SCS BACKGROUND DOCUMENTATION APPENDIX

REGIONAL TRANSPORTATION PLAN
2012–2035
SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future
RTP

Southern California Association of Governments

ADOPTED APRIL 2012

SCS BACKGROUND DOCUMENTATION

A. Overall Land Use Pattern Maps

Given the number of square miles the SCAG region encompasses, SCAG developed a simplified series of Community Types to represent the dominant themes taken from the region's many General Plans. This was developed in order to facilitate regional modeling of land use information from nearly 200 distinct jurisdictions.

The Community Types employed in the RTP/SCS are not intended to represent detailed land use policies, but are used to describe the general conditions likely to occur within a specific area if recently emerging trends, such as transit-oriented development, were to continue in concert with the implementation of the 2012–2035 RTP/SCS. These land use maps are shown by county and subregion.

EXHIBIT 1 Land Use Pattern Map – SCAG Region 2008

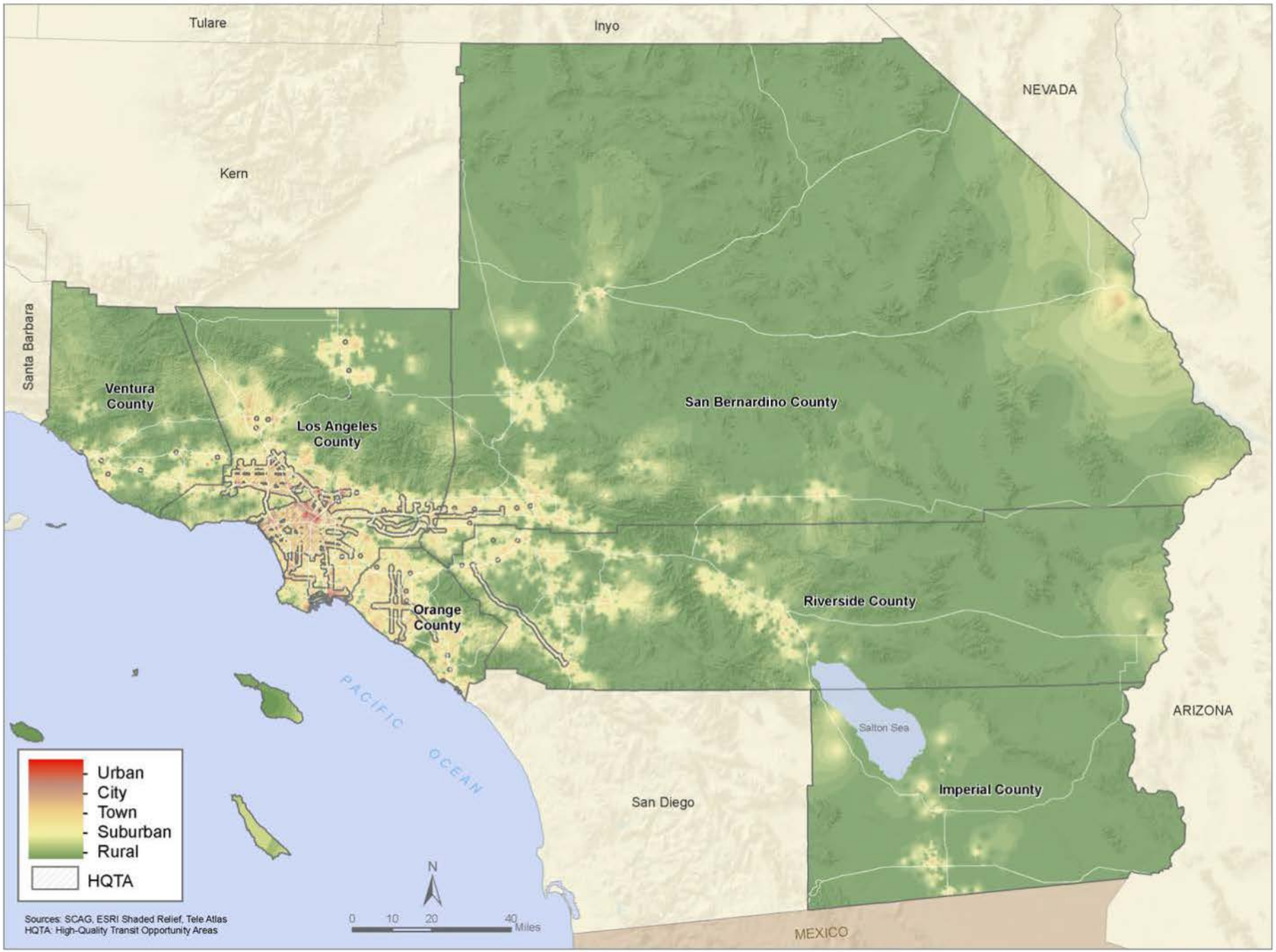


EXHIBIT 2 Land Use Pattern Map – SCAG Region 2020

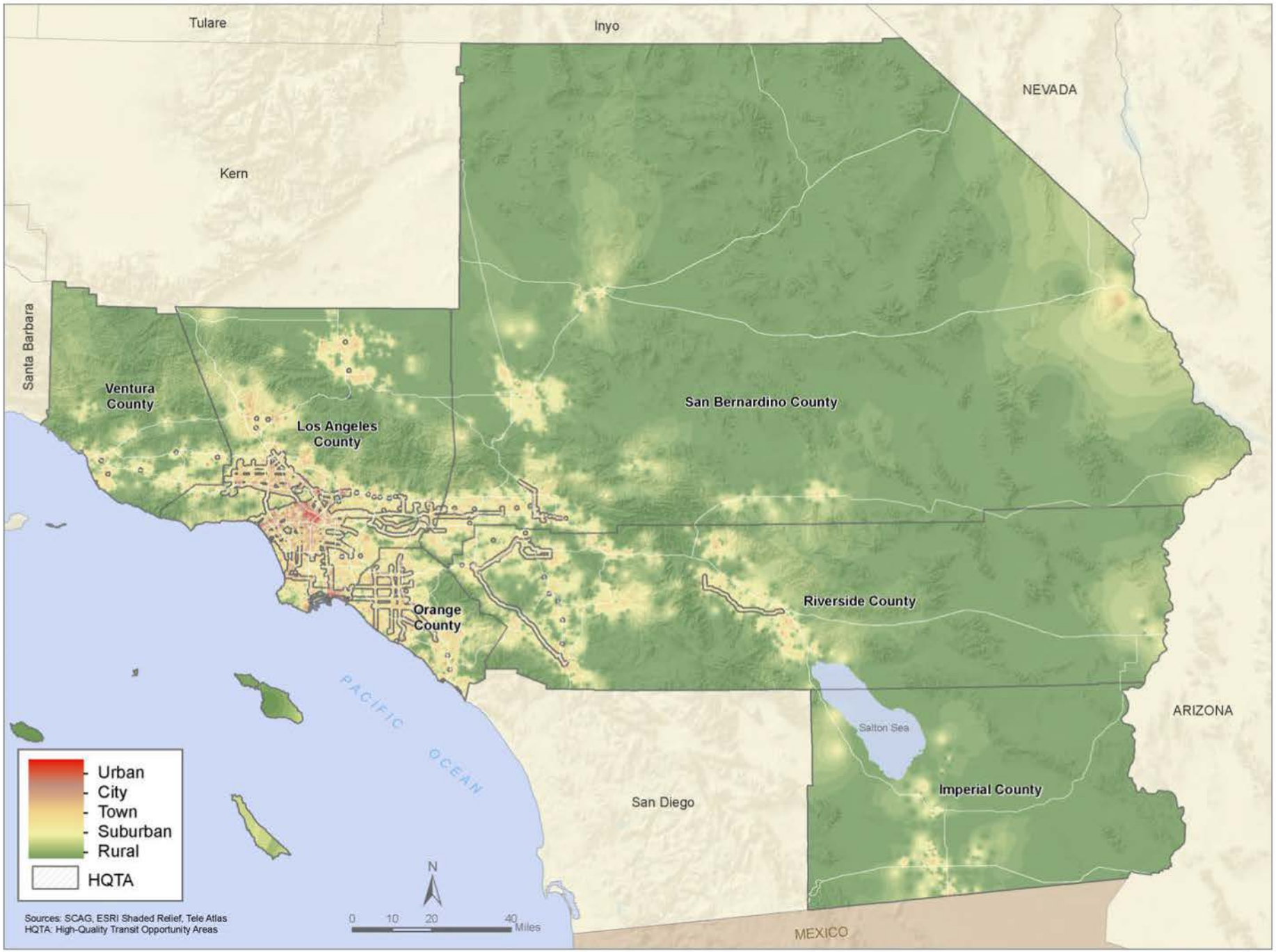


EXHIBIT 3 Land Use Pattern Map – SCAG Region 2035

EXHIBIT 4 Land Use Pattern Map – Imperial County 2008

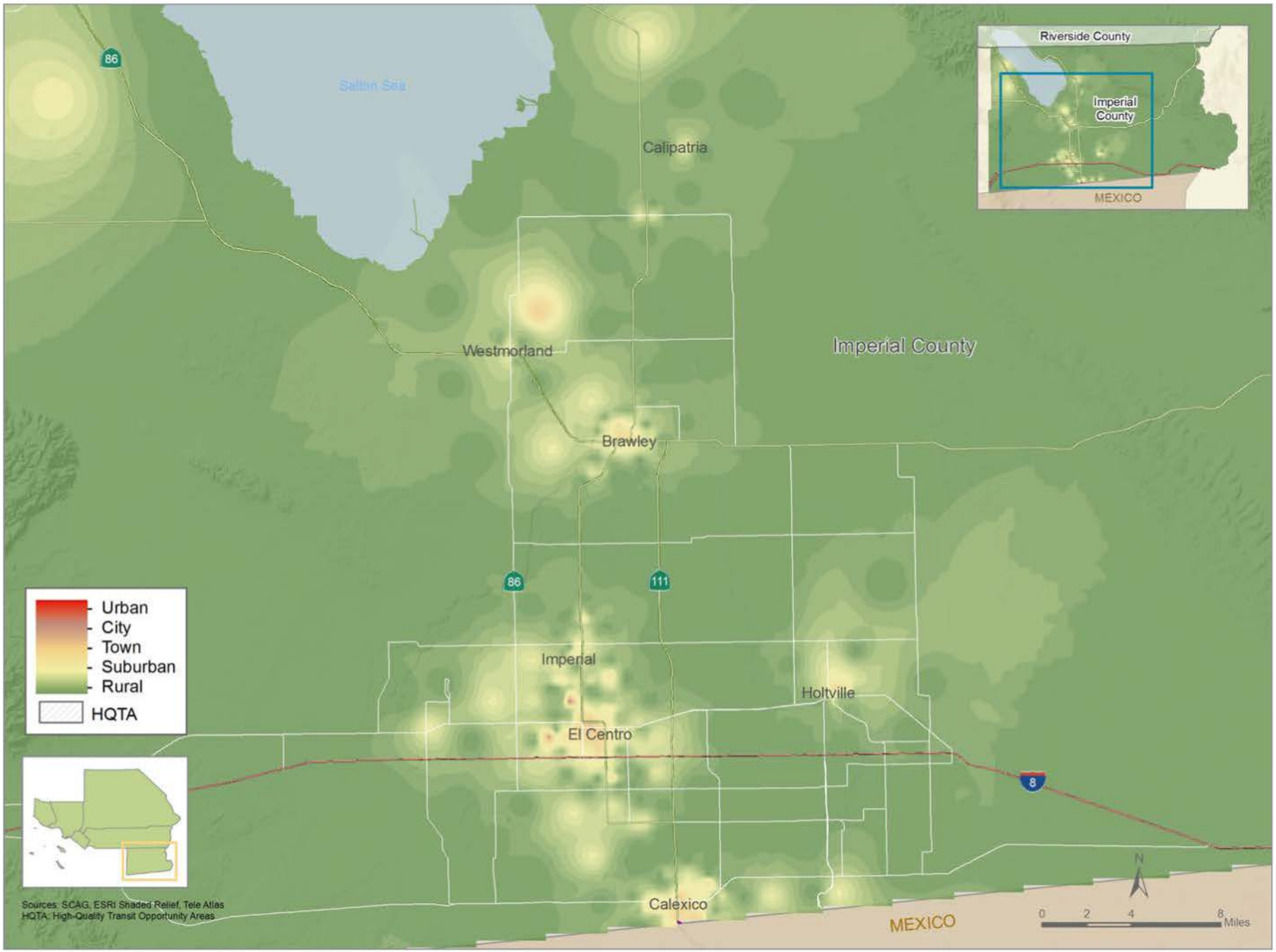


EXHIBIT 5 Land Use Pattern Map – Imperial County 2020

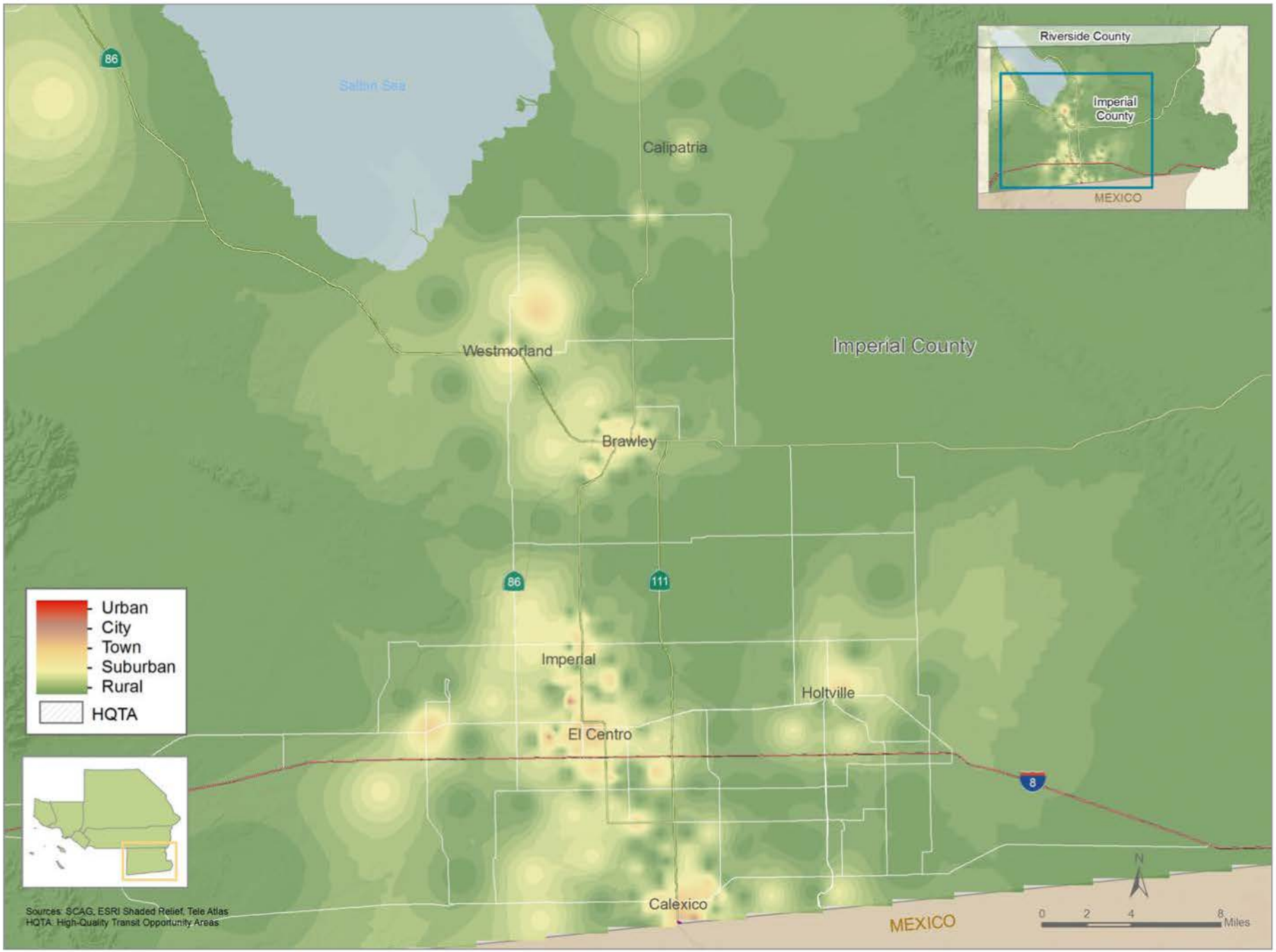


EXHIBIT 6 Land Use Pattern Map – Imperial County 2035

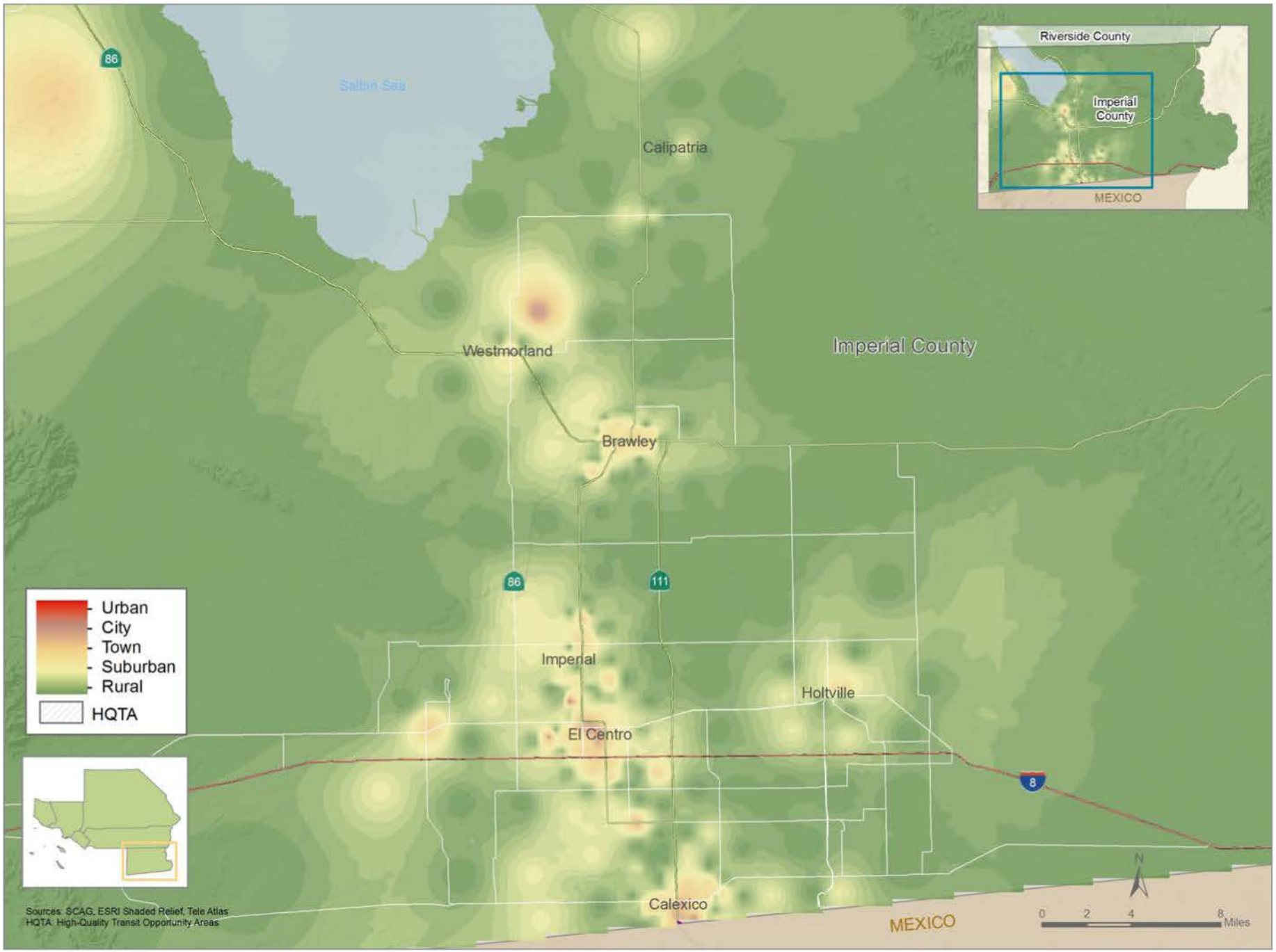


EXHIBIT 7 Land Use Pattern Map – Los Angeles County 2008

EXHIBIT 8 Land Use Pattern Map – Los Angeles County 2020

