Project Level PM Quantitative Hot-Spot Analysis – Consultation

Project Setting and Description

The Arizona Department of Transportation (ADOT) has initiated a project to construct improvements to State Route (SR) 24 between SR Loop 202 (SR 202L) and Ironwood Drive. The project is located on SR 24 between milepost (MP) 0.00 and MP 5.64 and SR 202L between MP 31.57 to MP 37.70 within the City of Mesa, Town of Queen Creek, Town of Gilbert, and unincorporated areas in Maricopa County and Pinal County, Arizona (see enclosed Figure 1).

In 2014 the initial segment of SR 24 between SR 202L and Ellsworth Road was opened to traffic. In 2023 the second segment of SR 24 between Ellsworth Road and Ironwood Drive was completed in an interim condition. The purpose of the project is to widen SR 24 to accommodate two additional general-purpose lanes between Ellsworth Road and Ironwood Drive, resulting in three new bridges over existing crossroads at Williams Field, Signal Butte, and Meridian Road and widening the existing SR 24 bridge over Mountain Road. Roadway and bridge widening over Power Road and the East Maricopa Floodway is proposed along SR 202L to provide lane continuity and additional traffic capacity to and from the SR 24/SR 202L system traffic interchange (TI). The need for the project is to construct improvements to accommodate increased traffic demand.

The scope of work for the project consists of:

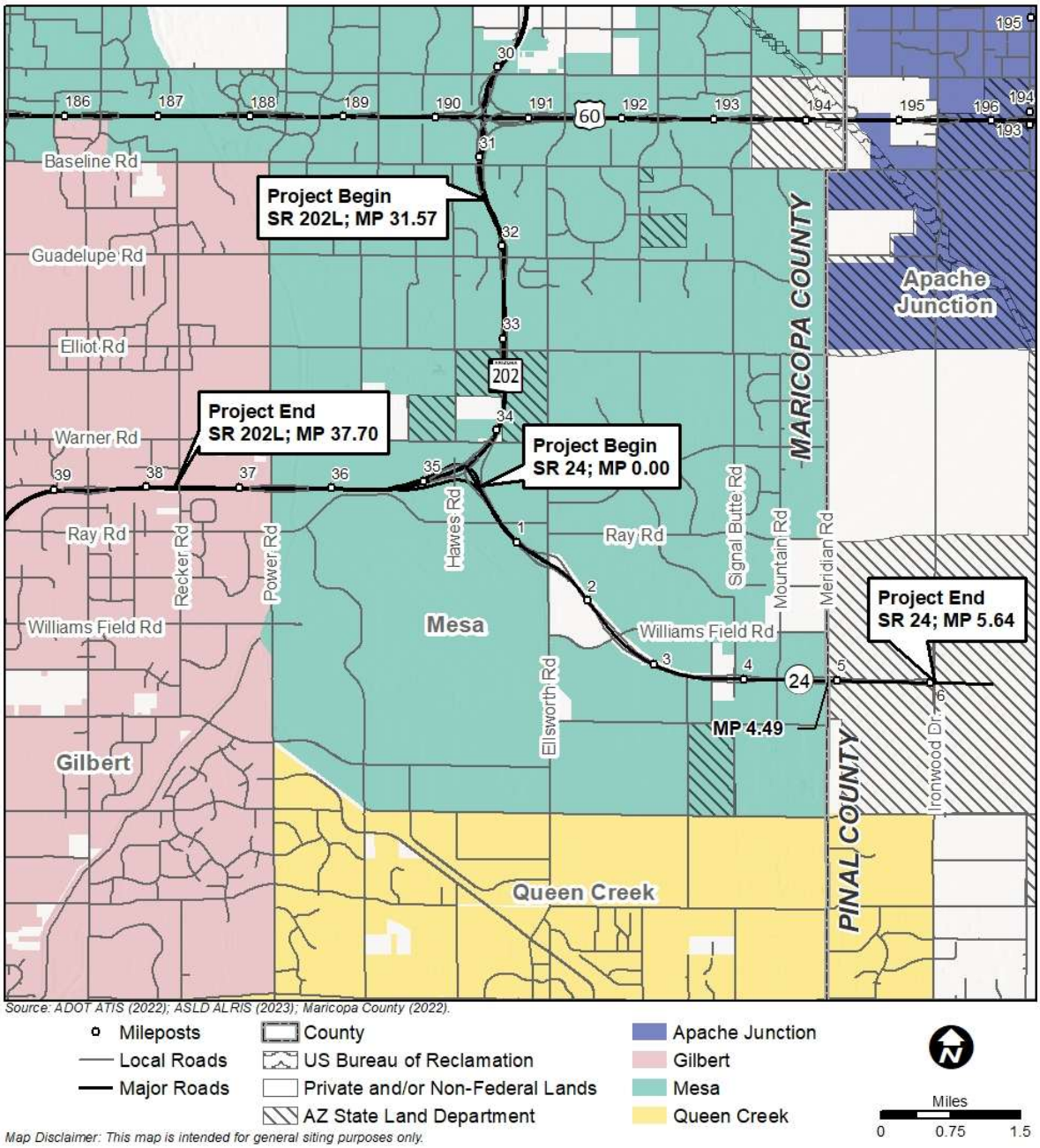
- Adding two additional travel lanes on SR 24 in each direction between Ellsworth Road and Ironwood Drive (3+ auxiliary)
- Adding new three-lane approaches and traffic interchange overpass structures (TIOP) at Williams Field Road, Signal Butte Road, and Meridian Road
- Widening the existing grade separated structures at Mountain Road
- Adding ramp connector roads between SR 202L and the Ellsworth Road intersection including structures over Ray and Hawes Road, a service ramp, and the Powerline Floodway
- Restriping portions of the directional system TI ramps from one lane to two lanes
- Adding an outside general purpose travel lane on the northbound SR 202L between SR 24 and Guadalupe Road
- Reconstructing NB SR 202L exit and entrance ramps at the Elliott Road TI and the exit ramp at Guadalupe Road TI
- Modifying existing on-site roadway drainage system to accommodate additional lanes
- Installing and upgrading signing and pavement markings
- Installing ITS/FMS, traffic signals, and lighting
- Placing seeding on SR 24
- Restoring landscaping and irrigation on SR 202L
- Upgrading sidewalks and ramps to be ADA compliant on Ellsworth Road
- Removing existing SR 202L AR-ACFC and resurfacing by diamond grinding the roadway surface on both directions between Recker Road to Guadalupe Road
- Widening WB SR 202L from the Power Road WB exit ramp to Recker Road including both Power Road ramps
- Widening EB SR 202L between the Power Road entrance and exit ramps including both Power Road ramps
- Widening the existing SR 202L structures over Power Road and the Eastern Maricopa Floodway
- Replacing deck joints on existing SR 202L structures within the project limits

- Constructing new retaining and sound walls and screen walls if needed
- Conducting geotechnical investigations consisting of structure and roadway borings
- Replacing sign panels and removing sign lighting at three SB SR 202L locations north of Guadalupe Rd
- Reconstructing the existing half-diamond intersection of SR 24 at Ironwood Drive to a half diverging diamond intersection (DDI)
- Repairing a pavement crack on the system TI NW Ramp

Permanent project improvements would occur within the existing ADOT right-of-way (ROW). New ROW is not anticipated. Temporary construction easements are anticipated to construct sound walls along the existing ROW. Wall agreements between ADOT and adjacent landowners for maintenance purposes are anticipated. Construction is anticipated to begin in Fall 2026, and is expected to take approximately 28 months. Traffic restrictions are anticipated during construction with temporary advanced-warning signs extending approximately 1-mile in advance of the work limits. Night work and temporary lane closures along the SR 24 and SR 202L mainline, ramps, and crossroads will be required during construction. Lane closures will occur during off-peak travel times with the existing number of lanes maintained at all other times. Formal detour routes on local streets will not be designated during construction. Traffic delays should be expected during construction efforts.

These projects are within the Phoenix PM10 nonattainment area. The proposed project is included in the *Maricopa Association of Governments (MAG) Regional Transportation Plan (RTP) MOMENTUM 2050*. In addition, the combined project is included in the *FY 2025-2030 MAG Transportation Improvement Program*.

Figure 1. Project Vincinity Map



Project Assessment

The following questionnaire is used to compare the proposed project to a list of project types in 40 CFR 93.123(b) requiring a quantitative analysis of local particulate emissions (Hot- spots) in nonattainment or maintenance areas, which include:

i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles;

ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of an increase in traffic volumes from a significant number of diesel vehicles related to the project;

iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM_{10} or $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

If the project matches one of the listed project types in 40 CFR 123(b)(1) above, it is considered a project of local air quality concern and the hot-spot demonstration must be based on quantitative analysis methods in accordance to 40 CFR 93.116(a) and the consultation requirements of 40 CFR 93.105(c)(1)(i). If the project does not require a PM hot- spot analysis, a qualitative assessment will be developed that demonstrates that the project will not contribute to any new localized violations, increase the frequency of severity of any existing violations, or delay the timely attainment of any NAAQS or any required emission reductions or milestones in any nonattainment or maintenance area.

