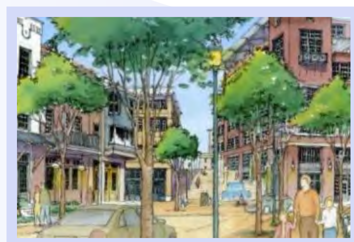
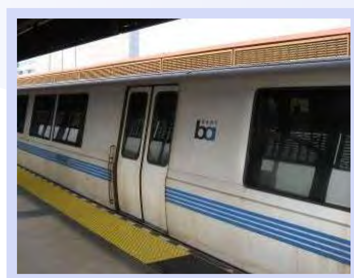
Bay Area Air Quality Management District

California Environmental Quality Act

Air Quality Guidelines





Note: This May 2017 version of the Guidelines includes revisions made to the Air District's 2010 Guidelines to address the California Supreme Court's 2015 opinion in Cal. Bldg. Indus. Ass'n vs. Bay Area Air Quality Mgmt. Dist., 62 Cal.4th 369. ***The May 2017 CEQA Guidelines update does not address outdated references, links, analytical methodologies or other technical information that may be in the Guidelines or Thresholds Justification Report. The Air District is currently working to update any outdated information in the Guidelines.*** *Please see the CEQA webpage at http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa for status updates on the Air District's CEQA Guidelines or contact Jaclyn Winkel at jwinkel@baaqmd.gov for further information.*

May 2017

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PART I: THRESHOLDS OF SIGNIFICANCE & PROJECT SCREENING

2. THRESHOLDS OF SIGNIFICANCE

The SFBAAB is currently designated as a nonattainment area for state and national ozone standards and national particulate matter ambient air quality standards. SFBAAB's nonattainment status is attributed to the region's development history. Past, present and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary. The analysis to assess project-level air quality impacts should be as comprehensive and rigorous as possible.

Similar to regulated air pollutants, GHG emissions and global climate change also represent cumulative impacts. GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Climate change impacts may include an increase in extreme heat days, higher concentrations of air pollutants, sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts.

BAAQMD's approach to developing a *Threshold of Significance* for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions needed to move us towards climate stabilization. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact, and would be considered significant. Refer to Table 2-1 for a summary of Air Quality CEQA Thresholds and to Appendix D for *Thresholds of Significance* documentation.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Table 2-1
Air Quality CEQA Thresholds of Significance*

Pollutant	**Construction-Related**	**Operational-Related**	
Project-Level			
Criteria Air Pollutants and Precursors (Regional)	**Average Daily Emissions (lb/day)**	**Average Daily Emissions (lb/day)**	**Maximum Annual Emissions (tpy)**
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
PM_{10}/$PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
Local CO	None	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)	
GHGs – Projects other than Stationary Sources	None	Compliance with Qualified GHG Reduction Strategy OR 1,100 MT of CO_2e/yr OR 4.6 MT CO_2e/SP/yr (residents+employees)	
GHGs –Stationary Sources	None	10,000 MT/yr	
Risk and Hazards for new sources and receptors (Individual Project)*	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: > 0.3 $\mu g/m^3$ annual average Zone of Influence: 1,000-foot radius from property line of source or receptor	
Risk and Hazards for new sources and receptors (Cumulative Threshold)*	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) $PM_{2.5}$: > 0.8 $\mu g/m^3$ annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of source or receptor	
Accidental Release of Acutely Hazardous Air Pollutants*	None	Storage or use of acutely hazardous materials locating near receptors or new receptors locating near stored or used acutely hazardous materials considered significant	
Odors*	None	5 confirmed complaints per year averaged over three years	

Table 2-1 Air Quality CEQA Thresholds of Significance*		
Pollutant	**Construction-Related**	**Operational-Related**
Plan-Level		
Criteria Air Pollutants and Precursors	None	1. Consistency with Current Air Quality Plan control measures, and 2. Projected VMT or vehicle trip increase is less than or equal to projected population increase
GHGs	None	Compliance with Qualified GHG Reduction Strategy OR 6.6 MT CO_2e/SP/yr (residents + employees)
Risks and Hazards*	None	1. Overlay zones around existing and planned sources of TACs (including adopted Risk Reduction Plan areas) and 2. Overlay zones of at least 500 feet from all freeways and high volume roadways
Accidental Release of Acutely Hazardous Air Pollutants	None	None
Odors*	None	Identify the location, and include policies to reduce the impacts, of existing or planned sources of odors
Regional Plans (Transportation and Air Quality Plans)		
GHGs, Criteria Air Pollutants and Precursors, and Toxic Air Contaminants	None	No net increase in emissions

CEQA = California Environmental Quality Act; CO = carbon monoxide; CO_2e = carbon dioxide equivalent; GHGs = greenhouse gases; lb/day = pounds per day; MT = metric tons; NO_X = oxides of nitrogen; $PM_{2.5}$= fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ppm = parts per million; ROG = reactive organic gases; SO_2 = sulfur dioxide; SP = service population; TACs = toxic air contaminants; TBP = toxic best practices; tons/day = tons per day; tpy = tons per year; yr= year; TBD: to be determined.

*The receptor thresholds were the subject of litigation in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369. The use of the receptor thresholds is discussed in section 2.8 of these Guidelines.

** The Air District recommends that for construction projects that are less than one year duration, Lead Agencies should annualize impacts over the scope of actual days that peak impacts are to occur, rather than the full year.

2.1. CRITERIA AIR POLLUTANTS AND PRECURSORS – PROJECT LEVEL

Table 2-2 presents the *Thresholds of Significance* for operational-related criteria air pollutant and precursor emissions. These represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If daily average or annual emissions of operational-related criteria air pollutants or precursors would exceed any applicable *Threshold of Significance* listed in Table 2-2, the proposed project would result in a cumulatively significant impact.

Table 2-2
Thresholds of Significance for Operational-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Maximum Annual Emissions (tpy)	Average Daily Emissions (lb/day)
ROG	10	54
NO_X	10	54
PM_{10}	15	82
$PM_{2.5}$	10	54

Notes: tpy = tons per year; lb/day = pounds per day; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or lCOess; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; tpy = tons per year.
Refer to Appendix D for support documentation.

2.2. GREENHOUSE GASES – PROJECT LEVEL

The *Thresholds of Significance* for operational-related GHG emissions are:

- For land use development projects, the threshold is compliance with a qualified GHG Reduction Strategy; or annual emissions less than 1,100 metric tons per year (MT/yr) of CO_2e; or 4.6 MT CO_2e/SP/yr (residents + employees). Land use development projects include residential, commercial, industrial, and public land uses and facilities.
- For stationary-source projects, the threshold is 10,000 metric tons per year (MT/yr) of CO_2e. Stationary-source projects include land uses that would accommodate processes and equipment that emit GHG emissions and would require an Air District permit to operate.

If annual emissions of operational-related GHGs exceed these levels, the proposed project would result in a cumulatively considerable contribution of GHG emissions and a cumulatively significant impact to global climate change.

2.3. LOCAL COMMUNITY RISK AND HAZARD IMPACTS – PROJECT LEVEL

The *Thresholds of Significance* for local community risk and hazard impacts are identified below, which apply to the siting of a new source. Local community risk and hazard impacts are associated with TACs and $PM_{2.5}$ because emissions of these pollutants can have significant health impacts at the local level. If emissions of TACs or fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$) exceed any of the *Thresholds of Significance*

listed below, the proposed project would result in a significant impact.

- Non-compliance with a qualified risk reduction plan; or
- An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 would be a cumulatively considerable contribution; or
- An incremental increase of greater than 0.3 micrograms per cubic meter (µg/m^3) annual average $PM_{2.5}$ would be a cumulatively considerable contribution.

Cumulative Impacts
A project would have a cumulative considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius from the fence line of a source plus the contribution from the project, exceeds the following:

- Non-compliance with a qualified risk reduction plan; or
- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0; or
- 0.8 µg/m^3 annual average $PM_{2.5}$.

A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius.

2.4. LOCAL CARBON MONOXIDE IMPACTS – PROJECT LEVEL

Table 2-3 presents the *Thresholds of Significance* for local CO emissions, the 1- and 8-hour California Ambient Air Quality Standards (CAAQS) of 20.0 parts per million (ppm) and 9.0 ppm, respectively. By definition, these represent levels that are protective of public health. If a project would cause local emissions of CO to exceed any of the *Thresholds of Significance* listed below, the proposed project would result in a significant impact to air quality.

Table 2-3
Thresholds of Significance for Local Carbon Monoxide Emissions

CAAQS Averaging Time	Concentration (ppm)
1-Hour	20.0
8-Hour	9.0

Refer to Appendix D for support documentation.

2.5. ODOR IMPACTS – PROJECT LEVEL

The *Thresholds of Significance* for odor impacts are qualitative in nature. A project that would result in the siting of a new source should consider the screening level distances and the complaint history of the odor sources:

- Projects that would site a new odor source farther than the applicable screening distance shown in Table 3-3 from an existing receptor, would not likely result in a significant odor impact.

- A type of odor source with five (5) or more confirmed complaints in the new source area per year averaged over three years is considered to have a significant impact on receptors within the screening distance shown in Table 3-3.

Facilities that are regulated by the CalRecycle agency (e.g. landfill, composting, etc) are required to have Odor Impact Minimization Plans (OIMP) in place and have procedures that establish fence line odor detection thresholds. The Air District recognizes a Lead Agency's discretion under CEQA to use established odor detection thresholds as thresholds of significance for CEQA review for CalRecycle regulated facilities with an adopted OIMP. Refer to *Chapter 7 Assessing and Mitigating Odor Impacts* for further discussion of odor analysis.

2.6. CONSTRUCTION-RELATED IMPACTS – PROJECT LEVEL

2.6.1. Criteria Air Pollutants and Precursors

Table 2-4 presents the *Thresholds of Significance* for construction-related criteria air pollutant and precursor emissions. If daily average emissions of construction-related criteria air pollutants or precursors would exceed any applicable *Threshold of Significance* listed in Table 2-4, the project would result in a significant cumulative impact.

Table 2-4
Thresholds of Significance for Construction-Related Criteria Air Pollutants and Precursors

Pollutant/Precursor	Daily Average Emissions (lb/day)
ROG	54
NO_X	54
PM_{10}	82*
$PM_{2.5}$	54*

* Applies to construction exhaust emissions only.
Notes: CO = carbon monoxide; lb/day = pounds per day; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; SO_2 = sulfur dioxide.
Refer to Appendix D for support documentation.

2.6.2. Greenhouse Gases

The District does not have an adopted *Threshold of Significance* for construction-related GHG emissions. However, the Lead Agency should quantify and disclose GHG emissions that would occur during construction, and make a determination on the significance of these construction-generated GHG emission impacts in relation to meeting AB 32 GHG reduction goals, as required by the Public Resources Code, Section 21082.2. The Lead Agency is encouraged to incorporate best management practices to reduce GHG emissions during construction, as feasible and applicable.

2.6.3. Local Community Risk and Hazards

The *Threshold of Significance* for construction-related local community risk and hazard impacts is the same as that for project operations. Construction-related TAC and PM impacts should be addressed on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and proximity to off-site receptors, as applicable. The Air District recommends that for construction projects that are less than one year duration, Lead Agencies should annualize impacts over the scope of actual days that peak impacts are to occur, rather than the full year.

2.7. THRESHOLDS OF SIGNIFICANCE FOR PLAN-LEVEL IMPACTS

The *Thresholds of Significance* for plans (e.g., general plans, community plans, specific plans, regional plans, congestion management plans, etc.) within the SFBAAB are summarized in Table 2-5 and discussed separately below.

Table 2-5
Thresholds of Significance for Plans*

Criteria Air Pollutants and Precursors	Construction: none Operational: Consistency with Current AQP and projected VMT or vehicle trip increase is less than or equal to projected population increase.
GHGs	Construction: none Operational: 6.6 MT CO_2e/SP/yr (residents & employees) or a Qualified GHG Reduction Strategy. The efficiency threshold should only be applied to general plans. Other plans, e.g. specific plans, congestion management plans, etc., should use the project-level threshold of 4.6 CO_2e/SP/yr.
Local Community Risk and Hazards	Land use diagram identifies special overlay zones around existing and planned sources of TACs and $PM_{2.5}$, including special overlay zones of at least 500 feet (or Air District-approved modeled distance) on each side of all freeways and high-volume roadways, and plan identifies goals, policies, and objectives to minimize potentially adverse impacts.
Odors	Identify locations of odor sources in plan; identify goals, policies, and objectives to minimize potentially adverse impacts.
Regional Plans (transportation and air quality plans)	No net increase in emissions of GHGs, Criteria Air Pollutants and Precursors, and Toxic Air Contaminants. Threshold only applies to regional transportation and air quality plans.

* The receptor thresholds were the subject of litigation in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369. The use of the receptor thresholds is discussed in section 2.8 of these Guidelines.

Notes: AQP = Air Quality Plan; CO_2e = carbon dioxide equivalent; GHGs = greenhouse gases; MT = metric tons; SP = service population; TACs = toxic air contaminants; yr = year; $PM_{2.5}$= fine particulate matter

Refer to Appendix D for support documentation.

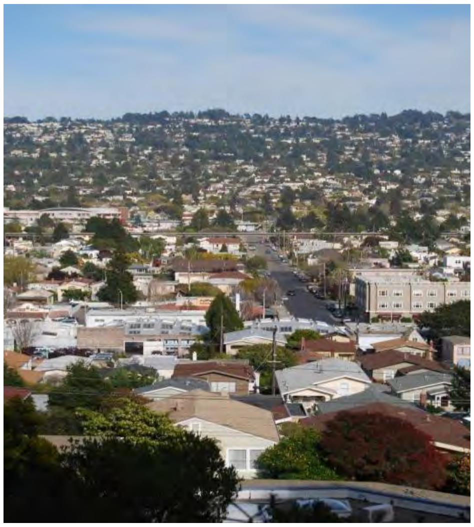
2.7.1. Criteria Air Pollutants and Precursor Emissions

Proposed plans (except regional plans) must show the following over the planning period of the plan to result in a less than significant impact:

- Consistency with current air quality plan control measures.
- A proposed plan's projected VMT or vehicle trips (VT) (either measure may be used) increase is less than or equal to its projected population increase.

2.7.2. Greenhouse Gases

The *Threshold of Significance* for operational-related GHG impacts of plans employs either a GHG efficiency-based metric (per Service Population [SP]), or a GHG Reduction Strategy option, described in Section 4.3.



The *Thresholds of Significance* options for plan level GHG emissions are:

- A GHG efficiency metric of 6.6 MT per SP per year of carbon dioxide equivalent (CO_2e). If annual maximum emissions of operational-related GHGs exceed this level, the proposed plan would result in a significant impact to global climate change.
- Consistency with an adopted GHG Reduction Strategy. If a proposed plan is consistent with an adopted GHG Reduction Strategy that meets the standards described in Section 4.3, the plan would be considered to have a less than significant impact. This approach is consistent with the plan elements described in the State CEQA Guidelines, Section 15183.5.

2.7.3. Local Community Risk and Hazards

The *Thresholds of Significance* for plans with regard to community risk and hazard impacts are:

1. The land use diagram must identify:
   a. Special overlay zones around existing and planned sources of TACs and PM (including adopted risk reduction plan areas); and
   b. Special overlay zones of at least 500 feet (or Air District-approved modeled distance) on each side of all freeways and high-volume roadways.
2. The plan must also identify goals, policies, and objectives to minimize potential impacts and create overlay zones around sources of TACs, PM, and hazards.

Although the Risk and Hazard Thresholds recommend evaluating the impacts of locating new development in areas subject to high levels of TACs and PM, the California Supreme Court determined in 2015 that, as a general rule, CEQA does not require this analysis. Section 2.8 below discusses the Supreme Court's decision with respect to the use of the Risk and Hazard Thresholds.

2.7.4. Odors

The *Thresholds of Significance* for plans with regard to odor impacts are to identify locations of odor sources in a plan and the plan must also identify goals, policies, and objectives to minimize potentially adverse impacts.

2.7.5. Regional Plans

The *Thresholds of Significance* for regional plans is to achieve a no net increase in emissions of criteria pollutants and precursors, GHG, and toxic air contaminants. This threshold applies only to regional transportation and air quality plans.

2.8 Receptor Thresholds

The Receptor Thresholds in these Guidelines address the analysis of exposing new receptors to existing sources of toxic air pollution and odors. These Thresholds were the subject of litigation brought by the California Building Industry Association. The California Supreme Court's decision in that litigation states that: "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents . . . Despite the statute's evident concern with protecting the environment and human health, its relevant provisions are best read to focus almost entirely on how projects affect the environment." The Supreme Court upheld "evaluating a project's potentially significant exacerbating effects on existing environmental hazards . . .Because this type of inquiry still focuses on the project's impacts on the environment—how a project might worsen existing conditions—directing an agency to evaluate how such worsened conditions could affect a project's future users or residents is entirely consistent with this focus and with CEQA as a whole."

The Supreme Court also determined that CEQA requires an analysis of exposing new receptors to existing environmental hazards "in several specific contexts involving certain airport (§ 21096) and school construction projects (§ 21151.8), and some housing development projects (§§ 21159.21, subds. (f), (h), 21159.22, subds. (a), (b)(3), 21159.23, subd. (a)(2)(A), 21159.24, subd. (a)(1), (3), 21155.1, subd. (a)(4), (6))." These provisions "constitute specific exceptions to CEQA's general rule requiring consideration only of a project's effect on the environment, not the environment's effects on project users."

The Supreme Court also indicated that nothing in CEQA prevents local agencies from considering the impact of locating new development in areas subject to existing environmental hazards. However, the Court of Appeal explained "CEQA cannot be used by a lead agency to require a developer or other agency to obtain an EIR or implement mitigation measures solely because the occupants or users of a new project would be subjected to the levels of emissions specified, an agency may do so voluntarily on its own project and may use the Receptor Thresholds for guidance." The Court of Appeal also explained that, under CEQA, the Receptor Thresholds should not be applied to "routinely assess the effect of existing environmental conditions on future users or occupants of a project." The courts did not address the extent to which agencies could rely on their police power, general plans, or other regulatory authority outside of CEQA to require mitigation to address existing environmental hazards. For more information on planning approaches to addressing the impacts of locating new development in areas subject to existing air pollution, please see "Planning Healthy Places." http://www.baaqmd.gov/plans-and-climate/planning-healthy-places

Under the appropriate circumstances described above, the District recommends the following Receptor Thresholds:

Table 2-6

Receptor Thresholds

Risks and Hazards (Individual Project)	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient PM2.5 increase: >0.3 µg/m3 annual average Zone of Influence: 1,000-foot radius from property line of receptor
Risks and Hazards (Cumulative Threshold)	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) PM2.5: > 0.8 µg/m3 annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of receptor
Accidental Release of Acutely Hazardous Air Pollutants	New receptors locating near stored or used acutely hazardous materials considered significant
Odors	5 confirmed complaints per year averaged over three years

5. LOCAL COMMUNITY RISK AND HAZARD IMPACTS[3]

The purpose of this Chapter is (1) to recommend methods whereby local community risk and hazard impacts from projects for both new sources and new receptors can be determined based on comparison with applicable thresholds of significance and screening criteria and (2) to recommend mitigation measures for these impacts. This chapter contains the following sections:

Section 5.2 – Presents methods for assessing single-source impacts from either an individual new source or impacts on new receptors from existing individual sources.

Section 5.3 – Discusses methods for assessing cumulative impacts from multiple sources.

Section 5.4 – Discusses methods for mitigating local community risk and hazard impacts.

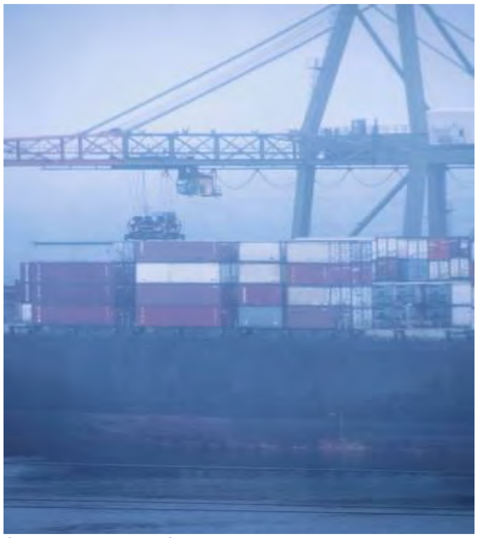
The recommendations provided in this chapter apply to assessing and mitigating impacts for project-level impacts and related cumulative impacts. Refer to Chapter 9 for recommendations for assessing and mitigating local community risk and hazard impacts at the plan-level.

To assist the Lead Agency in evaluating air quality impacts at the neighborhood scale, *Thresholds of Significance* have been established for local community risks and hazards associated with TACs and $PM_{2.5}$ with respect to siting a new source and/or receptor; as well as for assessing both individual source and cumulative multiple source impacts. These *Thresholds of Significance* focus on $PM_{2.5}$ and TACs because these more so than other emission types pose significant health impacts at the local level as discussed separately below.

5.1. TOXIC AIR CONTAMINANTS

TACs are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A wide range of sources, from industrial plants to motor vehicles, emit TACs. Like $PM_{2.5}$, TAC can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The methods presented in this Chapter for assessing local community risk and hazard impacts only include direct TAC emissions, not those formed in the atmosphere.

The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches. For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure. Non-carcinogenic substances differ in that there is generally assumed to



[3] The use of the receptor thresholds is discussed in section 2.8 of these Guidelines

be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to non-carcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to an acceptable reference exposure levels.

TACs are primarily regulated through State and local risk management programs. These programs are designed to eliminate, avoid, or minimize the risk of adverse health effects from exposures to TACs. A chemical becomes a regulated TAC in California based on designation by the California Office of Environmental Health Hazard Assessment (OEHHA). As part of its jurisdiction under Air Toxics Hot Spots Program (Health and Safety Code Section 44360(b)(2)), OEHHA derives cancer potencies and reference exposure levels (RELs) for individual air contaminants based on the current scientific knowledge that includes consideration of possible differential effects on the health of infants, children and other sensitive subpopulations, in accordance with the mandate of the Children's Environmental Health Protection Act (Senate Bill 25, Escutia, Chapter 731, Statutes of 1999, Health and Safety Code Sections 39669.5 et seq.). The methodology in this Chapter reflects the approach adopted by OEHHA in May 2009, which considers age sensitivity factors to account for early life stage exposures. The specific toxicity values of each particular TAC as identified by OEHHA are listed in BAAQMD's Regulation 2, Rule 5: New Source Review of Toxic Air Contaminants.

5.1.1. Fine Particulate Matter

$PM_{2.5}$ is a complex mixture of substances that includes elements such as carbon and metals; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and wood smoke. $PM_{2.5}$ can be emitted directly and can also be formed in the atmosphere through reactions among different pollutants. The methods presented in this Chapter for assessing local community risk and hazard impacts only include direct $PM_{2.5}$ emissions, not those formed in the atmosphere.

Compelling evidence suggests that $PM_{2.5}$ is by far the most harmful air pollutant in the SFBAAB in terms of the associated impact on public health. A large body of scientific evidence indicates that both long-term and short-term exposure to $PM_{2.5}$ can cause a wide range of health effects (e.g., aggravating asthma and bronchitis, causing visits to the hospital for respiratory and cardio-vascular symptoms, and contributing to heart attacks and deaths). BAAQMD recommends characterizing potential health effects from exposure to directly $PM_{2.5}$ emissions through comparison to the applicable *Thresholds of Significance*.

5.1.2. Common Source Types

Common stationary source types of TAC and $PM_{2.5}$ emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to BAAQMD permit requirements. The other, often more significant, common source type is on-road motor vehicles on freeways and roads such as trucks and cars, and off-road sources such as construction equipment, ships and trains. Because these common sources are prevalent in many communities, this Chapter focuses on screening tools for the evaluation of associated cumulative community risk and hazard impacts. However, it is important to note that other influential source types do exist (e.g., ports, railyards, and truck distribution centers), but these are often more complex and require more advanced modeling techniques beyond those discussed herein.

