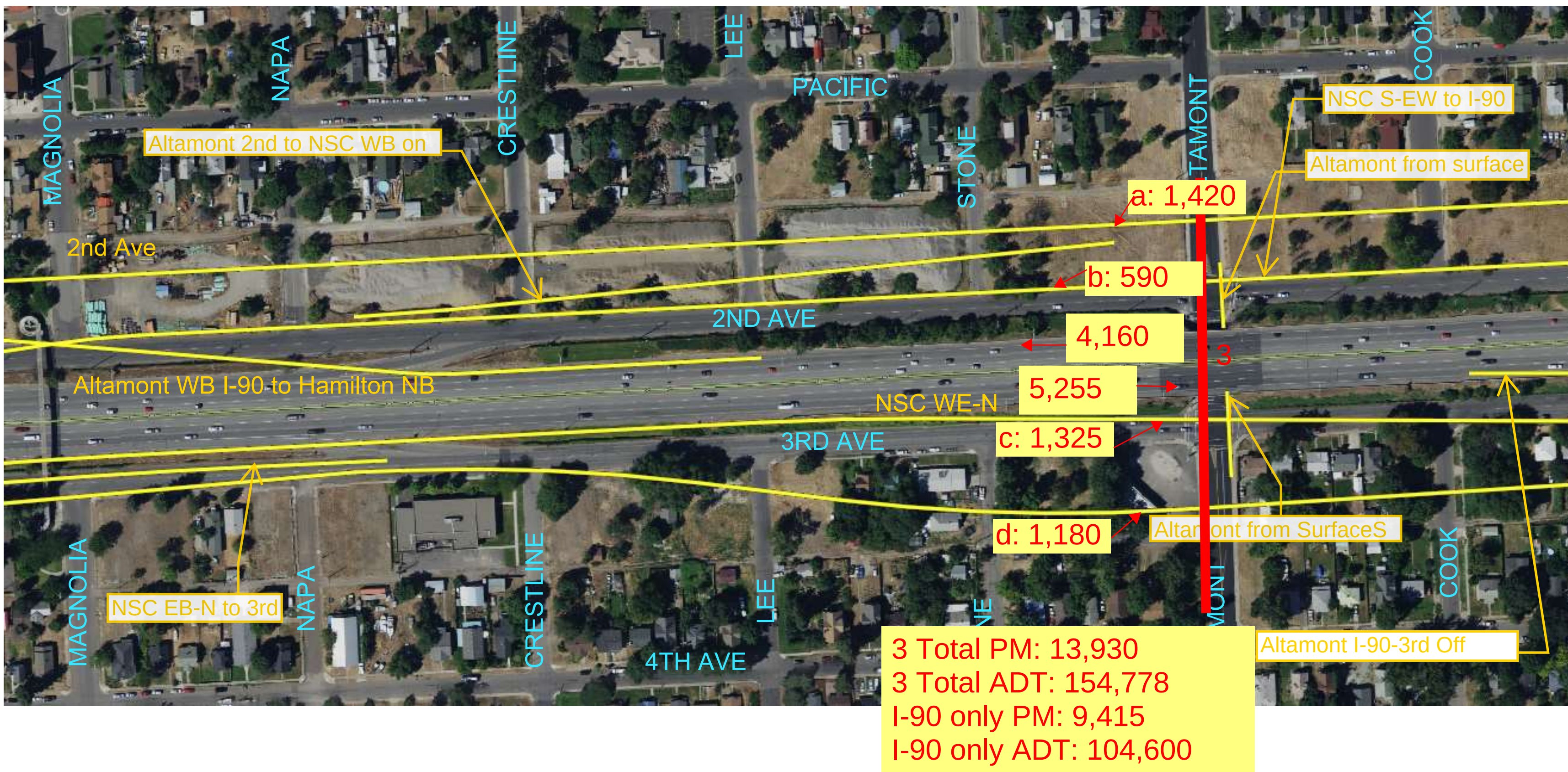
1 Total PM: 14,020
1 Total ADT: 155,778
I-90 only PM: 8,730
I-90 only ADT: 97,000

