

# TRANSPORTATION IMPACT ANALYSIS GUIDELINES

City of Glendale, CA



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# Transportation Impact Analysis Guidelines

Glendale, California

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# 1. INTRODUCTION

The Transportation Impact Analysis Guidelines (Glendale TIA Guidelines) document provides guidance to City staff, applicants, and consultants on the requirements to evaluate transportation impacts for projects in the City of Glendale. It is intended to:

- ▶ promote conformance with applicable city and state regulations;
- ▶ provide evaluation consistent with the California Environmental Quality Act (CEQA);
- ▶ ensure consistency in preparation of studies by applicants and consultants; and,
- ▶ provide predictability in content for staff and the public in reviewing studies.

Although the Glendale TIA Guidelines are intended to be comprehensive, not all aspects of every transportation analysis can be addressed in this framework. Project applicants and other parties should first consult with City staff through a scoping meeting before utilizing the information provided in the Glendale TIA Guidelines to analyze a project for potential transportation impacts. City staff reserve the right to use professional engineering judgement to provide exemptions and/or to modify requirements for specific projects at the time of the review application.

## 1.1. BACKGROUND

The Glendale TIA Guidelines specifically address the requirements of California Senate Bill (SB) 743 which mandated specific types of CEQA analysis of transportation projects effective July 1, 2020.

Prior to implementation of SB 743, CEQA transportation analyses of individual projects typically determined impacts on the circulation system in terms of roadway delay and/or capacity usage at specific locations, such as street intersections or roadway segments. SB 743, signed into law in September 2013, required changes to the guidelines for CEQA transportation analysis. The changes include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. The purpose of SB 743 is to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for CEQA analysis. The California Office of Planning and Research (OPR) has updated the CEQA Guidelines and provided a final technical advisory in December 2018, which recommends vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA. The California Natural Resources Agency certified and adopted the CEQA Guidelines including the Guidelines section implementing SB 743. The changes have been approved by the Office of the Administrative Law and are now in effect.

While VMT is the preferred quantitative metric for assessing potentially significant transportation impacts under CEQA, it should be noted that SB 743 does not prevent a city or county from using

metrics such as LOS as part of the application of local general plan policies, municipal and zoning codes, conditions of approval, or any other planning requirements through a city's planning approval process; cities can still ensure adequate operation of the transportation system in terms of transportation congestion measures related to vehicular delay and roadway capacity. As such, the City of Glendale can continue to require congestion-related transportation analysis and mitigation projects through planning approval processes outside CEQA.

## 1.2. TRANSPORTATION ANALYSIS IN THE CITY OF GLENDALE

To comply with the requirements of SB 743, the City of Glendale has prepared the Glendale TIA Guidelines to provide guidance on conducting transportation impact analyses in the City. This document is organized as follows:

- ▶ **CEQA Analysis Requirements:** This section presents the requirements for conducting CEQA analysis, which consists of SB 743-consistent VMT analysis as well as assessing impacts to pedestrians, bicyclists, transit, hazards, emergency access, and other impacts.
- ▶ **Local Transportation Analysis Requirements:** This section presents the requirements for conducting LOS analysis, site access assessments, and other local transportation analyses for non-CEQA purposes.

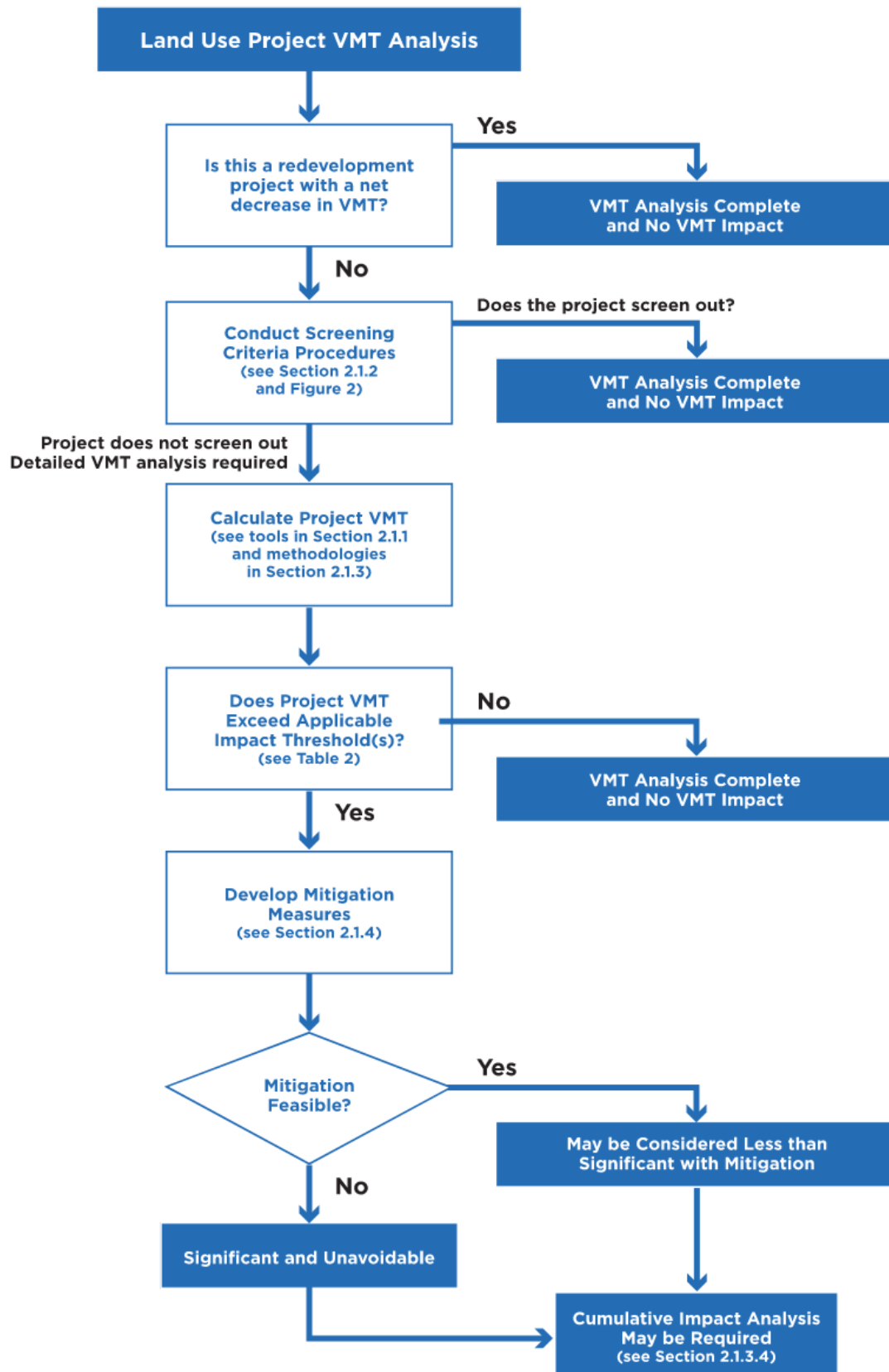
## 2. CEQA ANALYSIS REQUIREMENTS

This section discusses the requirements for conducting transportation impact analyses for CEQA, which primarily consists of SB 743-consistent VMT analysis. Project applicants and other parties shall consult with City staff before utilizing the information provided in this section.

### 2.1. LAND USE PROJECTS

This section provides information for analyzing individual land use projects, including the process to aid in deciding if a detailed VMT analysis is needed for a land use project. Figure 1 presents a flowchart depicting how a land use project would be analyzed under VMT-based metrics. For land use plans that cover an area beyond an individual project site, the information and guidance provide in the section Area Plans (see Section 2.3) should be used instead.

Figure 1: Land Use Projects VMT Analysis Flowchart



The City of Glendale has developed the following VMT metrics and impact thresholds for land use projects:

- ▶ **Residential Uses:** A significant impact will occur if the project generates home-based VMT per capita exceeding a level of 15 percent below the existing citywide average.
- ▶ **Office Uses:** A significant impact will occur if the project generates home-based work VMT per employee exceeding a level of 15 percent below the existing citywide average.
- ▶ **Retail Uses:** A significant impact will occur if the project would result in a net increase in existing total citywide VMT.
- ▶ **Other Uses:** Refer to Table 2 and consult with City staff.
- ▶ **Mixed Uses:** Evaluate each component of a mixed-use project independently and apply the applicable significance threshold for each land use type, incorporating internalization reductions (defined as trips that would remain internal to the project site due to the mix of uses).

#### 2.1.1. VMT Estimating Tools

The recommended tools to estimate VMT for land use projects in the City of Glendale are outlined below.

- ▶ **City of Glendale Travel Demand Model:** The City of Glendale has developed a travel demand model (the Glendale Model) that can be used to estimate VMT and traffic volumes in the City. This tool can be used to estimate VMT efficiency metrics specific to a project as well as total citywide VMT. The project applicant should consult with City staff to coordinate travel demand model runs; model runs will be conducted by either City staff or the City's on-call modeling consultant.
- ▶ **Static VMT Maps:** Static residential and employment VMT maps can be used to estimate VMT efficiency metrics (such as VMT per capita or per employee) for a land use project. Current VMT maps are provided as Attachment C to these guidelines.
- ▶ **City of Glendale Online VMT Tool:** The City's online VMT estimating tool can be utilized to estimate VMT efficiency metrics for land use projects. VMT can be located using the project's address or assessor's parcel number (APN).

In determining the appropriate VMT estimating tool(s), it should be noted that the static VMT maps and online VMT tool cannot be used for the purposes listed below, which require conducting a full Glendale Model run:

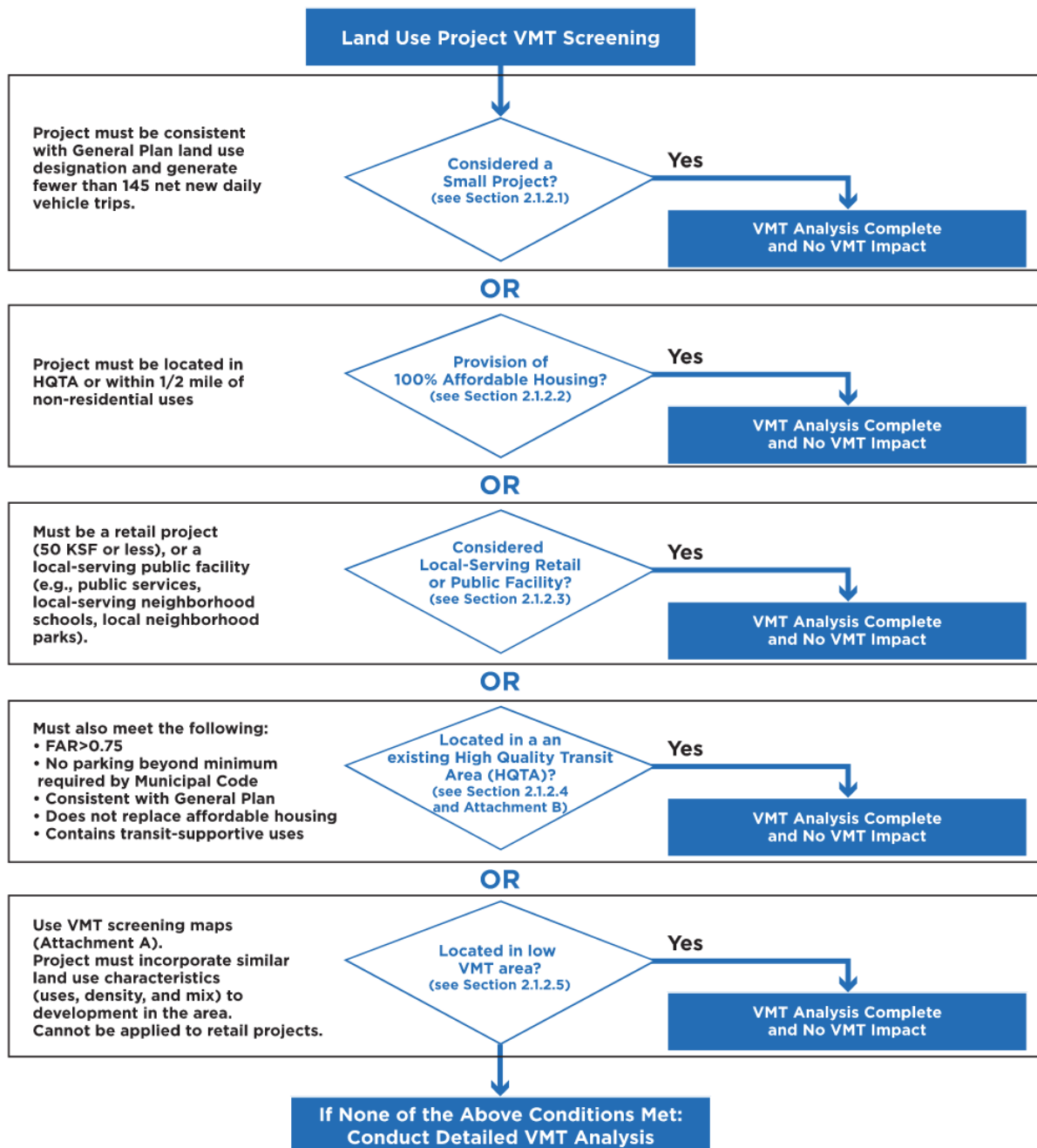
- ▶ Estimating net changes in VMT and evaluating VMT impacts of regional-serving retail projects, entertainment projects, or event centers
- ▶ Estimating changes in cumulative citywide VMT

The use of mapping tools should be limited to individual land-use projects where an efficiency metric (such as VMT per capita or per employee) is being estimated. Project applicants should consult with City staff before utilizing one of these VMT estimating tools.

### 2.1.2. Project Screening

This subsection provides guidance on determining if a detailed VMT analysis is needed, including several screening approaches that can be used to quickly identify when a project should be expected to cause a less-than-significant impact related to VMT. Figure 2 presents a flowchart depicting how a land use project would be analyzed under the proposed screening criteria. A project that meets at least one of the screening criteria would be considered to have a less-than-significant VMT impact due to project or location characteristics.

**Figure 2: Land Use Projects Screening Criteria Flowchart**



### 2.1.2.1. Small Projects

Projects that generate fewer than 145 daily vehicle trips can be presumed to cause a less-than-significant transportation impact and would not require a detailed VMT analysis. Trips should be calculated using Institute of Transportation Engineers (ITE) trip generation rates or local data if available. If a project is in a high-quality transit area (Attachment A) a reduction of up to five (5) percent can be applied to the project trip generation. For mixed-use projects, this screening criteria should be applied to the entirety of the project to determine if the project screens out of a detailed VMT analysis; internalization and pass-by reductions (if applicable) should be applied to the project's estimated trip generation. If a project is replacing existing active uses, a credit should be taken for existing trip generation, with the 145 daily trip small project threshold being applied to net new daily vehicle trips. Examples of projects that typically generate fewer than 145 daily vehicle trips are shown in Table 1 (note, this table is not all-encompassing and applicants should prepare trip generation estimates for uses not included in the table).

**Table 1: Sample Small Projects (fewer than 145 daily trips)**

Land Use Type	Number of Units/ Square Feet
Single-Family Detached Housing	15 dwelling units
Multi-Family Housing (Low-Rise)	19 dwelling units
Multi-Family Housing (Mid-Rise)	26 dwelling units
Multi-Family Housing (High-Rise)	32 dwelling units
General Office Building	14,830 square feet
Medical-Dental Office Building	4,150 square feet
Motel	43 rooms
General Light Industrial	29,130 square feet
Warehousing	83,040 square feet

Note: Trips calculated using trip generation rates from the ITE Trip Generation Manual (10<sup>th</sup> Edition).

This screening criteria would screen out a project from both existing and cumulative VMT analyses requirements. This screening criteria cannot be applied if the project is inconsistent with the General Plan's land use designation for that site.

### 2.1.2.2. Affordable Housing

Residential projects with 100 percent deed restricted affordable housing<sup>1</sup> can be presumed to have a less-than-significant transportation impact and would not require a detailed VMT analysis. If a

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<sup>1</sup> Defined as housing that is affordable to lower income (60% Area Median Income) individuals or families.

project contains less than 100 percent affordable housing, the portion that is affordable should be screened out of needing a detailed VMT analysis. Projects can only be screened out if they are located in a high-quality transit area or within walking distance (a half-mile radius) of non-residential uses. For mixed-use projects, this screening criteria should be applied to the residential component separately to determine if that portion of the project screens out of a detailed VMT analysis.

This screening criteria would screen out a project from both existing and cumulative VMT analyses requirements.

#### *2.1.2.3. Local-Serving Retail and Public Facilities*

Retail projects that are 50,000 square feet gross floor area or less can be presumed to have a less-than-significant transportation impact and would not require a detailed VMT analysis. Examples of local-serving retail establishments can include markets, restaurants, and gas stations that are 50,000 square feet or less. This screening criteria applies to the entirety of a retail project; it would not be applied to multiple tenants at a retail site separately. For a mixed-use project, this screening criteria should be applied to the retail/commercial component separately to determine if that portion of the project screens out of a detailed VMT analysis. This screening criteria would screen out a retail project from both existing and cumulative analyses.

For specific retail projects, the City could consider the findings of a market study to provide substantial evidence that a retail project under a higher square footage threshold would primarily serve a local population and result in an overall reduction in citywide VMT. Based on the results of the market study and staff discretion, a higher square footage threshold may be considered.

Uses that are local-serving public facilities can be presumed to have a less-than-significant transportation impact and would not require a detailed VMT analysis, absent substantial evidence that they will generate significant VMT. These uses include, but are not limited to:

- ▶ Public services (e.g., police, fire stations, public utilities)
- ▶ Local-serving neighborhood schools
- ▶ Local neighborhood parks

#### *2.1.2.4. Adjacency to High-Quality Transit*

Projects that are located in a high-quality transit area can be presumed to have a less-than-significant transportation impact and would not require a detailed VMT analysis. A high-quality

transit area is defined as located within a half mile of an existing major transit stop<sup>2</sup> or an existing stop along a high-quality transit corridor.<sup>3</sup>

However, this presumption does not apply if the project:

- ▶ has a floor area ratio (FAR) of less than 0.75;
- ▶ includes more parking for use by residents, customers, or employees of the project than required by the City;
- ▶ is inconsistent with the General Plan's land use designation for that site;
- ▶ replaces affordable residential units with a smaller number of moderate- or high-income residential units; or
- ▶ does not contain a use that is transit supportive (such as residential, office, and/or retail); in other words, a 100 percent warehouse project cannot be screened out using this criterion.

A project should be considered to be within one-half mile of a major transit stop or high-quality transit corridor if all parcels within the project have no more than 25 percent of their area farther than one-half mile from the stop or corridor and if not more than 10 percent of the residential units or 100 units (whichever is lower) in the project are farther than one-half mile from the stop or corridor.

Current high-quality transit area maps are provided as Attachment A to these guidelines. These maps highlight existing high-quality transit areas in the city, as well as anticipated future high-quality transit areas that are expected to be in place by 2045 due to new and expanded transit service, based on information published online by the Southern California Association of Governments (SCAG) or other local projects. Given that transit services changes can result in adding or removing high-quality transit areas, the project applicant should check with City staff for the most recently available high-quality transit information.

This screening criteria would screen out a project from the existing and/or cumulative analyses. The determination to screen a project out of the existing VMT analysis should be based on the existing high-quality transit map; the determination to screen a project out of the cumulative analysis should be based on the future high-quality transit map and consistent with the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)<sup>4</sup> assumption of projects that would be in place by the cumulative scenario (shown in Attachment A). For mixed-use projects, this screening criteria should be applied to the entirety of the project to determine if the project screens out of a detailed VMT analysis.

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<sup>2</sup> Defined as a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods

<sup>3</sup> Defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during AM and PM peak commute hours.