5.1.3. Area of Influence

For assessing community risks and hazards, a 1,000 foot radius is recommended around the project property boundary. BAAQMD recommends that any proposed project that includes the siting of a new source or receptor assess associated impacts within 1,000 feet, taking into account both individual and nearby cumulative sources (i.e., proposed project plus existing and foreseeable future projects). Cumulative sources represent the combined total risk values of each individual source within the 1,000-foot evaluation zone. A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius.

The recommended methodology for assessing community risks and hazards from $PM_{2.5}$ and TACs follows a phased approach. Within this approach, more advanced techniques, for both new sources and receptors, which require additional site specific information are presented for each progressive phase to assess risks and hazards. Each phase provides concentrations and risks that are directly comparable to the applicable *Thresholds of Significance*, although it is important to note that the use of more site specific modeling input data produces more accurate results. Also, progression from one phase to the next in a sequential fashion is not necessary and a refined modeling analysis can be conducted at any time.

5.1.4. Impacted Communities

In the Bay Area, there are a number of urban or industrialized communities where the exposure to TACs is relatively high in comparison to others. These same communities are often faced with other environmental and socio-economic hardships that further stress their residents and result in poor health outcomes. To address community risk from air toxics, the Air District initiated the Community Air Risk Evaluation (CARE) program in 2004 to identify locations with high levels of risk from TACs co-located with sensitive populations and use the information to help focus mitigation measures. Through the CARE program, the Air District developed an inventory of TAC emissions for 2005 and compiled demographic and heath indicator data. According to the findings of the CARE Program, diesel PM, mostly from on and off-road mobile sources, accounts for over 80 percent of the inhalation cancer risk from TACs in the Bay Area. Figure 5-1 shows the impacted communities as of November 2009, including: the urban core areas of Concord, eastern San Francisco, western Alameda County, Redwood City/East Palo Alto, Richmond/San Pablo, and San Jose. For more information on, and possible revisions to, impacted communities, go to the CARE Program website.

In many cases, air quality conditions in impacted communities result in part from land use and transportation decisions made over many years. BAAQMD believes comprehensive, community-wide strategies will achieve the greatest reductions in emissions of and exposure to TAC and $PM_{2.5}$. BAAQMD strongly recommends that within these impacted areas local jurisdictions develop and adopt Community Risk Reduction Plans, described in Section 5.4. The goal of the Community Risk Reduction Plan is to encourage local jurisdictions to take a proactive approach to reduce the overall exposure to TAC and $PM_{2.5}$ emissions and concentrations from new and existing sources. Local plans may also be developed in other areas to address air quality impacts related to land use decisions and ensure sufficient health protection in the community.

5.2. SINGLE SOURCE IMPACTS

5.2.1. Significance Determination

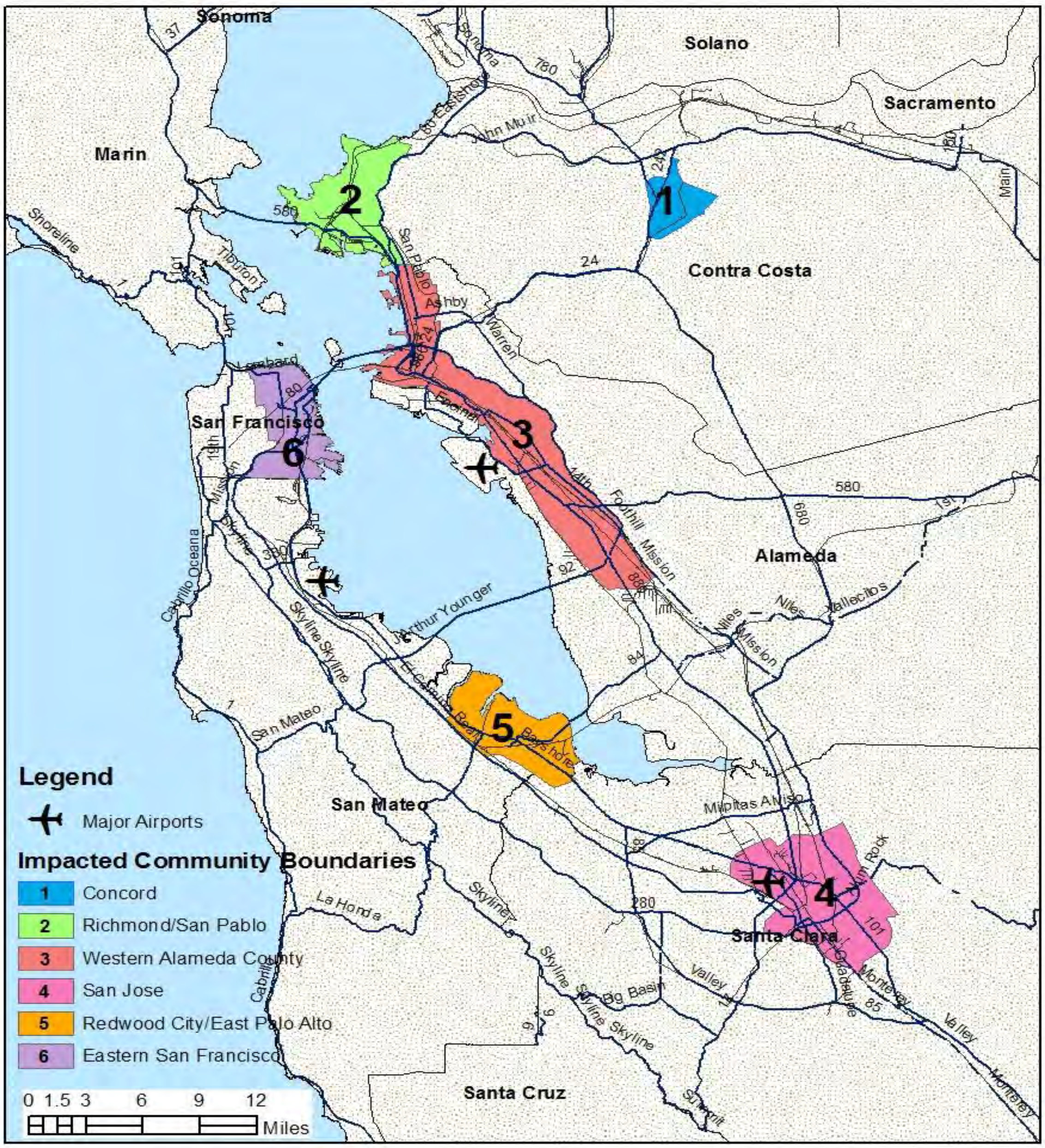
The Lead Agency shall determine whether operational-related TAC and $PM_{2.5}$ emissions generated as part of a proposed project siting a new source or receptor would expose existing or new receptors to levels that exceed BAAQMD's applicable *Thresholds of Significance* stated below:

- Compliance with a qualified Community Risk Reduction Plan;
- An excess cancer risk level of more than 10 in one million, or a non-cancer (i.e., chronic or acute) risk greater than 1.0 HI from a single source would be a significant cumulatively considerable contribution;

- An incremental increase of greater than 0.3 µg/m^3 annual average $PM_{2.5}$ from a single source would be a significant cumulatively considerable contribution.

In all areas, but especially within impacted communities identified under BAAQMD's CARE program, the Lead Agency is encouraged to develop and adopt a Community Risk Reduction Plan. To determine whether an impacted community is located in a jurisdiction, the Lead Agency should refer to Figure 5-1 and the BAAQMD CARE web page at http://www.baaqmd.gov/CARE/. Please consult with BAAQMD if a more precise map is needed.

Impacted Communities **Figure 5-1**



Source: BAAQMD 2009

Exposure of receptors to substantial concentrations of TACs and $PM_{2.5}$ could occur from the following situations:

1. Siting a new TAC and/or $PM_{2.5}$ source (e.g., diesel generator, truck distribution center, freeway) near existing or planned receptors; and
2. Siting a new receptor near an existing source of TAC and/or $PM_{2.5}$ emissions.

BAAQMD recommendations for evaluating and making a significance determination for each of these situations are discussed separately below.

5.2.2. Siting a New Source

When evaluating whether a new source of TAC and/or $PM_{2.5}$ emissions would adversely affect existing or future proposed receptors, a Lead Agency shall examine:

- the extent to which the new source would increase risk levels, hazard index, and/or $PM_{2.5}$ concentrations at nearby receptors,
- whether the source would be permitted or non-permitted by the BAAQMD, and
- whether the project would implement Best Available Control Technology for Toxics (T-BACT), as determined by BAAQMD.

The incremental increase in cancer and non-cancer (chronic and acute) risk from TACs and $PM_{2.5}$ concentrations at the affected receptors shall be assessed. As described above, the recommended methodology for assessing community risks and hazards from $PM_{2.5}$ and TACs follows a phased approach, within which progressively more advanced techniques are presented for each phase (Figure 5-2). Each phase provides concentrations and risks that are directly comparable to the applicable *Thresholds of Significance*, although it is important to note that the use of more site specific modeling input data produces more accurate results. Also, progression from one phase to the next in a sequential fashion is not necessary and a refined modeling analysis can be conducted at any time.

For siting a new source, the first step is to determine the associated emission levels.

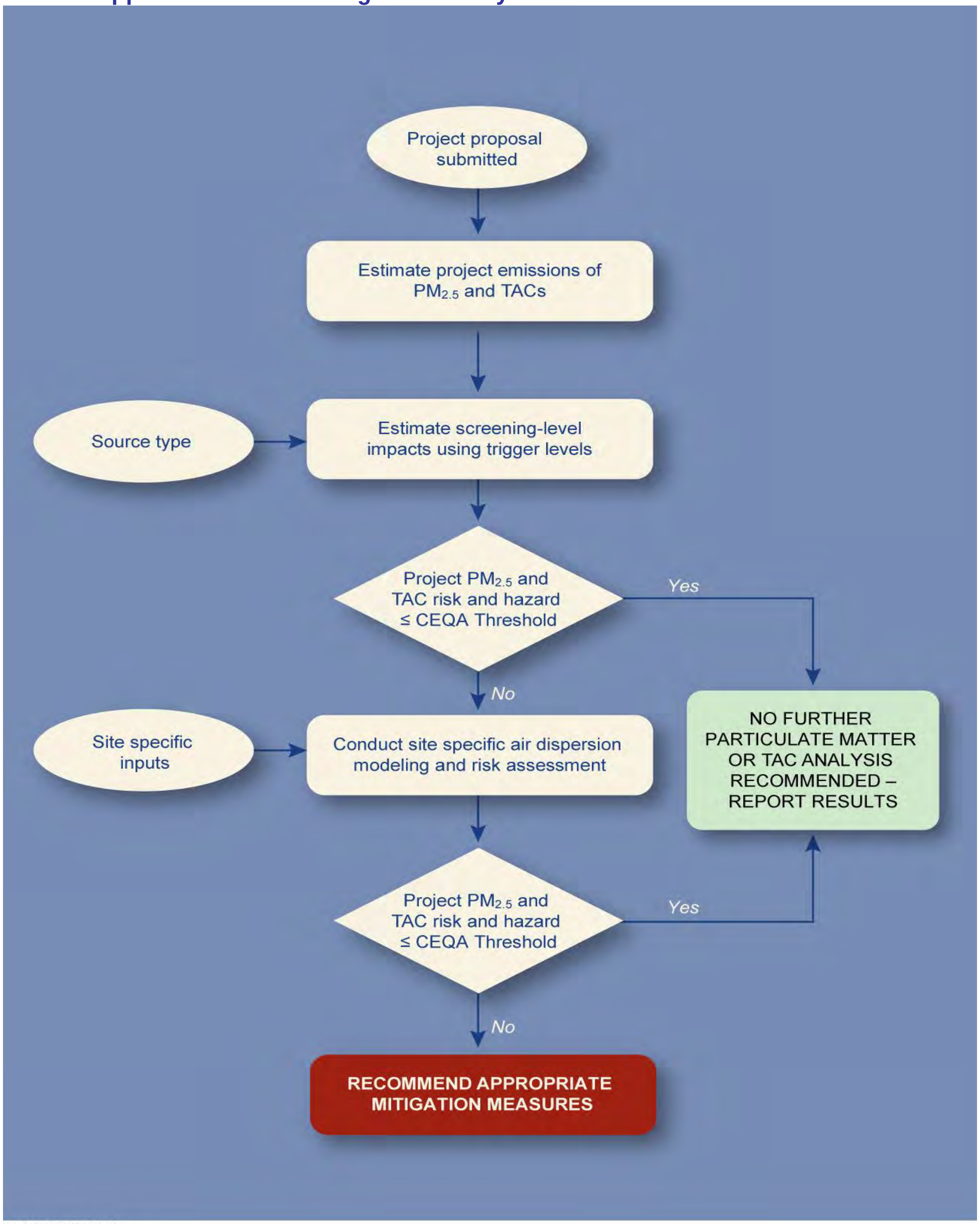
5.2.3. Sources Permitted by BAAQMD

For sources that would be permitted by BAAQMD (e.g., gas stations and back-up diesel generators) the project's type, size, or planned level of use can be used to help estimate $PM_{2.5}$ and TAC emissions. Screening or modeling conducted as part of the permit application can be used to determine cancer and non-cancer risk and $PM_{2.5}$ concentrations for comparing to the applicable *Thresholds of Significance*. BAAQMD can assist in determining the level of emissions associated with the new source. A Lead Agency should identify the maximally exposed existing or reasonably foreseeable future receptor.

Requirements of Toxics New Source Review (Regulation 2, Rule 5) will determine whether the project would implement T-BACT.

Figure 5-2

Phased Approach for Estimating Community Risks and Hazards – New Sources



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Concentration estimates of $PM_{2.5}$ from screening or modeling should be compared with the *Threshold of Significance* for $PM_{2.5}$. If screening estimates determine $PM_{2.5}$ concentrations from the project would not exceed the *Threshold of Significance*, no further analysis is recommended (See Figure 5-2). If emissions would exceed the *Threshold of Significance*, more refined modeling or mitigation measures to offset emission can be considered.

5.2.4. Sources Not Requiring a BAAQMD Permit

Some proposed projects would include the operation of non-permitted sources of TAC and/or $PM_{2.5}$ emissions. For instance, projects that would attract high numbers of diesel-powered on-road trucks or use off-road diesel equipment on site, such as a distribution center, a quarry, or a manufacturing facility, would potentially expose existing or future planned receptors to substantial risk levels and/or health hazards.

For sources that would not require permits from BAAQMD (e.g., distribution centers and large retail centers) where emissions are primarily from mobile sources—the number and activity of vehicles and fleet information would be required. The latest version of the State of California's EMFAC model is recommended for estimating emissions from on-road vehicles; the OFFROAD model is recommended for estimating emissions from off-road vehicles. For these types of new sources (not permitted by BAAQMD) screening methods are not currently available and a more refined analysis is necessary.

If modeling estimates for community risks and hazards determine that local levels associated with the proposed project meet the applicable *Thresholds of Significance*, no further analysis is recommended. More details on project screening and recommended protocols for modeling stationary and mobile sources are presented in *Recommended Methods for Screening and Modeling Local Risks and Hazards*. This online companion document provides screening tables for emissions from on-road cars and trucks on major roadways and many existing permitted sources in the SFBAAB. It describes how to use screening tables to determine whether a site specific modeling analysis and risk assessment is required. The document also addresses sources that BAAQMD has determined to have negligible impact on health outcomes. It describes the recommended methodology for performing dispersion modeling and estimating emission factors if the project exceeds the thresholds based on the screening analysis; it describes how to calculate the potential cancer risk using age-sensitivity toxicity factors from the concentrations produced from the air modeling analysis; and it provides a sample calculation and the methodology for estimating short term, acute exposures and long term, chronic health impacts. The recommended protocols are consistent with the most current risk assessment methodology used for the BAAQMD's *New Source Review for Toxic Air Contaminants Regulation 2, Rule 5: Toxics New Source Review* and, with few exceptions, follows the California Air Pollution Control Officers Association's (CAPCOA) *Health Risk Assessments for Proposed Land Use Projects* (July 2009).

BAAQMD recommends that all receptors located within a 1,000 foot radius of the project's fence line be assessed for potentially significant impacts from the incremental increase in risks or hazards from the proposed new source. A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius.

For new land uses that would host a high number of non-permitted TAC sources, such as a distribution center, the incremental increase in cancer risk shall be determined by an HRA using an acceptable air dispersion model in accordance with BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* and/or CAPCOA's guidance document titled *Health Risk Assessments for Proposed Land Use Projects*. A Lead Agency may consult HRAs that have previously been conducted for similar land uses to determine whether it assesses the incremental increase in cancer risk qualitatively or by performing an HRA. This analysis shall account for all TAC and PM emissions generated on the project site, as well as any TAC emissions that would occur near the site as a result of the implementation of the project (e.g., diesel trucks queuing outside an entrance, a high volume of trucks using a road to access a quarry or landfill).

Some proposed projects would include both permitted and non-permitted TAC sources. For instance, a manufacturing facility may include some permitted stationary sources and also attract a high volume of diesel trucks and/or include a rail yard. All sources should be accounted for in the analysis.

5.2.5. Siting a New Receptor[4]

If a project is likely to be a place where people live, play, or convalesce, it should be considered a receptor. It should also be considered a receptor if sensitive individuals are likely to spend a significant amount of time there. Sensitive individuals refer to those segments of the population most susceptible to poor air quality: children, the elderly, and those with pre-existing serious health problems affected by air quality (ARB 2005). Examples of receptors include residences, schools and school yards, parks and play grounds, daycare centers, nursing homes, and medical facilities. Residences can include houses, apartments, and senior living complexes. Medical facilities can include hospitals, convalescent homes, and health clinics. Playgrounds could be play areas associated with parks or community centers.

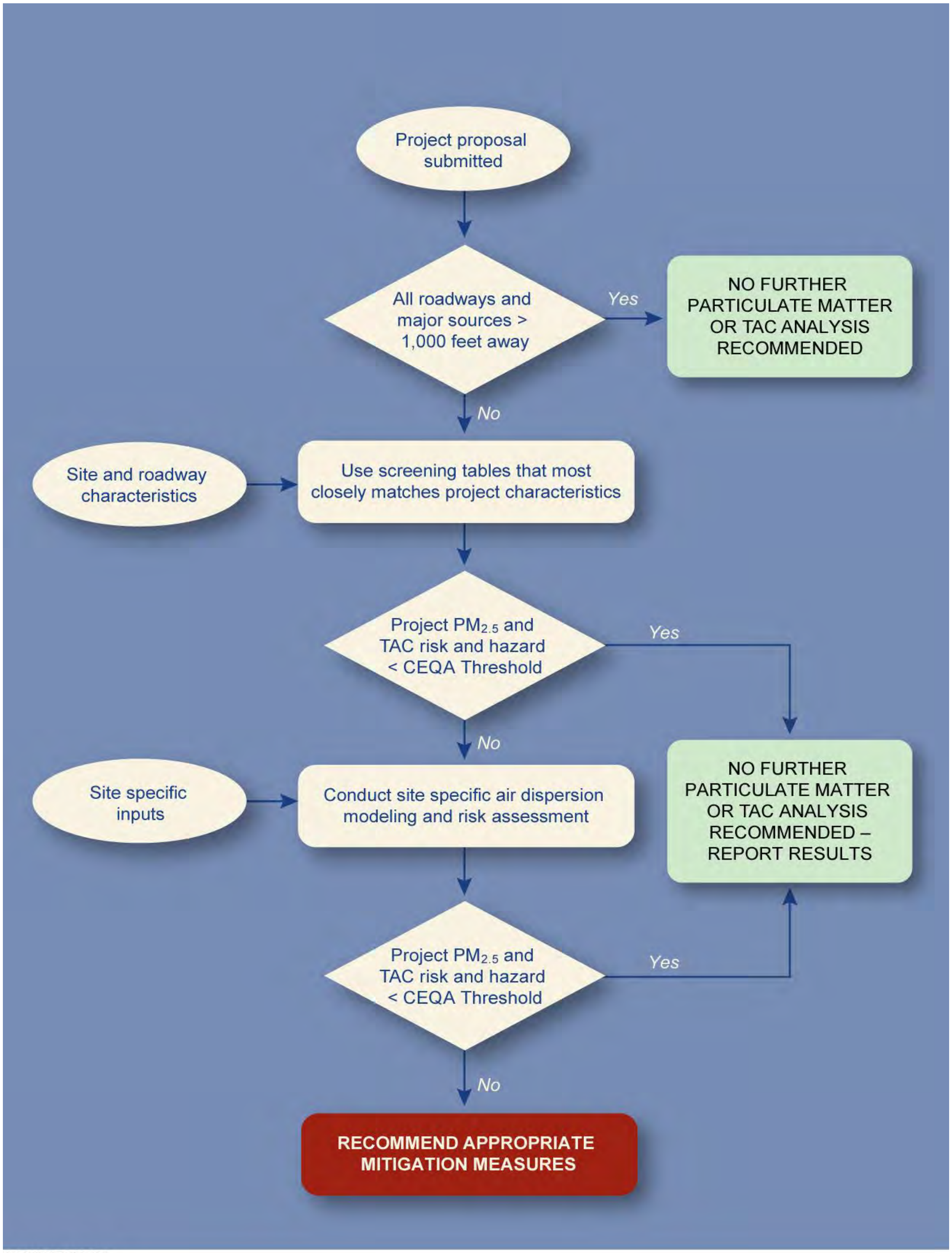
When siting a new receptor, a Lead Agency shall examine existing or future proposed sources of TAC and/or $PM_{2.5}$ emissions that would adversely affect individuals within the planned project. A Lead Agency shall examine:

- the extent to which existing sources would increase risk levels, hazard index, and/or $PM_{2.5}$ concentrations near the planned receptor,
- whether the existing sources are permitted or non-permitted by the BAAQMD, and
- whether there are freeways or major roadways near the planned receptor.

BAAQMD recommends that a Lead Agency identify all TAC and $PM_{2.5}$ sources located within a 1,000 foot radius of the proposed project site. A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius. Permitted sources of TAC and $PM_{2.5}$ should be identified and located as should freeways and major roadways, and other potential sources. To conduct a thorough search, a Lead Agency shall gather all facility data within 1,000 feet of the project site (and beyond where appropriate).

The phased approach for evaluating impacts to new receptors is shown in Figure 5-3.

[4] The use of the receptor thresholds is discussed in section 2.8 of these Guidelines



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Phased Approach for Estimating Community Risks and Hazards – Receptors
Figure 5-3

5.2.6. Screening Table for Stationary Sources

BAAQMD will make available data for certain existing permitted, stationary sources of TAC and $PM_{2.5}$ with site locations, coordinates, source type, and screening-level estimates of excess cancer risk, chronic, and acute HI, and $PM_{2.5}$ concentrations. An example of the entries to be provided in this table is shown in Table 5-1.

Table 5-1
Screening Table for Existing Permitted Stationary Sources*
(within 1,000 feet of the Proposed Project)

EXAMPLE
Proposed Project Location Details:
Address-19th Avenue and Judah Street, San Francisco, CA
Centroid UTMs-E 546090, N 4179460

Site #	Facility Name	Street Address	City	UTM E	UTM N	Cancer Risk in a million	Chronic Hazard Index	Acute Hazard Index	$PM_{2.5}$ ug/m^3
462	20th Avenue Cleaner	1845 Irving Street	San Francisco	546113	4179490	7.5	0.02	0.00	
4672	Sundown Cleaners	1952 Irving Street	San Francisco	546016	4179510	7.5	0.02	0.00	
13519	Pacific Bell	1515 19th Avenue	San Francisco	546086	4179240	58.4	0.10	0.04	0.10
2155	Chevron Station #91000	1288 19th Avenue	San Francisco	546052	4179720	5.8	0.03	0.00	
8756	ConocoPhillips #251075	1400 19th Avenue	San Francisco	546064	4179490	2.7	0.01	0.00	
9266	ConocoPhillips #2611185	1401 19th Avenue	San Francisco	546058	4179500	2.2	0.01	0.00	
					Cumulative:	84	0.19	0.04	0.10

Source: BAAQMD 2009

*This example provides conservative screening level estimates and does not represent actual risk levels, HI or PM concentrations for the facilities listed.