EXHIBIT 9 Land Use Pattern Map – Los Angeles County 2035

EXHIBIT 10 Land Use Pattern Map – Arroyo Verdugo 2008

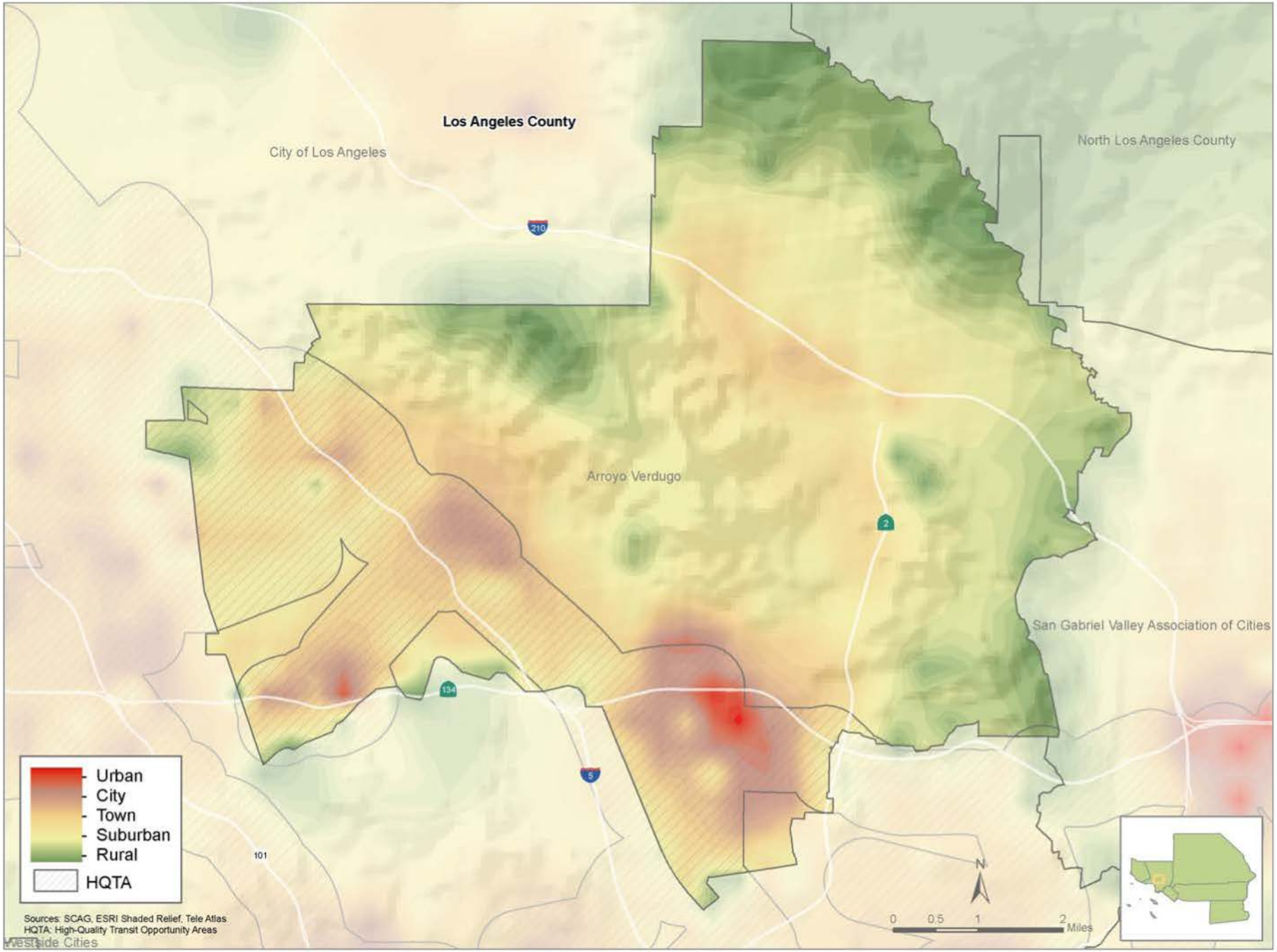


EXHIBIT 11 Land Use Pattern Map – Arroyo Verdugo 2020

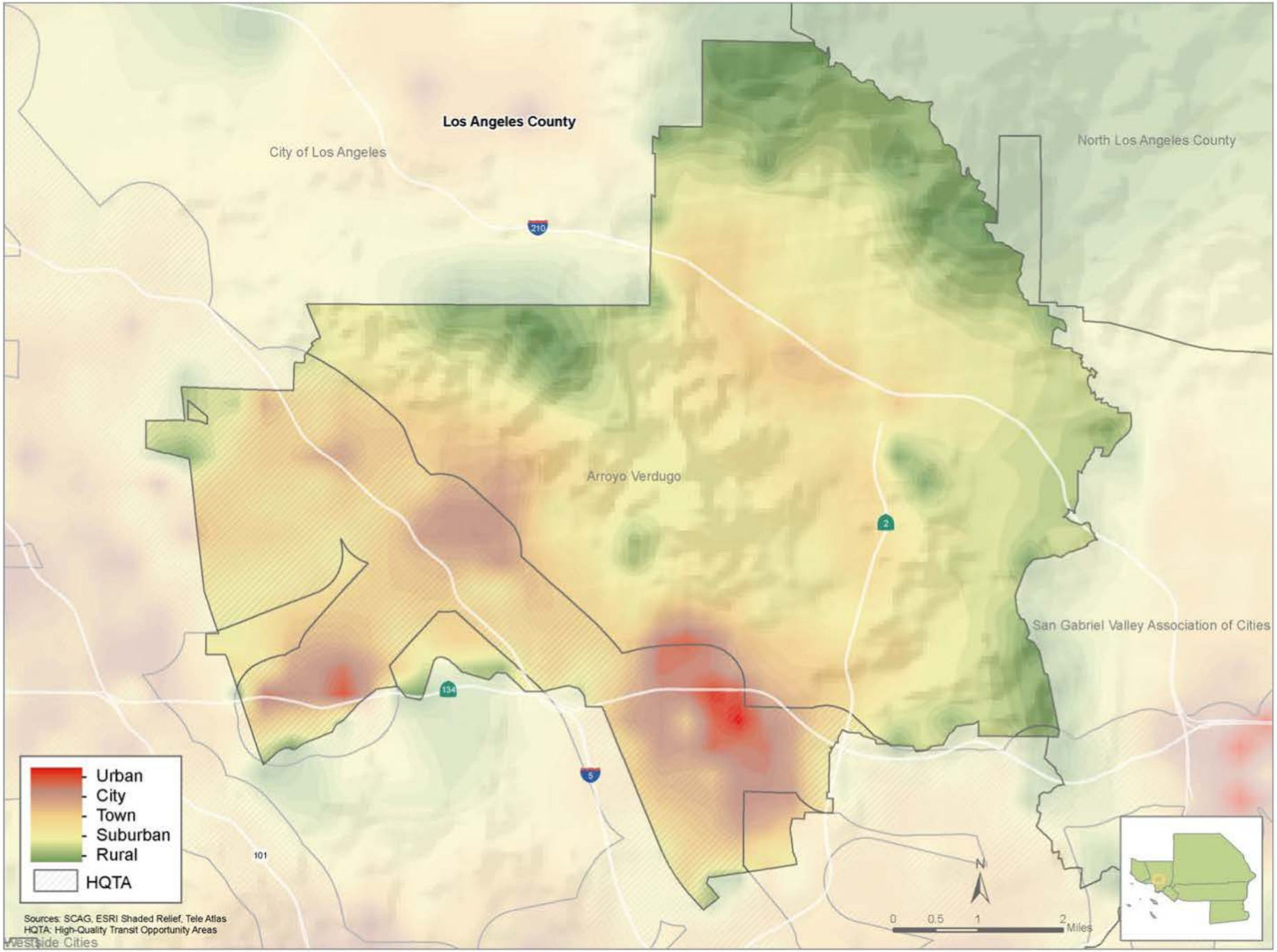


EXHIBIT 12 Land Use Pattern Map – Arroyo Verdugo 2035

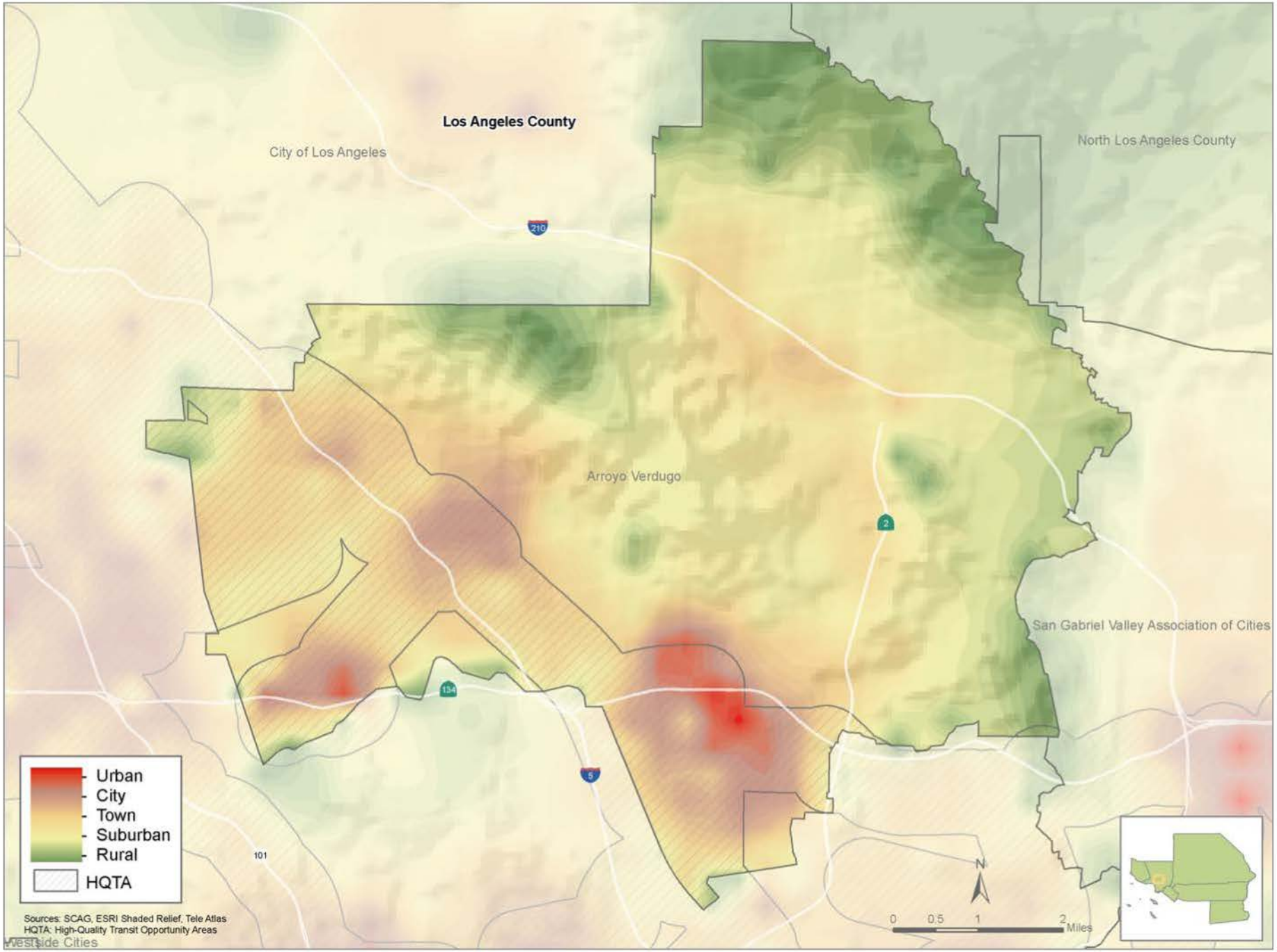


EXHIBIT 13 Land Use Pattern Map – Gateway Cities 2008

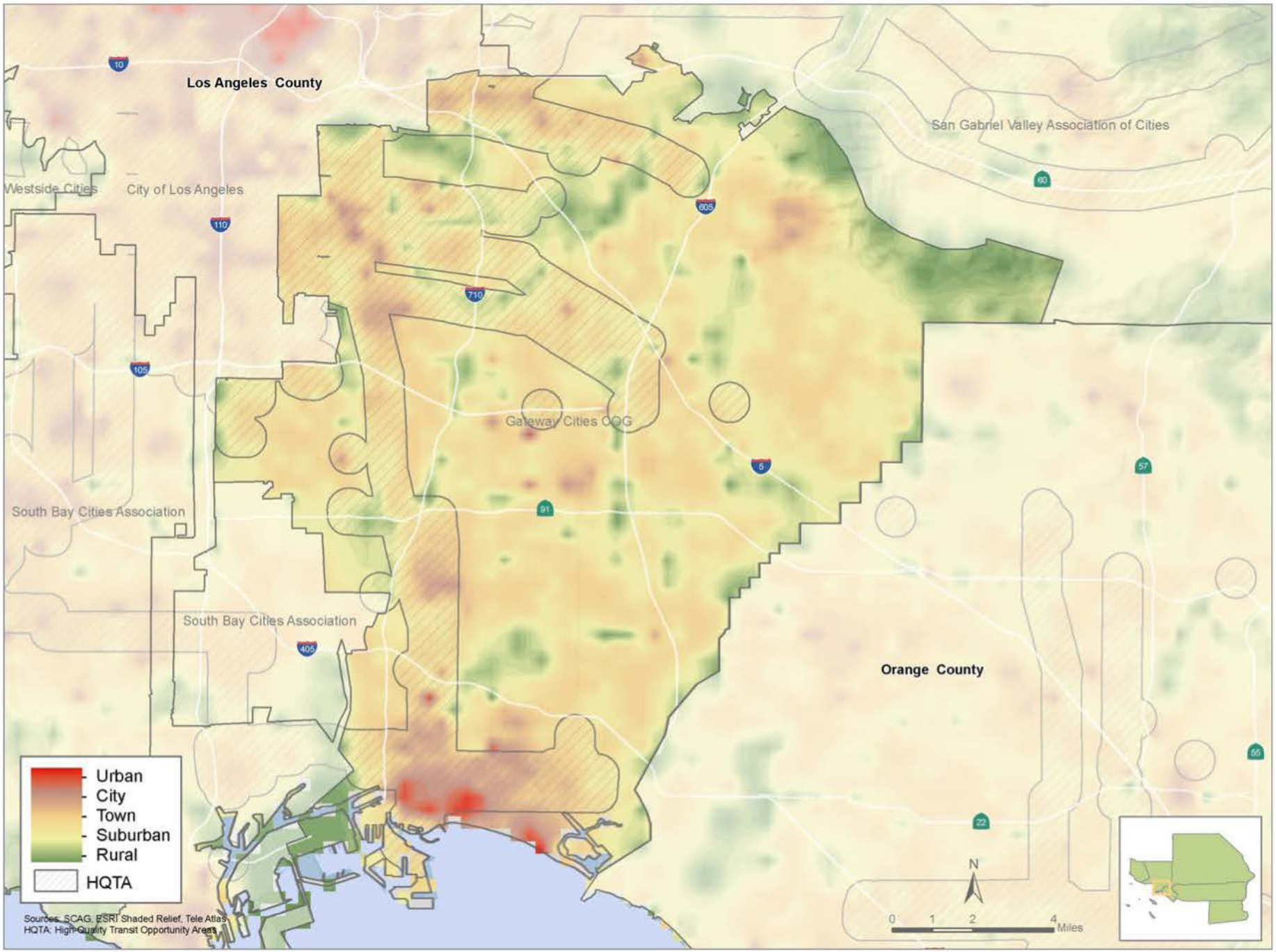


EXHIBIT 14 Land Use Pattern Map – Gateway Cities 2020

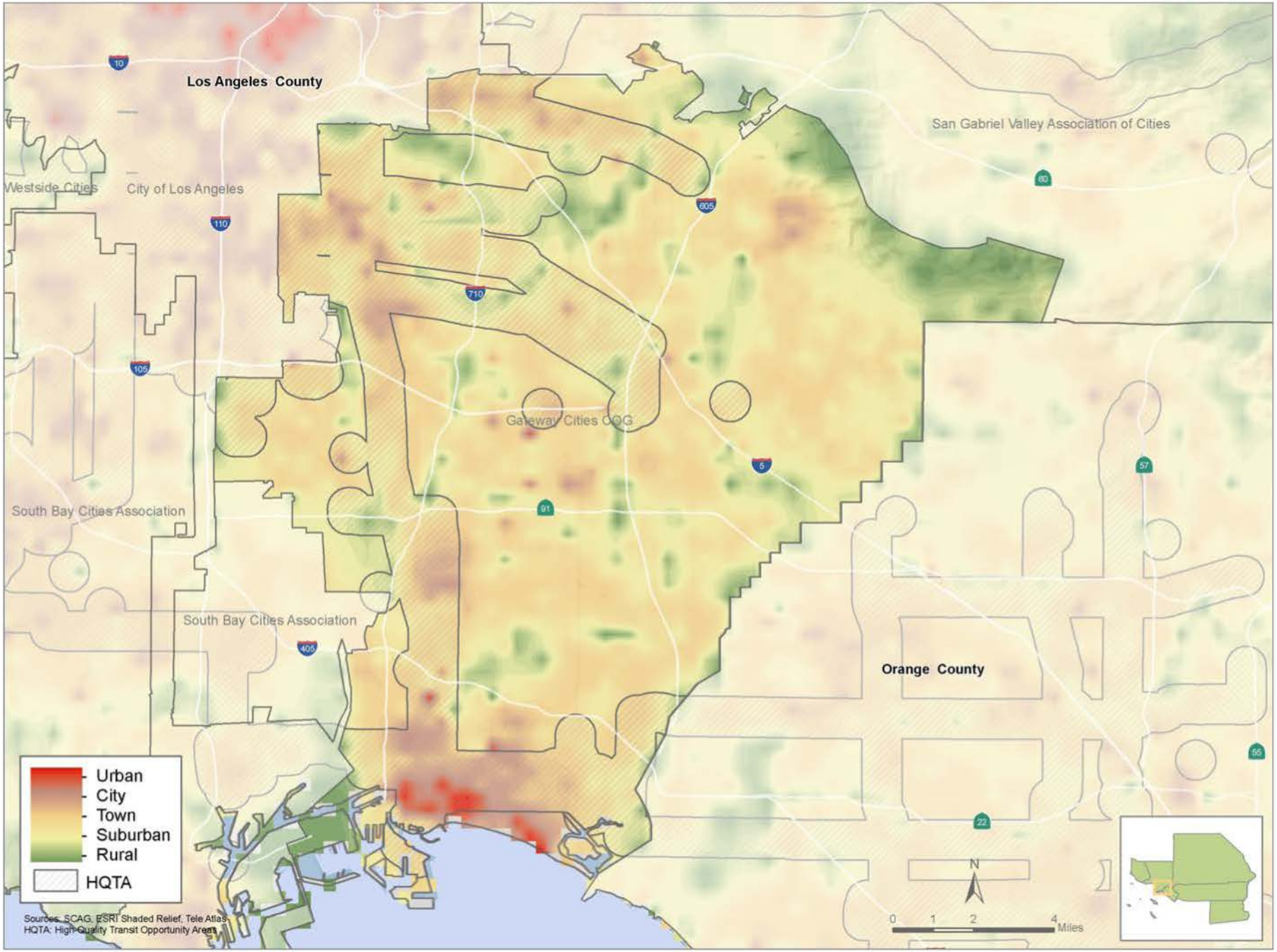


EXHIBIT 15 Land Use Pattern Map – Gateway Cities 2035

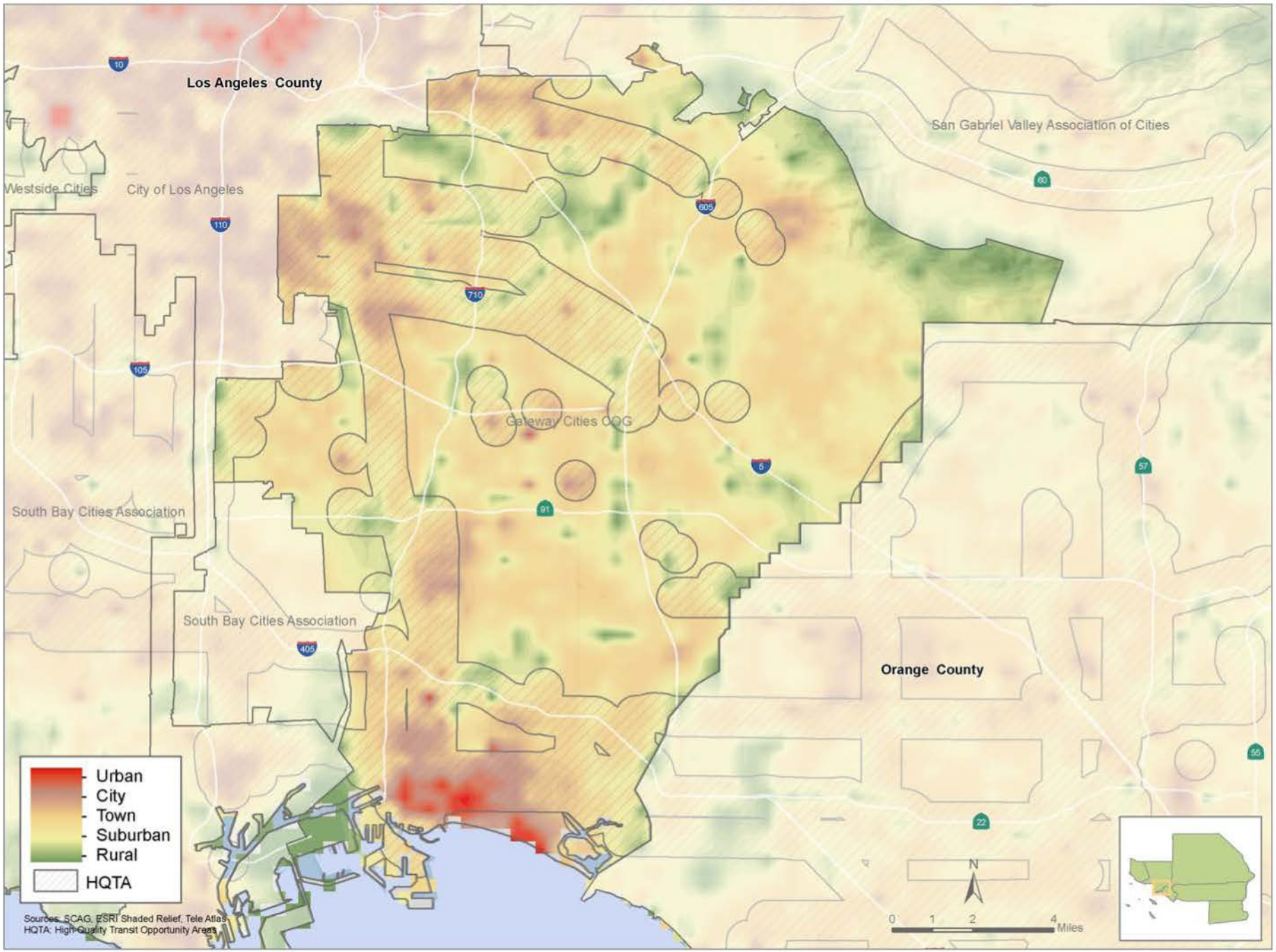


EXHIBIT 16 Land Use Pattern Map – Las Virgenes – Malibu 2008

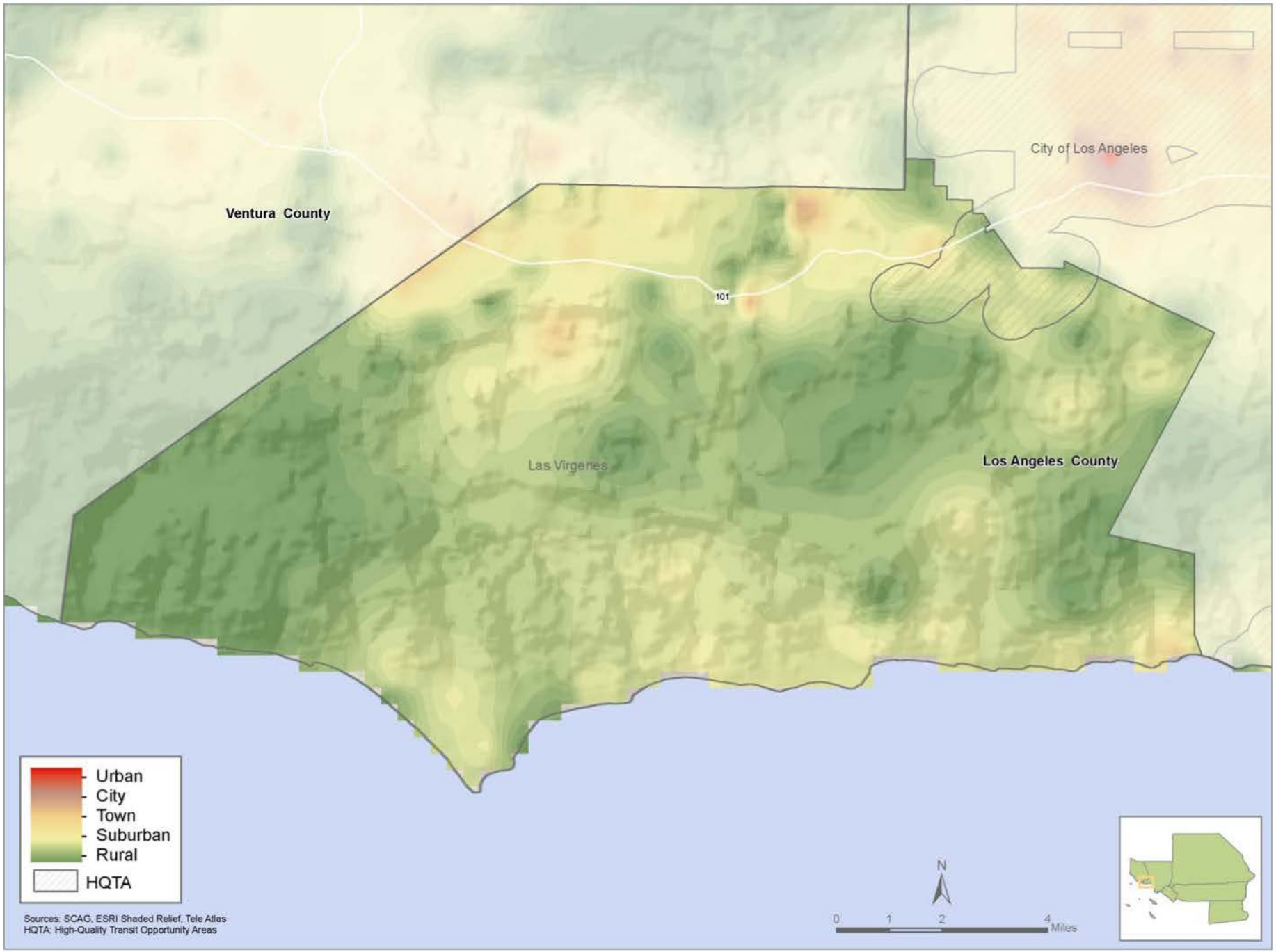


EXHIBIT 17 Land Use Pattern Map – Las Virgenes – Malibu 2020

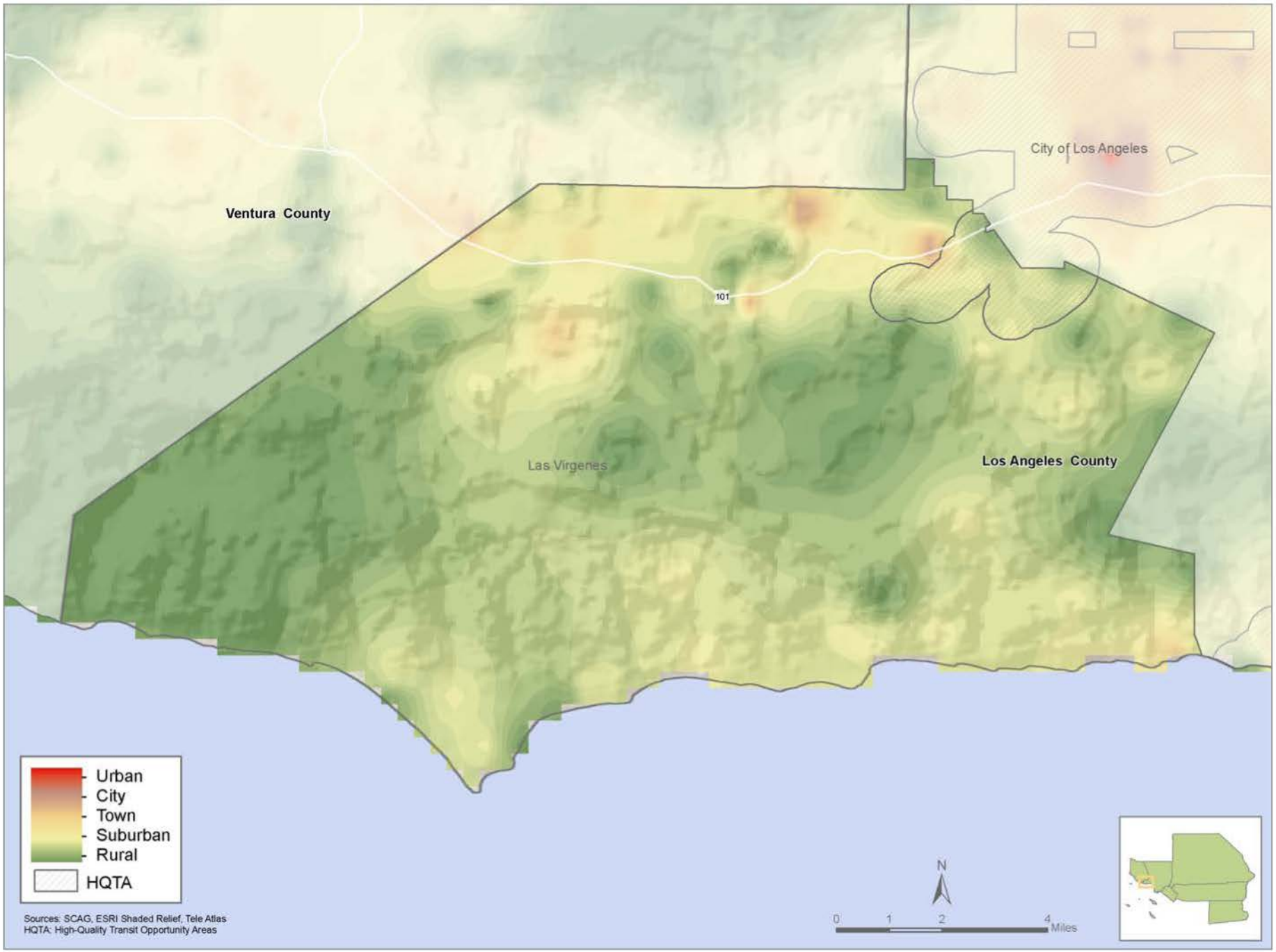


EXHIBIT 18 Land Use Pattern Map – Las Virgenes – Malibu 2035

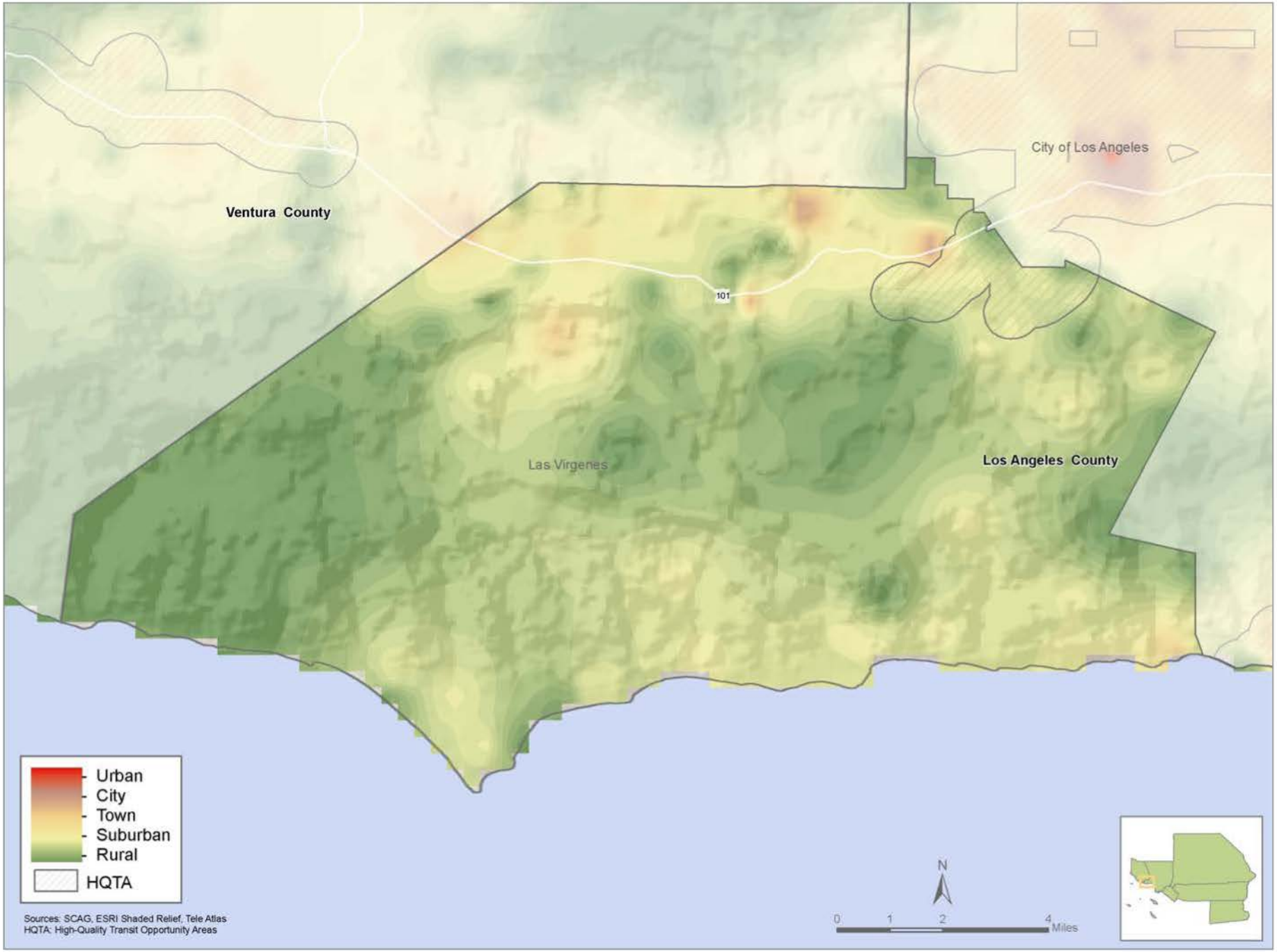


EXHIBIT 19 Land Use Pattern Map – City of Los Angeles 2008

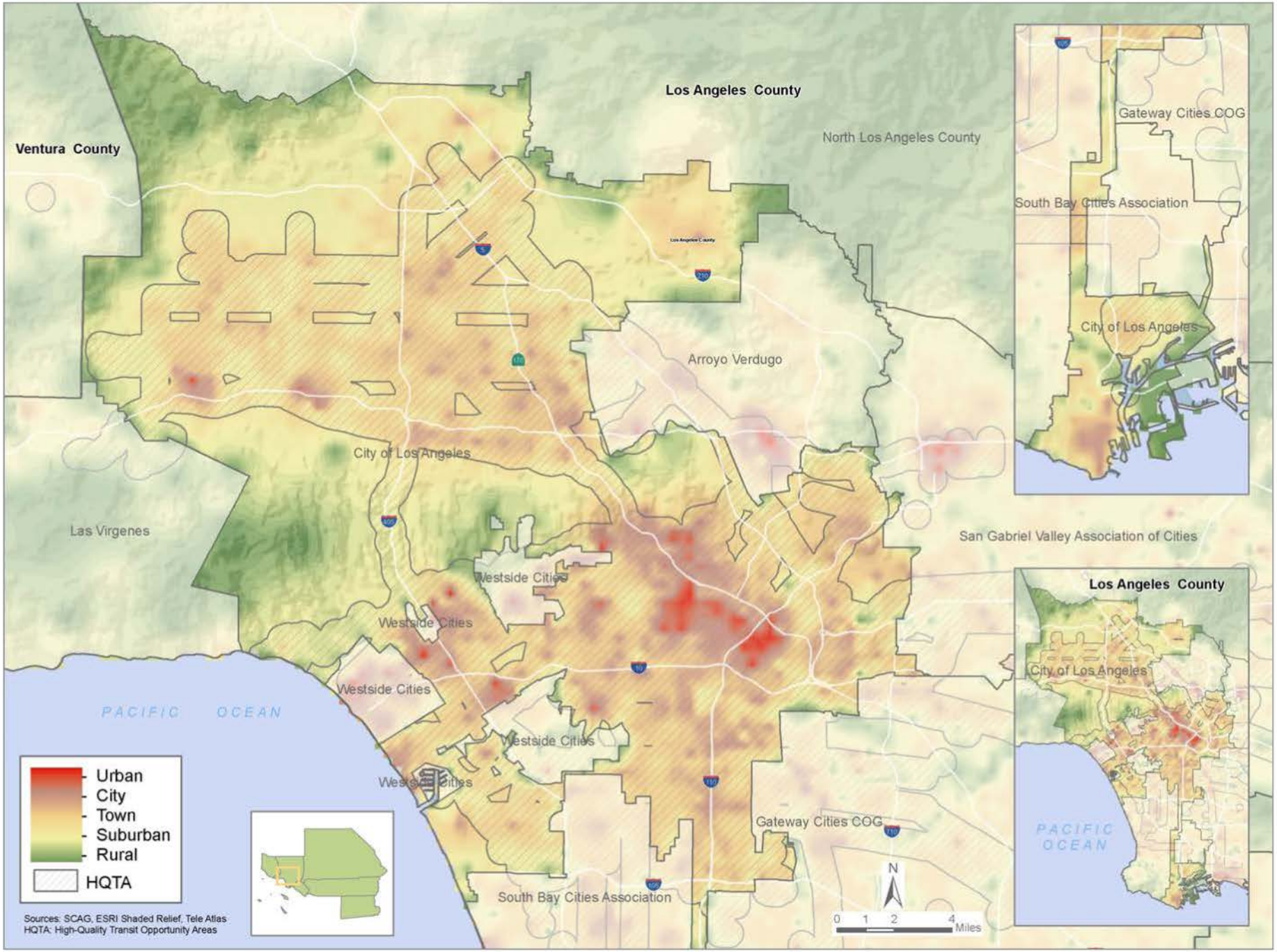


EXHIBIT 20 Land Use Pattern Map – City of Los Angeles 2020

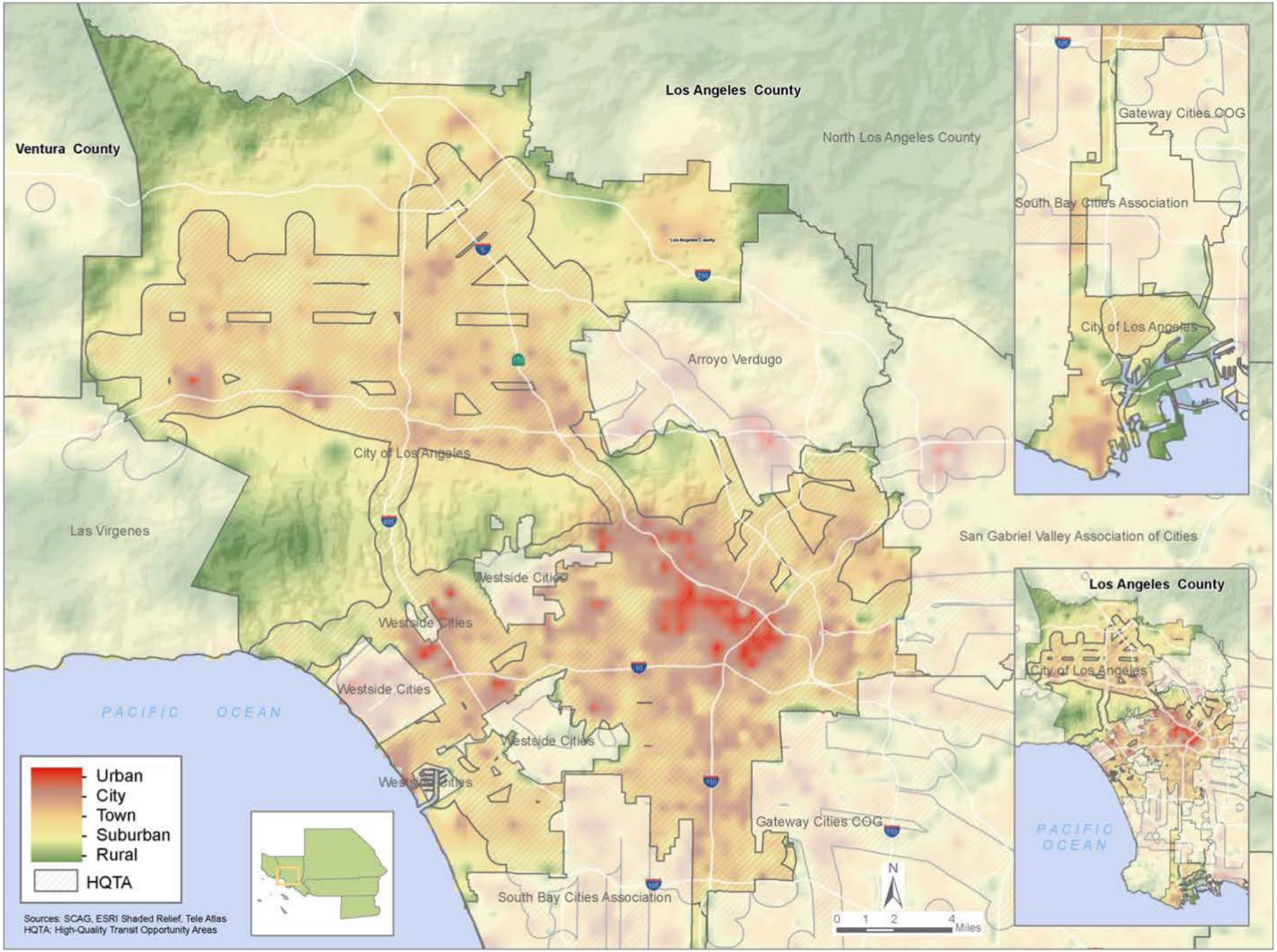


EXHIBIT 21 Land Use Pattern Map – City of Los Angeles 2035

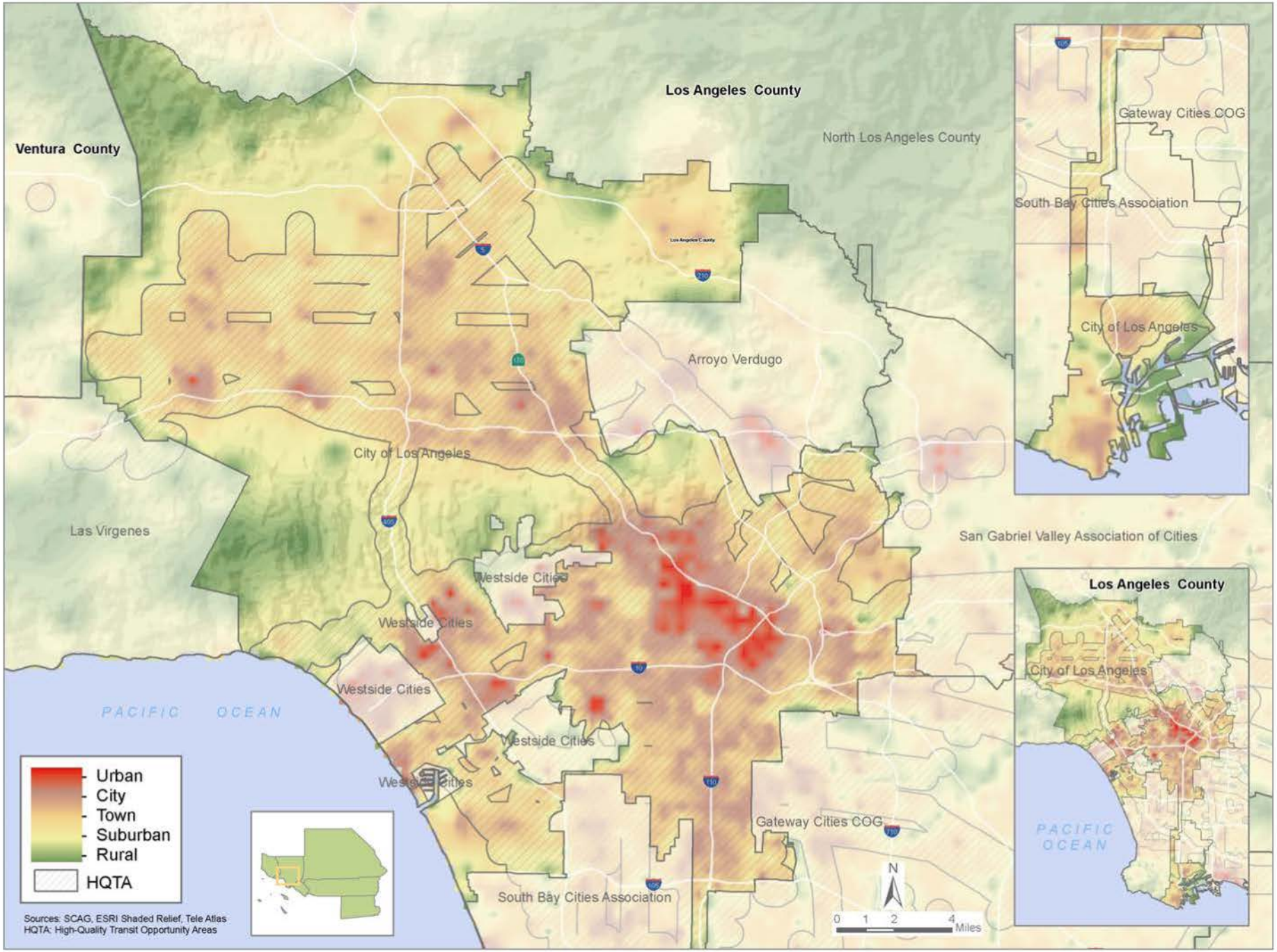


EXHIBIT 22 Land Use Pattern Map – North Los Angeles 2008

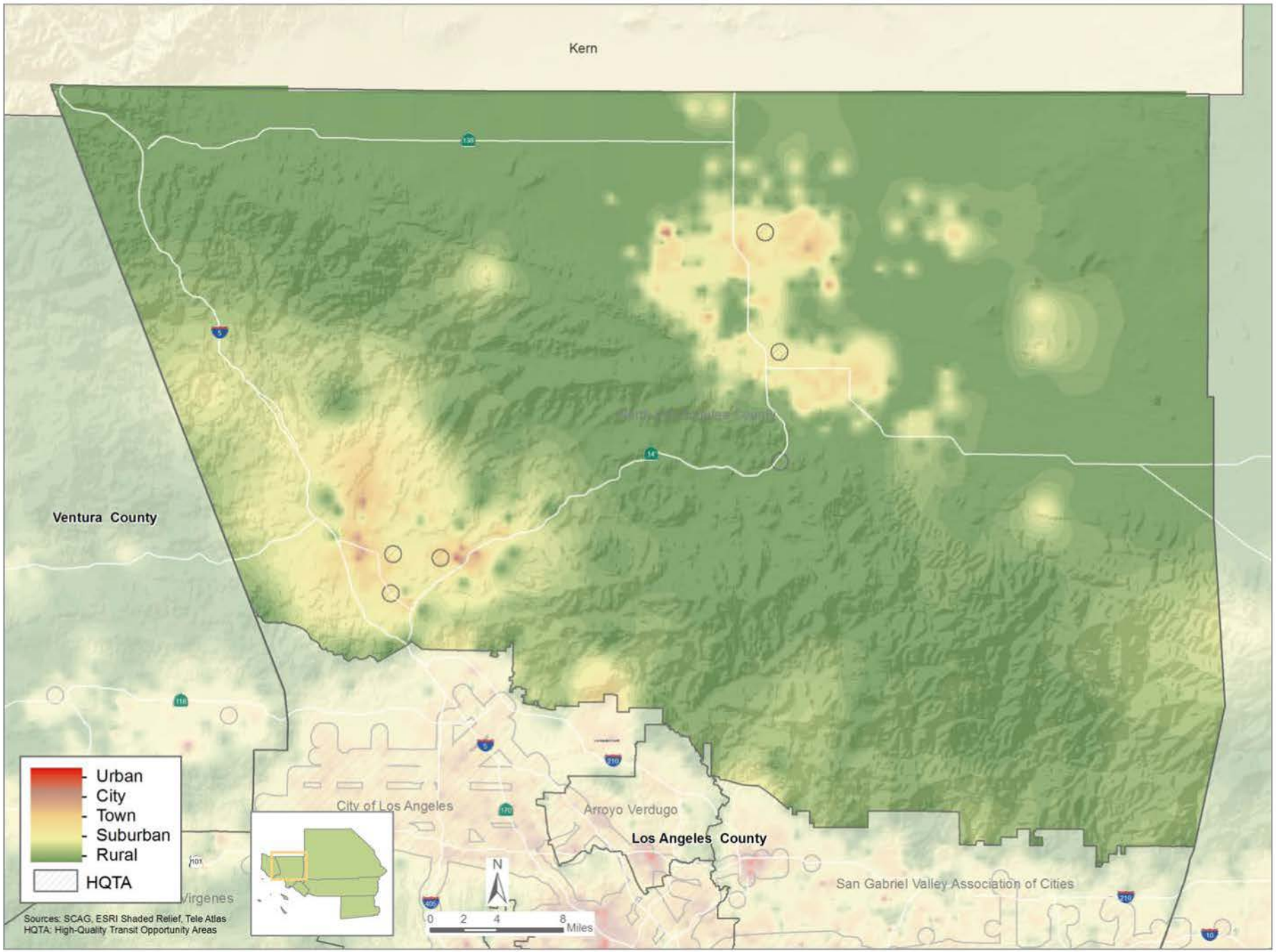


EXHIBIT 23 Land Use Pattern Map – North Los Angeles 2020

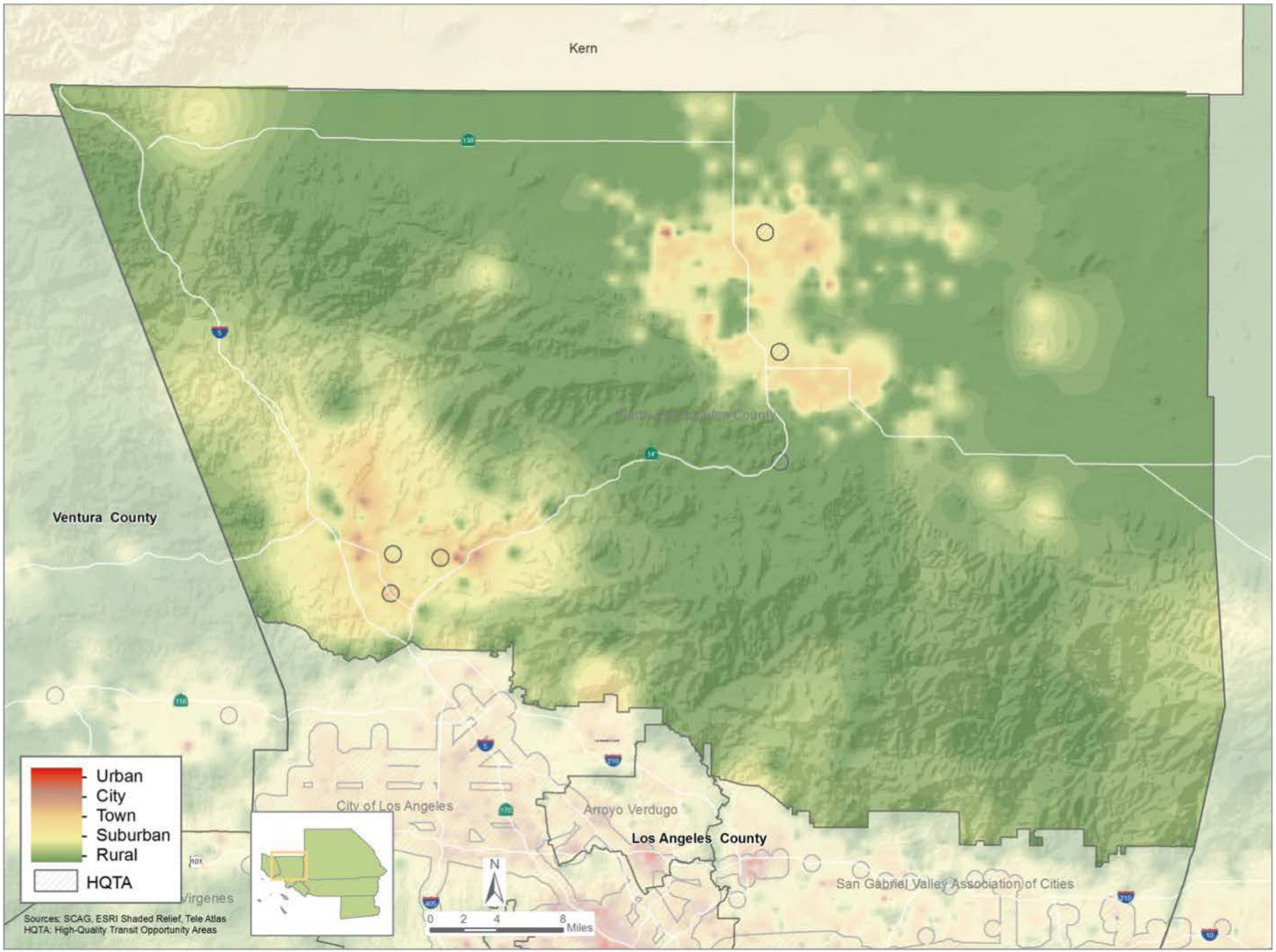


EXHIBIT 24 Land Use Pattern Map – North Los Angeles 2035

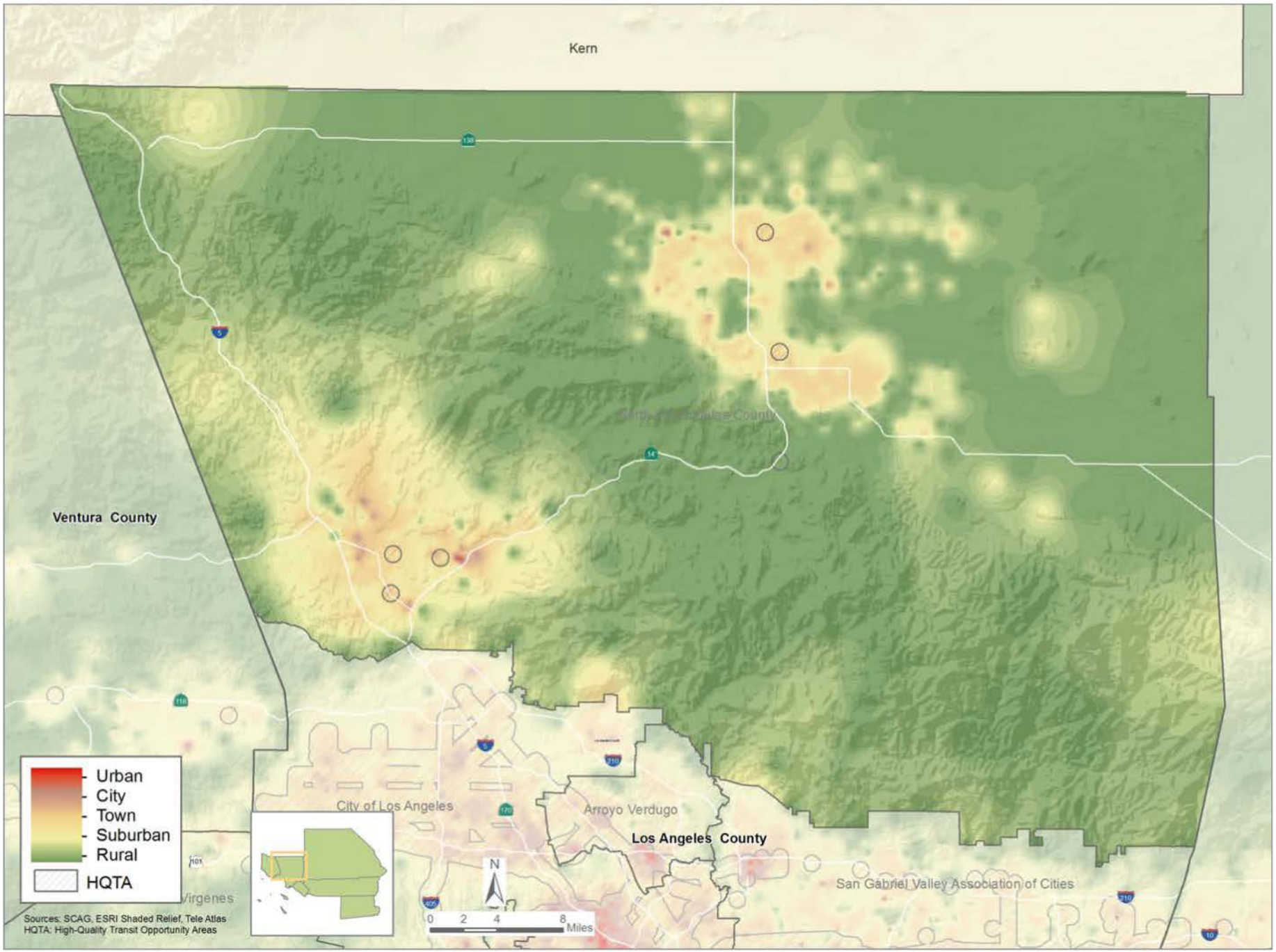