On March 10, 2006, EPA published *PM2.5 and PM10 Hot-Spot Analyses in Project-Level Transportation Conformity Determinations for the New PM2.5 and Existing PM10 National Ambient Air Quality Standards; Final Rule* describing the types of projects that would be considered a project of air quality concern and that require a hot-spot analysis (71 FR 12468-12511). Specifically on page 12491, EPA provides the following clarification: “Some examples of *projects of air quality concern* that would be covered by § 93.123(b)(1)(i) and (ii) are: A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8% or more of such AADT is diesel truck traffic;” ..” Expansion of an existing highway or other facility that affects a congested intersection (operated at Level-of-Service D, E, or F) that has a significant increase in the number of diesel trucks;” These examples will be used as the baseline for determining if the project is a project of air quality concern.

Since the issuance of this rulemaking, the Office of Transportation and Air Quality issued additional clarification (EPA-420-F-18-011 June 2018) identifying additional examples that are not projects of air quality concern. “For example, the following projects typically do not involve “a significant number of diesel vehicles” or “a significant increase in the number of diesel vehicles” as described in 40 CFR 93.123(b)(1), and thus typically would not need a PM2.5 or PM10 hotspot analysis:

- New HOV lanes and ramp HOV lanes which do not involve a “a significant number of diesel vehicles” or “a significant increase in the number of diesel vehicles” as described in 40 CFR 93.123(b)(1);

- Bus rapid transit projects where the buses are non-diesel, (e.g., CNG buses);
- New transit stations or transit lines with no diesel vehicles; and
- Light rail projects powered by electricity."

Based on the project types listed above, this project may be considered a project of air quality concern under *40 CFR 93.123(b)(i) and (ii).*

New Highway Capacity

Is this a new highway project that has a significant number of diesel vehicles? *40CFR 93.123(b(i).*

NO – This project is not a new highway project that has a significant number of diesel vehicles.

Expanded Highway Capacity

Is this an expanded highway projects that have a significant increase in the number of diesel vehicles? *40CFR 93.123(b)(i).*

YES – This project is an expanded highway project that has a significant number of diesel vehicles. The AADT and truck percentage for the Build alternative were compared to the No Build alternative on roadway segments and intersections along the project corridor for SR24 project, as summarized in Tables 1 and 2 below. As can be seen in Table 1, total truck AADT would be 3,965 to 17,875 on SR202 segments and 3,564 to 12,756 on SR24 segments in 2050 Build alternative, and truck AADT would increase -699 to 8,248 vehicles on SR202 segments and 3,564 to 12,317 on SR24 segments in 2050 Build alternative, compared to the No-Build alternative. As shown in Table 2, total truck AADT at intersections would be 645 to 3,205 vehicles in 2050 Build alternative, and truck ADT would increase -1,522 to 531 vehicles at 18 intersections.

Projects with Congested Intersections

Is this a project that affects a congested intersection (LOS D or greater) that has a significant number of diesel trucks, OR will change LOS to D or greater because of an increase in traffic volumes from a significant number of diesel trucks related to the project? *40CFR 93.123(b)(ii).*

YES - This project is a project that affects a congested intersection of LOS D or will change LOS to D or greater which has a significant number of diesel trucks, see Table 3. The intersection operation analysis shows 7 intersections have a LOS of D or E , with total truck AADT at intersections 645 to 3,205 vehicles in 2050 Build alternative, as shown in Table 2.

Table 1 – Roadway Annual Average Daily Traffic and Truck Volumes

Segment	2024 Existing Alternative				2050 No-Build Alternative				2050 Build Alternative				Total Truck AADT Difference (Build - No-Build)
	AADT	Total Truck AADT	MT AADT	HT AADT	AADT	Total Truck AADT	MT AADT	HT AADT	AADT	Total Truck AADT	MT AADT	HT AADT	
SR 202L (W of Power)	62,542	5,551	4,736	815	96,645	10,085	7,980	2,105	111,251	11,258	9,399	1,859	1,173
SR 202L (Between Power Ramps)	48,452	4,227	3,626	601	77,275	8,085	6,384	1,701	89,862	9,027	7,576	1,451	942
SR 202L (Power Ramp to SR 24 Ramp)	64,209	5,003	4,335	668	102,707	8,999	7,199	1,800	116,840	10,105	8,493	1,612	1,106
SR 202L (SR 24 Ramp to Hawes Ramp)	43,358	3,385	2,949	436	66,698	5,518	4,501	1,017	61,797	4,819	4,122	697	-699
SR 202L (Between Hawes Ramps)	41,176	3,160	2,741	419	55,396	4,658	3,805	853	51,329	3,965	3,416	549	-693
SR 202L (Hawes Ramp to SR 24 Ramp)	45,764	3,635	3,152	483	67,853	5,911	4,887	1,024	57,633	5,414	4,218	1,196	-497
SR 202L (SR 24 Ramp to Elliott Ramp)	101,700	8,842	7,702	1,140	139,389	12,930	10,824	2,106	162,557	15,744	13,322	2,422	2,814
SR 202L (Between Elliott Ramps)	93,334	8,182	7,116	1,066	124,356	12,126	10,221	1,905	147,641	15,032	12,732	2,300	2,906
SR 202L (Elliott Ramp to Guadalupe Ramp)	112,900	9,872	8,639	1,233	150,532	14,240	11,959	2,281	172,838	17,087	14,449	2,638	2,847
SR 202L (Between Guadalupe Ramp)	62,933	5,507	4,822	685	90,134	8,077	6,693	1,384	161,018	16,325	13,779	2,546	8,248
SR 202L (N of Guadalupe)	116,910	10,507	9,221	1,286	161,843	15,279	12,672	2,607	182,592	17,875	14,904	2,971	2,596
SR 24 (Between Ellsworth Ramps)	---	---	---	---	---	---	---	---	115,568	12,317	10,226	2,091	12,317
SR 24 (Ellsworth to Williams Field)	38,562	3,820	3,295	525	57,094	6,580	5,282	1,298	126,978	12,756	10,592	2,164	6,176
SR 24 (Between Williams Field Ramps)	---	---	---	---	---	---	---	---	104,944	10,458	8,567	1,891	10,458
SR 24 (Williams Field to Signal Butte)	34,794	3,310	2,813	497	46,582	5,423	4,302	1,121	111,698	10,820	8,861	1,959	5,397
SR 24 (Between Signal Butte Ramps)	---	---	---	---	---	---	---	---	97,804	8,733	7,216	1,517	8,733
SR 24 (Signal Butte to Meridian)	21,960	1,381	1,185	196	37,252	3,523	2,809	714	107,101	8,726	7,176	1,550	5,203
SR 24 (Between Meridian Ramps)	---	---	---	---	---	---	---	---	75,414	6,312	5,089	1,223	6,312
SR 24 (Meridian to Ironwood)	18,174	1,112	961	151	35,100	2,716	2,146	570	79,270	6,534	5,239	1,295	3,818
SR 24 (E of Ironwood Off-Ramp)	---	---	---	---	---	---	---	---	39,725	3,564	2,884	680	3,564
Ramp N-E (WB SR 24 to NB SR 202L)	28,098	2,662	2,308	354	35,817	3,600	3,022	578	47,675	5,098	4,263	835	1,498
Ramp N-W (WB SR 24 to WB SR 202L)	11,275	900	778	122	18,707	1,798	1,398	400	27,450	2,742	2,278	464	944
Ramp W-S (SB SR 202L to EB SR 24)	27,838	2,545	2,243	302	35,719	3,420	2,916	504	45,646	4,797	4,038	759	1,377
Ramp E-S (EB SR 202L to EB SR 24)	9,574	717	608	109	17,302	1,684	1,300	384	27,593	2,545	2,092	453	861

Notes: AADT – Annual average daily traffic
MT – Medium Trucks (vehicles with 2 axles & 6 wheels; gross vehicle weight – 10,000 to 26,400 pounds).
HT – Heavy Trucks (vehicles with 3 or more axles; gross vehicle weight greater than 26,400 pounds).

Source: Traffic data provided by Stanley Consultants on February 22, 2025.