Table 5-1 selects a hypothetical location at 19th Avenue and Judah Street in San Francisco, as shown at the top of the table along with the Universal Transverse Mercator (UTM) coordinates of the location. Below this location are listed permitted facilities within 1,000 feet of the example location. Each row contains entries for a specific existing permitted source and conservative estimates of maximum risk, hazard index, and $PM_{2.5}$ concentration within the 1,000 foot radius. Within a row, each risk, HI, or $PM_{2.5}$ concentration for a source can be compared to the significance threshold: cancer risk is compared to 10 in a million; chronic and acute hazard index are compared to 1.0; and $PM_{2.5}$ concentration is compared to 0.3 $\mu g/m^3$. In Table 5-1 all entries are below the target threshold except for the source at 1515 19th Avenue, which has a cancer risk, conservatively estimated at about 58 in a million.

It is important to note that the listing of existing sources provided by the BAAQMD provides conservative screening-level estimates and does not represent the actual risk levels, HI, or PM concentrations for that facility. These estimates are assumed to be uniform within the 1,000 foot radius and independent of the distance between source and receptor.

To use the screening tables, a Lead Agency would identify sources in the tables within 1,000 feet (or beyond where appropriate) of the project site. Risks, hazards, and $PM_{2.5}$ concentrations for individual sources correspond to the table entries. These values are assumed to remain constant for all locations within the 1,000 foot radius. Table entries within a column can be summed to estimate the cumulative risks from all sources. The screening table for Air District permitted sources is also available as a compressed keyhole language (kmz) file for each of the nine Bay Area counties. The kmz file can be plotted using the Google Earth™ mapping tool, which is freely available as described in *Recommended Methodology for Screening and Modeling Local Risks and Hazards*.

5.2.7. Screening Tables for On-road Mobile Sources

For all State highways within the SFBAAB, BAAQMD will make available a set of maps and tables that provide screening-level risks and $PM_{2.5}$ concentrations. Screening tables are provided for each of the nine counties within BAAQMD's jurisdiction. To develop these tables, BAAQMD selected conservative assumptions and inputs following this general methodology:

- Hourly vehicle miles traveled (VMT) and emissions for 2012 were developed for each county using EMFAC based on default vehicle mix and full range of vehicle speeds.
- Highest vehicle traffic volumes for each roadway based on Caltrans's *2007 Traffic Volumes on California State Highways* were scaled based on VMT to develop hourly vehicle volumes.
- Hourly vehicle volume and emissions were input into a roadway model, CAL3QHCR, to estimate annual average concentrations using the most conservative meteorological data collected from monitoring locations within each county.

For the $PM_{2.5}$ screening tables, the peak one hour of traffic was used to develop hourly vehicle volumes that totaled to the annual average daily traffic while risk and hazard tables are based on annual average daily vehicle volumes.

The purpose of the screening tables is to provide an easy-to-use initial analysis to determine if nearby roadway impacts to a new receptor are below the thresholds of significance. The outcome of the screening may be used to make a determination of no further action or it may indicate that a more refined analysis is warranted. The recommended project screening approach is as follows:

1. Determine if the new receptor is at least 1,000 feet from the nearest significant traffic volume roadway defined as a freeway or arterial roadway with greater than 10,000 vehicles per day. For new residential developments, the receptor should be placed at the edge of the property boundary. If the receptor does not have any significant roadway sources within 1,000 foot radius, then the proposed project meets the distance requirements and no further single-source roadway-related air quality evaluation is recommended.

2. If the receptor is within the 1,000 feet radius of a nearby roadway that has greater than 20,000 vehicles per day, then use the county- and road-specific screening tables to determine the $PM_{2.5}$ concentrations, cancer risks, and hazards for the project. For non-California highways, default local roadway screening tables are provided in the online report *Recommended Methodology for Screening and Modeling Local Risks and Hazards*. If any of the thresholds for $PM_{2.5}$ concentration, risks, and hazards are

exceeded based on the comparisons, then more refined modeling analysis is recommended or the project sponsor may choose to implement mitigation measures.

3. For developments that exceed the screening analysis, site specific modeling analysis is recommended following BAAQMD's *Recommended Methodology for Screening and Modeling Local Risks and Hazards*.

For completion of Step 2 as described above, the methodology requires the use of appropriate screening tables to determine if the distance from the development to the nearby significant roadway will expose new receptors to concentrations exceeding the thresholds. The first step is to ensure that the latest screening tables have been downloaded from BAAQMD's website. An example (Table 5-2) is included in this section for San Francisco County for demonstration purposes only and should not be relied upon for use in a CEQA analysis. The Lead Agency or project sponsor must first gather project information including the county for which the development is proposed and the distance of the project to the nearest state highway or local roadway to determine which screening tables are appropriate. For each county, two tables are provided for $PM_{2.5}$ concentrations, cancer risks, chronic non-cancer hazards, and acute non-cancer hazards based on whether the project is located north or south of the roadway or east or west of the roadway. The direction tables correspond to whether the projects are located generally upwind or downwind of the roadway with respect to the prevailing wind direction. Appropriate values are then posted in each table based on the project being located 100 feet, 200 feet, 500 feet, 700 feet, and 1,000 feet from the edge of the nearest travel lane to the project.

For proposed projects, the appropriate cell should be determined by referencing the corresponding county, roadway, and project distance in the tables that most closely matches the project conditions. If the project is predominantly north or south of the roadway, choose the north or south tables. Likewise, if the project is predominantly east or west, choose the east or west tables. If the project is evenly located for example, northeast or southwest of the roadway, select the higher value between either screening tables based on the project distance to the roadway. For distances not listed in the tables, BAAQMD recommends that the values between the two closest distances be linearly interpolated to estimate the value that best reflects the actual project distance.

The results of the screening analysis indicate whether new receptors will be exposed to roadway TAC emissions at concentrations exceeding the threshold of significance and therefore, a more refined modeling analysis and quantitative HRA may be required. If the concentration is less than the thresholds, then no further analysis is required for the single source comparison for roadways. The results of the analysis should be reported in the environmental documentation or staff report that includes a reference to the screening tables used. If the concentrations exceed the thresholds, then the project sponsor has the option to conduct a more refined modeling analysis or implement appropriate mitigation measures.

An example of how to use the screening tables is provided as follows. A new residential development is hypothetically proposed at the intersection of 23rd Street and Minnesota Street in San Francisco. It is located approximately 440 feet to the east of midpoint of northbound Highway 280. Based on Table 5-2, the $PM_{2.5}$ concentrations from Highway 280 is 0.60 $\mu g/m^3$ at 200 feet away and 0.28 $\mu g/m^3$ 500 feet away from the project.

Table 5-2 East or West of San Francisco County Highway					
Highway	Distance East or West of Freeway – $PM_{2.5}$ Concentrations (ug/m^3)				
	100 Feet	200 Feet	500 Feet	700 Feet	1,000 Feet
1	0.50	0.28	0.12	0.096	0.060
35	0.14	0.11	0.032	0.020	0.016
80	1.0	0.64	0.30	0.20	0.15
101	1.1	0.72	0.34	0.26	0.17
280	0.80	**0.60**	**0.28**	0.19	0.13
Source: BAAQMD 2009; table above for demonstration purposes and should not be used in CEQA analysis.					

To linearly interpolate the $PM_{2.5}$ concentration for the project distance of 440 feet, the following equation was used:

(200 ft – 500 ft) x (0.60 ug/m^3 – $PM_{2.5\ 440\ feet}$) = (200 ft – 440 ft) x (0.6 ug/m^3 – 0.28 ug/m^3)

Solving for $PM_{2.5}$ at 440 feet, the $PM_{2.5}$ concentration is estimated as 0.34 ug/m^3.

A similar example methodology was applied to the cancer risk, chronic non-cancer hazard and acute hazard. The resulting values based on a distance of 440 feet are shown in Table 5-3.

Table 5-3 Cancer and Non-Cancer (Chronic and Acute) Hazard Indices at 440 feet			
Description	Screening Value	Thresholds	Exceeds Threshold?
$PM_{2.5}$ Concentration	0.34 ug/m^3	0.3 ug/m^3	Yes
Cancer Risk	1.1 in a million	10 in a million	No
Chronic Non-cancer Hazard Index	0.028	1	No
Acute Non-cancer Hazard Index	0.028	1	No
Source: BAAQMD 2009; table above for demonstration purposes and should not be used in CEQA analysis.			

In this example, the proposed project would exceed the $PM_{2.5}$ threshold, but not the risk or hazard-based thresholds. At this point, the project sponsor can ratio the PM concentration further based on the actual AADT at the closest milepost to the project. If the concentrations continue to exceed the threshold, the project sponsor can determine whether additional modeling is warranted or implementation of mitigation measures is appropriate. Possible options include moving the residential portion of the development to a distance at which the roadway impacts would be negligible or installing high efficiency filtration in the development.

If the project sponsors choose to conduct a more refined modeling analysis, BAAQMD recommends the following general procedures. More detailed methodology is provided on the online resources located at BAAQMD's CEQA webpage. To evaluate $PM_{2.5}$ concentrations, BAAQMD recommends using CAL3QHC, which was designed to model roadside CO and PM concentrations. The CAL3QHCR model can estimate $PM_{2.5}$ concentrations at defined receptor locations by processing hourly meteorological data over a year, hourly emissions, and traffic volume. The latest version of the model is available at: http://www.epa.gov/scram001/dispersion_prefrec.htm.

To run CAL3QHCR, meteorological, traffic, and vehicle emissions data at specified intervals over time are required. BAAQMD recommends the use of the meteorological data that most closely representatives conditions at the site. BAAQMD offers readily compatible meteorological data for each county within the SFBAAB that can be run by CAL3QHCR at http://hank.baaqmd.gov/tec/data/. For the screening analysis, BAAQMD relied on the most conservative meteorological data collected from any stations within the county; however, in this site-specific analysis, the user should select the data that is nearest the project and reflects actual meteorological conditions.

Emissions data must also be input into the CAL3QHCR model. Year 2012 average hourly emissions (e.g., grams/vehicle mile) were used in developing the screening tables. The emissions data can be produced using the EMFAC2007 model, but should be reflective of the base year in which residents will be residing in the new development. The model should also be run assuming the full range of vehicle fleet and if available, the average vehicle speeds along the specific stretch of road. However, if average speeds are not available, the user should select the full range of variable speeds to ensure that the analysis is health protective.

Table 5-4
San Francisco County State Highway Traffic Volumes

Highway Number	Average Daily 2-way Traffic Volumes (Vehicles/day)	Start Location	End Location
1	122,000	Alemany Boulevard	Presidio, South Highway 2, onto Golden Gate Bridge
35	31,000	John Muir Drive	Highway 1, Sloat Boulevard at 19th Avenue
80	254,000	Highway 101 at Division Street	Bay Bridge at Treasure Island, Yerba Buena Island
101	245,000	Third Street	Van Ness Avenue to Highway 1 at Golden Gate Bridge
280	195,000	Alemany Boulevard, San Jose Avenue	Mariposa Street to 4th Street and Brannan Street
Source: BAAQMD 2009			

How to use the screening tables:

- Distance is from the center of the highway to the facility or development
- When two or more highways are within the influence area, sum the contribution from each freeway

The CAL3QHCR model also relies on hourly traffic volumes (e.g., vehicles per hour) as determined by the relative VMT. BAAQMD recommends developing a weighed VMT by using the ratio of VMT per hour to the peak VMT over the 24 hour day (as produced by the EMFAC model). This weighed VMT represents the percentage of traffic volume on an hourly basis over a 24 hour period. The hourly traffic volumes for the CAL3QHCR model are then the product of the weighed VMT by the peak traffic volumes for that roadway. The peak one-hour vehicle traffic for the applicable milepost of any California highway can be determined through the Caltrans web site at http://traffic-counts.dot.ca.gov/. Develop hourly emissions rates for input into the air model. The model provides annual average $PM_{2.5}$ concentrations that can be compared directly against the thresholds.

A more detailed analysis is required for estimating the risk and hazard evaluation. TAC emissions were evaluated for only those toxic compounds found in diesel or gasoline fuel including diesel PM, benzene, ethylbenzene, acrolein, etc. The District recommends using the CAL3QHCR model. The model must be run separately to estimate emissions from diesel PM and emission of other TAC. In each analysis, the District recommends developing diesel specific emission factors from EMFAC. Because risk and hazard are expressed as lifetime exposure, the emissions were averaged from 2012 to 2040 that accounts for more efficient vehicle emissions and increased VMT. Beyond 2040, the EMFAC model does not have emissions and consequently, the 2040 emissions were applied from 2040 to 2082, to complete a 70-year lifetime exposure.

Annual average traffic volumes were used in the model. As specified in Regulation 2, Rule 5, BAAQMD recommends that age sensitivity factors be applied to the emissions per year to account for early life-stage exposures. The cancer risk and hazard levels are calculated using the predicted annual average concentrations multiplied by the cancer slope factor for cancer risk or divided by the relative exposure levels for hazard.

The risk and hazard levels are then compared against the applicable thresholds. Further assessment may be warranted if the thresholds are exceeded, but the project sponsor may consider design changes and other mitigation measures as a means of reducing potential risks (see Section 5.4). For detailed discussion on this methodology, the project sponsor should download the online report *Recommended Methodology for Screening and Modeling Local Risks and Hazards*.

5.3. CUMULATIVE IMPACTS

5.3.1. Significance Determination

A Lead Agency shall examine TAC and/or $PM_{2.5}$ sources that are located within 1,000 feet of a proposed project site. Sources of TACs include, but are not limited to, land uses such as freeways and high volume roadways, truck distribution centers, ports, rail yards, refineries, chrome plating facilities, dry cleaners using perchloroethylene, and gasoline dispensing facilities. Land uses that contain permitted sources, such as a landfill or manufacturing plant, may also contain non-permitted TAC and/or $PM_{2.5}$ sources, particularly if they host a high volume of diesel truck activity. A Lead Agency should determine what the combined risk levels are from all nearby TAC sources in the vicinity of sensitive receptors. Lead agencies should use their judgment to decide if there are significant sources outside 1,000 feet that should be included.

A Lead Agency's analysis shall determine whether TAC and/or $PM_{2.5}$ emissions generated as part of a proposed project would expose off-site receptors to risk levels that exceed BAAQMD's applicable *Thresholds of Significance* for determining cumulative impacts.

A project would have a cumulative significant impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius (or beyond where appropriate) from the fence line of a source, or from the location of a receptor, plus the contribution from the project, exceeds the following:

- An excess cancer risk levels of more than 100 in one million or a chronic hazard index greater than 10 for TACs; or
- 0.8 µg/m^3 annual average $PM_{2.5}$.

Within impacted communities identified under BAAQMD's CARE program, the Lead Agency is encouraged to develop and adopt a Community Risk Reduction Plan. To determine whether a new source is located in an impacted community, the Lead Agency should refer to Figure 5-1 and the CARE webpage. Please consult with BAAQMD if a more precise map is needed.

BAAQMD recommends that cumulative impacts of new sources and new receptors be evaluated as described in Section 5.2, and include the impacts of all individual sources (stationary and roadways) within the 1,000 foot radius.

Community risk and hazards analyses should follow guidance developed by BAAQMD for risk screening described in *Recommended Methodology for Screening and Modeling Local Risks and Hazards*, which generally follows CAPCOA's guidance document titled *Health Risk Assessments for Proposed Land Use Projects*. $PM_{2.5}$ concentrations and risk levels estimated for the locations where receptors may be located should be compared to BAAQMD's applicable *Threshold of Significance* for siting a new receptor near existing sources of TAC emissions.

A Lead Agency shall compare the analysis results from TAC and $PM_{2.5}$ emissions with the applicable *Threshold of Significance*. *Thresholds of Significance* apply for projects that would site new permitted or non-permitted sources in close proximity to receptors and for projects that would site new sensitive receptors in close proximity to permitted or non-permitted sources of TAC emissions. If a proposed project would not exceed BAAQMD's applicable *Threshold of Significance* for TACs or $PM_{2.5}$, then the project would result in a less-than-significant air quality impact. If a project would exceed the applicable *Threshold of Significance,* the proposed project would result in a significant air quality impact and the Lead Agency should implement all feasible mitigation to reduce the impact (refer to Section 5.4).

If implementation of BAAQMD-recommended mitigation measures for reducing TAC and $PM_{2.5}$ emissions and resultant exposure to health risks would reduce all TAC impacts to levels below the applicable *Threshold of Significance*, TAC impacts would be reduced to a less-than-significant level. If resultant health risk exposure would still exceed the applicable *Threshold of Significance*, the impacts would remain significant and unavoidable.

5.4. COMMUNITY RISK REDUCTION PLANS

The goal of a Community Risk Reduction Plan would be to bring TAC and $PM_{2.5}$ concentrations for the entire community covered by the Plan down to acceptable levels as identified by the local jurisdiction and approved by the Air District. This approach provides local agencies a proactive alternative to addressing communities with high levels of risk on a project-by-project approach. The Air District has developed detailed guidelines for preparing Community Risk Reduction Plans which can be found on the Air District web site at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES.aspx.

Qualified Community Risk Reduction Plans
A qualified Community Risk Reduction Plan adopted by a local jurisdiction should include, at a minimum, the following elements:

(A) Define a planning area;

(B) Include base year and future year emissions inventories of TACs and PM2.5;

(C) Include Air District–approved risk modeling of current and future risks;

(D) Establish risk and exposure reduction goals and targets for the community in consultation with Air District staff;

(E) Identify feasible, quantifiable, and verifiable measures to reduce emissions and exposures;

(F) Include procedures for monitoring and updating the inventory, modeling and reduction measures in coordination with Air District staff;

(G) Be adopted in a public process following environmental review.

5.5. MITIGATING LOCAL COMMUNITY RISK AND HAZARD IMPACTS

For stationary sources, please refer to BAAQMD's permit handbook and BACT/T-BACT workbook. BAAQMD-recommended mitigation measures for reducing the exposure of sensitive receptors to TACs and hazards include the following:

1. Increase project distance from freeways and/or major roadways.

2. Redesign the site layout to locate sensitive receptors as far as possible from any freeways, major roadways, or other non-permitted TAC sources (e.g., loading docks, parking lots).

3. In some cases, BAAQMD may recommend site redesign. BAAQMD will work closely with the local jurisdiction and project consultant in developing a design that is more appropriate for the site.

4. Large projects may consider phased development where commercial/retail portions of the project are developed first. This would allow time for CARB's diesel regulations to effectively reduce diesel emissions along major highways and arterial roadways. Ultimately lower concentrations would be predicted along the roads in the near future such that residential development would be impacted by less risk in later phases of development.

5. Projects that propose sensitive receptors adjacent to sources of diesel PM (e.g., freeways, major roadways, rail lines, and rail yards) shall consider tiered plantings of trees such as redwood, deodar cedar, live oak and oleander to reduce TAC and PM exposure. This recommendation is based on a laboratory study that measured the removal rates of PM passing through leaves and needles of vegetation. Particles were generated in a wind tunnel and a static chamber and passed through vegetative layers at low wind velocities. Redwood, deodar cedar, live oak, and oleander were tested. The results indicate that all forms of vegetation were able to remove 65–85 percent of very fine particles at wind velocities below 1.5 meters per second (approximately 3 miles per hour [mph]) with redwood and deodar cedar being the most effective. Even greater

removal rates were predicted for ultra-fine PM (i.e., aerodynamic resistance diameter of 0.1 micrometer or less).

6. Install and maintain air filtration systems of fresh air supply either on an individual unit-by-unit basis, with individual air intake and exhaust ducts ventilating each unit separately, or through a centralized building ventilation system. The ventilation system should be certified to achieve a certain effectiveness, for example, to remove at least 80% of ambient $PM_{2.5}$ concentrations from indoor areas. The air intake for these units should be located away from areas producing the air pollution (i.e., away from major roadways and highways).

7. Where appropriate, install passive (drop-in) electrostatic filtering systems, especially those with low air velocities (i.e., 1 mph).

8. Locate air intakes and design windows to reduce PM exposure (e.g., windows nearest to the freeway do not open).

9. Install indoor air quality monitoring units in buildings.

10. Require rerouting of nearby heavy-duty truck routes.

11. Enforce illegal parking and/or idling of heavy-duty trucks in vicinity.

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November 3, 2017

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RE: AWA Comments Regarding Air Quality Analysis and Significance Determinations Within the Johnson Drive Economic Development Zone SEIR, City of Pleasanton

I. Introduction

At your request, Autumn Wind Associates has reviewed the above-referenced Supplemental EIR (SEIR) documentation and provides these comments regarding its analysis, evaluation, and proposed mitigation of project-related air quality impacts.

This comment letter identifies defects involving the SEIR's failure to adequately analyze and review of project-related cumulative toxic air contaminants, and with its application of an ineffectual, unenforceable transportation demand management mitigation that will provide few if any real mobile source emission reductions over the project's planning lifetime.

Our review of SEIR documentation for the above-referenced project reflects these specific concerns:

- The Lead Agency has failed to require preparation of a Health Risk Assessment (HRA) necessary to comprehensively and effectively quantify increased Toxic Air Contaminant (TAC) health risks associated with the proposed JDEDZ (project), including the proposed Costco Fueling Center, the existing FedEx distribution center, future land uses anticipated within the JDEDZ, and offsite TAC sources (e.g. I-580 and I-680') already affecting the area in and near the project area. Without it, the Lead Agency cannot reasonably determine that the project will not cause significant cumulative TAC-related health risks to sensitive receptors both inside the JDEDZ and within 1000' of its boundaries;
- The SEIR provides no analytical information or evidence (e.g. diesel truck counts for the project and I-580 and I-680, information from HRAs conducted for similar projects, etc.) that existing sources contributing to TAC inhalation risks to sensitive receptors within the JDEDZ and within the 1000' zone specified in the project's cumulative TAC threshold of significance are not presently contributing health risks approaching or even exceeding the SEIR-specified cumulative TAC threshold of significance. The SEIR has failed to analyze existing cumulative TAC-related health risks in the area in and around the

project as a prerequisite to establishing the level at which the project would cause a cumulatively considerable increase in TAC impacts, and thus it cannot conclude that its TAC emissions will not lead to exceedances of the applicable significance thresholds;

- The SEIR mistakenly assumes that Mitigation Measure 4.B-4, designed to reduce TAC health risks for future development of sensitive receptor land uses inside the JDEDZ, is sufficient to declare that the project's inhalation TAC health risks will not exceed BAAQMD thresholds of significance. As noted below, reducing the project's operational TAC emissions inside the project area to levels below the operational TAC CEQA threshold of significance does not ensure that the project's cumulative TAC threshold components will not be exceeded at sensitive receptors residing near or adjacent to the project area.

II. The JDEDZ SEIR Cannot Conclude Less-Than-Significant TAC Impacts Without Preparation of a Health Risk Assessment

It appears that a number of comments submitted on the Draft SEIR sought additional information and analysis concerning the potential health risks from project TAC emissions on receptors both within and outside the JDEDZ boundaries. The Final SEIR responded to these comments by modifying MM 4.B-4 to require a risk assessment in the event a "new sensitive residential use" is located within the project area. This mitigation measure does not address potential individual and cumulative health risks to off-site receptors within 1,000 feet of the project.

Based on information provided by BAAQMD and CARB for screening background cancer risks, and in combination with reduced atmospheric dispersal conditions in the Livermore Valley area (evidenced by ozone nonattainment monitoring data and nonattainment designation), JDEDZ TAC emission may increase cumulative TAC health risks beyond BAAQMD thresholds of significance.

To determine their impact significance for comparison to the BAAQMD's thresholds cited in the SEIR, particularly the 100/million increased cancer threshold, the Lead Agency should have conducted a Health Risk Assessment[1] (HRA) addressing TAC emissions anticipated from land uses (both existing and anticipated for development) within the JDEDZ, and for their potential to combine with existing or "background" ambient air TACs. Relying on localized emission estimates, local meteorology records, and other critical inputs, the AERMOD dispersion model recommended for use by BAAQMD would have permitted the Lead Agency to provide precise, quantitative health risk estimates for comparison to operational and cumulative TAC thresholds of significance identified in the SEIR. An HRA for the JDEDZ would have:

- Evaluated emission sources associated with vehicles and trucks traveling on I-680 and I-580; I-680 is located immediately west of the project area and I-580 is immediately to the north;

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[1] From US EPA, "A risk assessment for a toxic air pollutant combines results of studies on the health effects of various animal and human exposures to the pollutant with results of studies that estimate the level of people's exposures at different distances from the source of the pollutant." (See https://www3.epa.gov/airtoxics/3_90_024.html) CARB defines a risk assessment within the Air Toxics "Hot Spots" Act as "a comprehensive analysis of the dispersion of hazardous substances into the environment, the potential for human exposure, and a quantitative assessment of both individual and population-wide health risks associated with those levels of exposure." (See https://www.arb.ca.gov/ab2588/riskassess.htm)

- Evaluated all proximately-located, permitted stationary sources of ambient air TACs in Pleasanton and Dublin;
- Estimated ambient air TAC emissions for all land uses within the JDEDZ;
- Conducted air dispersion modeling with use of the AERMOD model, quantifying non-cancer and cancer risks within and adjacent to the project area with use of the latest BAAQMD and OEEHA guidance;
- Graphically represented mapped boundaries of pollutant concentrations and associated cancer risks within 1000' of all boundaries of the JDEDZ, inclusive of project- and background-TAC health risks;
- Provided the scientific basis for developing and applying effective, reasonable mitigation to reduce the project's potentially significant TAC impacts.