<sup>4</sup> <http://scagrtpscscs.net/Pages/FINAL2016RTPSCS.aspx>



#### 2.1.2.5. Map-Based Screening

Residential and employment projects that are proposed in areas that generate VMT below adopted City thresholds can be presumed to have a less-than-significant transportation impact and would not require a detailed VMT analysis. This determination would be based on residential and employment VMT screening maps (Attachment B) which show transportation analysis zones (TAZs) in the City where the VMT is below the City's impact threshold. The following types of projects could be screened out using this approach:

- ▶ Residential projects proposed in TAZs with home-based VMT per capita below the City's threshold of exceeding 85 percent of the citywide average
- ▶ Office (or other employment projects) proposed in TAZs with home-based work VMT per employee below the City's threshold of exceeding 85 percent of the citywide average

In order to utilize this screening approach, the project must incorporate similar land use characteristics to other projects in the Glendale Model TAZ. For mixed-use projects, this screening criteria should be applied to the residential and employment components separately to determine if any portions of the project screen out of a detailed VMT analysis. Map-based screening cannot be applied to a retail project, the retail portion of a mixed-use project, or any projects that are not analyzed using VMT per capita or per employee.

#### 2.1.3. VMT Methodology, Metrics, and Significant Impact Thresholds

For projects which do not meet any of the screening criteria, the City of Glendale has adopted VMT thresholds for new land use development consistent with OPR guidance. The VMT metrics, significance thresholds, and impact criteria used to indicate a significant transportation impact are described by land use type in Table 2 and detailed in this section.

**Table 2: Thresholds and Impact Criteria by Land Use Type**

Land Use Type	Threshold and Impact Criteria
Residential Uses	The threshold is home-based VMT per capita 15 percent below the existing citywide average. A significant impact would occur if the project generates home-based VMT per capita exceeding this threshold.
Office Uses	The threshold is home-based work VMT per employee 15 percent below the existing citywide average. A significant impact would occur if the project generates home-based work VMT per employee exceeding this threshold.

Land Use Type	Threshold and Impact Criteria
Retail Uses	<p>The threshold is existing total citywide VMT.</p> <p>A significant impact will occur if the project would result in a net increase in existing total citywide VMT.</p>
Other Land Uses	<ul style="list-style-type: none"> <li>• Government Office: Use office threshold and impact criteria</li> <li>• Medical Office: Use office threshold and impact criteria</li> <li>• Hospital: Use office threshold and impact criteria</li> <li>• Auto Dealership: Use retail threshold and impact criteria</li> <li>• Automotive Services: Use retail threshold and impact criteria</li> <li>• Restaurant: Use retail threshold and impact criteria</li> <li>• Entertainment: Use retail threshold and impact criteria</li> <li>• Hotel/Lodging: Use office threshold and impact criteria</li> <li>• Churches and Other Religious Institutions: Use retail threshold and impact criteria</li> <li>• Industrial: Use office threshold and impact criteria</li> <li>• Education (including colleges): Use retail threshold and impact criteria</li> <li>• Large event centers, arenas, convention centers, and similar uses: Use retail threshold and impact criteria</li> <li>• Recreational Facilities: Use retail threshold and impact criteria</li> <li>• Bank: Use retail threshold and impact criteria</li> </ul> <p>When non-standard land uses are being analyzed, the City will make a determination of the applicable thresholds and impact criteria on a case-by-case basis based on the land use type, project description and setting.</p>
Mixed-Use Projects	<p>Evaluate each component of a mixed-use project independently and apply the significance threshold and impact criteria for each land use type, incorporating internalization reductions.</p>
Redevelopment Projects (replaces existing uses)	<p>If the project results in a net increase in VMT, apply the appropriate significance threshold and impact criteria for the project land use type(s).</p>

When determining potentially significant impacts using efficiency metrics such as home-based VMT per capita (for residential projects) and home-based work VMT per employee (for office and other employment projects), the following analysis method should be used:

- ▶ The project's VMT per capita or per employee should be looked up using the latest static maps (Attachment C) or online mapping tool and the TAZ (or TAZs) containing the project site, or should be generated for the project TAZ if the latest version of the base year Glendale Model has been run to include the project.
- ▶ The existing citywide average(s) for home-based VMT per capita or home-based work VMT per employee are determined using the latest version of the base year Glendale Model based on the trips generated by all TAZs within the city. The project applicant should consult with City staff to obtain the most recent citywide averages, since they may be updated with newer versions of the Glendale Model.

For land use projects that use the change in total VMT to determine impacts (such as retail), the following analysis method should be used:

- ▶ The total VMT for the city without and with the project should be calculated using the most recent version of the base year Glendale Model. The net change in total VMT that is attributable to the project is defined as the difference between the total VMT generated by all TAZs in the city between the no project and plus project model runs.

While residential, office, and retail projects tend to be the most common land use projects requiring a VMT analysis, projects consisting of other uses may require a VMT analysis. When considering metrics and thresholds for other land uses, the project applicant should consult with City staff. For other uses, the City will make the final determination on the appropriate metric(s) and threshold(s). The City will require analyzing the trip-making characteristics of the project and determining whether to use the residential, office/employment, and/or retail/commercial methodologies.

If a project contains transportation demand management (TDM) and other strategies to reduce trips as project features, those reductions should be incorporated into the project VMT estimate before an impact determination is made. Additional information on TDM is provided in Section 2.1.4 Mitigation.

#### *2.1.3.1. Mixed Use Projects*

For land use projects with a mixed-use component, each use in the project (e.g., residential, office, and retail) should be analyzed separately, taking internalization of trips into account. This approach ensures that the vehicle trip-reducing aspects of such projects are not omitted in the VMT analysis. Internalization can be calculated using tools such as the ITE methodology, National Cooperative Highway Research Program (NCHRP) Report 684 "Enhancing Internal Trip Capture Estimation for

Mixed-Use Developments,”<sup>5</sup> and the US Environmental Protection Agency (EPA) Mixed-Use Trip Generation Model (MXD).<sup>6</sup> Such tools can be used to calculate trip reduction rates for individual mixed-use projects in the city. Project applicants should consult with the City to determine which tool to use for estimating internalization. The percentage of internal trips needs to be confirmed with City staff.

#### *2.1.3.2. Redevelopment Projects*

Per CEQA, a redevelopment project that replaces existing uses and results in a net decrease in VMT can be presumed to have a less-than-significant transportation impact and would not require a detailed VMT analysis; a redevelopment project that replaces existing uses and results in a net increase in VMT will require a VMT analysis. This should be calculated by estimating the total VMT for the existing and proposed land uses using ITE or locally available trip generation rates and average trip lengths by project type from the Glendale Model provided in Attachment D and in the City’s online VMT mapping tool. The daily trip generation for the existing and proposed uses should each be multiplied by the applicable average trip lengths to get total VMT for existing versus proposed uses. If a project replaces existing uses and the project leads to a net overall increase in VMT compared to the previous uses, then the appropriate metrics and impact thresholds should be applied to each proposed use. If the project is a mixed-use project, then internalization should be considered when estimating its total VMT and each component’s trip generation should be multiplied by its respective trip length; if the project results in a net increase in VMT, then each individual use should be analyzed under its respective threshold. In addition, the proposed land uses should be analyzed without incorporating a credit or reduction for the displacement of existing land uses at the project site.

#### *2.1.3.3. Exclusion of Heavy Vehicle and Truck VMT*

It shall be noted that SB 743 does not apply to goods movement (i.e. trucks). Section 15064.3 of the CEQA Guidelines states that VMT for transportation impacts refers to. “... the amount and distance of automobile travel...”. Therefore, the VMT associated with trucks and the movement of goods is not required to be analyzed and mitigated for the evaluation of transportation impacts under CEQA. VMT analysis and mitigation is limited to passenger vehicle and light truck trips. The VMT for all vehicles including heavy trucks related to a project will still be calculated as input for air quality, GHG, noise and energy impact analyses to be evaluated in non-transportation parts of the environmental analysis. In addition, heavy vehicle trips would still be assessed as part of the Local Transportation Analysis.

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<sup>5</sup> <http://www.trb.org/Publications/Blurbs/165014.aspx>

<sup>6</sup> <https://www.epa.gov/smartgrowth/mixed-use-trip-generation-model>

#### *2.1.3.4. Cumulative Impacts*

If a land use project (or a component of a mixed-use project) is screened out of requiring a detailed existing VMT analysis (per Section 2.1.2) or if it falls below the existing VMT thresholds outlined in Table 2 and does not trigger a project impact, it would also result in less than significant cumulative impacts. Alternatively, a project could be screened out of assessing cumulative VMT impacts if it is within a future high-quality transit area, based on a future transit map that is consistent with the SCAG RTP/SCS, and meets the high-quality transit area requirements outlined in Section 2.1.2.4. A future high-quality transit area map is provided in Attachment A.

Otherwise, the project must demonstrate consistency with the General Plan's land use designation for that site to result in a less than significant cumulative impact. If City staff determines inconsistency, a cumulative impact analysis would be required to determine if the project would result in a net increase in citywide VMT. This analysis must be conducted using the most recent version of the cumulative year Glendale Model. The total VMT for the city without and with the project should be calculated. The difference between the total VMT generated by all TAZs in the city from the two scenarios' model runs is the net change in total VMT that is attributable to the project; the cumulative impact threshold is a net increase in total citywide VMT.

#### *2.1.4. Mitigation*

If a project would result in significant impacts, CEQA requires mitigation measures to be implemented to reduce or mitigate an impact. For VMT impacts, a combination of measures from several VMT reduction strategies may be implemented – project characteristics, multimodal improvements, parking, and transportation demand management (TDM) strategies. VMT is reduced by implementing strategies that reduce the number of automobile trips generated by the project, shift more trips from automobile to non-automobile modes, and/or reduce the distances that people drive. Generally, these reductions can be achieved by the implementation of TDM strategies.

Potential measures to reduce VMT that are appropriate to implement in the City of Glendale are provided in Attachment E. Projects for which VMT impacts are determined to be significant are required to propose a list of VMT reduction measures and document the associated percent reduction in VMT. Mitigated project VMT is calculated by applying the percent reduction. Project VMT is then compared to the threshold of significance to determine if the project's VMT impact has been mitigated. The project applicant should consult with the City before conducting any mitigation analysis, and the City will review and approve the proposed mitigation and the calculated VMT percentage reductions.

If a project is required to conduct a cumulative VMT analysis, TDM measures that are already included in the cumulative model baseline for the project TAZ cannot be applied towards mitigating cumulative impacts. Attachment E includes maps of the city, model TAZs, and corresponding TDM measures that are included as part of the cumulative travel demand model assumptions.

## 2.2. TRANSPORTATION PROJECTS

This section provides information for analyzing transportation projects, including the process to aid in deciding if a detailed VMT analysis should be conducted.

### 2.2.1. Determining Need for Detailed VMT Analysis

A detailed VMT analysis is required for transportation projects if they are expected to increase VMT; these primarily consist of projects that encourage the use of single-occupant automobile use such as the addition of through travel lanes. Projects that would require a detailed VMT analysis include, but are not limited to:

- ▶ Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

A transportation project would be excluded from VMT analysis requirements if it has already undergone VMT analysis as part of a citywide plan. This exemption may be granted if the necessary VMT analysis and potential mitigations have already been identified and quantified at the plan level.

Examples of projects that are unlikely to lead to increases in vehicular travel and are excluded from VMT analysis requirements are listed below. A full list is provided in Attachment F.

- ▶ Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets and that do not add additional motor vehicle capacity
- ▶ Roadside safety devices or hardware installation such as median barriers and guardrails
- ▶ Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pocket and two-way left turn lanes
- ▶ Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- ▶ Conversion of existing general-purpose lanes to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- ▶ Addition of a new lane that is permanently restricted to use only by transit vehicles
- ▶ Reduction in number of through lanes
- ▶ Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- ▶ Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- ▶ Installation of roundabouts or traffic circles
- ▶ Installation or reconfiguration of traffic calming devices
- ▶ Initiation of new transit service
- ▶ Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes

- ▶ Removal or relocation of off-street or on-street parking spaces
- ▶ Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- ▶ Addition of traffic wayfinding signage
- ▶ Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- ▶ Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- ▶ Installation of publicly available alternative fuel/charging infrastructure

## 2.2.2. Methodology and Tools

For projects that require a detailed VMT analysis (e.g., increasing vehicular throughput and not analyzed as part of a citywide plan), two tiers of VMT analysis must be conducted. Near-term and long-term impacts should be assessed using the most recent version of the cumulative-year Glendale Model.

### 2.2.2.1. Near-Term VMT Analysis

Near-term VMT analysis must be conducted with the Glendale Model in order to estimate near-term changes to citywide VMT due to rerouted trips that could result from a new or expanded facility. The model must be run for two scenarios, with and without the implementation of the transportation project. VMT should be captured using the boundary method, which would provide the total daily VMT on all roads within the City of Glendale. The metric for this analysis would be the net change in total citywide VMT with the transportation project.

### 2.2.2.2. Induced Demand Analysis

Long-term VMT analysis must be conducted in order to estimate potential long-term increases in citywide VMT due to induced demand. To capture the long-term effects such as increased travel demand, an induced demand assessment is required using the following formula recommended:

$$[\% \text{ increase in lane miles}] \times [\text{baseline VMT}] \times [\text{elasticity}] = [\text{VMT resulting from the project}]$$

The baseline VMT in the City should be estimated using the boundary method on a model run that does not contain the proposed transportation project. The metric for this analysis would be the net increase in total citywide VMT with the transportation project.

Research indicates an elasticity of 0.75 may be appropriate for arterial roads in the city; City staff shall be consulted before any induced demand analysis is undertaken.

## 2.2.3. Significant Impact Threshold

Total citywide VMT on roads in the City of Glendale (using the boundary method) is the appropriate VMT metric for assessing transportation projects. A significant impact will occur if a transportation

project would result in a net increase in total citywide VMT for any study scenario (near-term or long-term).

#### 2.2.4. Mitigation

If a transportation project would result in significant VMT impacts, CEQA requires mitigation measures to be implemented to reduce or mitigate the impact. Mitigation measures for transportation projects generally seek to reduce VMT by discouraging increased single-occupant vehicle travel or funding TDM measures. The following are potential mitigation measures for transportation projects:

- ▶ Bicycle network improvements
- ▶ Pedestrian network improvements
- ▶ Transit network improvements
- ▶ Off-site TDM strategies

In addition, intelligent transportation system (ITS) strategies should be considered in place of additional vehicular through lanes to reduce VMT.

### 2.3. AREA PLANS

This section provides information for analyzing area plans, such as specific plans and citywide area plans.

#### 2.3.1. Methodology and Tools

Area plans must be analyzed using the Glendale Model. The following model runs and scenarios must be conducted:

- ▶ Base year model to estimate existing conditions
- ▶ Cumulative model to estimate horizon year conditions for the no project or previous plan scenario
- ▶ Cumulative model updated to reflect the proposed project to estimate horizon year conditions with the proposed plan

Total VMT per service population (residents and employees) is the appropriate metric for assessing area plans. Total VMT per service population must be calculated for the plan area. In the case of a general plan, this would consist of all trips originating and/or ending in the city; in the case of a specific plan, this would consist of all trips originating and/or ending in the plan area.



### 2.3.2. Significant Impact Thresholds

A significant impact would occur if either of the following conditions takes place:

- ▶ If the plan generates total VMT per service population in the horizon year plus project scenario that exceeds the total VMT per service population under existing conditions.
- ▶ If the plan generates total VMT per service population in the horizon year plus project scenario that exceeds the total VMT per service population under the horizon year no project/previous plan scenario.

### 2.3.3. Mitigation

If an area plan results in significant impacts, CEQA requires mitigation measures to be implemented to reduce or mitigate impacts. Potential mitigation measures for area plans can include:

- ▶ Increasing the density and mix of proposed land uses
- ▶ Proposing bicycle, pedestrian, and transit network improvements as opposed to automobile facilities
- ▶ Policies to reduce parking supply
- ▶ Policies to address promote worker commute reduction programs
- ▶ Policies to require on-site TDM strategies for individual projects under the plan

Measures to reduce VMT that are appropriate to implement in the City of Glendale are provided in Attachment E.

## 2.4. OTHER CEQA ANALYSES

In addition to VMT analysis, other analyses must also be conducted to fully capture the potential effects of a project on the transportation network under CEQA. These thresholds and analysis requirements are outlined below.

### 2.4.1. Impacts to Public Transit, Bicycles, and Pedestrians

A proposed project will result in a significant impact if it will conflict with or impact existing or proposed public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. These qualitative reviews can include an assessment of increased conflicts between modes or decreased accessibility to transit, bicycle, and pedestrian facilities resulting from a proposed project.

Impacts related to public transit, bicycles, and pedestrians should be assessed as follows:

- ▶ **Transit Impacts:** Examine potential operational impacts to transit routes and facilities (e.g. resulting from increased vehicular conflicts or traffic volumes). Examine potential impacts to transit user safety and accessibility for all existing and planned transit stops or stations adjacent to the project site or within a quarter mile of the project site.

- ▶ **Bicyclist Impacts:** Examine potential impacts to bicyclist safety and accessibility for all existing and planned bikeways and other bicycle facilities (including roadways) adjacent to the project site, within a quarter mile of the project site, or connecting to transit stops or stations in the quarter-mile vicinity of the project site.
- ▶ **Pedestrian Impacts:** Examine potential impacts to pedestrian safety and accessibility for all existing and planned sidewalks, crosswalks, and other pedestrian facilities adjacent to the project site, within a quarter mile of the project site, or connecting to transit stops or stations in the quarter-mile vicinity of the project site.

A significant impact would also occur if the proposed project would conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities.

The following safety-related impact criteria must also be considered:

- ▶ A proposed project will result in a significant impact if it will substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- ▶ A proposed project will result in a significant impact if it will result in inadequate emergency access.

### 3. LOCAL TRANSPORTATION ANALYSIS REQUIREMENTS

In addition to the CEQA analysis, a non-CEQA local transportation analysis may be required for land use projects to evaluate the effects of a development project on the circulation network, primarily on local access and circulation in the proximity of a project site. This analysis will address traffic operations, safety issues and needed project design features related to a proposed land use project, as well as site access and internal circulation.

A local transportation analysis is required for projects generating at least 50 net-new peak hour vehicle trips, using ITE trip generation rates or local rates (if available).

Before conducting a local transportation analysis, the project applicant should provide a scoping memorandum to the City for staff approval, detailing the assumptions and proposed study components as outlined below.

#### 3.1. STUDY AREA

At a minimum, the study must examine signalized and unsignalized intersections that fall into at least one of the following categories:

- ▶ Project driveways
- ▶ Intersections at either end of the block on which the project is located or up to 500 feet from the primary project driveways, whichever is closer

This study must also examine any residential streets that are linked to intersections that are being studied. Residential streets consist of streets that are classified as local or collector streets in the Circulation Element.

The study should also examine any other intersections or roadway segments necessary as determined by City staff.

### 3.2. DATA COLLECTION AND STUDY PERIODS

Two-hour peak period vehicular, bicycle, and pedestrian volumes should be collected for all study intersections for the weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) periods. Weekday AM and PM peak hour LOS analysis should be conducted for all study intersections for all study scenarios. Weekday twenty-four (24) hour daily vehicle counts should be collected for all study roadway segments. Traffic counts should be collected and included in the Appendix of the study.

Available existing counts can be used if they are less than twelve (12) months old and the traffic volumes have not been significantly changed due to more recent development in the vicinity. City staff shall approve all requests to use other available traffic counts.

Weekday counts should be conducted on a Tuesday, Wednesday, or Thursday when schools are in session and during weeks not containing major holidays.

During the scoping process, City staff may require additional periods for analysis and traffic counts due to a project's unique traffic patterns (such a school or an event center).

