Widener & Associates Transportation & Environmental Planning
1902 120th PL. SE. STE 202 Everett, WA 98208 Telephone (425)332-3961

April 14, 2022

Air Quality Analysis
East-West Corridor Project
Yakima County, Washington

The following has been prepared to document air quality conformity requirements for the East-West Corridor Project. Under federal and state clean air rules, there are requirements to ensure that proposed transportation projects do not cause or contribute to existing air quality problems. These "conformity rules" require analysis to demonstrate compliance with existing air quality control plans and programs. Federal, state, and local regulations require analysis for projects within maintenance or non-attainment areas that change traffic flow, increase capacity/and or traffic lanes, or add traffic signals.

Project Information

The purpose of the proposed project is to reduce congestion and connect the growing neighborhood of Terrace Heights to the City of Yakima (as stated in the Purpose & Need for this project, dated March 22, 2022):

- Provide an alternative Yakima River crossing for east-west travel between the City of Yakima and Terrace Heights.
- Increase mobility, by decreasing travel delay, and relieving traffic congestion at the I-82/Yakima Avenue Interchange and on Terrace Heights Drive and Yakima Avenue.
- Construct the local road corridor which would allow for the consideration of construction of the recommended alternative for an interchange with I-82 identified in the WSDOT I-82/Yakima Avenue/Terrace Heights Drive IJR.
- Provide bicycle and pedestrian facilities including a connection to the Yakima Greenway Trail.
- Serve the existing approved transportation and land use planning along the roadway corridor as documented in the Yakima Valley Conference of Governments (YVCOG) 2020-2045 Metropolitan and Regional Transportation Plan.

The needs for the project include the following (as stated in the Purpose & Need for this project, dated March 22, 2022):

- *Congested Corridor* –The current road network cannot support the growth anticipated in the area under the current comprehensive plan. The Terrace Heights neighborhood lies just to the east of the City of Yakima. The neighborhood, an unincorporated part of Yakima County, has grown considerably over the last five decades, with its population increasing fivefold in the 30 years between 1970 and 2000, to a 2019 total of 8,507. Redevelopment of the Boise Cascade Mill Site consistent with the planned land use in the current City of Yakima Comprehensive Plan is also anticipated to increase traffic demand within the City of Yakima.

The level of service (LOS) on the Yakima Avenue/Terrace Heights Drive corridor has been getting steadily worse and by 2035 it is expected to have multiple turning movements operating at LOS E or F. LOS is a letter grade corresponding to the amount of congestion a road has when completed to a standard. LOS A is the best or the least congested grade. LOS F indicates failure because the demand for a road is more than its capacity.

The current LOS along the Yakima Avenue/Terrace Heights Drive corridor has triggered Yakima County's concurrency requirements, which limits new development permits along the corridor. In order to relax the restrictions, the County must either increase the capacity of the existing corridor or divert sufficient traffic volume onto another route. Right-of-way constraints along the existing Yakima Avenue/Terrace Heights Drive route prevent widening of the existing roadway. The future LOS at the Yakima Avenue interchange is also anticipated to cause back-ups onto the I-82 mainline.

- *Emergency Response* – The Yakima River poses a natural barrier to travel between Yakima and Terrace Heights. Historically, east-west traffic in the project vicinity has had only one option to travel between these two locations: the Yakima Avenue/Terrace Heights Drive corridor. A new corridor is needed to provide an alternative redundant route to Terrace Heights during any future closures of the Terrace Heights Bridge as well as an additional route for emergency services.

- *Lack of pedestrian and bicycle connectivity* – Access to the Greenway Trail is limited as it travels between I-82 and the Yakima River. The existing East H Street corridor does not include sidewalks or bike lanes and there is no access for pedestrians to the Greenway Trail from the surrounding residential neighborhood.