2 Total PM: 14,185
2 Total ADT: 157,611
I-90 only PM: 8,695
I-90 only ADT: 96,600

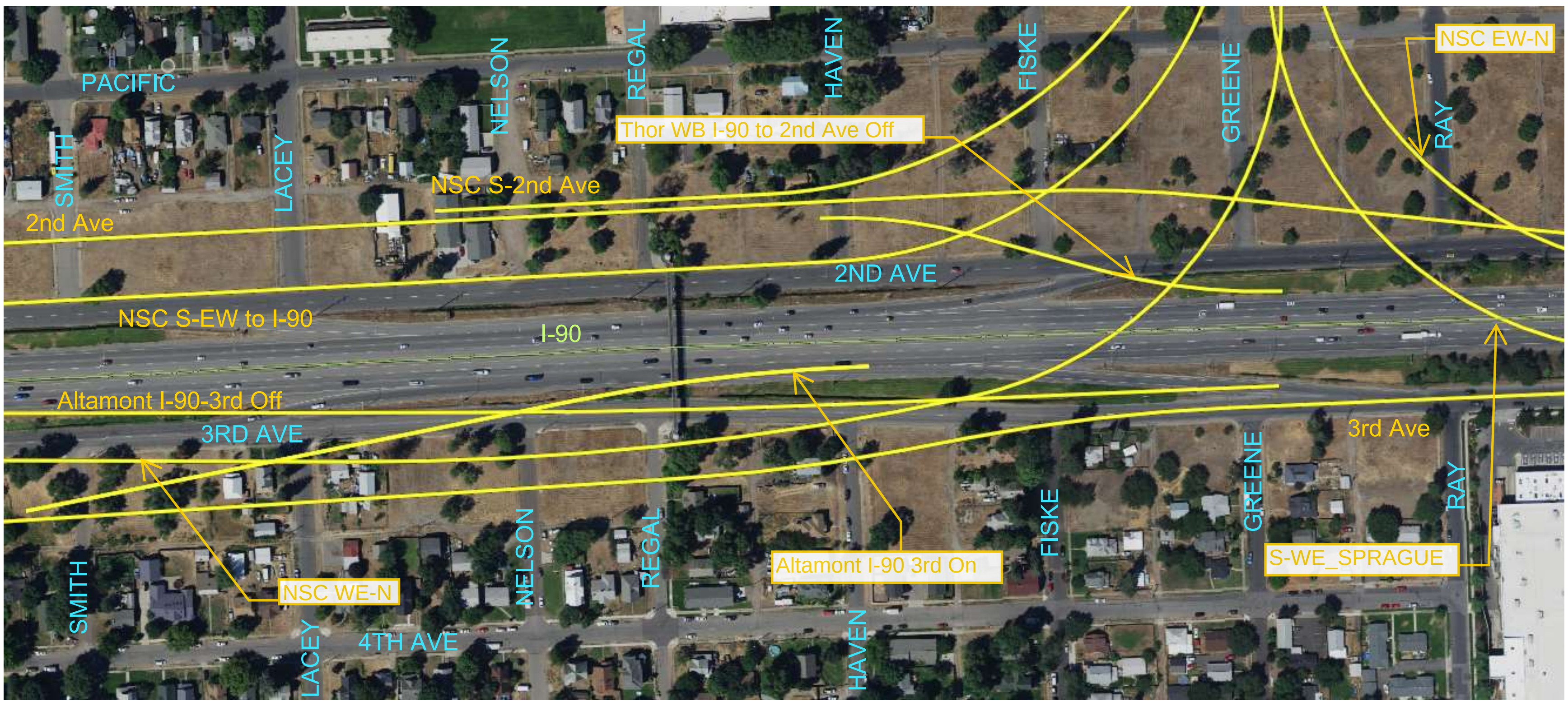
RFP Configuration

1 Total PM: 13,680 (-2%)
1 Total ADT: 152,000 (-2%)
I-90 only PM: 9,235
I-90 only ADT: 102,600

2 Total PM: 13,415 (-5%)
2 Total ADT: 149,056 (-5%)
I-90 only PM: 9,430
I-90 only ADT: 104,800



*Location includes I-90 +
Hamilton/2nd WB off-ramp



PACIFIC
SMITH
LACEY
NELSON
REGAL
HAVEN
FISKE
GREENE
RAY
NSC EW-N
Thor WB I-90 to 2nd Ave Off
NSC S-2nd Ave
2nd Ave
2ND AVE
NSC S-EW to I-90
I-90
Altamont I-90-3rd Off
3RD AVE
3rd Ave
Altamont I-90 3rd On
S-WE_SPRAGUE
NSC WE-N
4TH AVE