### 3.3. STUDY SCENARIOS

Intersection and roadway segment LOS should be analyzed for the following scenarios:

- ▶ Existing Conditions
- ▶ Opening Year Conditions
- ▶ Opening Year Plus Project Conditions (project-generated traffic added to Opening Year volumes)
- ▶ Cumulative Conditions (typically based on the year consistent with the cumulative Glendale Model, but should be determined in consultation with City staff)
- ▶ Cumulative Plus Project Conditions (project-generated traffic added to cumulative traffic volumes)

### 3.4. FUTURE TRAFFIC VOLUME FORECASTING METHODOLOGY

Once the cumulative analysis year has been established in coordination with City staff, opening year and cumulative year traffic volumes should be developed. Future volumes should be forecast and interpolated or extrapolated based on outputs from the base year and future year versions of the

Glendale Model. Volumes should be interpolated for study intersections and roadway segments not included in the model.

City staff must approve alternative methods to develop future volumes such as general growth rates.

While the opening year scenario is based on an interpolation of base and future year model outputs, the City may require the project applicant to include specific approved projects in Opening Year (no project) forecasts, at staff discretion.

### 3.5. TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

Project-generated vehicle trips should be estimated using the most recent edition of the Institute of Traffic Engineers' (ITE) Trip Generation Manual or local trip generation rates other sources for unique land uses, if available and approved by City staff. Appropriate trip reductions should be applied for internal capture, proximity to transit, or project TDM strategies. If a project is in a high-quality transit area (Attachment A) a reduction of up to five (5) percent can be applied to the project trip generation. If a project contains TDM strategies to reduce trips as project features, those reductions should be applied to the trip generation estimate. Additional information on TDM is in Section 2.1.4 Mitigation. Note, TDM reductions from VMT impact mitigation measures cannot be applied to the project trip generation unless unacceptable traffic operations are identified.

Projected weekday daily, AM peak hour, and PM peak hour trip generation estimates for the proposed project shall be summarized in a table. Trip generation rates, factors and source should be provided. Inbound and outbound trips shall be provided in the table.

Trip distribution should be developed and project trips assigned to the study intersections and roadway segments using either existing travel patterns and relative locations of complementary land uses or a Glendale Model select zone run (in consultation with City staff).

A trip distribution figure illustrating the percentage of trips going to and from the project along the surrounding roadway network shall be provided. A figure illustrating peak hour project only trips at the driveways, study intersections and roadway segments shall be provided based on the trip distribution.

### 3.6. OPERATIONS ANALYSIS METHODOLOGY

Existing, Opening Year, Opening Year Plus Project, Cumulative, and Cumulative Plus Project peak hour intersection LOS must be evaluated for all study intersections using the most recent edition of the Highway Capacity Manual (HCM) methodology.

Residential streets should be analyzed by calculating daily volume/capacity (V/C) ratios using the daily volume capacities detailed in the current Circulation Element.

### 3.7. LEVEL OF SERVICE STANDARDS

The City of Glendale strives to maintain intersection and roadway segment operations based on LOS standards outlined in the General Plan Circulation Element. The local transportation analysis should note intersections and roadway segments that perform unacceptably (based on standards in the current General Plan Circulation Element) under no project and/or plus project conditions, and improvements that can be applied to increase performance to acceptable levels.

For study intersections, a traffic operations issue is identified if the addition of the traffic generated from the proposed project results in any one of the following, and improvements should be identified to increase performance to pre-project conditions under each scenario:

- ▶ Triggers an intersection operating at acceptable LOS to operate at unacceptable LOS (based on Circulation Element standards)
- ▶ Increases the average delay for a study intersection that is already operating at unacceptable LOS by 5.0 seconds or more.

For study segments, the study should identify segments that operate above capacity under no project and/or plus project conditions, and identify if the addition of the daily traffic generated from the proposed project causes a residential street to exceed its capacity.

### 3.8. OTHER ANALYSIS REQUIREMENTS

In addition to LOS, the local transportation assessment must include the following analyses:

- ▶ **Site Access and On-Site Circulation:** Review site access and on-site circulation for vehicles, heavy vehicles, bicyclists, and pedestrians and identify any issues that should be improved.
- ▶ **Driveway Site Distance:** Analyze driveway sight distance for all signalized and unsignalized driveways and identify any deficiencies.
- ▶ **Parking:** Identify and compare the project's proposed parking supply, parking requirements, and expected peak parking demand (based on ITE parking rates). For mixed-use projects, examine the feasibility of shared parking. The bicycle parking supply will also be compared to code requirements (if applicable).
- ▶ **Vehicle Queuing:** Examine inbound and outbound vehicle queuing at project driveways and note any on-site deficiencies or conflicts with circulation. Also examine the adequacy of turn pocket storage length at off-site study intersections based on 95<sup>th</sup> percentile queues. On-site queuing analysis is necessary if the project has a drive-thru component.

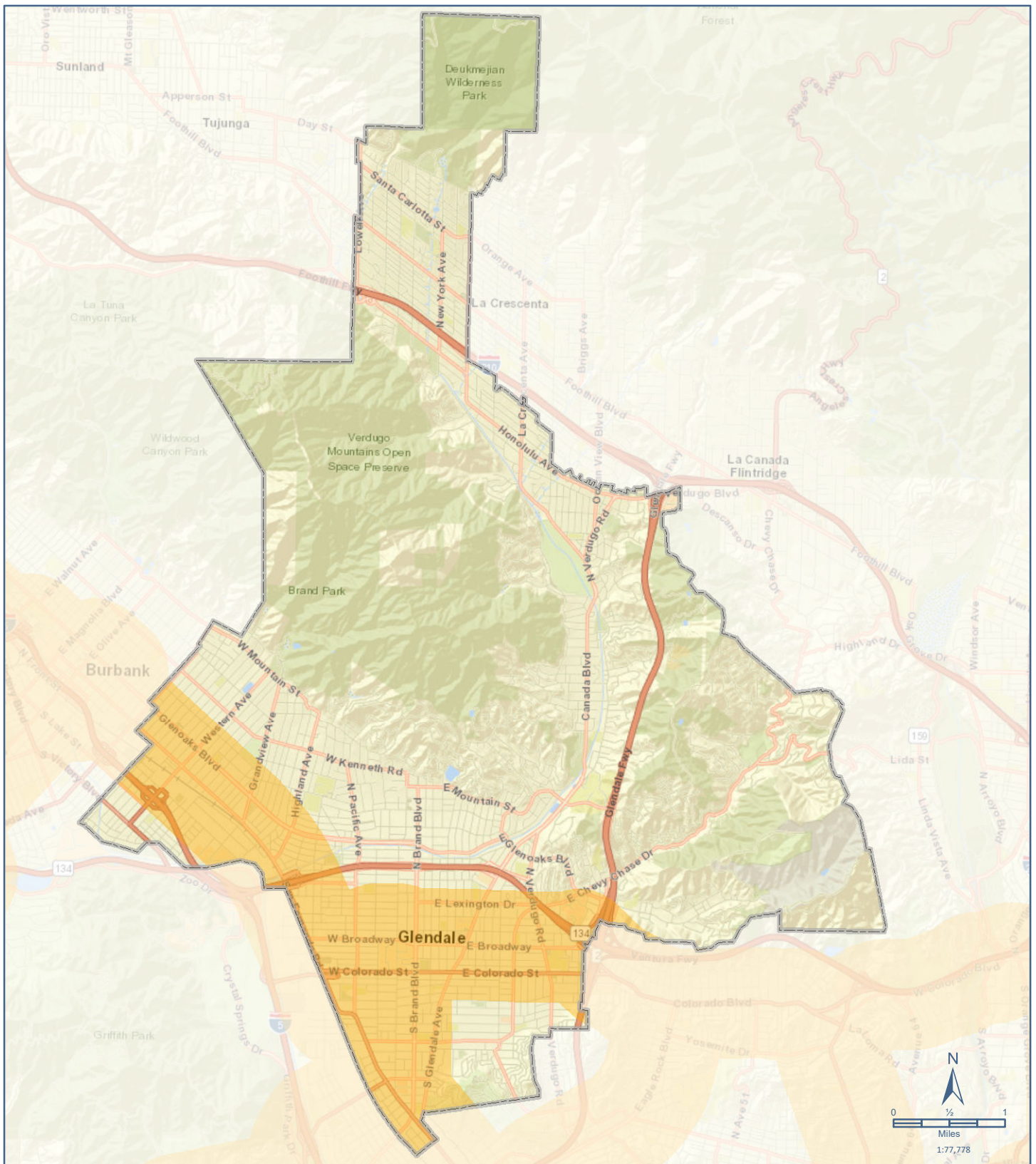
The project applicant should conduct any additional analysis that is deemed necessary by City staff, to be determined through a scoping meeting. This could include passenger loading demand analyses, freight loading demand analysis, and truck turning templates.

### 3.9. CROSS-JURISDICTIONAL ANALYSIS

If a project will affect another jurisdiction, such as Caltrans, County of Los Angeles, LA Metro, or adjacent cities, coordination with that jurisdiction may be required. City of Glendale staff will provide guidance and contact information for other jurisdictions, as necessary.

## Attachment A: High-Quality Transit Maps





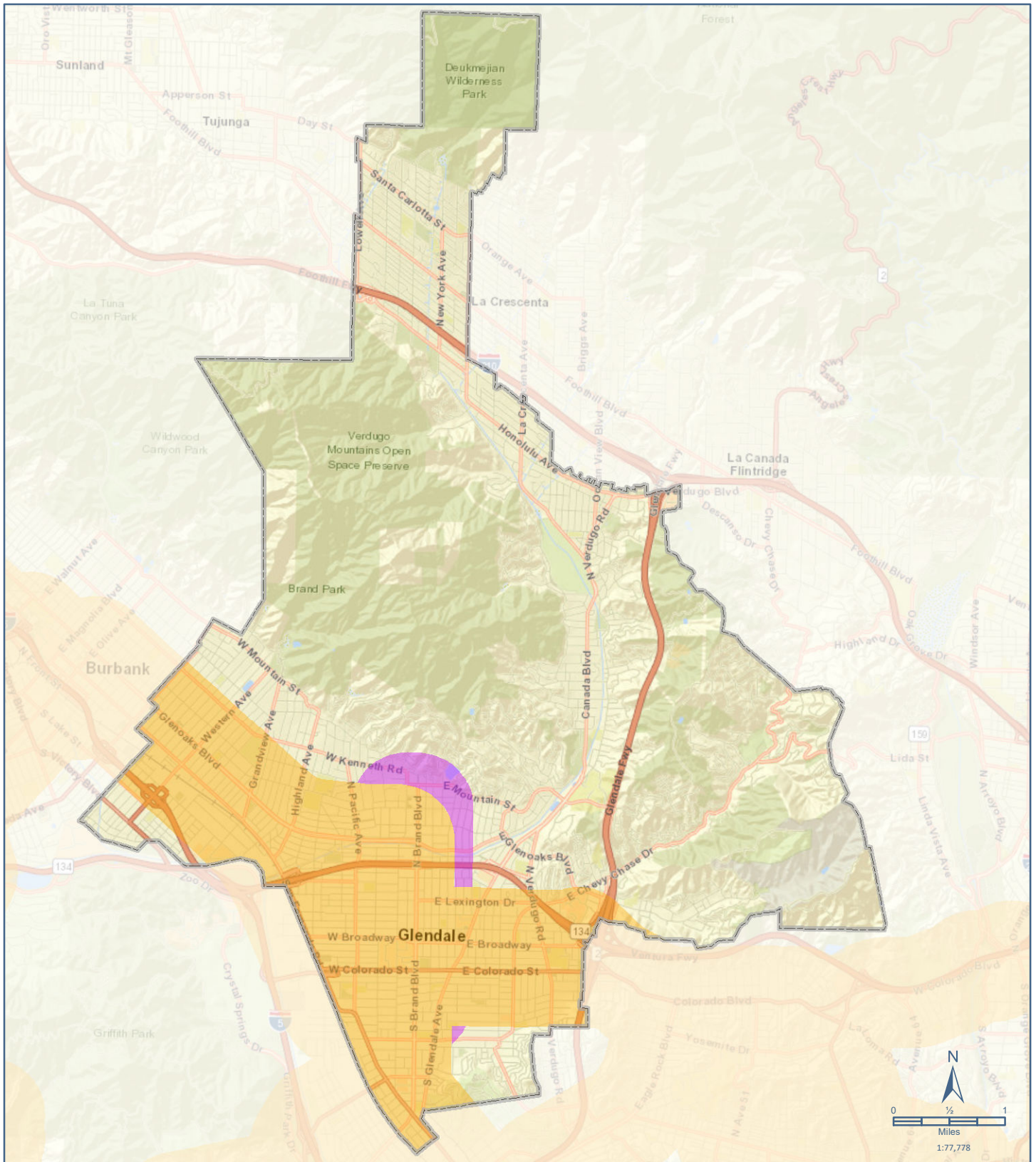
-  Glendale
-  Existing High Quality Transit Areas

Data sources: SWITRS; SANGIS; CalAtlas. Map date: February 24, 2020.

City of Glendale  
SB 743 Implementation

Existing  
High Quality  
Transit Areas





- Glendale
- Future High Quality Transit Areas
- Potential Future High Quality Transit Areas (Glendale Streetcar)

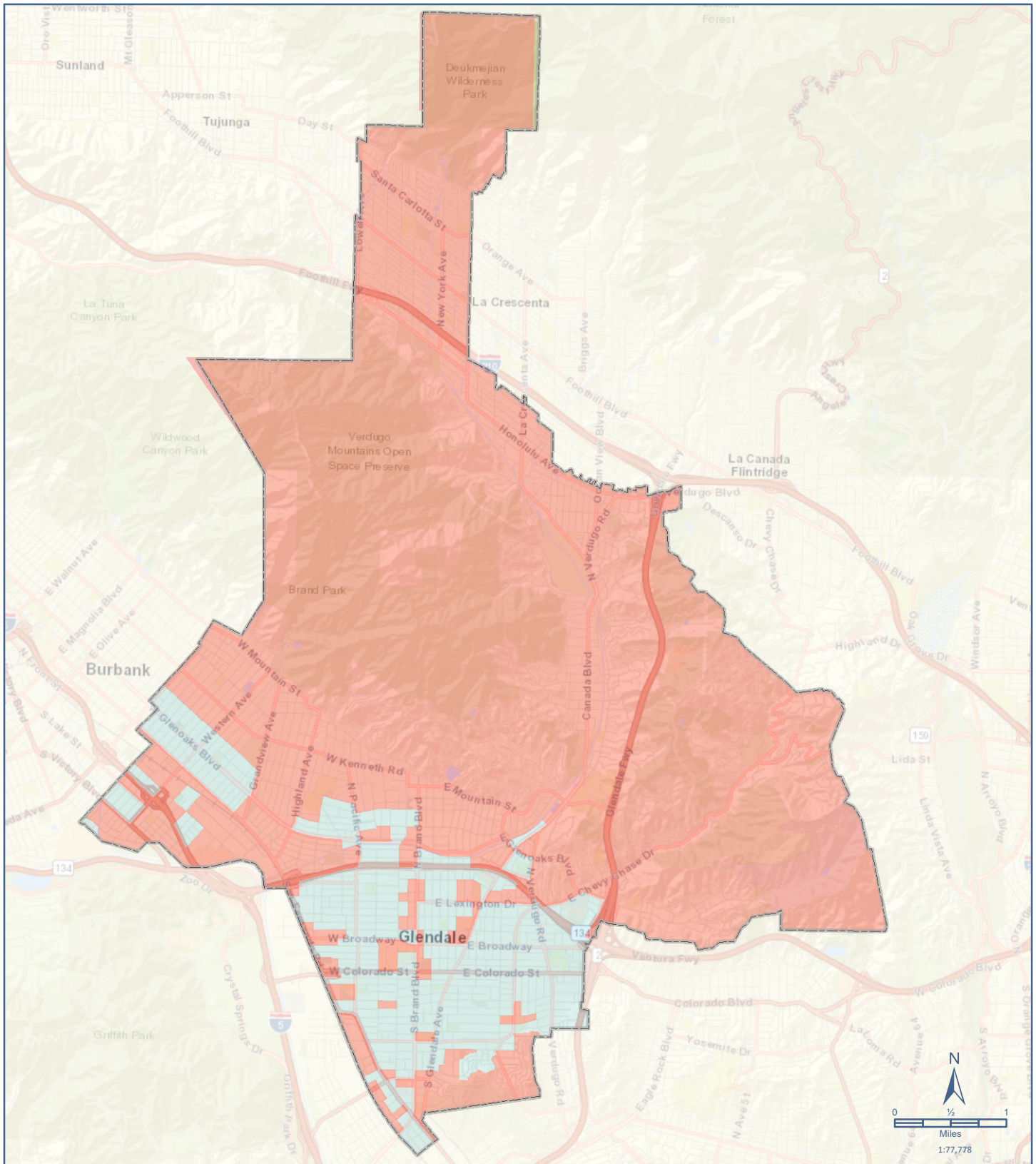
Data sources: SWITRS; SANGIS; CalAtlas. Map date: February 24, 2020.

City of Glendale  
SB 743 Implementation

Future  
High Quality  
Transit Areas

## Attachment B: VMT Screening Maps





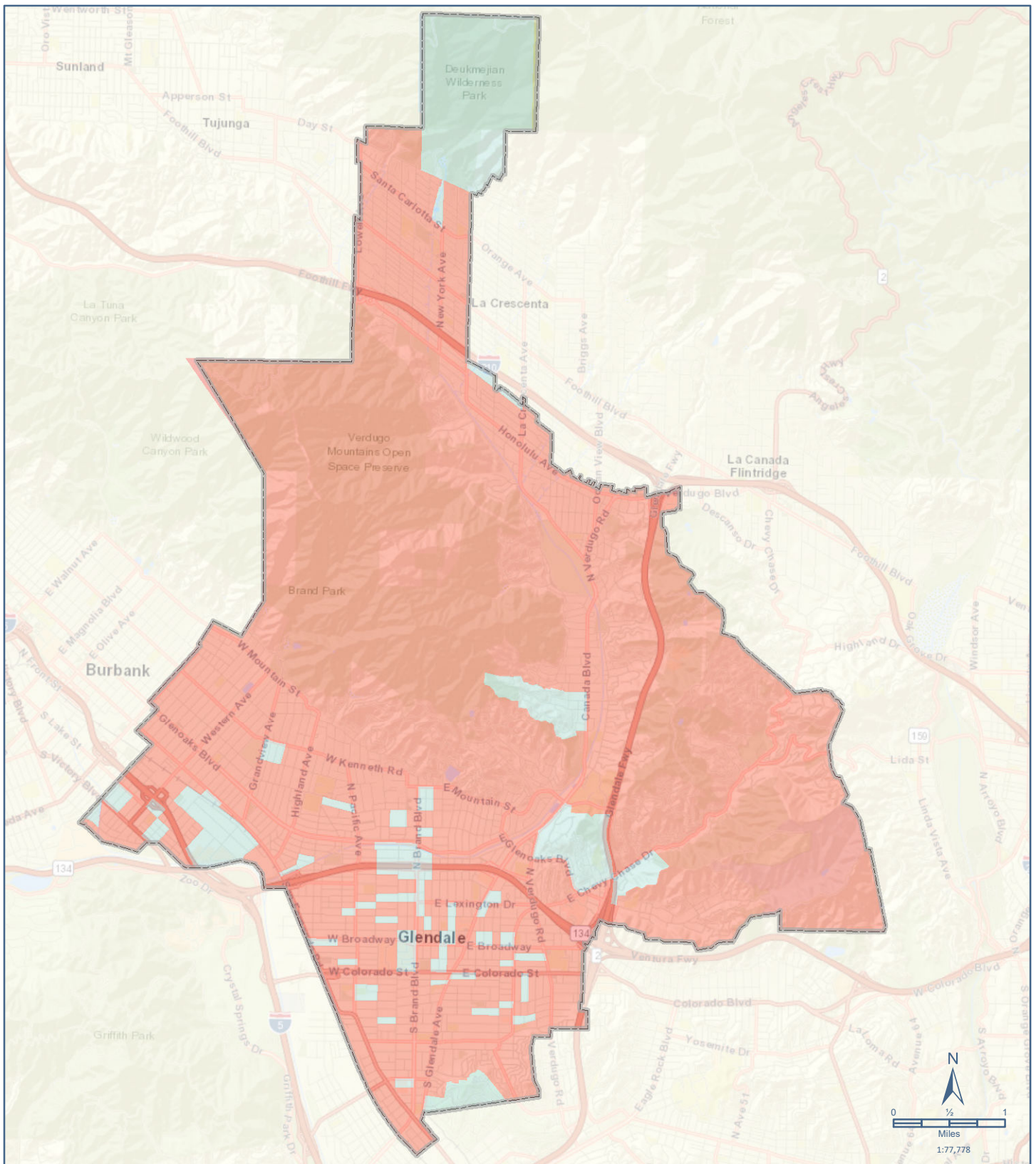
- Screened Out
- Not Screened Out (VMT Analysis Required)

**The City of Glendale average daily VMT per capita is estimated to be 8.69.  
15% below the average is 7.39.**

Data sources: S/W Tris, SA/Nois, Caltrans. Map date: February 24, 2020.