Table 2 – SR202 and SR24 Intersection AADT & Truck Volumes

Intersection	Veh Class	2050 No-Build Alternative					2050 Build Alternative					Difference (Build - No-Build)
		EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	
Power Road and EB SR 202L	Total AADT	9,768		24,903	24,810	59,481	9,768		24,903	24,810	59,481	0
	MT AADT	264		672	670	1,606	264		672	670	1,606	0
	HT AADT	88		224	223	535	88		224	223	535	0
Power Road and WB SR 202L	Total AADT		13,150	22,156	24,592	59,898		13,150	22,156	24,592	59,898	0
	MT AADT		434	731	812	1,977		434	731	812	1,977	0
	HT AADT		158	266	295	719		158	266	295	719	0
Hawes Road and EB SR 202L	Total AADT	5,535		8,751	11,139	25,425	7,033		11,119	14,153	32,306	6,881
	MT AADT	161		254	323	737	204		322	410	937	200
	HT AADT	89		140	178	407	113		178	226	517	110
Hawes Road and WB SR 202L	Total AADT		7,927	8,968	4,467	21,362		10,111	11,439	5,698	27,248	5,885
	MT AADT		277	314	156	748		354	400	199	954	206
	HT AADT		135	152	76	363		172	194	97	463	100
Elliot Road and NB SR202L	Total AADT	20,216	20,832	7,821		48,869	20,324	20,943	7,863		49,130	261
	MT AADT	708	729	274		1,710	711	733	275		1,720	9
	HT AADT	323	333	125		782	325	335	126		786	4
Elliot Road and SB SR202L	Total AADT	8,635	12,523		13,992	35,151	8,732	12,663		14,149	35,543	393
	MT AADT	440	639		714	1,793	445	646		722	1,813	20
	HT AADT	173	250		280	703	175	253		283	711	8
Guadalupe Road and NB SR 202L	Total AADT	18,296	21,860	6,248	0	46,404	18,296	21,860	6,248		46,404	0
	MT AADT	238	284	81	0	603	238	284	81		603	0
	HT AADT	55	66	19	0	139	55	66	19		139	0
Guadalupe Road and SB SR 202L	Total AADT	11,941	15,099		10,916	37,956	11,941	15,099		10,916	37,956	0
	MT AADT	155	196		142	493	155	196		142	493	0
	HT AADT	48	60		44	152	48	60		44	152	0
Ellsworth Road and EB SR 24	Total AADT	14,680		14,843	11,192	40,715	15,365		15,536	11,714	42,615	1,901
	MT AADT	440		445	336	1,221	461		466	351	1,278	57
	HT AADT	206		208	157	570	215		218	164	597	27
Ellsworth Road and WB SR 24	Total AADT		5,485	20,176	13,244	38,904		5,625	20,692	13,583	39,899	995
	MT AADT		159	585	384	1,128		163	600	394	1,157	29
	HT AADT		66	242	159	467		67	248	163	479	12
Williams Field Road and EB SR 24	Total AADT	26,340		6,720	13,159	46,219	10,274		2,621	5,133	18,027	-28,191
	MT AADT	869		222	434	1,525	339		86	169	595	-930
	HT AADT	500		128	250	878	195		50	98	343	-536
Williams Field Road and WB SR 24	Total AADT		6,741	22,954	23,715	53,410		3,481	11,853	12,246	27,581	-25,829
	MT AADT		209	712	735	1,656		108	367	380	855	-801
	HT AADT		128	436	451	1,015		66	225	233	524	-491
Signal Butte Road and EB SR 24	Total AADT	12,192		28,700	18,917	59,808	7,653		18,016	11,875	37,545	-22,263
	MT AADT	439		1,033	681	2,153	276		649	428	1,352	-801
	HT AADT	305		717	473	1,495	191		450	297	939	-557
Signal Butte Road and WB SR 24	Total AADT		8,643	29,802	21,504	59,949		4,654	16,048	11,580	32,283	-27,666
	MT AADT		311	1,073	774	2,158		168	578	417	1,162	**-996**
	HT AADT		164	566	409	1,139		88	305	220	613	**-526**
Meridian Road and EB SR 24	Total AADT	11,856		16,273	5,351	33,480	15,335		21,049	6,922	43,306	9,826
	MT AADT	462		635	209	1,306	598		821	270	1,689	**383**
	HT AADT	178		244	80	502	230		316	104	650	**147**
Meridian Road and WB SR 24	Total AADT		1,664	17,332	6,660	25,656		1,991	20,743	7,971	30,705	5,049
	MT AADT		63	659	253	975		76	788	303	1,167	**192**
	HT AADT		23	243	93	359		28	290	112	430	**71**
Ironwood Drive and EB SR 24	Total AADT	20,958		24,150	7,584	52,691	20,558		23,689	7,439	51,687	-1,005
	MT AADT	985		1,135	356	2,476	966		1,113	350	2,429	**-47**
	HT AADT	314		362	114	790	308		355	112	775	**-15**
Ironwood Drive and WB SR 24	Total AADT		2,554	8,778	14,624	25,956		2,420	8,315	13,853	24,588	-1,369
	MT AADT		143	492	819	1,454		135	466	776	1,377	-77
	HT AADT		43	149	249	441		41	141	236	418	-23

Notes: AADT – Annual average daily traffic on Approaching Movements
MT – Medium Trucks (vehicles with 2 axles & 6 wheels; gross vehicle weight – 10,000 to 26,400 pounds).
HT – Heavy Trucks (vehicles with 3 or more axles; gross vehicle weight greater than 26,400 pounds).

Source: Traffic data provided by Stanley Consultants on February 22, 2025.

Table 3 – Intersections LOS and Peak-Hour Volumes

Intersection	Peak Hour	2024 Existing Alternative				2050 No-Build Alternative				2050 Build Alternative				Total Truck Volume Difference (Build Alternative - No Build Alternative, vph)[1]
		LOS (delay, sec.)	Volumes (vph)	Medium Truck Volumes (vph)	Heavy Truck Volumes (vph)	LOS (delay, sec.)	Volumes (vph)	Medium Truck Volumes (vph)	Heavy Truck Volumes (vph)	LOS (delay, sec.)	Volumes (vph)	Medium Truck Volumes (vph)	Heavy Truck Volumes (vph)	
Power Road and EB SR 202L	AM	C (24.7)	3001	82	28	D (35.1)	4350	118	40	**E (56.0)**	4,350	118	40	0
	PM	D (37.2)	3846	104	35	F (98.0)	5383	146	49	C (20.5)	5,382	146	49	0
Power Road and WB SR 202L	AM	B (13.1)	2403	80	29	C (23.8)	3250	108	39	C (23.8)	3,250	108	39	0
	PM	B (19.0)	3374	112	41	D (37.9)	4829	160	58	D (40.3)	4,830	160	58	0
Hawes Road and EB SR 202L	AM	B (16.9)	987	29	16	B (19.1)	2114	62	34	B (18.6)	2,643	77	43	24
	PM	B (10.4)	959	28	16	B (17.3)	2345	69	38	C (21.4)	3,030	88	49	30
Hawes Road and WB SR 202L	AM	A (7.8)	379	14	7	D (43.2)	2056	72	35	D (41.2)	2,604	92	45	30
	PM	A (8.2)	514	18	9	D (41.8)	2004	71	35	D (42.7)	2,576	91	44	29
Elliot Road and NB SR202L	AM	D (46.3)	2642	93	43	B (12.7)	3744	132	60	B (13.1)	3,764	132	61	1
	PM	B (13.9)	2524	89	41	B (12.2)	3844	135	62	B (12.2)	3,846	135	62	0
Elliot Road and SB SR202L	AM	C (22.3)	1129	58	23	C (31.3)	1790	92	36	C (31.3)	1,810	93	37	2
	PM	E (59.3)	1886	97	38	D (43.4)	2902	149	59	D (41.6)	2,900	148	58	-2
Guadalupe Road and NB SR 202L	AM	B (12.6)	1968	26	6	B (17.9)	2556	34	8	B (17.9)	2,556	34	8	0
	PM	B (13.5)	2445	32	8	B (15.7)	3303	43	10	B (15.7)	3,303	43	10	0
Guadalupe Road and SB SR 202L	AM	B (18.1)	1566	21	7	C (21.7)	2232	30	9	C (20.6)	2,231	30	9	0
	PM	**F (176.5)**	2385	32	10	C (27.8)	3174	42	13	C (27.9)	3,174	42	13	0
Ellsworth Road and EB SR 24	AM	C (28.6)	3444	104	49	C (25.2)	5026	151	71	C (24.4)	5,128	154	72	4
	PM	B (10.1)	3719	112	53	C (33.9)	5280	159	74	D (36.9)	5,414	163	76	6
Ellsworth Road and WB SR 24	AM	A (6.4)	2752	80	34	C (27.0)	3779	110	46	C (28.8)	3,781	110	46	0
	PM	A (6.5)	2789	81	34	C (28.4)	4066	118	49	C (28.3)	4,170	121	51	5
Williams Field Road and EB SR 24	AM	B (10.9)	1312	44	25	B (17.5)	2448	81	47	C (31.6)	1,186	40	23	-65
	PM	E (95.4)	2907	96	56	F (144.8)	4488	149	86	D (38.2)	1,465	49	28	-158
Williams Field Road and WB SR 24	AM	**F (141.4)**	2724	85	52	F (81.2)	4096	127	78	C (31.3)	1,960	61	38	-106
	PM	**F (95.4)**	1891	59	36	D (38.3)	3859	120	74	C (34.7)	2,164	68	42	-84
Signal Butte Road and EB SR 24	AM	C (26.3)	1845	67	47	C (23.9)	2863	104	72	B (15.5)	2,075	75	52	-49
	PM	C (27.1)	3314	120	83	E (61.3)	5135	185	129	C (28.0)	2,843	103	72	-139
Signal Butte Road and WB SR 24	AM	C (27.9)	2596	94	50	F (109.4)	3602	130	69	C (34.1)	1,727	63	33	-103
	PM	C (27.4)	1806	66	35	D (53.0)	3488	126	67	C (30.2)	2,142	78	41	-74
Meridian Road and EB SR 24	AM	A (5.6)	1211	48	19	C (24.8)	2223	87	34	C (25.1)	3,136	123	48	50
	PM	A (6.6)	2185	86	33	C (29.7)	4137	162	63	C (35.0)	4,941	193	75	43
Meridian Road and WB SR 24	AM	A (4.3)	1792	69	26	F (238.8)	3045	116	43	**D (52.6)**	2,684	102	38	-19
	PM	A (3.1)	983	38	14	F (214.9)	3363	128	48	**E (63.5)**	4,985	190	70	84
Ironwood Drive and EB SR 24	AM	A (6.3)	2992	141	45	C (20.4)	4733	223	71	B (16.0)	4,533	214	68	-12
	PM	B (10.8)	3037	143	46	D (37.1)	5754	271	87	C (26.4)	5,754	271	87	0
Ironwood Drive and WB SR 24	AM	A (7.2)	2343	132	40	B (12.4)	3890	218	67	B (11.3)	3,690	207	63	-15
	PM	A (8.9)	1660	93	29	D (37.6)	3664	206	63	C (27.5)	3,466	195	59	-15

1. Truck Volume Difference includes both MT and HT
Volumes (vph) at the intersection includes all approaching movements

MT – Medium Trucks (vehicles with 2 axles & 6 wheels; gross vehicle weight – 10,000 to 26,400 pounds) HT – Heavy Trucks (vehicles with 3 or more axles; gross vehicle weight greater than 26,400 pounds).