Other, similar land use projects evaluated under CEQA have relied on HRA outputs to determine operational and cumulative TAC impact significance. For example, the EIR prepared by the City of Fresno for the Downtown Neighborhoods Community Plan, Fulton Corridor Specific Plan, and the Downtown Development Code Project[2] included preparation of an HRA. As noted in the EIR's Appendix E, the HRA relied on estimates[3] of the "maximum amount of development that is anticipated to occur within the two Plan areas...quantified for the purposes of conducting environmental impact analysis," with TAC impacts accounting for increased population growth through 2035 and modeled with the AERMOD dispersion program.

BAAQMD CEQA guidance[4] makes it clear that for a more complex project involving a large source of TACs (such as the existing FedEx distribution center at Parcel 11 in combination with the proposed Costco and its refueling facility) or multiple non-permitted TAC emitters (such as project-serving and customer diesels, and I-680), an HRA with dispersion modeling should be undertaken. The BAAQMD excerpt below also recommends that the Lead Agency look to other HRAs prepared for similar projects—e.g. the HRA prepared for the City of Fresno DDCP, DNCP, FCP EIR noted above.

> "BAAQMD recommends that all receptors located within a 1,000 foot radius of the project's fence line be assessed for potentially significant impacts from the incremental increase in risks or hazards from the proposed new source. A lead agency should enlarge the 1,000-foot radius on a case-by-case basis if an unusually large source or sources of risk or hazard emissions that may affect a proposed project is beyond the recommended radius. For new land uses that would host a high number of non-permitted TAC sources, such as a distribution center, the incremental increase in cancer risk should be determined by an HRA using an acceptable air dispersion model in accordance with BAAQMD's Recommended Methods for Screening and Modeling Local Risks and Hazards and/or CAPCOA's guidance document titled Health Risk Assessments for Proposed Land Use Projects. A lead agency **may consult HRAs that have previously been conducted for similar land uses** (emphasis added) to determine whether it assesses the incremental increase in cancer risk qualitatively or by performing an HRA. This analysis should account for all TAC and PM emissions generated on the project site, as well as any TAC emissions that would occur near the site as a result of the implementation of the project (e.g., diesel trucks queuing outside an entrance, a high volume of trucks using a road to access a quarry or landfill). Some proposed projects would include both permitted and non-permitted TAC sources. For instance, a manufacturing facility may include some permitted stationary sources and also attract a high volume of diesel trucks and/or include a rail yard. All sources should be accounted for in the analysis."

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[2] City of Fresno; DEIR for the DNCP, FCSP, and DDC; see https://www.fresno.gov/darm/general-plan-development-code/#tab-03
[3] City of Fresno; DNCP, FCSP, DDC Draft EIR; Appendix E - Air Quality; pg. 5
[4] BAAQMD; "CEQA Air Quality Guidelines"; May 2011; pg. 5-7

JDEDZ TAC emissions will combine cumulatively with diesel particulate matter (DPM) from nearby major freeways and the area's three BAAQMD-permitted AB2588 TAC sources; those emissions should have been quantified and evaluated within an HRA prepared for the project. In the Fresno EIR, the HRA's dispersion modeling included DPM emissions from its major roadways (SR 41, SR-99, and SR-180). Notwithstanding the project's location in the San Joaquin Valley, the Lead Agency (City of Fresno) chose to utilize the same (BAAQMD) CEQA cumulative thresholds of significance to evaluate its TAC-related impacts used in the JZEDZ SEIR; Fresno's HRA predicted that the cumulative cancer threshold of 100/million would be exceeded at one or more existing residences adjacent to a major freeway, and consistent with CEQA guidance mitigations were then applied to reduce health risks to less-than-significant impact levels.

The Fresno EIR illustrates what should have occurred with preparation of an HRA as an integral part of the JDEDZ SEIR's estimates of air quality impacts and their significance; the JDEDZ project will involve multiple land uses, a major gasoline dispensing facility and a distribution center, is adjacent to major roadway TAC sources and within two hundred feet of sensitive receptors co-located within 500' of I-680 and 1000' of JDEZD's borders. By failing to prepare an HRA, the Lead Agency cannot now justify its claim that the JDEDZ project will not result in cumulatively considerable contributions of TACs or that those contributions will not cause significant cumulative TAC impacts.

III. The JDEDZ SEIR Provides Inadequate Review of Potentially Significant Cumulative TAC Impacts Within and Adjacent to the Project Area

At pg. 2-3, the JDEDZ DSEIR identifies significant and unavoidable operational air quality impacts resulting from estimated project criteria pollutants NOx and PM-10 emissions. TACs are identified under Impact 4.B-4 (pg. 4.B-23) as potentially significant for future sensitive-receptor uses (e.g. senior housing, outdoor recreation) within the project area. Responding to the potential for significant TAC impacts to future sensitive receptors inside the development, MM 4.B-4 requires preparation and City approval of a Health Risk Assessment (HRA) consistent with BAAQMD guidelines for sensitive receptor uses inside the project boundaries; the HRA would theoretically prevent sensitive receptor land uses inside the JZEDZ estimated to experience TAC-related health risks exceeding BAAQMD operational TAC significance thresholds.

While operational TAC emissions inside the project area are evaluated in the SEIR with MM 4.B-4 intended to reduce any related TAC impacts to less-than-significant levels, no information is provided in Table 2-1 or at pg. 2-3 regarding the project's potential to generate cumulatively considerable contributions of TAC emissions, or that those emissions would not cause an exceedance of the BAAQMD's cumulative TAC threshold exceedances with exposures of nearby sensitive receptors to unacceptable health risks.

At DSEIR pg. 4.B-14, cumulative TAC impact significance for the project is defined:

> "... a significant cumulative air quality impact would occur if the probability of contracting cancer for the maximally exposed individual (MEI) would exceed 100 in one million or if the project would expose persons to TACs such that a non-cancer chronic Hazard Index (HI) of 10.0 would be exceeded at any receptor as a result of project operations, in addition to existing emission sources and cumulative emissions sources within a 1,000 foot radius of a project site. However, a project's construction or

> operational impacts would result in a considerable contribution to an identified cumulative health risk impact if the project's construction or operation activities would exceed the project-level health risk significance thresholds identified above."

In condensed form, the excerpt identifies TAC significance criteria as the project-related increase in cancer risk of 100/million, or a non-cancer, chronic Hazard Index exceeding 10.0, alone or in combination with existing ambient air toxics found within 1000' of the JDEDZ project boundaries. Additionally, JDEDZ's operational TAC emissions would be considered significant if estimated to cause a "considerable contribution" to an existing, identified TAC health risk. However, no information or discussion is found in the SEIR to define what would constitute a considerable contribution made by the JDEDZ project emissions to cumulatively significant TAC health risks. In fact, the DSEIR never considers its cumulative TAC contribution to existing TAC inhalation risks outside the JDEDZ but within 1000' of the project, presumably on the basis that the project's TAC emissions are not, through application of MM 4.B-4[5], expected to "exceed the project-level health risk significance thresholds" discussed at pg. 4.B-14. However, a mitigation proposed to reduce the project's TAC emission-related health risks within the project area is no substitute for the analysis and "careful judgment...based to the extent possible on scientific and factual data" [6] envisioned in CEQA for reliably estimating JDEZD's potential to cause excessive cumulative TAC health risks to sensitive receptors outside the project's boundaries but within 1000' of the project area.

And while MM 4.B-4 identifies two TAC sources within the JDEDZ (presumably the FedEx Distribution Center at Parcel 11, and the Costco fueling center planned for Parcel 6) and one outside the JDEDZ (I-680), it fails to note heavily-traveled I-580 immediately north of the project, nor does it attempt to evaluate DPM TAC emissions singly or cumulatively that will result from buildout and operations of all project parcels inside the project boundaries. See aerial depiction on the following page.

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[5] DSEIR MM 4.B-4 requires that any future sensitive receptor land uses within the JDEDZ project not be located within 300 feet of a fuel station or within 1,000 feet of warehouse loading docks or Highway I-680.
[6] CEQA Guidelines § 15064(b)

Figure 1 - JDEDZ and Surrounding Area Sensitive Receptors Within 1000'

In a recent EIR involving a Costco retail and fueling center development project[7] in the City of Redwood City, an HRA was appropriately prepared to evaluate the project's TAC emissions for project-specific AND cumulative impacts, including those that would be generated by vehicles traveling to and from the proposed fueling station, vehicle queues at the station, gasoline-powered delivery trucks serving the station, and from TACs emitted during vehicle refueling. Each of those incremental TAC contributors, including emissions associated with vehicle queuing, will be in play at the JDEDZ's Costco fueling facility, as well, and should have been identified and reviewed in the SEIR.

The Redwood City Costco CEQA HRA was based on 20 fueling positions at the station; while the JDEDZ SEIR is largely silent on Costco fueling station details, particularly those involving the size of the station or its anticipated annual throughput of gasoline, it is likely the Costco refueling center planned for Parcel 6 will contain at least 20 refueling positions. 18 million gallons per year of gasoline throughput was estimated for the Redwood City refueling center with 20 refueling positions; based on similarities between the two projects, the JDEDZ SEIR should have also prepared an HRA as part of the CEQA review process.

Notably different for the proposed JDEDZ Costco, however, is its location in an area with poorer meteorological dispersal conditions---concentrations of inhalation TACs in the Redwood City Costco case can be expected to result in relatively lower health risks due to prevalent onshore marine breezes at the site's location next to San Francisco Bay and at several miles of relatively flat topography distance from the Pacific. By comparison, Pleasanton is located 31 miles inland in a valley with surrounding hills causing reduced atmospheric clearance; those reduced atmospheric clearance conditions help to explain the area's violations of ambient air quality standards for ozone and the resulting ozone federal nonattainment designation, and they will similarly exert an inhibitory effect on dispersal of the JDEDZ's contribution of TACs to existing local cumulative cancer and non-cancer ambient air health risks. An HRA for the project would have identified poorer local dispersal conditions (in comparison to the Redwood City Costco), along with other project-specific factors influencing the JDEDZ's potential to cause significant local air impacts, and calculated specific cancer and non-cancer health risks for subsequent comparison to the BAAQMD's TAC thresholds of significance.

IV. The JDEDZ SEIR Appears to Conflate Less-Than-Significant Operational TAC Impacts with Compliance with BAAQMD's Cumulative TAC Threshold Components

The DSEIR should have identified off-site receptors who would experience JDEZD's maximum anticipated cumulative impact, while accounting for project vehicles that would generate TACs both on- and off-site. An adequate cumulative impact analysis of TACs, achieved with an HRA such as that prepared for the City of Redwood City's Costco facility, would have quantitatively identified cumulatively significant impacts to residents to the west and southeast, to daycare and gym receptors located at the northern area in or adjacent to the project, as well as serving to define the criteria for determining the project's cumulatively considerable contribution to significant TAC impacts.

Impact 4.B-4 and MM 4.B-4 are used to identify and then mitigate the project's TAC impacts within the JDEDZ, but by failing to quantitatively estimate and then evaluate the potential to cause cumulative impacts to sensitive receptors within 1000' of the project boundaries, the DSEIR appears to have inappropriately conflated operational TAC threshold compliance within the project with project-related cumulative TAC threshold compliance area outside the project yet still within the cumulative TAC threshold's 1000' JDEDZ boundary distance. Operational TAC threshold components identified in the DSEIR, as they affect cumulative

[7] ICF Int'l for City of Redwood City; "Addendum No. 2 to the EIR for the Redwood City Costco Wholesale Project"; Sept. 2012.

TAC impacts solely inside the project area, are neither transferable nor interchangeable with threshold components applying to the area outside the project's boundaries but within that 1000' boundary distance.

Accordingly, without quantifying health risks of existing and anticipated TAC-related health risks in an HRA, the DSEIR cannot reasonably determine that the project will not make a considerable contribution to cumulative TAC risks, or that it will not lead to exceedances of the 100/million cumulative cancer risk threshold for Pleasanton residents, children, recreationalists, and athletes in the areas in or near the JDEDZ.

V. The SEIR Provides Inadequate Review of DPM and TAC Sources Within the Project Area

At DSEIR pg. 4.B-6, air pollution-sensitive receptor individuals and their locations nearest to the JDEDZ project site are discussed:

> "Some receptors are considered more sensitive than others to air pollutants. Greater than average sensitivity may be the result of pre-existing health problems, proximity to an emissions source, duration of exposure to air pollutants. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses are also considered sensitive, due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.
>
> ...The mix of uses expected to occur within the EDZ area with full buildout includes club retail, hotel, recreational, and small- and large-format general retail establishments which would generally not contain sensitive receptors with respect to localized air pollutants. Senior housing may also be developed within the EDZ area. Existing uses within the EDZ area would be permitted to operate until redevelopment activities occur on those specific sites. The nearest sensitive receptors to the EDZ area are a Club Sport athletic and recreation facility (about 200 feet north), multi-family residences across I-680 (approximately 600 feet west and southwest), single family residences across Stoneridge Drive (approximately 715 feet southeast), and Val Vista Park, which includes a skate park and ballfields and is located approximately 500 feet southeast of the proposed EDZ area. Valley Bible Church and Love & Care Preschool are located within the northern portion of the EDZ area."

The JDEDZ land use project envisions a variety of retail and light industrial land uses; these land uses will rely on daily diesel vehicle operations for related sales and deliveries, with toxic diesel particulate emissions[8] ("DPM") exposures resulting from diesel vehicle and engine operation. Those DPM emissions should have been identified and quantified for each anticipated land use in the JDEDZ.

The anticipated 20-dispenser fueling station anticipated at JDEDZ Parcel 6 will sell gasoline and diesel fuel brought daily to the facility by diesel tanker trucks. Information from CAPCOA Gasoline Service Station Industry-wide Risk Assessment Guidelines provides that most gasoline dispensing facilities (GDF), selling less than 3.6 million gallons per year, result in an increased cancer risk of less than 10/million at 50 feet under

[8] DPM was declared a carcinogen by CARB in 1998. The proposed fueling facility's related cancer health risk is expressed as an estimate of the increased chances of contracting cancer per million population over a 70-year lifetime. Risk increases with proximity to the source, and facility-related toxics, primarily benzene and DPM for the proposed Costco, will combine cumulatively with existing "background" air toxics to create even greater health risks to residents and other sensitive receptors in the surrounding area. While never mentioned in the JDEZD SEIR, it is highly likely that the FedEx distribution center at Parcel 11 contains refueling storage and dispensing equipment.

urban air dispersion conditions. At nine million gallons/yr, CARB has calculated that the risk will increase to 25/million at 50' from the property line[9]. Since CARB research conducted in 2002, there has been a growing number of extremely large GDFs with fuel sales topping 19 million gallons per year. Under rural air dispersion conditions, those large GDFs have been estimated to result in an increased cancer risk value of 120/million[10], which exceeds the BAAQMD cumulative TAC threshold of 100/million used by the Lead Agency to assess JDEDZ's emission impacts.

Unfortunately, we were unable to find an estimate of annual fuel sales for the discount club refueling center at Parcel 6 in the SEIR; a CEQA-conservative approach assumes that the Costco facility's annual sales would approach and could even surpass the upper bound identified in CARB's 2002 GDF review. At 19 million gallons/year throughput, fuels delivered to the facility in 8500-gallon tanker load could be expected to generate more than 6 tanker truck deliveries each day. Combined with other fueling-related TAC emissions that will occur there, it is possible that the proposed Costco station could result in an increased cumulative cancer risk of 120/million based on analyses conducted for other very-large gasoline-dispensing facility proposals, and particularly when combined with existing cumulative inhalation TACs and their health risks that should have been but were not identified and quantified in the JDEDZ SEIR.

Discount Club fueling station delivery-related DPM emissions will combine with diesel emissions from diesel delivery trucks serving the Costco retail "store," with diesel emissions of trucks serving the other land uses in the EDZ, with GDF-related benzene toxics, and with DPM emissions of customer vehicles. Aggregated operational TAC emissions will then combine cumulatively with DPM from the adjacent I-680 and I-580 freeways, and with toxics from the three BAAQMD-registered facilities in Pleasanton noted at DSEIR pg. 4.B-6.

At DSEIR pg. 4.B-23, the Lead Agency has assumed, without providing evidence of annual estimated fuel throughput for the Costco fueling center, that its health risks will fall below the BAAQMD's operational TAC cancer threshold of significance (10/million) on the basis of a generic CARB TAC-guidance recommended receptor setback distance of 300' from the facility, and a 1000' buffer distance presumably to the FedEx distribution center operating on Parcel 11. However, those assumptions are focused solely on potential operational TAC impacts to future residential uses <u>inside</u> the JDEDZ project, and they ignore the project's potential to cause significant cumulative health risks to existing breathers in proximate residences to the west, southwest, and southeast; at the preschool at the north end and within the project area; to gyms[11] within a few hundred feet north of the JDEDZ property line; and to recreationalists at Val Vista Park. This is unacceptable under CEQA, since the SEIR's evaluation of TAC risks clearly fails to identify or evaluate the considerable number of DPM-emitting, project-related sources in or near the JDEDZ, and no discussion is found in the SEIR to show that sensitive receptors within 1000' distance identified in BAAQMD's cumulative TAC threshold of significance are protected against project-related cumulatively significant TAC impacts.

We also note that the 93,573-square foot FedEx facility at Parcel 11, developed in the late 1990's, relies on daily deliveries and transport of packages by heavy-duty diesel trucks, and total trips-per-day for all vehicle types likely exceed several hundred, to and from the facility. No environmental impact analysis is currently available to show that the facility's DPM emissions were ever evaluated for direct or cumulative potential health risk impacts to numerous sensitive residential receptors located to the west and southwest within several hundred feet, nor does the JDEDZ SEIR provide any discussion of its TAC emissions that would combine

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9 CARB; "Air Quality and Land Use Handbook: A Community Health Perspective"; April 2005; pg. 32.
10 City of Fresno; DNCP, FCSP, DDC Draft EIR; Appendix E: Air Quality; pg. 7
11 Google Maps identifies five recreational gym and sports-oriented athletic facilities within several hundred feet north of the JDEDZ; these are, each and all, sensitive receptor land uses. See https://www.google.com/maps/@37.6979263,-121.9176888,250m/data=!3m1!1e3

cumulatively with freeway TACs, TACs associated with the proposed Costco fueling facility, or TACs from other land uses within the JZEDZ.

Under current guidance of the CA Air Pollution Control Officers Association (CAPCOA) designed to reduce public health exposures to TAC emissions of proposed new large land uses, the FedEx facility would undercut the recommended 1000' setback distance to sensitive receptors.[12] Further, it is likely that the FedEx facility utilizes its own vehicle fueling storage and dispensing equipment onsite, with TAC emissions resulting. FedEx's emissions should have been evaluated within the JDEDZ SEIR, and its TAC emissions included in a project-wide HRA.

VI. The SEIR Fails to Adequately Identify and Evaluate Internal- and Adjacent Freeway-TAC Emissions for Cumulative Significance

JDEDZ's existing land uses will routinely emit TACs within the 1000' cumulative TAC threshold distance identified for protection of sensitive receptors, and those will combine with TACs from the two heavily-travelled freeways (I-680, I-580) bordering the project and sensitive receptors within 1000' of the project's borders. Future land uses to be developed within the JZEDZ area will also contribute DPM TAC, primarily resulting from project-generated increases in vehicle use.

Major roadway TAC emissions can be significant. CARB's Roseville Rail Yard Study[13] estimated DPM-related increased cancer risks for 10,000 diesel trucks operating on I-80 daily, at a distance of 300 feet downwind of residences, at 100/million. While diesel truck exhaust emission standards have become much more stringent in recent years, the JDEDZ's proximity to I-580 and I-680 means that it will receive substantially higher-than-average DPM emissions. According to Caltrans 2015 Daily Truck Traffic[14] document, heavy-duty diesel trucks on I-580 adjacent to the JDEDZ will range between 17,831 and 14,828 each day. Heavy-duty diesels on I-680 adjacent to the JDEDZ will range from 9,361 and 12,291 trucks per day. A total of 338,000 average vehicle trips for both freeways, adjacent to the project area, were estimated by Caltrans in 2015 (reflecting the latest-available traffic count information available from Caltrans) to occur each day; those numbers are virtually certain to have increased in 2016 and 2017.

Cumulative TAC health risks resulting from the project's proximity to two major freeways will be affected by poorer dispersal conditions occurring in the Livermore valley area resulting from the effects of local topography and meteorology. BAAQMD's "Planning Healthy Places" document[15] notes that a "number of health studies have shown that increased pollutant levels occur near busy roadways. For example, according to CARB a study conducted in the Bay Area found concentrations of traffic-related fine PM and TACs to be highest within 300 <u>meters</u> downwind of freeways." 300 meters converts to a distance of 984 feet, and existing residences to the southeast and west/southwest of the JDEDZ project are at lesser distances from the project's boundaries.

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[12] According to CAPCOA's "Health Risk Assessments for Proposed Land Use Projects", Table 2, "Distribution centers: Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week)."

[13] CARB; "Roseville Rail Yard Study"; 2004; pg. 9.

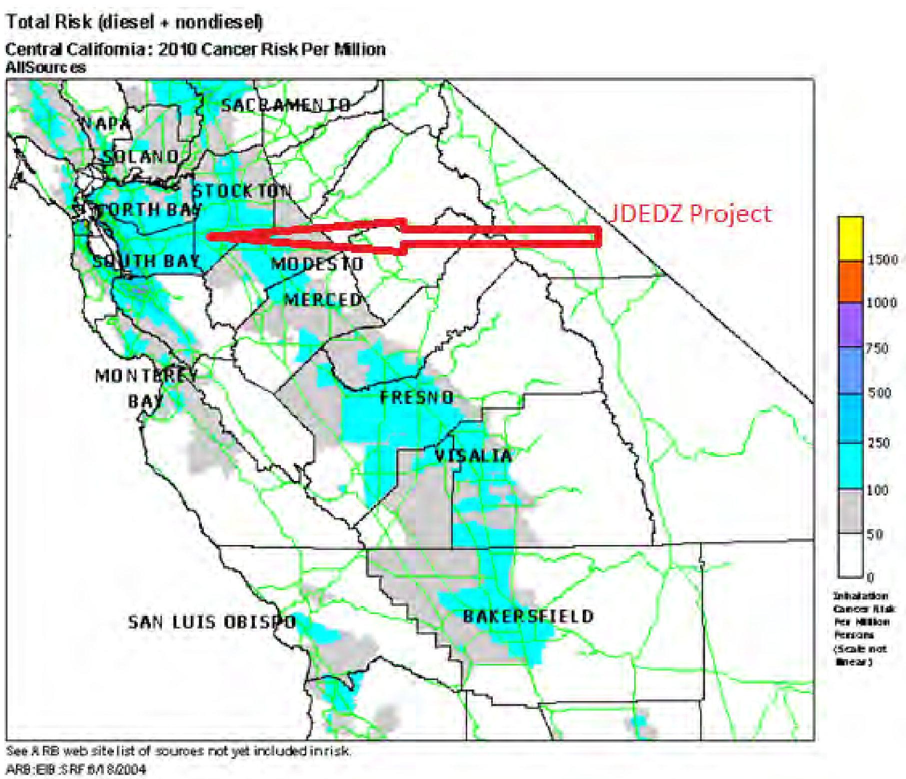
[14] Caltrans; 2015 Annual Average Daily Truck Traffic on the CA Highway System.