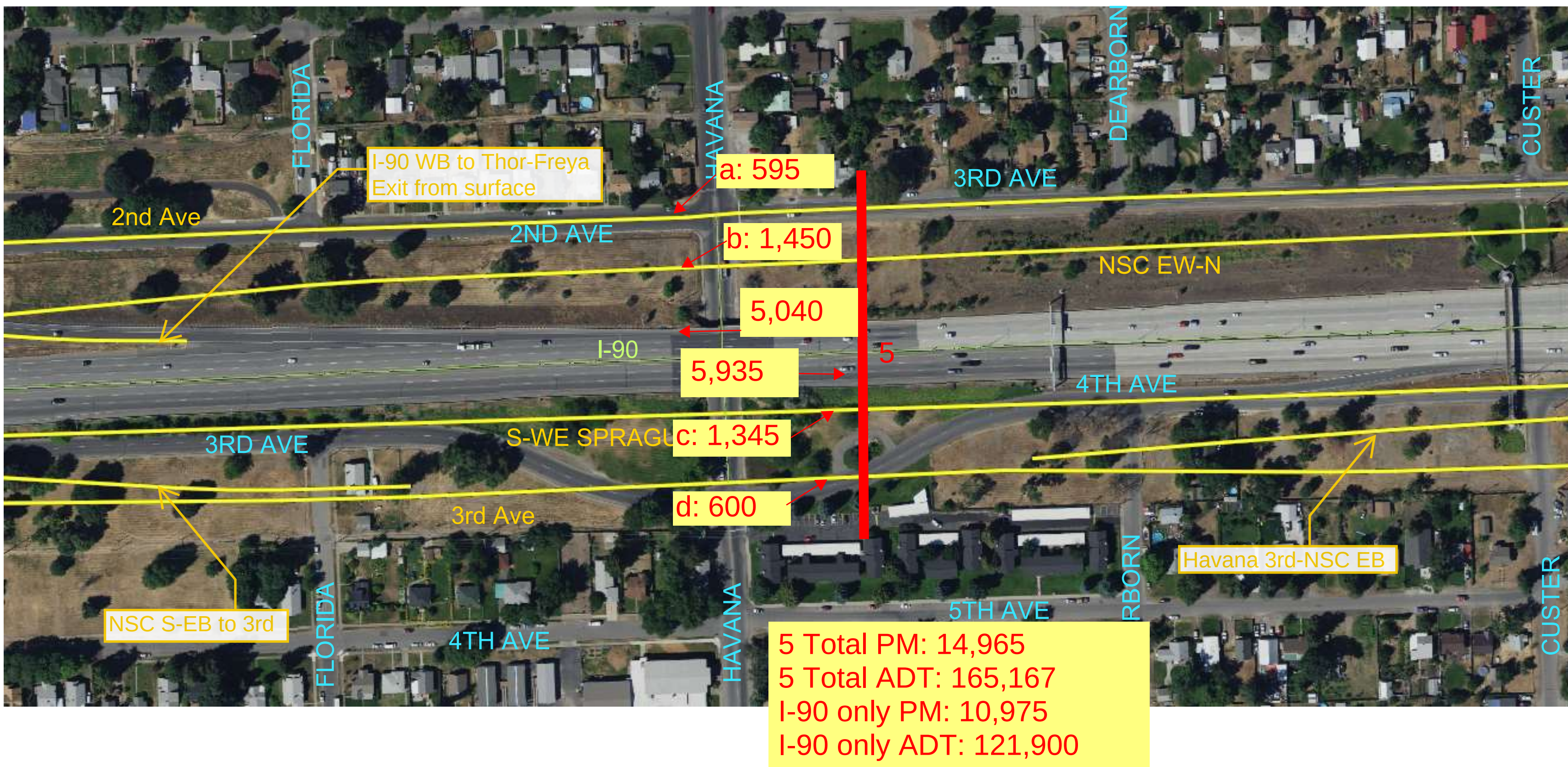
PACIFIC
S-EW
S-2ND
SMITH
NELSON
REGAL
HAVEN
FISKE
GREENE
RAY
2ND-N
2 LINE
2ND AVE
I-90
3RD AVE
3 LINE
I90R2
WE-N
I90R5
I90R4
S-WE
EW-N
LACEY
4TH AVE