Source: LOS data provided by Stanley Consultants on February 22, 2025.

New Bus and Rail Terminals

Does the project involve construction of a new bus or intermodal terminal that accommodates a significant number of diesel vehicles? *40 CFR 93.123(b)(iii)*

NO – This project does not construct any new bus or rail terminals.

Expanded Bus and Rail Terminals

Does the project involve an existing bus or intermodal terminal that has a large vehicle fleet where the number of diesel buses (or trains) increases by 50% or more, as measured by arrivals? *40 CFR 93.123(b)(iv)*

NO – This project does not expand any bus or rail terminals.

Projects Affecting PM Sites of Violation or Possible Violation

Does the project affect locations, areas or categories of sites that are identified in the PM_{10} or $PM_{2.5}$ applicable plan or implementation plan submissions, as appropriate, as sites of violation or potential violation? *40 CFR 93.123(b)(v)*

NO – The project location is not listed in MAG's 2012 SIP as a site of violation or potential violation.

Project Determination

SR24 project is a expanded highway project that has a significant increase in the number of diesel vehicles on roadway segments and at TIs/intersections. Therefore, ADOT is recommending this project for interagency consultation in accordance with 40 CFR93.105 as a Project of Air Quality Concern under *40 CFR 93.123(b(i) and (ii)* and thereby will require a PM hot-spot analysis.

The top three TIs/intersections ranked by volume are as follows:

- Guadalupe Road and SR 202L
- Elliot Road and SR 202L
- Ellsworth Road and SR 24

And, the top three TIs/intersections ranked by LOS and delay are as follows:

- Meridian Road and WB SR 24 (PM Peak Hour)
- Power Road and EB SR 202L (AM Peak Hour)
- Meridian Road and WB SR 24 (AM Peak Hour)

Based on the top intersections ranked by volume and by LOS and delay, the intersection modeling analysis will be performed for the following five TIs/intersections' peak hours of the days for SR24 project:

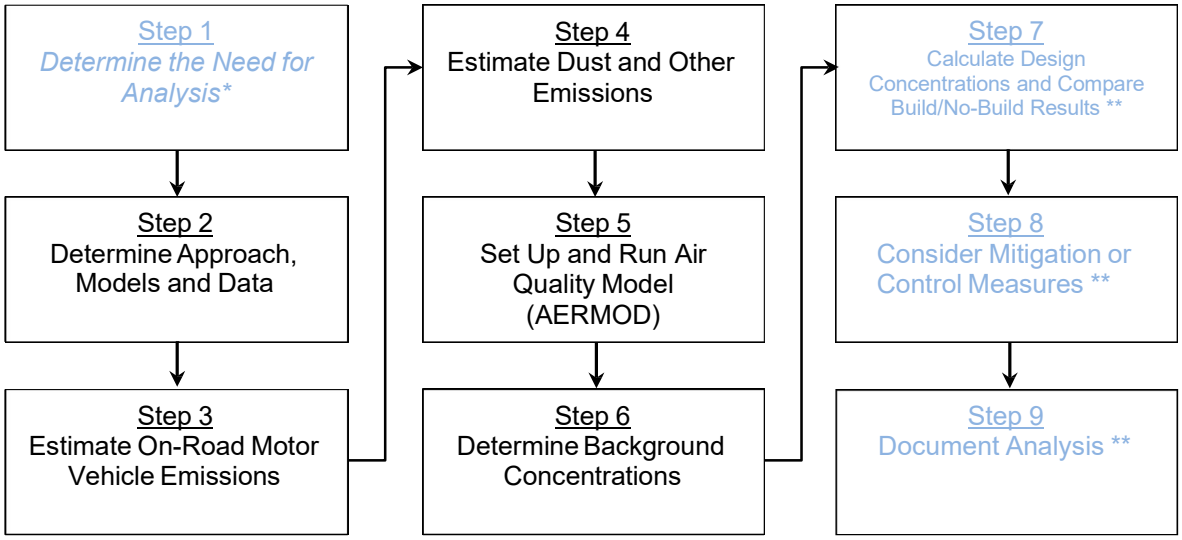
- Guadalupe Road and SR 202L
- Elliot Road and SR 202L
- Ellsworth Road and SR 24
- Meridian Road and SR 24
- Power Road and SR 202L

Section 3.3.2 of EPA's PM Hot Spot Guidance indicates the geographic area to be covered by a PM hot-spot analysis is to be determined on a case-by-case basis. The guidance states that it may be appropriate to focus the PM hot-spot analysis only on locations of highest air quality concentrations, and that if conformity requirements are met at such locations, then it can be assumed that conformity is met throughout the project area.

Based on the above reasons, we believe the five TIs/intersections selected for PM hotspot analysis in the consultation document are the locations that would result in highest air quality concentrations.

Completing a Particulate Matter (PM) Hot-Spot Analysis

The general steps required to complete a quantitative PM hot-spot analysis are outlined below and described in detail in the EPA Office of Transportation and Air Quality guidance document "Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" EPA-420-B-21-037, October 2021.



* Described in this document.
** These Steps will be described and documented in a final air quality analysis report.

Step 2: Determine the Approach, Models, and Data

- Describe the project area (area substantially affected by the project, 58 FR 62212) and emission sources.
- Determine general approach and analysis year(s) – year(s) of peak emissions during the time frame of the transportation plan (69 FR 40056).
- Determine National Ambient Air Quality Standards (NAAQS) and PM types to be evaluated.
- Select emissions and dispersion models and methods to be used.
- Obtain project-specific data (e.g., fleet mix, peak-hour volumes and average speed).

Step 3: Estimate On-Road Motor Vehicle Emissions

a. Estimate on-road motor vehicle emissions using MOVES.

Step 4: Estimate Dust and Other Emissions

□ Estimate road dust emissions using AP-42 Paved Roads.
□ Do emissions from other sources (e.g., locomotives) need to be considered?

Step 5: Set Up and Run Air Quality Model (AERMOD)

- Obtain and input required site data (e.g., meteorological).
- Input MOVES and AP-42 outputs (emission factors).
- Determine number and location of receptors, roadway links, and signal timing.
- Run air quality dispersion model and obtain concentration results.

Step 6: Determine Background Concentrations

a. Determine background concentrations from nearby and other emission sources excluding the emissions from the project itself.
b. An Atypical Events Report is needed for this project.

Step 7: Calculate Design Concentrations and Compare Build/No-Build Results

* Add step 5 results to background concentrations to obtain values for the Build scenario.
* Determine if the design values allow the project to conform.

Step 8: Consider Mitigation or Control Measures

a. Consider measures to reduce emissions and redo the analysis. If mitigation measures are required for project conformity, they must be included in the applicable SIP and be enforceable.
b. Determine if the design values from allow the project to conform after implementing mitigation or control measures.