Yakima County is proposing to construct an East-West Corridor in the City of Yakima and unincorporated Yakima County, Washington from North 1st Street and East H Street on the west side of Interstate 82 (I-82) in the City of Yakima to the eastern terminus on the east side of the Roza Canal Wasteway #2 in the community of Terrace Heights. This corridor will connect with Yakima County's Phase 1 of Cascade Mill Parkway (currently under construction) which will continue to Butterfield Road and North Keys Road. The project would include construction of three separate streets:

- **East H Street** –The existing road would be extended to the east from the current terminus at North 7th Street where it would connect to Bravo Company Boulevard as the road turns to the south. The existing portion from North 1st Street to North 7th Street would be widened. A new signal would be installed at the intersection with North 1st Street.
- **Bravo Company Boulevard** – An extension of Bravo Company Boulevard connecting to East H Street would be constructed which would turn south and connect to the current terminus near Fair Avenue. A roundabout intersection with Cascade Mill Parkway would be constructed along with one additional roundabout intersection to connect to an existing access road to the adjacent properties.
- **Cascade Mill Parkway** –Cascade Mill Parkway would connect to Bravo Company Boulevard at a roundabout intersection and then continue east beneath I-82 and across the Yakima River and Roza Canal Wasteway #2.

The East-West Corridor project will involve improvements to existing roadways, including transforming East H Street from a residential street to a free-flowing arterial between North 1st Street and North 7th Street; the building of new connections and roundabouts; non-motorized facilities including bike lanes, sidewalks, Americans with Disabilities Act (ADA) ramps, crosswalks, and a shared-use path that will connect to the Yakima Greenway Trail; and construction of four bridges: two to carry I-82 over the proposed roadway, one over the Yakima River, and one over the Roza Canal Wasteway #2. This project will also involve restoration and levee work along the Yakima River floodplain including removal and/or setback of levees and floodplain habitat restoration.

The proposed project is located within Sections 17 and 18 of Township 13 North and Range 19 East as well as Section 13 of Township 13 North and Range 18 East. The project is located within Yakima, WA and the Terrace Heights neighborhood in unincorporated Yakima County. Land use surrounding the project varies with industrial, commercial, residential, and vacant land. Zoning designations surrounding the project area include general commercial (GC), single family (R-1), multi-family (R-3), regional development (RD), suburban residential (SR), and light industrial (M-1). See Figure 1.