EXHIBIT 25 Land Use Pattern Map – San Gabriel Valley 2008

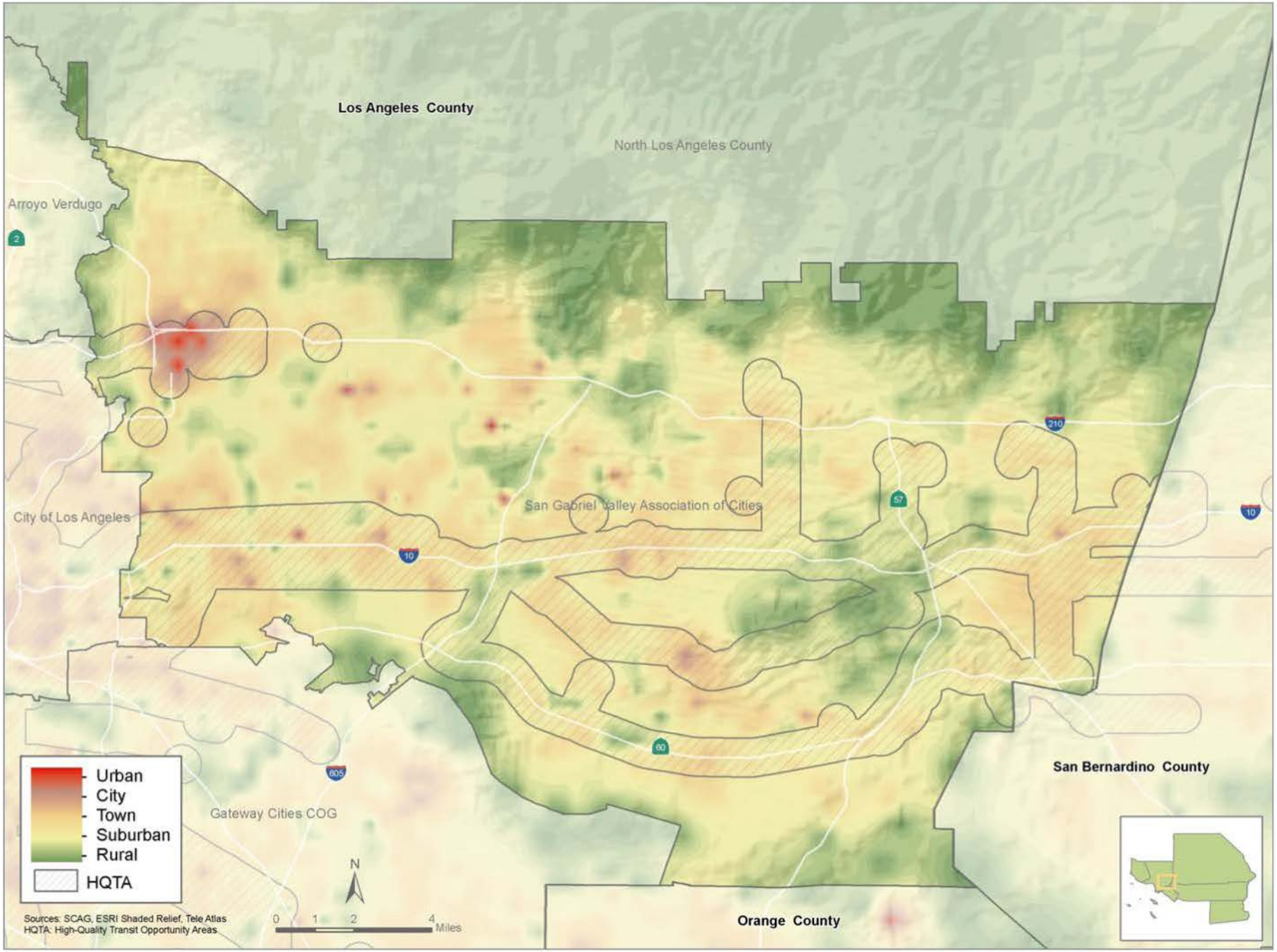


EXHIBIT 26 Land Use Pattern Map – San Gabriel Valley 2020

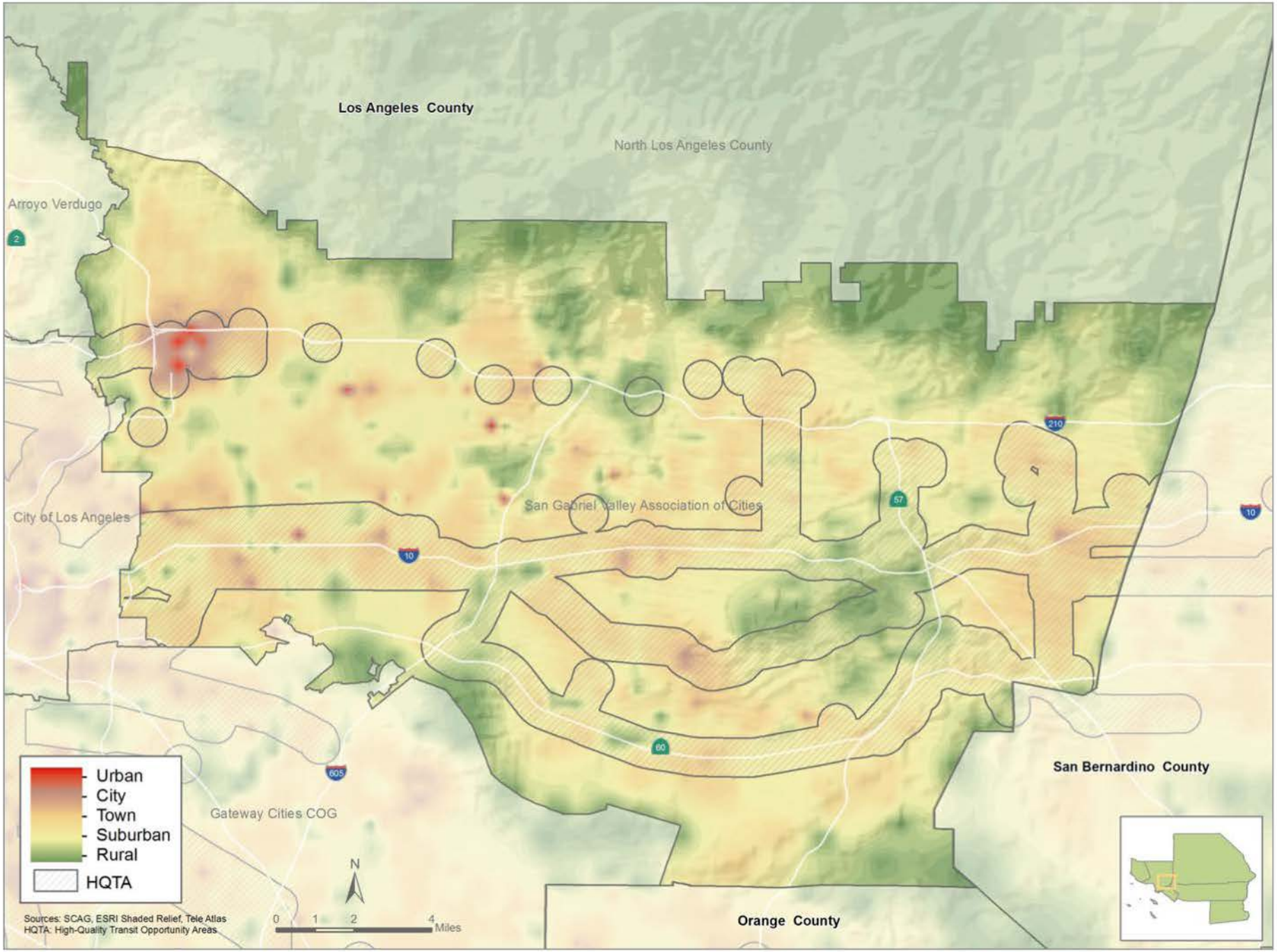


EXHIBIT 27 Land Use Pattern Map – San Gabriel Valley 2035

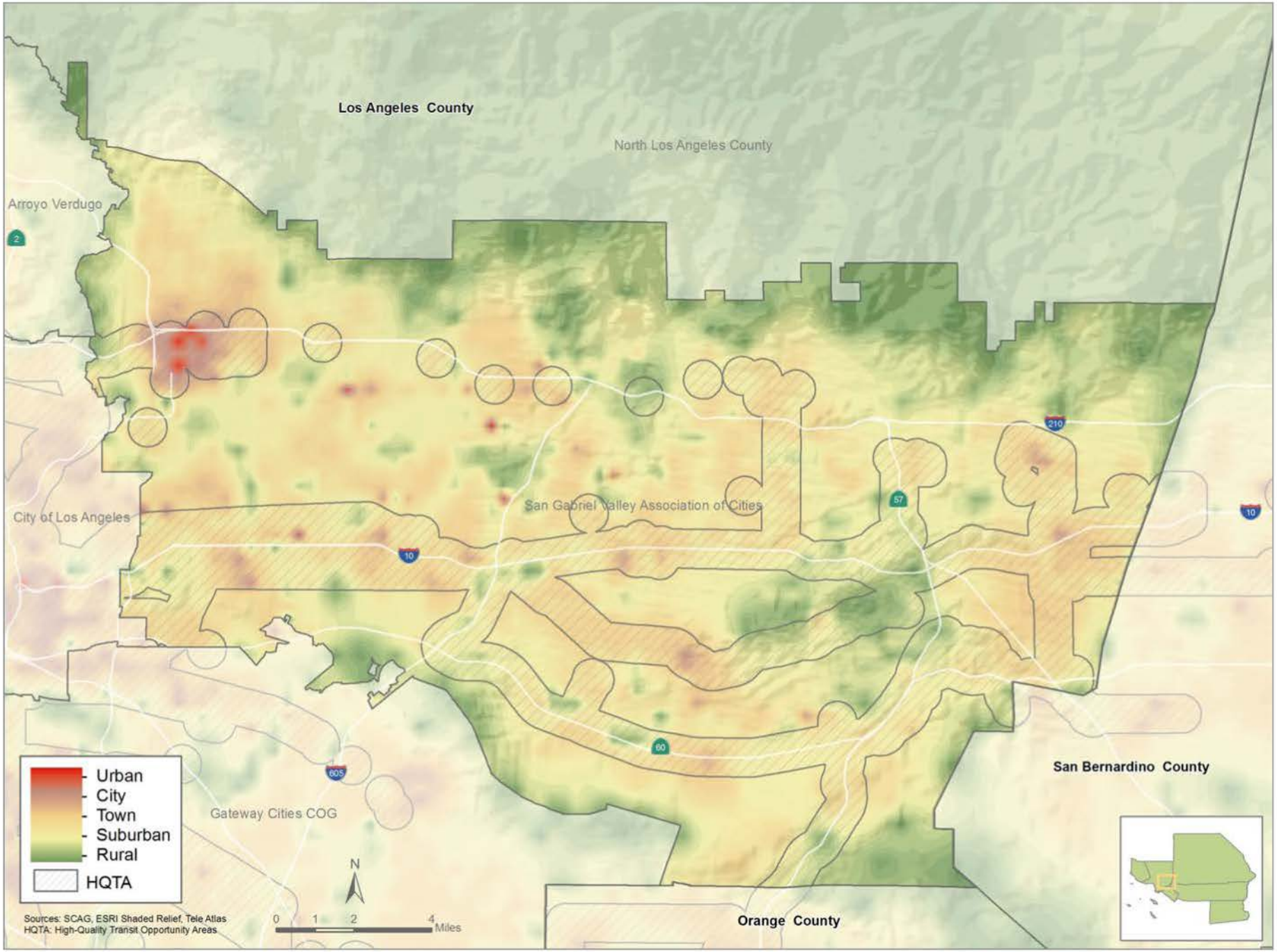


EXHIBIT 28 Land Use Pattern Map – South Bay Cities 2008

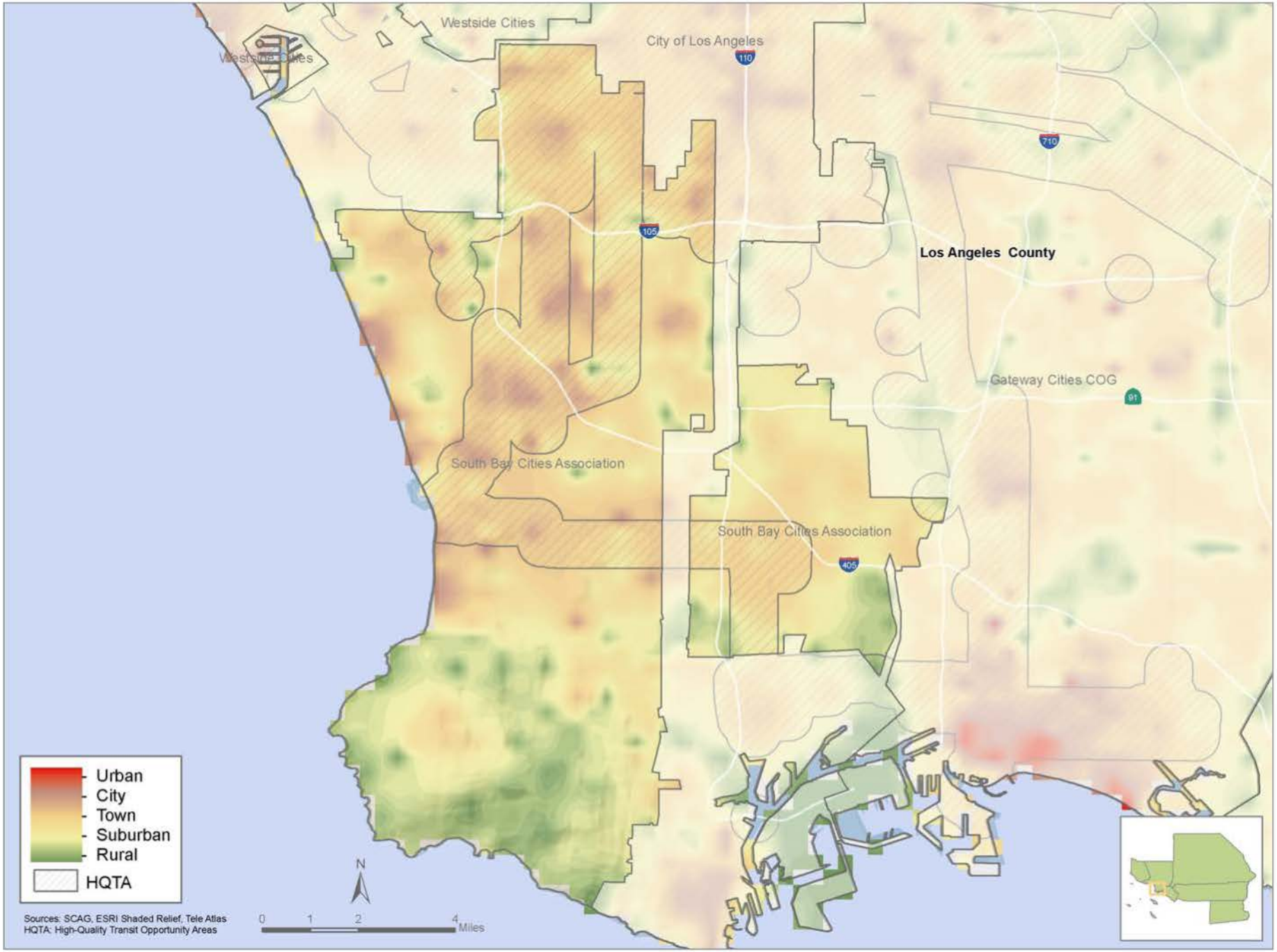


EXHIBIT 29 Land Use Pattern Map – South Bay Cities 2020

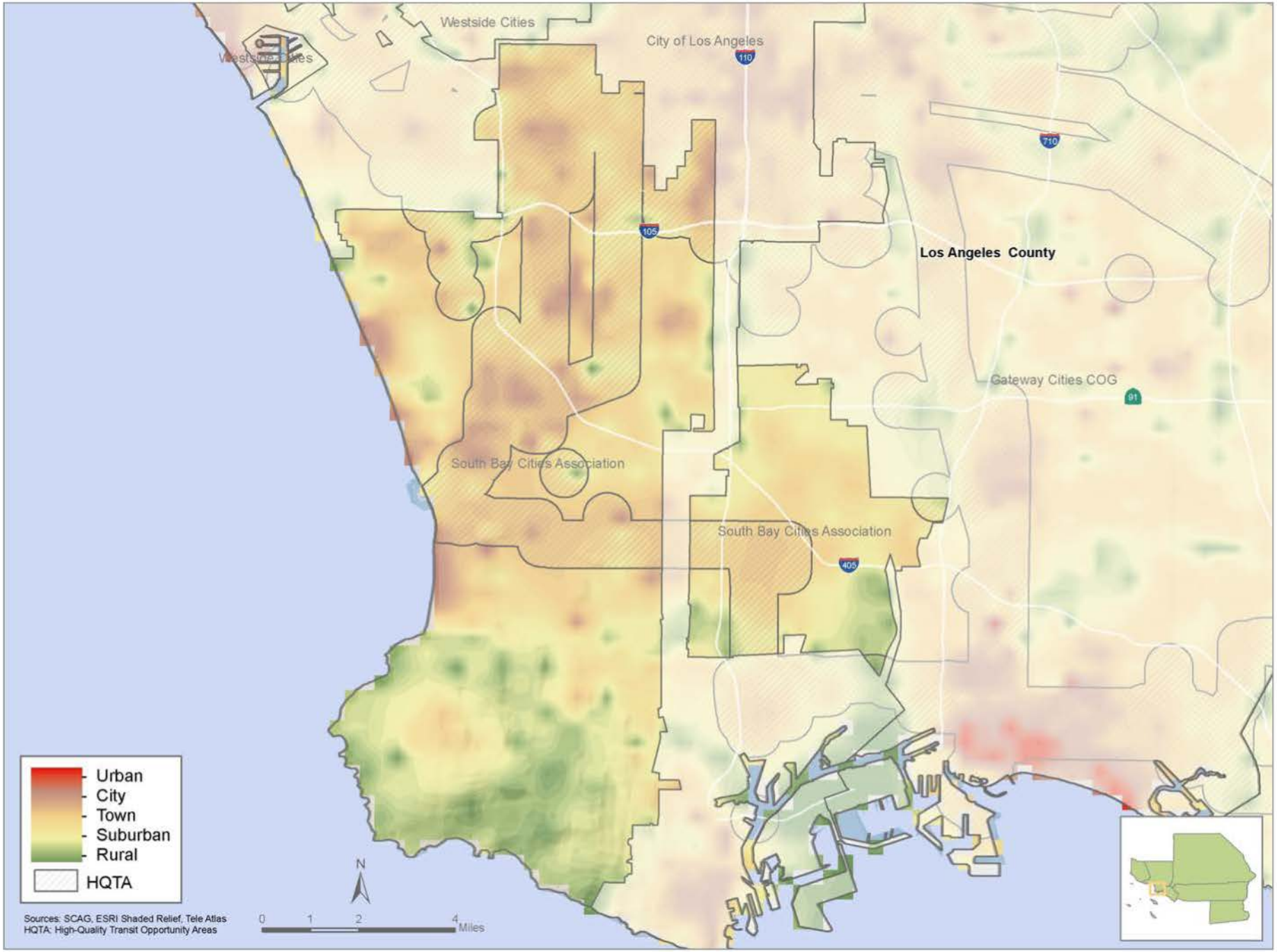


EXHIBIT 30 Land Use Pattern Map – South Bay Cities 2035

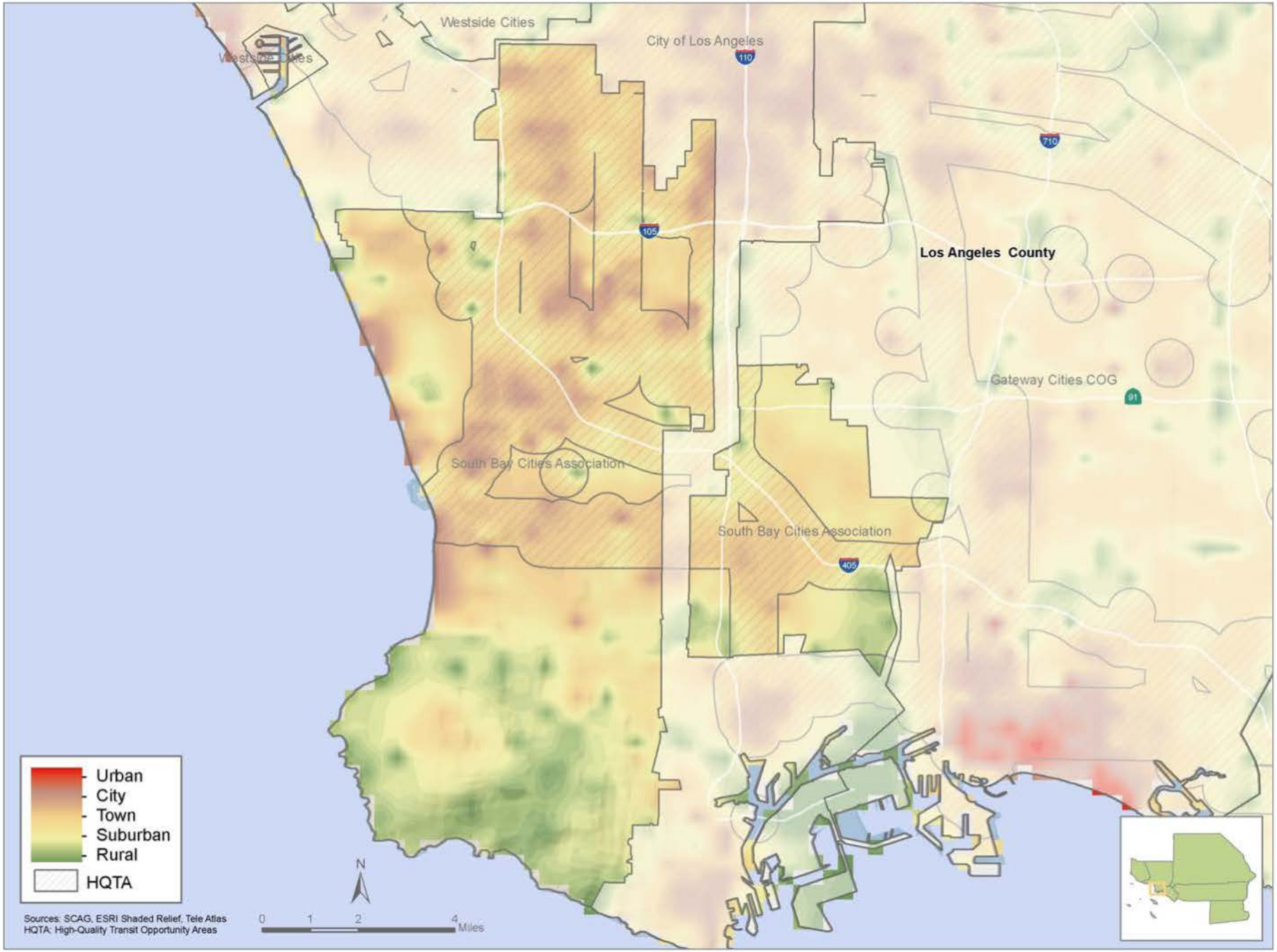


EXHIBIT 31 Land Use Pattern Map – Westside Cities 2008

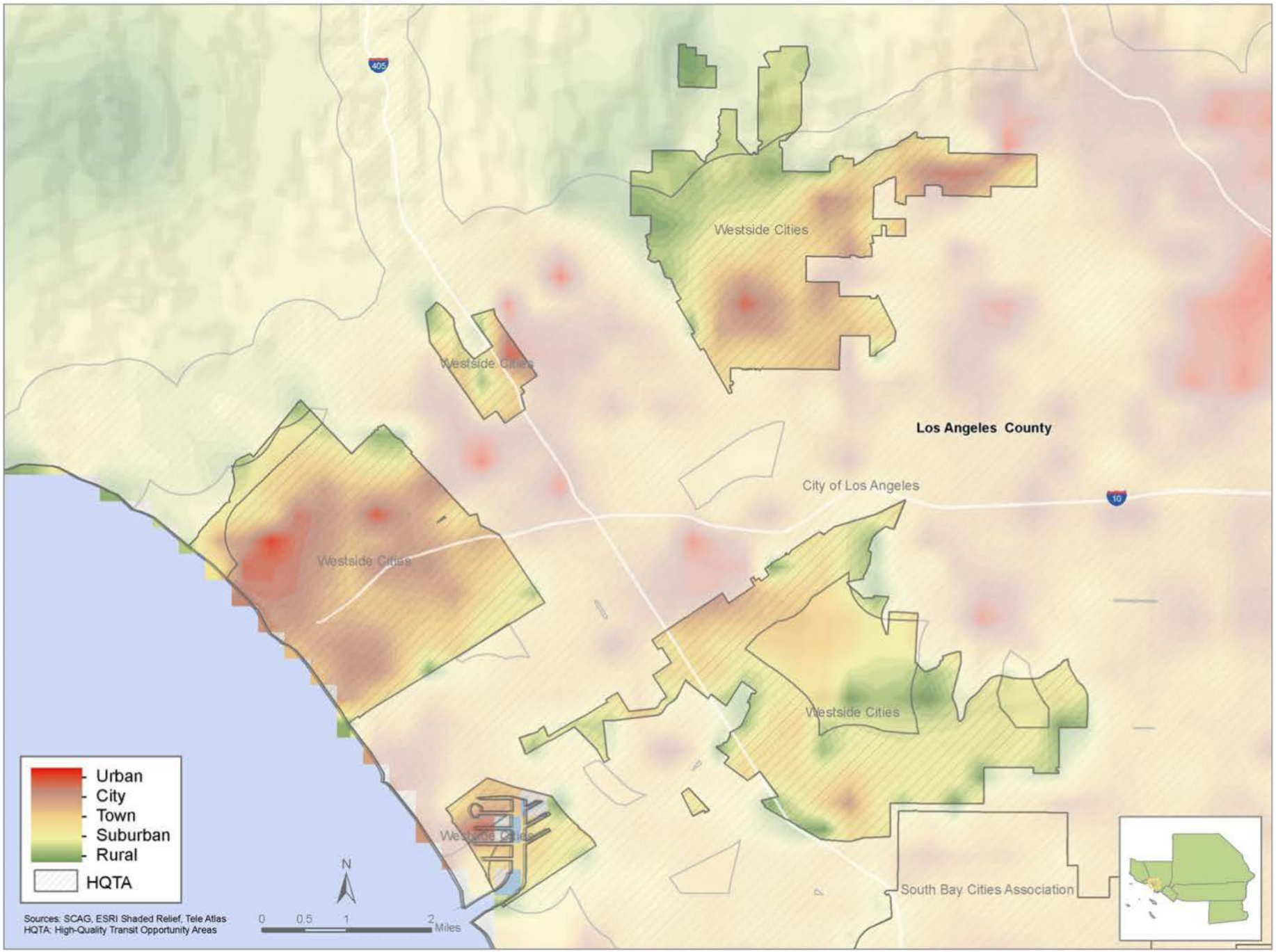


EXHIBIT 32 Land Use Pattern Map – Westside Cities 2020

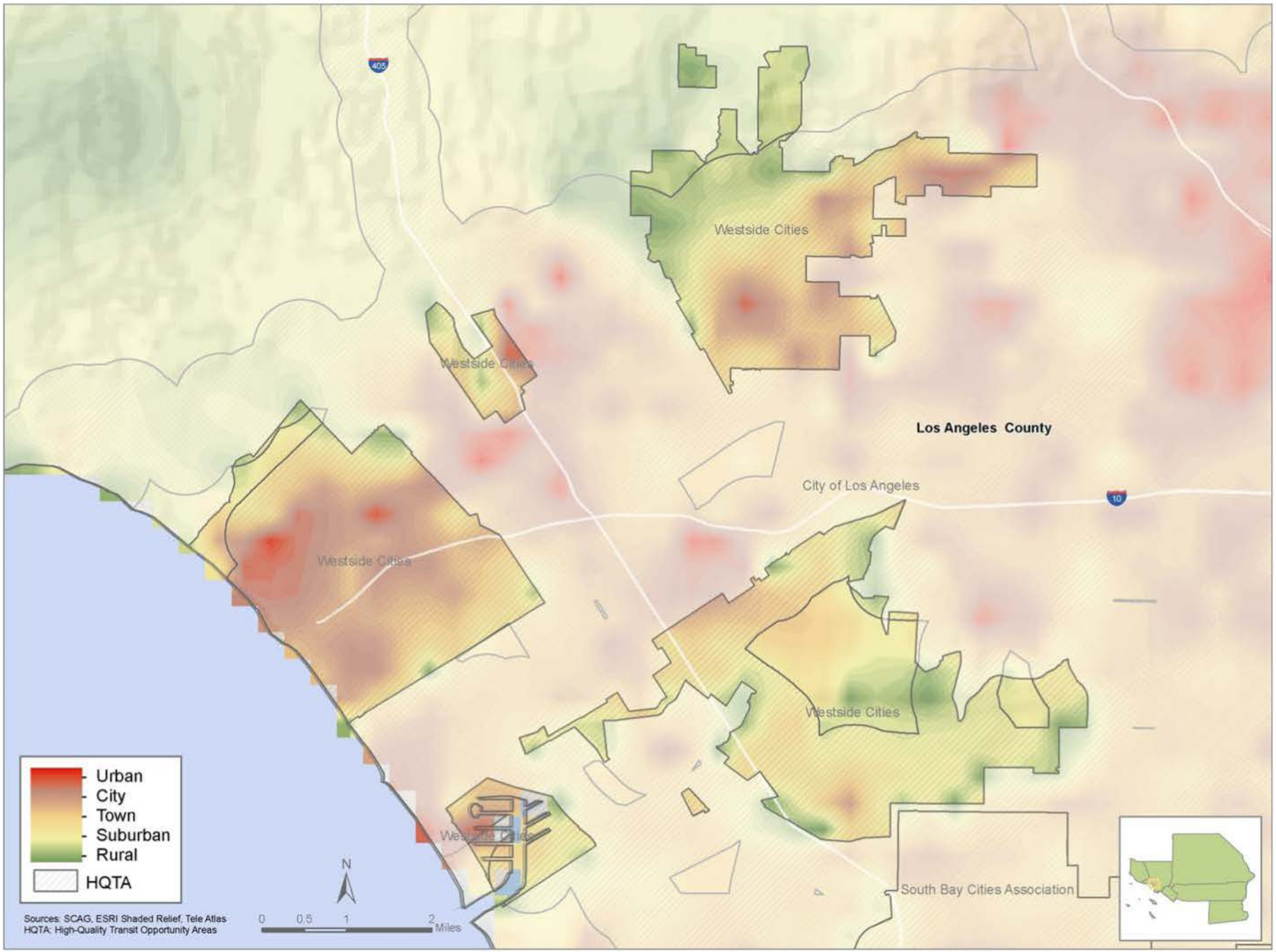


EXHIBIT 33 Land Use Pattern Map – Westside Cities 2035

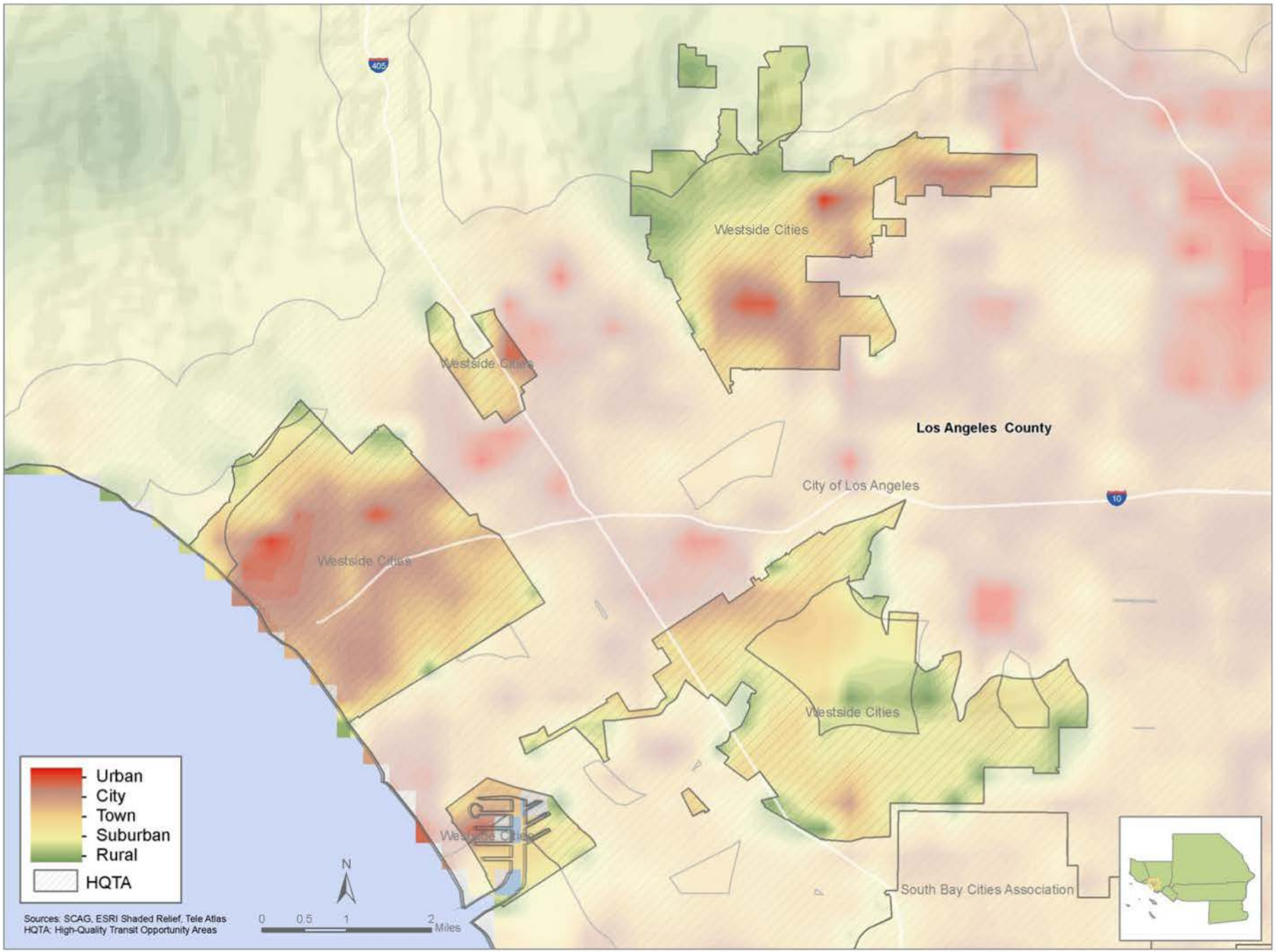


EXHIBIT 34 Land Use Pattern Map – Orange County 2008

EXHIBIT 35 Land Use Pattern Map – Orange County 2020

EXHIBIT 36 Land Use Pattern Map – Orange County 2035

EXHIBIT 37 Land Use Pattern Map – Riverside County 2008

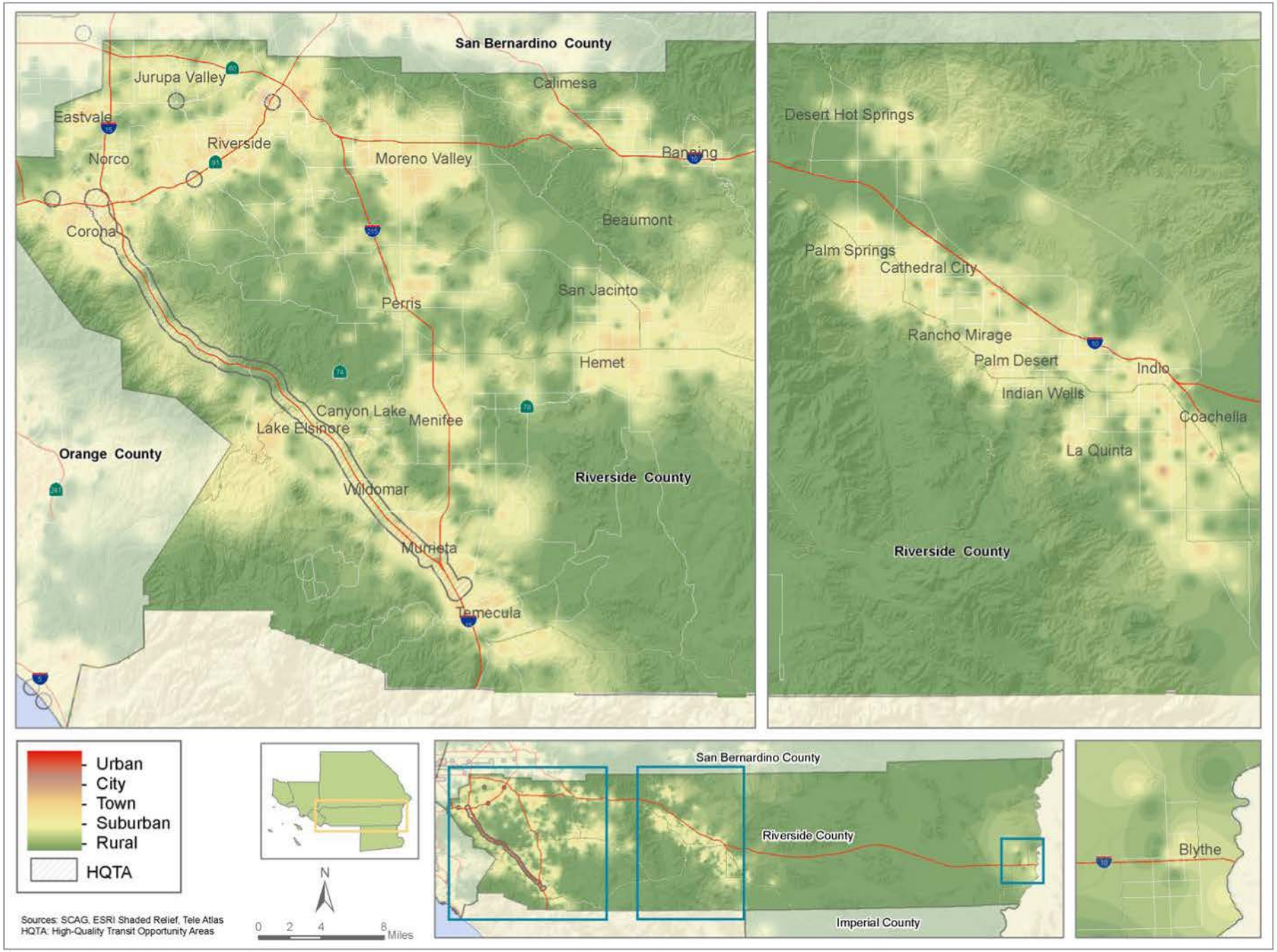


EXHIBIT 38 Land Use Pattern Map – Riverside County 2020

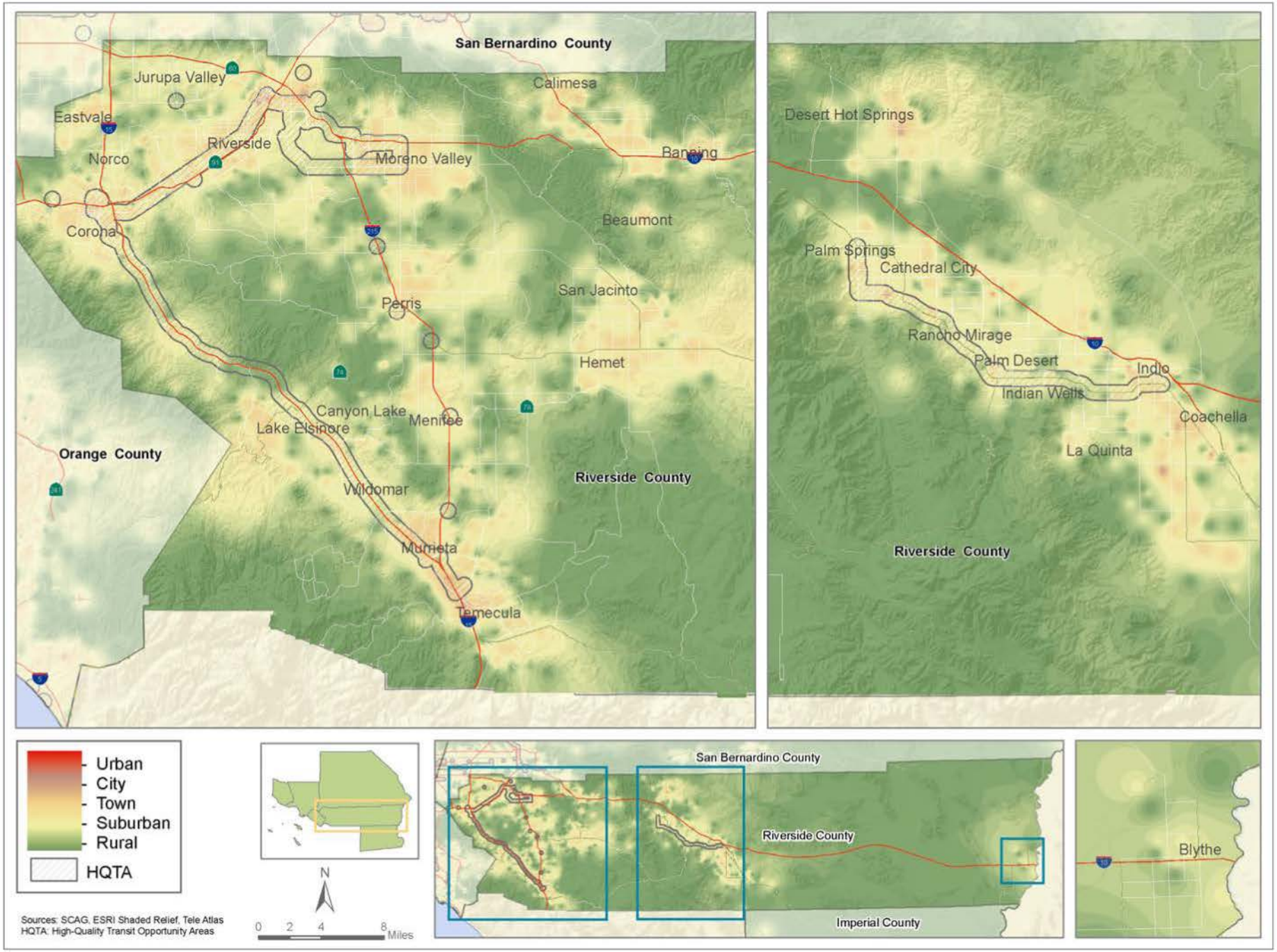


EXHIBIT 39 Land Use Pattern Map – Riverside County 2035

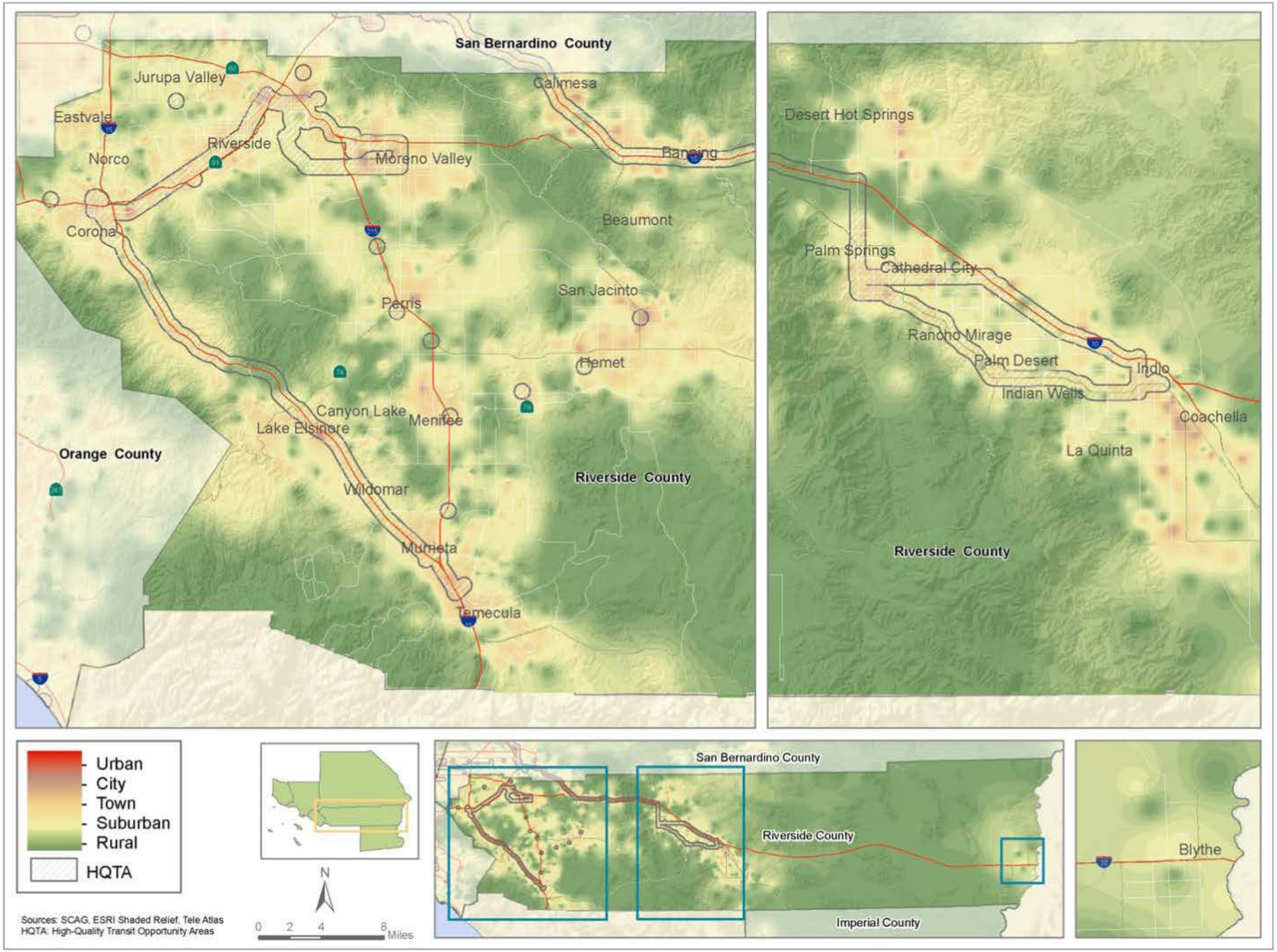


EXHIBIT 40 Land Use Pattern Map – Coachella Valley 2008

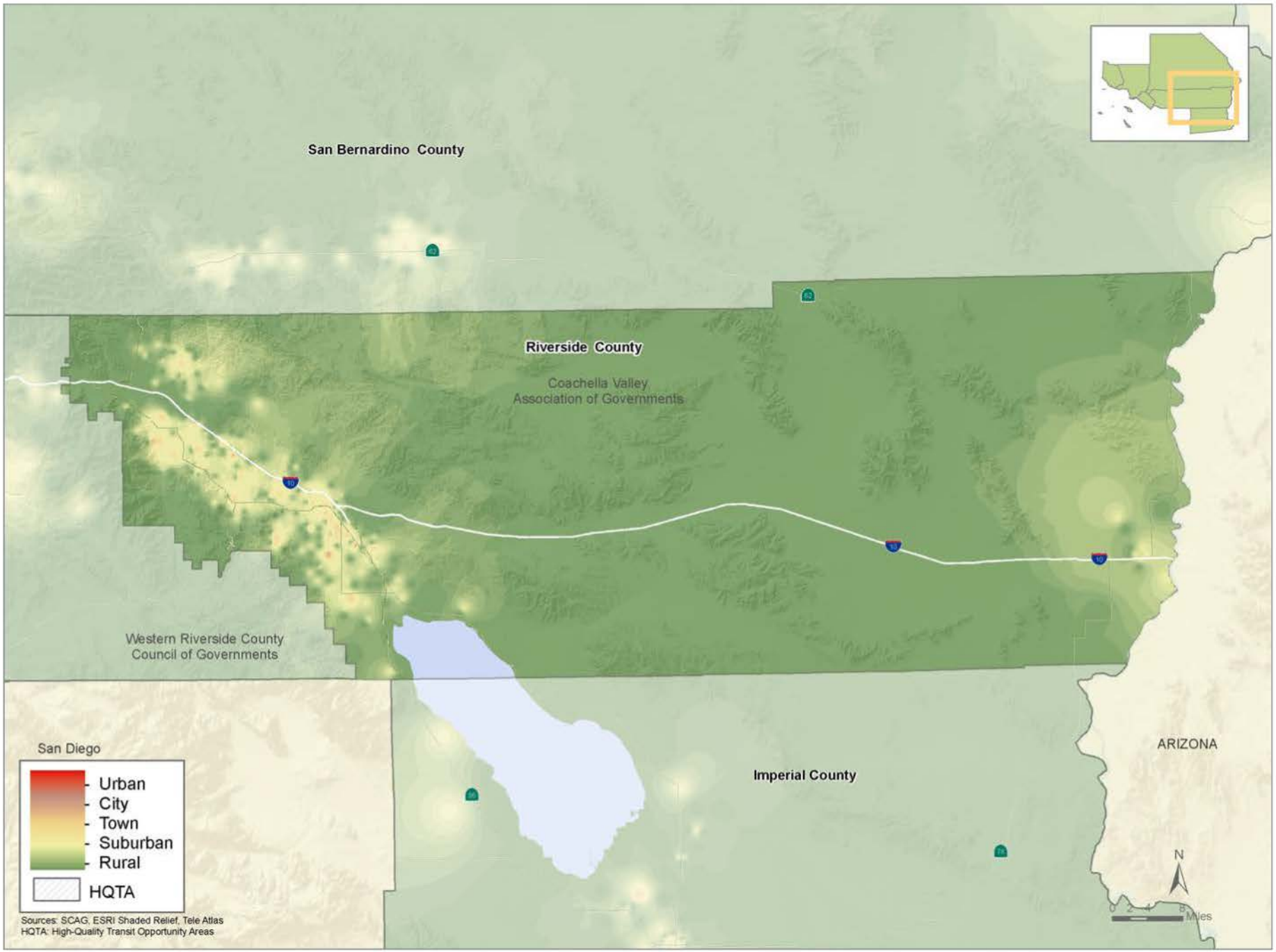


EXHIBIT 41 Land Use Pattern Map – Coachella Valley 2020

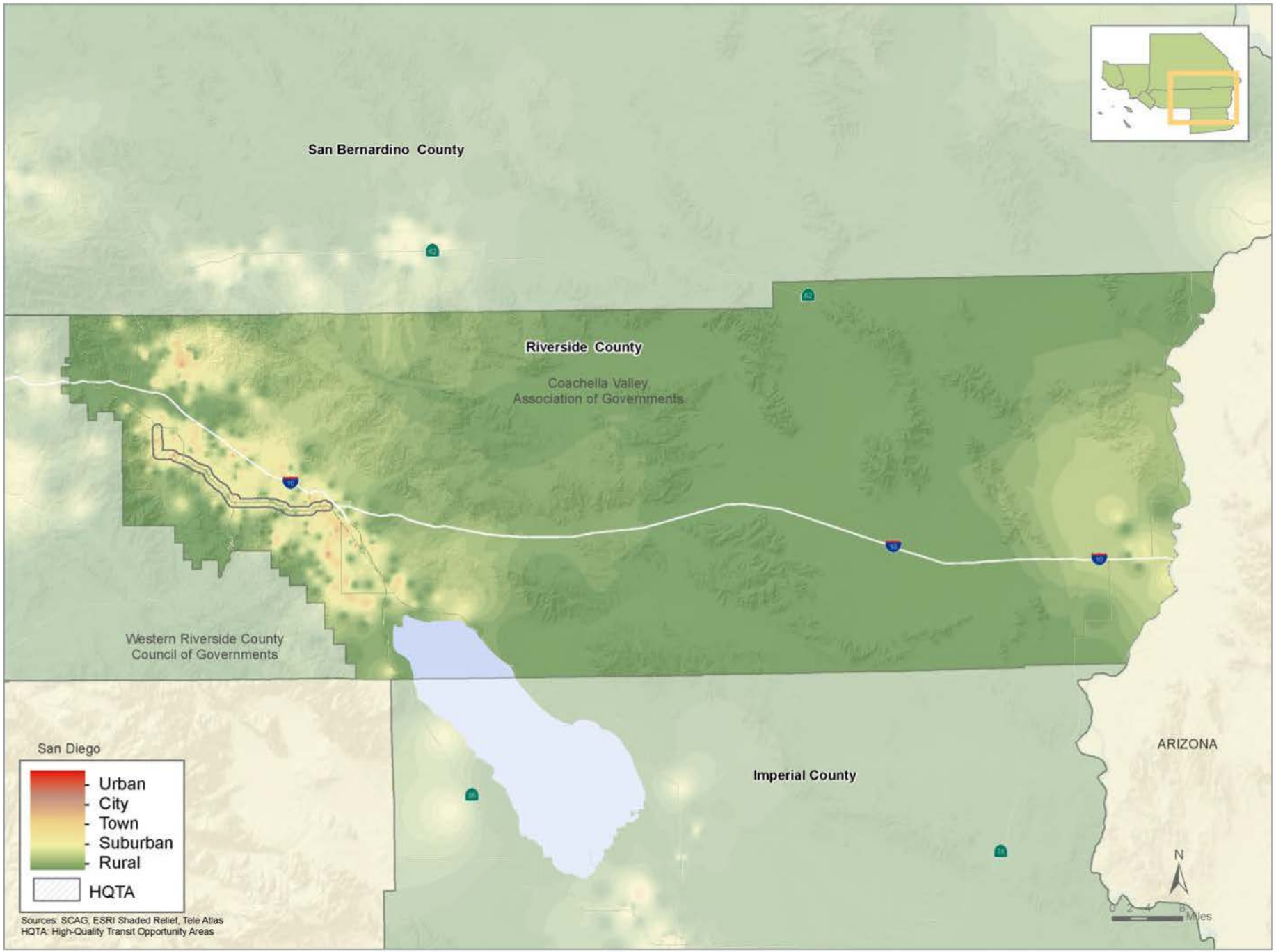


EXHIBIT 42 Land Use Pattern Map – Coachella Valley 2035