Step 9: Document Analysis

a. Determine if the project conforms or not based on the results of step 7 or step 8.
To support the conclusion that a project meets conformity under 40 CFR 93.116 and 93.123, at a minimum the documentation will include:

- *Description of proposed project, when it is expected to open, and projected travel activity data.*
- *Analysis year(s) examined and factors considering in determining year(s) of peak emissions.*
- *Emissions modeling data, model used with inputs and results, and how characterization of project links.*
- *Model inputs and results for road dust, construction emissions, and emissions from other source if needed.*
- *Air Quality modeling data, included model used, inputs and results and receptors.*
- *How background concentrations were determined.*
- *Any mitigation and control measures implemented, including public involvement or consultation if needed.*
- *How interagency and public participation requirements were met.*
- *Conclusion that the proposed project meets conformity requirements.*
- *Sources of data for modeling.*

Table 1. Proposed Inputs, Parameters and Data Sources

Estimate On-Road Motor Vehicle Emissions (Step 3)		
MOVES3.1	**Input**	**Data Source/Detail**
Scale	*Onroad, Project Scale and Inventory*	*MAG Regional Conformity Data (Feb, 2025)*
Time Spans	*2050, 16 runs* *PM_{10} emission factors were developed for an analysis year of 2050, which represents the year peak emissions from the project are expected. Vehicle emissions of PM10 are a combination of vehicle exhaust, brakewear, tirewear, and road dust. Road dust is the largest contributor to the overall emissions. Because road dust is highly dependent on vehicle volumes, the analysis year of 2050 was selected as the year of peak emissions because it was the year with the greatest vehicle volumes. This has been reflected in the 2021 MAG Conformity Analysis budget test, which resulted in highest PM10 emissions in 2050 due to largest VMT and the most surrounding PM emissions.*	*4 seasons (Jan, Apr, July & Oct) x 4 weekday time periods (6-9AM, 9AM-4PM, 4-7PM & 7PM-6AM)*
Geographic Bounds	*Maricopa County*	*EPA Hot Spot Guidance Section 4.4.4*
Onroad Vehicles	*All Fuels and Source Use Types*	*EPA Hot Spot Guidance Section 4.4.5*
Road Type	*Urban Restricted and Urban Unrestricted access*	*EPA Hot Spot Guidance Section 4.4.6*
Pollutants and Processes	*Primary Exhaust PM10-Total(for Running Exhaust and Crankcase Running Exhaust), Break Wear Particulate, Tire Wear Particulate*	*EPA Hot Spot Guidance Sections 2.5, 4.4.7*
General Output and Output Emissions Detail	*Output Database TBD*	*EPA Hot Spot Guidance Section 4.4.8, 4.4.9 & 4.6*
Create Input Database	*Input database will be created and modified for Project level using required Regional Inputs from latest Regional Conformity Analysis.*	*MAG Regional Conformity Data (Feb, 2025)*
Project Data Manager	*Database will be created and MOVES3.1 templates will be created to include local project data and information provided by MAG, e.g., Fuel, Age Distribution, Meteorology Data, to be consistent with the regional model. Links and Link Source Type will be specific to project as provided by the traffic study, any missing information will use default MOVES3.1 data.*	*EPA Hot Spot Guidance Sections 4.5 &Appendix D*
Meteorology	*Calculated from current ADEQ Phoenix AERMET data based on 4 seasons and 4 weekday time periods from year 2017 to 2021.*	*16 meteorology data set, 4 seasons (Jan, Apr, July & Oct) x 4 weekday time periods*
Age Distribution	*MAG local specific data (sourceTypeID: 11 – 62, yearID: 2050, ageID: 0 -30)*	*MAG Regional Conformity Data (Feb, 2025)*
Fuel	*MOVES default*	*EPA Hot Spot Guidance Section 4.5.3*

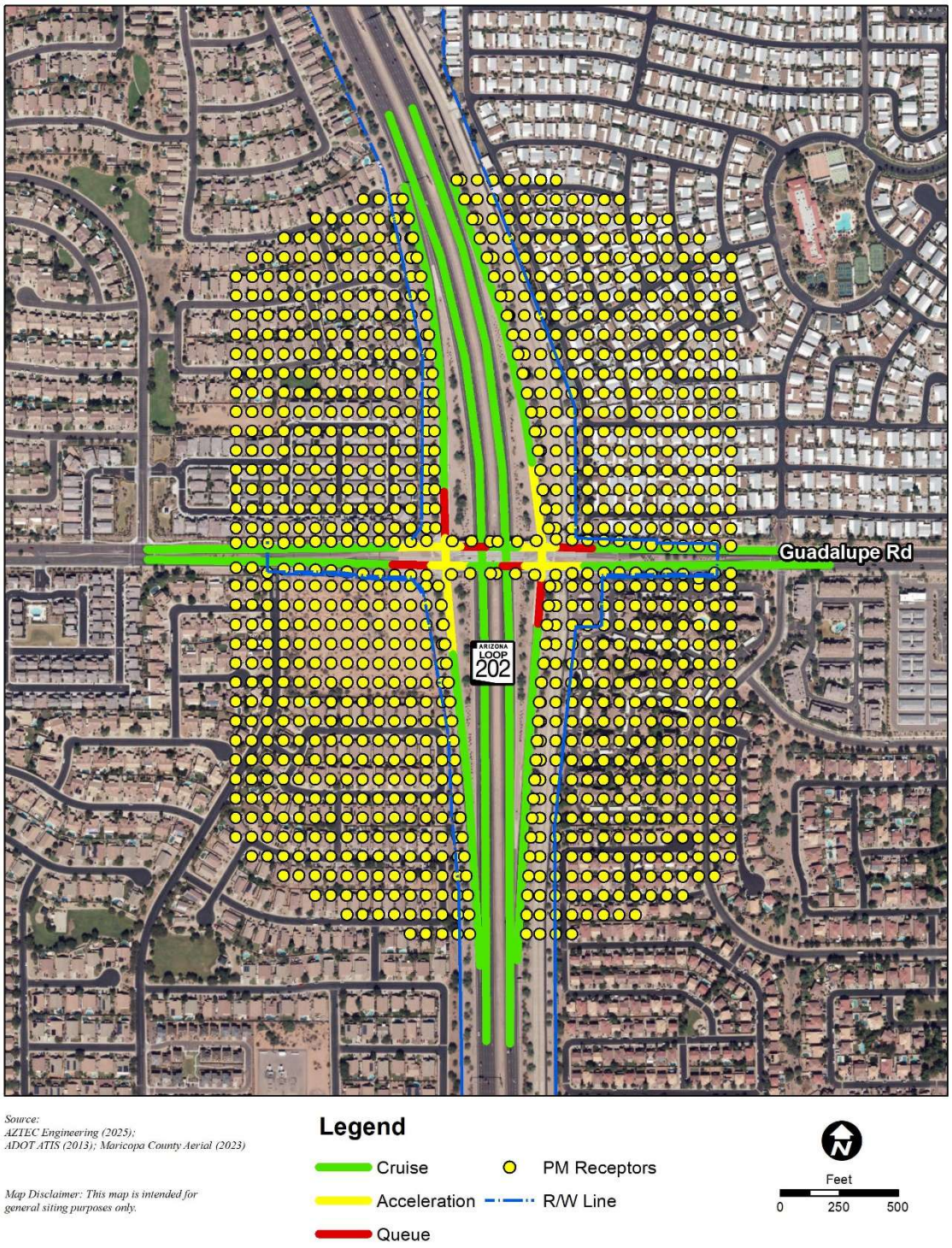
I/M Programs	*Not used. Check the box labeled "No I/M Program" in MOVES*	*MAG Regional Conformity Data (Feb, 2025)*
Retrofit Data	*Not used*	
Links	*Please see attached the link maps.*	
Link Source Types	*Option 2 in the EPA's PM Hot- spot Guidance Section 4.5.7 will be used.*	*MAG Regional Conformity Data (Feb, 2025)*
Link Drive Schedules, Operating Mode Distribution	*Options 1 in the EPA's PM Hot-spot Guidance Section 4.5.8 will be used. Average speeds and road types through the Links Importer will be used. Detailed information through the Link Drive Schedules of Option 2 and Op-Mode Distribution Importers of Option 3 is not available by MAG. MAG provided travel demand model (TDM) supplied traffic data for PM hotspot analysis. This detailed information is normally used/generated by traffic micro-simulations, which is not the intent for this exercise.*	
Off-Network, Hoteling	*Not used*	
Estimate Dust and Other Emissions (Step 4)		
AP-42, Fifth Edition, 2011	**Parameter**	**Data Source/Detail**
Average Weight Vehicles	*Freeways 3.95 tons in 2025, 4.00 tons in 2030, 4.12 tons in 2040, and 4.27 tons in 2050. Arterials 2.65 tons in 2025, 2.65 tons in 2030, 2.65 tons in 2040, and 2.65 tons in 2050*	*MAG Regional Conformity Data (Feb. 2025)*
Silt Loading	*Section 13.2.1 Paved Roads from AP 42 will be used, consistent with the Regional analysis from MAG. Emission factors for road and construction dust should be added to the emission factors generated for each link by MOVES. Ex. Silt loading – Freeways .02 g/m^2, Arterials >10,000 ADT .067g/m^2, Low traffic roads <10,000 ADT .23g/m^2.*	*EPA Hot Spot Guidance Section 6, When estimating emissions of re-entrained road dust from paved roads, site-specific silt loading data must be consistent with the data used for the project's county in the regional emissions analysis (40 CFR 93.123(c)(3)).*
Construction Dust	*Construction Emissions will not be addressed because the construction of this project is not expected to last longer than 5 years. There are no other sources (e.g., locomotives) that need to be considered for most projects.*	EPA Hot Spot Guidance Section 6.5
Precipitation	*In 2008-2012 SIP/Regional Conformity used average of 32 days with at least .01 inch of precipitation County.*	*The MAG 2012 Five Percent Plan for PM-10 (used for the Conformity Analysis for the FY 2025-2030 MAG TIP and the Momentum 2050 RTP).*
Set Up and Run Air Quality Model (AERMOD) (Step 5)		
AERMOD v.24142	**Parameter**	**Data Source/Detail**
Model Setup (CO Pathway)		*EPA Hot Spot Guidance Section 7.1, 7.2 & Appendix J, AERMOD User's Guide Section 2.3.2 & 3.2*