[15] See http://www.baaqmd.gov/~/media/files/planning-and-research/planning-healthy-places/php_may20_2016-pdf.pdf?la=en

The extent to which JDEDZ's TAC emissions could cause a cumulatively considerable increase in health risk-related cumulative TAC impacts, particularly under poorer dispersal conditions noted for the area, has not been evaluated due to the SEIR's failure to provide an HRA. Importantly, if existing "background" TAC health risks in the project area are already at high levels due to poorer dispersal conditions and proximity to two major freeways, it would take only a relatively small increment of project-related DPM (or other TAC) to act as the "straw that breaks the camel's back" with health risks then moving past the 100/million increased cancer threshold. Unfortunately, without having conducted an HRA the SEIR is unable to determine the level at which its TAC emissions could likely cause a significant, adverse cumulative inhalation risk impact. Without evidence as proof, the SEIR has assumed that its cumulative impacts will not be significant.

VII. CARB and BAAQMD TAC Screens Point to High Cumulative TAC Health Risks in the Project Area

In the absence of an HRA prepared for the JDEDZ, cumulative TAC cancer risk screening information showing below was obtained from CARB's CHAPIS website and BAAQMD's 2016 online CEQA guidance. The CHAPIS website[16] provides ambient air TAC-related health risk estimates for the central CA area including Pleasanton; a screenshot from the CHAPIS website is provided, below. CHAPIS projections for the central CA region are for year 2010, and reflect the most recent major reductions in heavy-duty diesel onroad vehicle tailpipe standards applying to 2010 and later heavy-duty diesel vehicles operating in CA.



As the graphic illustrates, the JDEDZ project is in an area with existing cancer inhalation health risks estimated by CARB to range from 100 – 250/million; notably, the project area, according to the screenshot, already exceeds the BAAQMD 100/million cumulative cancer risk threshold.

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[16] CARB CHAPIS website; "Cancer Inhalation Risk: Local Trend Maps"; see https://www.arb.ca.gov/ch/communities/hlthrisk/cncrinhl/rskmapvwtrend.htm.400

In addition, in early 2015 the State Office of Environmental Health Hazard Assessment(OEHHA) adopted new, more stringent standards to be utilized in assessing cancer health risks, based on significant scientific advances and inclusion of increased breathing rates of infants and children. In comparison to the previous rates, OEEHA's revised standards are up to three times more health-protective. OEEHA's 2015 revisions have been characterized in CARB guidance to "cause cancer risk estimates to increase for most sources...with **greater responsibilities for facilities and agencies to notify** (the) public and reduce risk"[17] (emphasis added).

Diesel particulate matter (DPM) emissions represent the single greatest airborne toxic threat to public health, with CARB estimating that about 70 percent of the cancer risk that the average Californian faces from breathing toxic air pollutants stems from diesel exhaust particles[18]. And while CARB statewide regulations over the last two decades have substantially reduced DPM exhaust emissions and their related health risks, local "facilities and agencies" must, per CARB guidance, continue to identify and quantify project-related cumulative health risks with notice to the public where evidence of a project's TAC exposures suggests that applicable CEQA significance thresholds would be exceeded. This is particularly appropriate for the JDEDZ project area since it is adjacent to two major freeways, in a nonattainment area with reduced dispersal conditions, and due to locale's population and land use growth, regional growth-related increases in numbers of diesel engines and vehicles, and in diesel-related vehicle-miles-traveled throughout the air basin.

Importantly, the CHAPIS estimate of 100 – 250 cancers per million population identified in the graphic showing (above) for the Pleasanton area was developed prior to OEEHA's 2015 health risk assessment-related revisions, and OEEHA's more stringent health risk assessment values can be expected to increase those health risk values. While CARB diesel exhaust reduction control measures have substantially reduced DPM exhaust emissions across the State, the Lead Agency's implicit assumption in the JDEZD SEIR that project TAC emissions are less than significant is unsubstantiated. The only definitive method to precisely identify and quantify the project's cumulative and operational TAC emissions for the determination of impact significance is with preparation of an HRA consistent with BAAQMD CEQA guidance.

BAAQMD land use guidance[19] issued in May 2016 during the JDEZD land use review process also identifies higher cancer-risk background areas within the Bay Area. The screenshot provided below, from BAAQMD's Interactive Maps website, shows that I-680 and I-580 are identified in purple.

According to BAAQMD's Planning Healthy Places guidance at pg. 42:

> "The purple areas on the maps are based on a screening level, cumulative analysis of all mobile and stationary sources of air pollution in the region. To create the purple areas, the Air District identified areas that exceed 100 in a million for cancer risk, and/or exceed fine PM concentrations of 0.8 micrograms per cubic meter, and/or are within 500 feet of a freeway, 175 feet of a major roadway (>30k AADT), or 500 feet of a ferry terminal. Implementation of best practices to reduce emissions and

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[17] CARB; "Proposed Risk Management Guidance for Stationary Sources of Air Toxics"; Air Resources Board Meeting, July 23, 2015. See https://www.arb.ca.gov/board/books/2015/072315/15-6-8pres.pdf.

[18] CARB; "Summary: Diesel Particulate Matter Health Impacts"; April 12, 2016. See https://www.arb.ca.gov/Research/diesel/diesel-health_summ.htm.

[19] BAAQMD; "Planning Healthy Places"; pg. 42. BAAQMD Interactive Maps at http://www.baaqmd.gov/plans-and-climate/planning-healthy-places.

> exposure will reduce the health risks; however, the emissions and exposures will not be completely eliminated."

The BAAQMD interactive map identifies existing high cumulative TAC risks to sensitive receptors within 500' of I-680, and some sensitive receptors there (residents to the southwest and west of the JDEDZ, along with the Love and Care Preschool and recreationalists to the north) will also fall within the 1000' cumulative TAC significance threshold distance identified in the JDEDZ SEIR. Those same receptors are, according to BAAQMD, already at high risk from cumulative TACs largely attributable to co-location within 500' of I-680.

But because the SEIR contains no evidence to ensure that those receptors will not experience health risks exceeding significance thresholds with the addition of JDEDZ TAC emissions, the public and decision-makers cannot be assured that cumulatively TAC significance thresholds will not be exceeded with project development. Estimated increases in health risks beyond BAAQMD thresholds are not trivial---while dispersion modeling and risk estimates are not an exact science, relative increases in predicted risks can be assumed to translate into increased numbers of non-cancer and cancer cases.

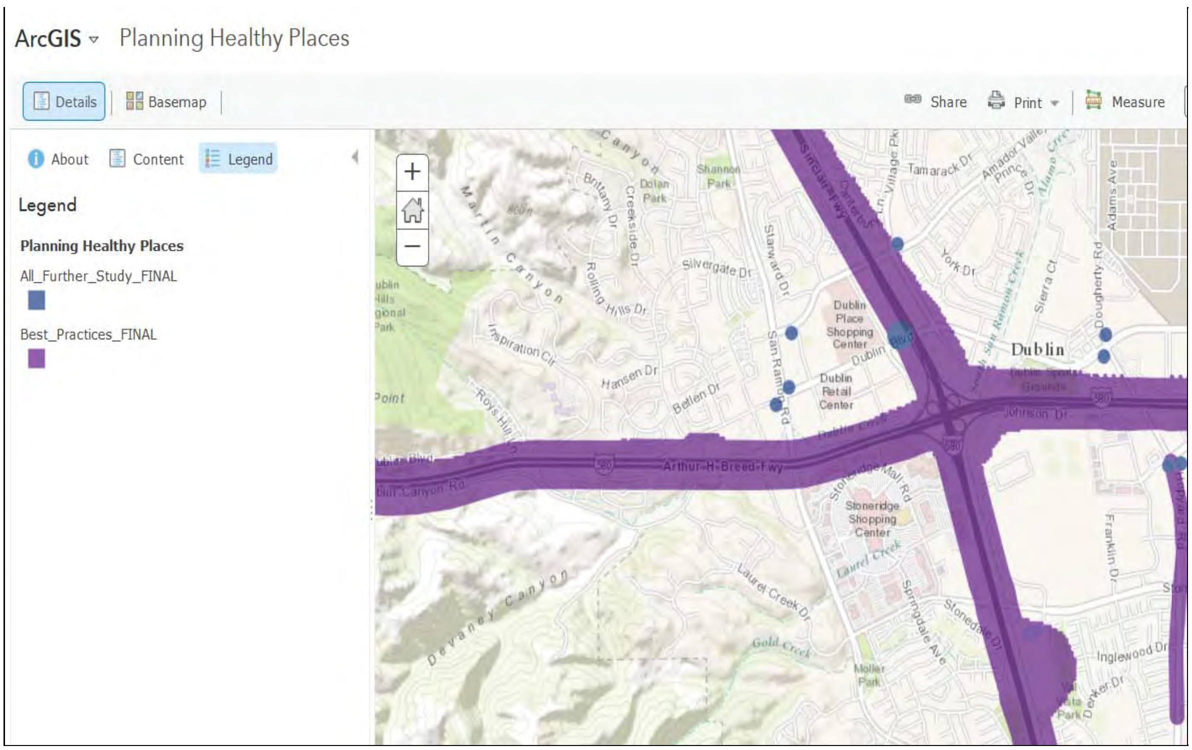

Figure 2 - BAAQMD PHP Cumulative TAC Map Excerpt Including Freeways Adjacent to JDEDZ Project Area

Sincerely,

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STATEMENT OF QUALIFICATIONS

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Professional History
Greg Gilbert has consulted on air quality land use planning and mobile source issues and projects to private and public clients since forming Autumn Wind Associates in 2001. Previously, he was marketing director for a specialty emissions catalyst manufacturer. Between 1990 and 2000 Mr. Gilbert worked in two California air agencies, most recently as project manager in the Mobile Source Division of the Sacramento Metropolitan Air Quality Management District. While at the SMAQMD, Mr. Gilbert was responsible for implementing the District's heavy-duty vehicle low-emission incentive program that would later serve as a model for creation of the statewide Moyer Program. Air agency experience included evaluating land use-related air quality emission impacts and control strategies, developing CEQA mitigations and updating CEQA guidance, and creation of the first in-lieu air quality CEQA mitigation fee program.

Since leaving the SMAQMD he has provided consulting expertise to air agencies, provided input for revisions to the URBEMIS model, conducted research on construction practices and equipment emissions, and assisted with development of air district CEQA land use guidance documents and mitigation strategies. Mr. Gilbert has reviewed CEQA project-specific environmental documentation and provided expert written comments and testimony for public-, private-, and environmental-sector clients.

Health Risk Assessment Report
Downtown Neighborhoods Community Plan, Fulton Corridor Specific Plan, and the Downtown Development Code Project
City of Fresno, Fresno County, California

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
AREL	acute reference exposure level
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technologies
BTU	British Thermal Unit
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
DDC	Downtown Development Code
DNCP	Downtown Neighborhood Community Plan
DPM	diesel particulate matter
EMFAC	Emission Factors Model
EPA	United States Environmental Protection Agency
FCSP	Fulton Corridor Specific Plan
HAP	hazardous air pollutants (same as TAC)
HI	hazard index
K	Kelvin
MBTU	one million British Thermal Units
MERV	minimum efficiency reporting value
NSR	New Source Review
OEHHA	California Office of Environmental Health and Hazards Assessment
PAH	polycyclic aromatic hydrocarbons
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
REL	Reference exposure level
ROG	reactive organic gases
SCAQMD	South Coast Air Quality Management District
SJVAPCD	San Joaquin Valley Air Pollution Control District
TAC	toxic air contaminants
TOG	total organic gases

SECTION 1: EXECUTIVE SUMMARY

This health risk assessment (HRA) was prepared to evaluate the potential health risks from toxic air contaminants (TACs) at the proposed locations for sensitive receptors as detailed in the proposed Downtown Neighborhoods Community Plan (DNCP), Fulton Corridor Specific Plan (FCSP), and the Downtown Development Code (DDC or Downtown Code) in Fresno, California.

The California Air Resources Board (CARB) has identified several TACs, including diesel particulate matter (DPM), as carcinogenic substances, based on their potential to cause cancer, premature death, and other health problems. Those most vulnerable to these TACs are children whose lungs are still developing and the elderly who may have other serious health problems. In addition, diesel soot causes visibility reduction.

This HRA was conducted in accordance with the California Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2015), the Guidance for Air Dispersion Modeling (SJVAPCD, 2007), and the Final Staff Report Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document (SJVAPCD, 2015). This HRA includes: (1) an estimate of the TAC emissions from State Routes 41, 99 and 180 to the project study area; (2) a list of all stationary source TAC emissions in the project study area; (3) methodology utilized to analyze the TAC concentrations at the proposed sensitive receptors, (4) an assessment of human exposure to the TACs and $PM_{2.5}$ at various sensitive receptor locations throughout the project study area; and (5) a quantitative estimation of project-specific health risks and hazards associated with these levels of exposure. These potential impacts are then compared with the applicable thresholds for cumulative sources of TAC emissions to assess the regulatory significance of these impacts.

Several mathematical modeling tools were employed in this assessment that are routinely used and approved by the BAAQMD to perform such air quality assessments.

- Lakes Environmental's AERMOD View Version 9.0.0 Model running the U.S Environmental Protection Agency (EPA) AERMOD air dispersion model.
- The ARB EMFAC2014 mobile emissions source model, which is used to calculate exhaust emissions from various types of vehicles operating on the nearby freeways.

The above models and their assumptions are described in subsequent sections and appendices to this report.

1.1 - Executive Summary

This report contains the results of a detailed health risk assessment to determine the cumulative community health risk and hazard impacts to the proposed placement of sensitive receptors within the DNCP and FCSP.

1.1.1 - TAC Emissions Impacts

This report contains the results of a detailed health risk assessment to determine the potential community health risk and hazard impacts associated with TAC emissions from nearby TAC sources including diesel particulate matter (DPM) sources located within the project study area. The principal focus was on assessing the long-term health impacts from TAC emissions used in assessing both long-term and short-term hazards. The analyses contained in this support the following conclusions:

- Development of residential units associated with the proposed project would have the potential to be located where the cumulative cancer risk exceeds the cumulative threshold of 100 in one million. Mitigation Measures 1 and 2 are provided to reduce the cancer risks to less than significant levels.
- The project study area would not exceed the cumulative noncancer chronic and acute hazard indexes of 10.0 at any location where development of residential uses would occur.

1.1.2 - Mitigation Measures

MM HRA-1 The City shall require that requires any new residential development that is located within 0.1 $\mu g/m^3$ DPM concentration contours as detailed in Exhibit 4, to install a positive static pressure forced air heating, ventilation, and air conditioning (HVAC) system into each residential unit. Each HVAC system will be required to install a high efficiency Minimum Efficiency Reporting Value (MERV) filter of MERV 13 or better in the air intake for the HVAC system and the air intake will be installed with a fan designed to force air through the MERV 13 filter in order to create positive static pressure.

MM HRA-2 The City shall require that requires require any new residential development that is located within the recommended setback distances detailed in Table 10 from a stationary source of TAC emissions to install a positive static pressure forced air heating, ventilation, and air conditioning (HVAC) system into each residential unit. Each HVAC system will be required to install a high efficiency Minimum Efficiency Reporting Value (MERV) filter of MERV 13 or better in the air intake for the HVAC system and the air intake will be installed with a fan designed to force air through the MERV 13 filter in order to create positive static pressure.

SECTION 2: PROJECT DESCRIPTION

2.1 - Project Location

The DNCP boundaries are located within the southern portion of the City of Fresno. The community plan boundaries encompass 7,290 acres. The Community Plan area is generally bounded to the east by Chestnut Avenue, to the south by Church Avenue, to the west by Thorne, West, and Marks Avenues, and to the north by State Route 180 (Exhibit 1). Along the western side of the Community Plan area, the boundaries extend as far north as Clinton Avenue. The Community Plan area is divided by State Routes 99, 41, and 180, as well as the Union Pacific and BNSF railroad right-of-ways.

The FCSP area is located within the boundaries of the DNCP (Exhibit2). The FCSP boundaries encompass 655 acres. The Specific Plan area is generally bounded to the north by Divisadero Street, to the west by State Route 99, to the south by State Route 41, and to the east by N Street, O Street, and the alley between M and N Streets (Exhibit 3). The Specific Plan area is divided by the Union Pacific railroad right-of-way.

2.1.1 - Sensitive Receptors in Project Vicinity

Individual who are more sensitive to toxic exposures than the general population are considered sensitive receptors. This would include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. Such receptors may reside at hospitals, residences, convalescent facilities, and schools.

2.2 - Project Description

2.2.1 - Downtown Neighborhoods Community Plan Objectives

The primary objectives of the DNCP are as follows:

- To make the Downtown Neighborhoods attractive, healthy, mixed-income places to live, thanks to their historic character and their proximity to a revitalized Downtown.
- To revive the underlying structure of the Downtown Neighborhoods to create identifiable neighborhoods, districts, and corridors.
- To integrate the public realm of streets with a multi-modal transportation network that renders them walkable and livable.
- To regenerate parks and public spaces and make them safe and accessible to residents.
- To reinforce the identity of each of the Plan subareas by including all of the remaining ingredients for quality of life from childhood to old age within a walkable range.
- To reintroduce missing street trees, irrigation, and sidewalks, and slow down traffic on primary thoroughfares through various traffic-calming measures.
- To introduce a range of well-designed building types that provide a variety of housing choices within easy access of parks, services, and jobs.

- To design residential buildings to promote safety and community on the sidewalk and street.
- To design commercial buildings with facades that are adjacent to sidewalks, are constructed of quality and durable materials, can accommodate a mix of uses at any one time, and can be reused over time under different programs.
- To introduce the High Speed Train in a manner that has the least impact possible on the surrounding homes, businesses, and open spaces, while preserving Downtown's interconnected street network to the maximum extent possible.

2.2.2 - Fulton Corridor Specific Plan Objectives

The primary objectives of the FCSP are to define:

- A vision for the future of Downtown that recognizes the importance of history and tradition while embracing opportunities for continued reinvestment, growth, and beneficial change.
- Goals and policies that work in tandem with and refine those of the General Plan and the Downtown Neighborhoods Community Plan to achieve the revitalization of the Plan area.
- New zoning standards for the Plan area that will replace current zoning regulations. These new standards are calibrated to deliver new development that is consistent with Fresno's physical character, history, and culture, as well as the community's vision for its future growth.
- The implementation strategy for transforming the Plan area's streets, infrastructure, parks, and other public spaces. The above purposes provide private property owners with a clear understanding of the future context within which they are investing and reinvesting in their properties.

2.2.3 - Downtown Development Code Objectives

The objectives of the DDC are summarized as follows:

1. Property shall be occupied with land use activity to improve health; stabilize and improve property values; provide continuity of Fresno's heritage; maximize compatibility; offer a range of housing choices; increase reinvestment in the Downtown Neighborhoods; provide a wide range of services and shopping; revitalize mixed-use corridors; and support convenient transit.
2. Buildings and their additions shall be designed and maintained to support reinvestment; generate one main building per site; front the adjacent street(s); enhance the building's relationship to the public realm; use appropriate landscape materials; generate long-term value; and express creativity.
3. Frontages shall be designed and maintained to support the intended physical environment; support active and continuous pedestrian-oriented environments; provide appropriate physical transitions between the public right-of-way and the property; and express creativity.

4. Signage shall be designed and maintained to promote the aesthetic and environmental values of the community; provide an effective channel of communication; avoid traffic safety hazards; and safeguard and protect the public health, safety, and general welfare.
5. Open spaces, landscaping and streetscapes shall be designed and maintained to preserve and promote the aesthetic character and environmental quality of Fresno as a place to live, work, and shop; correspond to the adjacent streetscapes; incorporate urban agriculture at all scales, as practical; and contribute to mitigating environmental degradation.
6. Each new or modified block and street shall be designed and maintained to interconnect and form/maintain a network; support the intended physical context; generate pedestrian-oriented block lengths; transform large sites into pedestrian-oriented blocks; increase the number of blocks; and support a multi-modal transportation system.

2.3 - Project Characteristics

2.3.1 - Development Potential

The maximum amount of development that is anticipated to occur within the two Plan areas has been quantified for the purposes of conducting environmental impact analysis, as summarized in Table 1.

Table 1: Maximum Development Potential by Land Use[1]

Land Use	Quantity DNCP (excl. FCSP)	Quantity FCSP	DNCP + FCSP
Residential (dwelling units)	3,697	6,293	9,990
Office (sf)	2,000,000	3,900,000	5,900,000
Retail (sf)	350,000	1,600,000	1,950,000
Industrial (sf)	2,900,000	150,000	3,050,000
Public Facilities (sf)	0	0	0
Agriculture (acres)	0	0	0
Open Conservation (acres)	33	31	64
Vacant Land (acres)	0	0	0

Note:
[1] To examine the level of development allowed within the FCSP area, individual underutilized parcels were identified within the FCSP area. These consisted of vacant lots, parking lots, lots that contain underutilized non-historic buildings, and buildings with parking lots in front of them. For the DNCP area, vacant parcels were identified. A floor area ratio (FAR) range, derived from the FAR of each proposed building type allowed within each parcel's respective zone in the Downtown Development Code, was then applied to each of the underutilized parcels, resulting in a total gross new building square footage.
This gross square footage was then apportioned among the uses projected within the plan area according to the land use proportions of the market demand development potential. Since the Market Analysis did not evaluate the industrial market, the industrial development potential was assumed to be approximately 10% of the total building square footage for the combined plan areas. The existing building square footage currently present within these parcels was then subtracted, by use from the proposed square footage.
Note that the allowed development potential within the FCSP area included 1.5 million square feet (sf) of space within

Land Use	Quantity DNCP (excl. FCSP)	Quantity FCSP	DNCP + FCSP
existing vacant buildings. As with new development potential, this 1.5 million sf of existing vacant space was apportioned according to the market demand potential, adding up to approximately 860 residential units 390,975 sf of office space, 119,233 sf of retail space, and a reduction of 42,587 sf of industrial space. This existing vacant space is considered new development potential, not existing development. Thus, the FCSP determines the allowed development that can occur within the FCSP area, regardless of whether it is a new building on vacant land or new uses in an existing vacant building.			

The "high" capacity development potential, by land use, for each of the FCSP districts is shown in Table 2. Negative development potential for industrial uses in certain districts is attributed to existing industrial uses that are assumed to be replaced by non-industrial uses.

Table 2: Development Potential by Downtown (FCSP) District (High Development Potential)

Land Use	Central Business District[1]	Cultural Arts District	Civic Center	South Stadium District	Chinatown	Armenian Town/	Divisadero Triangle	Total
Residential (units)	1,338	1,719	191	691	1,587	447	320	6,293
Office (s.f.)	1,338,402	1,172,463	57,775	290,845	891,318	206,191	-60,115	3,896,879
Retail (s.f.)	483,053	662,143	35,385	108,058	246,541	32,280	19,026	1,586,486
Industrial (s.f.)	—	-42,180	—	-848	204,062	-15,949	—	145,085

Note:
[1] Includes approximately 1.5 million sf, as estimated by the City, of vacant, but usable, space in existing multi-floor buildings in the Plan Area. Development potential is divided into 860 residential units and 467,621 sf of non-residential uses.

2.3.2 - Residential Population Potential

Population projections were based on the 2025 General Plan, which allocated population by Community Plan areas. Table 3 shows the population increase allowed under the 2025 General Plan within each existing community plan area; the allowed population increase within the portion of each community plan that overlapped the DNCP area, the actual population within the portion of each community plan that overlapped the DNCP area in the year 2000 (per the 2000 Census); and the total expected 2035 population within the portion of each community plan that overlapped the DNCP area.