City of Glendale  
SB 743 Implementation

**Residential Project  
VMT Screening**



- Screened Out
- Not Screened Out (VMT Analysis Required)

**The City of Glendale average daily VMT per employee is estimated to be 17.87.  
15% below the average is 15.19.**

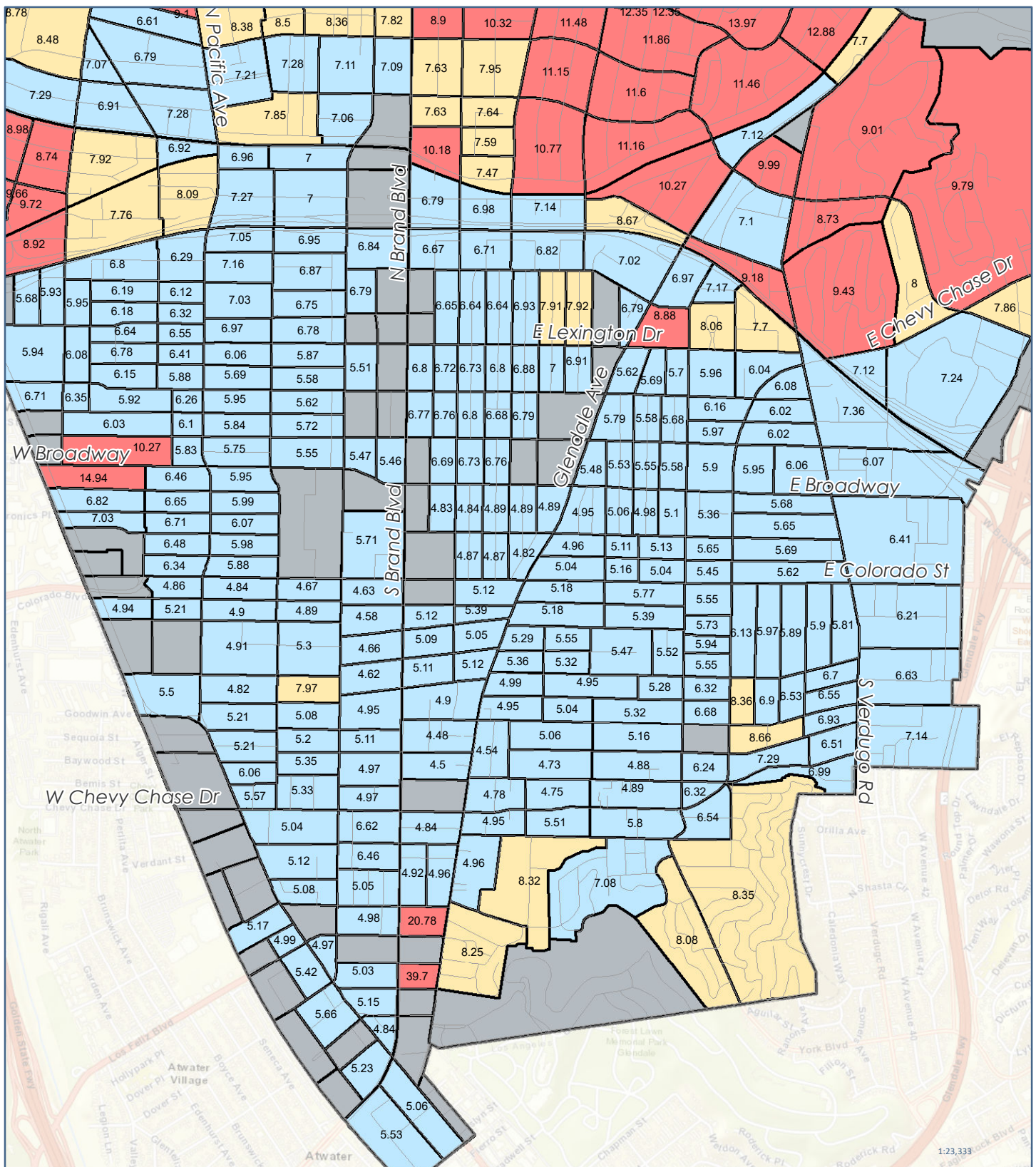
Data sources: SWVTR, SANDAG, Caltrans. Map date: February 24, 2020.

City of Glendale  
SB 743 Implementation

Office/Employment  
Project  
VMT Screening

Attachment C: VMT per Resident and per  
Employee Maps





- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)

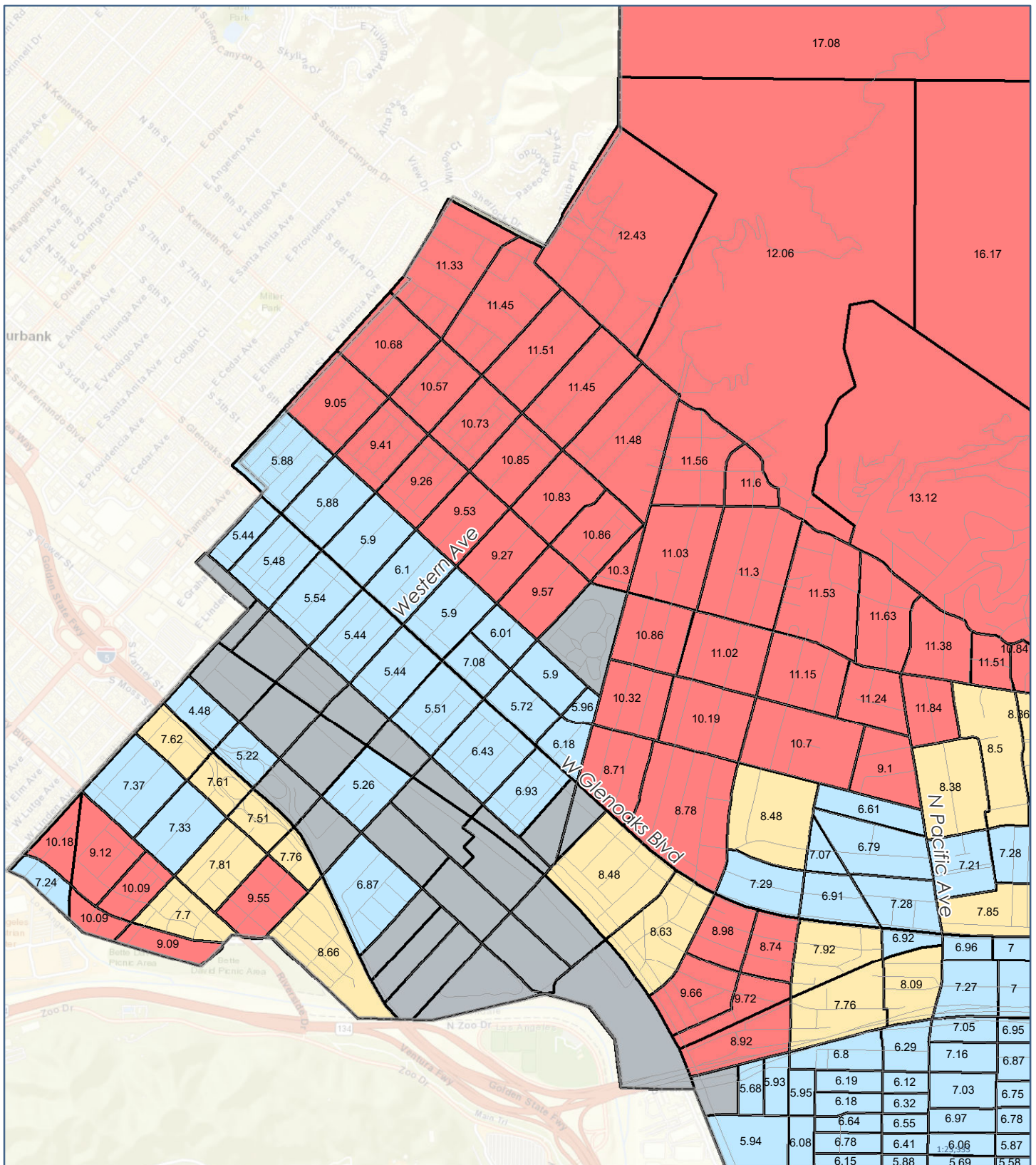


City of Glendale  
SB 743 Implementation

**The City of Glendale average daily VMT per capita is estimated to be 8.69.  
15% below the average is 7.39.**

Date sources: SWVTR, SANAV, Caltrans. Map date: February 27, 2020

**Residential Project  
VMT Map (South)**



- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)



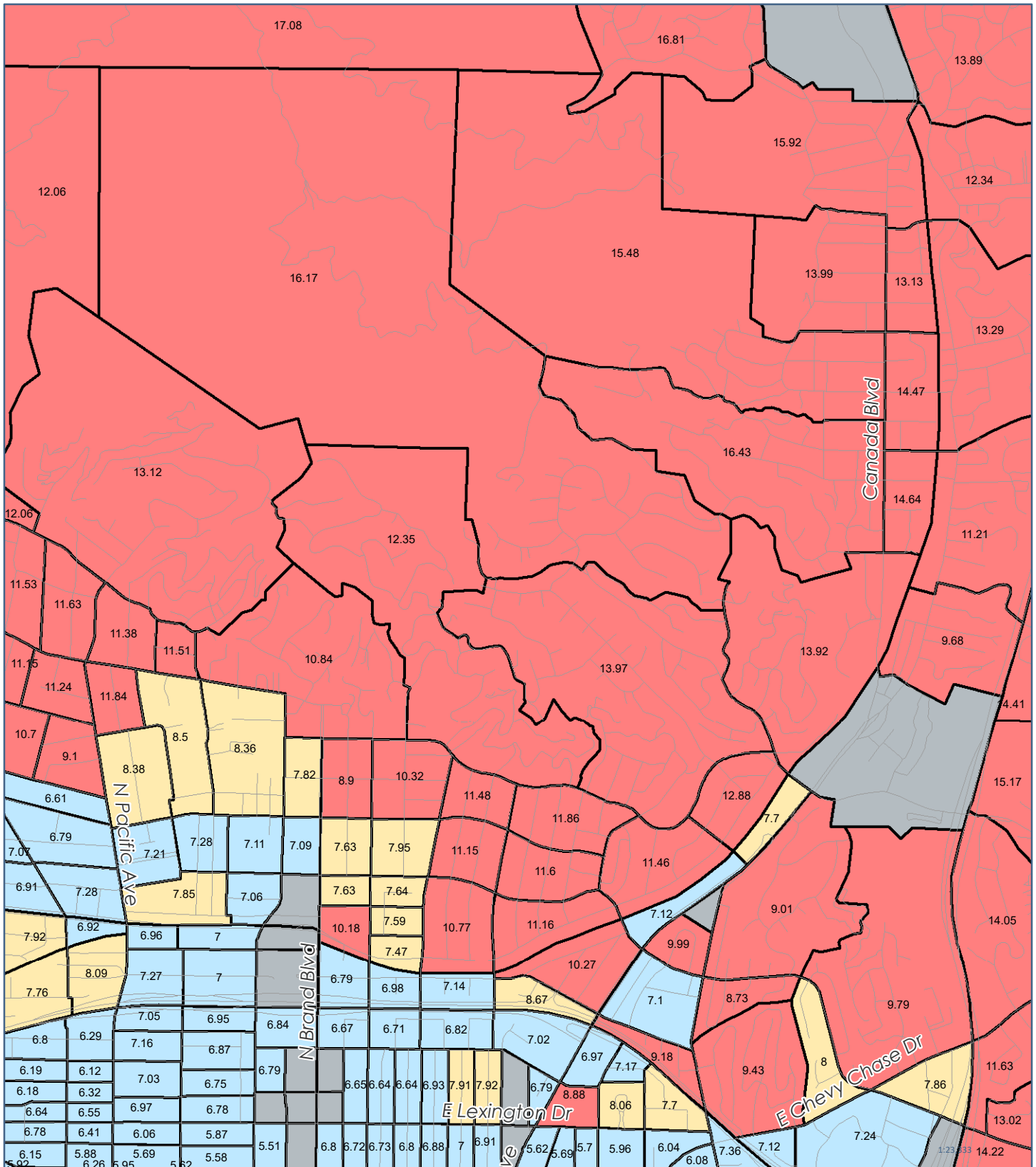
City of Glendale  
SB 743 Implementation

**The City of Glendale average daily VMT per capita is estimated to be 8.69.  
15% below the average is 7.39.**

Date sources: SWITCO, SANDAG, Caltrans. Map date: February 27, 2020

**Residential Project  
VMT Map (West)**





- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)



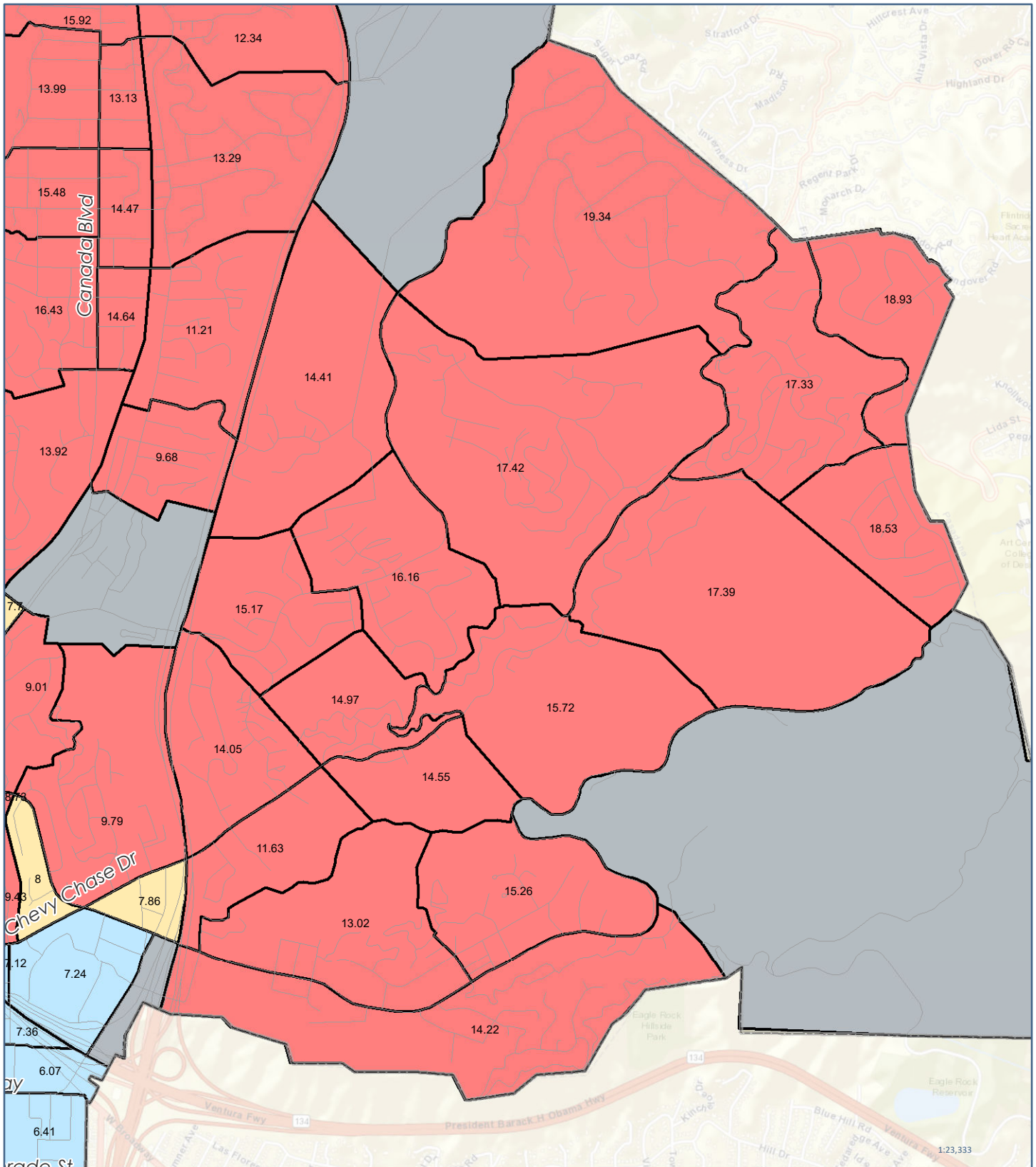
City of Glendale  
SB 743 Implementation

**The City of Glendale average daily VMT per capita is estimated to be 8.69.  
15% below the average is 7.39.**

Data sources: SWITCO, SANDAG, Caltrans. Map date: February 27, 2020.

**Residential Project  
VMT Map (Central)**





- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)

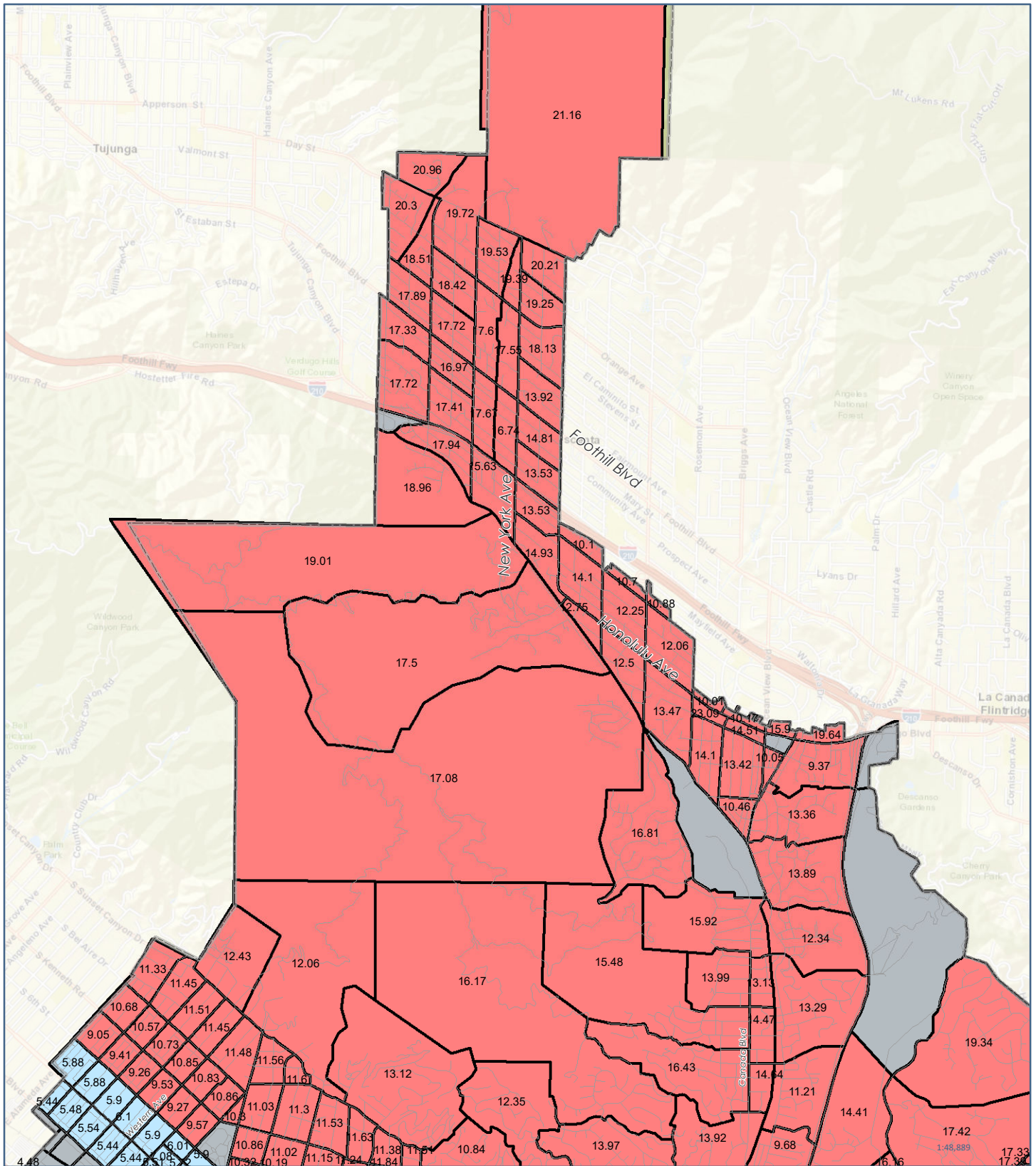


City of Glendale  
SB 743 Implementation

## Residential Project VMT Map (East)

**The City of Glendale average daily VMT per capita is estimated to be 8.69.  
15% below the average is 7.39.**

Data sources: SWITCO, SANCO, Caltrans. Map date: February 27, 2020.



- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)



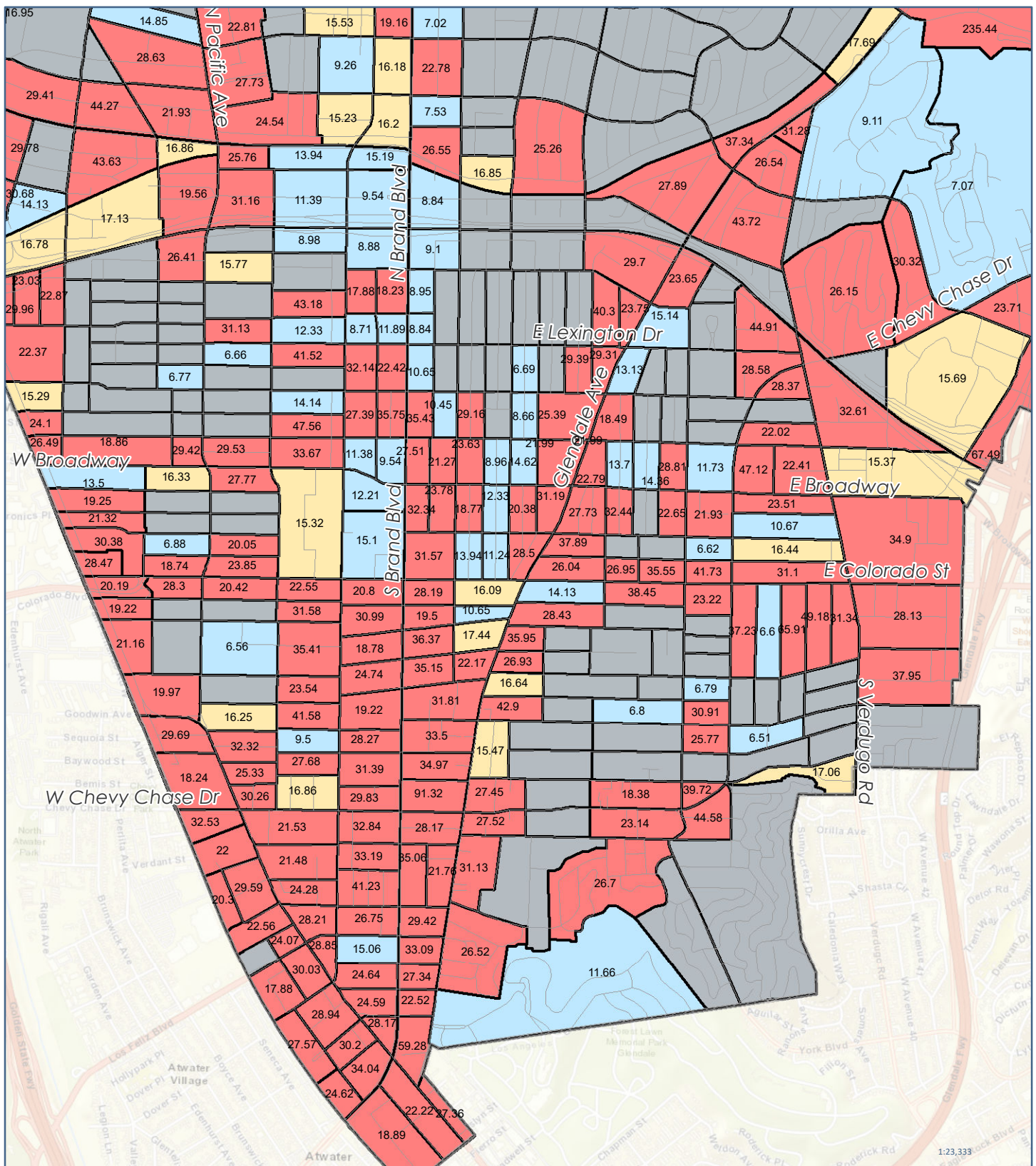
City of Glendale  
SB 743 Implementation

**The City of Glendale average daily VMT per capita is estimated to be 8.69.  
15% below the average is 7.39.**

Data sources: SWVTR, SANUS, Caltrans. Map date: February 27, 2020.

**Residential Project  
VMT Map (North)**





- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)

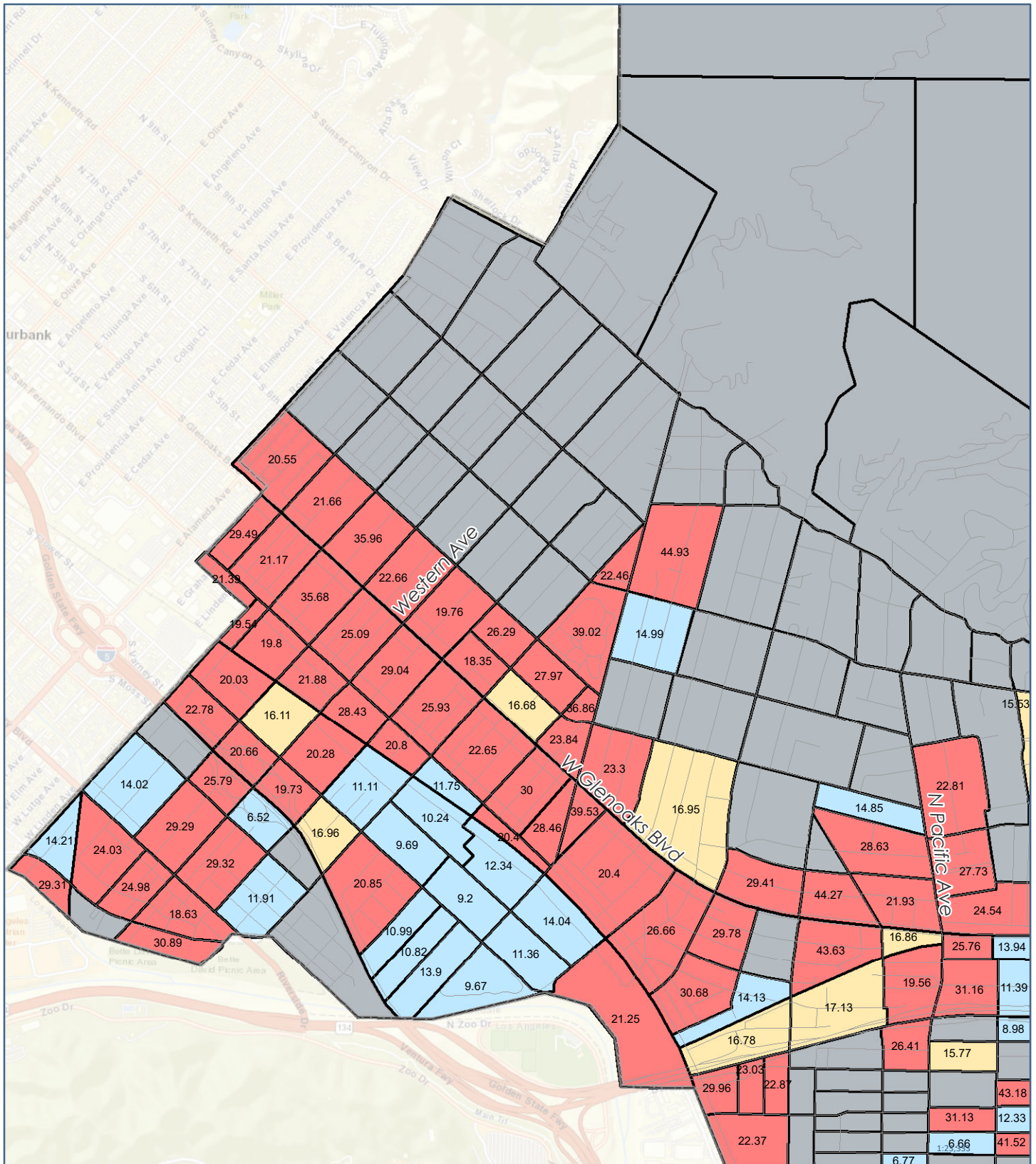


City of Glendale  
SB 743 Implementation

Office/Employment  
Project  
VMT Map (South)

**The City of Glendale average daily VMT per employee is estimated to be 17.87.  
15% below the average is 15.19.**

Data sources: SWITB, SANDAG, Caltrans. Map date: February 24, 2020.



- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)



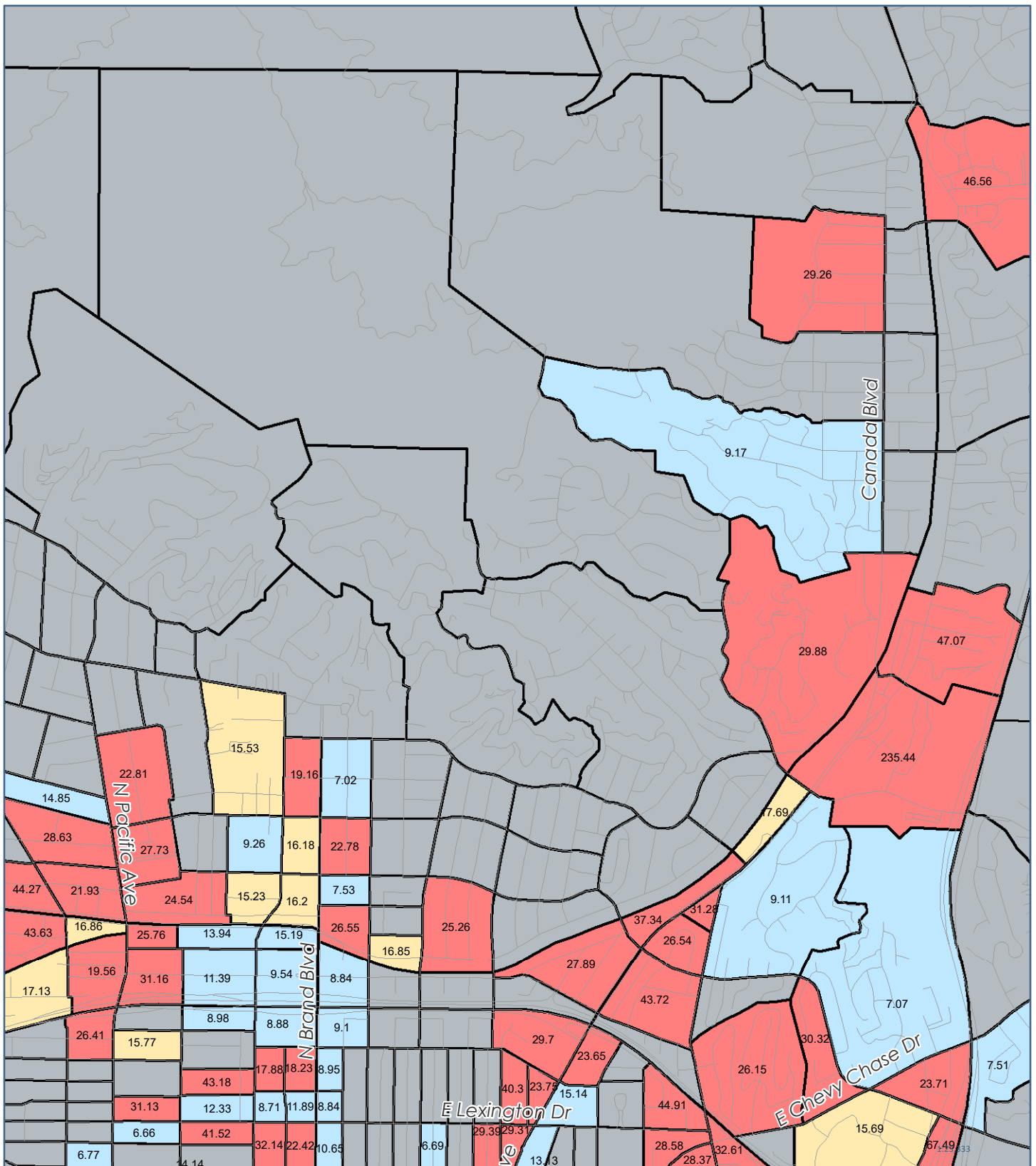
**The City of Glendale average daily VMT per employee is estimated to be 17.87.  
15% below the average is 15.19.**

Data sources: SWITCO, SANUS, Caltrans. Map date: February 27, 2020.

City of Glendale  
SB 743 Implementation

Office/Employment  
Project  
VMT Map (West)





- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)

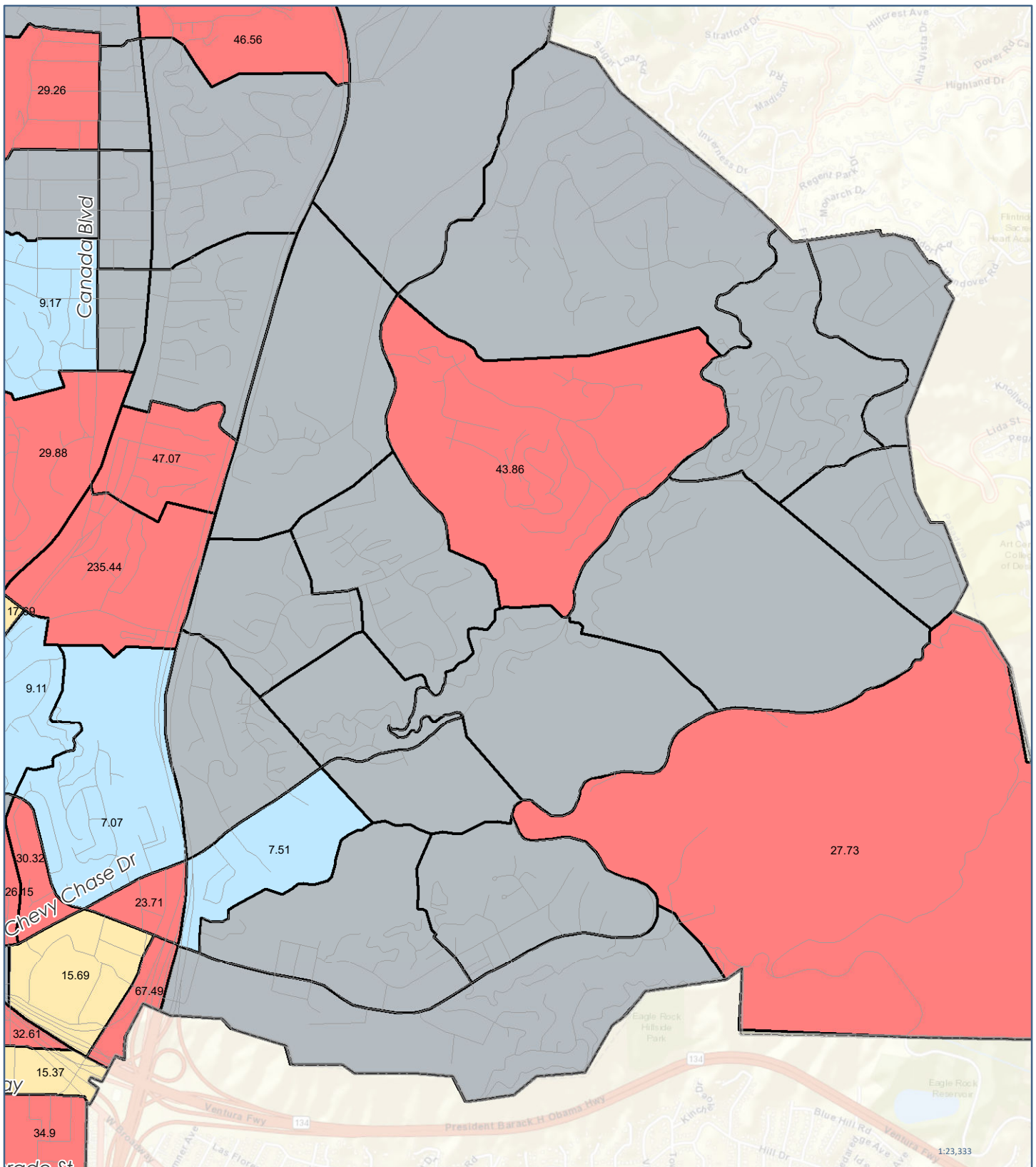


**The City of Glendale average daily VMT per employee is estimated to be 17.87.  
15% below the average is 15.19.**

Data sources: SWITCO, SANUS, Caltrans. Map date: February 27, 2020

City of Glendale  
SB 743 Implementation

Office/Employment  
Project  
VMT Map (Central)



- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)

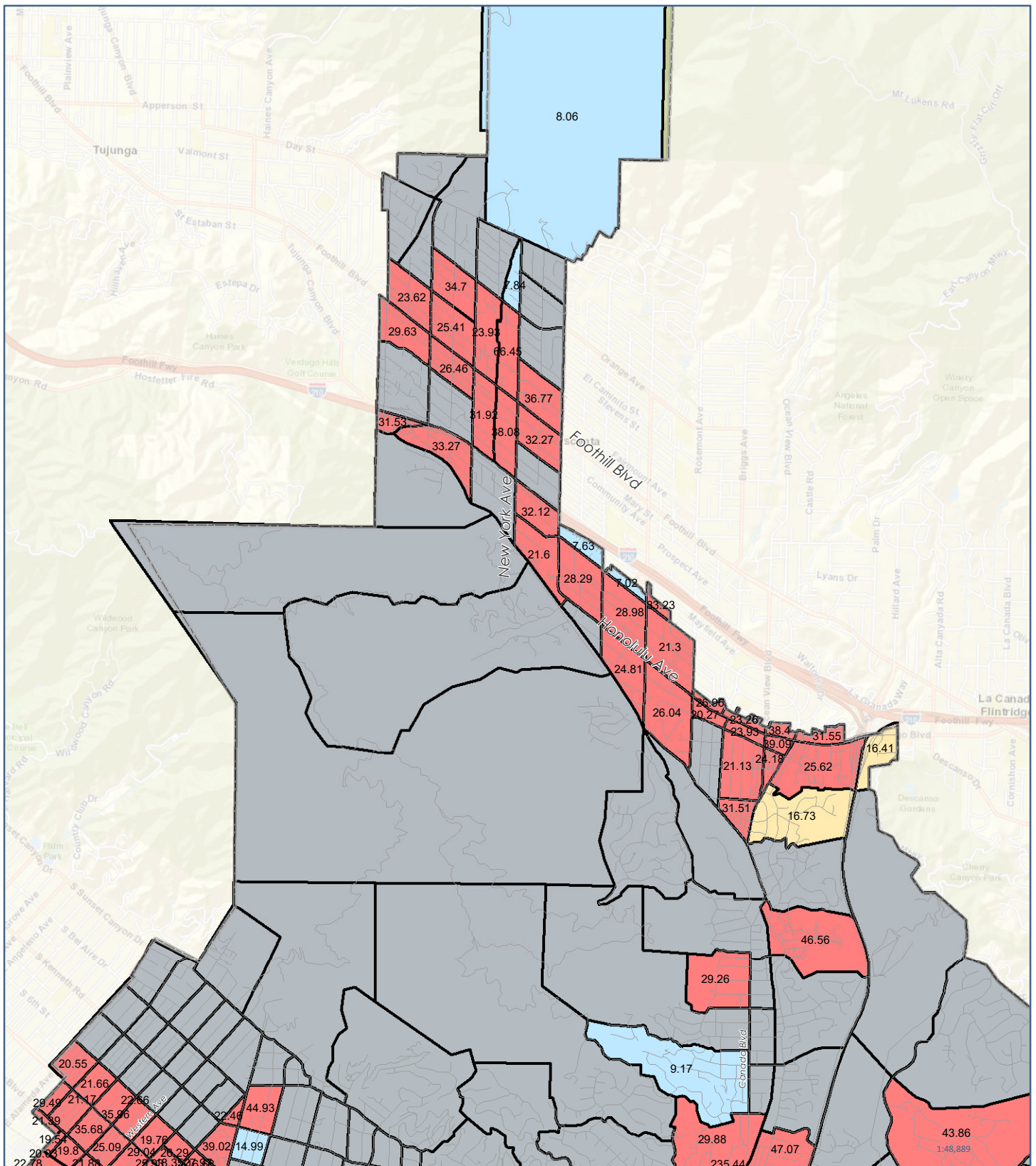


**The City of Glendale average daily VMT per employee is estimated to be 17.87.  
15% below the average is 15.19.**

Data sources: SWITCO, SAHUB, Caltrans. Map date: February 27, 2020.