TITLEONE	*TBD*	
MODELOPT	*CONC FLAT. Initial modeling will be done with all sources and receptors at grade.*	*Modeling Concentrations and Flat Terrain*
AVERTIME	*24*	*Average across each 24-hour period from the available met data*
URBANOPT	*1,650,070*	*Population of Phoenix, AZ https://www.census.gov/quickfacts/fact/table/phoenixcityarizona/PST045222*
FLAGPOLE	*Receptor height in meter, 1.8*	
POLLUTID	*PM10*	
Source Types and Characters (SO Pathway)		
LOCATION	*Srcid Srctyp (VOLUME)*	
SRCPARAM	*Srcid Vlemis Relhgt Syinit Szinit*	*VOLUME Source parameters See EPA Hot Spot Guidance Appendix*
URBANSRC	*ALL*	*All urban source*
EMISFACT	*Emission rate=1, Use SEASHR (season by hour-of-day)* *As directed by the PM Hot Spot Guidance, emissions were input in a manner to reflect changes in emission factors and vehicle volumes throughout the day. This was represented in AERMOD by specifying an emission rate of 1 g/s/m² with the variable emission rate option to specify the emission rate of 96 emission factors (4 seasons/24 hours per day) for each emission source. Excel files that outline this process are included with MOVES and AERMOD modeling files for agency review.*	*Total 16 MOVES run=4 seasons x 4 time periods to 96 factors (4 seasons/24 hours)* *See PM hot-spot training slides (FHWA, 2022)*
SRCGROUP	*ALL*	
Meteorological Data (ME Pathway)		
SURFFILE	*Phoenix2017-2021.sfc* *ADOT followed up with ADEQ on the AERMET files- the Phoenix Sky Harbor Airport dataset. ADEQ provided a document detailing the AERMET data completeness, their representativeness of meteorology of the project area, and QA/QC.*	*ADEQ Phoenix AERMET files*
PROFFILE	*Phoenix2017-2021.pfl* *ADOT followed up with ADEQ on the AERMET files- the Phoenix Sky Harbor Airport dataset. ADEQ provided a document detailing the AERMET data completeness, their representativeness of meteorology of the project area, and QA/QC.*	*ADEQ Phoenix AERMET files*
SURFDATA	*23183 2017*	*ADEQ Phoenix AERMET files*
UAIRDATA	*23160 2017*	*ADEQ Phoenix AERMET files*

PROFBASE	*0*	*ADEQ Phoenix AERMET files*
Run Met Pre-Processor	*Not used*	
Urban or Rural Sources	*Specifications for URBANSRC (SO Pathway). The emission sources are SR 303L and I-17 mainlines, ramps, frontage roads, and cross streets. No nearby emission sources other than the roadway links included in the model run would be affected by the project. All emission sources used URBANOPT to specify urban dispersion coefficients. The PM Hot-spot Guidance recommends "in urban areas, sources should generally be treated as urban." Appendix W recommends multiple procedures to identify an area as urban. Using the Auer land use procedure described in Section 7.2.1.1(b)(i). Based on aerial maps, this project is in the urban fringe of Phoenix that is partially developed. Currently, residential takes 13% of the land use, transportation takes 32%, and vacant land takes 41%, other minor land use includes industrial and agriculture. Therefore, the use of urban dispersion coefficients is appropriate for the project area.*	*EPA Hot Spot Guidance Section 7.5.5 & Appendix J.4, AERMOD Implementation Guide, Section 7.2.3 of Appendix W to 40 CFR Part 51*
Receptors (RE Pathway)	*Please see attached receptor maps on pages 15 to 19. Guadalupe Road and SR 202L TI, Elliot Road and SR 202L TI, Power Road and SR 202L TI, Ellsworth Road and SR 24 TI, and Meridian Road and SR 24 TI were selected for PM hotspot analysis that were ranked by AADT volumes on mainline and at intersections, and LOS and delay at intersections. The receptor placement is consistent with the guidance. Receptors were placed 5m from the edge of the roadway. Receptors were placed at 25 meters spacing. (total 1058 receptors for Guadalupe Road and SR 202L TI, 1061 receptors for Elliot Road and SR 202L TI, 1055 receptors for Power Road and SR 202L TI, 996 receptors for Ellsworth Road and SR 24 TI, and 1054 receptors for Meridian Road and SR 24 TI). the highest PM concentration would normally occur at receptors near the roadway sources. the PM concentrations would decrease further away from the roadway sources, and receptor placements further away from the source would not affect the highest PM concentration design value for the intersection and analysis results.*	*EPA Hot Spot Guidance Section 7.6, AERMOD User's Guide Section 2.3.4 & 3.4, Section 7.2.2 of Appendix W to 40 CFR Part 51, See PM hot-spot training slides*
DISCCART	*X Y (Z)*	*Z is optional if FLAGPOLE is already defined in CO Pathway.*

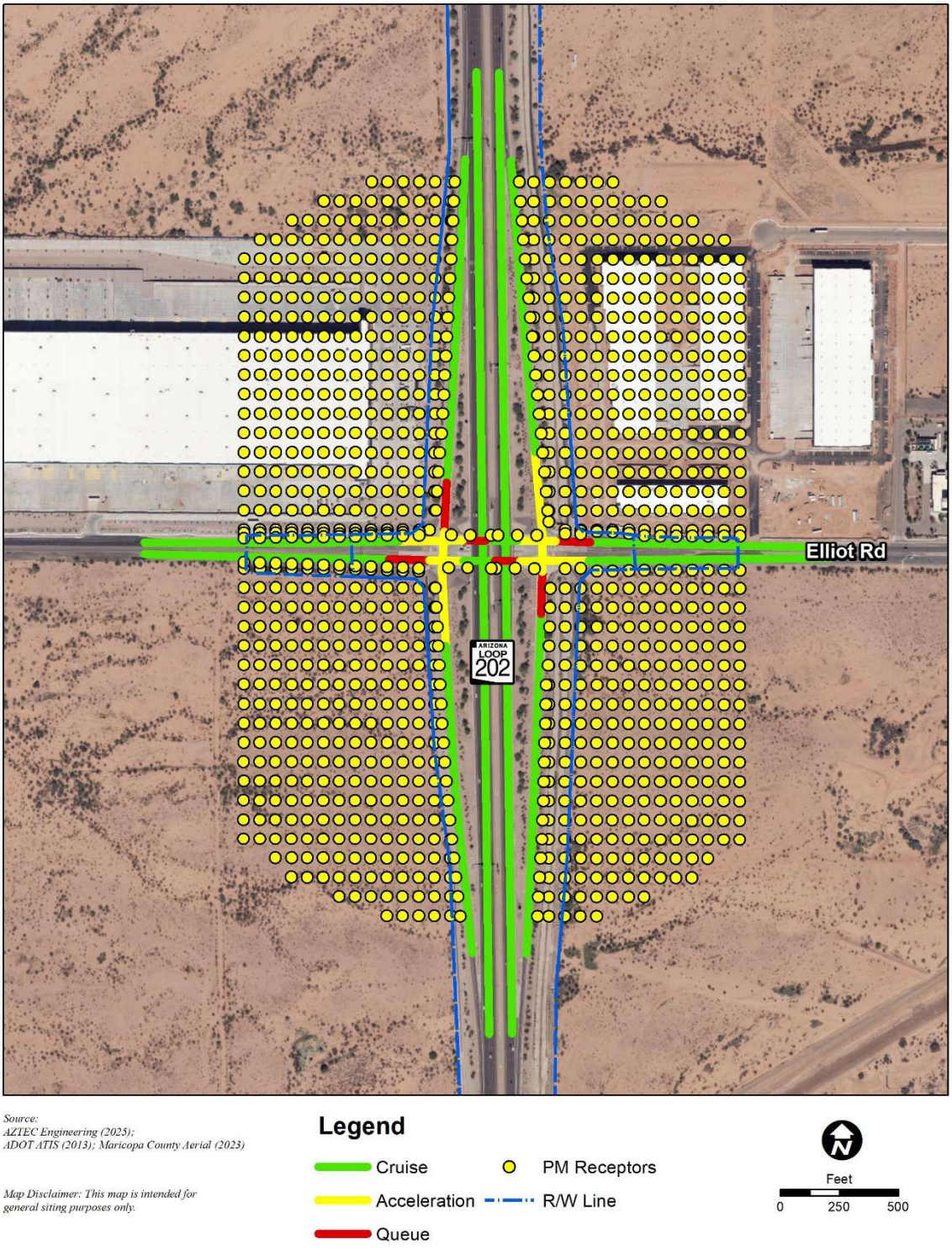
GRIDCART	*Not used*	
Output (OU Pathway)		
RECTABLE	*24 6th*	*Since PM should be one or less exceedance per year, with 5 years of met data, the 6th highest concentration at each receptor*
PLOTFILE	*Not used*	
POSTFILE	*Not used*	
Model Runs		
Determine Background Concentrations (Step 6)		
Source Type	**Description**	**Data Source/Detail**
Nearby Sources	*No nearby sources*	
Other Sources (Ambient Monitoring Data)	*Please see the selected monitor's location map and monitoring data with wind rose information. Higley (HI) monitor was selected as PM background monitor. The background concentration data of Higley (HI) monitor is representative for the project area.* 1. *Similar characteristics between the monitor location and project area including density, mix of emission sources, land use, terrain, etc.* 2. *Distance of monitor from the project area. HI monitor is closer to the project and have concentration most similar to the project area.* 3. *Wind patterns between the monitor and the project area. HI monitor shows significant upwind patterns.* *Draft Atypical Events Report will be prepared. See Atypical Events Report for detailed monitor data, calculations, and resulting recommended background concentrations when ready.* *For the design concentration, the highest sixth-highest value among all receptors should be added to the fourth highest background monitor value (Section 9.3.4 of PM Hot-spot Guidance). The design concentration will then be compared to NAAQS threshold for conformity determination.*	*EPA Hot Spot Guidance Section 8.3, PM hot-spot training slides Module 5 & 6*