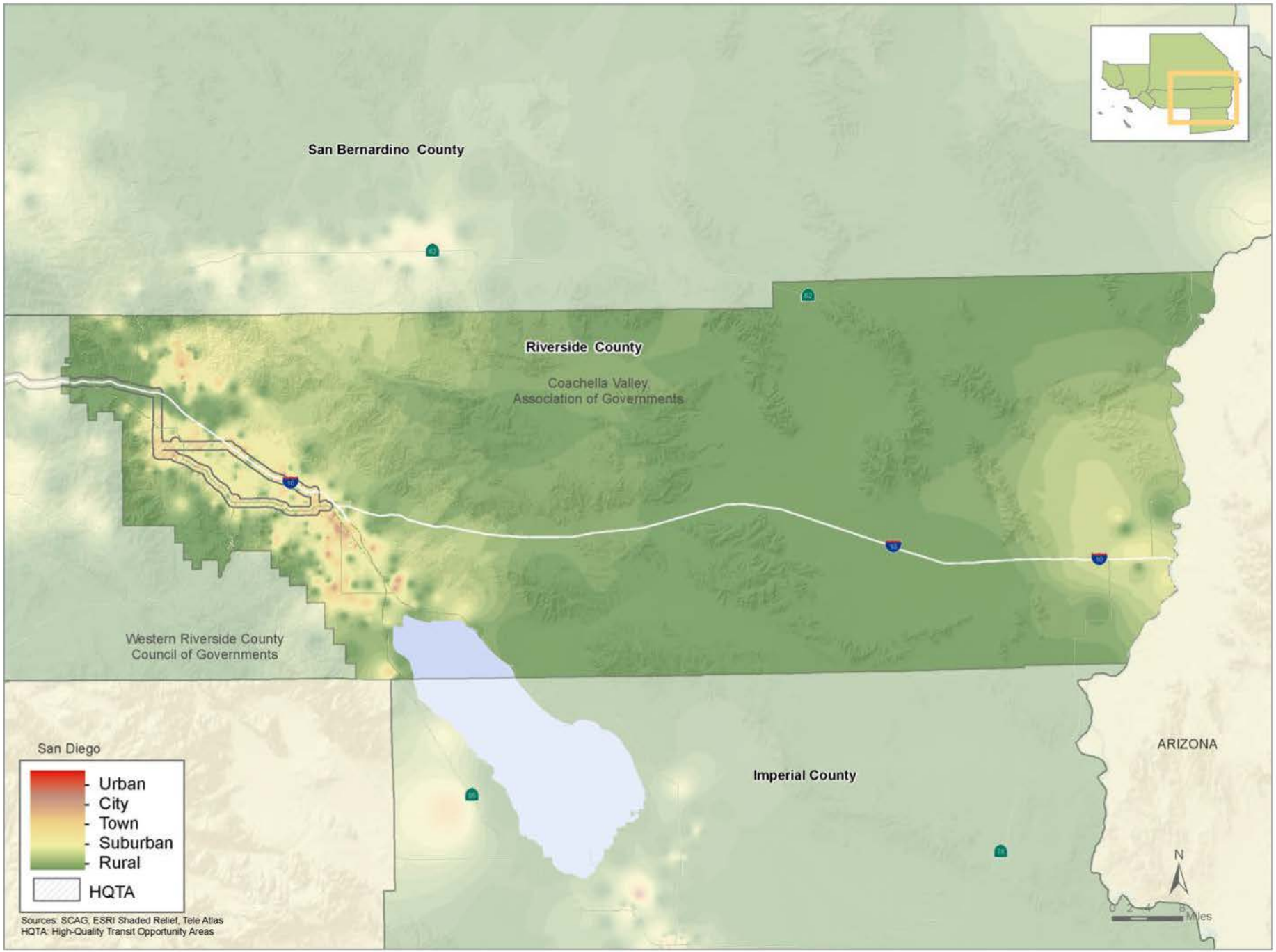


EXHIBIT 43 Land Use Pattern Map – Western Riverside County 2008

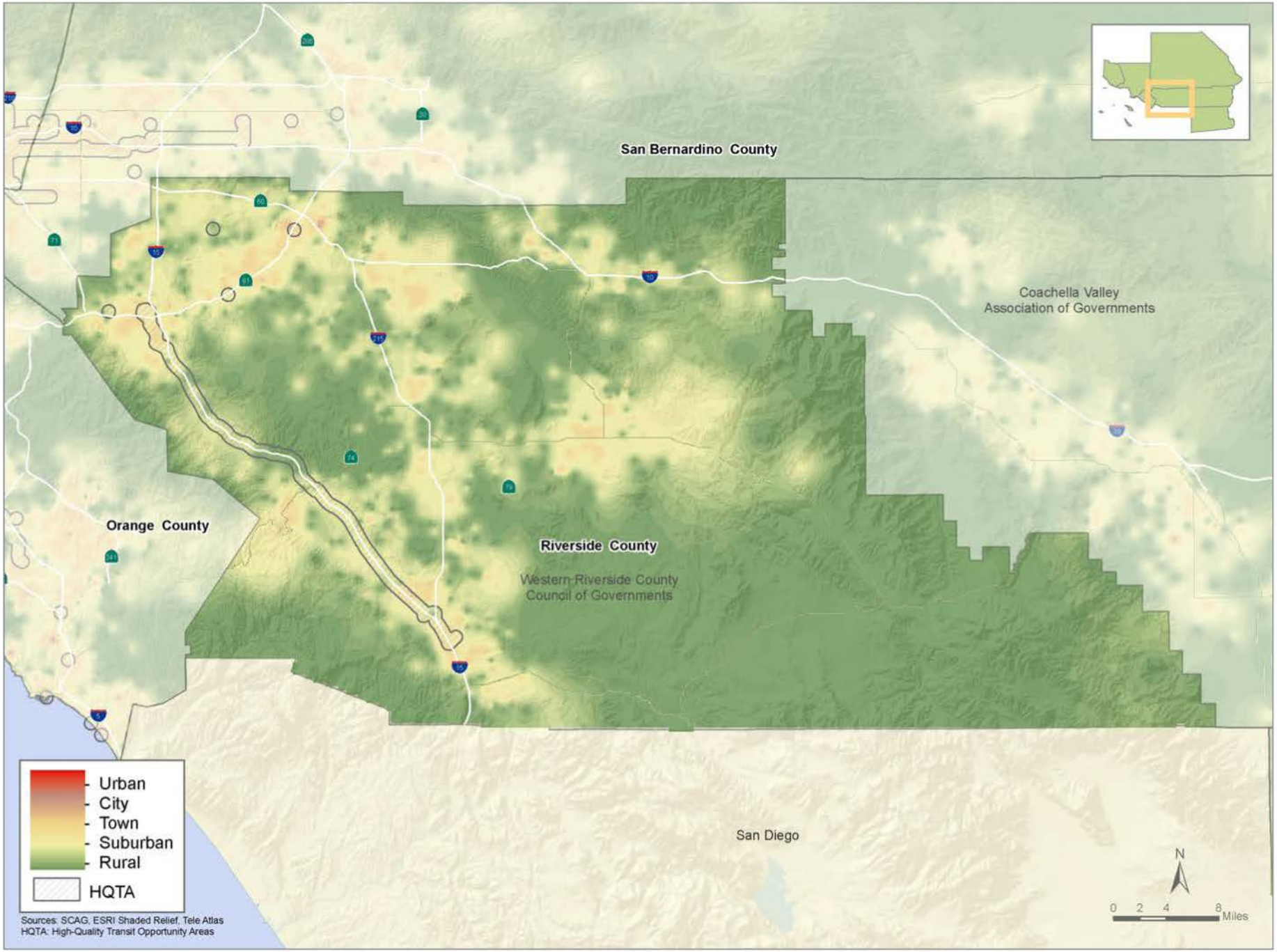


EXHIBIT 44 Land Use Pattern Map – Western Riverside County 2020

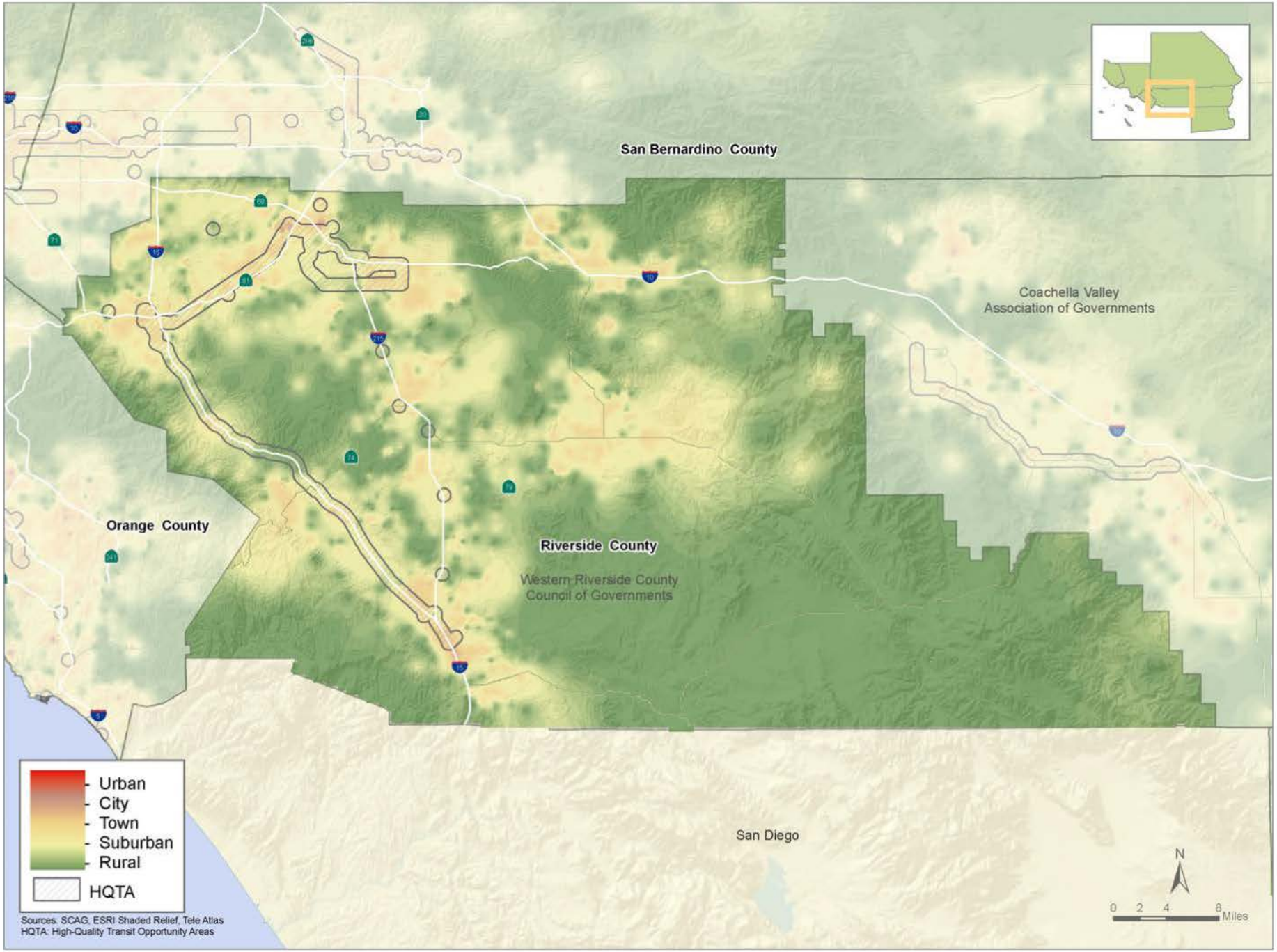


EXHIBIT 45 Land Use Pattern Map – Western Riverside County 2035

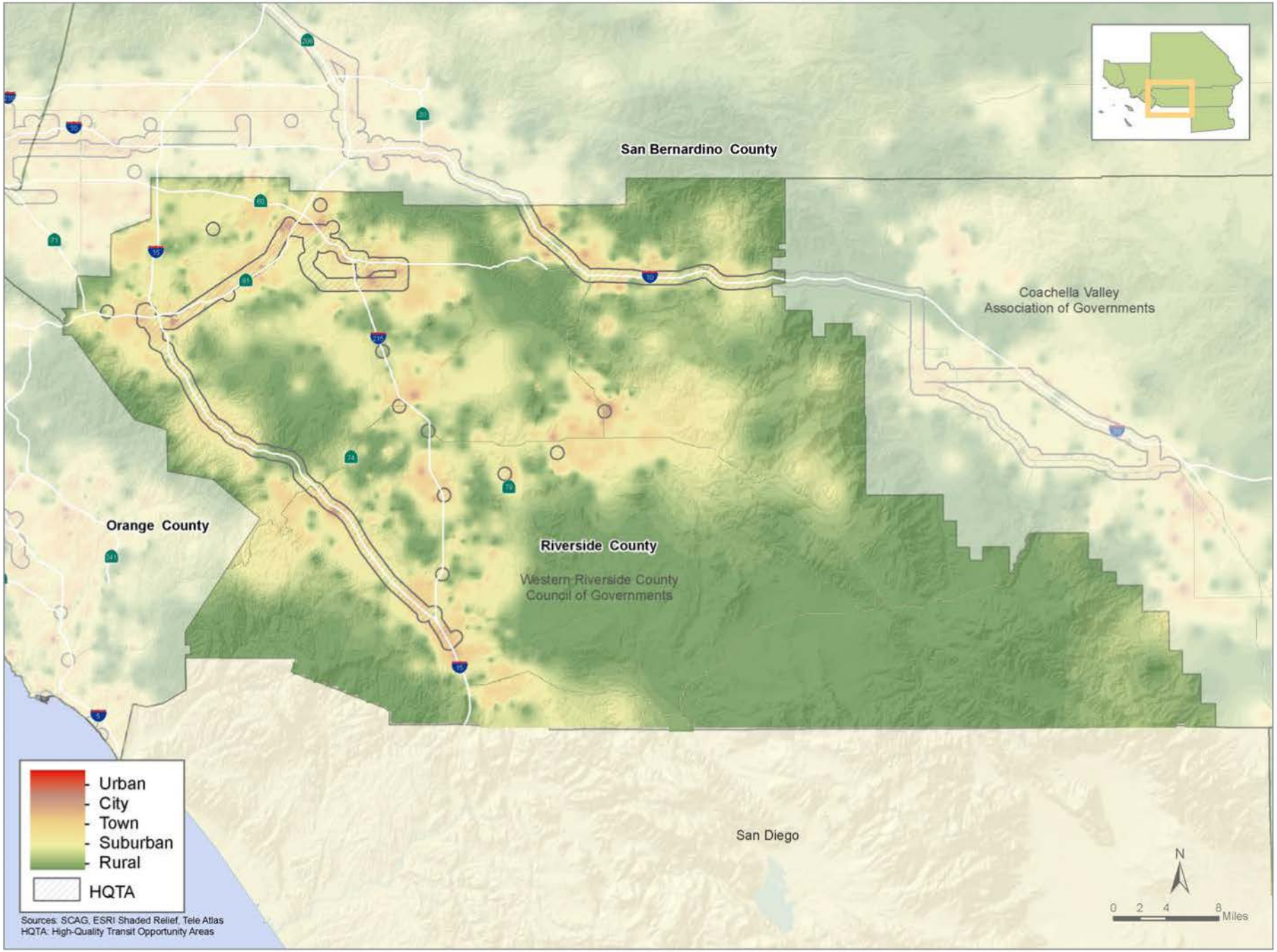


EXHIBIT 46 Land Use Pattern Map – San Bernardino County 2008

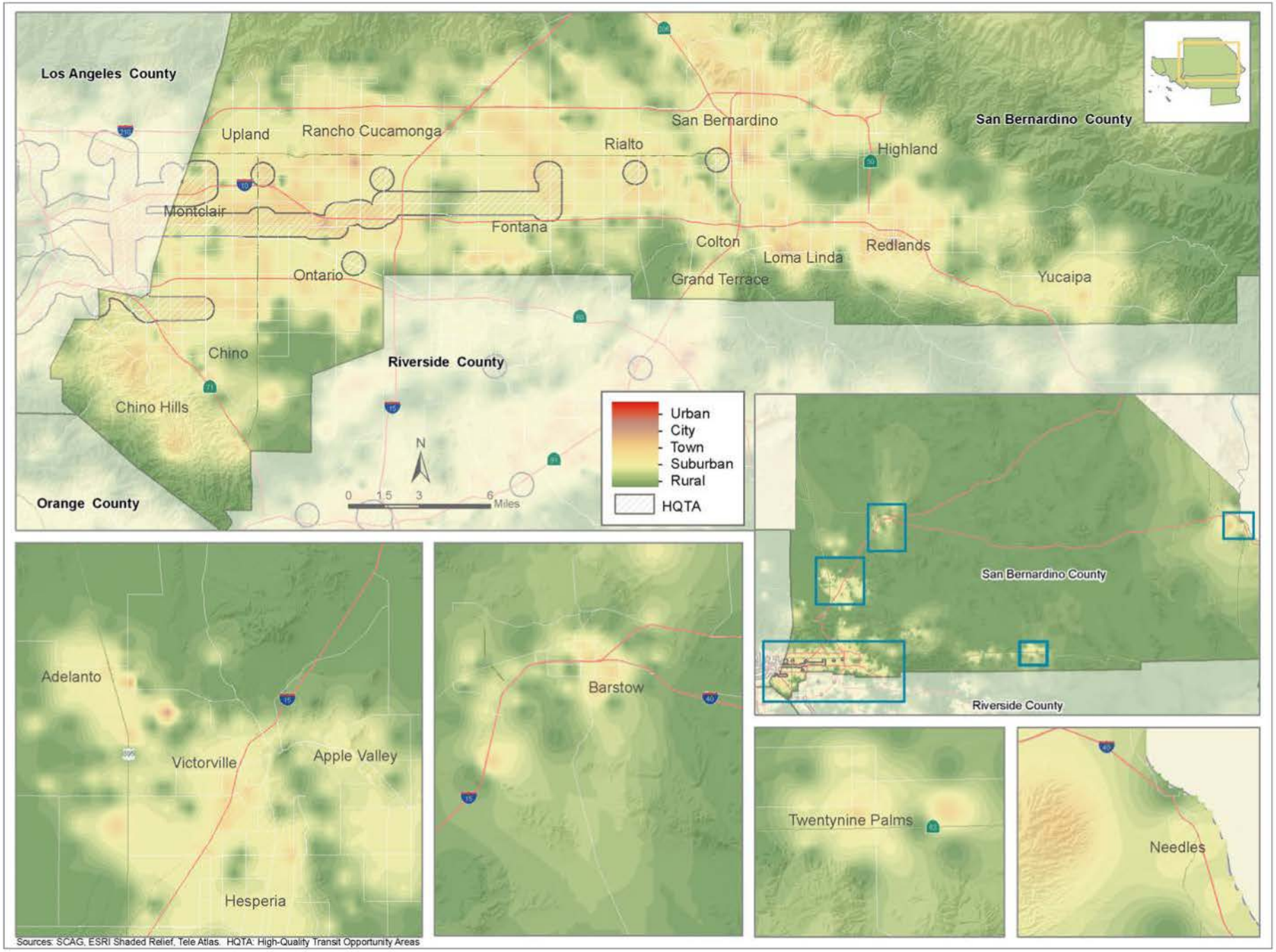


EXHIBIT 47 Land Use Pattern Map – San Bernardino County 2020

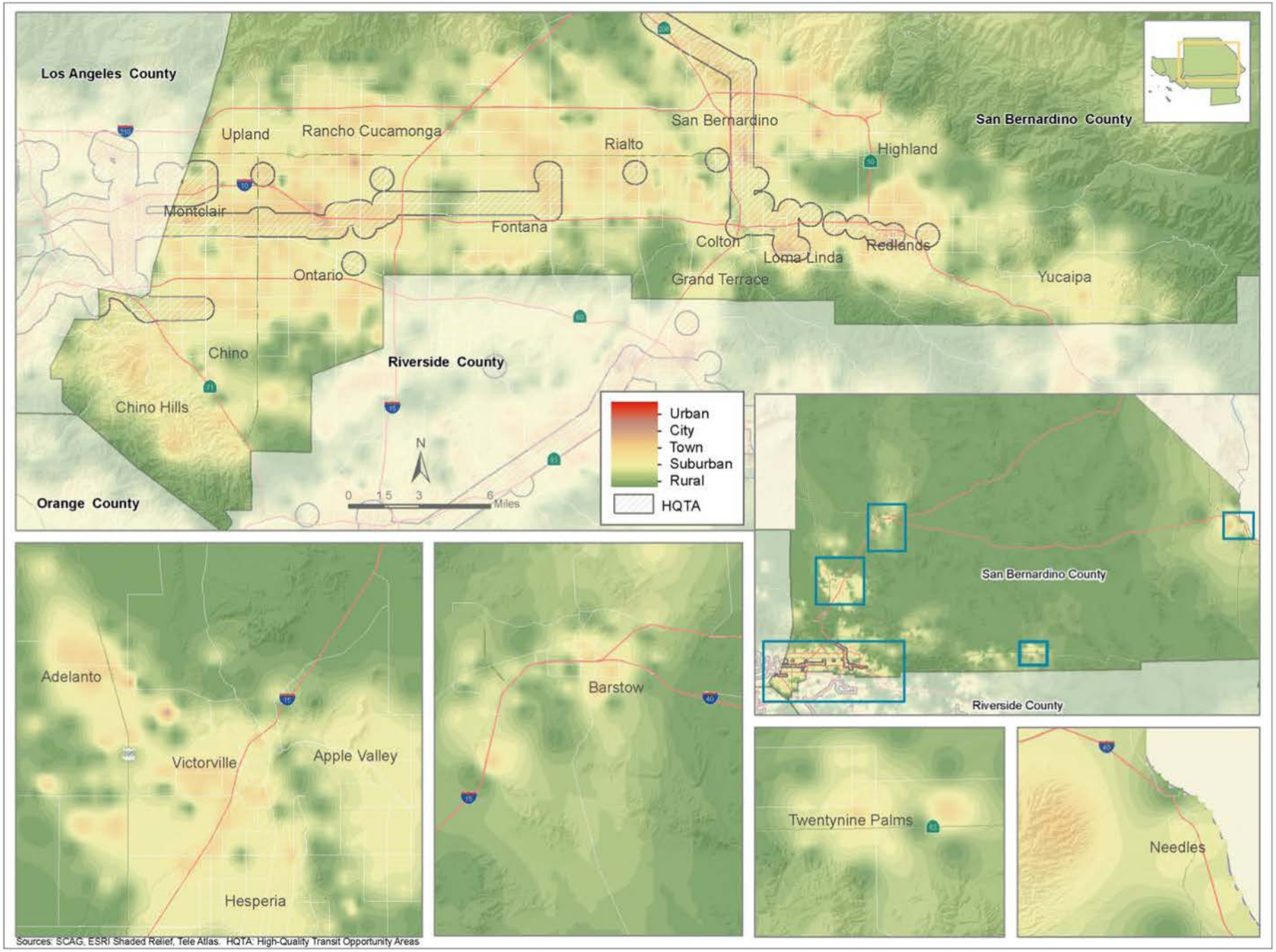


EXHIBIT 48 Land Use Pattern Map – San Bernardino County 2035

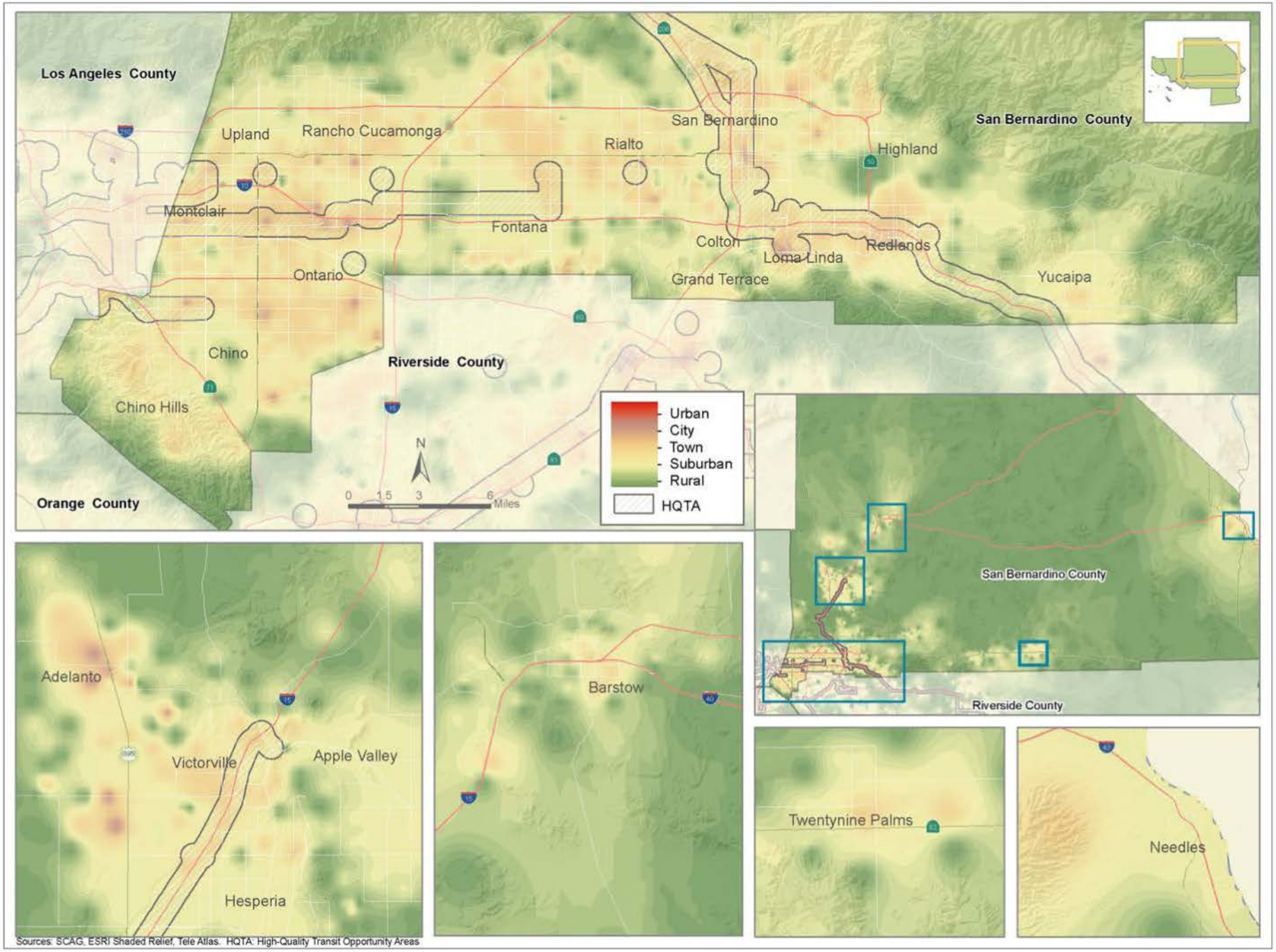


EXHIBIT 49 Land Use Pattern Map – Ventura County 2008

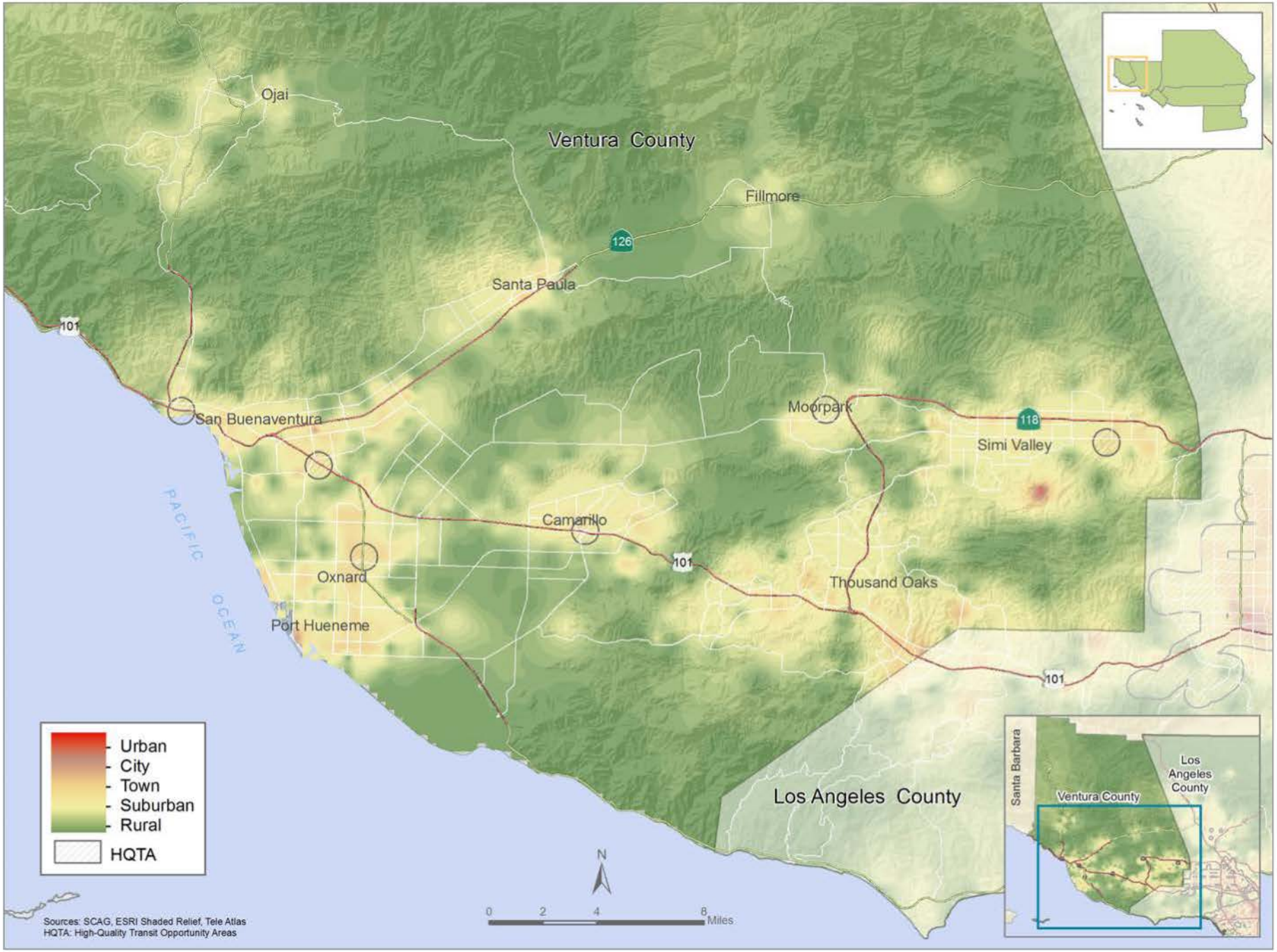


EXHIBIT 50 Land Use Pattern Map – Ventura County 2020

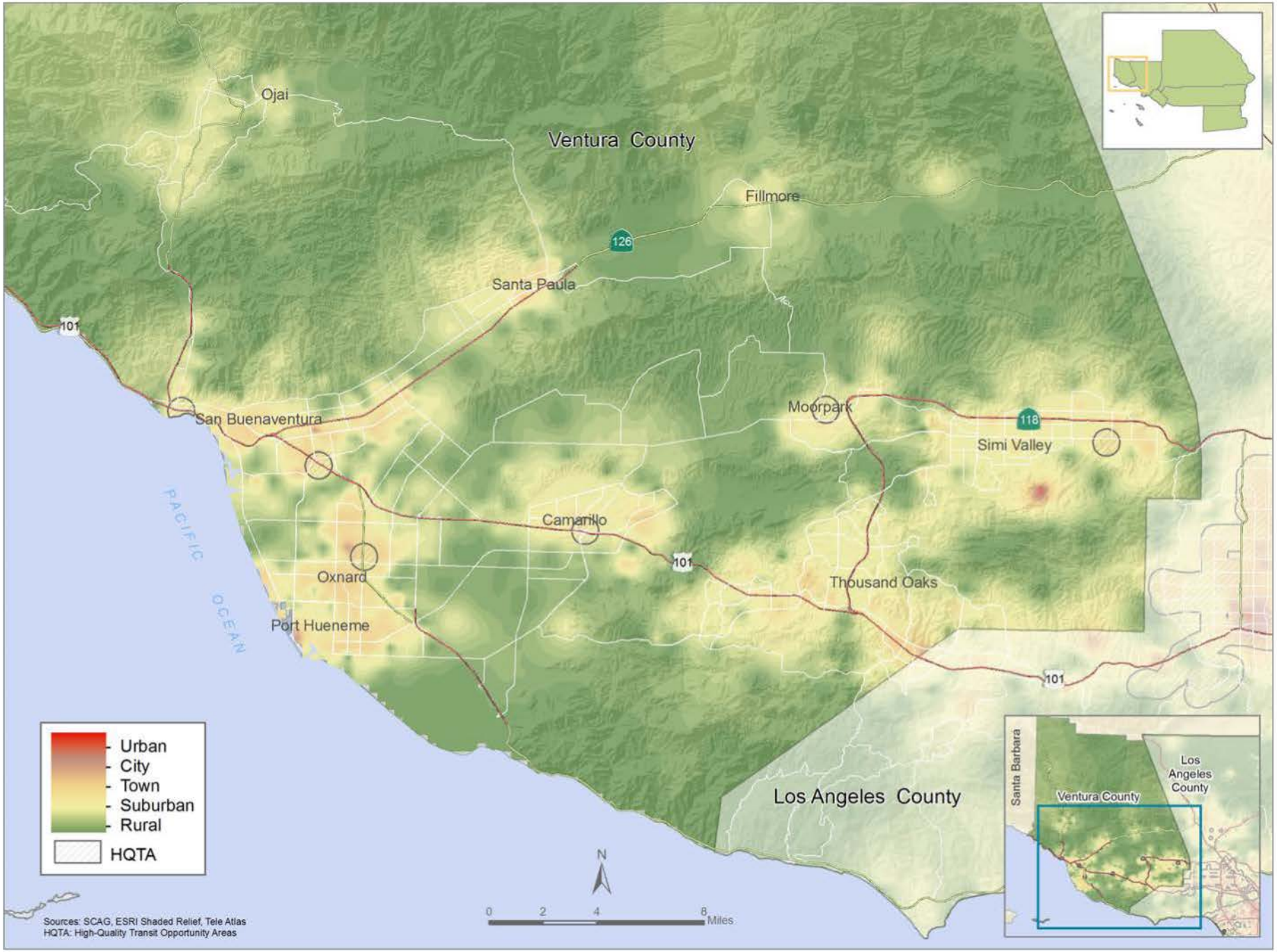
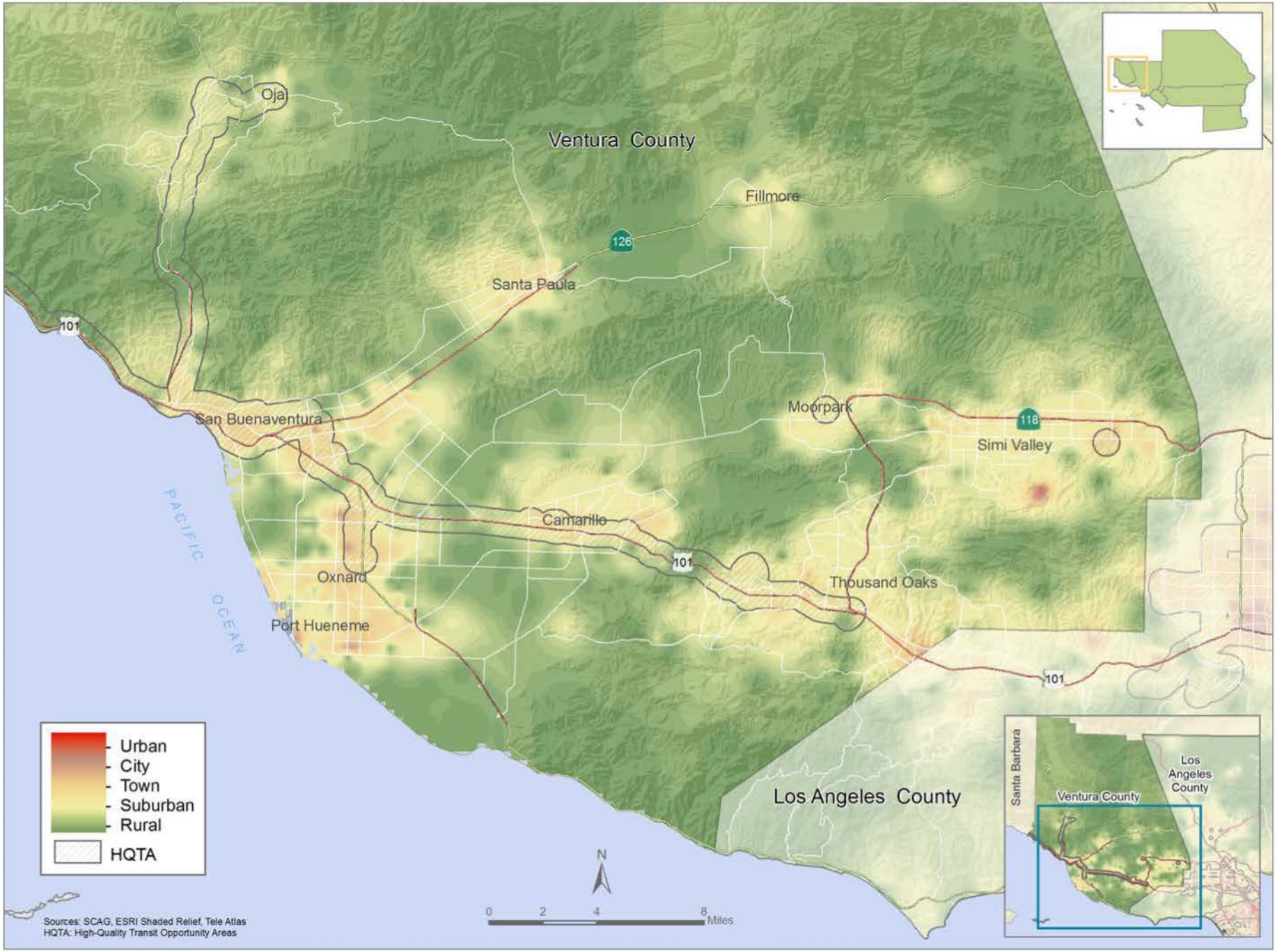


EXHIBIT 51 Land Use Pattern Map – Ventura County 2035



B. 2012–2035 RTP/SCS Scenarios for Public Outreach Workshops

The Rapid Fire Model

The four scenarios presented at the 2012–2035 RTP/SCS Public Outreach Workshops were produced using the Rapid Fire scenario modeling tool developed by Berkeley, CA-based planning and design firm Calthorpe Associates. The model is a user-friendly, spreadsheet-based tool that produces and evaluates scenarios at the national, state, regional, and county scales across a range of critical metrics. It constitutes a single framework into which data and research-based assumptions about the future can be loaded to test the impacts of varying land use patterns.