Table 3: 2025 General Plan Allowed Population Increase by Existing Community Plan Area

Existing Community Plan	Allowed Population Increase (Persons)		Population Within Proposed DNCP/FCSP Boundary (Persons)	
	Within Each Existing Community Plan Boundary	Within Proposed DNCP/FCSP Boundary[1]	Year 2000[2]	Year 2035
Central Area	12,845	12,845	14,927	27,772

Existing Community Plan	Allowed Population Increase (Persons)		Population Within Proposed DNCP/FCSP Boundary (Persons)	
	Within Each Existing Community Plan Boundary	Within Proposed DNCP/FCSP Boundary[1]	Year 2000[2]	Year 2035
Edison	43,286	7,657	12,356	20,013
Roosevelt	39,036	5,809	35,598	41,407
West Area	73,913	5,447	4,754	10,201
Total	**169,080**	**31,758**	**67,635**	**99,393**

Notes:
[1] Percentage of existing community plan areas within proposed DNCP/FCSP boundary are as follows:
Central Area: 100.00% Edison: 17.69% Roosevelt: 14.88% West Area: 7.37%
[2] Source: 2000 Census

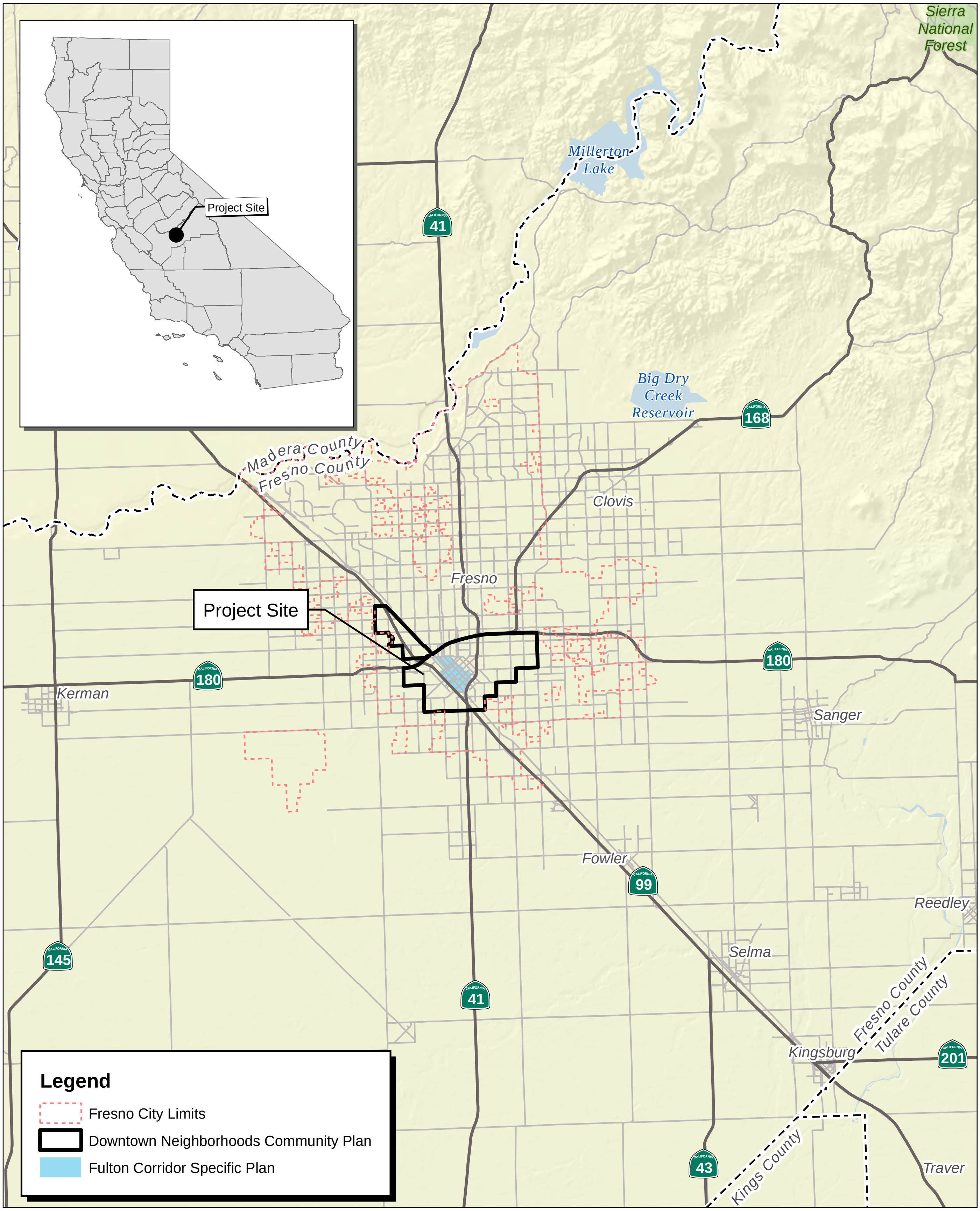
As Table 3 shows, the anticipated year 2035 population within the portions of the Edison, Roosevelt, and West Area community plans that overlapped the DNCP is within the limits of the 2025 General Plan. While the Central Area Community Plan permitted only 12,845 additional residents, the DNCP proposes to allow as many as 14,927 additional residents within this area. This increase is based upon the DNCP's – and the accompanying FCSP's – goals of generating a vibrant, mixed-use Downtown by introducing the maximum number of residents within the heart of Downtown (i.e., within the FCSP area). To achieve this end, the DNCP applies the aggregate allowed residential population increase for each portion of the Community Plan areas to the entire combined DNCP boundary, as shown below in Table 4.

The residential population for each plan area, as well as the combined population for both plan areas, is shown in Table 4. Together, the DNCP and FCSP anticipate that by the year 2035, the residential population of the plan areas could increase by as many as 28,860 people, to a total population of 99,081 residents, which is within the limits established by the Fresno General Plan.

Table 4: Residential Population Potential

Land Use	DNCP (excl. FCSP)	FCSP	DNCP + FCSP
Existing Population (persons)[a]	66,344	3,877	70,221
New Population (persons)[b]	15,268	13,593	28,860
Total Residential Population (persons)	**81,612**	**15,834**	**99,081**
Existing Population Density (persons/acre)	9.98	5.92	9.62
Population Density in Year 2035 (persons/acre)	12.28	24.17	13.35

Notes:
[a] Source: Claritas, Inc.; American Community Survey 2006-2008; Strategic Economics 2010.
[b] Assumes 4.1 persons per household for the DNCP and 1.9 persons per household for the FCSP. The Citywide average for persons per household is 3.0. Source: Claritas, Inc.; American Community Survey 2006-2008; Strategic Economics 2010. The DNCP is composed primarily of large families, while the FCSP is home to a much larger proportion of single person households.

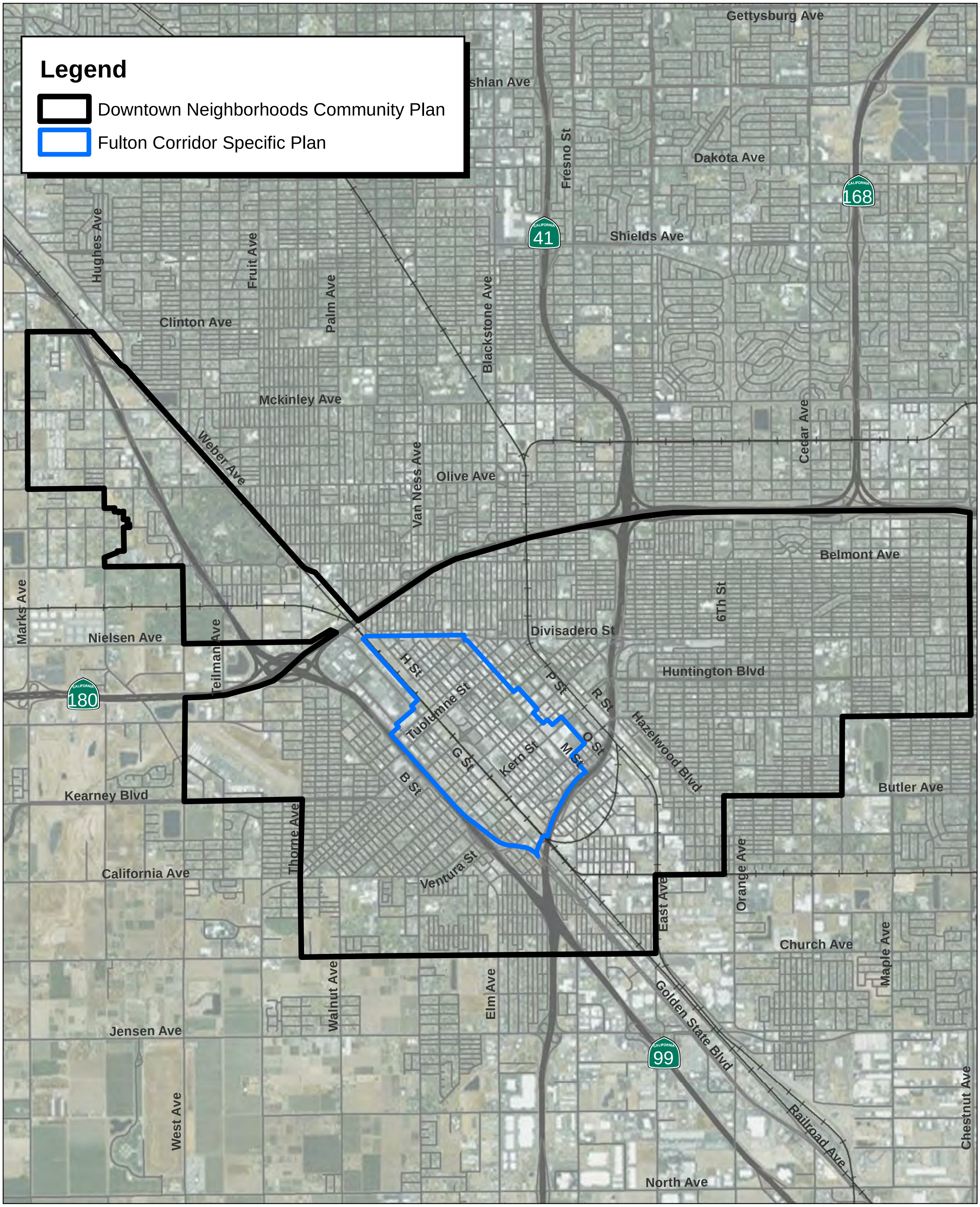


Source: Census 2000 Data, The CaSIL, FCS GIS 2013.

FirstCarbon® SOLUTIONS

5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

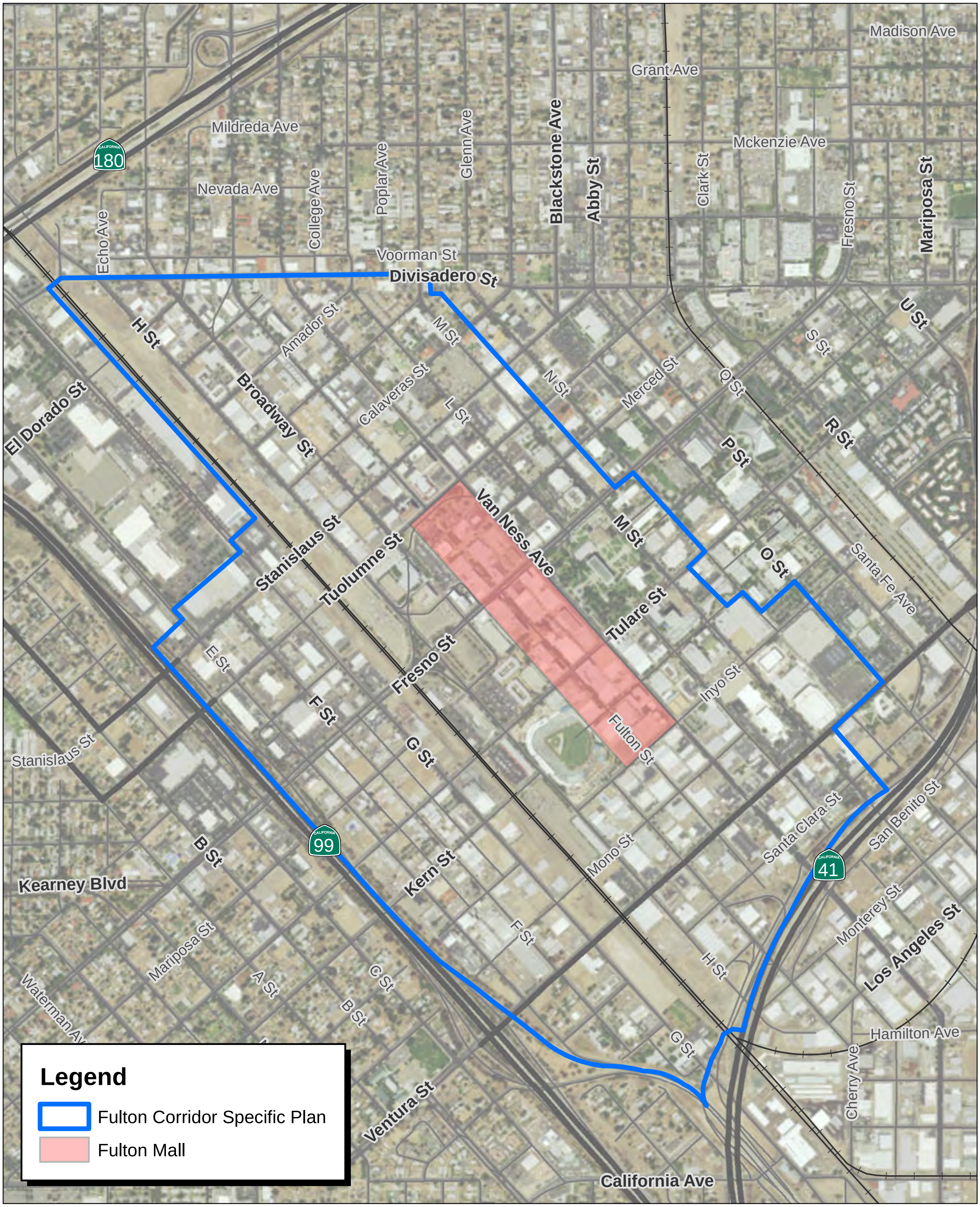


Source: ESRI Imagery, 2014

FirstCarbon SOLUTIONS

1 0.5 0 1 Miles

Exhibit 2
Plan Areas



Source: ESRI Imagery, 2014

1,200 600 0 1,200 Feet

Exhibit 3
Fulton Corridor Specific Plan Area

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SECTION 3: TOXIC AIR CONTAMINANTS

TACs is a term that is defined under the California Clean Air Act and consists of the same substances that are defined as Hazardous Air Pollutants (HAPs) in the Federal Clean Air Act. There are over 700 hundred different types of TACs with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different TACs. The most important of these TACs, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as from accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

3.1 - Diesel Emissions

According to The California Almanac of Emissions and Air Quality 2013 Edition (CARB, 2013), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). DPM is a subset of $PM_{2.5}$ because the size of diesel particles are typically 2.5 microns and smaller. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot." Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of DPM as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources. The various pollutants within DPM that also cause acute and chronic health impacts are detailed in Table 5, which was developed through crosschecking all diesel emissions pollutants provided in San Diego Air Pollution Control District's (SDAPCD) Diesel Fired Engines Emissions Factor Table to the list of acute and chronic reference exposure levels provided at: http://oehha.ca.gov/air/allrels.html.

Table 5: Diesel Emission Pollutants that Cause Acute and Chronic Health Impacts

Toxic Air Contaminant	Reference Exposure Level ($\mu g/m^3$)(1)		Percent of DPM Emission Rate(3)	Target Organ Systems
	Acute REL(2)	Chronic REL		
1,3-Butadiene	660	140	0.51	Development
Acetaldehyde	470	140	1.84	Eyes, respiratory system (sensory irritation)
Acrolein	2.5	0.35	0.08	Eyes, respiratory system
Arsenic	0.2	0.015	0.004	Reproductive/developmental, cardiovascular system, nervous system
Benzene	27	3	0.44	Hematologic system, immune system, reproductive/developmental
Cadmium	—	0.02	0.004	Kidney, respiratory system

Table 2 (cont.): Diesel Emission Pollutants that Cause Acute and Chronic Health Impacts

Toxic Air Contaminant	TAC Potency factors (μg/m³)(1)		Percent of DPM Emission Rate(3)	Target Organ Systems
	Acute REL(2)	Chronic REL		
Chlorobenzene	--	1,000	0.0005	Eyes, respiratory system
Chromium (hexavalent)	—	0.2	0.001	Respiratory system, hematologic system
Copper	100	—	0.01	Respiratory system
Ethyl benzene	—	5	0.03	Liver, kidney, developmental
Formaldehyde	55	9	4.07	Eyes, immune system, respiratory
Hexane	—	200	0.06	Nervous system
Hydrogen Chloride	2,100	9	4.07	Eyes, immune system, respiratory
Manganese	—	0.09	0.01	Nervous system
Mercury	0.6	0.03	0.005	Reproductive/developmental
Naphthalene	—	9	0.05	Respiratory system
Nickel	0.2	0.02	0.01	Immune system, respiratory system
Propylene	—	3,000	1.10	Respiratory system
Selenium	—	20	0.01	Liver, cardiovascular system, nervous system
Toluene	37,000	300	0.25	Nervous system, eyes, respiratory system, reproductive/developmental
Xylene	22,000	700	0.10	Eyes, nervous and respiratory systems
DPM	—	5	—	Respiratory system

Notes:
(1) Potency factors obtained from: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
(2) REL = Reference Exposure Level
(3) Percentage of DPM Emission Rate calculated by dividing the pollutant's pounds per 1,000 gallons rate by the PM2.5 pounds per 1,000 gallons rate provided by the SDAPCD
Source: OEHHA, 2014; SDAPCD, 2011.

3.2 - Gasoline Emissions

CARB staff has evaluated the potential cancer risk levels caused by the use of gasoline and their findings are shown in Table 6. Table 6 shows the emissions of four major compounds of gasoline exhaust in the year 2005 for the study area, which included the San Francisco Bay Air Basin (CARB, 2008). As indicated in Table 6, the cancer potency weighted emissions of these four TACs from all types of gasoline sources are estimated at 481 tons per year. For gasoline vehicle sources, the potency weighted emissions of these four TACs are estimated at about 253 tons per year, or about 6 percent of the potency of diesel emissions. Since the potential cancer risks associated with gasoline vehicles are substantially less then the potential cancer risks associated with DPM emissions, gasoline-vehicle TAC emissions have not been analyzed in this HRA.

Table 6: TAC Emissions from Gasoline Exhaust

Toxic Air Contaminant	Emissions (tons per year)[1]			
	All Gasoline Sources[2]	Potency Weighted[3]	Gasoline Vehicular Sources	Potency Weighted
1,3-Butadiene	414	228	245	135
Benzene	1,997	180	1,153	104
Formaldehyde	3,208	61	605	12
Acetaldehyde	1,355	12	177	2
Total (other than DPM)	6,974	481	2,180	253
DPM (from Diesel)	4,552	4,552	-	-
Ratio of Gasoline Vehicular Sources to DPM Potency Weight				**0.06**

Notes:
[1] The tons per year of emissions are based on the total emissions from the San Francisco Bay Air Basin study area. potency weighting factors.
[2] Includes gasoline storage, distribution, and filing stations as well as vehicle sources.
[3] Potency factors obtained from: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
Source: CARB, 2008; OEHHA, 2014.

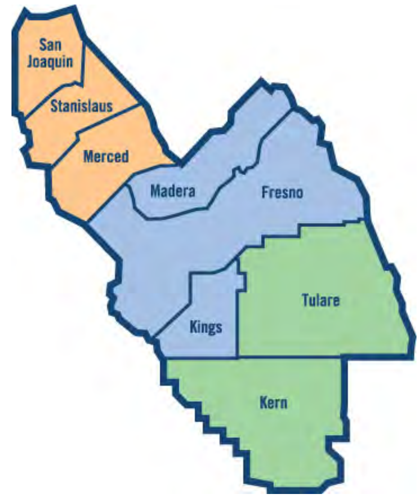
The 1990 Clean Air requires the use of reformulated gasoline that reduces TAC emissions by a minimum of 20 percent by the year 2000. The TAC reductions have been achieved by mainly reducing gasoline volatility as well as reducing the benzene content in gasoline. (http://www.epa.gov/otaq/consumer/02-toxic.pdf). In 2001, the EPA strengthened the benzene limitations in gasoline with adoption of the Mobile Source Air Toxics Rules (MSAT). The MSAT Phase 2 rules, which are now in effect limits benzene to an average of 0.62 percent of gasoline and provides other measures to reduce benzene emissions from gasoline.

Although, gasoline-powered vehicles create TACs, since TAC emissions from gasoline have been greatly reduced from the 1990 Clean Air Act and MSAT, and since gasoline-related TAC emissions are emitted at a rate of approximately 6 percent of diesel-related TAC emissions, the cancer risk created from gasoline-powered vehicles is negligible, when compared to DPM. Therefore no further analysis of gasoline emissions is provided in this analysis.

SECTION 4: ENVIRONMENTAL AND REGULATORY SETTING

4.1 - Environmental Setting

The project is located in the City of Fresno, in Fresno County and within the eight-county San Joaquin Valley Air Basin (SJVAB) (see figure at right). The air quality in the SJVAB is among the worst in the nation, and routinely exceeds federal and state air quality health standards for ozone and particulates. The SVAB's poor air quality is caused by natural geographic and climatic conditions, as well as local and regional development, transportation, and land use practices.



Source: SJVAPCD.

4.2 - Regulatory Setting – Toxic Air Contaminants

The toxic air contaminants (TACs) at the project site are addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to reduce TACs through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving TACs are discussed below.

4.2.1 - Federal and State

The United States Environmental Protection Agency (EPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. There are national standards for six common "criteria" air pollutants including ozone, nitrogen dioxide, carbon monoxide, particulate matter (PM10 and PM2.5), lead, and sulfur dioxide, which were identified from provisions of the Clean Air Act of 1970. California, under the California Clean Air Act, has also defined a set of health protective California Ambient Air Quality Standards (CAAQS).

Besides the "criteria" air pollutants, there is another group of substances found in ambient air referred as Hazardous Air Pollutants (HAPs) under the Federal Clean Air Act and Toxic Air Contaminants (TACs) under the California Clean Air Act. These contaminants tend to be localized to their sources and are found in relatively low concentrations in ambient air. They are regulated at the federal, state and regional levels, due to their potential of causing adverse health effects from exposure to low concentrations for long periods of time. HAPs are the air contaminants identified by the EPA as known or suspected to cause cancer, serious illness, birth defects, or death. Many of the contaminants originate from human activities, such as fuel combustion and solvent use. Mobile Source Air Toxics (MSATs) are a subset of the 188 identified HAPs. Of the 21 different HAPs that constitute the MSATs, there are six primary HAPs identified that include diesel exhaust, benzene, formaldehyde, acetaldehyde, acrolein, and 1, 3-butadiene. While vehicle miles traveled in the United States is anticipated to increase by 64 percent between 2000 and 2020, emissions of MSATs are anticipated to decrease between 57 and 67 percent as a result of efforts to control mobile source emissions.

The CARB Statewide comprehensive air toxics program was established in the early 1980s. The TAC Identification and Control Act (Assembly Bill 1807, Tanner 1983 [AB 1807]) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill 2588, Connelly 1987 [AB 2588]) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

AB 1807, requires the CARB to identify and control TACs. In selecting substances, the CARB must consider "the risk of harm to the public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community." AB 1807 also requires the CARB to use available information gathered from the AB 2588 program to include in the prioritization of compounds. In 1992, the Hot Spots Act was amended by Senate Bill 1731, to require facilities that pose a significant health risk to reduce their risk through a risk management plan.

In 2000, the CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce PM emissions and the associated health risks by 75 percent by 2010 and 85 percent by 2020. The plan provides a roadmap that identifies steps CARB will be taking to develop specific regulations to reduce diesel particulate matter (DPM) emissions.

As a result of controls on motor vehicles, fuels, stationary sources, and consumer products, the public's exposure to air toxics has decreased dramatically. Between the early 1990's and today, the decrease in statewide average health risk ranged from approximately a 20 percent decrease from formaldehyde to approximately a 90 decrease for perchlorethylene. 1,3-butadiene and benzene have also seen significant decreases of 80 to 85 percent as a result of CARB's mobile source control program. In addition dioxins have been reduced by 99 percent in that time period, however that is primarily due to CARB's restrictions on medical waste incinerators.