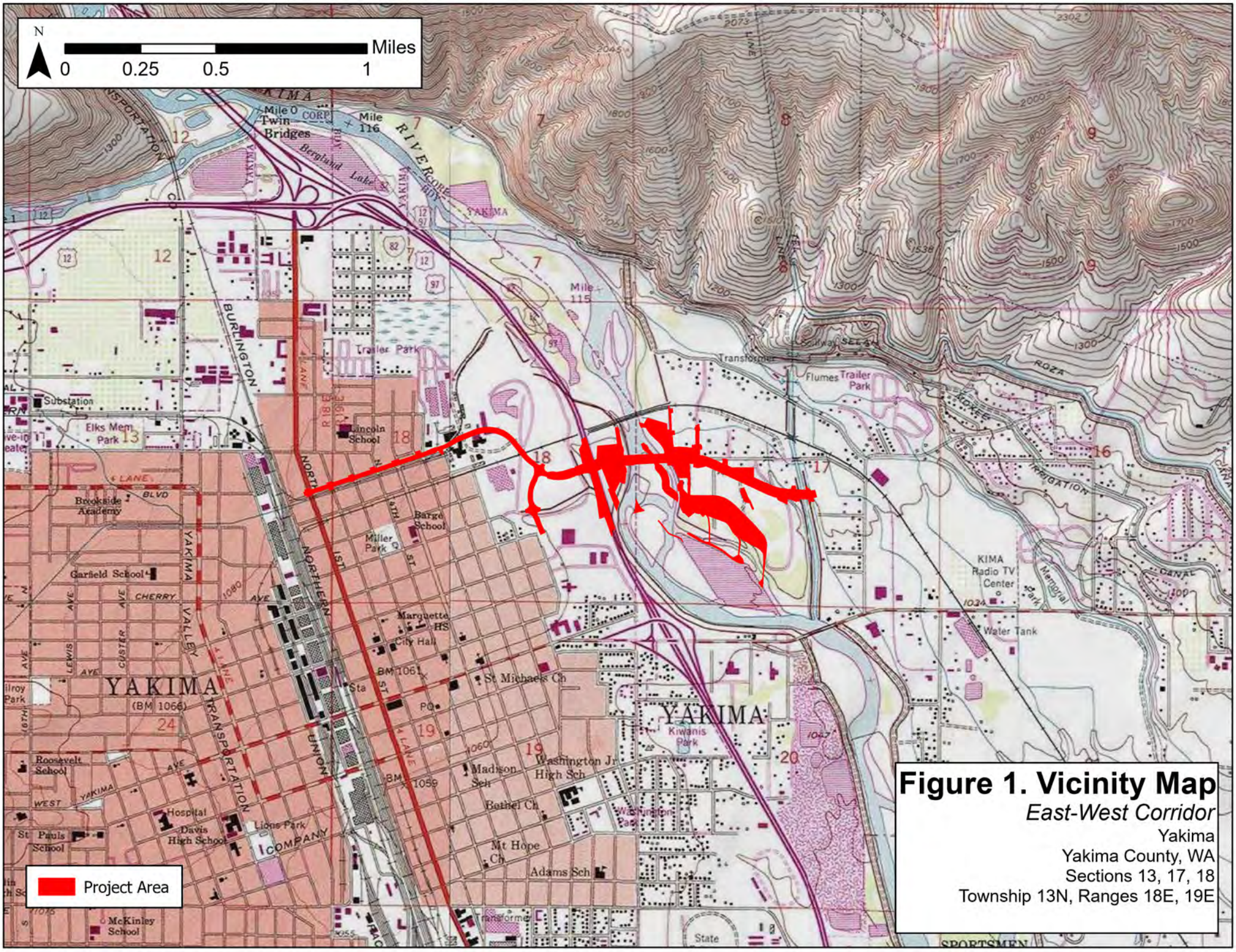
Maintenance Areas

The project is partially located within the Yakima Carbon Monoxide (CO) maintenance area and entirely within the Yakima particulate matter (PM_{10}) maintenance area. The area near the intersection of North 1st Street and East H Street is the only portion of the proposed project within the CO maintenance area. See Figure 2 for the road alignment in relation to the maintenance area boundaries.