Figure 1. PM Links and Receptors Placement for Air Quality Modeling
(Guadalupe Road and SR 202L)



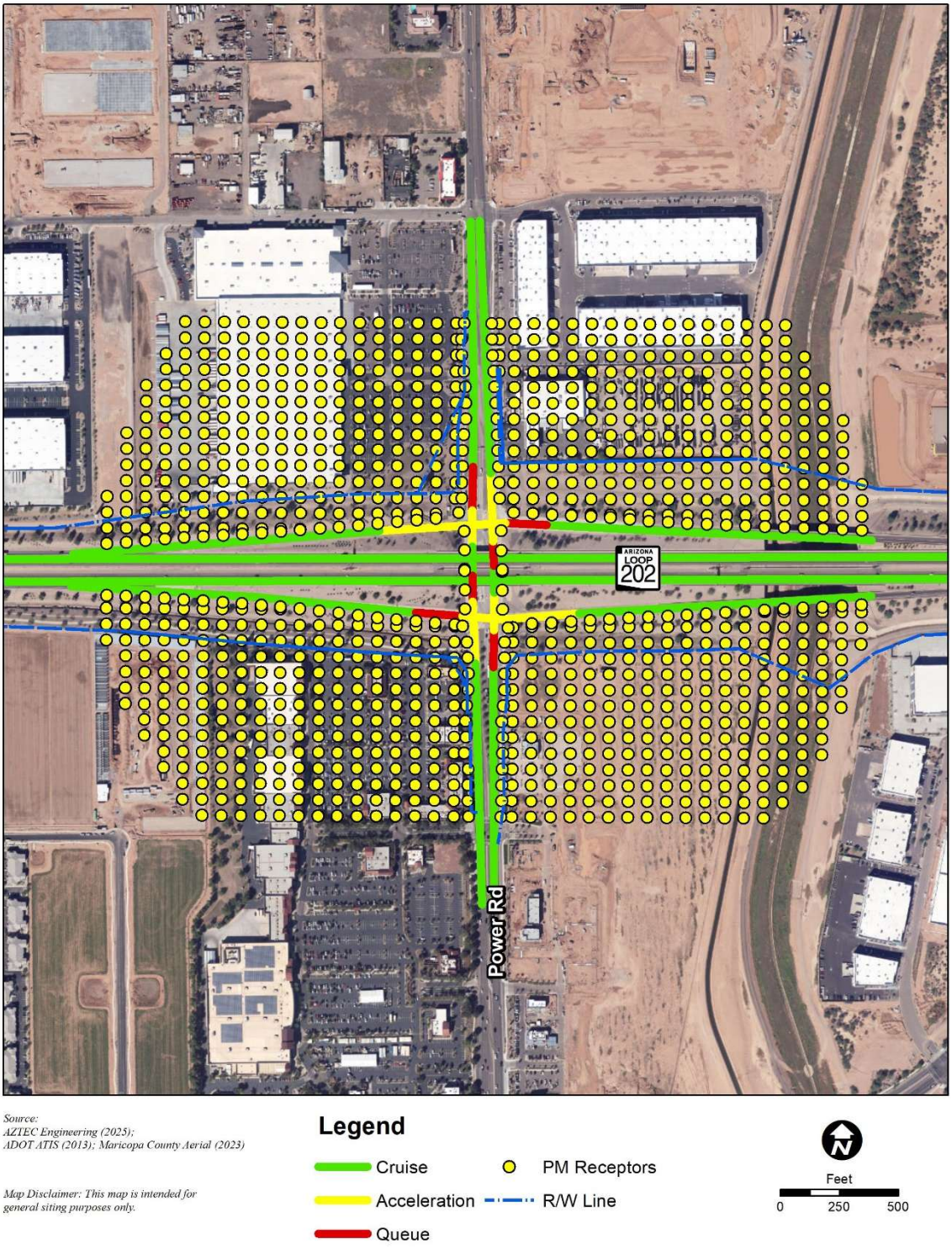
PM receptors were placed on the Guadalupe Road sidewalks above the freeway mainline.

Figure 2. PM Links and Receptors Placement for Air Quality Modeling
(Elliot Road and SR 202L)



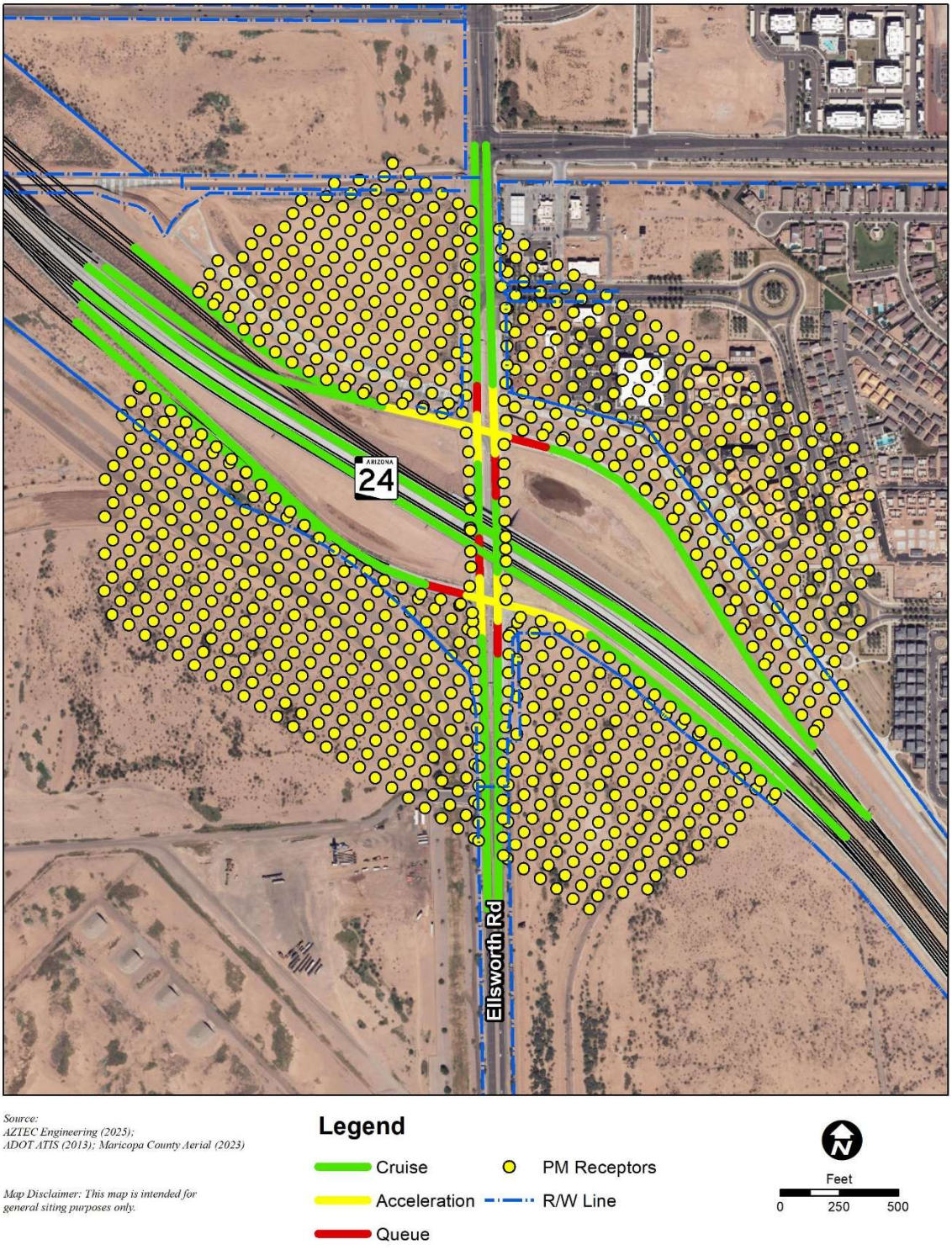
PM receptors were placed on the Elliot Road sidewalks under the freeway mainline.