City of Glendale  
SB 743 Implementation

Office/Employment  
Project  
VMT Map (East)



- Less than 85% of Citywide Average (No VMT Impact)
- 85% to 100% of Citywide Average (VMT Impact)
- Higher than Citywide Average (VMT Impact)
- N/A (Map not applicable, consult with City staff)



City of Glendale  
SB 743 Implementation

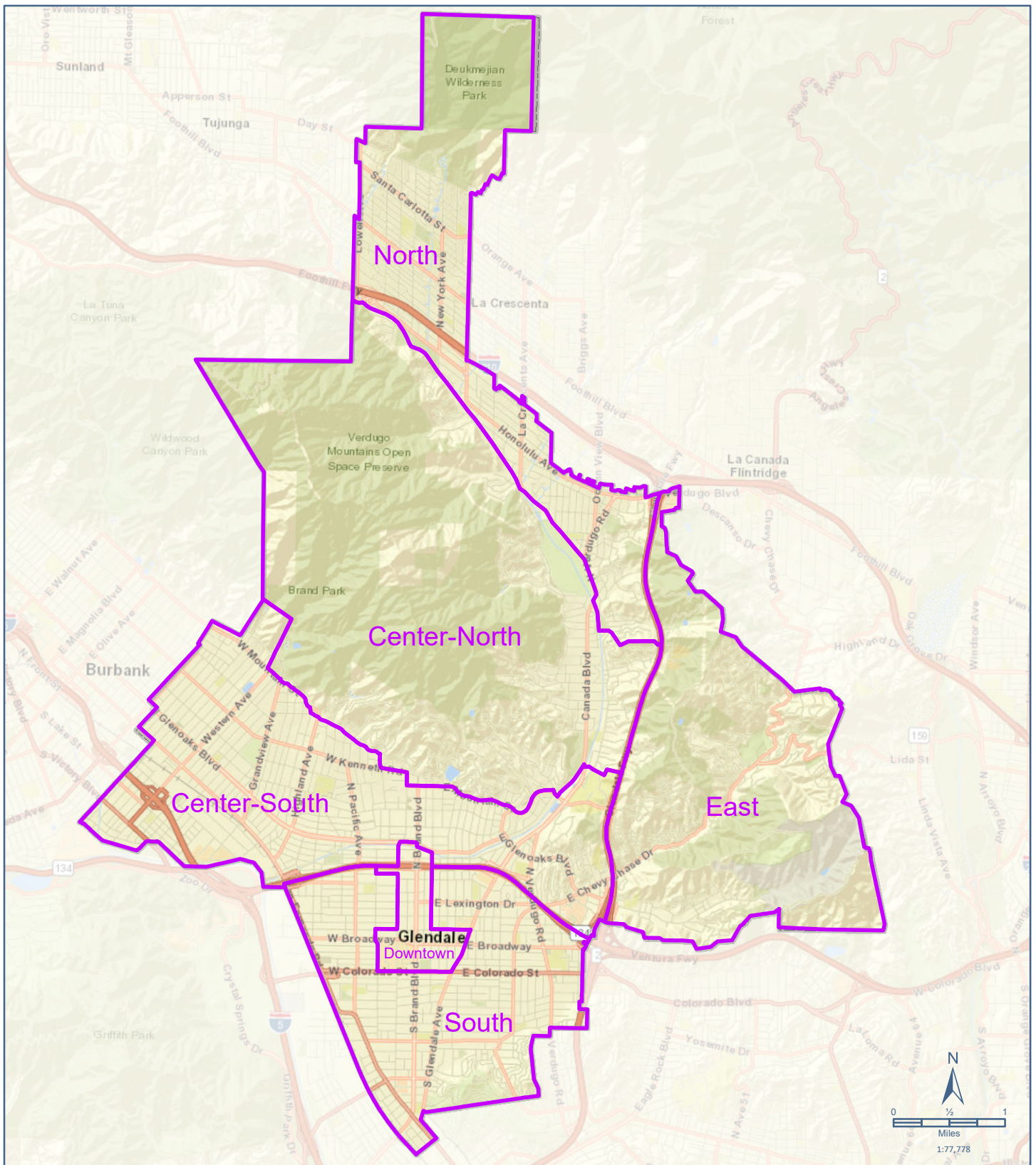
Office/Employment  
Project  
VMT Map (North)

**The City of Glendale average daily VMT per employee is estimated to be 17.87.  
15% below the average is 15.19.**

Data sources: SWITRS, SANIS, Caltrans. Map date: February 27, 2020

## Attachment D: Average Trip Lengths





Location	Residential Trip Length	Office/ Employment Trip Length	Retail Trip Length	College Trip Length	K-12 Trip Length	Recreational Trip Length
North	7.11 miles	10.89 miles	6.43 miles	N/A	4.10 miles	4.80 miles
Center-North	6.26 miles	12.73 miles	6.14 miles	N/A	3.97 miles	5.36 miles
South	4.21 miles	9.63 miles	5.64 miles	4.88 miles	2.95 miles	3.20 miles
Downtown	4.04 miles	9.72 miles	5.78 miles	N/A	N/A	3.05 miles
Center-South	4.59 miles	10.10 miles	6.11 miles	7.27 miles	3.06 miles	3.42 miles
East	6.74 miles	11.11 miles	7.07 miles	N/A	3.90 miles	5.83 miles

City of Glendale  
SB 743 Implementation

Average  
Trip Lengths

Attachment E: VMT Mitigation

## MEMORANDUM

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Date: October 28, 2020

Project #24123

To: City of Glendale

From: Michael Sahimi

Project: City of Glendale SB 743 Implementation

Subject: VMT Mitigation Measures

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With the passage of Senate Bill (SB) 743 in 2013, and the adoption of the City's updated transportation impact analysis guidelines in 2020, the basis for measuring significant transportation impacts for development projects under the California Environmental Quality Act (CEQA) has shifted from level of service (LOS) and automobile delay to vehicle miles traveled (VMT). This shift in focus from reducing impact to drivers to reducing the impact of driving better aligns with the State's goals to reduce greenhouse gas (GHG) emissions and encourage infill development and active transportation.

When projects under CEQA review are found to result in significant impacts to the environment, the lead agency must consider mitigation measures that would reduce the impact to below significant levels. With the shift away from LOS, delay, and vehicular capacity metrics and impact thresholds to VMT thresholds, mitigating significant impacts now requires focusing on measures to shorten vehicle trip distances or reduce single-occupancy vehicle trips (in favor of carpooling, taking public transit, bicycling, walking, and other modes), since VMT in essence is a function of the number of vehicle trips and their associated trip lengths. Whereas previous LOS-related mitigation measures focused on expanding roadway facilities primarily for vehicles, VMT-reducing mitigation measures can include modifying project characteristics, implementing on- or off-site improvements to transit, pedestrian and bicycle facilities, parking management strategies, and Transportation Demand Management (TDM) strategies to either reduce or shorten vehicular trips. In particular, TDM can reduce travel by single-occupancy vehicles by expanding traveler choices and encouraging ridesharing, carpooling, bicycling, walking, and riding transit. TDM strategies are among the most effective at reducing VMT impacts for land development projects at the project level.

This memorandum documents VMT mitigation strategies that Kittelson has determined can be applicable to projects in the City of Glendale, based on a review of relevant literature and research. The selected strategies, as well as the applicable VMT reduction percentages and other attributes, are primarily based on a review of the guidance published by the California Air Pollution Control Officers Association (CAPCOA) in August 2010 (*Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*). This resource forms the basis for much of the TDM and VMT mitigation research and policymaking in the state. The recommendations in this memo are also based on more recent information, such as recent research

published by the San Diego Association of Governments (SANDAG) in June 2019 (*Mobility Management Guidebook* and *Mobility Management VMT Reduction Calculator Tool – Design Document*), California Air Resources Board (CARB) in 2014, Western Riverside Council of Governments (WRCOG) in March 2019, and City of San Jose in February 2018.

VMT mitigation measures that can be applicable to projects in the City are provided in Table 1. Information provided in the table includes the following:

- **Tier:** Mitigation measures can fall within one of two categories – Project Tier (strategies that would be implemented at a project site) and City/Community Tier (strategies that would be implemented at a community or citywide scale).
- **Measure Category:** Measures consist of multiple categories including commute strategies (aimed at employee trips), parking policies and programs (can apply to multiple land use and trip types), transit improvements (can include networkwide service and/or fare changes), neighborhood enhancements (to improve multimodal connectivity), and land use and location strategies (involve project location and land use mix).
- **Description:** A detailed description is included for each measure, including requirements to successfully implement the measure. In addition, some measures may overlap and should not be analyzed together as part of a mitigation program; this information is also included.
- **Range of Reductions:** The maximum allowable reduction per each measure is provided.
- **Land Use Applicability:** The applicable land use for each measure (primarily consisting of residential, office/employment, and retail) is provided. It is important to note that some measures may not be applicable to all project types; for example, commute trip reduction measures cannot be applied to residential projects.
- **Implementation Body:** The appropriate implementation body or bodies are included for each measure. For example, some measures are under the purview of the City or local transit agencies such as NCTD. Physical on-site improvements are generally implemented by the site developer. Programs or other continuous measures would generally be implemented by tenants or other bodies (such as homeowners associations).
- **Source:** For each measure, the source for the appropriate methodology and VMT reduction formula is included.

It is important to note that reductions between multiple measures are not additive, and the sum of VMT reductions across measures must be dampened using the following formula per CAPCOA:

$$\text{Total VMT Reduction \%} = 1 - (1-A) * (1-B) * (1-C) * \dots$$

Where A, B, and C represent the reduction percentages from individual strategies

This calculation should be applied within each category, and then across all five categories to obtain the total VMT reduction percentage for a project undergoing VMT mitigation. For example, if an applicant estimates reductions from four mitigation measures (5% from Land Use and Location: Increase Site Density, 8% from Land Use and Location: Major Transit Center Accessibility, 10% from Parking

Management Strategies: Parking Supply Limits, and 3% from Parking Management Strategies: Parking Pricing), then the calculations would be as follows:

$$\text{Total Land Use and Location Strategies Reduction \%} = 1 - (1 - 5\%) * (1 - 8\%) = 12.6\%$$

$$\text{Total Parking Management Strategies Reduction \%} = 1 - (1 - 10\%) * (1 - 3\%) = 12.7\%$$

$$\text{Total Global VMT Reduction \%} = 1 - (1 - 12.6\%) * (1 - 12.7\%) = \underline{\mathbf{23.7\%}}$$

In addition, it is important to note that this is a limit to the amount of VMT reduction that can be applied to a development project. Most areas of the city can be characterized by a suburban land use and transportation context; CAPCOA indicates that the maximum feasible total reduction combining all measures is 15% in such areas. In the city's high quality transit areas, which can be characterized by a suburban-center land use and transportation context, CAPCOA indicates that the maximum feasible total reduction combining all measures is 20%. There are also maximum feasible reductions within and across the five mitigation categories; these are indicated in Table 2 and Table 3. Care should be taken that any calculated VMT reductions do not exceed these maximums. In the example above, in a suburban setting the Land Use and Location strategies reduction of 12.6% would be capped at 5%, and the total reduction would be capped at 15%.

At this time, several VMT-reducing measures are already required for new developments by the City's Municipal Code, which should be considered project features to be applied during a project's VMT impact assessment and should not be used as part of mitigation calculations:

- 30.32.170 (Trip Reduction and Travel Demand Measures) requires trip reduction measures for development projects prior to approval. For nonresidential development of 25,000 gross square feet or more, requirements include a bullet board, display case, or kiosk displaying transportation information such as transit and ridesharing. For nonresidential development of 50,000 gross square feet or more, requirements include a preferential carpool/vanpool parking area and bicycle racks or other secure bicycle parking. For nonresidential development of 100,000 gross square feet or more, requirements include vanpool/carpool areas, an internal sidewalk system, bus stop improvements, and bicycle parking.
- 30.32.171 (Additional Trip Reduction and Travel Demand Measures in the Downtown Specific Plan Zone) includes additional requirements for projects in the DSP zone such as developing a TDM plan, becoming a member of a designated TMA or TMO, and providing additional bicycle, pedestrian, transit and carpool/ vanpool facilities.

LA Metro provides valuable resources and assistance that can be utilized by developers and tenants looking to implement TDM programs. LA Metro can provide the following resources:

- Rideshare assistance (including school pools)
- Vanpool assistance and subsidies
- Guaranteed Ride Home program

- Employer annual transit pass program
- Bike share

If a project is required to conduct a cumulative VMT analysis, TDM measures that are already included in the cumulative model baseline for the project transportation analysis zone (TAZ) cannot be applied towards mitigating cumulative impacts. The maps in this attachment show areas of the city and corresponding TDM measures that are included as part of the cumulative travel demand model baseline assumptions.

**Table 1: Applicable VMT Reduction Strategies**

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
Project Tier: Land Use and Location	Increase Site Density	This measure increases the density of households and employment per acre for the project site over what was used in the initial project VMT estimation. Density can be measured in terms of jobs, residents, employees, or dwelling units per unit area. Floor area ratio may be used as a proxy for employment, when employment is not known, or when considering non-office commercial developments.	Up to 30%	Residential, Office, Retail	Developer, City	CAPCOA (1.1)
	Increase Site Diversity	This measure involves improving the mix of uses and jobs/housing balance within a project or a planning area, incorporating a range of complementary land uses that provide a balanced development approach relative to the surrounding neighborhood and encourage shorter trips and transportation alternatives.	Up to 30%	Residential, Office, Retail	Developer, City	SANDAG (2B)
	Major Transit Center Accessibility	This measure locates a project within half a mile or a ten minute walk of a major transit center, defined as a rail transit station or a bus rapid transit station, but can be any transit stop with frequent service (5 to 15 minute headways) and significant transfer opportunities to other transit routes. Residential and commercial centers designed around rail and bus stations are known as Transit-Oriented Development and contain bike and pedestrian access.	Up to 14.4%	Residential, Office, Retail	Developer, City	SANDAG (2A)
	Integrate Affordable Housing	This measure incorporates a higher proportion of affordable housing within the residential portion of a project, subdivision, or a planning area. Income has a statistically significant effect on whether someone will drive a single-occupant vehicle to work or for other trip purposes.	Up to 32.5% of home VMT	Residential, Office, Retail	Developer, City	San Jose (PC-003)
Project Tier: Commute Demand Management Strategies	Voluntary Employer Commute Program	<p>This measure consists of a variety of measures to reduce single-occupant vehicle commuting through an employer, such as carpool/vanpool programs, subsidized transit passes, preferential carpool parking, bicycle facilities, and flexible work schedules. Unlike a mandatory program, this strategy does not require monitoring, reporting, or performance standards.</p> <p>Note, this measure cannot be analyzed in combination with a mandatory employer commute program. In addition, separate commute demand management measures should not be analyzed if already included under this measure.</p>	Up to 6.2% of work VMT	Office, Retail	Tenant	SANDAG (1A)



Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Mandatory Employer Commute Program	This measure consists of a variety of measures to reduce single-occupant vehicle commuting through an employer, such as carpool/vanpool programs, subsidized transit passes, preferential carpool parking, bicycle facilities, and flexible work schedules. Unlike a voluntary program, this strategy requires regular monitoring, reporting, and performance standards.  Note, this measure cannot be analyzed in combination with a voluntary employer commute program. In addition, separate commute demand management measures should not be analyzed if already included under this measure.	Up to 26% of work VMT	Office, Retail	Tenant	SANDAG (1B)
	Employer Carpool/Vanpool Program	This measure consists of supporting ride sharing through more convenient pick up/drop off locations, parking locations during workdays, and subsidies. Employers can encourage vanpooling and carpooling by providing ride-matching assistance, priority parking for carpool/vanpool vehicles, incentives, and subsidies.	Up to 7.1% of work VMT	Office, Retail	Tenant (in partnership with City or other agencies)	SANDAG (1E)
	Employer Transit Subsidy	This measure consists of employer-provided subsidized or discounted daily or monthly transit passes to employees; the employer would pay for a portion or the entirety of an employee's transit costs.	Up to 10.9% of work VMT	Office, Retail	Tenant (in partnership with transit agencies)	SANDAG (1D)
	Employer Telecommute and Alternative Work Schedules	This measure involves encouraging and supporting employers and employees interested in telecommuting or working alternative work schedules. It involves marketing, equipment, and infrastructure to support telecommuting. A telework program enables employees to work from home or a remote location one or more days per week. Alternative work schedules are usually compressed work weeks that allow workers to reduce the number of commute trips they make.	Up to 5.5% of work VMT	Office	Tenant	CAPCOA (4.6)/San Jose (TP-008)
	School Bus Program/ School Pool Program	This measure consists of two types of programs: supporting expanded school bus programs, or organizing groups of volunteer parents to provide shared rides to school. Developers and the City can work with school districts to expand school bus services in the project area and local community; alternatively, school carpool programs can fill service gaps for school buses.	Up to 6.3% of school VMT (school bus); Up to 15.8% of school VMT (school pool)	Residential	Developer, City	CAPCOA (4.10/4.13)
<b>Project Tier: Parking Management Strategies</b>	Parking Cash Out	This measure consists of providing cash to employees for not parking a vehicle on site, if free parking is provided for employees and is paid for by the employer. The cash payment would consist of the cash value of the space in lieu of the space itself. This measure can be used where free parking is prevalent and it is not feasible to directly charge for parking.	Up to 7.7% of work VMT	Office, Retail	Property Manager, Tenant	CAPCOA (4.15)



Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Parking Pricing	This measure consists of charging drivers directly for parking. Parking pricing can be implemented on- or off-street. This measure can be implemented in several ways, including implementing residential parking permit programs, unbundling parking costs from rent or property costs, charging for on-street parking, and charging for workplace parking.	Up to 7.5%	Residential, Office, Retail	Property Manager, Tenant, City	SANDAG (3A)
	Parking Supply Limits	This measure sets the amount of available on-site and on-street parking available at some level below current peak demand. This measure can be implemented in several ways, including eliminating or reducing minimum parking requirements, establishing maximum parking requirements, requiring shared parking between different uses, limiting parking to residents with permits, and establishing parking time limits.	Up to 12.5%	Residential, Office, Retail	Developer, City	CAPCOA (3.1)
City/Community Tier: Transit Strategies	New Transit Service and Coverage	This measure involves expanding transit service in terms of areas and/or times of day being served, in order to better accommodate existing and future demand and encourage a shift away from driving. This can include creating new transit routes.	Up to 5.9%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5A)
	Reduce fares	This measure consists of lowering transit fares in specific zones or across the transit system service area to make transit accessible to an increased number of users. Unlike the Employer Transit Subsidy, this measure is not limited to a single project site and reduces fares rather than providing discounts or subsidies.	Up to 1.2%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5D)
	Increased Transit Service Frequency	This measure consists of measures to increase the frequency of service on transit routes to improve the viability of taking public transit as an alternative to driving. Measures can be implemented systemwide or on specific routes to reduce headways and increase ridership by reducing travel times.	Up to 8.2%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5B)
	Increased Transit Speed and Reliability	This measure consists of roadway, traffic control, and other infrastructure improvements that expedite transit service and improve schedule adherence (reliability). Transit supportive treatments to increase transit vehicle speed and service reliability can include transit signal priority, bus-only signal phases, queue jumps, curb improvements to increase the speed of passenger loading, and dedicated bus lanes.	Up to 0.4%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5C)

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Microtransit NEV Shuttle	Microtransit services use real-time ride-hailing, mobile tracking, and app-based payment to provide demand-based services to user; this can include services utilizing Neighborhood Electric Vehicles (NEVs). Microtransit services are flexible and can consist of point-to-point shuttles or first/last-mile shuttles connecting with major transit hubs to provide an alternative to short vehicle trips.	Up to 0.1%	Residential, Office, Retail	Property Manager, Tenant, City, Transit Agencies	SANDAG (5E)
City/Community Tier: Neighborhood Circulation Enhancements	Improved Street Connectivity	This measure consists of strategies to improve street connectivity by increasing the density of publicly accessible streets, resulting in shorter block lengths between intersections to shorten trip lengths to increase the comfort and connectivity of pedestrians and bicyclists.	Up to 6%	Residential, Office, Retail	Developer, City	SANDAG (4A)/San Jose (MI-003)
	Pedestrian and Bicycle Facility and Network Improvements	This strategy improves the accessibility, convenience, and perceived safety of sidewalks, bicycle lanes, and pedestrian/bicycle paths. Improvements to the pedestrian/bicycle network include removing physical barriers, adding crossing infrastructure, widening sidewalks and bike lanes, and creating network links. This consists of three types of improvements: <ul style="list-style-type: none"> <li>• Pedestrian facility improvements (enhancing the existing streetscape and adding crossing improvements)</li> <li>• Bikeway network expansion (increasing the existing network of on- or off-street bikeways)</li> <li>• Bike facility improvements (implementing new bikeways)</li> </ul>	Up to 1.4% (pedestrian facility improvements); Up to 5.0% (bikeway network expansion); Up to 0.3% (individual bike facility improvement)	Residential, Office, Retail	Developer, City	SANDAG (4B/4C/4D)
	Support Bike Share	This measure consists of supporting bike sharing through parking facilities and subsidies. This can include partnering with docked and dockless bicycle, e-bike, and scooter share companies to provide on-demand active transportation options to residents and employees. Employers and cities can support these programs by providing bicycle parking, marketing bike share services, and subsidizing user cost.	Up to 0.1%	Residential, Office, Retail	Property Manager/HOA, Tenant, Developer, City	SANDAG (4E)
	Car Share	This measure consists of supporting car sharing through priority parking facilities and membership discounts and subsidies. This measure can help reduce automobile ownership. Types of carshare programs can include one-way (free-floating) programs that allow users to leave their vehicle at their final destination (without returning it to the origin) while roundtrip programs require users to return the vehicle to a designated location.	Up to 0.7%	Residential, Office, Retail	Property Manager/HOA, Tenant, Developer, City	SANDAG (4F)

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Traffic Calming	This measure consists of strategies to reduce the speeds of vehicle traffic on the street and improve the lateral separation between bicyclists, pedestrians, and motor vehicles; such strategies increase bicyclist and pedestrian comfort and can encourage a shift away from driving for shorter trips. Traffic calming strategies can include: <ul style="list-style-type: none"> <li>• Narrowing roadways</li> <li>• Vertical deflection such as speed bumps, humps, or tables</li> <li>• Horizontal deflection</li> <li>• Enforcement and education</li> <li>• Lowering speed limits</li> </ul>	Up to 1%	Residential, Office, Retail	Developer, City	CAPCOA (2.2)
	Community-Based Travel Planning	This measure consists of an agency- or HOA-sponsored TDM program; unlike the Voluntary Employer Commute Program and Mandatory Employer Commute Program, this measure is focused on residents. The organization responsible for operating the TDM program utilizes advisors to engage residents and provide information, incentives, and support to encourage residents and visitors to use alternative modes of travel. It may or may not be monitored with reduction targets.	Up to 2%	Residential	Property Manager/HOA, Tenant, Developer, City	SANDAG (4G)
	NEV Network	This measure consists of establishing a neighborhood electric vehicle (NEV) network. NEVs are low speed vehicles which are electric powered, offering an alternative to traditional vehicle trips and can legally be used on roadways with speed limits of 35 MPH or less (unless specifically restricted). Creating an NEV network requires implementing the necessary infrastructure, including NEV parking, charging facilities, striping, signage, and educational tools.	Up to 13%	Residential	Property Manager/HOA, Tenant, Developer, City	CAPCOA (2.3)
	Cordon Pricing	This strategy consists of levying a toll on motor vehicles seeking to enter a specific area, such as a downtown area. The cordon pricing system would be set up to cover all entry points to the area, with funds potentially being utilized to improve multimodal facilities in the area.	Up to 22%	Residential, Office, Retail	City	CAPCOA (6.1)

**Table 2: Maximum VMT Reductions (Suburban Areas)**

Max Category Reductions			Max Cross-Category Reductions	Global Max Reduction
Project Tier	Commute Demand Management Strategies (including Parking Cash Out)	25% (work VMT)	15% overall; 25% work VMT; 65% school VMT	15% without NEV; 20% with NEV (all VMT)
	Parking Management Strategies (excluding Parking Cash Out)	20%	10% without NEV; 15% with NEV (all VMT)	
	Land Use and Location	5%		
City/Community Tier	Transit Strategies	10%		
	Neighborhood Circulation Enhancements (excluding Cordon Pricing)	5% without NEV; 15% with NEV		
	Cordon Pricing	22%		

Source: California Air Pollution Control Officers Association (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (August 2010)

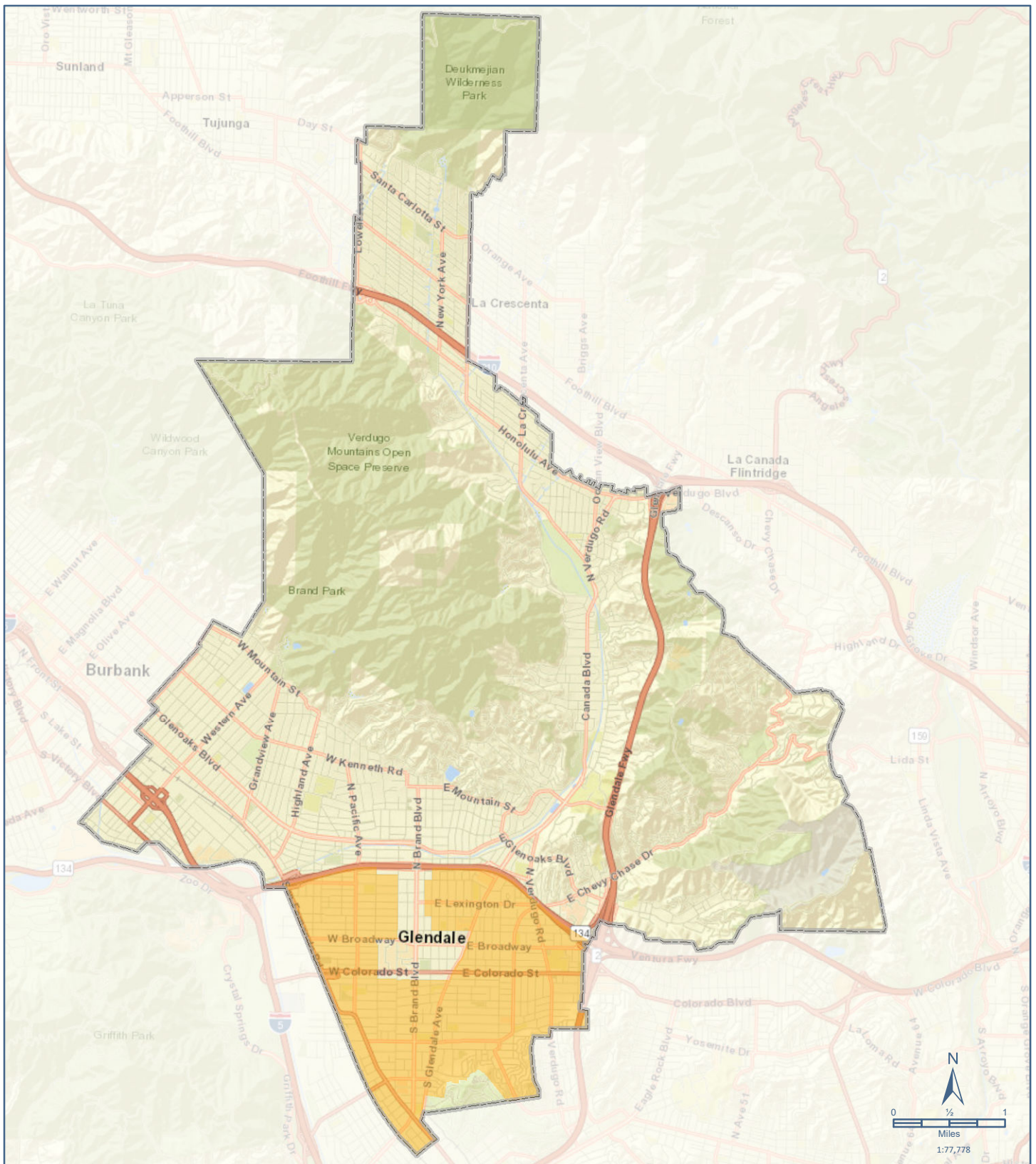
Note: NEV signifies the Neighborhood Electric Vehicle network mitigation measure, which is within the Neighborhood Circulation Enhancements category.

**Table 3: Maximum VMT Reductions (Suburban Areas)**

Max Category Reductions			Max Cross-Category Reductions	Global Max Reduction
Project Tier	Commute Demand Management Strategies (including Parking Cash Out)	25% (work VMT)	15% overall; 25% work VMT; 65% school VMT	20% (all VMT)
	Parking Management Strategies (excluding Parking Cash Out)	20%	15% (all VMT)	
	Land Use and Location	10%		
City/Community Tier	Transit Strategies	10%		
	Neighborhood Circulation Enhancements (excluding Cordon Pricing)	5% without NEV; 15% with NEV		
	Cordon Pricing	22%		

Source: California Air Pollution Control Officers Association (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (August 2010)

Note: NEV signifies the Neighborhood Electric Vehicle network mitigation measure, which is within the Neighborhood Circulation Enhancements category.

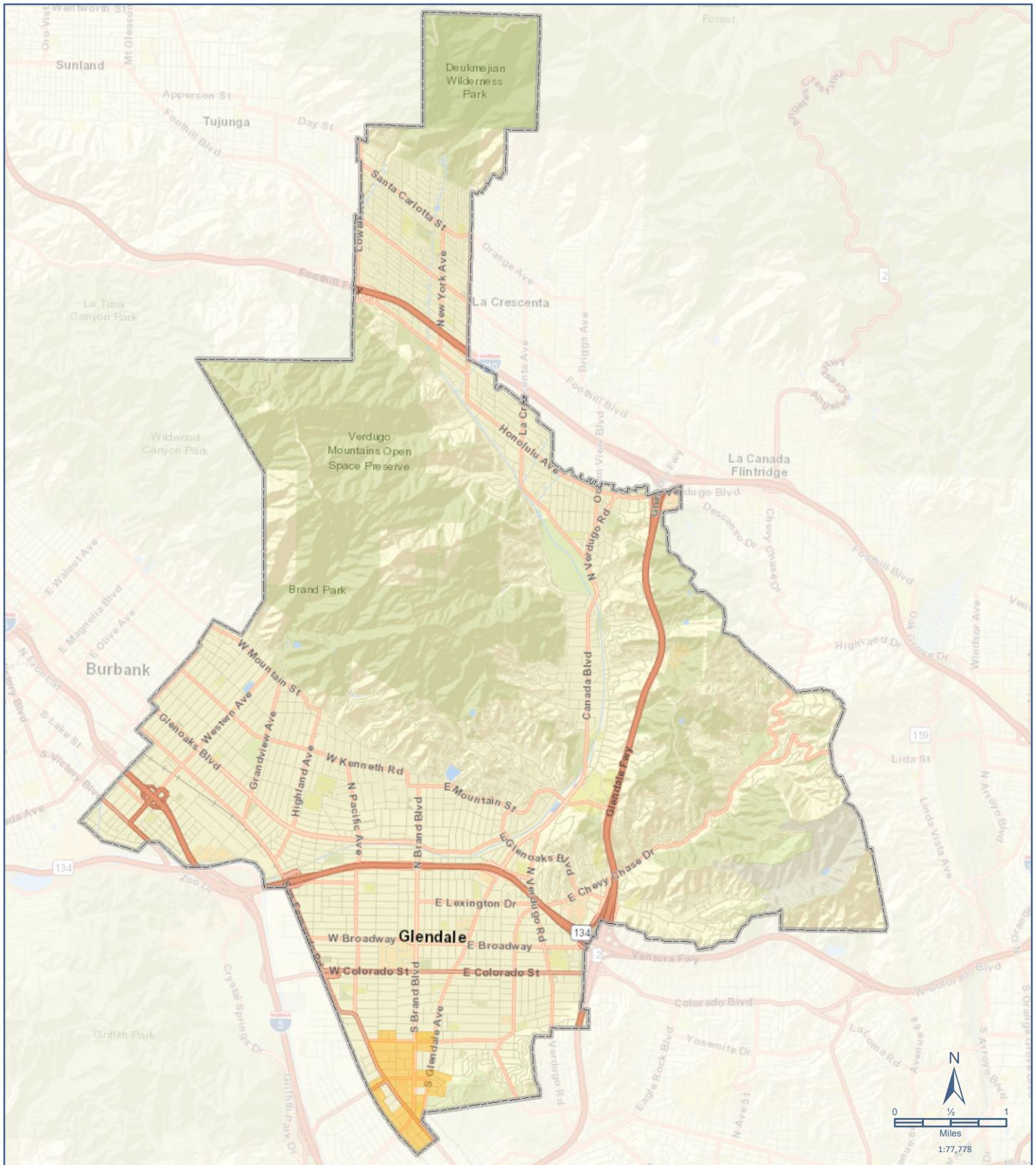


Areas with Measure SDT-2 (Traffic Calming Measures)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions



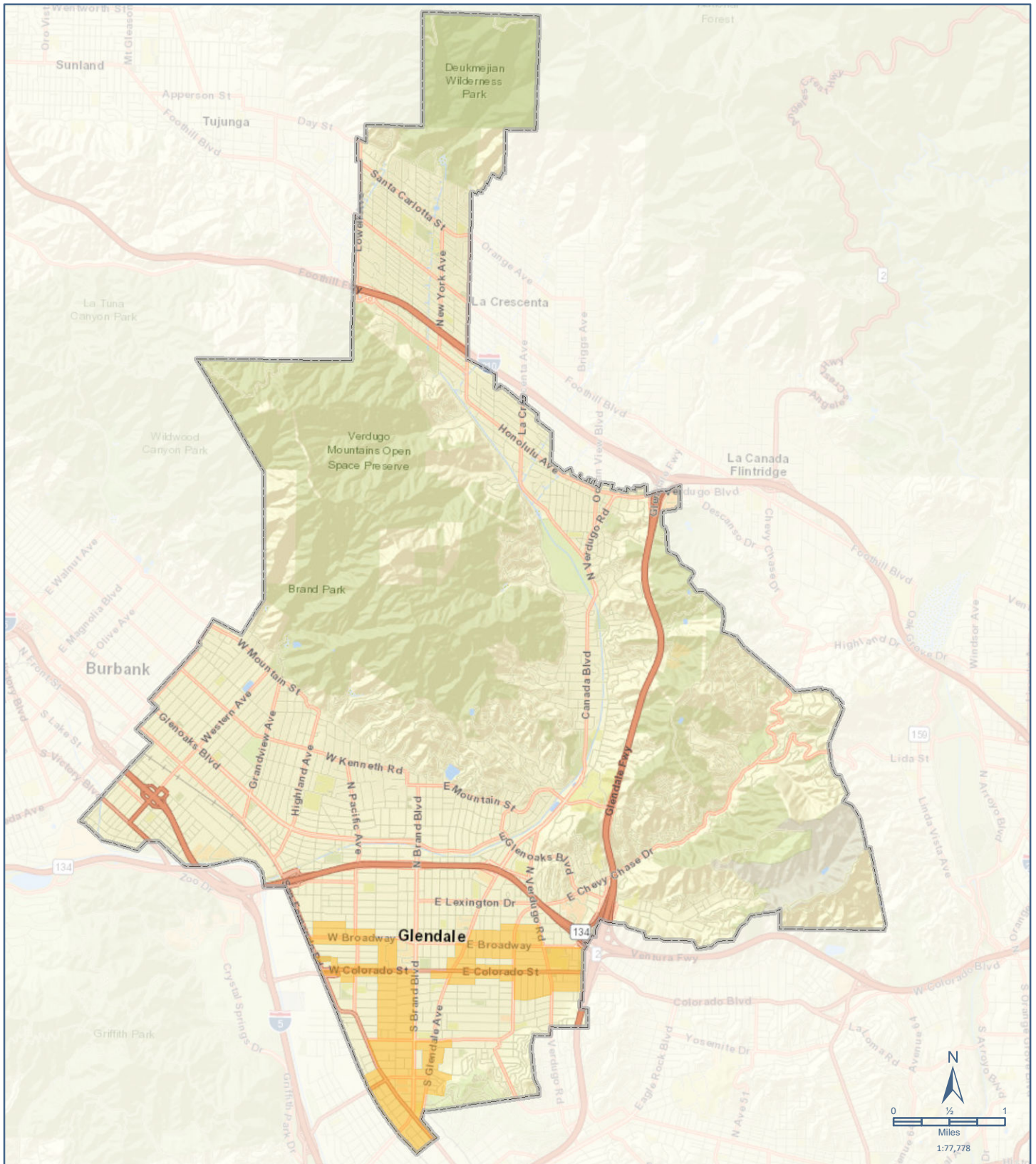


Areas with Measure SDT-5 (Bike Lane Street Design)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions



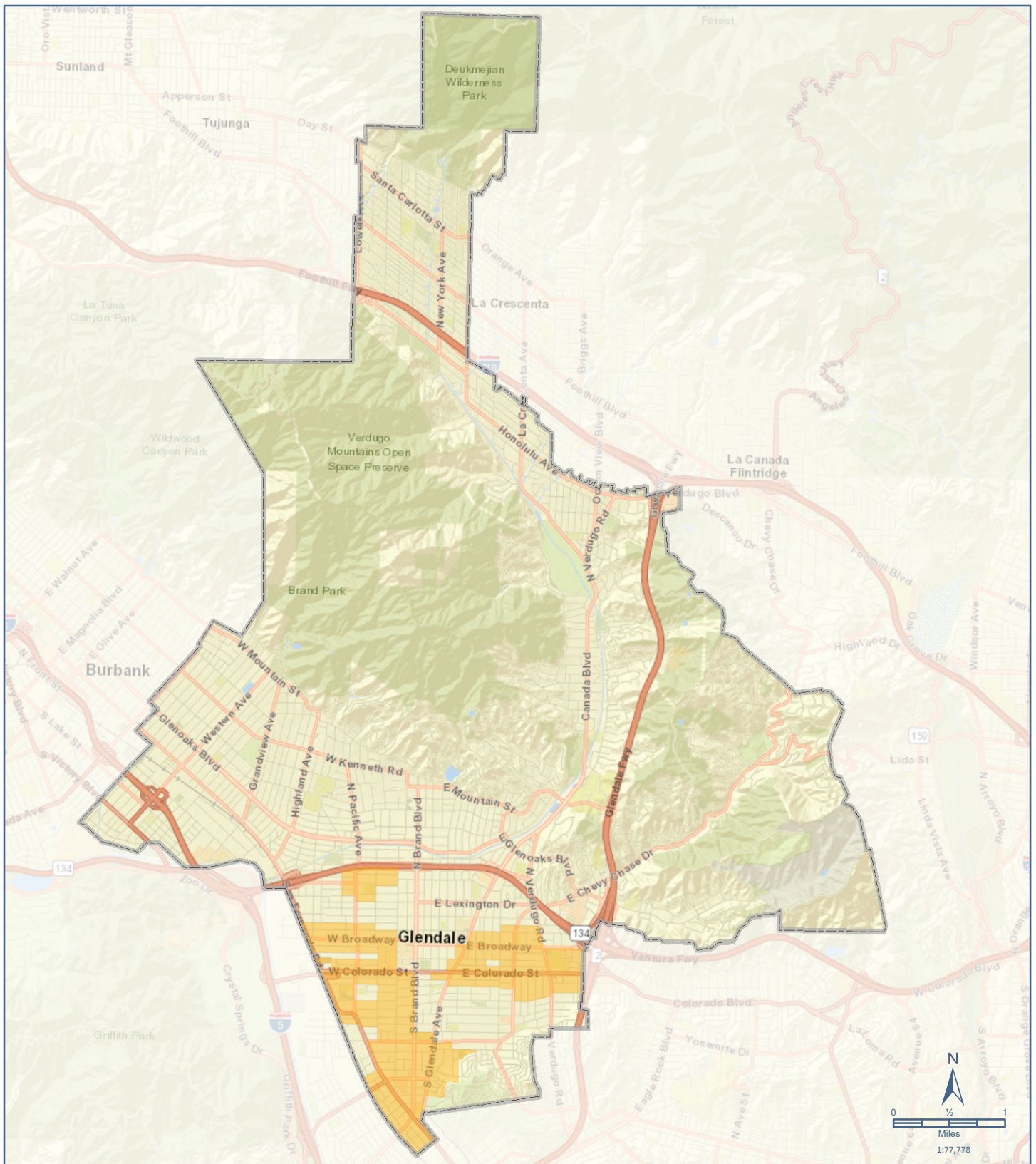


Areas with Measure PDT-1 (Limit Parking Supply)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions



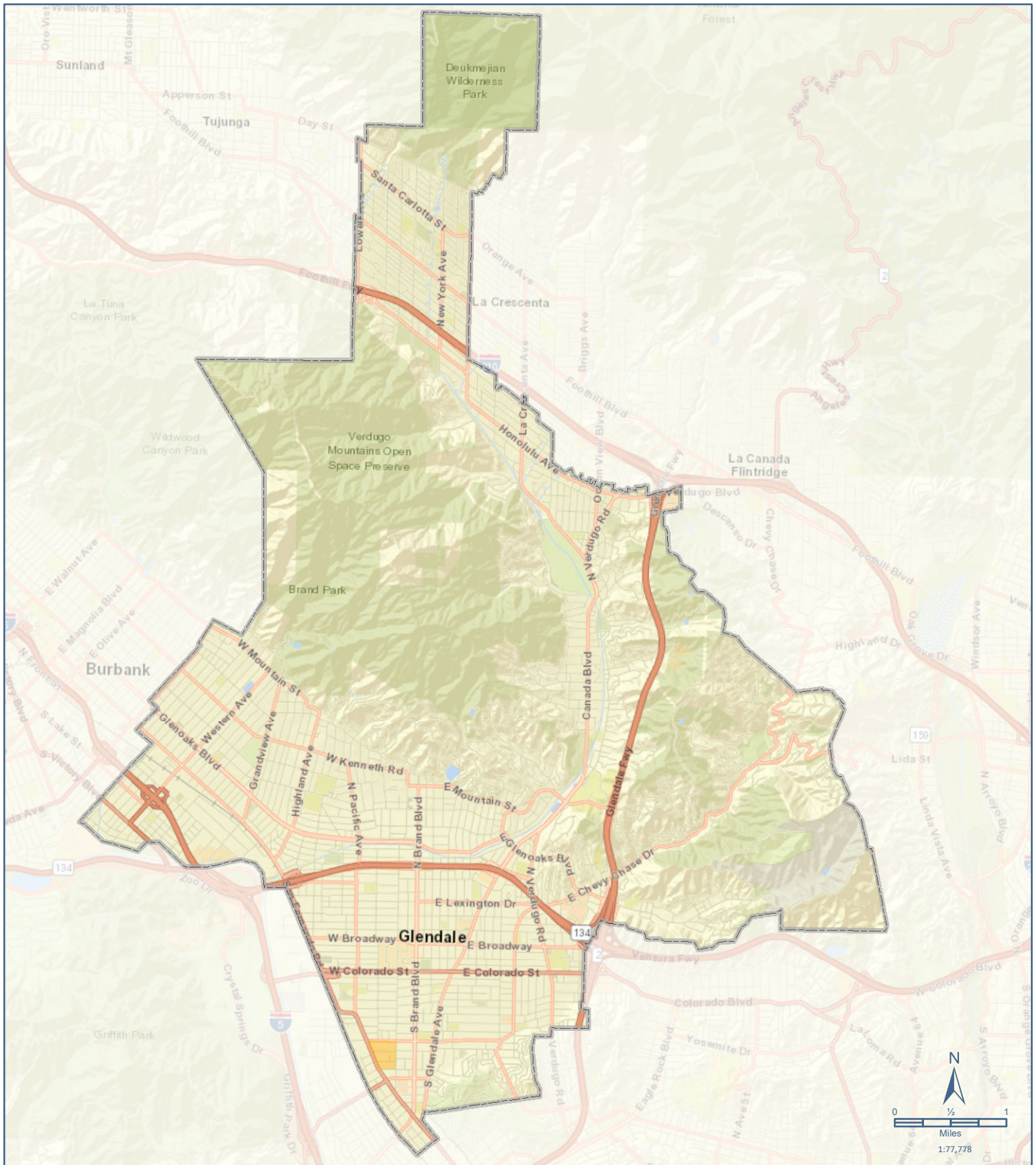


Areas with Measure PDT-3 (Market Price Public Parking)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions

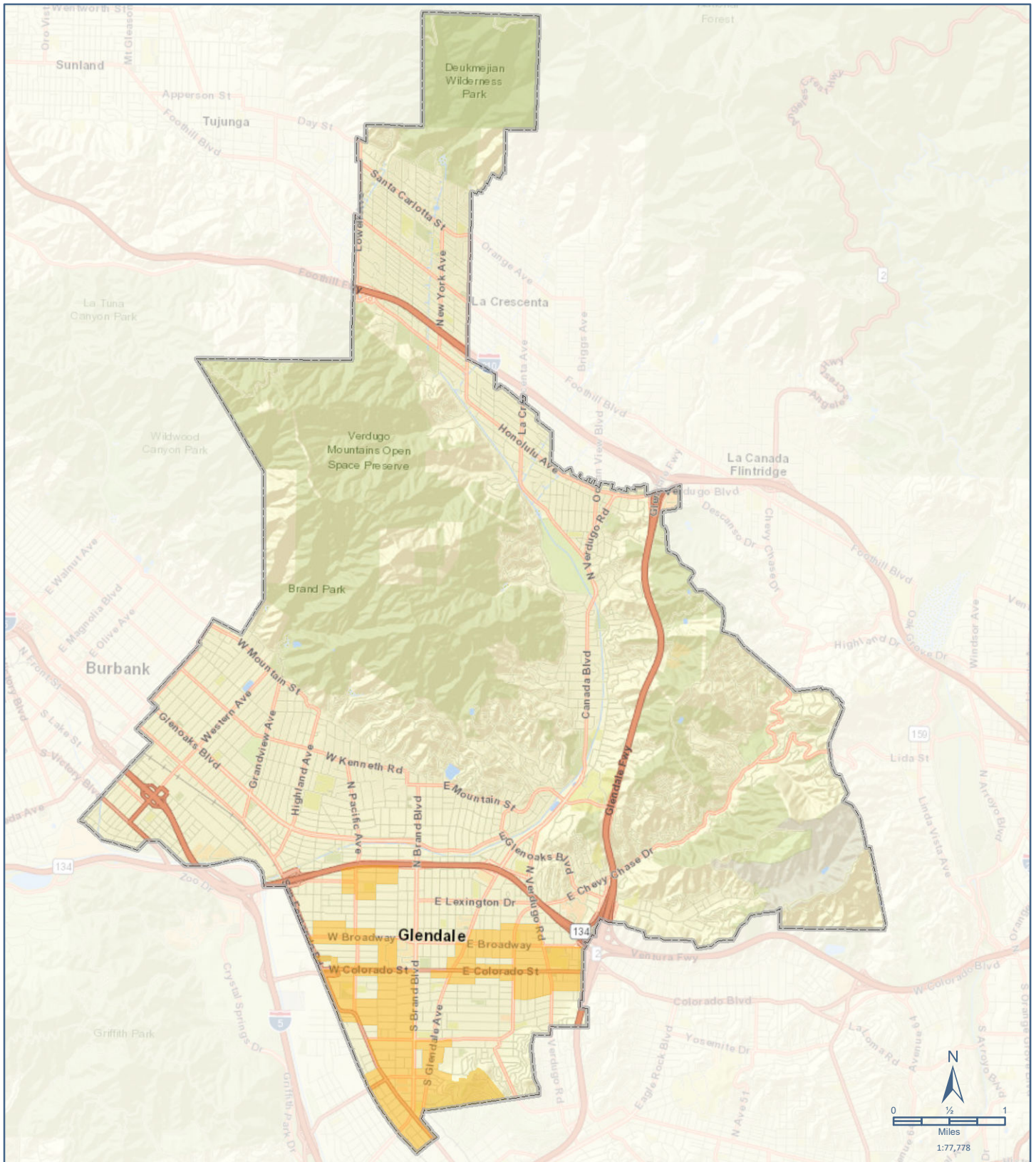




City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions



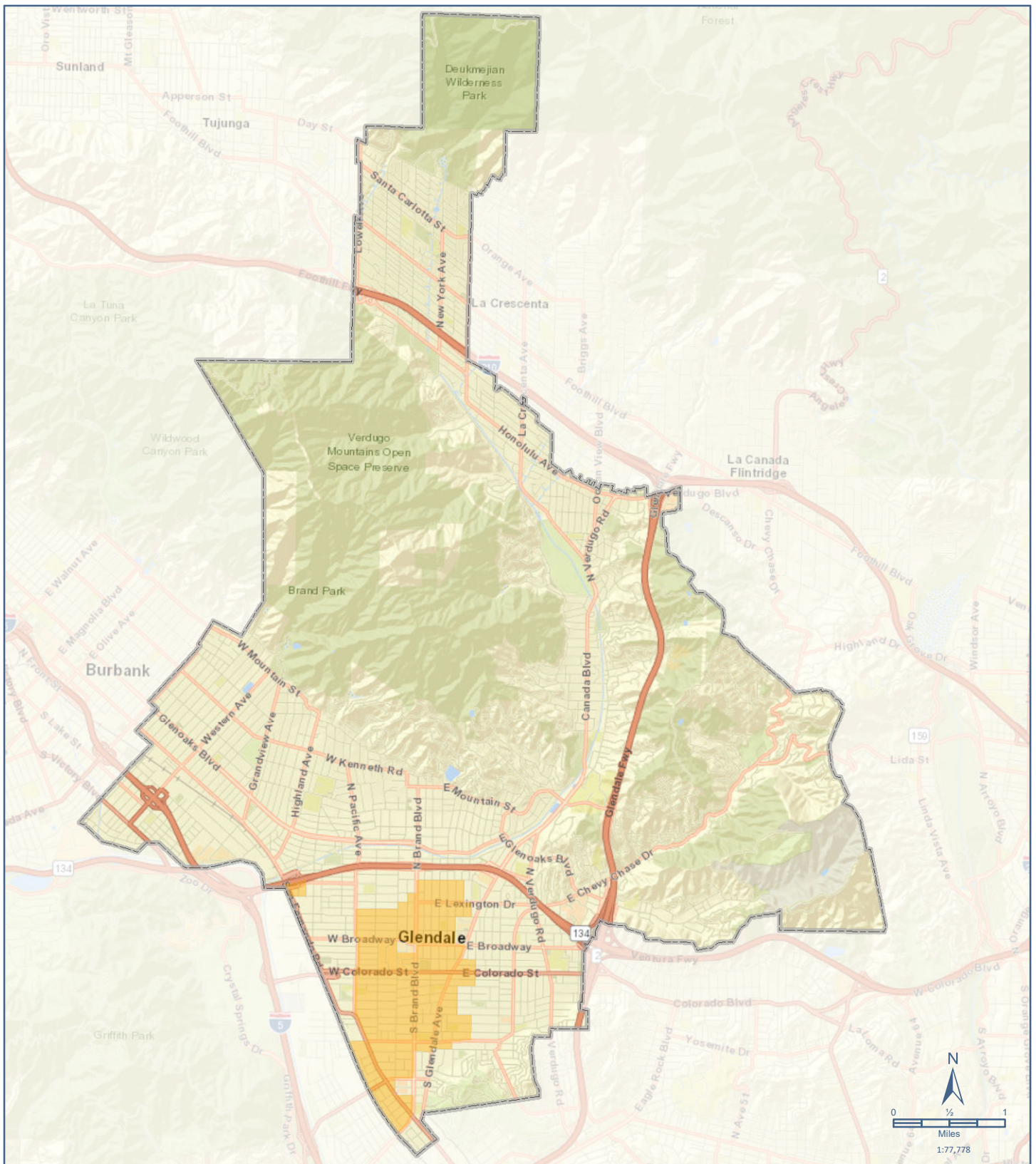


Areas with Measure TRT-9 (Implement Carsharing Program)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions



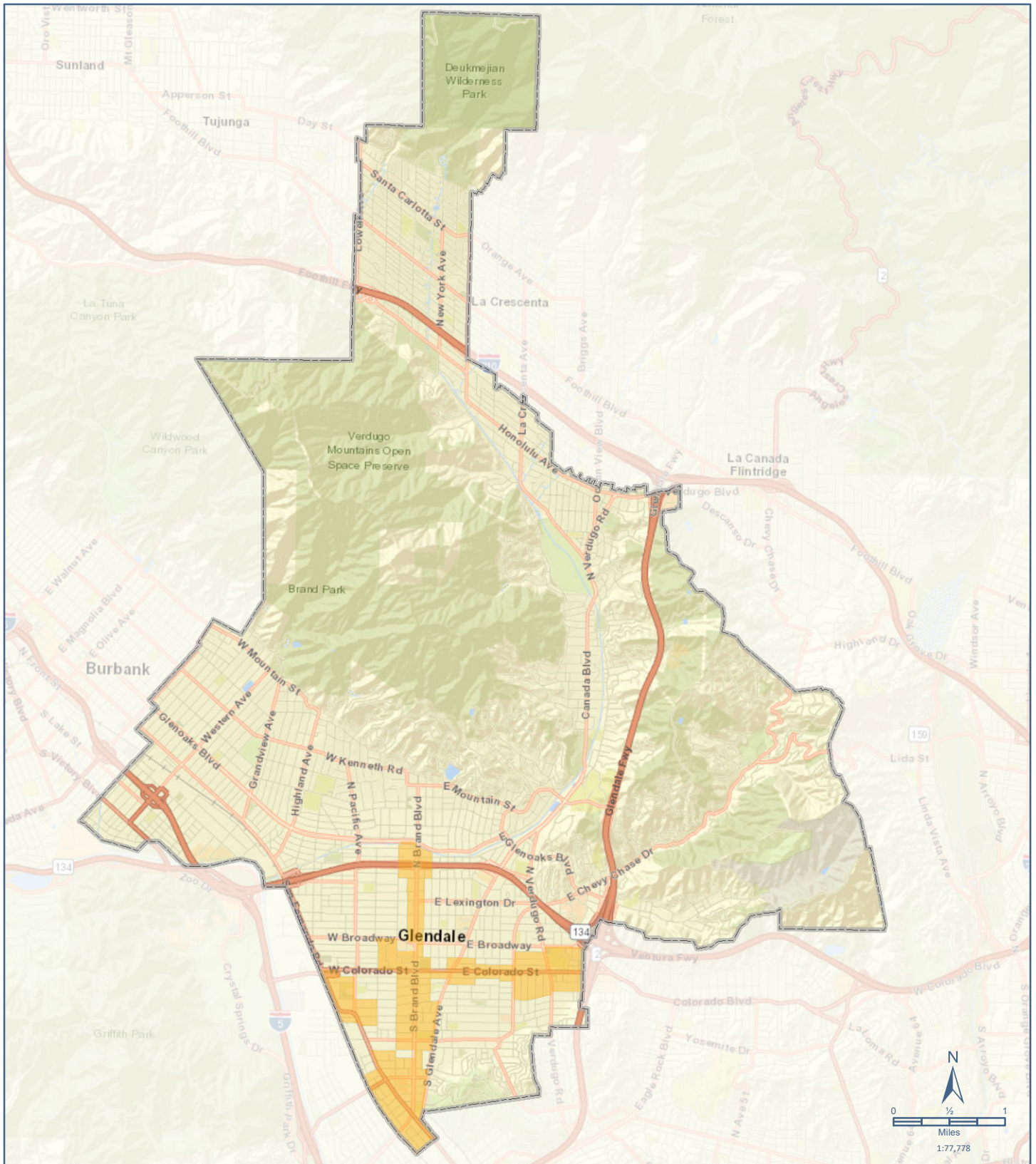


Areas with Measure TRT-12 (Implement Bikesharing Program)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions





Areas with Measure TST-4 (Increase Transit Service Frequency/Speed)

City of Glendale  
SB 743 Implementation

Cumulative Model  
TDM Assumptions

Attachment F: Transportation Project Types  
and VMT Analysis  
Requirements



**Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:**

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges.

**Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:**

- Rehabilitation, maintenance, replacement, safety, and repair projects designed to improve the condition of existing transportation assets (e.g., highways; roadways; bridges; culverts; Transportation Management System field elements such as cameras, message signs, detection, or signals; tunnels; transit systems; and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadside safety devices or hardware installation such as median barriers and guardrails
- Roadway shoulder enhancements to provide “breakdown space,” dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, two-way left turn lanes, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Installation of traffic metering systems, detection systems, cameras, changeable message signs and other electronics designed to optimize vehicle, bicycle, or pedestrian flow
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage
- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes, truck climbing lanes, or truck brake-check lanes in rural areas that do not increase overall vehicle capacity along the corridor