California emission regulations appropriate to the local industrial facility emission sources include:

- CARB Air Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling limits the idling of diesel vehicles to reduce emissions of toxics and criteria pollutants (CARB 2005). The driver of any vehicle subject to this section: (1) shall not idle the vehicle's primary diesel engine for greater than five minutes at any location; and (2) shall not idle a diesel-fueled auxiliary power system (APS) for more than five minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

- CARB Air Toxics Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRUs) and TRU Generator Sets, and Facilities Where TRUs Operate implements the provisions of the CARB Diesel Risk Reduction Program that limits the emissions of diesel particulate matter emissions from TRUs that operate in California (CARB 2011a).

- CARB Final Regulation Order, Requirements to Reduce Idling Emissions from New and In-Use Trucks, beginning in 2008, would require that new 2008 and subsequent model-year heavy-duty diesel engines be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to "neutral" or "park", and the parking brake is engaged (CARB 2005).

- CARB Final Regulation Order, Adoption of the Statewide Truck and Bus Regulations, would require affected on-road trucks and buses to meet performance requirements between 2013 and 2023 such that by January 1, 2023 all vehicles must have a 2010 model year engine or equivalent (CARB 2011b).

4.2.2 - Regional

The SJVAPCD is the agency principally responsible for comprehensive air pollution control for the SJVAB. The SJVAPCD is responsible for regulating emissions primarily from stationary sources and certain areawide and indirect sources, but has no authority over motor vehicle emissions and other non-stationary sources of TAC emissions. To that end, as a regional agency, the SJVAPCD works directly with the eight countywide transportation commissions and local governments and cooperates actively with all federal and state agencies. The SJVAPCD with coordination of the eight county transportation agencies is also responsible for developing, updating and implementing the Air Quality Plans for the Air Basin. In addition, the SJVAPCD has prepared the Guide for Assessing and Mitigating Air Quality Impact (GAMAQI) (SJVAPCD, 2014), which sets forth recommended thresholds of significance, analysis methodologies, and provides guidance on mitigating significant impacts.

SECTION 5: MODELING PARAMETERS AND ASSUMPTIONS

The TAC dispersion modeling utilized in this analysis has been based on the recommended methodology provided by the SJVAPCD (SJVAPCD, 2007; SJVAPCD, 2015) and OEHHA (OEHHA, 2015). This assessment focused on estimating potential health risk impacts to the proposed placement of sensitive receptors within the DNCP and FCSP from the nearby freeways. Important issues that affect the dispersion modeling include the following: 1) Model Selection, 2) Source Treatment, 3) Meteorological Data, and 4) Receptor Grid. Each of these issues is addressed below.

5.1 - Model Selection

Lakes Environmental's AERMOD View Version 9.0.0 Model running the AERMOD dispersion model was used for all dispersion modeling. Key dispersion modeling options selected include the regulatory default option and urban modeling option for the City of Fresno with a population of 520,159. Flagpole receptor height was set to 0 meters. AERMAP (the terrain pre-processor for AERMOD) was run with a 1-degree USGS DEM Map of West Fresno.

5.1.1 - Meteorological Data

Meteorological data from the National Climatological Data Center at the Fresno Air Terminal Airport was selected for this modeling application. Five full years of sequential meteorological data was collected at the Fresno Airport from 2009 to 2013. The SJVAPCD processed the data for input to the model. The data was obtained at:
http://www.valleyair.org/busind/pto/Tox_Resources/2013_Modeling/fresno.htm.

5.1.2 - Receptor Grid

Discrete Receptors were placed at the approximate location of representative nearby sensitive receptors located throughout the project study area. Sensitive receptors include but are not limited to single- and multi-family homes, schools, hospitals and convalescent care centers, parks, and churches.

5.2 - Freeway Emissions Assumptions

The principal source of TAC emissions from State Routes 41, 99, and 180 are from diesel vehicles operating on these freeways. The 2014 Annual Average Daily Truck Traffic on the California State Highway System (Caltrans, 2015), provides the annual average daily traffic on every State Route in the State as well as the percentage of traffic that are trucks. However, for State Route 180 this report does not provide any traffic information in the vicinity of the project site so for State Route 180 the traffic volumes were obtained from the Annual Average Daily Traffic (AADT) for all Vehicles on California State Highways (Caltrans, 2015a). Table 7 provides a summary of the Caltrans traffic volumes for State Routes 41, 99, and 180. Table 7 also shows the estimated number of diesel-powered non-trucks, which is based on the California, Texas & Florida Lead U.S. in High-Mileage Diesel & Hybrid Passenger Vehicles (Diesel Technology Forum, 2014), which found that diesel vehicles represent 1.85 percent of all vehicles in California.

Table 7: Vehicle Volumes and Vehicle Mixes on Nearby Freeways

Freeway	Segment	Annual Average Daily Traffic		
		Non-Trucks/Diesel	2-Axle Trucks	3+Axle Trucks
State Route 41	South of State Route 180	135,360/2,504	3,948	1,692
State Route 99	North of State Route 41	48,510/897	3,043	11,447
State Route 180	West of McCall Avenue	22,829/422	776	1,420
Source: Caltrans, 2015.				

5.2.1 - Freeway DPM Emission Factors

The vehicle travel emission rates were obtained from the CARB EMFAC2014 model Version 1.0.7. The EMFAC2014 model is the latest emissions inventory model released by CARB that calculates motor vehicle emissions from vehicles operating on roads in California. The EMFAC2014 includes the latest data on California's car and truck fleets and travel activity and also reflects the emissions reductions associated with CARB's recent rulemaking, including on-road diesel fleet rules, Advanced Clean Car Standards, and the Smartway/Phase I Heavy-Duty Vehicle GHG Regulations. The EMFAC2014 model was run based on annual emission rates for Fresno County with a vehicle travel speed of 65 miles per hour for non-trucks and 2-axle trucks (Trucks 1) and a vehicle speed of 55 miles per hour was assumed for 3+-axle trucks (Trucks 2).

DNCP, FCSP, and DDC could potentially be adopted and projects could be constructed based on the adopted plans as soon as the year 2017. The EMFAC2014 PM10 running emission factors utilized in this assessment are shown in Table 8 and the EMFAC2014 model printouts are provided in Appendix A.

Table 8: EMFAC2014 DPM Emission Rates

Vehicle Class	Speed (mph)	EMFAC2014 PM_{10} Running Emission Rates (grams/mile)
Non-trucks	65	0.053
2-axle trucks[1]	65	0.033
3+axle trucks[2]	55	0.056
Non-trucks	65	0.053
2-axle trucks[1]	65	0.033
Notes: [1] 2-axle trucks were modeled as Trucks 1 in EMFAC2014. [2] 3+axle trucks were modeled as Trucks 2 in EMFAC2014. Source: Caltrans, 2015.		

The freeway emissions were modeled in the AERMOD model by using line volume sources. The line volume sources were modeled with a plume height of 6 feet and plume width of 12 feet for the onsite roads, and a plume width of 60 feet for the off-site roads. All roads were modeled with a release height of 12 feet. The road source emissions rates entered into the AERMOD model are shown in Table 9. The road source emissions were determined by calculating the time it takes for each truck to cross the road length and then multiplying that amount of time by the daily truck operations and dividing it by 24 hours in order to determine the percent of daily running time. The daily running time was then multiplied by the EMFAC2014 emissions rates that are detailed above and were converted to grams per second.

Table 9: Vehicle Emissions Rates used in the AERMOD Model

Source ID	Description	Daily Vehicle Trips	DPM Emission Rates (grams/second)
	SR-41 non trucks	2504	0.0172
	SR-41 2-axle trucks	3948	0.0169
	SR-41 3+axle trucks	1692	0.0123
SR41	SR-41 total emissions	--	0.0465
	SR-99 non trucks	897	0.006
	SR-99 2-axle trucks	3043	0.013
	SR-99 3+axle trucks	11447	0.082
SR99	SR-99 total emissions	--	0.101
	SR-180 non trucks	422	0.0032
	SR-180 2-axle trucks	776	0.0037
	SR-180 3+axle trucks	1420	0.0114
SR180	SR-180 total emissions	--	0.0183
Source: EMFAC2014.			

SECTION 6: HEALTH RISK STANDARDS AND THRESHOLDS

Any project with the potential to expose sensitive receptors or the general public to substantial levels of TACs would be deemed to have a potentially significant impact. A health risk is the probability that exposure to a TAC under a given set of conditions will result in an adverse health effect. The health risk is affected by several factors, such as the amount, toxicity, and concentration of the contaminant; meteorological conditions; distance from the emission sources to people; the distance between emission sources; the age, health, and lifestyle of the people living or working at a location; and the length of exposure to the toxic air contaminant.

The term “risk” usually refers to the chance of contracting cancer as a result of an exposure, and it is expressed as a probability: chances-in-a-million. The values expressed for cancer risk do not predict actual cases that will result from exposure to toxic air contaminants. Rather, they state a probability of contracting cancer over and above the background level and over a given exposure to toxic air contaminants.

According to APR-1906 Framework for Performing Health Risk Assessments (SJVAPCD, 2015), any project that has the potential to expose the public to TACs in excess of the following threshold would be considered to result in a significant impact:

- Maximum Exposed Individual Cancer Risk from carcinogens equals or exceeds 20 in one million persons;
- Maximum Exposed Individual Acute Hazard Index from non-carcinogens equals or exceeds 1.0; or
- Maximum Exposed Individual Chronic Hazard Index from non-carcinogens equals or exceeds 1.0.

It should be noted that the above thresholds have been developed by the SJVAPCD in order to analyze projects that create new sources of TAC emissions and are not meant to be used in analyzing existing ambient concentrations of TAC emissions to projects with new sensitive receptors, such as the proposed project.

The only air district in California to develop a threshold to analyze the existing cancer and non-cancer risks to proposed sensitive receptors is the Bay Area Air Quality Management District. However, their thresholds have being challenged in court and they are awaiting the outcome of the pending appeal of the California Building Industry Association v. Bay Area Air Quality Management District (BAAQMD), is resolved prior to officially adopting the following draft thresholds.The BAAQMD Guidelines (BAAQMD, 2011) provides quantitative thresholds for both project-only impacts and cumulative impacts. However, the BAAQMD Guidelines (BAAQMD, 2012), removed the quantitative thresholds due to awaiting the outcome of the pending appeal of the California Building Industry Association v. Bay Area Air Quality Management District is resolved. In order to provide a conservative analysis, the quantitative thresholds provided in the 2011 BAAMD Guidelines have been utilized.

According to the BAAQMD 2011 Guidelines (BAAQMD, 2011) a cumulative impact would occur if the project impacts combined with all sources within 1,000 feet of the project site at the maximum likely exposed individual resident to TACs in excess of the following thresholds would be considered to result in a significant impact:

- Maximum Incremental Cancer Risk: 100 in 1 million at the proposed sensitive receptors (i.e., residential, school, and hospital uses);
- Maximum Exposed Individual Acute Hazard Index from non-carcinogens equals or exceeds 10.0; or
- Maximum Exposed Individual Chronic Hazard Index from non-carcinogens equals or exceeds 10.0.

SECTION 7: HEALTH RISK IMPACTS

Health risks from TACs are twofold. First, TACs are carcinogens according to the State of California. Second, short-term acute and long-term chronic exposure to TACs can cause health effects to the respiratory system and other organs. Each of these health risks is discussed below.

7.1 - Cancer Risks

7.1.1 - DPM Cancer Risks from Freeways

According to the SJVAPCD Guidance (SJVAPCD, 2014), the SJVAPCD Staff Report (SJVAPCD, 2015), and OEHHA methodology (OEHHA 2015), health effects from carcinogenic air toxics are usually described in terms of individual cancer risk, which is the likelihood that a person exposed to concentrations of TACs over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. The cancer risk should be calculated using the following formula:

Slope Factor x [C_{air} * DBR * A * EF * ED * ASF *$1x10^{-6}$] / AT = Potential Cancer Risk

Where:

Oral Slope Factor = 1.1

C_{air} [Concentration in air ($\mu g/m^3$)] = (Calculated by AERMOD Model)

DBR [Daily breathing rate (L/kg body weight – day)] = 361 for 3rd trimester to 0, 1,090 for 0 to 2 years, 745 for 2 to 16 years, and 233 for 16 to 69.75 years

A [Inhalation absorption factor] = 1

EF [Exposure frequency (days/year)] = 350 for residential uses

ED [Exposure duration (years)] = 0.25 (3rd trimester to 0), 2.0 (0 to 2 years), 14 (2 to 16 years), and 53.75 (16 to 69.75 years)

ASF [Age Sensitivity factors] = 10 10 for 3rd trimester to 2 years, 3 for 2 to 16 years and 1 for 16 to 69.75 years

10^{-6} [Conversion to cancer risk per 1,000,000 persons]

AT [Average time period over which exposure is averaged in days] = 25,550

The SJVAPCD Staff Report recommends that the OEHHA's Age Sensitivity factors be utilized, which includes utilizing a 10-fold multiplier to infants (3rd trimester to age 2), a 3-fold increase in exposure for children (ages 2 to 16 years old), and an exposure factor of 1 for ages 16 and older. The SJVAPCD also recommends utilizing OEHHA guidelines of separate breathing rates for each age group, which utilizes the 95th percentile for all age groups up to 16 years old and utilizes the 80th percentile for 16 years and older. The 95th percentile breathing rates for 3rd trimester is 361, for 0 to 2 years is 1,090, and for 2 to 16 years is 745 and the 80th percentile for 16 years and older is 233.

According to the above formula the residential receptors equates to:

Potential Cancer Risk = C_{air} * 14 (3rd trimester to 0) + C_{air} * 328 (0 to 2 years) + C_{air} * 471 (2 to 16 years) + C_{air} * 1898 (16 to 69.75 years) = 1,002 *C_{air}

Therefore, in order to exceed the cumulative cancer risk threshold of 100 per million that is detailed above in Section 6.0, the DPM concentration has to exceed 0.1 µg/m^3 (i.e., 0.1 x 1,002 = 100.2). The AERMOD model (see Appendix B) found that that most impacted sensitive receptor in the study area is located at Three Palms RV Park, that is located on the east side of State Route 99 and west of Golden State Boulevard, which measured a PM_{10} concentration of 0.98 µg/m^3. The cancer risk at this location is 979.6 per million from DPM emissions. Exhibit 4 shows the DPM concentrations and it should be noted that all areas within the project study area that are shaded red would exceed the 100 per million cumulative cancer risk threshold. Since the proposed project would allow development of residential uses within the area that exceeds the 100 per million cumulative cancer risk threshold, this would be considered a significant impact.

Mitigation Measure HRA-1 is provided that would require any new residential development that is located within 0.1 µg/m^3 DPM concentration contours to install a positive static pressure forced air heating, ventilation, and air conditioning (HVAC) system into each residential unit. Each HVAC system will be required to install a high efficiency Minimum Efficiency Reporting Value (MERV) filter of MERV 13 or better in the air intake for the HVAC system and the air intake will be installed with a fan designed to force air through the MERV 13 filter in order to create positive static pressure.

According to Status of Research on Potential Mitigation Concepts to Reduce Exposure to Nearby Traffic Pollution (CARB, 2012), research has shown that homes with positive static pressure HVAC systems with MERV 13 to 16 air filters result in a 90 percent reduction in fine particles (PM10) when compared to outdoor levels of PM10. Based on this PM10 reduction rate, implementation of Mitigation Measure 1 would reduce the cancer risk experienced indoors at the most impacted location to 98.0 per million persons, which is within the BAAQMD's draft threshold of 100 per million from cumulative sources located within 1,000 feet of the project site. Therefore, with implementation of Mitigation Measure 1, the proposed residents would be exposed to a less than significant cancer risk from cumulative TAC concentrations.

7.1.2 - TAC Cancer Risks from Stationary Sources

CARB requires all facilities in California that emit TAC emissions to obtain a permit from CARB. CARB provides a Facility Search Engine at its website that can be used to identify facilities that emit TACs in different areas of the State. The project study area was analyzed in the Facility Search Engine and the stationary sources of TACs for year 2013 (most current year available) are shown in the following exhibits:

- Exhibit 5: Jane Addams Neighborhoods TAC Sources;
- Exhibit 6: Southwest Neighborhoods TAC Sources;
- Exhibit 7: Lowell and Jefferson Neighborhoods TAC Sources;
- Exhibit 8: Southeast Neighborhoods TAC Sources; and
- Exhibit 9: Downtown and South Van Ness Neighborhoods TAC Sources.

Each Exhibit shows the company name and address of each stationary TAC source as well as a map with the approximate location of the source. According to Health Risk Assessment for Proposed Land Use Project (CAPCOA, 2009), the siting of new sensitive receptors should adhere to the setback recommendations as detailed in Table 10. If a residential use is proposed to be located within the setback distance from a stationary source of TAC emissions as detailed in Table 10 it may result in a significant cancer risk impact.

Table 10: CAPCOA Recommendations on Siting New Sensitive Receptors Near TAC Sources

Source Category	Advisory Recommendation
Distribution centers	Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail yards	Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Chrome platters	Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry cleaners using perchloroethylene	Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline dispensing facilities	Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.
Source: CAPCOA, 2009.	

Mitigation Measure HRA-2 is provided that would require any new residential development that is located within the recommended setback distances detailed in Table 10 from a stationary source of TAC emissions to install a positive static pressure forced air heating, ventilation, and air conditioning (HVAC) system into each residential unit. Each HVAC system will be required to install a high efficiency Minimum Efficiency Reporting Value (MERV) filter of MERV 13 or better in the air intake for the HVAC system and the air intake will be installed with a fan designed to force air through the MERV 13 filter in order to create positive static pressure.

7.2 - Non-Cancer Risks

In addition to the cancer risk from exposure to DPM there is also the potential DPM exposure may result in adverse health impacts from acute and chronic illnesses, as well as exceed $PM_{2.5}$ concentrations, which are detailed below.

Chronic Health Impacts

Chronic health effects are characterized by prolonged or repeated exposure to a TAC over many days, months, or years. Symptoms from chronic health impacts may not be immediately apparent and are often irreversible. The chronic hazard index is based on the most impacted sensitive receptor from the proposed project and is calculated from the annual average concentrations of DPM equivalent emissions. The relationship for non-cancer chronic health effects is given by the equation:

$HI_{DPM} = C_{DPM/}REL_{DPM}$

Where

HI_{DPM} = Hazard Index; an expression of the potential for non-cancer health effects
C_{DPM} = Annual average diesel particulate matter concentration in µg/m^3
REL_{DPM} = Reference Exposure Level (REL) for diesel particulate matter; the diesel particulate matter concentration at which no adverse health effects are anticipated

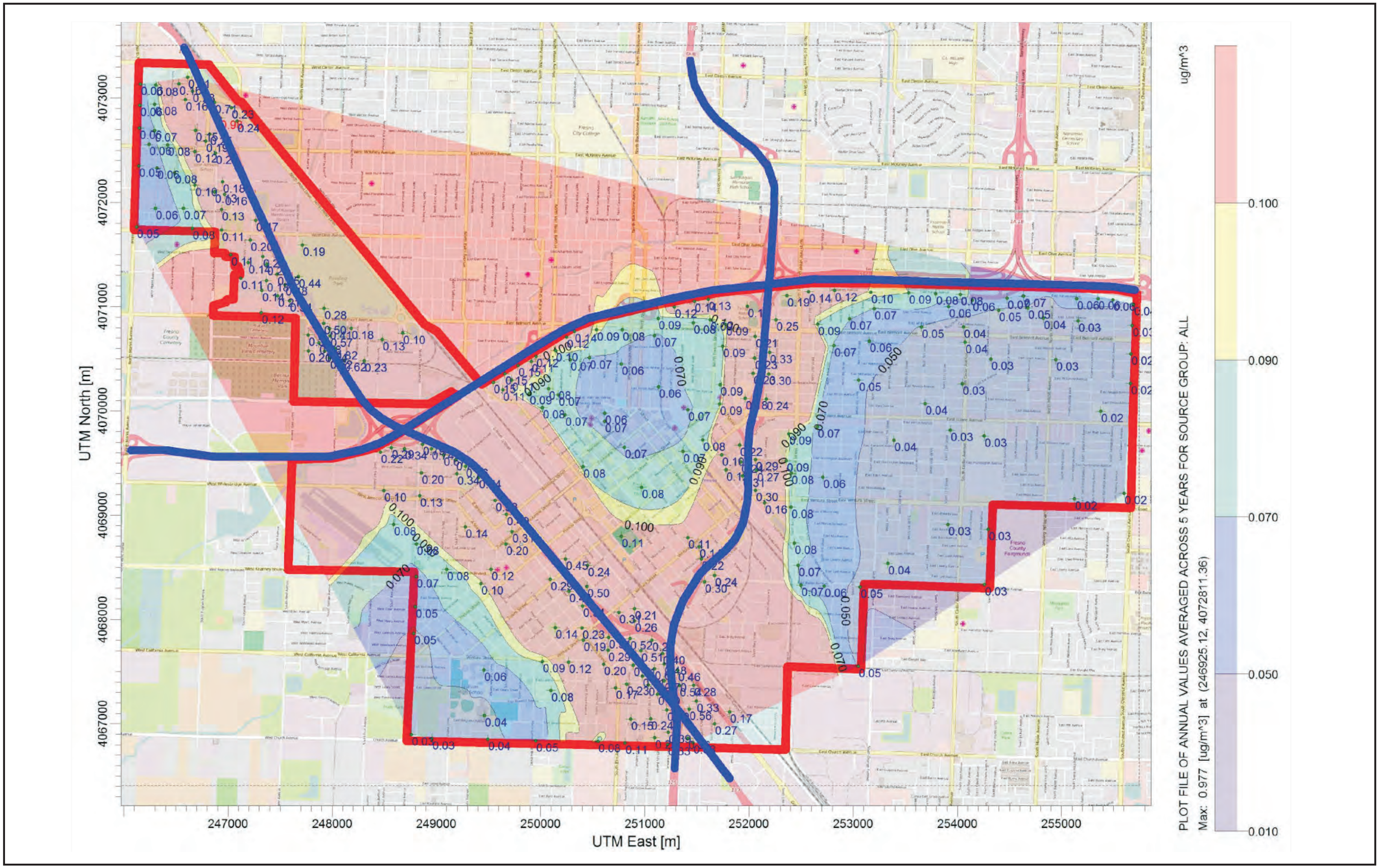
The REL_{DPM} is 5 µg/m^3. The OEHHA, as protective for the respiratory system, has established this concentration. The AERMOD model found that the highest annual concentration at the proposed homes is 0.98 µg/m3 for DPM equivalent chronic non-cancer risk emissions. The resulting Hazard Index is:

HIDPM = 0.98 / 5 = 0.196

As detailed in Section 6.0, the criterion for significance for new residential uses from existing TAC sources is 10.0 or greater. Since the proposed homes would experience a chronic risk from the nearby freeways that is below the cumulative threshold for new homes, the proposed project is not anticipated to expose new sensitive receptors to unacceptable non-cancer chronic risk levels from TAC emissions.