Figure 3. PM Links and Receptors Placement for Air Quality Modeling
(Power Road and SR 202L)



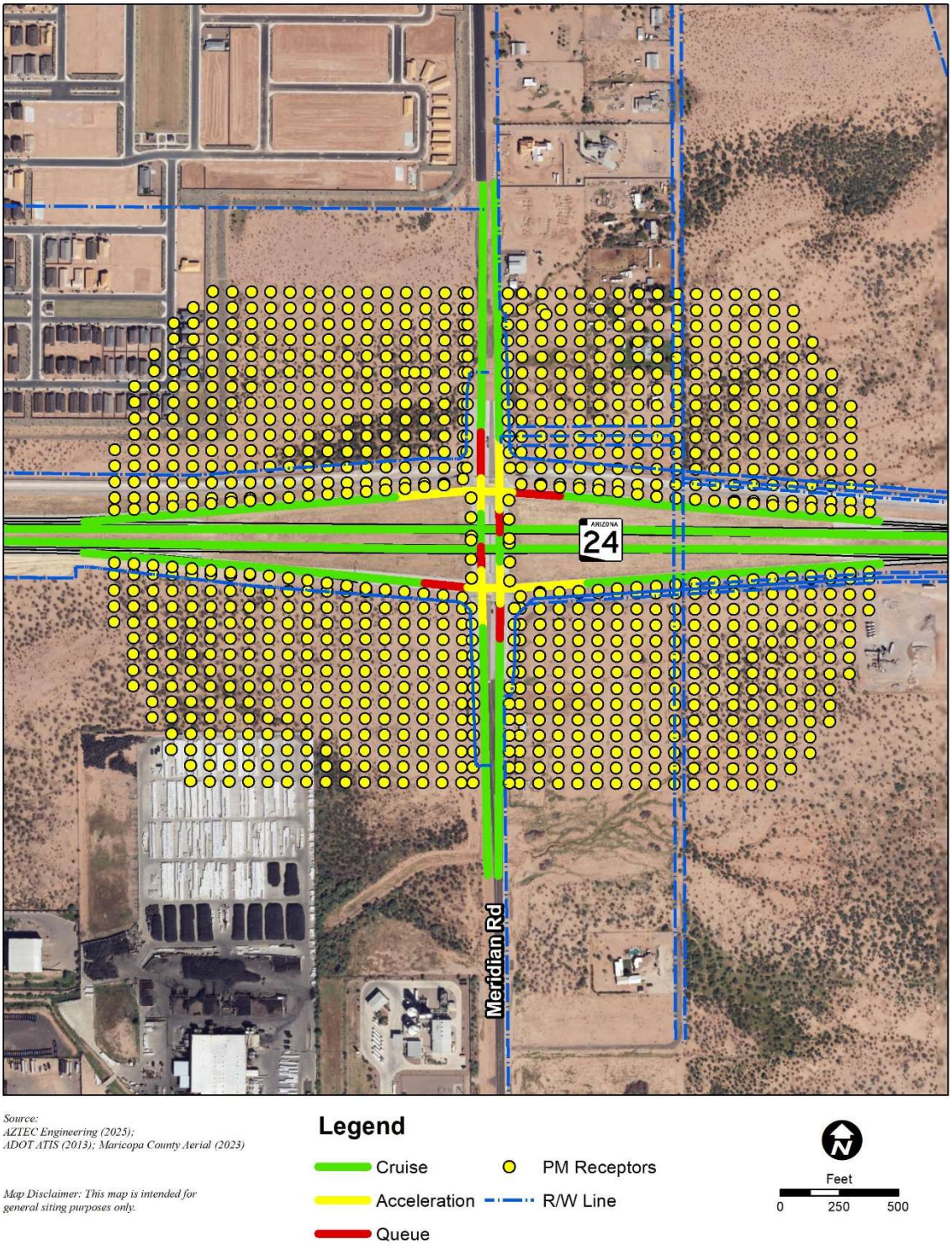
PM receptors were placed on the Power Road sidewalks under the freeway mainline.

Figure 4. PM Links and Receptors Placement for Air Quality Modeling
(Ellsworth Road and SR 24)



PM receptors were placed on the Ellsworth Road sidewalks under the freeway mainline.

Figure 5. PM Links and Receptors Placement for Air Quality Modeling
(Meridian Road and SR 24)



PM receptors were placed on the Meridian Road sidewalks under the freeway mainline.

Figure 6. PM Monitoring Sites adjacent to the Project Area

Source: ADOT ATIS (2022); ASLD ALRIS (2023); Maricopa County (2022).

Map Disclaimer: This map is intended for general siting purposes only.

Higley (HI) (04-013-4006)

Site Location	Higley Rd. & Williams Field Rd., Gilbert
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: Originally, ADEQ began monitoring at this site in 1994 to measure background particulate concentrations near the urban limits of Maricopa County. The MCAQD assumed operating this site in July 2000. This SLAMS location monitors for PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

Number of complete monitoring days at Higley:

2021	2022	2023	Total
357	362	333	1052

4th Highest 24-hour readings at Higley **Without** removing atypical events (in red number):

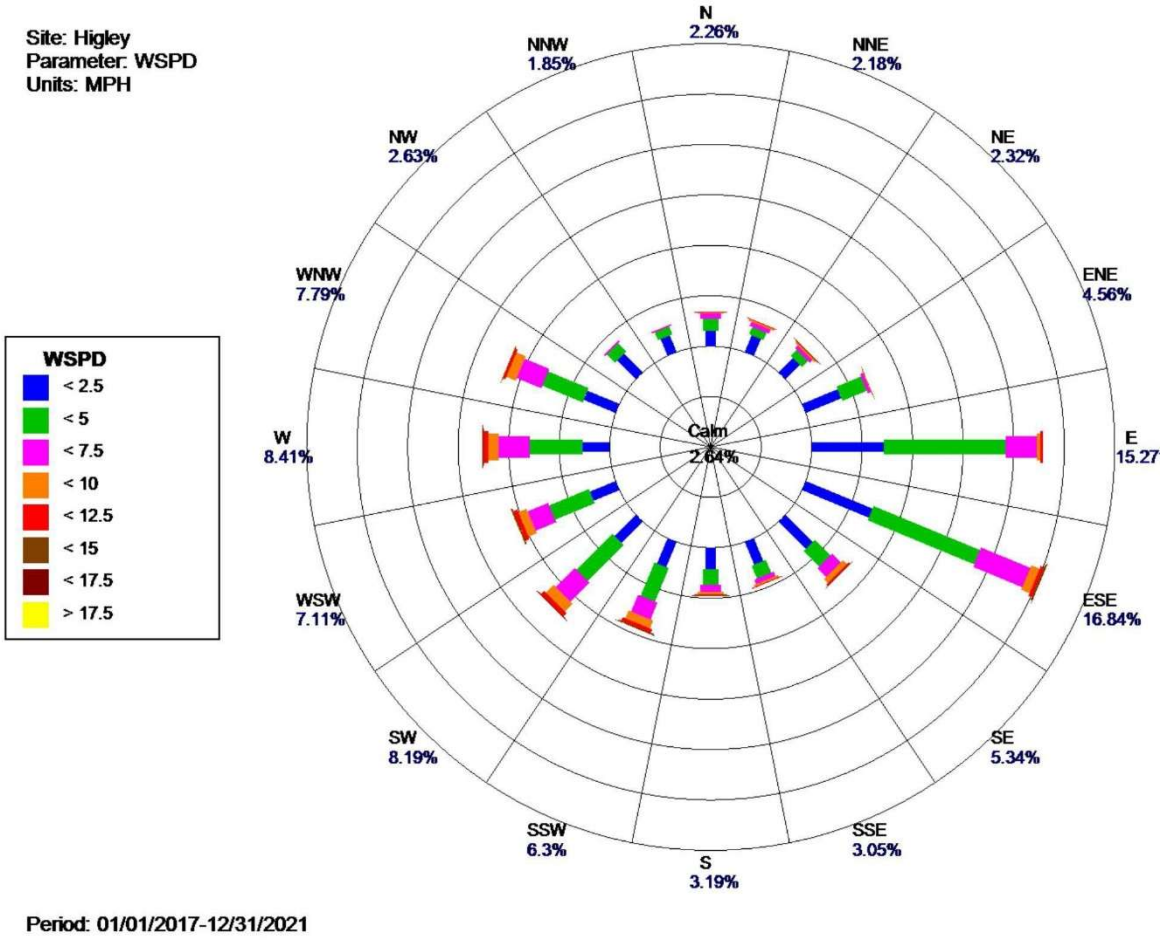
	2021	2022	2023
1	*219*	***160***	*164*
2	*207*	99	*143*
3	134	88	122
4	130	86	114

Based on the background PM10 concentrations and preliminary modeling results, the potential dates (subject to minor changes based on coordination with EPA) of the atypical events to be removed for Higley are: 3/3/2021; 10/11/2021; 10/12/2021; 9/2/2022; 7/21/2023; 7/26/2023; 10/1/2023. These dates have been flagged as atypical events because of PM10 exceedances at varies PM10 monitors per Maricopa County Air Monitoring Network Plans.

4th Highest 24-hour readings at Higley after removing atypical events (in red number). Pending EPA approval.

	2021	2022	2023
1	130	99	122
2	116	88	107
3	***108***	86	103
4	93	83	99

Source: https://www.epa.gov/outdoor-air-quality-data/download-daily-data



Source: email from Ron Pope (AQD) Thu, Dec 1, 2022

References

PM Hot-spot guidance, EPA-420-B-21-037, October 2021.

User's Guide for the AMS/EPA Regulatory Model (AERMOD), EPA-454/B-21-001, April 2021.

AERMOD Implementation Guide, EPA-454/B-21-006, July 2021.

User's Guide for the AERMOD Meteorological Preprocessor (AERMET), EPA-454/B-22-006, June 2022.