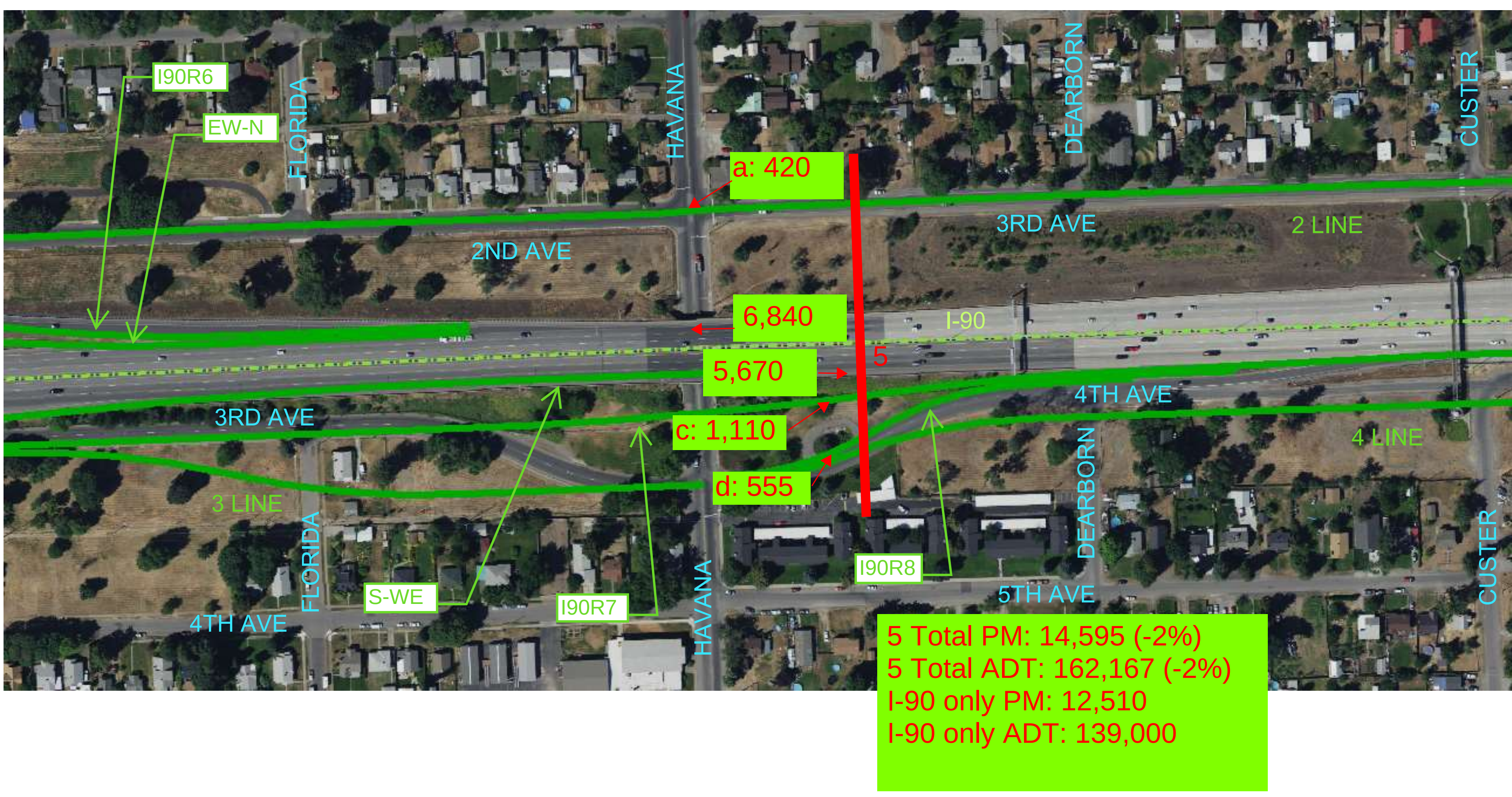

LL Line
LR Line
HAVEN
FISKE
GREENE
RALPH
1ST AVE
REGAL
HAVEN
FISKE
GREENE
RAY
RALPH
THOR
FERRALL
S-WE_SPRAGUE
NSC S-EW to I-90
NSC WE-N
PACIFIC
NSC EW-N
NSC S-2nd Ave