The Rapid Fire model emerged out of the near-term need for a comprehensive modeling tool that could inform state, regional, and local agencies and policy makers in evaluating climate, land use, and infrastructure investment policies. The model produces results for a range of metrics including:

- GHG (CO_2e) emissions from cars and buildings
- Air pollution and public health impacts
- Fuel use and cost
- Building energy and water use, and cost
- Land consumption
- Fiscal impacts, including capital infrastructure costs, operations and maintenance costs, and local revenues

Results are summarized so that users can compare the impacts of different scenarios. All assumptions are clearly identified and can be easily modified to test varying land use and policy choices. A detailed description of the Rapid Fire model can be found in the Section D. Rapid Fire Technical Summary.

The Scenarios

The scenarios were designed to explore and clearly convey the impact of both where the 6-county SCAG region grows over the next 25 years—to what extent growth is focused within existing cities and towns; and how it grows—the shape and style of the neighborhoods and transportation systems that will shape growth over the period. These scenarios were precursors to the 2012–2035 RTP/SCS alternatives. The scenarios facilitated public dialogue and feedback, which in turn allowed SCAG to develop substantially more detailed and refined Plan alternatives. In addition, the 2012–2035 RTP/SCS scenarios also helped to refine the California Environmental Quality Act (CEQA) alternatives considered in the Program Environmental Impact Report (PEIR). These Plan alternatives were extensively analyzed in the 2012–2035 RTP/SCS and the potential impacts of the 2012–2035 RTP/SCS Plan alternative were evaluated in the PEIR. Note that the 2012–2035 RTP/SCS Plan alternatives are separate and distinct from the scenarios discussed here.

The scenarios vary in their land use programs and in the package of transportation investments that support the quality and location of growth in the scenarios. The range of the scenarios can be described by how they address the following key elements:

- Development Location (Dispersed Growth vs. Focused Development): The four scenarios vary in the proportion of growth accommodated at the edges of cities and the region's urbanized areas versus that located in and around existing cities and towns, particularly in the region's designated High-Quality Transit Areas (HQTAs). An HQTA is generally a walkable transit village or corridor, consistent with the adopted RTP/SCS, and is within one half-mile of a well-serviced transit stop or corridor with 15-minute or less service frequency during peak commute hours. This is represented by the proportion of Greenfield versus Refill (infill and redevelopment) growth in each of the scenarios.
- Community/Neighborhood Design (Auto-Oriented vs. Walkable): The shape and quality of growth in the scenarios vary, from a focus on walkable and transit-oriented places where most daily needs are within walking, biking, or short driving distance from homes, to a future in which most new communities are centered around the car as the dominant form of transportation for nearly all trips. This is represented across the four scenarios by the proportion of Standard Suburban, Mixed-Use/Walkable, and Urban Infill development in each of the scenarios.

- Housing Options and Mix (Single-Family Subdivisions vs. Multifamily Focus): The four workshop scenarios varied future housing mix in order to depict the impacts of meeting (or not meeting) measured housing demand and the changing demographics and preferences of current and future southern Californians. Trend-based housing programs that focus more on larger-lot (>5,500 SF) single-family options are compared to varying mixes of single-family, townhome, and multifamily options. Housing demand profiles are informed by the recent work of A.C. Nelson and other state and national studies which connect changing demographic and economic conditions with housing demand.
- Transportation Investments (Road/Highway vs. Transit/Non-Auto Strategies): While all scenarios are supported by a range of transportation options, they vary in the proportion of new investments that are focused on transit and non-auto modes versus highway and roadway improvements that facilitate local and regional automobile travel. These transportation 'packages' are informed by past and present RTPs and incorporate a range of transit emphasis up to and including the recent Measure R and 30/10 Initiative. Each scenario's land use pattern and specific mix of place and location types are matched to a generalized transportation package that supports the pattern and quality of growth. The scenarios were designed to capture a range of potential strategies and investments under consideration for the RTP/SCS by considering the relative emphasis on investment by mode, or the inclusion of policy mechanisms such as TDM or congestion pricing. The scenarios do not consider or evaluate specific transportation networks, or individual projects.

The scenarios illustrate different 'themes' for how the region can grow, and the transport system that supports that growth. Each theme mixes a unique combination of the above factors and in turn varies in its impact on critical fiscal, environmental, and transportation challenges facing the region.

Scenario 1. This scenario is based on the General Plans prepared by cities and compiled by SCAG, with assistance from local planners, using the Local Sustainability Planning Tool (LSPT). It includes a significant proportion of suburban, auto-oriented development, but also recognizes the recent trend of increased growth in existing urban areas and around transit. New housing is mostly single-family (58 percent), with an increase in smaller-lot single-family homes, as well as an increase in multifamily homes (42 percent). The transportation system is based on the package of improvements in the 2008 RTP. While these investments tend to favor automobile infrastructure, they also support new transit lines and other non-auto strategies and improvements.

Scenario 2. This scenario focuses more growth in walkable, mixed-use communities and in existing and planned high-quality transit areas. Under this scenario, there would be an increase in investments in transit and non-auto modes as compared to the 2008 RTP. Employment growth is focused in urban centers, around transit. Fewer new homes (29 percent) are single-family homes, as this scenario comes closer to meeting demand for a broader range of housing types, with new housing weighted less toward large-lot (>5,500) single-family homes (two percent) and more towards smaller-lot single-family homes (27 percent), and multifamily condos, townhomes and apartments (70 percent).

Scenario 3. This scenario builds on the walkable, mixed-use focus of the growth in Scenario 2, and also aims to improve fiscal and environmental performance by shifting even more of the region's growth into areas that are closer to transit, and less auto-centric. Like Scenario 2, this scenario, aims to meet demand for a broader range of housing types, with new housing weighted towards smaller-lot single-family homes, townhomes, multifamily condos and apartments. In terms of percentage, the mix of housing types is very similar to Scenario 2, but the location of the growth within the region is shifted more toward transit-rich locations. Also like Scenario 2, transportation system investments would be more weighted towards transit investments, TDM, and non-auto strategies, which would support the move away from more auto-oriented development patterns.

Scenario 4. This scenario maximizes growth in urban and mixed-use configurations in already developed areas, and around existing and planned transit investments. To support this shift, transportation system investments are heavily weighted towards transit infrastructure and operational improvements (i.e., higher frequencies and more transit feeder service), as well as improvements to bicycle and pedestrian infrastructure. In order to maximize the transit investments and accommodate population in already developed areas, the vast majority of new housing (96 percent) is multifamily, while four percent is single-family development.

Pricing and Vehicle Policy Assumptions

The scenarios were designed to highlight the impacts of land use and transportation infrastructure options within the SCAG region. Transportation system pricing, vehicle and fuels technology, and power generation policies will also play a role in meeting the region's fiscal, climate, mobility, and public health goals. Pricing and technology components were held constant in order to more clearly communicate the impacts of land use and infrastructure policy options.

PRICING ASSUMPTIONS

Each of the scenarios presented at the 2012–2035 RTP/SCS Workshops assumed a hypothetical two-cent per mile VMT charge, which on average, results in a two percent reduction in VMT. More detailed pricing schemes and analyses are being developed to support refined scenarios and detailed 2012–2035 RTP/SCS options.

VEHICLE AND FUEL POLICY

Meeting greenhouse gas (GHG), pollutant emissions, and energy goals will include a suite of strategies and policies. In addition to the land use and transportation strategies explored in these first 2012–2035 RTP/SCS scenarios, the efficiency of cars and the fuels used to power them will also play a role, as will energy and water conservation measures for homes and businesses. While these first scenarios focus on the impact of land use and transportation investments and strategies in meeting VMT, GHG, pollution, and energy challenges, subsequent analysis will explore the impacts of emerging vehicle technologies, renewable power generation, building measures, and a host of state, regional, and local environmental and energy policies.

Scenario Outcomes

Variations among the scenarios highlight the impacts of land use and transportation infrastructure options within the SCAG region. The Rapid Fire model was used to estimate a broad set of fiscal, environmental, and transportation impacts in order to facilitate comparison among the scenarios.

LAND CONSUMPTION – NEW LAND CONSUMED

The amount of land consumed to accommodate new population growth varies substantially among the 2012–2035 RTP/SCS scenarios. New land consumption includes all land that will be newly urbanized, including residential and employment areas, roadways, open space, and public lands. Through infill, redevelopment, and more efficient use of new "greenfield" land (lands, including agricultural areas, not previously developed for urban uses) to accommodate new growth, scenarios with a greater share of Urban Infill and Mixed-Use Walkable (Compact) development consume less land overall. By contrast, scenarios that place a greater share of new growth in dispersed Standard development patterns, consume more land.

Scenario 1, which is based on the General Plans prepared by cities, consumes 251 square miles of greenfield land—nearly twice as much as Scenario 2, which consumes 127 square miles—to accommodate growth to 2035. Scenario 3 consumes 84 square miles, and Scenario 4, which maximizes growth in urban and mixed-use configurations in already developed areas, brings that number down to 46 square miles.

FISCAL IMPACTS – LOCAL INFRASTRUCTURE CAPITAL AND OPERATIONS AND MAINTENANCE COSTS

Increased land consumption can lead to higher costs for local and sub-regional infrastructure, as new greenfield development requires significant capital investments to extend or build new local roads, water and sewer systems, and parks. Conversely, growth focused in existing urban areas takes advantage of existing infrastructure and capitalizes on the efficiencies of providing service to higher concentrations of jobs and housing. This cost variation amplifies when operations and maintenance (O&M) costs are taken into account. O&M costs include the ongoing city expenditures required to operate and maintain the infrastructure serving new residential growth. Engineering and public works costs are strongly linked to the physical form of infrastructure. More dispersed development, which entails greater lengths of roads and sewer pipes, incur higher O&M costs to local jurisdictions than more compact development, which capitalizes on the economic efficiencies of shared infrastructure capacity.

The 2012–2035 RTP/SCS scenarios show that growth in urban and mixed-use configurations in already developed areas can reduce costs significantly, as demonstrated by

adding up capital infrastructure and ongoing O&M costs to 2035 for each scenario. As compared to Scenario 1, following the development pattern of Scenario 2 would save $3.3 billion; Scenario 3 would save $3.7 billion; and Scenario 4 would save $6.7 billion—an average savings of $4,500 per new home, or over 25 percent less on the whole than Scenario 1.

Note that the capital infrastructure and O&M costs detailed here represent those associated with residential growth only. It is expected that the inclusion of non-residential fiscal impacts would compound the cost and revenue differences that have been evidenced between dispersed and compact development patterns.

FISCAL IMPACTS – LOCAL REVENUES

The Rapid Fire model estimates potential revenues from property and property transfer taxes, sales taxes, and vehicle license fees generated by new households. Due to the price premiums of higher-intensity locations, more compact development can generate higher local revenues than more dispersed development. This relationship is clear particularly on a per-acre basis—by 2035, Scenario 2 generates $18,500 more, Scenario 3 generates $23,500 more, and Scenario 4 generates nearly $27,000 more per acre per year than Scenario 1. On a per-unit basis, results vary: the cumulative revenues through 2035 of Scenario 2 are $2.9 billion lower than Scenario 1, and those of Scenario 4 are $12 billion lower. Scenario 3, on the other hand, yields $2.7 billion more in revenues—demonstrating the magnitude of the benefits that result from a strategic nexus between compact development patterns and housing mix.

TRANSPORTATION

Transportation system impacts—including vehicle miles traveled (VMT), fuel use and cost, and greenhouse gas (GHG) and air pollutant emissions—vary significantly across the 2012–2035 RTP/SCS scenarios. The different land use patterns of the scenarios result in different rates of passenger auto use, measured as vehicle miles traveled, or VMT, which then impact fuel consumption, fuel cost, and emissions.

VEHICLE MILES TRAVELED

Scenario results for VMT indicate a wide variation in passenger vehicle use related to the form of new growth. Scenario 1, which accommodates 41 percent of new growth in more auto-oriented Standard Suburban development, results in an annual VMT of 153 billion miles by 2035. This is almost 17 billion miles more than Scenario 2, 20 billion miles more than Scenario 3, and 21 billion miles, or 14 percent, more than Scenario 4. Scenario 1 averages 20,920 miles driven per household, per year; Scenario 4 averages 17,990 miles.

AUTOMOBILE FUEL USE AND COST OF DRIVING

Variations in passenger VMT lead to differences in the amount of gas (or equivalent) used. These differences will vary depending on how efficient cars become. Assuming the same modest vehicle fuel economy improvements (in line with California's "Pavley 1" Clean Car Standards) for all scenarios, there would be substantial differences in fuel use due to land use-related VMT variations. By 2035, Scenario 1 would require 5.5 billion gallons of fuel annually. Scenario 2 would require 600 million gallons less, Scenario 3 would require more than 700 million gallons less, and Scenario 4 would require 800 million fewer gallons per year. 800 million gallons of gas is equivalent to 1.1 percent of the oil imported to the entire United States in 2008.

Reduced VMT and fuel use leads to lower costs for all households in Southern California. When compared to Scenario 1, Scenario 2 saves the average Southern California household more than $1,380 per year in driving costs in 2035 (including auto ownership, maintenance, and other driving-related costs); Scenario 3 saves $1,600; and Scenario 4 saves $1,770—significant savings that could be applied to housing and other essentials. For the entire SCAG region, the savings total as much as $12.9 billion per year in Scenario 4.

GHG emissions from passenger vehicles are determined by VMT (related to land use patterns), vehicle fuel economy, and the carbon intensity of automobile fuel. Assuming the same modest improvements in fuel emissions (in line with California's Low Carbon Fuel Standard) for all scenarios, there would be substantial differences in CO2e emissions (carbon dioxide equivalent, which includes the main forms of greenhouse gases). The land use-related variations in GHG are directly proportional to VMT and fuel use.

AIR POLLUTANT EMISSIONS FROM PASSENGER VEHICLES

Differences in VMT lead to different levels of air pollutants (including nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compounds, and particulate matter) among the 2012–2035 RTP/SCS scenarios. Accounting for vehicle technology improvements, Scenario 1, with higher VMT, sees 2035 passenger-vehicle pollutant emissions that are

11 percent higher than emissions in Scenario 2, 13 percent higher than Scenario 3, and 14 percent higher than Scenario 4. These results translate to significant public health impacts, as described in the following section.

HEALTH INCIDENCES AND COSTS

Auto-related air pollution results in a spectrum of health incidences, including cases of chronic bronchitis; acute myocardial infarction; respiratory and cardiovascular hospitalizations; respiratory-related ER visits; acute bronchitis; work loss days; premature mortality; asthma exacerbation; and acute, lower, and upper respiratory symptoms. Health incidences, and their related costs, are reduced along with miles driven (VMT). Using research-based rates and valuations produced by the American Lung Association, the Rapid Fire model estimates savings (rather than absolute totals) in health incidences and costs to 2035.

Relative to a status quo scenario, the 2012–2035 RTP/SCS scenarios show reductions in health incidences and costs. In 2035, Scenario 1 results in a 20 percent reduction; Scenario 2 results in a 29 percent reduction; Scenario 3 results in a 30 percent reduction; and, Scenario 4 results in a 31 percent reduction. In terms of costs, Scenarios 1, 2, 3, and 4 save $648 million, $932 million, $980 million, and $1.01 billion per year, respectively.

BUILDING ENERGY USE

The 2012–2035 RTP/SCS scenarios vary in their building energy use profiles due to their different mixes of housing types, and the proportion of development in more or less temperate climate zones in the SCAG region. Scenarios that contain more Mixed-Use/Walkable and Urban Infill development accommodate a higher proportion of growth in more energy-efficient housing types like townhomes, apartments, and smaller single-family homes, as well as more compact commercial building types. By contrast, a large proportion of Standard development leads to a higher proportion of larger single-family homes, which are typically less energy-efficient. Location also comes into play—buildings in the warmer areas at the edges of the region and beyond use more energy each year, in part because they require more energy to cool during the summer months.

Variations in land use patterns lead to substantial differences in the amount of electricity and natural gas used. These differences will vary depending on policies regulating how efficient buildings become. Assuming the same efficiency standards for all scenarios, there would be marked differences in energy use due to land use-related variations. Compared to Scenario 1, Scenario 2 uses 7 percent less energy per year; Scenario 3 uses 9 percent less; and Scenario 4 uses 11 percent less.

The overall energy savings that come from developing more compactly translate to meaningful savings in residential energy bills. On average, Scenario 2 saves $700 million per year in total by 2035, or about $100 per household; Scenario 3 saves $900 million, or $120 per household; and Scenario 4 saves $1.2 billion, or $170 per household. Note that these estimates assume only modest, trend-based rises in energy prices—if energy prices climb higher, the savings will be even more substantial.

Conserving energy also reduces GHG emissions. The progressively more compact land uses of Scenarios 2, 3, and 4 would reduce emissions in proportion to energy use as compared to Scenario 1. When combined with the effects of more stringent clean energy policies, which would reduce the amount of GHG emissions for every kilowatt-hour of electricity used, building energy emissions can be reduced even further.

RESIDENTIAL WATER USE

Variations in land use patterns and their related building profiles also lead to substantial differences in residential water use and cost. Residential water use is a function of both indoor and outdoor water needs, with outdoor use (landscape irrigation) accounting for the majority of the difference among housing types. Because homes with larger yards require more water for landscape irrigation, lot size is generally correlated with a household's overall water consumption. Thus, scenarios with a greater proportion of the Standard development, which includes more large-lot (5,500 SF and above) single-family homes, require more water than scenarios with a greater proportion of Mixed-Use/Walkable and Urban Infill development, which include more attached and multifamily homes. And, as is the case for energy use, the location of new development has a significant bearing on water use—homes in warmer areas use more water to maintain lawns and other landscaping.

Water use will vary based on efficiency and conservation policies, which will be increasingly important as California faces future constraints to water supply. Assuming the same modest improvements for all scenarios, we can see the potential savings attributable to land use patterns alone. Compared to Scenario 1, which uses 996 billion gallons of water

per year by 2035, Scenario 2 uses 47 billion gallons, or 4.7 percent, less; Scenario 3 uses 51 billion gallons, or 5.1 percent, less; and Scenario 4 uses 63 billion gallons, or 6.3 percent, less. These savings are equivalent to the average new home using 6,400 fewer gallons per year in Scenario 2; 6,900 fewer gallons in Scenario 3; and 8,700 fewer gallons in Scenario 4.

Saving water also saves on residential water costs. On the whole, Scenario 2 saves $176 million per year in total by 2035; Scenario 3 saves $191 million; and Scenario 4 saves $239 million. These estimates assume trend-based rises in water costs; if water prices rise higher, the cost differences will be greater.

HOUSEHOLD COSTS

Breaking scenario costs down to the household level exposes the impact of land use and policy choices on Southern California households: by 2035, Scenario 1 would cost the average household $15,100 in costs associated with driving and residential energy and water use (2009 dollars). By comparison, Scenario 2 would cost $1,500 less; Scenario 3 would cost $1,750 less; and Scenario 4 would cost nearly $2,000 less. Over time, the differences in annual expenditures would amount to a significant sum for each household—money that could instead be applied to a home mortgage or other living expenses. This difference is further exacerbated if considering the effect of local infrastructure cost burdens, which are typically passed on to homeowners and renters in the form of taxes, fees, home prices, and assessments.

GREENHOUSE GAS (GHG) EMISSIONS FROM PASSENGER VEHICLES AND BUILDINGS

Combined transportation and building sector impacts provide the most complete picture of the greenhouse gas emissions and fiscal implications of the futures presented by the 2012–2035 RTP/SCS scenarios. Passenger vehicle transportation, along with residential and commercial building energy use, currently account for over half of total carbon emissions in California. Land use and transportation planning at the regional level, in conjunction with statewide policies in regulating energy emissions and efficiency, will be crucial to meeting the state's goals for GHG reductions, as well as its fiscal health.

Total GHG emissions—including those from passenger vehicles, and emissions associated with residential and commercial building energy consumption—vary across the 2012–2035 RTP/SCS scenarios due to their differences in land use patterns. In 2035, Scenario 1, with the highest proportion of growth occurring as Standard development, would produce 96 MMT of annual GHG emissions from buildings and passenger vehicle transportation. Emissions decrease as land use patterns become more compact: in comparison to Scenario 1, Scenario 2 results in 8 percent lower emissions; Scenario 3 results in 10 percent lower emissions, and Scenario 4 results in nearly 12 percent lower emissions.

C. Rapid Fire Model Technical Summary

RAPID FIRE MODEL

Technical Summary
Model Version 2.0

CALTHORPE ASSOCIATES
URBAN DESIGNERS. PLANNERS. ARCHITECTS

Revised: Jan 2011

CALTHORPE ASSOCIATES
URBAN DESIGNERS. PLANNERS. ARCHITECTS

INTRODUCTION and RAPID FIRE MODEL OVERVIEW

This technical summary provides an overview of the key features and functionality of the *Rapid Fire* model developed by Calthorpe Associates. The Rapid Fire model is designed to produce and evaluate statewide, regional, and/or county-level scenarios across a range of metrics. This document is intended to impart a fundamental understanding of how Rapid Fire scenarios are formulated and analyzed. A more detailed description of the model, including a step-by-step tour through the model's user interface and technical information about all model calculations and assumptions, is available in the *Rapid Fire White Paper and Technical Guide*.

The Rapid Fire Modeling Framework

The Rapid Fire model emerged out of the near-term need for a comprehensive modeling tool that could inform state, regional, and local agencies and policy makers in evaluating climate, land use, and infrastructure investment policies. Results are calculated using empirical data and the latest research on the role of land use and transportation systems on automobile travel; emissions; public health; infrastrucutre cost; city revenues; and land, energy, and water consumption. The model constitutes a single framework into which these research-based assumptions can be loaded to test the impacts of varying land use patterns. The transparency of the model's structure of input assumptions makes it readily adaptable to different study areas, as well as responsive to data emerging from ongoing technical analyses by state, regional, and local agencies.

The model allows users to create scenarios at the national, statewide, or regional scales. Results are produced for a range of metrics, including:

- GHG (CO_2e) emissions from cars and buildings
- Air pollution
- Fuel use and cost
- Building energy use and cost
- Residential water use and cost
- Land consumption
- Fiscal impacts (local capital infrastructure and O&M costs; city revenues)
- City revenues
- Public health impacts

The Rapid Fire model is not meant to replace more complex travel models or map-based models; rather, it is designed to fill a timely need for defensible comparative analysis that can inform land use and climate policy development and provide a credible and flexible sounding board for state and regional entities as they review and analyze plans and policies. More information about model results and the Vision California process can be found at *www.visioncallifornia.org* and at *www.calthorpe.com/vision-california*.

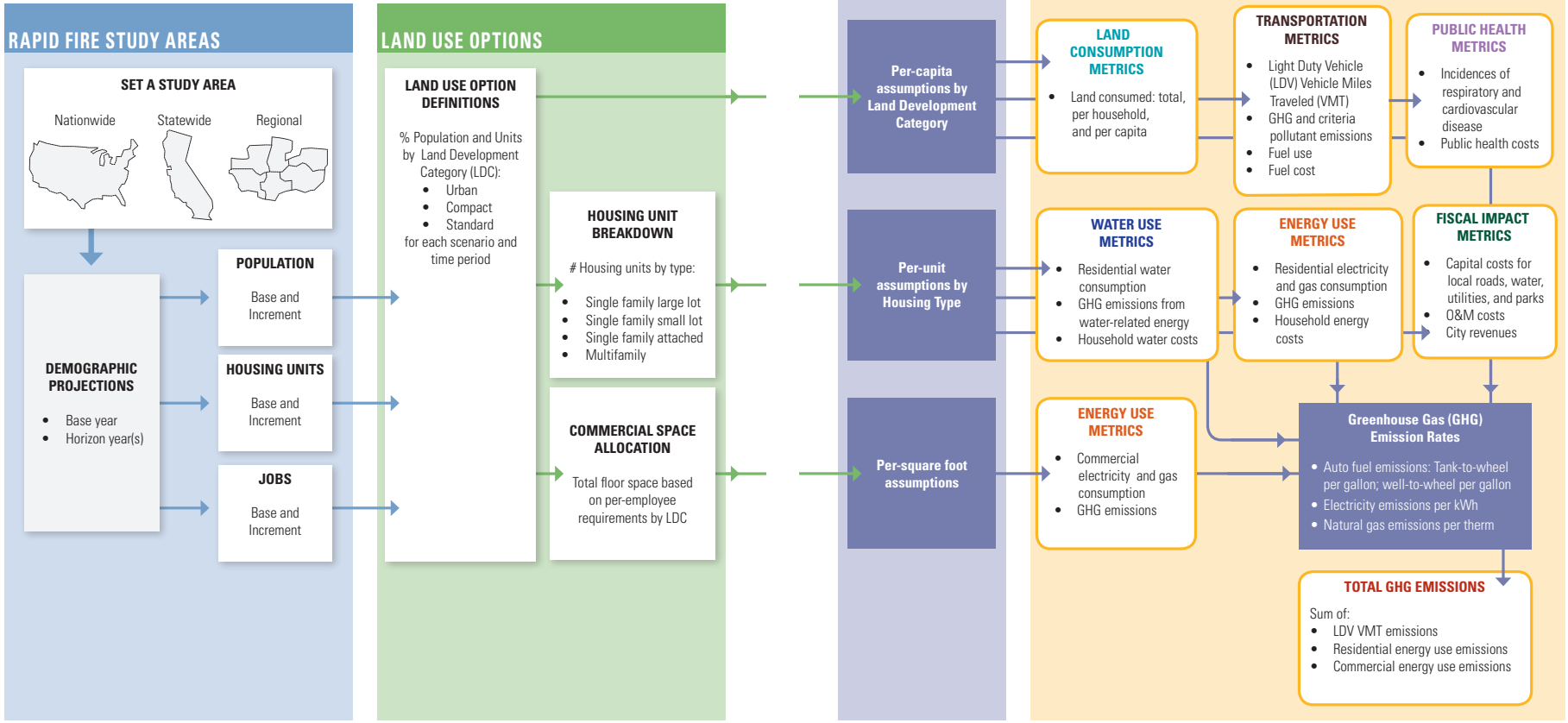
This document starts with an overview of the operational flow of the model, continues with an explanation of how study areas are set and how scenarios are composed, and finally describes how assumptions are applied to calculate results in each metrics category.

Technical Requirements. *The Rapid Fire model is a user-friendly, spreadsheet-based tool that allows for efficient testing of different combinations of compact, urban, and more sprawling growth. The model, which runs in Microsoft Excel, is designed to be flexible and transparent. All assumptions are clear and can be easily modified or customized.*

RAPID FIRE OPERATIONAL FLOW

From Input Assumptions to Output Metrics

The Rapid Fire model uses a full range of inputs, from demographic projections to travel behavior projections to technical factors for fuel and energy emissions, to calculate output metrics that demonstrate the relative effects of different land use scenarios and policy options. The following chart gives an overview of the operational flow of the model, starting from the selection of a study area, through the application of land use options and policy packages, to the final stage of metrics output. The chart generally categorizes the input assumptions by type; all assumptions are discussed in greater detail in the later sections of this paper.



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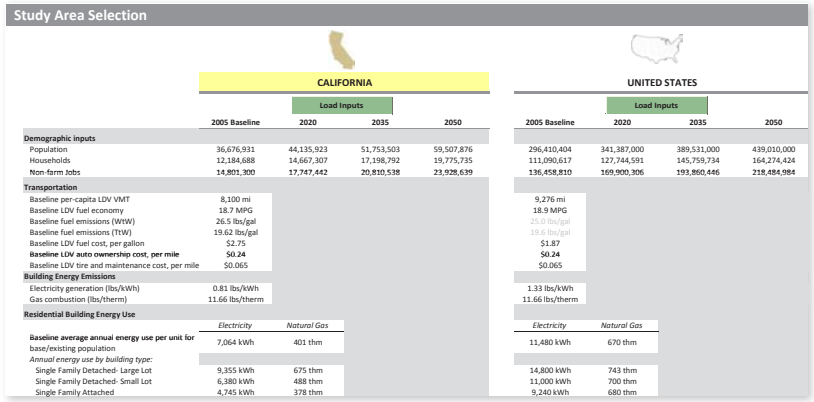
RAPID FIRE STUDY AREAS

Study areas can range in size, from the local to the national scale, so long as data are available. Study areas are defined by baseline demographic and performance data for an initial base year, and demographic projections for three horizon years. By default, the model uses a base year of 2005 and horizon years of 2020, 2035, and 2050, though these can be modified.

At a minimum, the following key assumptions (as listed in the table) are required to define a study area. These inputs are all geographically dependent – they vary according to study area rather than according to policy or other methodological assumptions.

Demographics	*Transportation*	*Building Energy*	*Water*
• *Baseline and projected population* • *Baseline and projected households* • *Baseline and projected jobs*	• *Average per-capita vehicle miles traveled (VMT)* • *Average LDV fuel economy* • *Baseline GHG emissions per gallon of fuel* • *Baseline auto ownership and maintenance costs per mile*	• *Baseline average energy use per existing residential unit and commercial square foot (can be derived from total residential and commercial energy use)* • *Baseline energy use by residential building type and commercial square foot* • *GHG emissions per kilowatt-hour (kWh) of electricity* • *GHG emissions per therm of natural gas* • *Baseline energy costs per kWh and therm*	• *Baseline residential water use per existing unit (can be derived from total water use)* • *Baseline per-capita water use*

Study Area Selection Sheet. *Input data are entered, stored, and loaded from the Study Area Selection sheet.*



Study Area Selection

	CALIFORNIA				UNITED STATES			
		Load Inputs				Load Inputs		
	2005 Baseline	2020	2035	2050	2005 Baseline	2020	2035	2050
Demographic inputs								
Population	36,676,931	44,135,923	51,753,503	59,507,876	296,410,404	341,387,000	389,531,000	439,010,000
Households	12,184,688	14,667,307	17,198,792	19,775,735	111,090,617	127,744,591	145,759,734	164,274,424
Non-farm Jobs	14,801,300	17,747,442	20,810,538	23,928,639	136,458,810	169,900,306	193,860,446	218,484,984
Transportation								
Baseline per-capita LDV VMT	8,100 mi				9,276 mi			
Baseline LDV fuel economy	18.7 MPG				18.9 MPG			
Baseline fuel emissions (WtW)	26.5 lbs/gal				25.0 lbs/gal			
Baseline fuel emissions (TtW)	19.62 lbs/gal				19.6 lbs/gal			
Baseline LDV fuel cost, per gallon	$2.75				$1.87			
Baseline LDV auto ownership cost, per mile	**$0.24**				**$0.24**			
Baseline LDV tire and maintenance cost, per mile	$0.065				$0.065			
Building Energy Emissions								
Electricity generation (lbs/kWh)	0.81 lbs/kWh				1.33 lbs/kWh			
Gas combustion (lbs/therm)	11.66 lbs/therm				11.66 lbs/therm			
Residential Building Energy Use								
	Electricity	*Natural Gas*			*Electricity*	*Natural Gas*		
Baseline average annual energy use per unit for base/existing population	7,064 kWh	401 thm			11,480 kWh	670 thm		
Annual energy use by building type:								
Single Family Detached- Large Lot	9,355 kWh	675 thm			14,800 kWh	743 thm		
Single Family Detached- Small Lot	6,380 kWh	488 thm			11,000 kWh	700 thm		
Single Family Attached	4,745 kWh	378 thm			9,240 kWh	680 thm		

LAND USE OPTIONS

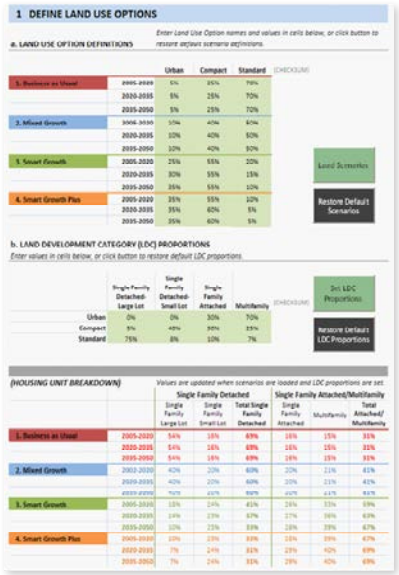
The Rapid Fire model analyzes up to four scenarios at a time. Each scenario consists of two components: a *land use option* and a *policy package*. The land use options vary the patterns of new growth, while the policy packages vary standards for automobile technology and fuel composition; building energy and water efficiency; and energy generation.

Land Use Options

The land use options all accommodate the same amount of projected population and job growth, but differ in how that growth is allocated. The user defines a land use option by varying the proportions of growth in each of three *Land Development Categories (LDCs)* – Urban, Compact, and Standard. The LDCs represent distinct forms of land use, ranging from dense, walkable, mixed-use urban areas that are well served by transit, to lower-intensity, less walkable places where land uses are segregated and most trips are made via automobile. Each LDC is associated with different travel behaviors and a different mix of housing types and commercial space profiles, as described generally on the next page.

The Rapid Fire model is loaded with four default land use options – ***Business as Usual, Mixed Growth, Smart Growth, and Smart Growth Plus*** – all which can be modified by the user. The figure at right shows the area of the Scenario Definition sheet in which land use options and the housing unit mixes of each LDC are defined. The definition and resulting housing type mix of an example land use option is outlined in the diagram on page 9.

Land Use Option Section of Scenario Definition Sheet. *Proportions for land use options and LDCs are set in the Land Use Option section of the Scenario Definition sheet.*



LAND USE OPTIONS

Land Development Categories

The Urban, Compact, and Standard LDCs represent distinct forms of land use. Their general land use characteristics and transportation infrastructure are described below. These characteristics are all determined by model inputs that can be entered or adjusted by the user.

	Land Use Characteristics	Transportation Infrastructure
URBAN	Most intense and most mixed LDC, often found within and directly adjacent to moderate and high density urban centers. Virtually all 'Urban' growth would be considered infill or redevelopment. The majority of housing in Urban areas is multifamily and attached single family (townhome). These housing types tend to consume less water and energy than the larger single family types found in greater proportion in less urban locations.	Supported by high levels of regional and local transit service. Well-connected street networks and the mix and intensity of uses result in a highly walkable environment and relatively low dependence on the automobile for many trips. **Per-capita VMT range: ~ 1,500 to 4,000 per year.**
COMPACT	Less intense than Urban LDC, but highly walkable with rich mix of retail, commercial, residential, and civic uses. The Compact form is most likely to occur as new growth on the urban edge or large-scale redevelopment. Rich mix of housing, from multifamily and attached single family (townhome) to small- and medium-lot single family homes. Housing types in Compact areas tend to consume less energy and water than the larger types found in the Standard LDC.	Well served by regional and local transit service, but may not benefit from as much service as Urban growth, and is less likely to occur around major multimodal hubs. Streets are well connected and walkable, and destinations such as schools, shopping, and entertainment areas can typically be reached via a walk, bike, transit, or short auto trip. **Per-capita VMT range: ~ 4,000 to 7,500 per year.**
STANDARD	Represents the majority of separate-use auto-oriented development that has dominated the American suburban landscape over the past decades. Densities tend to be lower than Compact LDC, and are generally not highly mixed or organized to facilitate walking, biking, or transit service. Can contain a wide variety of housing types, though medium- and larger-lot single family homes comprise the majority of this development form; these larger single family tend to consume more energy and water than those in the Urban or Compact LDCs.	Not well served by regional transit service (typically), with most trips made via automobile. **Per-capita VMT range: ~ 9,500 to 18,000 per year.**

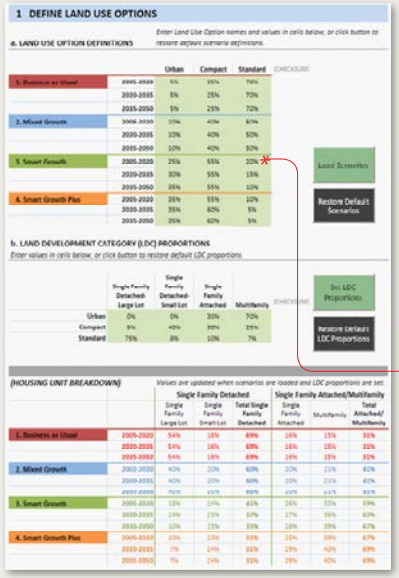
Housing Unit Mix

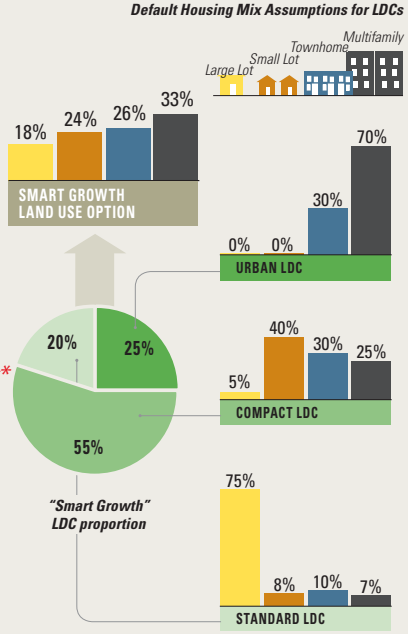
The housing mix assumptions for the three LDCs lead to an overall mix of housing units for each land use option and time period. The default housing mix assumptions for the LDCs are intended to reflect existing land use patterns and policies, and thus remain constant for each LDC over time. Housing unit mix assumptions can be changed to represent shifts in housing demand over time, or to represent different market conditions among land use options.

Urban areas are comprised of multifamily and attached single family units. Compact areas contain the widest range of housing types, from multifamily and attached single family to small-lot single family units, with a small proportion of large-lot single family units. Standard development is dominated by large-lot single family units, with small proportions of other housing types. The LDC and housing unit mix assumptions for the default "Smart Growth" land use option are shown below.

Assumptions by Land Development Category

The housing unit mix assumptions are applied to the housing growth projected for each LDC (determined by the proportion of population growth allocated to the LDC within a scenario/time period) to produce housing counts by type.





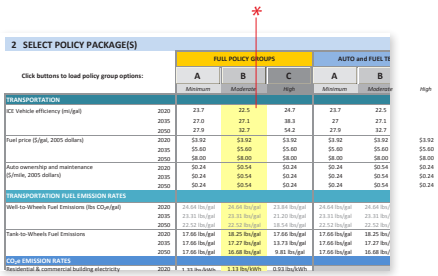
POLICY PACKAGE ASSUMPTIONS

Rapid Fire policy packages vary standards for automobile technology and fuel composition, building energy and water efficiency, and energy generation. *Auto and Fuel Technology* assumptions include those that guide vehicle efficiency, fuel emissions, and costs; *Building Efficiency* assumptions include building energy and water use standards as well as utility costs; and *Utility Portfolio* assumptions drive the carbon intensity of the power generation sector.

Policy-based input assumptions are grouped to represent different levels of improvement in each of these categories. While users can enter any combination of input assumptions, the policy packages allow users to instantly activate and switch between sets of assumptions to compare results. The components of the policy package categories are outlined in the table below.

As with the land use options, the policy packages can reflect a range of futures, from a business-as-usual case that continues current trends, to a progressive case that represents significant policy action. Users can enter values to define up to three alternate policy packages in each category.