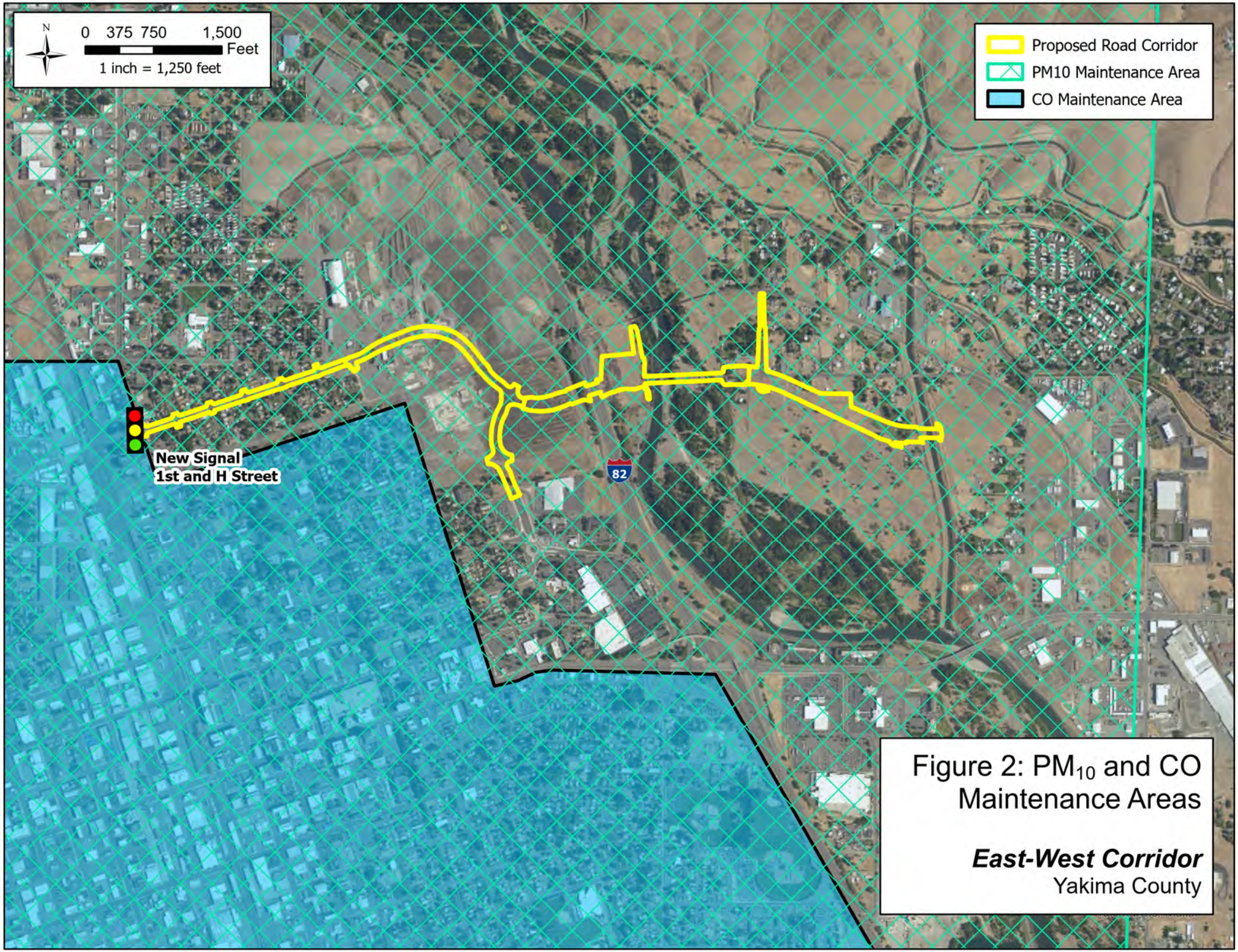
Regional and project level conformity analysis must be undertaken on all non-exempt projects located in 'non-attainment' or 'maintenance' areas with approved State Implementation Plans (SIPs). If the project is listed in the Transportation Improvement Plan (TIP) and/or in the Metropolitan Transportation Plan (MTP) for the appropriate Metropolitan Planning Organization (MPO), then (as long as it has not changed significantly since being listed in the plan(s)) it has undergone regional conformity analysis and can be concluded to meet regional conformity requirements for all criteria pollutants.

The Yakima Valley Conference of Governments (YVCOG) is responsible for meeting both the federal and state transportation planning requirements for the Yakima County Region. The East-West Corridor Project was included in the most recent 2020-2045 Yakima Valley Metropolitan and Regional Transportation Plan (M/RTP).[1] The project will be completed in several phases and is also listed on the Washington State Transportation Improvement Plan (STIP) under these phases, see Appendix A. The project has therefore met regional air quality analysis requirements.

[1] Yakima Valley Transportation Plan 2020-2045 available at https://www.yvcog.org/2020-2045-lrtp/


N
0
0.25
0.5
1
Miles
Project Area
Figure 1. Vicinity Map
East-West Corridor
Yakima
Yakima County, WA
Sections 13, 17, 18
Township 13N, Ranges 18E, 19E

This page intentionally left blank for printing purposes.


N
0 375 750 1,500
Feet
1 inch = 1,250 feet
Proposed Road Corridor
PM10 Maintenance Area
CO Maintenance Area
New Signal
1st and H Street
82
Figure 2: PM10 and CO Maintenance Areas
East-West Corridor
Yakima County

This page intentionally left blank for printing purposes.