LL Line
LR Line
HAVEN
FISKE
GREENE
RALPH
1ST AVE
FISKE
GREENE
RAY
RALPH
THOR
FERRALL
REGAL
HAVEN
S-WE
2ND-N
S-EW
EW-N
PACIFIC
S-2ND
WE-N


PACIFIC
THOR
FREYA
FREYA
REBECCA
MYRTLE
I-90 WB to Thor-Freya
Exist from surface
Freya from surface
Thor from surface
2ND AVE
a: 950
2nd Ave
b: 1,450
EW-N
4,320
I-90
5,230
4
c: 1,700
AVE
d: 1,120
THOR
S-WE_SPRAGUE
FREYA
Freya 3rd to EB I-90 On
REBECCA
NSC S-EB to 3rd
MYRTLE
4 Total PM: 14,770
4 Total ADT: 164,111
I-90 only PM: 9,550
I-90 only ADT: 106,100

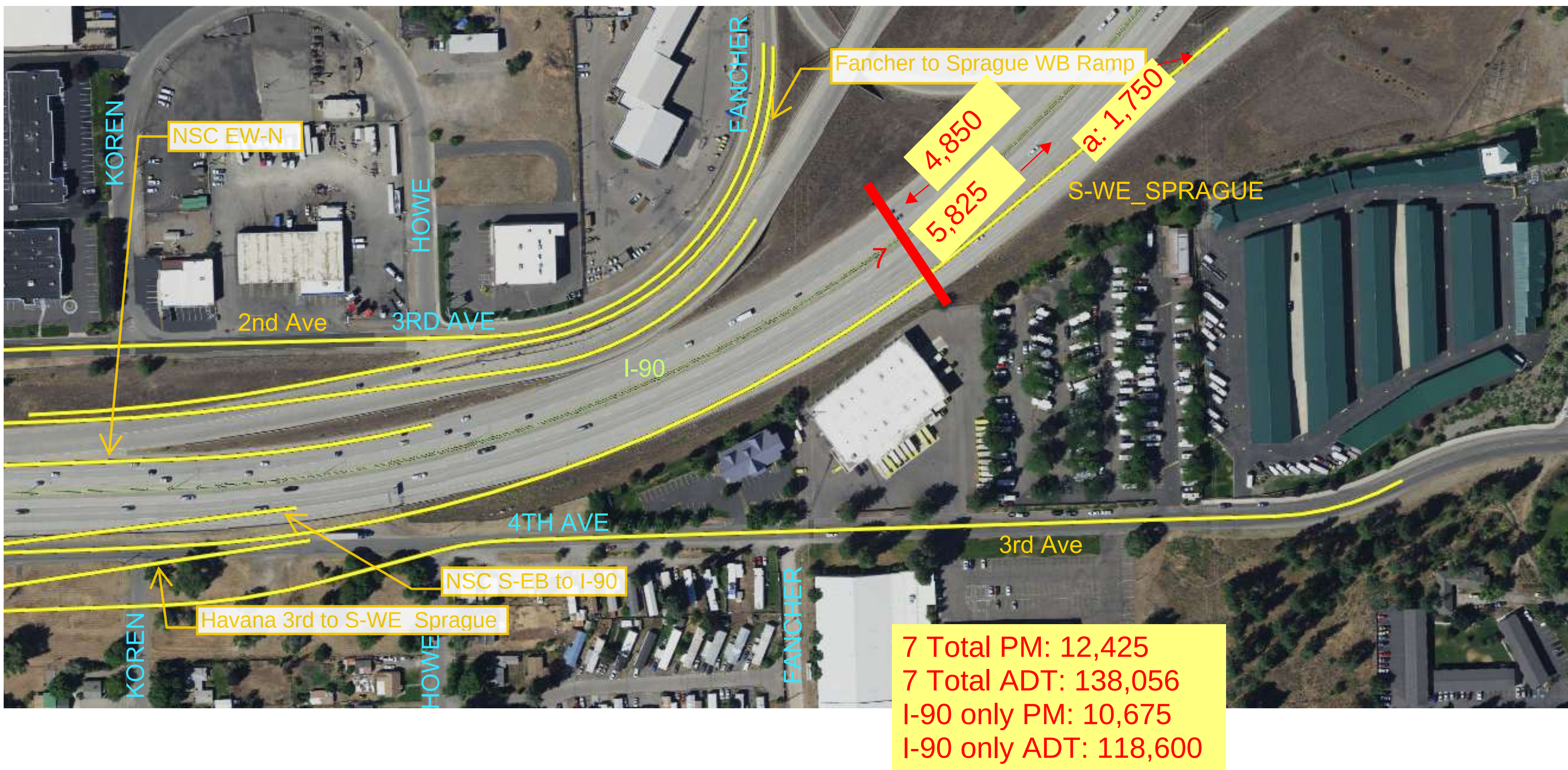

PACIFIC
THOR
FREYA
FREYA
REBECCA
MYRTLE
EW-N
I90R6
F LINE
T LINE
2ND AVE
2 LINE
a: 1,230
b: 1,175
4,805
I-90
4,605
4
c: 1,065
3RD AVE
d: 1,635
REBECCA
S-WE
THOR
FREYA
MYRTLE
I90R7
4 Total PM: 14,515 (-2%)
4 Total ADT: 161,278 (-2%)
I-90 only PM: 9,410
I-90 only ADT: 104,600