Policy Package Selection Section of Scenario Definition Sheet. *The policy packages are organized in sections on the 'Scenario Definition' sheet as shown below. Clicking on the buttons labeled A, B, and C at the top of each column loads input values to the 'Active Scenario' column located at the right of the 'Utility Portfolio' section (not shown). Users can select a 'Full Policy Group' of minimum, moderate, or high options, or they can select an option for each individual policy group. Once selected, the cells containing the active input values are highlighted in yellow (*). *In this sample view, the 'moderate' level full policy group is selected.*



Auto and Fuel Technology	*Building Efficiency*	*Utility Portfolio*
• *Internal combustion engine (ICE) vehicle fuel efficiency (miles per gallon)* • *Fuel price ($ per gallon)* • *Well-to-wheels GHG emissions from fuel (lbs CO2e per gallon)* • *Tank-to-wheels GHG emissions from fuel (lbs CO2e per gallon)* • *Percent alternative/electric vehicles* • *Battery electric vehicle efficiency (miles/kWh)* • *Plug-in hybrid electric vehicle efficiency (miles/kWh)*	• *New residential energy efficiency (% reduction from 2005 baseline use)* • *New commercial energy efficiency (% reduction from 2005 baseline use)* • *New residential water efficiency (% reduction from 2005)* • *Energy efficiency/conservation improvements for base/existing residential building stock (year-upon-year % reduction)* • *Energy efficiency/conservation improvements for base/existing commercial space (year-upon-year % reduction)* • *Percent of base/existing residential buildings replaced each year* • *Percent of base/existing commercial floorspace replaced each year* • *Electricity price ($ per kWh)* • *Natural gas price ($ per kWh)* • *Water price ($ per acre foot)*	• *Residential & commercial building electricity emissions (lbs CO_2e per kWh)* • *Residential & commercial building natural gas emissions (lbs CO_2e per therm)*

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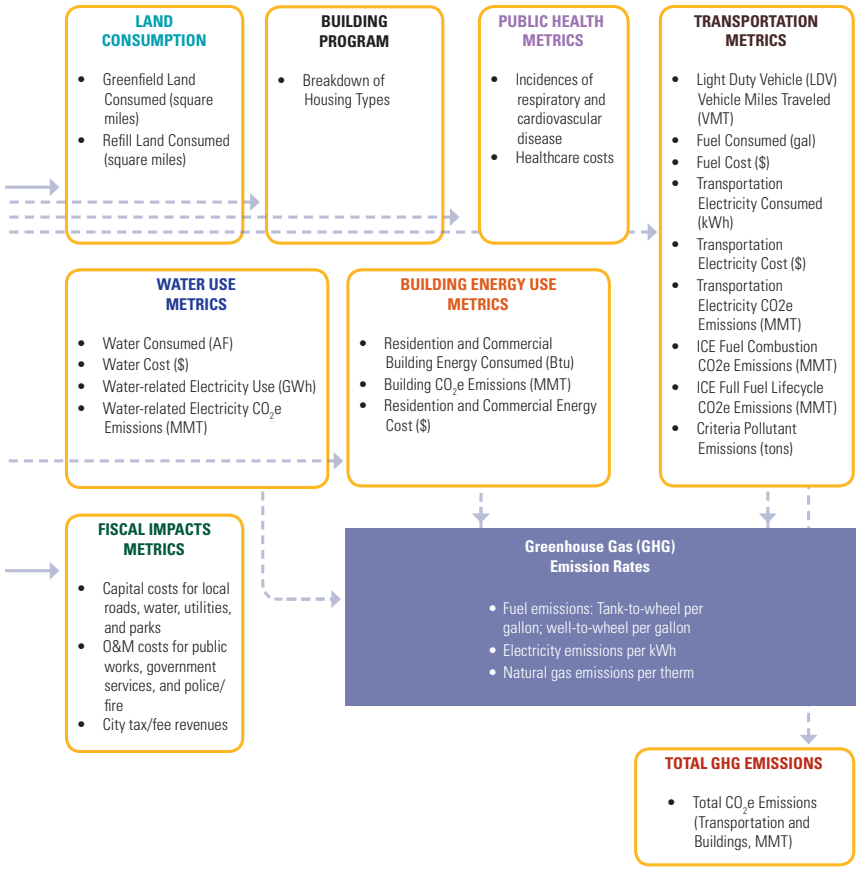
OUTPUT METRICS

The following sections describe how the model uses input assumptions to calculate results in each of the metrics categories. The categories of output metrics are summarized below.



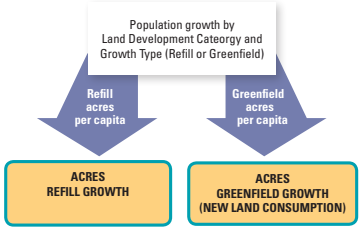
LAND CONSUMPTION

Land consumption includes all land that will be developed to accommodate population and job growth, including residential and employment areas, transportation alignments, open space, and public lands. The Rapid Fire model estimates land consumption using per-capita rates of land consumption, which vary by Land Development Category and the distribution of growth into greenfield or refill development. Default rates are based on studies of existing and planned development, and can be adjusted by the user.

Land consumption includes both refill and greenfield growth. Refill growth includes all development that may occur within the bounds of already-developed, urbanized areas, including infill, redevelopment, and greyfield and brownfield development. Greenfield growth refers to development that occurs on land that has not previously been developed or otherwise impacted, including agricultural land, forest land, desert land and other virgin sites. Only greenfield growth is counted towards the "new land consumption" of a scenario. The default land consumption characteristics for the three LDCs are as follows:

Urban: Comprised entirely of infill, redevelopment, greyfield, and brownfield growth, the Urban LDC consumes no greenfield acreage per capita.

Compact: Representing a combination of smart mixed-use growth in and around the urban edge (greenfield growth) as well as larger-scale greyfield growth within urban areas, the Compact LDC consumes a moderate acreage per capita. The land consumption rate for Compact growth is determined in part by the proportion of growth allocated to refill versus greenfield sites.



Standard: Generally consisting of lower-density, auto-oriented residential and commercial development, the Standard LDC consumes the highest acreage per capita since most, if not all, growth occurs on greenfield land. The new land consumption of a scenario is largely dictated by its proportion of Standard development.

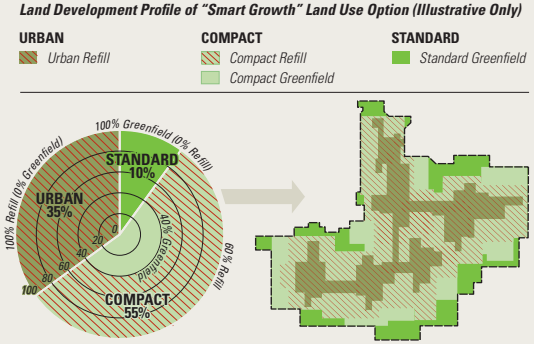
The specific allocation of growth to either refill or greenfield land in each LDC and time period can vary by land use option. By setting assumptions for the proportion of refill growth and greenfield land consumption, as well as the intensity of greenfield growth in terms of acres consumed per capita, users can model a range of land-use policy options, from business-as-usual growth, to the application of urban growth boundaries, to a restriction of growth to refill parcels and sites only.

A land development profile resulting from the LDC mix of the Rapid Fire default "Smart Growth" land use option is illustrated in the figure below.

Refill Growth and Greenfield Land Consumption

The LDCs differ significantly in the population allocated to either refill growth or greenfield land. The assumed proportions for Urban and Standard are straightforward: all Urban development takes place as refill growth, while virtually all Standard development takes place on greenfield land. These characteristics are elemental to the Urban and Standard LDC definitions. The land consumption characteristics of Compact development, however, can vary significantly over time, by scenario, and by geographic area. The incremental land consumption rate of the Compact LDC is largely dependent on the assumed proportion of refill growth vs. development on new land.

Land Development Profile of "Smart Growth" Land Use Option (Illustrative Only)



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FISCAL IMPACTS

The Rapid Fire model's fiscal impacts analysis module allows users to compare the cost and budget implications of varying scenarios and forms of development. The Rapid Fire model incorporates cost and revenue data from a number of local, regional, state, and utility sources to derive infrastructure cost factors on a per-housing unit basis according to land use option and development condition (refill or greenfield). Estimates are made for capital infrastructure costs, operations and maintenance costs, and city revenues from taxes and fees.

Capital costs for the following infrastructure elements are included:

- City costs for streets and transportation
- Water supply
- Sewage and wastewater
- Local parks

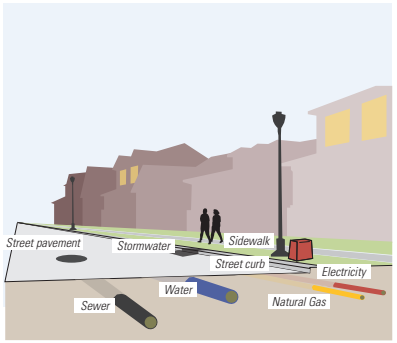
Operations and maintenance (O&M) costs estimates include the following categories of general fund spending:

- Public works functions
- General government services
- Public safety (police and fire)
- Community services

Jurisdictional revenues are estimated from the following tax and fee types:

- Property tax
- Property transfer tax
- Vehicle license fees

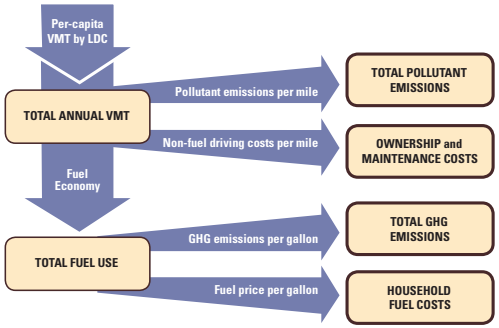
Calthorpe Associates worked with the firm Strategic Economics to develop the assumptions that drive infrastructure cost estimates and jurisdictional revenues. Assumptions are sensitive to development type and condition, including cost and revenue variations for both refill (infill and redevelopment) and greenfield locations. Note that the current version of the model estimates the impacts of variations in residential development unit types and patterns; future versions will incorporate the fiscal impacts due to commercial development variations.



TRANSPORTATION

All transportation metrics in the Rapid Fire model are calculated on the basis of light-duty/ passenger vehicle miles traveled (VMT). From VMT, the model estimates fuel use, greenhouse gas (GHG) and criteria pollutant emissions, and fuel and other driving costs.

Criteria pollutant emissions and non-fuel driving costs are calculated by applying per-mile assumptions to VMT. Fuel use is calculated according to vehicle fuel economy assumptions. In turn, GHG emissions are calculated based on per-gallon emission rates. All metrics are calculated on a total annual basis for every year leading up to the final horizon year. Per-capita and per-household averages are derived from annual and cumulative totals.



Vehicle Miles Traveled

The Rapid Fire model calculates VMT by applying assumptions about per-capita annual VMT to population growth. These assumptions, which differ by Land Development Category, are based on research and empirical evidence that per-capita VMT of both incremental (new) population and base year (existing) population vary based on the form of new growth.[1] Moreover, this variation is expected to change over time as areas become either more urban or compact, or more sprawling (determined on the proportions of LDCs in a scenario).

Variations in VMT across the scenarios is a result of year-by-year variation in per capita VMT by form of new growth (Urban, Compact, or Standard), and also the impact of new growth on the travel behavior of those already living in the study area in the base year (2005). For example, if one is living in an area 20 years from now that has seen increased transit service and/or new retail development in close proximity to their home or workplace, it is likely that they will drive less (and walk, bike, or take transit more) because daily destinations and services are closer.

It is an a priori assumption of the Rapid Fire model that requisite transportation investments go hand in hand with growth patterns, such that scenarios with a greater focus on Compact and Urban development would see increased transit, bicycle, pedestrian, streetscape, and livability investments. Conversely, scenarios dominated by Standard development would see large budget outlays to highway and road expansion.

Base and Increment VMT Rates

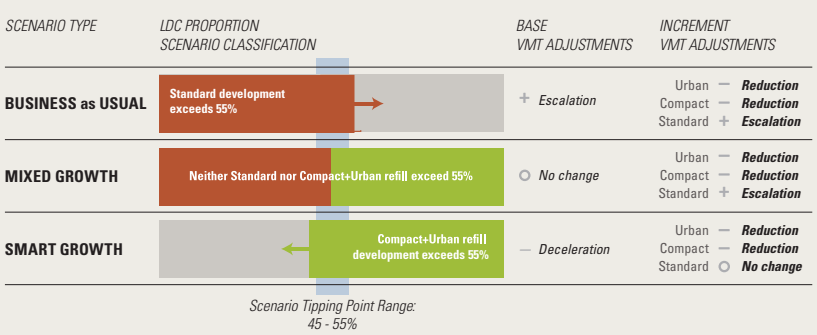
The Rapid Fire VMT assumptions are applied as adjustment factors to both incremental growth and the base year (existing) population. The user defines specific percentage increases or reductions from a baseline average VMT rate (which is specific to a study area).

For the growth increment, adjustment factors for each LDC within a land use option are applied to the baseline per-capita VMT rate. For the base population, adjustment factors are applied to total base year VMT. Varying factors are applied depending on the mix of LDCs in a specific scenario, and the amount of growth that occurs on refill or greenfield land (see the Land Consumption section for more information about refill and greenfield growth). The figure on the next page summarizes the relationship between scenario mix and the application of VMT adjustment factors.

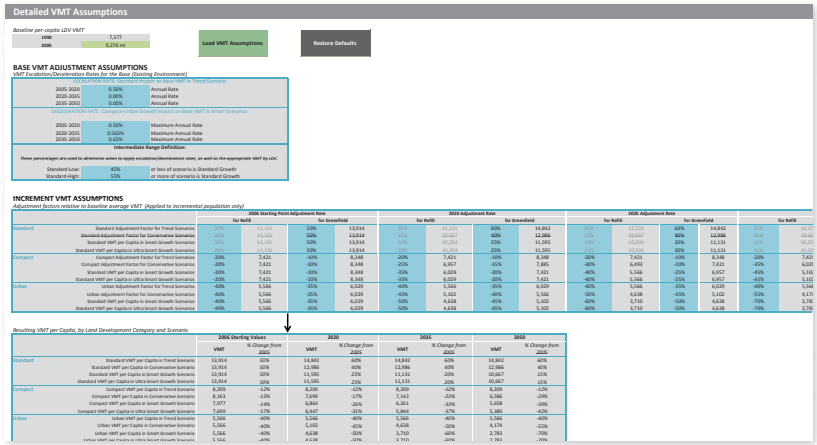
All VMT assumptions can be readily changed in the Rapid Fire model to test alternative hypotheses, integrate new empirical data, or calibrate to regional travel or other model outputs. For more detailed information about specific assumptions and their application, please refer to the *Rapid Fire Model White Paper and Technical Guide.*

TRANSPORTATION

Base and Increment VMT Adjustment Factors by Scenario Type. *If a scenario is more oriented towards Standard development, then VMT is calculated to increase at a greater rate than if a scenario is more focused towards Urban and Compact growth. Overall scenario orientation is determined using a "tipping point" range. If Standard development falls below the range, adjustment factors reflective of progressively decreasing VMT are applied; conversely, if Standard development surpasses the range, factors reflective of increasing VMT are applied. If Standard development falls within the tipping point range, then driving behavior does not change further beyond the default rates.*



Detailed VMT Assumptions Sheet. *Inputs are entered, stored, and loaded from the Study Area Selection sheet.*



TRANSPORTATION

The Rapid Fire model calculates transportation fuel use, GHG and criteria pollutant emissions, and costs by applying policy-based assumptions to output VMT. Each metric is calculated on a total annual basis for all years in the model.

Fuel Use

LDV fuel consumption is determined by applying on-road average fuel economy assumptions (miles per gallon of gasoline equivalent[2], or MPG) to VMT in each year for each scenario. Fuel economy changes year upon year according to horizon-year projections. Policy-based projections significantly affect fuel consumption, and thus GHG emission and fuel cost results. Users can easily input and test alternate assumptions, such as compliance with California's Pavley Clean Car Standards or the federal CAFE standard, either in isolation or in combination with fuel carbon intensity assumptions.

Electric and other low-emission vehicles will play an important role in reducing GHG emissions. The Rapid Fire model can reflect their impacts in either of two ways: through the use of fuel economy and emission assumptions that implicitly capture the effects of their inclusion in the fleet[3], or through the use of separate assumptions for electric and conventional (internal combustion engine) vehicles. More information about how the model estimates electric and alternative vehicle impacts can be found in the *Rapid Fire Model White Paper and Technical Guide.*

GHG Emissions

Transportation GHG emissions are calculated by applying carbon intensity assumptions, expressed in pounds of carbon dioxide equivalent (CO_2e) per gallon, to fuel consumption. Carbon intensity changes year upon year according to horizon-year projections. Projections can represent a range of standards, from a trend future in which carbon intensity remains constant or sees limited improvement, to a more aggressive policy-based future in which the carbon intensity of fuel declines significantly as low-carbon fuels, such as cellulosic ethanol and renewable biodiesel, comprise a higher proportion of fuel use.

The Rapid Fire model was designed to calculate emissions that occur upon fuel combustion ("tank-to-wheel" emissions), as well as those emitted during the full fuel lifecycle, from extraction and processing to transport and storage ("well-to-wheel" emissions). Users can look to either or both; typically, emission inventories compare tank-to-wheel emissions, although full well-to-wheel assessments are critical to developing climate change mitigation strategies. The Rapid Fire model is able to calculate both types of emission rates based on fuel mix assumptions, enabling an analysis of the role of fuel carbon intensity standards in meeting GHG reduction goals. More often, though, users will opt to model tank-to-wheel emissions on the basis of a baseline carbon intensity factor and projected reductions from it to each horizon year.

Fuel and other Driving Costs

The Rapid Fire model estimates three components of transportation costs, including fuel, auto ownership, and tires and maintenance. These costs are calculated separately using different assumptions. Fuel costs are calculated by multiplying fuel consumed by fuel price per gallon. Auto ownership and tire and maintenance costs are each calculated by multiplying VMT by an average price-per-mile factor. All per-gallon and per-mile prices change year upon year according to horizon-year projections.

Pricing Effects

Because fuel price, along with other driving costs, have been shown to have both short- and long-term effects on driving decisions, the Rapid Fire model allows users the option to "turn on" sensitivity to changes in per-mile driving costs to estimate changes in VMT due to pricing. Research into historic patterns has quantified relationships among the interrelated factors of VMT and automobile fuel economy with costs including fuel price and taxes; automobile ownership, insurance, and maintenance costs; and parking, toll, and congestion charges. The results, expressed as an "elasticity" of change in one factor with respect to change in another, can be used to estimate the effects of specific policy- or program-based assumptions on VMT.

RESIDENTIAL and COMMERCIAL BUILDING ENERGY

The Rapid Fire model calculates residential and commercial building energy use for both new and existing buildings. Scenarios vary in their building energy use profiles due to their building program and policy-based assumptions about improvements in energy efficiency.

Residential Energy Consumption

Residential energy use in the Rapid Fire model is calculated as a function of three basic sets of assumptions: a) average base-year energy use for existing units; b) base-year (2005) energy use for new units by building type; and c) reductions in building energy use resulting from advances in building energy efficiency policy and technology.

Energy Use of Base/Existing Buildings

Average per-household energy use for existing units is derived from total residential sector electricity and gas use and number of housing units in the baseline year (2005). The energy used by the population of existing units is expected to decline over time, as buildings are replaced, retrofitted, or upgraded. The extent of future energy savings due to each of these conditions are determined by user-specified rates.

Energy Use of New Buildings

Energy use for new units is calculated using per-unit factors for annual electricity and gas use. Reductions are applied to the baseline factors to reflect the assumption that, year-upon-year, new construction will be built to meet higher efficiency standards. It is also expected that new buildings can see further improvement over the time span of the model (for instance, a building built in 2011 may be retrofit by 2035 to meet even higher standards). The application of the energy use reduction assumptions applied to both new and existing units is shown in the flow chart on the following page.

Commercial Energy Consumption

As for residential energy use, commercial energy use in the Rapid Fire model is calculated as a function of three basic sets of assumptions: a) per-employee floorspace factors, b) baseline (2005) energy intensity factors, and c) reductions in building energy use resulting from advances in building energy efficiency policy and technology.

Energy Use of Base/Existing Buildings

Average per-square foot energy use for existing commercial buildings is derived from total commercial sector electricity and gas use and a floorspace estimate for the baseline year (2005). The energy used by existing buildings is expected to decline over time, as buildings are replaced, retrofitted, or upgraded. The extent of future energy savings due to each of these conditions are determined by user-specified rates.

Energy Use of New Buildings

Energy use for new commercial floorspace is calculated using per-square foot energy intensity factors for annual electricity and gas use. Reductions are applied to the baseline factors to reflect the assumption that, year-upon-year, new construction will be built to meet higher efficiency standards. It is also expected that new buildings can see further improvement over the time span of the model (for instance, a building built in 2011 may be retrofit by 2035 to meet even higher standards). The application of the energy use reduction assumptions applied to both new and existing units is shown in the flow chart on the following page.

The amount of new commercial space in each scenario is calculated using assumptions about the number of employees by commercial space type (office, retail, or warehouse), and the amount of floorspace required per employee in each of the three Land Development Categories. Floorspace requirements are highest in the Standard LDC, and lowest in the Urban LDC. The number of employees by type, which is held constant for all scenarios, is projected based on demographic assumption inputs.

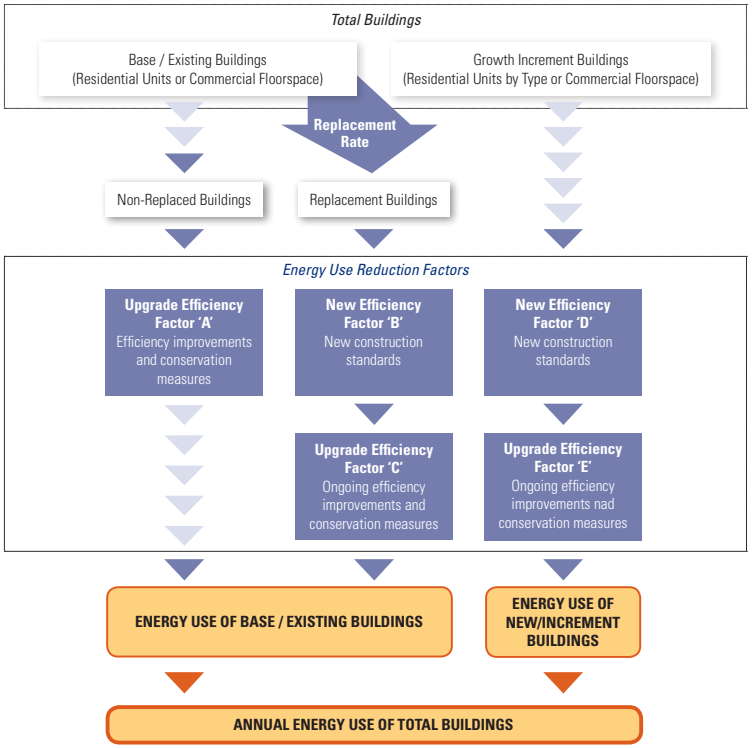
Baseline Annual Household Energy Use by Building Type*

Large Lot Single Family	Small Lot Single Family	Attached Single Family	Multifamily
100 million Btu	71 million Btu	54 million Btu	38 million Btu

** California averages, including residential electricity and natural gas use. Derived from the California Energy Commission Statewide Residential Appliance Saturation Survey (RASS), 2004.*

Baseline Residential Energy Use. *Because larger homes require more energy to heat and cool, home size is generally correlated with a household's overall energy consumption. Scenarios with a greater proportion of the Standard Land Development Category, which include primarily single-family detached homes, will require more energy – and produce more GHG emissions – than scenarios with a greater proportion of Compact or Urban areas, which include more attached and multifamily homes. Energy use also varies by climate zone, which can be reflected in the Rapid Fire model.*

RESIDENTIAL and COMMERCIAL BUILDING ENERGY



RESIDENTIAL and COMMERCIAL BUILDING ENERGY

Greenhouse Gas Emissions

Building GHG emissions include total emissions from residential and commercial electricity and natural gas use. Emission results are calculated based on energy consumption and emission rates, which are assumed to vary according to the mix of resources used to generate energy. The baseline and projected emission rates are measured per unit of energy consumed (kilowatt-hour or therm), and include carbon dioxide, methane, and nitrous oxide emissions in units of carbon dioxide equivalent (CO_2e). The same emission rates are applied to the energy used by residential and commercial buildings.

Emission Rate Assumptions

Projections are made for the horizon years of 2020, 2035, and 2050, with rates following a straight-line trend in between. The emission rate for electricity generation can be expected to decline over time, while that for natural gas use can be expected to remain constant. As with all Rapid Fire assumptions, users can enter different inputs to test the results of different policy-based projections, for instance comparing the effects of achieving California's 33% Renewables Portfolio Standard (RPS) by 2020, or by a later date.

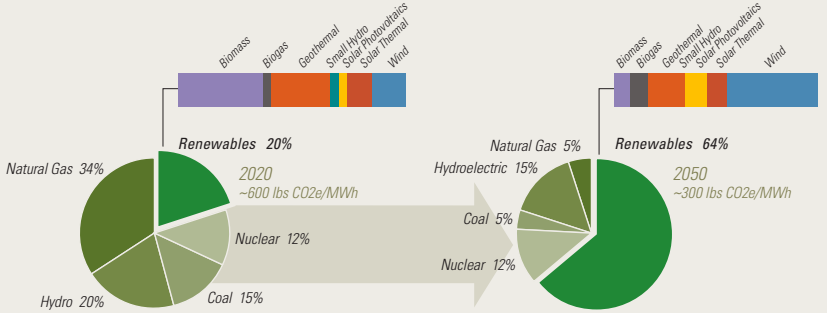
When available, absolute projections based on analyses specific to a state or region should be used. Because emissions from electricity are subject to a number of interrelated variables that can affect resource mix and emission rates into the future – including fuel price and availability, generation costs, energy use efficiency, the market penetration of renewable energy technologies, and the amount of electricity imported from other areas – rates are technically challenging to estimate. In the absence of such projections, users can enter emission rate projections calculated as simple percentage reductions from the baseline emission rate. For a detailed discussion of energy emission rate assumptions and their application in the model, please refer to the *Rapid Fire Model White Paper and Technical Guide*.

Energy Costs

Residential and commercial energy costs are calculated on the basis of energy use and price assumptions. The model applies separate retail price factors to residential and commercial electricity and natural gas use. Price projection assumptions are expressed in constant dollars, and like all assumptions are entered for the horizon years of 2020, 2035, and 2050. Between horizon years, prices are assumed to follow a straight-line trend.

Electricity prices are expected to increase over time, in response to changes in the portfolio mix and other factors such as the cost of electricity generation resources, various infrastructure costs, overall supply and demand, and potential regulations. Electricity price projections can be estimated to correspond generally with the portfolio mix inherent to the chosen GHG emission rate assumptions, or estimated as simple percentage increases over the baseline price. Natural gas price projections can be estimated similarly.

Resource Mix and Emission Rates. *Electricity greenhouse gas (CO_2e) emissions vary based on the mix of resources used. As the share of clean and renewable energy sources in the electricity generation portfolio is increased, the average electricity emission rate will decrease. Electricity emissions are estimated based on assumed rates in 2020, 2035, and 2050. The diagram below illustrates a hypothetical move toward a cleaner portfolio and lower emission rate.*



RESIDENTIAL WATER USE

Water Consumption

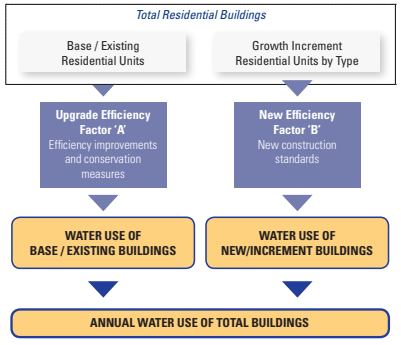
Residential water use in the Rapid Fire model is calculated as a function of three basic sets of assumptions: a) average base-year water use for existing units; b) base-year (2005) water use for new units by building type; and c) reductions in building water use resulting from advances in water efficiency policy and technology.

Water Use of Base/Existing Buildings

Average per-household water use for existing units is derived from total residential sector water use and housing units for the baseline year (2005). The energy used by the population of existing units is expected to decline over time, as water-saving measures are implemented. The extent of future energy savings due to each of these conditions are determined by user-specified rates – expressed as percentage reductions from baseline use – to each horizon year.

Water Use of New Buildings

Water use for new units is calculated using annual per-unit usage factors, which vary by building type. Reductions are applied to the baseline factors to reflect the assumption that, year-upon-year, new homes will be built with the technology to meet higher efficiency standards. It is also expected that new buildings can see further improvement over the time span of the model (for instance, a building built in 2011 may be upgraded by 2035 to meet even higher standards). The application of the water use reduction assumptions applied to both new and existing units is represented in the flow chart below.



Water Costs

Residential water costs are calculated on the basis of water use and retail water price assumptions. Water price projections are expressed in constant dollars per acre-foot, and like all assumptions are made for the horizon years of 2020, 2035, and 2050. Between horizon years, prices are assumed to follow a straight-line trend.

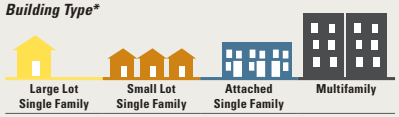
Water prices are expected to increase over time in response to limited supply and the potential application of pricing strategies to promote water conservation. Users can make absolute price assumptions based on specific policies, or assume a year-upon-year rate of increase.

GHG Emissions from Water-Related Energy Use

Water-related GHG emissions result from two main categories of energy use: a) system uses, including the transport, treatment, and distribution of water consumed; and b) end uses, including all uses of water that occur within homes (e.g., water heating).[22] The Rapid Fire model calculates energy use and emissions for system uses, while emissions resulting from end uses are accounted for as a component of residential and commercial building energy emissions.

Baseline Water Use. *Because larger homes with larger yards require more water for landscape irrigation, lot size is generally correlated with a household's overall water consumption. Scenarios with a greater proportion of the Standard Land Development Category, which include primarily single-family detached homes, will require more water – and produce more GHG emissions – than scenarios with a greater proportion of Compact or Urban areas, which include more attached and multifamily homes. Outdoor water needs also vary with climate. For California, the Rapid Fire model estimates outdoor water needs according to reference evapotranspiration (climate-based irrigation factors) for different geographic areas.*

2005 Annual Household Water Use by Building Type*



Large Lot Single Family	Small Lot Single Family	Attached Single Family	Multifamily
194,000 gal	125,000 gal	93,000 gal	89,000 gal

** California statewide baseline average consumption figures include indoor and outdoor water use. Indoor use is based on per-capita averages; outdoor use is based on generalized assumptions about landscape area and irrigation requirements.*

PUBLIC HEALTH

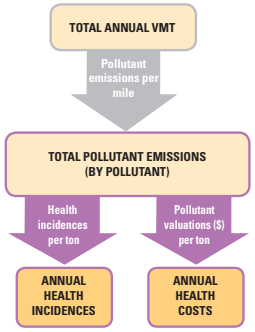
The Rapid Fire model calculates the public health impacts of automobile transportation-related air pollution. The number of health incidences, and their related costs, are calculated on the basis of criteria air pollutant emissions (measured in tons).[4] Note that these metrics express differences among scenarios, rather than as measurements of total health incidences or costs.

Health Incidences

Health incidences include cases of: premature mortality; chronic bronchitis; acute myocardial infarction; respiratory and cardiovascular hospitalizations; respiratory-related ER visits; acute bronchitis; work loss days; asthma exacerbation; and acute, lower, and upper respiratory symptoms. Per-ton assumptions for each of these incidences are individually applied to emissions of the following criteria pollutants: PM2.5, SOx, NOx, and VOC. The incidences are then totaled.

Health Costs

Health costs are based on per-ton valuations of emissions of the following pollutants: PM2.5, SOx, NOx, CO, VOC, and indirect PM from NOx, SOx, and VOC. As for health incidences, these valuations are applied to emissions of individual pollutants, and then totaled.



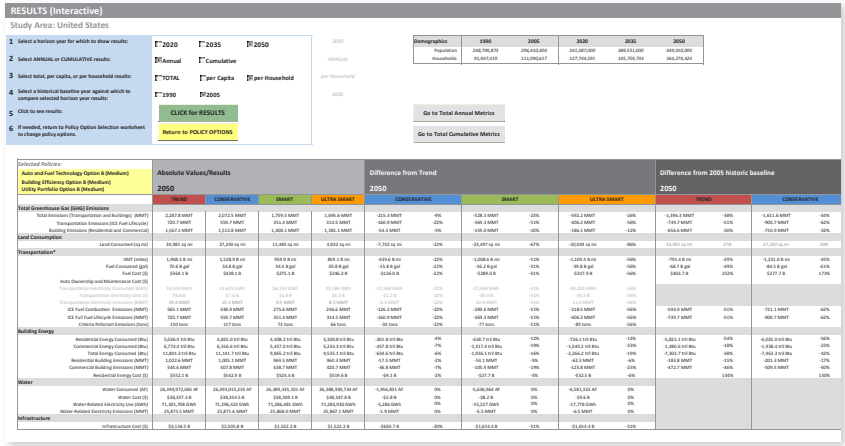
MODEL RESULTS

Viewing Model Results

Users can view model outputs through the model's static results summary (the "Results" sheet) or the automated interface of the "Interactive Results" sheet. The automated interface allows users to customize the results display according to the following parameters:

- Horizon year (2020, 2035, or 2050)
- Annual (single-year) or cumulative (multiple-year leading up to horizon year) metrics
- Total, per capita, or per household basis for metrics
- Comparison of annual metrics against historic baseline year (1990 or 2005)

Below is a sample view of the "Interactive Results" sheet.



Interactive Results Sheet. *Results are automatically displayed according to the parameters selected.*

THE VISION CALIFORNIA PROCESS

The development and application of the Rapid Fire model is part of the Vision California process, an unprecedented effort to explore the role of land use and transportation investments in meeting the environmental, fiscal, and public health challenges facing California over the coming decades. Funded by the California High Speed Rail Authority (*cahighspeedrail.ca.gov*) and the California Strategic Growth Council (*www.sgc.ca.gov*), Vision California will:

- Highlight the unique opportunity presented by California's planned High Speed Rail network in shaping growth and other investments.
- Frame California's development issues in a comprehensive manner, illustrating the role of land use in meeting greenhouse gas (GHG) reduction targets through robust analysis.
- Illustrate the connections between land use and other major challenges, including water and energy use, housing affordability, public health, farmland preservation, infrastructure provision, and economic development.
- Clearly link land use and infrastructure priorities to mandated targets as set forth by AB 32, SB 375, and the California Air Resources Board (CARB).
- Produce scalable tools, for use by state agencies, regions, local governments, and the non-profit community, which can defensibly measure the impacts of land use and transportation investment scenarios.
- Build upon Blueprints and other regional plans to produce statewide growth scenarios that go beyond regional boundaries and assess the combined impact of these plans.
- Connect state and national goals for energy independence, energy efficiency, and green job creation to land use and transportation investments.

Vision California is driven in part by the challenges set forth by the 2006 passage of the California Global Warming Solutions Act (AB 32), which sets aggressive targets for the reduction of greenhouse gas emissions (GHGs). The project is designed to provide critical context for the implementation of Senate Bill 375 (SB 375) and land use-related GHG-reduction targets for local governments, as it will illustrate and comprehensively measure the role of land use and SB 375-mandated regional "Sustainable Communities Strategies" in meeting AB 32 GHG targets.

Two new scenario development and analysis tools are being used to compare physical growth alternatives – the Rapid Fire model, and the 'Urban Footprint' map-based model. These related tools serve distinct purposes: while the spreadsheet-based Rapid Fire model quickly produces metrics that bracket the range of potential impacts, the map-based Urban Footprint model produces a more refined analysis that is greatly sensitive to land use and demographic characteristics.

The Urban Footprint Map-Based Model. *Currently under development, the Urban Footprint model uses geographic information system (GIS) technology to create and evaluate physical land use-transportation investment scenarios. Scenarios are defined through the application of 'Place Types' to the environment. The model's suite of Place Types represents a complete range of development types and patterns, from higher density mixed-use centers, to separated-use residential and commercial areas, to institutional and industrial areas. The physical and demographic characteristics associated with the Place Types are used to calculate the impacts of each scenario. Output metrics will include: land consumption; infrastructure cost (capital as well as operations and maintenance); building energy and water consumption, cost, and associated CO_2 emissions; public health impacts; vehicle miles traveled and all related fuel, GHG, and pollutant emissions; and non-auto travel mode share and other related travel metrics.*

BACKGROUND

Rapid Fire Model Output Metrics and Input Assumptions

Summary of Output Metrics

Land Consumption
- Land Consumed (square miles)
- Non-Residential Land Consumed (square miles)

Infrastructure Cost
- Capital Costs for Roads and Wet and Dry Utility Provision ($)
- Operations and Maintenance Costs ($)
- City Revenues from Residential Development ($)

Transportation System Impacts and Emissions
- Vehicle Miles Traveled (VMT) (miles)
- Fuel Consumed (gal)
- Fuel Cost ($)
- Transportation Electricity Consumed (kWh)
- Transportation Electricity Cost ($)
- Transportation Electricity CO_2e Emissions (MMT)
- ICE Fuel Combustion CO_2e Emissions (MMT)
- ICE Full Fuel Lifecycle CO_2e Emissions (MMT)
- Criteria Pollutant Emissions (tons)

Public Health Impacts Related to Transportation Emissions
- Respiratory and Cardiovascular Health Incidences (#)
- Health Costs associated with Health Incidences ($)

Building Energy, Cost, and Emissions
- Residential Energy Consumed (Btu)
- Commercial Energy Consumed (Btu)
- Total Energy Consumed (Btu)
- Residential Building CO_2e Emissions (MMT)
- Commercial Building CO_2e Emissions (MMT)
- Residential Energy Cost ($)
- Building Water Use, Cost, and Emissions
- Water Consumed (AF)
- Water Cost ($)
- Water-Related Electricity Use (GWh)
- Water-Related Electricity CO_2e Emissions (MMT)

Total Greenhouse Gas (GHG) Emissions
- Total CO_2e Emissions (Transportation & Buildings, MMT)

Building Program
- Housing type mix (# and %)

Summary of Input Assumptions

Demographics
- Baseline population and population growth
- Baseline households and household growth
- Baseline housing units and housing unit growth
- Baseline non-farm jobs and job growth

Scenarios
- Land Development Category (LDC) proportions for each scenario and time period
- Housing unit composition for each LDC

Infrastructure Cost
- Per-unit capital cost assumptions for roads and wet and dry utility provision by building type and Land Development Category (LDC)
- Per-unit operations and maintenance cost assumptions for roads, utilities, and public services by building type and LDC
- Per-unit revenue assumptions by building type and LDC

Land Consumption
- Percent greenfield vs. infill/greyfield/brownfield growth for each land development category, scenario, and time period
- Acres per capita required for greenfield development in each land development category, scenario, and time period

Vehicle Miles Traveled (VMT)
- Baseline Per Capita Light Duty Vehicle (LDV) VMT
- VMT adjustment factors by LDC and scenario for growth increment population
- VMT escalation and deceleration rates for the baseline environment population
- Elasticity of VMT with respect to driving costs per mile*

Vehicle Fuel Economy and Cost
- Baseline fuel economy for total fleet, internal combustion engine vehicles alone, and alternative/electric vehicles alone
- Fuel economy in horizon years for total fleet, internal combustion engine vehicles alone, and alternative/electric vehicles alone
- Elasticity of fuel economy with respect to fuel cost

Transportation Emissions
- Baseline fuel emissions, full lifecycle (well-to-wheel) for total fleet, internal combustion engine vehicles alone, and alternative/electric vehicles alone
- Baseline fuel emissions, combustion (tank-to-wheel) for total fleet, internal combustion engine vehicles alone, and alternative/electric vehicles alone
- Percent gasoline vs. diesel in liquid fuel mix
- Composition of gasoline and diesel fuel mix
- Criteria pollutant emissions per mile traveled

Public Health Impacts Related to Transportation Emissions
- Health incidences per ton of pollutant
- Health costs per ton of pollutant

Building Energy Emissions
- Electricity generation emissions (lbs/kWh)
- Natural gas combustion emissions (lbs/therm)
- Electricity generation emissions in horizon years (lbs/kWh)
- Natural gas combustion emissions in horizon years (lbs/therm)

Residential Building Energy Use & Price
- Baselineline average annual energy use per unit for base/existing population
- Annual energy use by building type
- Housing unit replacement rate for base/existing housing stock
- Upgrade efficiency reduction factor 'A' for base/existing housing stock
- New efficiency reduction factor 'B' for replacement units of base/existing housing stock
- Upgrade efficiency reduction factor 'C' for replacement units of base/existing housing stock
- New efficiency factor 'D' for new units of the growth increment
- Upgrade efficiency factor 'E' for new units of the growth increment
- Baseline residential electricity and gas prices
- Residential electricity and gas prices in horizon years

Commercial Building Energy Use & Price
- Non-farm job proportion by floorspace-type category
- Floorspace per employee by category for each LDC
- Commercial space replacement rate for base/existing housing stock
- Baseline average annual energy use per square foot for base/existing commercial space
- Annual baseline energy use for new commercial space
- Replacement rate for base/existing commercial space
- Upgrade efficiency reduction factor for base/existing commercial space
- New efficiency reduction factor for replacement commercial space
- Upgrade efficiency reduction factor for replacement commercial space
- New efficiency factor for new floorspace of the growth increment
- Upgrade efficiency factor for new floorspace of the growth increment
- Baseline commercial electricity and gas prices
- Commercial electricity and gas price in horizon years

Residential Building Water Use
- Baseline per capita indoor water demand by building type
- Baseline per-unit outdoor water demand by building type
- New residential water efficiency (% reduction from 2005)
- Baseline water price ($/acre foot)
- Water price in horizon years ($/acre foot)

Residential Water-Related Energy Use and Emissions
- Average water energy proxy (electricity required per million gallons water used)

D. Technical Methodology for 2012–2035 RTP/SCS Land Use Development Pattern

2012–2035 RTP/SCS Alternatives Creation Process

Using the public dialogue and feedback from the analysis of the 2012–2035 RTP/SCS Scenarios, SCAG developed the 2012–2035 RTP/SCS Plan alternatives. These land use alternatives tested the influence of future land use changes on a variety of metrics, including travel behavior and associated greenhouse gas emissions. A side-by-side comparison of alternative visions of the future is provided, which is helpful for weighing the costs and benefits of different policy choices.