Carbon Monoxide

40 CFR 93.123 (a)1 states project level quantitative analysis is required within non-attainment or maintenance areas "for projects affecting intersections that are at Level of Service (LOS) D, E, or F, or those that will change to LOS D, E, or F because of increased traffic volumes related to the project." Only the intersection of North 1st Street and East H Street is within the CO maintenance area and will be signalized during project construction. The intersection is expected to operate at level of service (LOS) C or better in all but the 2044 No Build scenario, see Table 1. The No Build LOS results are for the East H Street movement from the existing stop sign onto North 1st Street, while the North 1st Street traffic does not stop. The construction of the project will improve these conditions through the installation of a new signal. The intersection will not have LOS D, E, or F due to increased traffic from the project.

Table 1: Level of Service under Existing, Year of Opening, and Design Year Conditions

	2021 Existing	2024 No Build	2024 Build	2044 No Build	2044 Build
	LOS (delay)	LOS (delay)	LOS (delay)	LOS (delay)	LOS (delay)
North 1st Street/ East H Street	**C** (19.8 seconds)	**C** (23.3 seconds)*	**A** (10.0 seconds)	**E** (47.4 seconds)*	**C** (24.4 seconds)

*Results are for worst-performing side street movement

There are no other intersections within the CO maintenance area which are anticipated to have a 10 percent increase in traffic due to the project. Intersections along Yakima Avenue/Terrace Heights which are signalized and within the CO maintenance area are forecasted to have a decrease in traffic. No other intersections impacted by the project currently are or will be signalized.

A project-level air quality analysis (hot-spot analysis) is therefore not required in accordance with 40 CFR 93.123 as the intersection will have a level of service (LOS) of C or better under existing as well as modeled year of opening and design year conditions with the project. Refer to Appendix B for 2021, 2024, and 2044 LOS analysis for the project intersection.

PM_{10} Qualitative Analysis

The East-West Corridor is not considered a project of air quality concern as it will not impact a significant number of diesel vehicles. Within the project area, there is anticipated to be approximately 2% heavy truck traffic based on traffic counts at the Yakima Avenue/Terrace Heights Drive interchange with I-82. Projects which are not of air quality concern located in PM_{10} non-attainment or maintenance areas with approved SIPs, such as the East-West Corridor project, are required to complete a qualitative analysis of PM_{10}.

Heavy vehicle traffic is not significant in the project area as the majority of the project area is undeveloped land or single-family residential. The East H Street portion of the project is within an existing residential neighborhood. The area west of I-82, is within the Boise Cascade Mill Redevelopment Area and is zoned as Regional Development. This area was a part of a lumber mill from 1903 to 2006, with log ponds remaining until the 1960s. It currently consists of cleared land for redevelopment of mixed use, commercial, and light industrial purposes. There are several private residences and commercial businesses along the proposed route within the community of Terrace Heights, east of I-82.

The proposed project creates another direct route for residents of Terrace Heights to travel into the City of Yakima, which would avoid the congested Terrace Heights Drive/Yakima Avenue corridor. The roadway will provide a more efficient means of travel by providing roundabout intersections and turn lanes. Removing traffic from the Terrace Heights Drive/Yakima Avenue corridor will improve the level of service of the existing corridor thereby reducing the vehicle hours of delay (VHD) within the PM_{10} maintenance area. A reduction in VHD will reduce the amounts of PM_{10} emitted into the air.

For the reasons described above, future new or worsened PM_{10} violations of any standard are not anticipated, and therefore the project meets the qualitative analysis standards for PM_{10}.

Conclusion

The project was found to meet both regional and project level conformity requirements as dictated by federal and state requirements. It meets project-level air quality conformity requirements since the signalized intersection created by the project will maintain a LOS of C or better under future build conditions, and therefore no quantitative hot-spot analysis is required in accordance with 40 CFR 93.123. No changes to the project are necessary in order to meet conformity requirements. The project is listed in the Metropolitan Transportation Plan, and therefore it conforms to the State Implementation Plan and meets regional conformity requirements for all criteria pollutants.