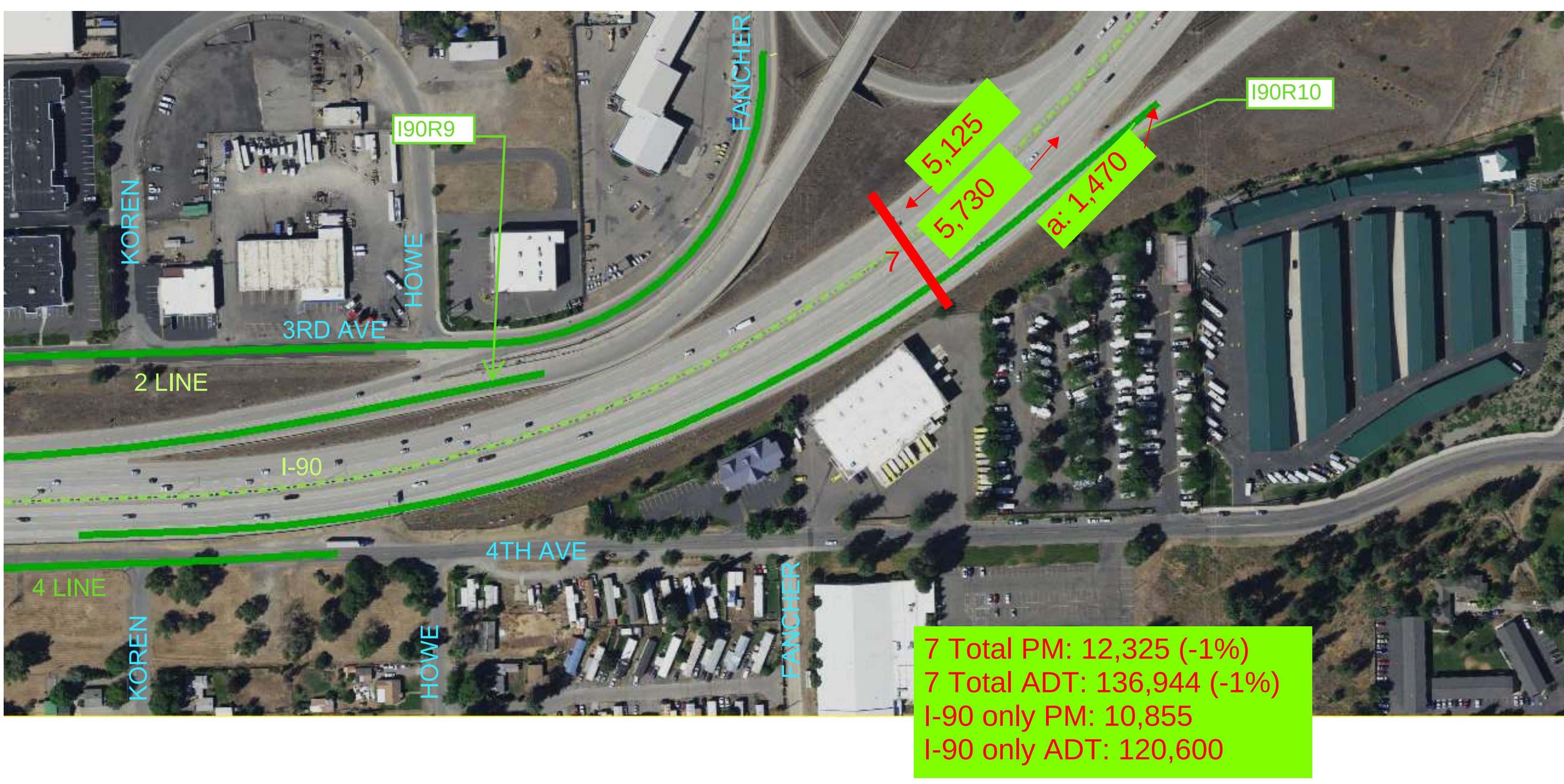

FLORIDA
HAVANA
DEARBORN
CUSTER
I-90 WB to Thor-Freya
Exit from surface
a: 595
3RD AVE
2nd Ave
2ND AVE
b: 1,450
NSC EW-N
5,040
I-90
5
5,935
4TH AVE
3RD AVE
S-WE SPRAGU
c: 1,345
d: 600
3rd Ave
Havana 3rd-NSC EB
NSC S-EB to 3rd
5TH AVE
4TH AVE
5 Total PM: 14,965
5 Total ADT: 165,167
I-90 only PM: 10,975
I-90 only ADT: 121,900


I90R6
EW-N
FLORIDA
HAVANA
DEARBORN
CUSTER
a: 420
3RD AVE
2 LINE
2ND AVE
6,840
I-90
5
5,670
4TH AVE
3RD AVE
c: 1,110
4 LINE
d: 555
3 LINE
I90R8
S-WE
I90R7
5TH AVE
4TH AVE
5 Total PM: 14,595 (-2%)
5 Total ADT: 162,167 (-2%)
I-90 only PM: 12,510
I-90 only ADT: 139,000


Sprague WB to WB I-90
Sprague WB to NSC EW-N
2ND AVE
CARNAHAN
NSC EW-N
NSC S-EB to I-90
MCKINNON
2nd Ave
CHRONICLE
a: 95
3RD AVE
b: 985
c: 2,040
I-90
3,865
6
4,845
d: 1,730
4TH AVE
e: 1,460