The following steps were undertaken before the alternative creation process could proceed:

1. Implemented a public outreach process;
2. Using public input, determined the range of alternatives, and the associated parameters, policies and controls to be tested; and
3. Defined the appropriate building blocks for the alternatives, knows as Community and Development Types.

The Alternatives and Parameters

FOUR ALTERNATIVES

Four alternatives were modeled as part of the alternative creation process. The alternatives were modeled to the years 2020 and 2035. The first alternative was a trend-based alternative called No Project Alternative. The second alternative, Alternative A, was based on the adopted regional RTP growth forecast and local General Plans. The Plan Alternative (B) maintains city-level growth forecasts, but makes shifts within cities to focus future growth around existing and planned High-Quality Transit Areas (HQTAs) and other opportunity areas. The fourth alternative, Alternative C, has the fewest fixed parameters and shifts a substantial amount of regional growth from suburban areas not well served by transit into compact communities clustered around transit.

No Project Alternative

The No Project Alternative represents a future in which growth continues based on past trends. The alternative includes significant growth in suburban areas not well served by transit. New housing growth in this alternative is predominately in single-family subdivisions. Housing and jobs continue to be built separate from one another. The overwhelming majority of travel around the region continues to be made by car with relatively few new opportunities for walking or biking.

Alternative A

Alternative A is a combination of the adopted RTP Forecast and local General Plans. The alternative is controlled to the TAZ-level RTP forecast in terms of single-family and multi-family housing, and retail, office and industrial employment. These detailed forecasts are accommodated in accordance with the local General Plans. The alternative represents the most likely future for the region assuming the implementation of local General Plans. For this alternative, no adjustments were made to the land use, socioeconomic, and transportation data of the two delegated subregions (GCCOG and OCCOG).

Plan Alternative (B)

The Plan Alternative is driven by two main policy objectives: focusing more regional growth around High-Quality Transit Areas (HQTAs) and accommodating future housing market demand. The alternative maintains city-level forecast control totals for both population, households, and jobs, however, within city boundaries, shifts are made to focus a much larger share of future growth in more compact communities around HQTAs. Future housing market demand is expected to shift significantly to small lot single-family, townhomes and multifamily housing. Again, for this alternative, no adjustments were made to the land use, socioeconomic, and transportation data of the two delegated subregions (GCCOG and OCCOG).

Alternative C

Alternative C has the fewest growth parameters and controls. The alternative assumes that all growth is accommodated according to where HQTAs are located. As a result very suburban communities may not experience new housing or employment growth, while some urban areas with very good access to regional transit may experience significant increases in housing and/or employment growth. Any revisions contemplated within Alternative C will be identified and discussed with GCCOG and OCCOG as stated in the Memoranda of Understanding, and Framework and Guidelines for Subregional SCSs.

Alternatives should be clearly distinguished from one another while also being plausible visions of the future. Establishing clear parameters for an alternative is important in order to understand the impact of a specific policy on the outcome of an alternative. The 2012–2035 RTP/SCS process resulted in four alternatives that each capture a unique vision for how future growth can be accommodated and the associated impacts to the region.

While each alternative is distinctive, a number of parameters remained constant across each alternative: the regional 2012–2035 RTP/SCS forecast total for population, households, and jobs; the detailed Tier 2 Transportation Analysis Zone (TAZ) boundaries that include jurisdiction boundaries (aligned to city boundaries to ensure that no TAZs are split between multiple cities); and the exclusion of regional parks and open space from the developable lands used in the alternatives.

The parameters that varied across the alternatives were:

- Detailed forecast- the detailed distribution of population, households, and jobs across the region;
- Housing profile- the mix of single-family and multifamily housing;
- Transit network- the transit network varied from planned to enhanced;
- High Quality Transit Areas (HQTA)- the HQTAs varied based on the variations in the transit network; and
- General Plans- the local General Plans were used to varying degree across the alternatives.

TABLE D1 Alternative Parameters[1]

Parameters	Alternatives			
	No Project Alternative	Alternative A	Plan Alternative (B)	Alternative C
Parks and Open Space	Excluded from Developable Land Capacity			
Regional Forecast Totals	Fixed			
Detailed Forecast	Trend-based for both 2020 and 2035	Adopted RTP Forecast: Controlled at TAZ level for both 2020 and 2035	Controlled to TAZ-based RTP/SCS Forecast for 2020; Controlled to city-level RTP/SCS Forecast for 2020–2035	Regional Totals Only
Transit Network	Plan Network	Plan Network	Enhanced Cost Constrained Network	Enhanced Cost Constrained Network
High Quality Transit Areas (HQTAs)	Based on Plan Network	Based on Plan Network	Based on Enhanced Cost Constrained Network	Based on Enhanced Cost Constrained Network
General Plans	Based on growth trends, not necessarily General Plans	Based on local General Plans	General Plans considered, but intensity exceeded in some transit-accessible areas	General Plans considered, but growth intensity significantly exceeded in transit-accessible areas and General Plan growth areas with no transit access receive no growth

[1] For Alternatives A and B, no adjustments were made to the land use, socioeconomic, and transportation data of the two delegated subregions (GCCOG and OCCOG) per their subregional SCS delegation agreements.

POLICIES TESTED BY EACH ALTERNATIVE

Each alternative represents a plausible future for the region based on a different set of policy options. The 2012–2035 RTP/SCS public outreach process helped identify and prioritize the policies that should be tested as part of the process. The first policy focuses on improving the pattern of recent growth by shifting dispersed single-use development into a more compact, walkable and mixed-use development pattern. The second policy is aimed at improving transit access through land use changes. Specifically, this policy option is meant to test where land uses can be intensified around transit facilities in order to improve access and mobility. The third policy tested is an attempt to match future housing market demand through land use changes. Future demographic shifts, such as an aging population, increasing immigrant population and changes in young people's housing preferences, are shifting the demand for housing away from traditional and large-lot (>5,500 SF) single-family homes to smaller single-family, townhome and multifamily housing products. The fourth policy objective is to improve the jobs-housing balance in the region.

The policies tested in each alternative are as follows:

- Growth Pattern- focus growth into more compact, walkable, mixed-use development patterns;
- Transit Access- improve regional transportation efficiency by focusing growth around transit facilities;
- Housing Profile- match future housing market demand through land use changes; and
- Jobs-Housing Balance- integrate land uses together and adjacent to one another to reduce the amount of regional auto travel and improve quality of life.

TABLE D2 Alternative Policies[2]

Policies	Existing (2008)	Alternatives			
		No Project Alternative	Alternative A	Plan Alternative (B)	Alternative C
Growth Pattern	Current development patterns include a diversity of places; growth in recent decades has been predominantly separated and single-use, however	Continues growth trends of the past 20 years; predominantly single-use growth on vacant land	Growth pattern follows local General Plans	Growth controlled at city level, however, focused almost exclusively around existing or planned transit	No city or subregional growth controls; all new growth focused around HQTA transit facilities
Transit Access	Currently 39 percent of houses have access to regional transit	Transit access declines to 36 percent of households with access to regional transit	General Plans result in an improvement in transit access; 43 percent of households have access	Over half of the region's households have access to regional transit at 50 percent	Focusing all new growth in transit areas results in 62 percent of houses having access to regional transit
Housing Profile	45 percent of all housing is multifamily and 55 percent is single-family	47 percent multifamily No significant shift in total housing profile 52 percent of new housing growth is multifamily	47 percent multifamily Slight shift in housing profile 54 percent of new housing growth is multifamily	50 percent multifamily Shift in housing profile to match future housing demand 68 percent of new housing growth is multifamily	50 percent multifamily Significant shift in housing towards multifamily as a result of focusing growth around transit 71 percent of new housing growth is multifamily
Jobs-Housing Balance		No significant subregional improvement in jobs-housing balance or increase in mixed-use development	Many General Plans include expanded areas of mixed-use; while others contain large areas planned for separated, single-use growth	In cities with transit facilities, new population, households, and jobs were located near each other to reduce the need for auto trips; however, there are still significant areas, particularly in unincorporated areas, with significant growth forecast but limited or no transit facilities	All new population, households, and jobs were located together, in mixed-use districts, near regional transit

2 For Alternatives A and B, no adjustments were made to the land use, socioeconomic, and transportation data of the two delegated subregions (GCCOG and OCCOG) per their subregional SCS delegation agreements.

Summary of Methodology and Process

The Plan Alternative was created using a three-tiered process for locating new growth from 2020 to 2035. The purpose of the Plan Alternative was to test the potential regional transportation benefits that could be accrued from a policy of focused growth near High Quality Transit Areas (HQTA). In addition to this policy objective (which represents the first tier of the process), the scenario also optimized areas served by local transit (not designated as HQTA) in communities with limited or no HQTA. This represents the second tier of the process. The final tier of the process involved allocating new growth in areas where no transit exists, nor is being planned. In those instances, the relative distribution from Alternative A was observed. Exhibit 53 illustrates the different areas where additional housing and jobs from 2020 to 2035 will be located in the Los Angeles Basin. At each point in the process, existing land use patterns, local General Plans and an understanding of regional variations in the market feasibility of different new development patterns served as additional design constraints.

STEP ONE: OPTIMIZE REGIONAL TRANSIT AREAS

The starting point for the Plan Alternative was Alternative A at year 2020, which reflected local General Plans. The first step in creating the Plan Alternative was to reallocate a portion, or in some cases all, of the 2020-2035 growth increment to TAZs well served by regional transit (with 25 percent or more of their land area within an HQTA boundary). These TAZs were designated as "HQTA TAZs."

In highly urbanized cities, where large portions are well served by regional transit, most, if not all, of their 2020-2035 growth increment could be accommodated within HQTAs. Suburban communities and unincorporated areas often had limited areas served by HQTA facilities, and thus very little of their growth increment could reasonably be accommodated in these areas.

The reallocation process attempted to balance the policy goal of optimizing growth within HQTAs with an understanding of variations in both acceptance for and market feasibility of certain levels of development intensity across the region. For instance, cities like Lancaster and Palmdale have HQTAs but allocating their entire 2020-2035 growth increment into these areas would result in development patterns that are not market feasible, and likely exceed local General Plans with regard to development intensity.

The expectation is that there is a market for Development Types such as Town Center or Town Neighborhood around transit facilities within these types of suburban communities, whereas, Urban Center and even City Center would likely not be the predominant new land use type. Conversely, urban centers such as Los Angeles, Long Beach, Anaheim and others, have significant regional transit service and significant market demand for more intense land use patterns.

STEP TWO: OPTIMIZE LOCAL TRANSIT AREAS

Nearly half of the region's transit trips occur on local transit. While the development potential around this system is not assumed to be as extensive as in areas near HQTAs, there are certainly opportunities to increase development intensity along some of these corridors.

In many instances, the amount of new growth forecast for a jurisdiction could not be reasonably accommodated within the TAZs near HQTAs, such as the following example of Palmdale. In these jurisdictions, areas adjacent to local transit facilities served as the second tier location for focusing growth.

In suburban communities with limited or no HQTA facilities, organizing growth near local transit facilities was a key strategy for achieving higher transportation efficiencies across the region than would have otherwise been achieved.

STEP THREE: ALLOCATION FOR AREAS NOT SERVED BY TRANSIT

In areas not served by transit or with very limited transit service, the growth pattern from Alternative A was assumed to remain. In areas with no transit service, the growth patterns in Alternative A were mirrored. In areas with limited transit, the area around the transit was optimized but, in most instances, could not reasonably accommodate the full growth increment. In these instances, the remaining growth was allocated proportionately based on the distribution in Alternative A.

Example Process: Palmdale

Palmdale is a suburban community located north of the City of Los Angeles, across the San Gabriel Mountains. Palmdale, along with the other cities in the Antelope Valley, have

EXHIBIT 53 Los Angeles – Three Tier Areas

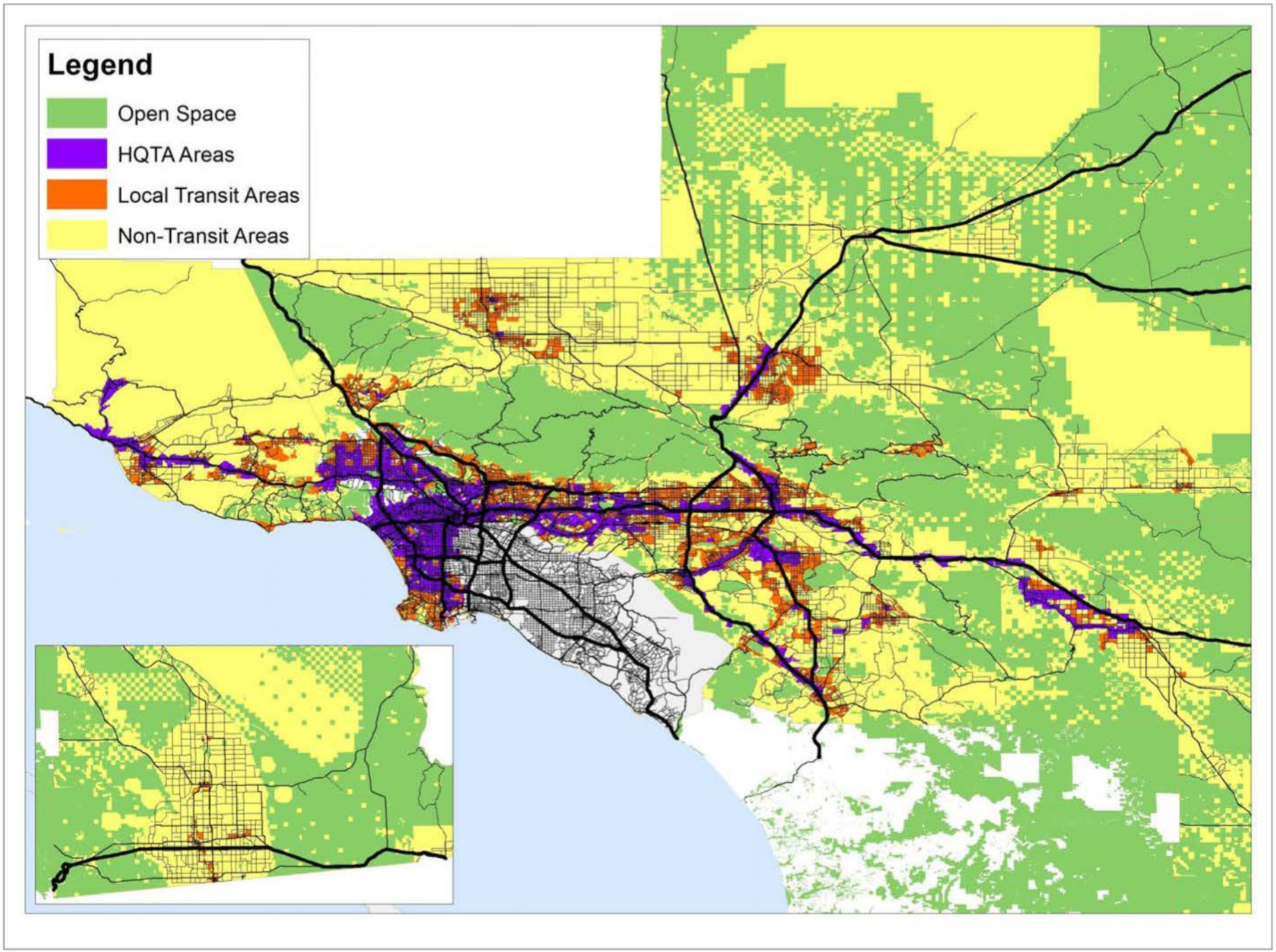
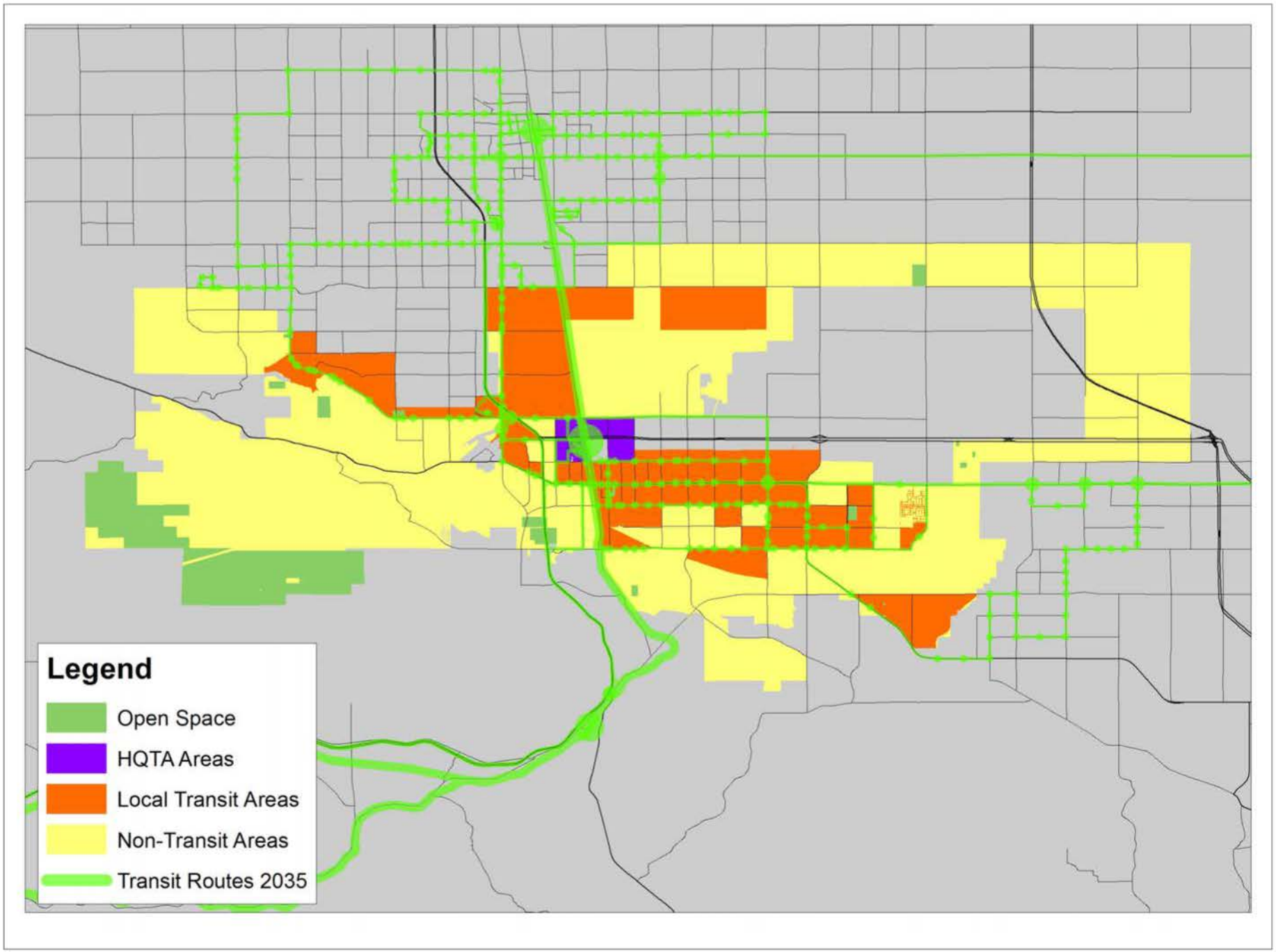


EXHIBIT 54 Palmdale – Areas for Additional Housing and Job Growth (2020 to 2035)



been, until the recent housing downturn, one of the fastest growing areas of the SCAG region. In fact, Palmdale was the fastest growing city in Los Angeles County in 2010.

Between 2020 and 2035, Palmdale is forecast to add an additional 7,500 new households. This represents a 15 percent increase over the 51,273 total households forecast in 2020. Palmdale has a single Metrolink commuter rail station and several bus lines serving the city. As a result the HQTA is quite small compared to the vacant land available at the urban fringe, as illustrated in **EXHIBIT 54**. While the HQTA is relatively small, there are over 500 acres of vacant land within the three HQTA TAZs adjacent to the Metrolink station.

It seems reasonable to expect a low- to moderate-intensity center to emerge surrounding the Metrolink station area in Palmdale by the year 2035. However, it would be unreasonable to assume that the entire growth increment could be accommodated within the HQTA. As a result, a mix of Suburban Center and Town Center were applied to the Metrolink station area.

Table D3 shows that Alternative A allocates only 52 new households on this land between 2020 and 2035, which is less than one percent of the city's housing forecast. The Plan Alternative, by contrast, envisions the HQTA becoming a low- to moderate-scale center with a mix of single-family, townhomes, and some apartments, with integrated employment and services. The resulting change would add 1,900 new households in the HQTA, representing 26 percent of the forecast for 2020 to 2035. In a suburban community like Palmdale, there is virtually no market for the very intense building types one would expect farther south in the City of Los Angeles. However, there is market demand for less expensive compact single-family, townhomes and even moderate density multifamily units.

Palmdale has a local bus network that covers a sizeable portion of the city, primarily southeast of the Metrolink station area. Local transit carries nearly half of all transit trips regionally every day. Focusing growth within walking distance of these facilities is a key strategy for reducing regional greenhouse gas emissions, particularly in areas with limited HQTAs.

The HQTA in Palmdale is not able to absorb all of the new growth for the City. However, there is significant vacant and underutilized land along several of the local transit routes. The Plan Alternative adds additional small lot single-family and townhomes onto vacant land adjacent to these transit routes. The changes are so modest that the additional households do not increase the overall density of the TAZs enough to alter the Development Type designation in most cases. With these modest changes in development intensity, the Plan Alternative was able to increase the housing capture for areas served by local transit to 62 percent—up from 48 percent in Alternative A.

The combined impact of creating a modest density center surrounding the Metrolink station and adding a broader range of housing types within a short distance of local bus service resulted in a significant reduction of housing growth in areas not served by transit. Over half of all new households allocated in Alternative A from 2020 to 2035 are in areas not served by transit. In contrast, only 12 percent of new households in the Plan Alternative are in areas not served by transit. Through relatively modest changes in density, the land use pattern in Palmdale can become much more transportation efficient.

TABLE D3 Palmdale – Household Distribution by Area

Scenario	HQTA		Local Transit Area		Non-Transit Area	
Alternative A	52	1%	3,600	48%	3,851	51%
Plan Alternative	1,926	26%	4,665	62%	910	12%

Example Process: San Bernardino

In urban areas, the process of scenario design was the same, however, in many instances the HQTAs were able to absorb a significantly higher share of new growth. The market for higher intensity buildings exists in many urban areas in the region, particularly those with higher achievable rents and places well served by regional and local transit.

The City of San Bernardino is one such example. The majority of the City is within HQTA TAZs, and most of the areas outside of the HQTAs are served by local transit, as illustrated by Exhibit 55. Through strategic increases in density in areas immediately adjacent to the station areas, the HQTAs could capture over three-quarters of the new housing growth in the Plan Alternative compared to just over one-third in Alternative A, as shown in **TABLE D4**.

EXHIBIT 55 San Bernardino – Areas for Additional Housing and Job Growth (2020 to 2035)

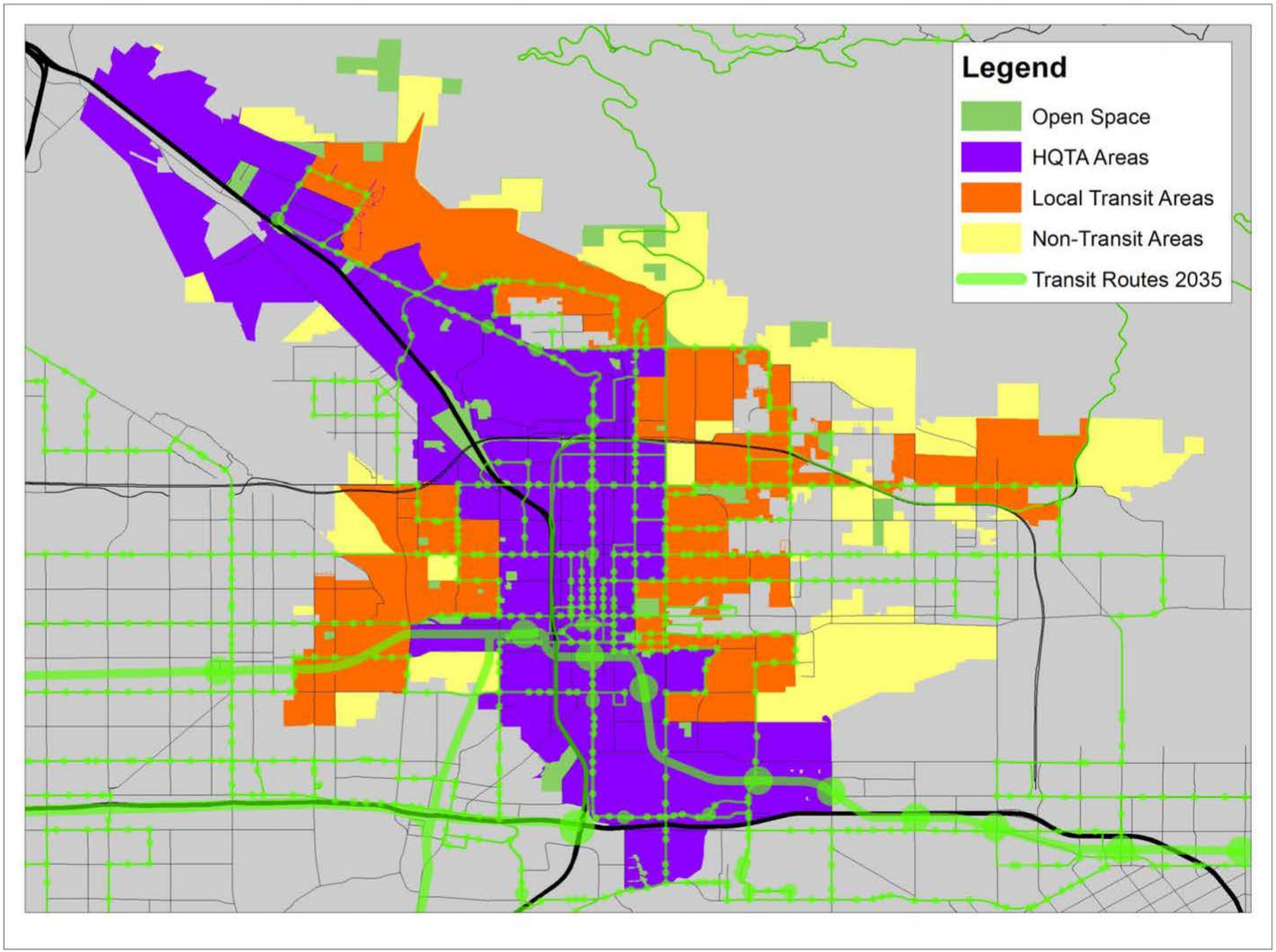


TABLE D4 San Bernardino – Household Distribution by Area

Scenario	HQTA		Local Transit Area		Non-Transit Area	
Alternative A	6,750	38%	8,400	47%	2,700	15%
Plan Alternative	13,800	77%	3,200	18%	800	5%

THE SCENARIO: ONE OUTCOME WITH MULTIPLE PATHS

The scenario planning process involves experimenting with policy options to measure potential regional costs or benefits associated with a variety of different choices. This scenario planning exercise attempted to quantify the regional benefits from improving land use efficiency around transit facilities. Undoubtedly there are multiple ways to achieve these efficiencies at the local level.

While the Plan Alternative shifted the distribution of development intensity within city boundaries, the overall city forecasts did not change. As a result of this three-tiered approach to growth location, the Plan Alternative may exceed growth expectations in some locations.

The process of creating Development Type-based regional forecasts and scenarios allows for local jurisdictions to experiment with different land use patterns at the local level that produce the same regional transportation and greenhouse gas benefits. This process allows for that level of local input to be incorporated quickly and modeled ensuring equivalent regional efficiency. A framework that allows for this local input and regional dialogue is of critical importance in the ultimate implementation of the regional policy objectives.

Community and Development Types

The Local Sustainability Planning Tool (LSPT) employs a series of Community and Development Types to describe the different types of land uses in the region. These Community and Development Types are comprised of a mix of different types of buildings along with assumptions about characteristics such as the amount of land devoted to streets, parks, and civic areas. There are two levels of detail. The first level, Community Types, is a simplified classification intended for conveying land use alternative and maps to the broader public. At a more detailed level, the Development Types are intended for modeling purposes at the Split TAZ level.

DEVELOPMENT TYPES

The Development Types were virtually painted onto the map of the region using the LSPT. Each Development Type carries with it values that describe the characteristics of the place it represents. It was important to establish a set of Development Types that represent the full range of development patterns and forms that make up the region today and into the future. In addition, these Development Types must be easy to communicate to the public and key policy decision makers. The Development Types contain a large amount of information relating to the characteristics of the landscape, including jobs and housing density, urban design and mix of land uses, and lend themselves to clear communication through photo-simulations and other types of renderings.

Through use of the LSPT, Development Types are the foundation of the land use alternatives. The LSPT uses the typologies to calculate results for a range of evaluation criteria, in advance of the four-step travel demand model including housing and job mix, densities and VMT. The alternatives are built upon, and provide data at the TAZ level including households and employment. This represents the data that is fed into the regional transportation model to determine how the potential land use pattern impacts travel behavior.

When assembling the Development Types within the sketch planning tool, SCAG began with Compass Blueprint Development Types. These Development Types were previously employed at a scale of roughly five acres through an artificial raster or ‘grid’ draped onto the virtual landscape. For the Plan Alternative, the Development Types were re-calibrated to fit the appropriate scale represented by the region’s TAZ map. The calibration was done by modifying the proportions of buildings within each Development Type to best represent the types of places represented by the scale of the TAZ within the Southern California landscape. The purpose was not to create a category to match every jurisdiction’s comprehensive plan category, but rather a description of all of the places that exist today, and those that may exist in the future.

Within the LSPT, Development Types were assigned a mix of building types, each having an associated job and housing density. Examples of building types include: mixed-use residential four stories, garden apartment, compact single-family home, office, main street retail, business flex and many others. Because Development Types make it possible

to measure evaluation criteria that rely on information tied directly to individual buildings and uses, many of the assumptions are built into the individual building spreadsheets (called prototype buildings) that were then grouped together to form Development Types.

STEPS FOR CREATING DEVELOPMENT TYPES

1. Developed prototype buildings
a. Devised a list or selection buildings that match or represent the current and potential future characteristics of the SCAG region.
b. Populated the prototype building spreadsheets with data relating to the physical form, intensity and mix of uses and financial attributes .
2. Assembled prototype buildings into Development Types
a. Selected a set or mix of buildings that would likely be found in each building block. Some Development Types are fairly homogenous. For example, a typical lower density Suburban Residential is comprised of four or fewer prototype buildings. Other Development Types, such as Town Center, require a mix of more than one dozen types of buildings to adequately represent the range of uses today, and those that will likely occur in 2035.
b. Assigned each building a percentage to indicate the portion of the Development Type that is comprised of each prototype building.
c. Added in net land reductions to account for streets, civic space and parks. The values for these reductions can usually be found in any previous land use capacity developed by the jurisdictions.

Development Types are primarily used in the sketch planning tools to perform land use analysis. The Development Types themselves do not include transportation network information, but are intended to match or complement specific transportation investments included in the scenario. Using the LSPT, the Development Types were applied to the TAZs within the SCAG region for places where growth could be located. The transportation design and assumptions served as a guide so that placement of Development Types is consistent with, and takes advantage of, planned transportation improvements and programs. For example, it may not have been highly effective to locate auto-oriented low-density Development Types in areas with existing or planned transit investments. Conversely, it would have been effective to place high-density and mixed-use Development Types in areas along transit lines and with well-connected streets.

Following is a list of the Development Types employed in the 2012–2035 RTP/SCS Plan Alternative.

Urban Center

(82–120+ housing units/acre; 260–320+ jobs/acre)

Urban Centers are the highest intensity areas. The best examples would be places such as Downtown Los Angeles or high intensity corridors such as Wilshire Boulevard. These centrally-located areas are jobs rich with significant amounts of employment, typically located in high-rise office buildings. Housing is also typically located in multi-story buildings located in more urbanized neighborhoods. These areas are well-served by transit and typically represent the convergence of a number of high capacity transit facilities. The Urban Center development type can be used in several parts of the region to signify high density land uses, mixing of uses and a saturation of non-auto transport options.

City Center

(48–82 housing units/acre: 120–260 jobs/acre)

City Centers are similar to Urban Centers. The mix of jobs to housing is similar as they too are significant employment centers. They are on average roughly one-half the intensity of urban centers. They share similar levels of transit and other non-auto infrastructure. They are likely home to one or two high capacity transit facilities and a number of bus routes. The City of Pasadena provides a relevant reference for the City Center development type.

Town Center

(16–48 housing units/acre; 30–120 jobs/acre)

Town Centers are another highly mixed-use development type. They are roughly one-third the level of intensity as found in the City Centers. They are employment centric but also provide housing opportunities that are located very close to daily services and jobs, but in a smaller town type of setting. Cities such as Ventura or Santa Monica are examples of Town Centers. Buildings are generally less than six stories on average. Sidewalks and bike facilities are plentiful and the areas typically benefit from one high capacity transit facility and local buses.

Suburban Center

(Up to 16 housing units/acre; Up to 30 jobs/acre)

Suburban Centers can contain a mix of uses, but may alternately have a focus towards either jobs or housing with very little mix. These areas are predominately served by automobiles, but likely have bus service or in some cases commuter rail. Buildings are typically one or two stories, but in some cases will go higher when surrounded by ample landscaping. These areas do provide some travel choice, but not at the scale of the Town or City Centers.

Urban Residential

(At least 60 housing units/acre; Up to 10 jobs/acre)

Urban residential areas represent high density concentrations of housing, typically in residential high-rise buildings. Because of the high number of residents, these areas provide a large number of customers for business districts located nearby. Within the district there may also be pockets of shopping, restaurants and some professional services. These neighborhoods benefit from excellent transit service, and are typically situated along or near at least one high capacity transit corridor.

City Residential

(30–60 housing units/acre; 4–10 jobs/acre)

These are relatively high density residential areas. They are typified by pre-war development patterns containing a mix of single- and multifamily housing. Buildings range from one- and two-story bungalows to five- or ten-story apartments and condos. Major streets in and near the neighborhood have high frequency bus service. Jobs in these areas are limited to some home offices and small, local-serving shops and restaurants. Residents in these areas have quick access to a range of activities and job locations using multiple modes of transportation.

Town Residential

(14–30 housing units/acre; 2–4 jobs/acre)

This typology is characterized by common prewar neighborhoods of single-family homes on modest lots, with the some garden apartments located near commercial streets. Townhomes, duplexes and accessory dwelling units will be interspersed, likely on corners or between apartments and single-family homes. The streets in these neighborhoods are generally low volume and include full sidewalk coverage and parking on the street. They are easily navigable via car, bike or on foot, with transit service often located within one-quarter- to half-mile of homes.

Suburban Residential

(Up to 14 housing units/acre; Up to 2 jobs/acre)

These neighborhoods have been the dominant form of housing in the region for the last several decades. These areas are the least dense form of development typified by homes with larger lots and are separated from active commercial and service areas. Utilizing transit often requires residents to drive to nearby park-and-ride facilities.

Urban Employment

(Up to 10 housing units/acre; At least 180 jobs/acre)

The Urban Employment development type is focused on jobs. Buildings are typically high-rise with parking in multi-level structures or underground. These districts are typically located in the center of an urban core and served by multiple high capacity transit lines. These districts will draw their employees from throughout the region.

City Employment

(Up to 10 housing units/acre; 90–180 jobs/acre)

This development type represents the employment core of a city. Jobs are typically in high-rise structures with a mix of surface and structured parking. These areas are often served by one or more high capacity transit lines. They will draw workers from nearby neighborhoods and cities.

Town Employment

(Up to 6 housing units/acre; 30–90 jobs/acre)

This development type represents the employment core of a smaller town, or an independent job node. Jobs are typically in low- to mid-rise structures with mostly surface parking. These areas are often served by one high capacity transit line, or frequent bus service. They will draw workers from nearby neighborhoods and some from adjacent cities.

Suburban Employment

(Up to 2 housing units/acre; 6–30 jobs/acre)

This development type represents job nodes that are typically situated along major arterials or near interchanges. The job density is low and likely to take the form of retail, restaurants or personal services. Jobs are typically in one-story structures with surface parking. These areas are served primarily by automobiles, but may have bus access or be located near commuter rail facilities.

Rural

(Up to 2 housing units/acre; Up to 6 jobs/acre)

This development type is more diverse. While it includes both jobs and housing, the two are rarely found together. Housing is typically in acreage lots or ranchettes, often far from services or jobs. Jobs are likely to be located in isolated nodes such as rural cross-roads or highway service areas. These areas are rarely served by transit, and the few people who occupy these areas greatly rely on their automobiles.

COMMUNITY TYPES

As previously mentioned, the future land use pattern of the region also employs a series of Community Types, which serve as a simplified classification used to describe the general conditions likely to occur within a specific area. These Community Types are aggregations of the thirteen Development Types used for modeling purposes. Following is a listing of the Community Types employed in the 2012–2035 RTP/SCS Plan Alternative.

Urban

Urban areas are the highest intensity Community Type. These centrally located districts have significant amounts of employment and corresponding residential uses and retail, typically located in a dense cluster of multi-story buildings and high-rise buildings. Urban areas are also typically located at the convergence of a number of high capacity transit facilities complemented by non-auto infrastructure that also provide access and connectivity.

City

The City community type is on average one-half the intensity of the Urban community type. These areas contain significant employment centers and a mix of medium- and high-density housing, supported by retail and daily services. One to two high capacity transit facilities, a number of bus routes, and non-auto infrastructure provide access and connectivity to a range of activities and locations.

Town

The Town community type provides low- to medium-density housing opportunities that are located close to local-serving retail and daily services. These areas are characterized by an employment core or an independent job center in low- to mid-rise structures. Sidewalks and bike facilities are adequate and the areas benefit from one high capacity transit facility and local buses.

Suburban

Suburban areas contain a mix of uses, but often have one predominant use, such as residential or office. Residential areas are typically low-density with larger lots and are separated from retail and other daily service uses. Though these areas are predominantly served by automobiles, bus service and commuter rail may also operate in certain neighborhoods.

Rural

Rural areas include both jobs and housing, though these two uses are rarely found in close proximity to each other. Housing is characterized by acreage lots and ranches, and is often far from commercial and employment activities, which occur in isolated nodes located on rural cross-roads and highway services zones. Transit and non-auto facilities rarely serve these areas, making automobile use the most frequent mode of travel.

E. 2012–2035 RTP/SCS Alternatives

Alternatives Analysis Framework

The alternatives analysis framework recognizes that this region is fortunate to have its citizens approve all the half-cent sales tax measures presented to the voters to date (three in Los Angeles; one in Riverside, San Bernardino, Orange, and Imperial counties). These and other local funds account for 71 percent of available transportation funding in the region. Together with state and federal funding, the region has over $300 billion available moving forward. These funds will allow for transit expansion, maintenance of the highway system, some congestion relief improvements, bikeway improvements, non-motorized enhancements, and several community mitigation investments. As a result, the $300 billion transportation investment will lead to improved mobility and accessibility, cleaner air, more jobs, and a more competitive regional economy.

In order to provide the kind of 2035 future Southern California deserves and needs in transportation and overall quality of life opportunities, additional investments should be considered by policy leaders to ensure a safe, reliable, and state of good repair for the transportation network. The alternatives developed for the 2012–2035 RTP/SCS address these challenges by assuming funding from various pricing strategies.

It should be noted that significant progress has been made throughout the region over the past decade towards sustainable growth. Such positive trends are largely reflected in the locally supported socio-economic data (growth forecast) through 2035 that serve as the foundation for each of the alternatives.

The discussion regarding alternatives began at the Plans and Programs Technical Advisory Committee (P&P TAC) with an initial set of three preliminary scenarios that used varying land use scenarios with progressively higher levels of investments on non-auto strategies including transit, bike and pedestrian improvements, and TDM and TSM strategies. Subsequently, these scenarios were further refined and analyzed using the Rapid Fire Model. Results from this effort were utilized to create refined scenarios for the 18 2012–2035 RTP/SCS workshops SCAG conducted through the months of July and August throughout the region. Information gathered through this process has helped further refine and shape the alternatives.

Each of the alternatives will be defined by its components. Key components associated with each of the alternatives are as follows:

- Growth Forecast/Socio-Economic Data (SED)/Land Use;
- Transportation Network (highways and arterials, light and heavy rail, commuter rail, inter-city rail, bus rapid transit, fixed route buses, high speed rail);
- Transportation System Preservation Investment level;
- Pricing Strategies (user fee, HOT Network, cordon pricing);
- Bicycle and Pedestrian Investments;
- Transportation Demand Management (TDM) Investments;
- Transportation Systems Management (TSM) Investments; and
- Planning and Policy assumptions (transit fares, tolls, auto operating costs, etc.).

The guiding principles that keep the 2012–2035 RTP/SCS alternatives grounded in reality are as follows:

- Alternatives should strongly consider regional economic competitiveness and overall economic development to help the region recover and prosper.
- Transportation investment commitments made by the CTCs through their sales tax expenditure plans, adopted long-range plans, and board-adopted resolutions will be fully respected.
- Subregional SCSs submitted by the Gateway Cities Council of Governments (GCCOG) and the Orange County Council of Governments (OCCOG) will be unchanged and integrated into the alternatives (with possible revisions for Alternative C only). Any revisions contemplated within Alternative C will be identified and discussed with GCCOG and OCCOG as stated in the Memoranda of Understanding, and Framework and Guidelines for Subregional SCSs.
- New investment strategies proposed over and beyond the county submitted commitments will only be funded through new funding sources identified and approved by the Regional Council.
- Ensuring an appropriate level of funding for system preservation will be given a priority.
- Each of the alternatives will be evaluated using a set of accepted performance measures.

Based on these considerations, three alternatives are defined and refined for detailed analysis. A fourth alternative is recommended simply to test the sensitivity of a dramatic increase in the price of gas, however, it is not viewed as a true alternative in the same sense as the first three alternatives. These alternatives address the issues and challenges discussed earlier in different ways. To be consistent with the principle of respecting county decisions, all four alternatives include all projects and strategies committed by the CTCs in their long-range transportation plans. The description of the four alternatives will therefore focus only on policies and investments over and beyond these existing long-range transportation plans.