Appendix A: STIP Listings

This page intentionally left blank for printing purposes.

Washington State S. T. I. P.

2021 to 2024

(Project Funds to Nearest Dollar)

MPO/RTPO: YVCOG Y Inside N Outside **February 11, 2021**

County: Yakima

Agency: Yakima Co.

Func Cls	Project Number	PIN	STIP ID	Imp Type	Total Project Length	Environmental Type	RW Required	Begin Termini	End Termini	Total Est. Cost of Project	STIP Amend. No.
04			YkCo45200A	01	1.050	CE	Yes	I-82 Turnback Limits	End of N. Keys Rd.	68,500,000	21-01

East-West Corridor -- I-82 Turnbacks Limits to End of N. Keys Rd.

Construct new arterial connection including new Yakima River Bridge, I-82 access modifications and connections to City of Yakima Mill Site.
Multi year project spanning through the 2025-27 fiscal biennium

Funding

Phase	Start Date	Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total
PE	2021		0		0	3,000,000	3,000,000
RW	2021		0		0	2,000,000	2,000,000
CN	2021		0	OTHER	1,350,000	0	1,350,000
CN	2021		0	TIB	1,500,000	3,000,000	4,500,000
CN	2021		0	CWA	5,799,000	0	5,799,000
CN	2023		0	CWA	26,989,000	0	26,989,000
		Project Totals	**0**		**35,638,000**	**8,000,000**	**43,638,000**

Expenditure Schedule

Phase	1st	2nd	3rd	4th	5th & 6th
PE	1,000,000	1,000,000	1,000,000	0	0
RW	1,000,000	1,000,000	0	0	0
CN	4,700,000	1,437,600	21,215,000	28,550,400	0
Totals	**6,700,000**	**3,437,600**	**22,215,000**	**28,550,400**	**0**

Washington State S. T. I. P.

2021 to 2024

(Project Funds to Nearest Dollar)

MPO/RTPO: YVCOG Y Inside N Outside **February 11, 2021**

County: Yakima

Agency: Yakima

Func Cls	Project Number	PIN	STIP ID	Imp Type	Total Project Length	Environmental Type	RW Required	Begin Termini	End Termini	Total Est. Cost of Project	STIP Amend. No.
04			YAK11	01	0.650	CE	Yes	'H' Street	'D' Street	18,000,000	

Bravo Company Boulevard

Construct four-lane roadway section with median, bike lanes and roundabouts, install curb, gutter, sidewalk, street lighting and storm drainage system, along with water and sewer systems.

Funding

Phase	Start Date	Federal Fund Code	Federal Funds	State Fund Code	State Funds	Local Funds	Total
CN	2021		0	OTHER	15,000,000	0	15,000,000
		Project Totals	**0**		**15,000,000**	**0**	**15,000,000**

Expenditure Schedule

Phase	1st	2nd	3rd	4th	5th & 6th
CN	15,000,000	0	0	0	0
Totals	**15,000,000**	**0**	**0**	**0**	**0**

Appendix B: North 1st Street and East H Street Intersection LOS Analysis

This page intentionally left blank for printing purposes.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	1	1	5	1	1135	10	15	475	1
Future Vol, veh/h	1	1	1	1	1	5	1	1135	10	15	475	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	1	1	1	6	1	1335	12	18	559	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1266	1945	280	1659	1939	674	560	0	0	1347	0	0
Stage 1	596	596	-	1343	1343	-	-	-	-	-	-	-
Stage 2	670	1349	-	316	596	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	126	64	717	64	65	397	1007	-	-	507	-	-
Stage 1	457	490	-	160	219	-	-	-	-	-	-	-
Stage 2	413	217	-	670	490	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	120	62	717	62	63	397	1007	-	-	507	-	-
Mov Cap-2 Maneuver	245	150	-	133	161	-	-	-	-	-	-	-
Stage 1	457	472	-	160	219	-	-	-	-	-	-	-
Stage 2	404	217	-	644	472	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.8	19	0	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	247	266	507	-	-
HCM Lane V/C Ratio	0.001	-	-	0.014	0.031	0.035	-	-
HCM Control Delay (s)	8.6	-	-	19.8	19	12.4	-	-
HCM Lane LOS	A	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