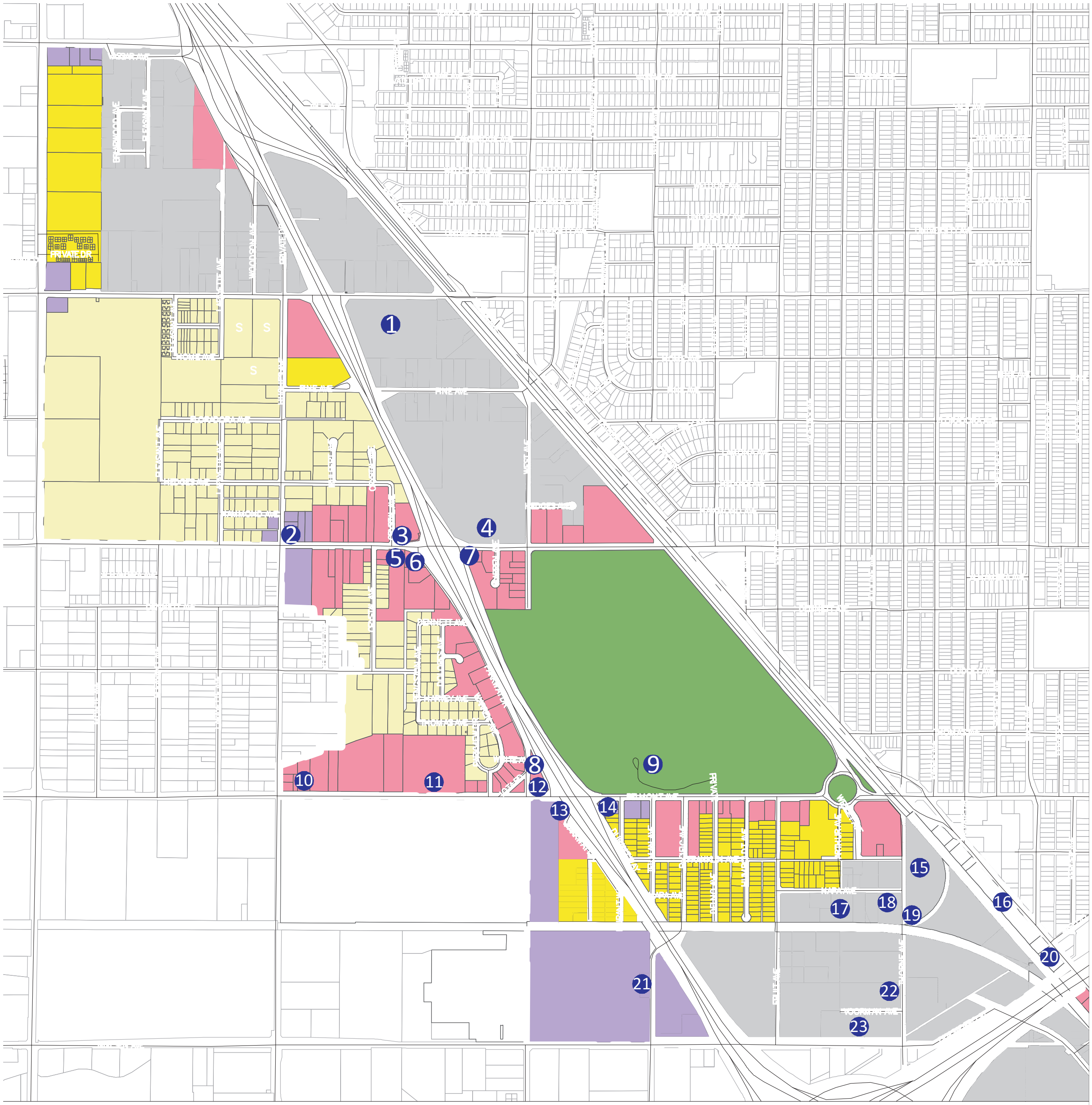
Acute Health Impacts

Acute health effects are characterized by sudden and severe exposure and rapid absorption of a TAC. Normally, a single large exposure is involved. Acute health effects are often treatable and reversible. According to the OEHHA, no acute risk has been found to be directly created from DPM, so there is no AREL assigned to DPM, and therefore the proposed project is not anticipated to expose new sensitive receptors to unacceptable non-cancer acute risk levels from TAC emissions.



Source: AERMCO View Version 9.0.0

Exhibit 4
Freeway-Related DPM Concentrations



Legend

1 = UPS (1601 W McKinley Ave)
2 = City of Fresno (2030 W Olive Ave)
3 = ARCO (1680 W Olive Ave)
4 = CHP (1382 W Olive Ave)
5 = Olive Mini Mart (1703 W Olive Ave)
6 = Fast N Easy (1135 N Parkway Dr)
7 = Chevron (1459 W Olive Ave)
8 = Verizon (530 N Parkway Dr)
9 = City of Fresno (890 W Belmont Ave)
10 = Belmont Boats (2006 W Belmont Ave)
11 = Chapel of Light (1620 W Belmont Ave)
12 = Valero (1280 W Belmont Ave)
13 = Shell (1155 W Belmont Ave)
14 = The Zoo Gas (1025 W Belmont Ave)
15 = Calaveras Materials (410 N Thorne Ave)
16 = Zacky Farms (315 N H St)
17 = Level 3 Communicatons(305 W Napa Ave)
18 = American Paving Co (315 N Thorne Ave)
19 = Fresno Flood Control (305 N Thorne Ave)
20 = Whirlwind Car Wash (225 North H St)
21 = Belmont Memorial (201 N Teilman Ave)
22 = PG&E (211 N Thorne Ave)
23 = Sprint/United (233 W Voorman Ave)

Source: CARB 2013

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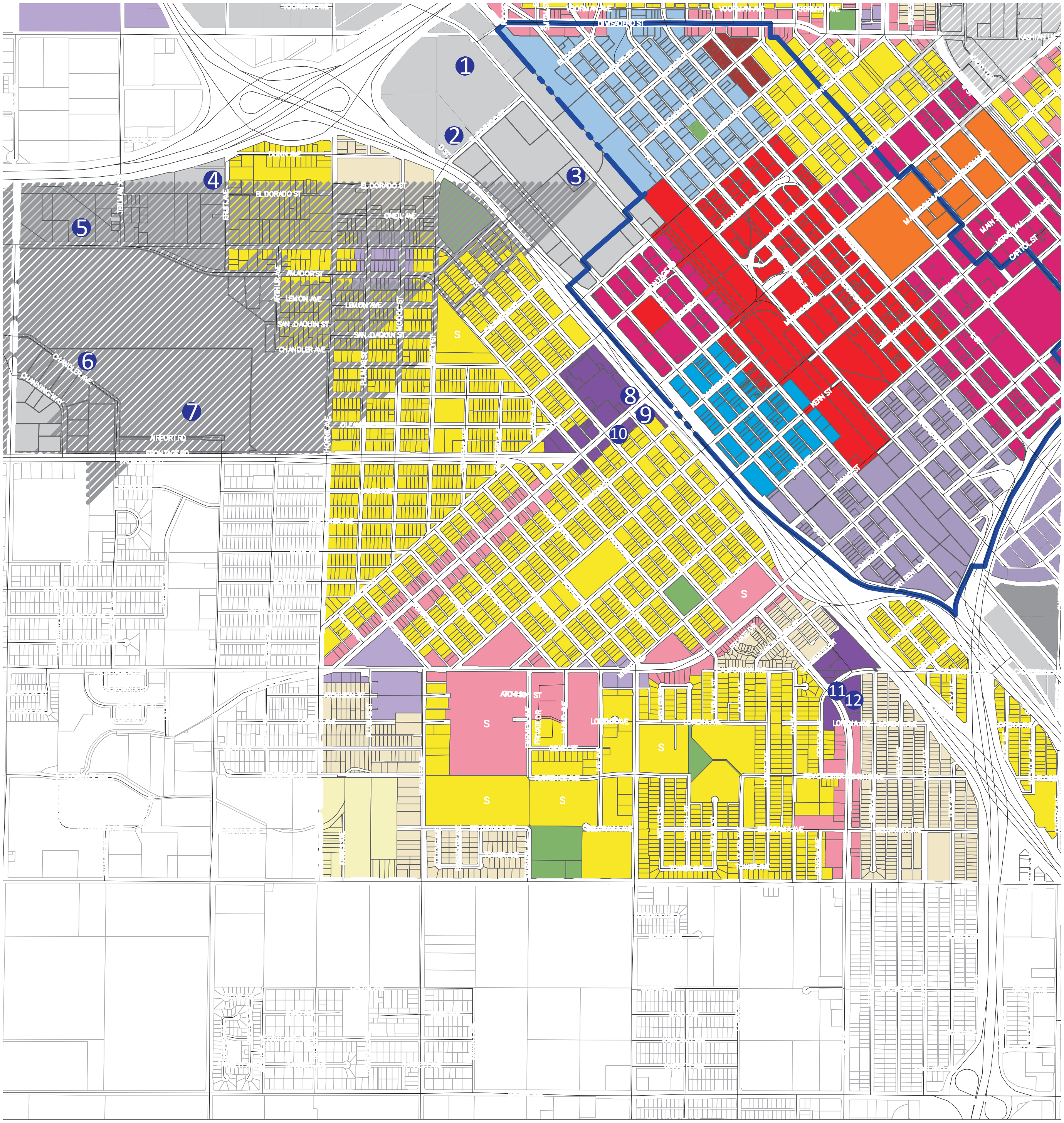
Exhibit 5
James Addams Neighborhoods TAC Sources



Legend

1. = City of Fresno Buildings T & F (2101 G St)
2. = City of Fresno Solid Waste (1325 El Dorado St)
3. = KFSN-TV/ABC (1777 G St)
4. = Angelica Healthcare Services (422 S Fruit Ave)
5. = Ameripride Uniform (1050 W Whitesbridge Ave)
6. = Frank Ruiz Avionics (970 W Chandler Ave)
7. = Memley Aviaton (524 W Kearney Blvd)
8. = Burger King (1233 Fresno St)
9. = Quick-N-Easy (1212 Fresno St)
10. = Family Express (1102 Fresno St)
11. = Valley Gas (2139 S Elm Ave)
12. = City of Fresno (1802 E California Ave)

Source: CARB 2013

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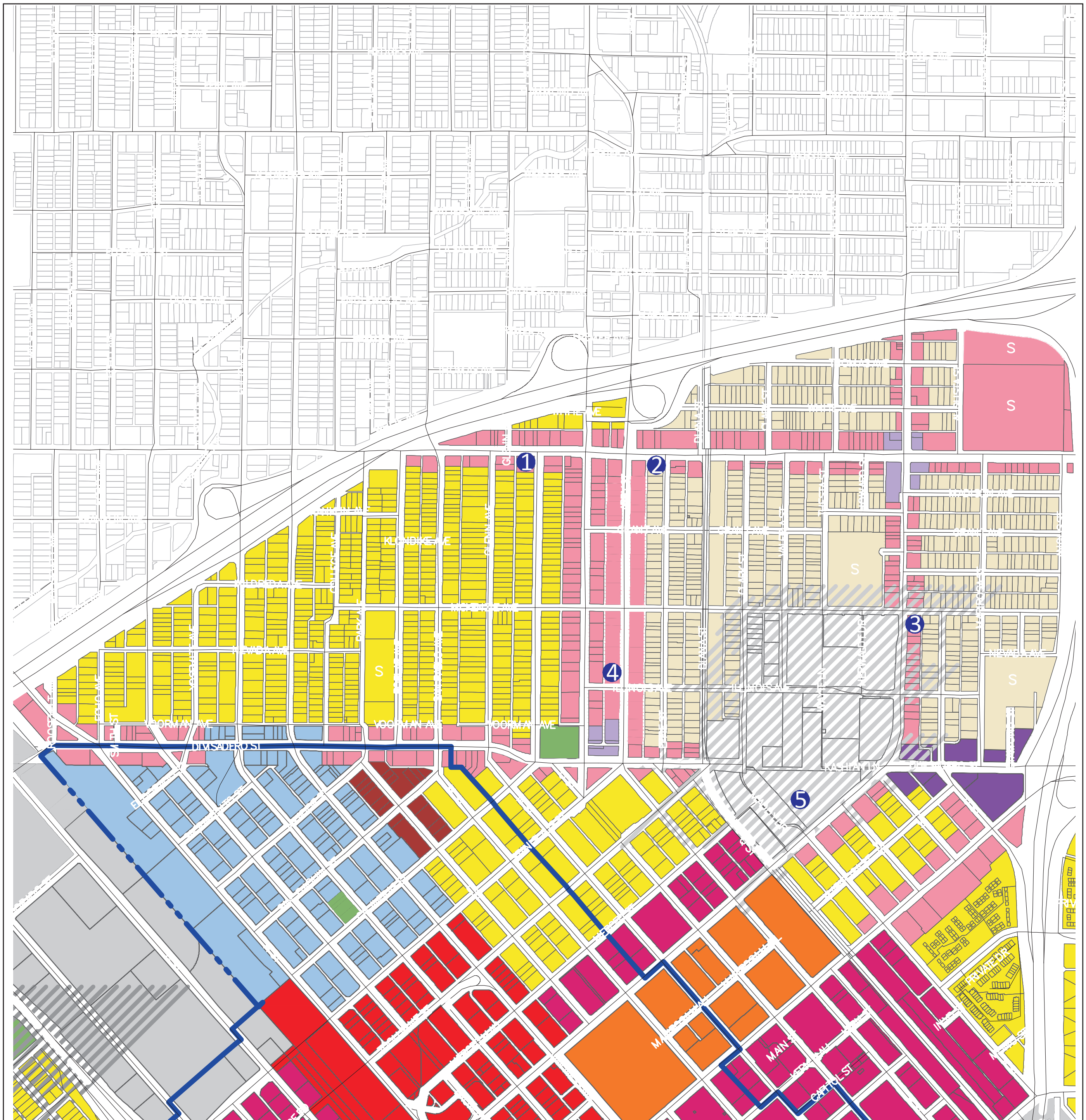
Exhibit 6
Southwest Neighborhoods TAC Sources



Legend

1. = Penny Wise (1536 E Belmont Ave)
2. = Fast N Easy (471 N Effie St)
3. = Fresno Central Market (294 N Fresno St)
4. = Carl's Jr. (217 N Abby St)
5. = Fresno Community Hospital (2823 Fresno St)

Source: CARB 2013

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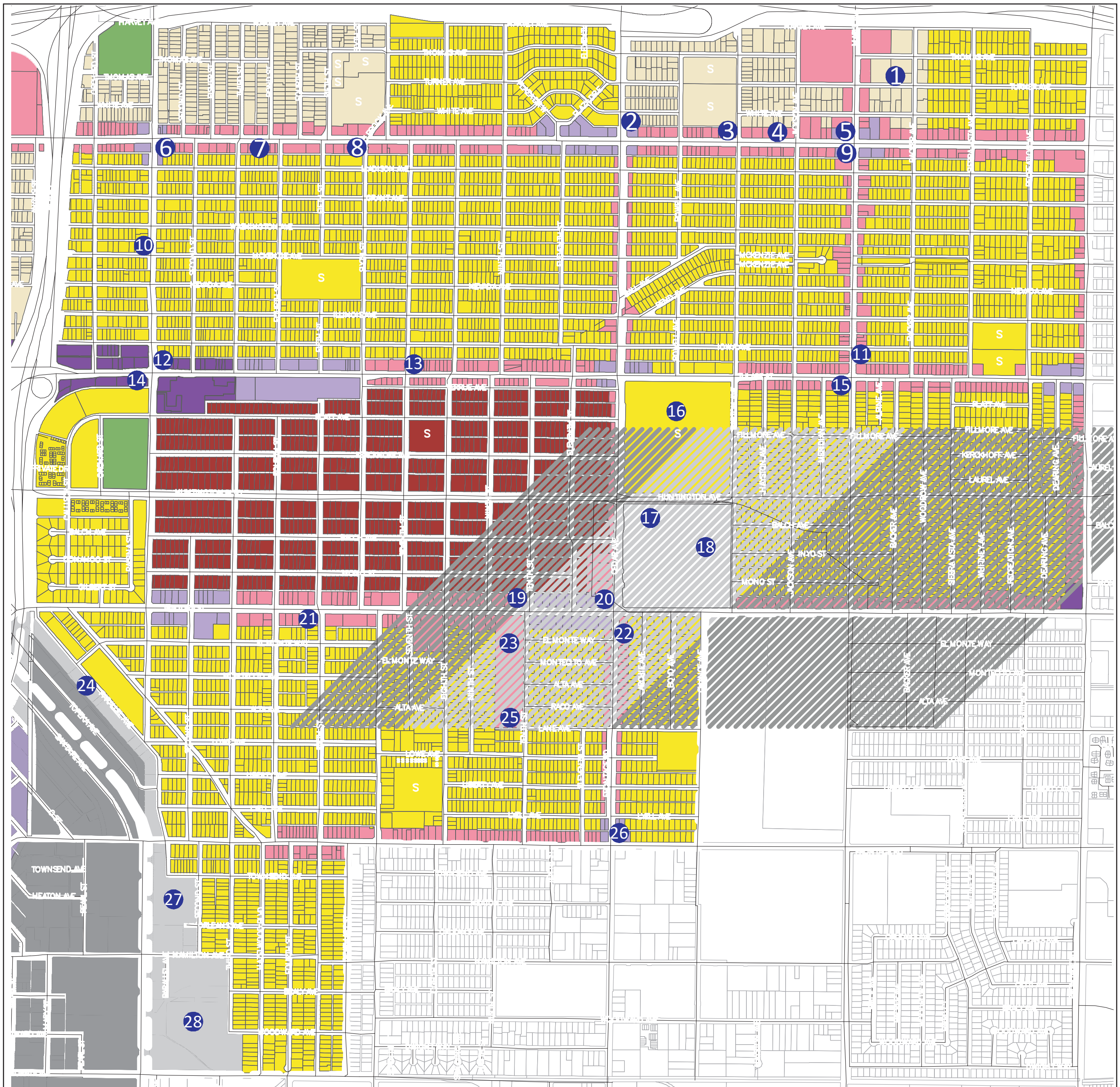
Exhibit 7
Lowell and Jefferson Neighborhoods TAC Sources



Legend

1 = VKL Auto Body (4631 E Turner Ave)
2 = Handi Stop 8 (4206 E White Ave)
3 = P&S Auto Body(4491 E Belmont Ave)
4 = ABC Auto Body(4533 E Belmont Ave)
5 = ARCO (4591 E Belmont Ave)
6 = Johnny Quik (3110 E Belmont Ave)
7 = P C Auto Body (3330 E Belmont Ave)
8 = Shop-N-Quick (3564 E Belmont Ave)
9 = Super-7 (4594 E Belmont Ave)
10 = City of Fresno Water (315 N First St)
11 = Pic 'N' Go (138 N Maple Ave)
12 = Quick Pick & Deli (3121 E Tulare Ave)
13 = Super 1 Food Store (3701 E Tulare Ave)
14 = ARCO AM/PM (3060 E Tulare Ave)
15 = Valero (4594 E Tulare Ave)
16 = Roosevelt High (4250 E Tulare Ave)
17 = Valley Medical Center(445 S Cedar Ave)
18 = Fresno County (500 S Barton Ave)
19 = Renewal Body Works(3951 E Ventura Ave)
20 = WKM Associates (4161 E Ventura Ave)
21 = Tony's Gas & Food (3464 E Ventura Ave)
22 = Wong Corp. (4202 E Kings Canyon Rd)
23 = Juvenile Hall (744 S 10th St)
24 = Evergreen Crematon (920 S Parallel Ave)
25 = Fresno County (1020 S 10th St)
26 = Family Express (4205 E Butler Ave)
27 = Lyons Magnus (1636 S 2nd St)
28 = Valley Fig Growers (2028 S 3rd St)

Source: CARB 2013

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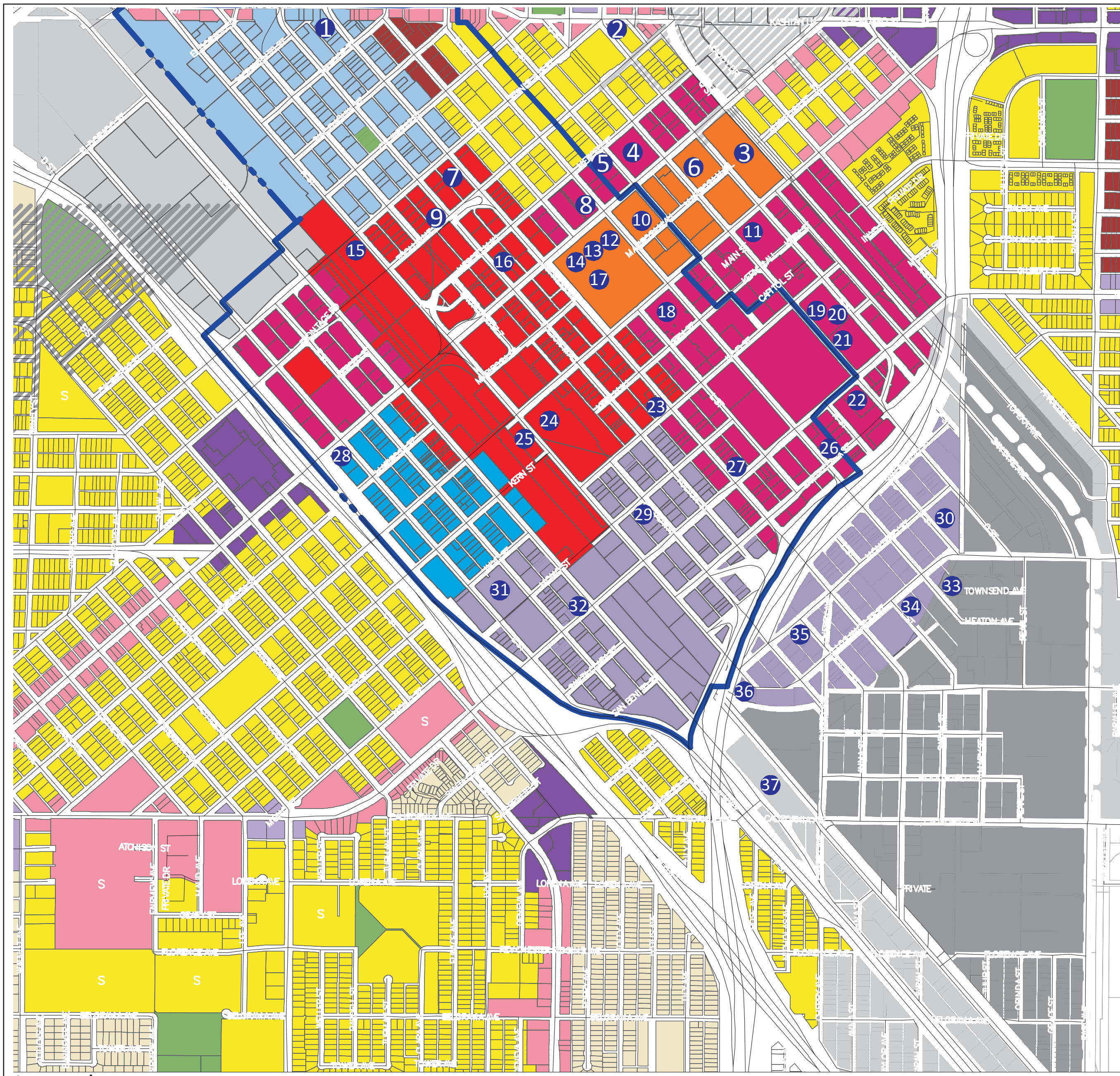
Exhibit 8
Southeast Neighborhoods TAC Sources



Legend

1 = Display Advert.(1837 Van Ness Ave)
2 = ARCO (1460 P St)
3 = City Hall (2600 Fresno St)
4 = Veterans Memorial (2425 Fresno St)
5 = Bureau of Reclamaton (1243 N St)
6 = Courthouse (1130 O St)
7 = AT&T (1445 Van Ness Ave)
8 = Fresno Main Jail (1225 M St)
9 = Nextel (1999 Tuolumne St)
10 = Police Department(2323 Mariposa St)
11 = GSA Pacific Rim (2502 Tulare St)
12 = Hall of Records (1155 M St)
13 = Annex Jail (2204 Fresno St)
14 = Sheriff Administraton (2200 Fresno St)
15 = Qwest Communicatons (1458 H St)
16 = Brix-Mercer Building (1221 Fulton Mall)
17 = Courthouse (1100 Van Ness Ave)
18 = Plaza Building (2220 Tulare St)
19 = City of Fresno (707 O St)
20 = PG&E (705 P St)
21 = PG&E (650 O St)
22 = 5th Appellate Court (2424 Ventura St)
23 = Traffic Engineering (801 Van Ness Ave)
24 = Chukansi Park (1800 Tulare St)
25 = Fire Department (911 H St)
26 = Valley Lavosh Baking Co (502 M St)
27 = Snappy Food & Liquor (2111 Ventura Ave)
28 = Chevron (1350 Fresno St)
29 = Arrow Electric (645 Broadway St)
30 = Visa Petroleum (2414 Monterey St)
31 = California Dairies (755 F St)
32 = Beacon Staton (603 G St)
33 = Gusmer Enterprises (124 M St)
34 = Earthgrains Baking Co (160 L St)
35 = Electric Motor Shop (253 Fulton St)
36 = County of Fresno (200 H St)
37 = Modern Custom Fabric.(2421 E Calif. Ave)

Source: CARB 2013

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Exhibit 9
Downtown and South Van Ness TAC Sources

SECTION 8: REFERENCES

The following references were used in the preparation of this analysis and are referenced in the text and/or were used to provide the author with background information necessary for the preparation of thresholds and content.

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