S-WE_SPRAGUE
3rd Ave
Havana 3rd to S-WE_Sprague
5TH AVE
Havana 3rd-NSC EB
Havana I90-3rd Off
6 Total PM: 15,020
6 Total ADT: 166,889
I-90 only PM: 8,710
I-90 only ADT: 96,800


2ND AVE
CHRONICLE
CARNAHAN
a: 170
2 LINE
3RD AVE
I90R9
6,840
I-90
6
7,200
4TH AVE
d: 345
4 LINE
I90R7
5TH AVE
MCKINNON
6 Total PM: 14,555 (-3%)
6 Total ADT: 161,722 (-3%)
I-90 only PM: 14,040
I-90 only ADT: 156,000


Fancher to Sprague WB Ramp
NSC EW-N
KOREN
HOWE
FANCHER
4,850
5,825
a: 1,750
S-WE_SPRAGUE
7
2nd Ave
3RD AVE
I-90
4TH AVE
3rd Ave
NSC S-EB to I-90
Havana 3rd to S-WE_Sprague
7 Total PM: 12,425
7 Total ADT: 138,056
I-90 only PM: 10,675
I-90 only ADT: 118,600


I90R9
I90R10
KOREN
HOWE
FANCHER
5,125
5,730
a: 1,470
7
3RD AVE
2 LINE
I-90
4TH AVE
4 LINE
7 Total PM: 12,325 (-1%)
7 Total ADT: 136,944 (-1%)
I-90 only PM: 10,855
I-90 only ADT: 120,600