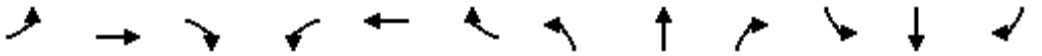
Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	5	1	50	1	1045	110	45	555	1
Future Vol, veh/h	1	1	1	5	1	50	1	1045	110	45	555	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	1	6	1	59	1	1229	129	53	653	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1377	2120	327	1729	2056	679	654	0	0	1358	0	0
Stage 1	760	760	-	1296	1296	-	-	-	-	-	-	-
Stage 2	617	1360	-	433	760	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	104	50	669	57	55	394	929	-	-	502	-	-
Stage 1	364	413	-	171	231	-	-	-	-	-	-	-
Stage 2	444	215	-	571	413	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	81	45	669	52	49	394	929	-	-	502	-	-
Mov Cap-2 Maneuver	193	120	-	134	151	-	-	-	-	-	-	-
Stage 1	364	369	-	171	231	-	-	-	-	-	-	-
Stage 2	375	215	-	508	369	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.3	18.7	0	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	929	-	-	200	328	502	-	-
HCM Lane V/C Ratio	0.001	-	-	0.018	0.201	0.105	-	-
HCM Control Delay (s)	8.9	-	-	23.3	18.7	13	-	-
HCM Lane LOS	A	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.4	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	35	1	100	1	990	85	50	450	1
Future Volume (veh/h)	1	1	1	35	1	100	1	990	85	50	450	1
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	1	1	41	1	118	1	1165	100	59	529	1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	117	78	152	15	158	589	1567	134	106	2340	4
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.47	0.47	0.47	0.06	0.64	0.64
Sat Flow, veh/h	287	857	572	304	107	1154	874	3312	284	1781	3639	7
Grp Volume(v), veh/h	3	0	0	160	0	0	1	624	641	59	258	272
Grp Sat Flow(s),veh/h/ln	1716	0	0	1565	0	0	874	1777	1819	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	2.7	0.0	0.0	0.0	11.7	11.7	1.3	2.5	2.5
Cycle Q Clear(g_c), s	0.1	0.0	0.0	4.0	0.0	0.0	0.0	11.7	11.7	1.3	2.5	2.5
Prop In Lane	0.33		0.33	0.26		0.74	1.00		0.16	1.00		0.00
Lane Grp Cap(c), veh/h	352	0	0	325	0	0	589	841	861	106	1143	1202
V/C Ratio(X)	0.01	0.00	0.00	0.49	0.00	0.00	0.00	0.74	0.74	0.55	0.23	0.23
Avail Cap(c_a), veh/h	823	0	0	795	0	0	674	1013	1037	222	1430	1504
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	0.0	16.9	0.0	0.0	5.7	8.7	8.8	18.7	3.0	3.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.2	0.0	0.0	0.0	2.4	2.4	4.5	0.1	0.1
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	0.0	0.0	0.0	1.3	0.0	0.0	0.0	3.5	3.6	0.6	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	0.0	0.0	18.1	0.0	0.0	5.7	11.2	11.1	23.1	3.1	3.1
LnGrp LOS	B	A	A	B	A	A	A	B	B	C	A	A
Approach Vol, veh/h		3			160			1266			589	
Approach Delay, s/veh		15.3			18.1			11.1			5.1	
Approach LOS		B			B			B			A	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.9	23.8		10.1		30.8		10.1				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	5.1	23.3		18.1		32.9		18.1				
Max Q Clear Time (g_c+I1), s	3.3	13.7		2.1		4.5		6.0				
Green Ext Time (p_c), s	0.0	5.6		0.0		3.4		0.6				

Intersection Summary			
HCM 6th Ctrl Delay		10.0	
HCM 6th LOS		A	

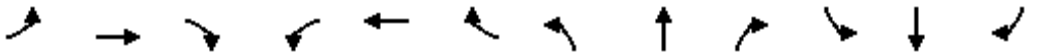
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↱		↰	↑↑↱	
Traffic Vol, veh/h	1	1	1	5	1	60	1	1245	120	115	1150	1
Future Vol, veh/h	1	1	1	5	1	60	1	1245	120	115	1150	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	1	5	1	63	1	1311	126	121	1211	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2112	2893	606	2224	2830	719	1212	0	0	1437	0	0
Stage 1	1454	1454	-	1376	1376	-	-	-	-	-	-	-
Stage 2	658	1439	-	848	1454	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	29	16	440	24	17	371	571	-	-	468	-	-
Stage 1	137	193	-	153	211	-	-	-	-	-	-	-
Stage 2	420	197	-	322	193	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	19	12	440	19	13	371	571	-	-	468	-	-
Mov Cap-2 Maneuver	86	50	-	93	83	-	-	-	-	-	-	-
Stage 1	137	143	-	153	211	-	-	-	-	-	-	-
Stage 2	346	197	-	236	143	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.4	21.3	0	1.4
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	571	-	-	88	290	468	-	-
HCM Lane V/C Ratio	0.002	-	-	0.036	0.24	0.259	-	-
HCM Control Delay (s)	11.3	-	-	47.4	21.3	15.4	-	-
HCM Lane LOS	B	-	-	E	C	C	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.9	1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	155	1	225	1	1115	160	120	540	1
Future Volume (veh/h)	1	1	1	155	1	225	1	1115	160	120	540	1
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	1	1	163	1	237	1	1174	168	126	568	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	169	137	234	14	256	469	1363	194	159	2144	4
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.44	0.44	0.44	0.09	0.59	0.59
Sat Flow, veh/h	367	596	482	573	50	901	843	3122	445	1781	3640	6
Grp Volume(v), veh/h	3	0	0	401	0	0	1	666	676	126	277	292
Grp Sat Flow(s),veh/h/ln	1445	0	0	1524	0	0	843	1777	1790	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.0	16.8	0.0	0.0	0.0	24.1	24.3	4.9	5.4	5.4
Cycle Q Clear(g_c), s	0.1	0.0	0.0	18.2	0.0	0.0	0.0	24.1	24.3	4.9	5.4	5.4
Prop In Lane	0.33		0.33	0.41		0.59	1.00		0.25	1.00		0.00
Lane Grp Cap(c), veh/h	478	0	0	505	0	0	469	775	781	159	1047	1101
V/C Ratio(X)	0.01	0.00	0.00	0.79	0.00	0.00	0.00	0.86	0.86	0.79	0.26	0.26
Avail Cap(c_a), veh/h	483	0	0	510	0	0	497	836	842	188	1135	1194
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	0.0	24.7	0.0	0.0	11.3	18.1	18.2	31.8	7.1	7.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	8.4	0.0	0.0	0.0	8.5	8.9	17.4	0.1	0.1
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	0.0	0.0	0.0	7.3	0.0	0.0	0.0	10.6	10.9	2.8	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	0.0	0.0	33.1	0.0	0.0	11.3	26.6	27.0	49.2	7.3	7.2
LnGrp LOS	B	A	A	C	A	A	B	C	C	D	A	A
Approach Vol, veh/h		3			401			1343			695	
Approach Delay, s/veh		18.3			33.1			26.8			14.9	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.9	35.6		24.8		46.5		24.8				
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s	7.5	33.5		20.5		45.5		20.5				
Max Q Clear Time (g_c+I1), s	6.9	26.3		2.1		7.4		20.2				
Green Ext Time (p_c), s	0.0	4.8		0.0		3.8		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		24.4	
HCM 6th LOS		C	