In addition, each alternative will be compared to a "No Project Baseline." This Baseline only includes projects that are fully programmed in the current 2011 Federal Transportation Improvement Program (2011 FTIP) and that have already received full environmental clearance. In other words, it only includes projects that are already under way. Moreover, this Baseline reflects historical trends of the land use that currently exist. It does not reflect land use changes already approved by local agencies for the future to increase densities, create mixed-use neighborhoods, create transit-oriented developments, and improve jobs/housing balance.

Alternatives

ALTERNATIVE A

This alternative evaluates how the region's transportation system will perform in the future with only currently committed policies and investments included, as embodied in the current six county transportation commissions' adopted long-range transportation plans. Funding for bicycle/pedestrian improvements, TDM and TSM projects, and strategies were based on currently funding trends. So, the investments represent "business-as-usual" levels and do not add any additional transportation strategies and investments. However, it should be noted that this alternative does include significant transit investments already committed by the CTCs. Some of these transit investments include:

- Purple Line Extension to Westwood
- Gold Line Extension to Glendora
- Metrolink San Jacinto and Temecula Extensions
- High-frequency Metrolink service from Laguna Niguel to Los Angeles

- Rail feeder service in Orange County
- Anaheim Rapid Connection
- New BRT services in Orange County
- Redlands Rail
- E-Street Corridor

This alternative represents commitments in the 2008 RTP updated with the latest information submitted by the CTCs and includes almost 3,000 separate transportation projects.

Alternative A includes updated land use and socio-economic forecasts based on 2012–2035 RTP/SCS local jurisdiction input. This growth input was developed through an extensive bottom-up process dating back to May 2009. The population, household and employment totals for cities and counties are based on information from the most up-to-date local General Plans. The distribution of land uses within cities and counties reflects not only the local input on growth forecasts, but also the specific distribution of those land uses as currently reflected in those General Plans. For this alternative, no adjustments were made to the land use, socioeconomic, and transportation data of the two delegated subregions (GCCOG and OCCOG).

The resulting land use pattern shows some departure from the historical suburban development pattern toward a greater emphasis on infill and redevelopment in many parts of the region. This is due to a decreasing amount of greenfields available for development within local juridictions in the future. This shift follows an emerging trend of a certain level of transit-oriented developments located near existing and planned transit stations in the core metro area, as well as in established cities in the region's periphery. The land use pattern provides an improved mix of uses within close proximity to each other to make transit, walking and bicycling increasingly viable travel choices for many activities.

This alternative shows significant performance improvements over the Baseline since it incorporates more progressive land use as well as county transportation investments of more than $300 billion.

ALTERNATIVE A: HOW IT DIFFERS FROM THE BASELINE

- Land Use- Local input as opposed to historic land use trend
- Investments- All committed county projects are included as opposed to only projects fully programmed in the 2011 FTIP

ALTERNATIVE B

Alternative B is the 2012–2035 RTP/SCS Plan Alternative. This alternative addresses many of the unfunded needs over and beyond Alternative A. Specifically, it dedicates significant funding to system preservation, non-motorized transportation, TDM, the East-West freight corridor, and grade separation projects. It also includes the cost of developing a regional High Occupancy Toll (HOT) lane network building on components already considered by the transportation commissions in Los Angeles, Orange, Riverside, and San Bernardino Counties.

Some of the specific transportation strategies included in this alternative over and beyond what is already included in Alternative A are as follows:

- Implementation of LA Metro's 30/10 initiative that would accelerate the completion of 12 major transit projects in LA County
- Implementation of the East-West Clean Freight Corridor
- Implementation of the Strategic HOT Network
- Consideration of Cordon Pricing in Downtown LA
- More than doubling of funding for Active Transportation to ensure expansion of bike/pedestrian network from the current 4,300 miles to 10,200 miles
- Significant increase in funding for TDM and TSM programs and strategies, including "First Mile/Last Mile" strategies that would enhance connectivity with existing and planned transit services
- Targeted expansion of existing and planned fixed guideway system to close the gaps
- Add BRT services on targeted corridors
- Add express bus services on proposed HOT Network

Additional funding needed to implement this alternative will be derived from revenues generated from the HOT lane network, from a cordon pricing implementation around Downtown Los Angeles, and a user fee to replace existing gas tax revenues enacted by the state legislature and Congress by 2020. This user fee will be proportional to system

use (e.g. proportional to vehicle miles traveled or VMT) and would not diminish over time due to improved fuel efficiency or the adoption of electric vehicles.

Regarding land use, Alternative B expands upon the Growth Forecast in Alternative A. It continues to respect local growth input for both 2020 and 2035. Adjustments have been made to the expected location of growth within cities to improve transportation performance and regional sustainability by assuming that many of the recent development trends within jurisdictions of locating growth nearer to current or future transit hubs will continue. In come cases, jurisdictions have agreed to increase or decrease their projected household growth to reflect the adequacy of infrastructure expected to accommodate this new growth. For this alternative, no adjustments were made to the land use, socioeconomic, and transportation data of the two delegated subregions (GCCOG and OCCOG).

Therefore, for 2035, the resulting land use pattern intensifies both residential and employment development in High-Quality Transit Areas (HQTAs) within cities and counties that will have such areas, while keeping the jurisdictional growth totals consistent with local input. It moves the region towards more walkable, mixed-use development leading to significant VMT reductions and other benefits due to higher walk/bike mode share, more transit use and shorter auto trips. This alternative strives to meet demand for a broader range of housing types, with new housing focused towards the development of smaller-lot single-family homes, townhomes, and multifamily condominiums and apartments.

Finally, Alternative B also includes Phase I of the state High Speed Rail (HSR) initiative as well as enhancements to the LOSSAN corridor and Metrolink services to upgrade them to support higher speeds.

ALTERNATIVE B: HOW IT DIFFERS FROM BASELINE

- Land Use – Local input and additional changes agreed to by locals as opposed to technical trends. Allocation of growth within cities to more emphasize HQTAs and other transit hubs and corridors, per recent development trends within jurisdictions.
- Investments – All committed county projects, plus increased preservation funding, implementation of HOT lane network, E-W freight corridor, HSR Phase I, LOSSAN corridor rail improvement, expanded regional bicycle network, and TDM investments, are included as opposed to only projects fully programmed in the 2011 FTIP
- Incremental Revenues – HOT lane, Cordon Pricing, and user fee revenues

ALTERNATIVE C

This final alternative is similar to Alternative B except for these key aspects:

- More aggressive growth in fixed guideway transit-oriented development (TOD) districts
- More aggressive transit and transportation funding to be consistent with the additional land use changes

Land use for this alternative shifts growth across jurisdictional boundaries in a manner that would be different from local input and different from both Alternatives A and B. This alternative adjusts densities and infill rates in order to present a more aggressive land use strategy within Southern California. In Alternative C, a small percentage of new growth is located on previously undeveloped greenfield land, with the significant majority occurring as infill or redevelopment. The growth redistributions that shape Alternative C consist of shifting future growth from areas with typically long commutes to transit station-adjacent areas with development potential and to employment centers with existing capacity to an extent even greater that Alternative B. Any revisions contemplated within Alternative C will be identified and discussed with GCCOG and OCCOG as stated in the Memoranda of Understanding, and Framework and Guidelines for Subregional SCSs.

Additional transportation investments for this alternative over and beyond Alternative B would include:

- Additional investments in Active Transportation (Non-motorized transportation), TDMs and TSMs
- Further expanded Metrolink services
- Additional transit services on the most utilized transit corridors
- Consider additional express bus services in key corridors featuring headways less than 15 minutes
- Phased implementation of the 5 percent of major arterials to have dedicated bus lanes
- Full implementation of point-to-point bus network
- Additional targeted expansion of fixed guideway system to close gaps

ALTERNATIVE C: HOW IT DIFFERS FROM BASELINE

- Land Use – Local input and additional changes agreed to by locals as opposed to technical trends. In addition, further changes from the trend and will reflect additional shifts of population, households, and jobs across jurisdictions to achieve a better jobs/housing balance and additional growth in fixed guideway transit oriented development (TOD) districts.
- Investments – All committed county projects, plus increased preservation funding (although less than Alternative B), implementation of HOT lane network, E-W freight corridor, HSR Phase I, LOSSAN corridor rail improvement, expanded regional bicycle network, TDM investments, and increased transit funding, are included as opposed to only projects fully programmed in the 2011 FTIP
- Incremental Revenues – HOT lane revenues, Cordon Pricing, and user fee revenues

ALTERNATIVE D

This alternative is identical to Alternative A except that it takes into consideration the possible (if not likely) increase in fuel prices. Since 2002, fuel prices in American cities have increased by more than 150 percent reflecting an average annual increase of almost 10 percent.[3] During that same time period, inflation, as captured by the Consumer Price Index (CPI) grew by only 30 percent reflecting an average increase of 2.6 percent annually.[4]

Therefore this alternative reflects similar increases going forward. However, using the same trend would lead to almost unbelievable costs. For instance, net of inflation, this previous trend starting in 2002 would translate into a cost of $40 per gallon (in 2011 dollars) by 2035. Instead of assuming such an ominous scenario that would undoubtedly alter transportation drastically (a 20 gallon tank would cost $800 in today's dollars), staff recommends using an $8 per gallon cost for fuel in 2011 dollars. This would approximately correspond to fuel costs growing at twice the aforementioned rate of inflation of 2.6 percent.

This alternative is likely to reduce overall travel to some extent due to cost increases. In addition, there should be an increase in transit use, a reduction in congestion, and a reduction in pollution and GHG emissions. SCAG utilized the regional travel demand model to quantify these impacts. Though SCAG does not anticipate assuming these price increases in the 2012–2035 RTP/SCS, it does believe that the 2012–2035 RTP/SCS should discuss the ramifications of such developments and potential strategic changes to be considered if this scenario becomes reality.

ALTERNATIVE D: HOW IT DIFFERS FROM BASELINE

- Land Use – Local input as opposed to technical trend
- Investments – All committed county projects are included as opposed to only projects fully programmed in the 2011 FTIP
- Incremental Revenues – Gas tax increase to address funding gap between base revenues and committed costs
- Energy Costs – Increase in fuel costs to $8 per gallon in 2011 dollars

3 US Energy Information Agency at: http://www.eia.gov/totalenergy/data/monthly/pdf/sec9_6.pdf
4 Bureau of Labor Statistics at: ftp://ftp.bls.gov/pub/special.request/cpi/cpiai.txt

F. Methodology for Calculating SB 375 CO2 Emissions per Capita for 2012 RTP/SCS

The methodology for calculating the SB 375 CO2 emissions per capita includes the following five steps.

STEP 1. PERFORM REGIONAL TRAVEL DEMAND MODEL RUNS FOR 2005, 2020, AND 2035

SCAG's Regional Travel Demand Model represents the current state-of-the-practice regional transportation modeling tool. The Regional Travel Demand Model produces detailed link-level attributes including VMT by vehicle class, speed, and time period.

STEP 2. CREATE 2005, 2020, AND 2035 INPUT FILES TO ARB'S EMFAC2007 MODEL

EMFAC2007 is the official emissions model developed by ARB. The detailed link-level 2005, 2020, and 2035 VMT data from SCAG's Regional Travel Demand Model is converted into EMFAC2007 input files. The EMFAC2007 input file contains sub-air basin level VMT by speed and time period.

STEP 3. RUN EMFAC2007 FOR 2005, 2020, AND 2035

EMFAC2007 emissions model runs were performed for 2005, 2020, and 2035 with the input files from Step 2. The EMFAC2007 model runs produce sub-air basin level CO2 emissions by vehicle classification.

STEP 4. CALCULATE 2005, 2020, AND 2035 CO2 EMISSIONS PER CAPITA FROM REGIONAL TRAVEL DEMAND MODEL

The sub-air basin level CO2 emissions for light- and medium-duty vehicles were aggregated to the regional total CO2 emissions for 2005, 2020, and 2035. The regional total CO2 emissions are divided by the corresponding resident population to derive the 2005, 2020, and 2035 CO2 emissions per capita.

STEP 5. CALCULATE ADDITIONAL 2035 CO2 EMISSIONS REDUCTION PER CAPITA FROM NHTS (4-D) MODEL

CO2 emission reductions per capita for 2035 in addition to that derived from Regional Travel Demand Model are based on the 2035 modeling results of SCAG's NHTS Model. The NHTS Model provides additional VMT reductions not accounted for in the Regional Travel Demand Model. CO2 emission reductions associated with these VMT reductions are then calculated based on the ratio of VMT per capita reduction to CO2 emissions reduction per capita derived from Steps 1 - 4.

STEP 6. CALCULATE FINAL 2035 CO2 EMISSIONS REDUCTION PER CAPITA

The final 2035 CO2 emission reductions per capita is a sum of the 2035 CO2 emission reductions per capita from Step 4 and Step 5.

G. CEQA Exemption Criteria

SB 375 amends CEQA to add Chapter 4.2 Implementation of the Sustainable Communities Strategy, which allows for CEQA exemption for certain projects, as well as reduced CEQA analysis. Lead agencies (including local jurisdictions) maintain the discretion and will be solely responsible for determining consistency of any future project with the SCS. Cities and counties maintain their existing authority over local planning and land use decisions, including discretion in certifying the environmental review for a project, regardless of eligibility for streamlining. SCAG staff may provide a lead agency at the time of its request readily available data and documentation to help support its finding upon request. In addition to a project's consistency with the SCS, below are additional criteria for CEQA streamlining eligibility.

Types of CEQA Streamlining

CEQA EXEMPTION

A full CEQA exemption is provided for a special class of Transit Priority Project (TPP) determined to be a Sustainable Communities Project (SCP) (§21155.1 (a)). As a threshold matter, to qualify as a TPP, a project must be consistent with the general use designation, density, building intensity, and applicable policies in an approved SCS or APS. The TPP must also:

- Be at least 50 percent residential use based on area;
- Be at least 20 units/acre; and
- Be within ½ mile of a major transit stop or high-quality transit corridor included in the RTP/SCS (a high-quality transit corridor is defined as one with 15-minute frequencies during peak commute hours)

Consequently, a Sustainable Communities Project (SCP) is a TPP that is consistent with the SCS or APS and meets additional criteria including numerous land use and environmental standards, such as being 15 percent more efficient than Title 24 standards and using 25 percent less water than the regional average household. In addition, the site cannot be more than eight acres or contain more than 200 units. The proposed project must be located within ½ mile of rail transit station or ferry terminal included in RTP/SCS or ¼ mile from a high quality transit corridor. Lastly, the project must meet additional requirements for the provision of affordable housing and open space. After a public hearing where a legislative body finds that a TPP meets all the requirements, a project can be declared to be an SCP and be exempted from CEQA.

SUSTAINABLE COMMUNITIES ENVIRONMENTAL ASSESSMENT (SCEA)/LIMITED EIR

CEQA relief is provided for TPPs that incorporate all feasible mitigation measures, performance standards, or criteria set forth in the prior applicable environmental impact reports and adopted in findings as described in (§21155.2 (a), (b), and (c)). This type of streamlining applies to initial studies that meet the following criteria:

- Avoids or mitigates impacts to a level of less than significant;
- Incorporates all feasible mitigation measures, performance standards, or criteria set forth in applicable EIRs; and
- Identifies all significant/potentially significant impacts and identify adequately addressed cumulative effects in prior applicable certified EIRs

An SCEA is not required to reference, describe, or discuss growth-inducing impacts; project-specific impacts; and cumulative impacts from cars and light duty truck trips generated by the project. If a lead agency determines that a cumulative effect has been adequately addressed and mitigated, that cumulative effect shall not be treated as cumulatively considerable, and the SCEA will be reviewed under the substantial evidence standard. The lead agency is required to circulate the document for a 30-day comment period, consider all comments received, conduct a public hearing, and make findings that the project has fully mitigated impacts.

If a TPP requires an EIR, certain CEQA relief also applies for projects that incorporate all feasible mitigation measures, identify all significant and potentially significant impacts, and identify adequately addressed cumulative effects in prior applicable certified EIRs. The streamlined EIR is not required to analyze off-site alternatives to the TPP or discuss a reduced residential density alternative to address the effects of car and light duty truck trips generated by the project. Furthermore, the EIR is not required to include an analysis of growth inducing impacts or any project specific or cumulative impacts from cars and light duty truck trips generated by the project on global warming or the regional transportation network. The initial study must identify any cumulative effects that have been

adequately addressed and mitigated in prior applicable certified EIRs and these cumulative effects are not to be treated as cumulatively considerable in the EIR. As with the SCEA, the Streamlined EIR will be reviewed under the substantial evidence standard. The certification process is consistent with CEQA Guidelines Section 15090.

LIMITED ANALYSIS FOR RESIDENTIAL/MIXED-USE PROJECTS

SB 375 also provides for general CEQA streamlining for residential and mixed-use residential projects as well as TPPs pursuant to Section 21159.28 of the Public Resources Code. Projects that meet the following requirements can be eligible for streamlined CEQA review:

- A residential or mixed-use residential project (or a TPP) consistent with the designation, density, building intensity, and applicable policies specified for the project area in an accepted SCS or APS (a residential or mixed-use residential project where at least 75 percent of the total building square footage consists of residential use or a project that is a transit priority project)
- A residential or mixed-use project that incorporates the mitigation measures required by an applicable prior environmental document
- If a project meets these requirements, any exemptions, negative declarations, mitigated negative declarations, SCEA, EIR or addenda prepared for the projects shall not be required to reference, describe, or discuss:
- Growth inducing impact;
- Any project specific or cumulative impacts from cars and light duty truck trips generated by the project on global warming or the regional transportation network; and
- A reduced density alternative (EIRs only)

TRAFFIC MITIGATION MEASURES

Pursuant to Section 21155.3, a legislative body or a local jurisdiction may adopt traffic mitigation measures that would only apply to TPPs which may include requirements for the installation of traffic control improvements, street or road improvements, and contributions to road improvement or transit funds, transit passes for future residents, or other measures that will avoid or mitigate traffic impacts of TPPs. A TPP does not need to comply with any additional mitigation measures for the traffic impacts of that project on streets, highways, intersections, or mass transit if the local jurisdiction has adopted these traffic mitigation measures. The traffic mitigation measures must be updated at least every five years.

H. SCAG Regional Housing Needs Allocation (RHNA) from HCD

STATE OF CALIFORNIA -BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF HOUSING POLICY DEVELOPMENT
1800 Third Street, Suite 430
P. O. Box 952053
Sacramento, CA 94252-2053
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August 17, 2011

Mr. Hasan Ikhrata
Executive Director
Southern California Association of Governments
818 West Seventh Street, 12th Floor
Los Angeles, CA 90017-3435

Dear Mr. Ikhrata:

RE: Regional Housing Need Assessment Determination

This letter provides the Southern California Association of Governments (SCAG) its Regional Housing Need Assessment Determination (RHNA Determination) for the projection period beginning January 2014 and ending October 2021. Pursuant to State housing element law (Government Code Section 65584, et seq.), the Department of Housing and Community Development (Department) is required to determine SCAG's existing and projected housing need.

As you know, Chapter 728, Statutes of 2008 (SB 375) strengthened coordination of housing and transportation planning and requires Metropolitan Planning Organizations (MPOs) to develop a new sustainable communities strategy (SCS) in the regional transportation plan (RTP) to achieve greenhouse gas emission reductions and ensure the SCS accommodates the RHNA Determination. Amendments to the law included revisions to the Department's RHNA schedule and methodology and also definitions addressing the RHNA projection period, housing element planning period, and coordination with updating the RTP. For SCAG, the Department's RHNA Determination is made on the basis of partial demographic data available at this time from Census 2010 complemented by the American Community Survey (ACS) data. In assessing SCAG's regional housing need, the Department considered the critical role housing plays in developing sustainable communities and supporting employment growth.

The Department has determined a range of housing need (409,060 – 438,030 units) for the period 2014-2021. This range considered the extraordinary uncertainty regarding national, State, and local economies and housing markets. For this RHNA cycle only, the Department made an adjustment to account for abnormally high vacancies and unique market conditions due to prolonged recessionary conditions, high unemployment, and unprecedented foreclosures.

The RHNA low range (409,060) reflects the Department's acceptance of SCAG's projections and assumptions as the minimum need after evaluating the reasonableness of data, assumptions and support documentation submitted by SCAG. This figure considers household growth for the projection period derived from using the 2005-2007 ACS household formation rates and includes an adjustment for projected household growth on tribal land, and for existing high unit vacancies resulting from the unusual turmoil in housing markets. The RHNA high range (438,030) considered SCAG's strong socio-economic assets and demographic trends to grow, become more diverse, and generate increased housing demand, particularly among older age groups.

SCAG's plan to distribute its RHNA must equal or exceed the minimum of the range shown in Attachment 1 for the Total and for Very-Low, Low, and Moderate income categories. The Department encourages planning for housing need above the minimum of the range, in which case the income category percentages applicable to very-low, low, and moderate households remain the same. The regional housing need to be allocated to each jurisdiction represents the minimum amount of residential development capacity to zone for and is not to be used within local general plans as the maximum amount of residential development to plan for or approve.

In assessing the RHNA for the SCAG region, the Department applied methodology and assumptions that considered all of the factors specified in Government Code Section 65584.01(c)(1). In addition, the Department consulted with SCAG and Department of Finance (DOF) staff as required by statute. A meeting with Mary Heim, DOF Chief Demographer, occurred in late February 2011 and was attended by SCAG representatives Frank Wen, Manager, Simon Choi, Chief Demographer, and Joe Carreras, Housing Project Manager. Subsequent consultation meetings, as well as correspondence, included Doug Williford, Deputy Executive Director, Huasha Liu, Director of Planning, and Joann Africa, Legal Counsel. Also consulted was Stephen Levy, Director for the Center for Continuing Study of the California Economy (CCSCE), who prepared employment, population, and household projections for SCAG.

The data, assumptions, and descriptive information provided by SCAG and CCSCE, included DOF's population estimates for 2011, American Community Survey household formation rates controlled for the 2010 Census data, and SCAG population projections. Information provided and/or discussed also included the region's relationship between jobs and housing, including information about inter- and intra-regional commute patterns, and assumptions about the rate with which existing "for sale" and "for rent" housing units will be absorbed by the beginning of the projection period in 2014.

The Attachments to this letter describe the RHNA methodology used by the Department and the income category distribution to be used by SCAG in allocating among all local governments within the region at least the minimum total RHNA and minimum amounts for very-low, low, and moderate income categories. The projection period (also described in the Attachments) was determined pursuant to Government Code Section 65588(e)(6), to coordinate housing and transportation planning based on notification from SCAG of its *estimated* RTP adoption date of April 5, 2012. As you know, if the actual RTP adoption date significantly differs from the estimated date, the RHNA determination and projection period will not change, however the housing element due date, and implicitly the planning period, would change.

Mr. Hasan Ikhrata
Page 3

SCAG is responsible for developing a RHNA distribution methodology and adopting a RHNA Plan for the period beginning January 1, 2014 and ending October 1, 2021. Housing element law (Section 65584, et.seq.) requires SCAG's methodology and RHNA Plan be consistent with the following objectives:

(1) increasing the housing supply and mix of housing types, tenure, and affordability;
(2) promoting infill development and socioeconomic equity, protecting environmental and agricultural resources, and encouraging efficient development patterns;
(3) promoting an improved intraregional relationship between jobs and housing;
(4) balancing the distribution of households by income category.

Pursuant to Government Code Section 65584.05(h), within three days of adopting the Plan, SCAG is required to submit its RHNA Plan to the Department for approval. Once the Department has approved the RHNA Plan, local governments must be notified of their share of the regional housing need, by income category, for use in updating the housing element for the *planning* period, anticipated to be from October 2013 until October 2021. In updating their housing elements, local governments may credit units permitted since the January 1, 2014 start date of the RHNA projection period. The element must describe the methodology for crediting units to different income categories such as based on the actual or projected sale price or rent level.

The Department commends SCAG for its leadership and efforts in fulfilling its important role in advancing the State's housing, transportation, and environmental goals. SCAG's successful Compass Blueprint has played a tremendous role in leading local organizations to improve community planning to expand housing and transportation choices.

The Department especially thanks Doug Williford, Huasha Liu, Frank Wen, and Simon Choi for their efforts and assistance. The Department looks forward to its continued partnership with SCAG and its member jurisdictions and assisting SCAG in its planning efforts to accommodate the region's share of housing need. If the Department can provide any assistance, or answer any questions, please contact me or Anda Draghici, Senior Housing Policy Specialist, at (916) 445-4728.

Sincerely,

Glen A. Campora
Assistant Deputy Director

Enclosures

ATTACHMENT 1

HCD REGIONAL HOUSING NEED DETERMINATION: SCAG

Projection Period: January 1, 2014 through October 1, 2021

Income Category	Percentage	Range of Housing Unit Need (Rounded) (1)		(2)
Very-Low	24.4%	99,810	-	106,880
Low	15.8%	64,630	-	69,210
Moderate	17.5%	71,590	-	76,650
Above-Moderate	42.3%	173,030	-	185,290
Total	**100.0%**	**409,060**	-	**438,030**

[1] The 409,060 low end of the range (see Attachment 2) reflects SCAG's projected minimum housing need (rounded), using 2005-2007 household formation rates from the American Community Survey (ACS) controlled for 2010 census household population. This column represents the rounded minimum housing need that SCAG's RHNA Plan must address in total and the minimum percentage and amount for very-low, low, and moderate income categories.

[2] The 438,030 high end of the range (see Attachment 3) reflects HCD's determined higher housing need (rounded), using the 2005-2007 ACS household formation rates controlled for 2010 Census household population and applied to SCAG's population projections. In planning for RHNA above the low range, income category percentages for very-low, low, and moderate income households remain the same.

[3] The income category percentages reflect the minimum percentage to apply against the total RHNA chosen by SCAG (at or above the minimum range) in determining housing need for very-low, low, and moderate income households.

[4] For this RHNA cycle only (due to unique conditions not expected to recur to impact future RHNA cycles), two downward adjustments were made: (1) projected households were adjusted (-2,810) for household growth on tribal land as tribal housing data had not been requested by Department of Finance in its annual survey to local jurisdictions regarding housing unit change, and (2) housing need was adjusted by -75,390 units at the low range (Attachment 2) and by -25,130 units at the high range (Attachment 3) to account for different absorption estimates for unprecedented high vacancies in existing stock due to extraordinary conditions including high foreclosures and recession uncertainties.

Notes:

Housing Need Determination

Refer to Attachments 2 and 3 for a description and explanation of methodology.

The Department and SCAG staff acknowledge important differences between the "projection" methodology specified in statute to determine housing need and the methodology SCAG uses in developing its Integrated Forecast for purposes of its Regional Transportation Plan and Sustainable Community Strategy. The statutory planning objective of the RHNA is to accommodate housing "capacity" for projected household growth.

Income Categories

Each category is defined by Health and Safety Code (Section 50093, et seq.). Percentages are derived from Census-reported household income brackets, from the 2005-2009 American Community Survey's number of households by income over 12 months, by County. Housing unit need under each income category is derived from multiplying the portion of households per income category against the total RHNA determination.

ATTACHMENT 2

HCD REGIONAL HOUSING NEED DETERMINATION (LOW RANGE): SCAG

	HCD Determined Population, Households, & New Housing Need: January 1, 2014-October 1, 2021 (7.75 years)				
1	**Population: October 1, 2021** (SCAG Projection)				**19,730,980**
2	*less: Group Quarters Population (SCAG's estimate)*				-347,750
3	**Household (HH) Population**				**19,383,230**
	Household Formation Groups	**HH Population**	***HH Formation or Headship Rate (ACS)***	**Households**	
	Age Groups (DOF)	**19,383,230**		**6,516,345**	
	Under 15	4,103,915	-	-	
	15 - 24 years	2,625,930	8.31%	218,223	
	25 - 34 years	2,825,093	38.62%	1,091,002	
	35 - 44 years	2,494,520	49.16%	1,226,416	
	45 - 54 years	2,380,969	52.39%	1,247,429	
	55 - 64 years	2,236,911	53.97%	1,207,223	
	65 and older	2,715,892	56.19%	1,526,052	
4	**Projected Households**				**6,516,345**
5	*less: Households at Beginning of Projection Period (January 1, 2014, interpolated)*				*-6,044,940*
6	*less: Household Growth on Tribal Lands*				*-2,810*
7	**Household Growth: 7.75 Year Projection Period (New Housing Unit Need)**				**468,595**
8	**Vacancy Allowance**	Owner	Renter	Total	
	Tenure Percentage	54.39%	45.61%		
	HH Growth (New Unit Need)	254,869	213,726	468,595	
	Vacancy Rate (SCAG)	1.50%	4.50%		
	Vacancy Allowance	3,825	9,620	13,445	13,445
9	**Replacement Allowance (minimum)**	0.50%		482,040	2,410
10	*less: Adjustment for Absorption of Existing Excess Vacant Units*				
	Estimate 10% Absorbed, 90% Not Absorbed by 2014	Effective Vacant Units	Healthy Market Units	Differential	
	Derived (2010 Census, HH Growth, & Vacancy Rate)	(252,023)	175,240	-76,783	
	Total 2011 Housing Stock	6,348,741			
	Existing Vacant Unit (Others) Adjustment	1.39%	1.28%		
	Total Adjusted Existing Vacant Units (Others)	(88,247)	81,264	-6,984	
	Estimated Units (Others) Not Absorbed by 2014	90%		-83,766	-75,390
	FINAL REGIONAL HOUSING NEED DETERMINATION (Low Range of New Housing Unit Need)				**409,060**

Explanation and Data Sources

1. **Population:** Population reflects SCAG's October 2021 projection. Pursuant to Government Code 65584.01(b), SCAG's 2021 population projection was compared to the 2021 population derived from Department of Finance (DOF) 2011 Interim Projections P3 for 2020 and DOF's E5 estimate for 2011. Based on SCAG's population projection being within 3% of the DOF Population Interim projections and consultation with SCAG, SCAG's population projection was used in determining housing need for the region. As such, this number reflects SCAG's October 2021 population projection.

2. **Group Quarter Population:** Figure is SCAG's estimate of persons residing in group home / institution / military / dormitory quarters that is 1.76% of total population (DOF estimate for 2010 was 1.78%) in which proportion is maintained constant throughout the projection period. As this population doesn't constitute a "household" population generating demand for a housing unit, the group quarter population is excluded from the calculation of the household population, and is not included in the housing need.

3. **Household (HH) Population:** The population projected to reside in housing units after subtracting the group quarter population from total projected population.

ATTACHMENT 2

HCD REGIONAL HOUSING NEED DETERMINATION (LOW RANGE): SCAG (continued)

4. **Projected Households (HHs):** Calculated by applying (to the 2021 HH population) SCAG's HH formation rates from DOF rates per 2005-2007 American Community Survey (ACS) controlled for the 2010 Census household population. HH formation rates were evaluated for reasonableness in conjunction with ACS HH formation rates for the region provided by DOF and with the vacancy assumptions as described below.

5. **Households at Beginning of Projection Period:** For the first time since inception of RHNA, the baseline number of households at the beginning of the projection period (January 2014) must be projected, as a direct effect of amendment to Section 65588(e)(6), specifying the new projection period to start on either June 30 or December 31 whichever date most closely precedes the end of the current housing element period (June 30, 2014 for SCAG). As such, the January 1, 2014 household number was calculated as an interpolation between the DOF E5 Estimate for 2011 and the projected 2021 number of households.

6. **Household Growth on Tribal Land:** For this RHNA cycle only, an adjustment (-2,810) was made for household growth on tribal land as tribal housing data had not been requested by Department of Finance in its annual survey to local jurisdictions regarding housing unit change. Calculated based on 2000 and 2010 Census and SCAG's Draft 2012 RTP Growth forecast.

7. **Household (HH) Growth:** This figure reflects projected HH growth and need for new units.

8. **Vacancy Allowance:** An allowance (unit increase) is made to facilitate availability and mobility among owner and renter units. Owner/Renter % is based on Census 2010 data. A smaller rate is applied to owner units due to less mobility than for renter households. Information from a variety of authoritative sources supports an acceptable range of 1 to 4% for owner units and 4 to 8% for renter units depending on market conditions.

9. **Replacement Allowance:** Rate (0.5%) reflects housing losses that localities annually reported to DOF each January for years 2000-2010, or 0.5%, whichever is higher.

10. **Adjustment for Absorption of Existing Excess Vacant Units:** For this RHNA cycle only (due to extraordinary uncertainty regarding conditions impacting the economy and housing market not expected to similarly impact future RHNA cycles), a new 1-time adjustment was made to account for unprecedented high vacancies in existing stock, due to unusual conditions including high foreclosures and recession uncertainties. A slow absorption rate of 10% of existing excess vacant units is assumed to occur in shrinking current excess vacant units before the start of 2014 RHNA projection period resulting in applying a 90% adjustment to account for units not absorbed that decreases new housing need by -75,390 units. Existing housing stock consists of two components: (1) housing units for sale and rent in existing housing stock that are above the housing units required to maintain the healthy market condition, calculated as the number
of units in housing stock (for sale+for rent+sold, not occupied+rented, not occupied + occupied units), (2) housing units in the "vacant units others" category of existing housing stock above the simple average of 1.28% calculated based on Census data from 1980 to 2010. To evaluate the reasonableness of vacancy adjustments proposed by SCAG to account for the unprecedented economic downturn, the Department used 2010 Census Demographic profile data (DP-1) and desirable "normal" vacancy rates by tenure, in conjunction with the region's household growth and proposed household formation rates. The proposed vacancy adjustment is limited to not exceed the differential between the 2010 Census vacant units and the healthy market vacant units rate associated with the region's annual household growth. As the adjustment was below the differential, the vacancy adjustment was applied in calculating the low RHNA range.

RHNA Projection Period January 1, 2014 to October 1, 2021: Per SB 375, the start of the *projection* period (in effect January 1, 2014) was determined pursuant to GC 65588(e)(6), which requires the new projection period to start on June 30 or December 31 whichever date most closely precedes the end of the current housing element period, which for SCAG region is June 30, 2014. The end of the projection period was determined pursuant to GC 65588(e)(5 to be the end of the housing element planning period**.** *Note: For projection purposes the end of the projection period is rounded to the nearest start/end of the month.*

Housing Element Planning Period October 1, 2013 to October 1, 2021: Per SB 375, the start of the *planning* period was determined pursuant to GC 65588(e)(5),18 months from the estimated adoption date of the SCAG's Regional Transportation Plan per SCAG's notice to the Department (April 5, 2012) with the date rounded to the nearest start/end of month for projection purposes. The end of the planning period was calculated pursuant to GC 65588(e)(3)(A), 18 months after the adoption of the second RTP, provided that it is not later than eight years from the adoption of the previous housing element. If the actual RTP adoption date differs from the estimated date, the RHNA determination and the projection period will not change, however the housing element due date, and implicitly, the planning period would change.

ATTACHMENT 3

HCD REGIONAL HOUSING NEED DETERMINATION (HIGH RANGE): SCAG

	HCD Determined Population, Households, & New Housing Need: January 1, 2014-October 1, 2021 (7.75 years)				
1	**Population: October 1, 2021** (SCAG Projection)				**19,730,980**
2	*less: Group Quarters Population (SCAG's estimate)*				-347,750
3	**Household (HH) Population**				**19,383,230**
	Household Formation Groups	**HH Population**	***HH Formation or Headship Rate (ACS)***	**Households**	
	Age Groups (DOF)	**19,383,230**		**6,487,790**	
	Under 15	4,103,915	-	-	
	15 - 24 years	2,625,930	7.42%	194,964	
	25 - 34 years	2,825,093	37.48%	1,058,923	
	35 - 44 years	2,494,520	49.52%	1,235,224	
	45 - 54 years	2,380,969	52.74%	1,255,834	
	55 - 64 years	2,236,911	54.03%	1,208,550	
	65 and older	2,715,892	56.49%	1,534,295	
4	**Projected Households**				**6,487,790**
5	*less: Households at Beginning of Projection Period (January 1, 2014, interpolated)*				-6,036,970
6	*less: Household Growth on Tribal Lands*				-2,810
7	**Household Growth: 7.75 Year Projection Period (New Housing Unit Need)**				**448,010**
8	**Vacancy Allowance**	Owner	Renter	Total	
	Tenure Percentage	54.39%	45.61%		
	HH Growth (New Unit Need)	243,673	204,337	448,010	
	Vacancy Rate (SCAG)	1.50%	4.50%		
	Vacancy Allowance	3,655	9,195	12,850	12,850
9	**Replacement Allowance (minimum)**	0.50%		460,860	2,300
10	*less: Adjustment for Absorption of Existing Excess Vacant Units*				
	Estimate 70% Absorbed, 30% Not Absorbed by 2014	Effective Vacant Units	Healthy Market Units	Differential	
	Derived (2010 Census, HH Growth, & Vacancy Rate)	(252,023)	175,240	-76,783	
	Total 2011 Housing Stock	6,348,741			
	Existing Vacant Unit (Others) Adjustment	1.39%	1.28%		
	Total Adjusted Existing Vacant Units (Others)	(88,247)	81,264	-6,984	
	Estimated Units (Others) Not Absorbed by 2014	30%		-83,766	-25,130
	FINAL REGIONAL HOUSING NEED DETERMINATION (High Range of New Housing Unit Need)				**438,030**

Explanation and Data Sources

1. **Population:** Pursuant to Government Code Section 65584.01(b), SCAG's 2021 population projection was compared to the 2021 population derived from Department of Finance (DOF) 2011 Interim Projections P3 for 2020 and DOF's E5 estimate for 2011. Based on SCAG's population projection being within 3% of the DOF Population Interim projections and consultation with SCAG, SCAG's population projection was used in determining housing need for the region. As such, this number reflects SCAG's October 2021 population projection.

2. **Group Quarter Population:** Figure is SCAG's estimate of persons residing in group home / institution / military / dormitory quarters that is 1.76% of total population (DOF estimate for 2010 was 1.71%) in which proportion is maintained constant throughout the projection period. As this population doesn't constitute a "household" population generating demand for a housing unit, the group quarter population is excluded from the calculation of the household population and is not included in housing need.

3. **Household (HH) Population:** The portion of population projected to reside in housing units after subtracting the group quarter population from total projected population.

ATTACHMENT 3

HCD REGIONAL HOUSING NEED DETERMINATION (HIGH RANGE): SCAG (continued)

4. **Projected 2021 Households (HHs):** Projected HHs are derived by applying (to 2021 HH population) the regional 2005-2009 American Community Survey (ACS) household formation rates as provided by DOF controlled for the 2010 household population. HH formation or headship rates reflect the propensity of different population groups (age, racial and ethnic) to form households.

5. **Households at Beginning of Projection Period:** For the first time since inception of RHNA, the baseline number of households at the beginning of the projection period (January 2014) must be projected, as a direct effect of amendment to Section 65588(e)(6) specifying the new projection period to start on either June 30 or December 31 whichever date most closely precedes the end of the current housing element period (June 30, 2014 for SCAG). As such, the January 1, 2014 household number was calculated as an interpolation between the DOF E5 Estimate for 2011 and the projected 2021 number of households.

6. **Household Growth on Tribal Land:** For this RHNA cycle only, an adjustment (-2,810) was made for household growth on tribal land as tribal housing data had not been requested by Department of Finance in its annual survey to local jurisdictions regarding housing unit change. Calculated based on 2000 and 2010 Census and SCAG's Draft 2012 RTP Growth Forecast.

7. **Household (HH) Growth:** This figure reflects projected HH growth and need for new units.

8. **Vacancy Allowance:** An allowance (unit increase) is made to facilitate availability and mobility among owner and renter units. Owner/Renter % is based on Census 2010 data. A smaller rate is applied to owner units due to less frequent mobility than for renter households. Information from a variety of authoritative sources supports an acceptable range of 1 to 4% for owner units and 4 to 8% for renter units depending on market conditions.

9. **Replacement Allowance:** Rate (0.5%) reflects the housing losses that localities annually reported to DOF each January for years 2000-2010, or 0.5%, whichever is higher.

10. **Adjustment for Absorption of Existing Excess Vacant Units:** For this RHNA cycle only (due to extraordinary uncertainty regarding conditions impacting the economy and housing market not expected to similarly impact future RHNA cycles), a new 1-time adjustment was made to account for unprecedented high vacancies in existing stock due to unusual conditions including high foreclosures and recession uncertainties. A fast absorption rate of 70% of existing excess vacant units is assumed to occur in shrinking current excess vacant units before start of 2014 RHNA projection period resulting in applying a 30% adjustment to account for units not absorbed that decreases new housing need by -25,130 units. Existing housing stock consists of two components: (1) housing units for sale and rent in existing housing stock that are above the housing units required to maintain the healthy market condition, calculated as the number of units in housing stock (for sale+for rent+sold, not occupied+rented, not occupied + occupied units), (2) housing units in the "vacant units others" category of existing housing stock above the simple average of 1.28% calculated based on Census data from 1980 to 2010. To evaluate the reasonableness of vacancy adjustments proposed by SCAG to account for the unprecedented economic downturn, the Department used 2010 Census Demographic profile data (DP-1) and desirable "normal" vacancy rates by tenure, in conjunction with the region's household growth and proposed household formation rates. The proposed vacancy adjustment is limited to not exceed the differential between the 2010 Census vacant units and the healthy market vacant units rate associated with the region's annual household growth. As the adjustment was below the differential, the adjustment was applied in calculating the high RHNA range.

RHNA Projection Period January 1, 2014 to October 1, 2021: Per SB 375, the start of the *projection* period (in effect January 1, 2014) was determined pursuant to GC 65588(e)(6), which requires the new projection period to start on June 30 or December 31 that most closely precedes the end of the current housing element period, which for SCAG region is June 30, 2014. The end of the projection period was determined pursuant to GC 65588(e)(5 to be the end of the housing element planning period**.** *Note: For projection purposes the end of the projection period is rounded to the nearest start/end of the month.*

Housing Element Planning Period October 1, 2013 to October 1, 2021: Per SB 375, the start of the *planning* period was determined pursuant to GC 65588(e)(5),18 months from the estimated adoption date of the SCAG's Regional Transportation Plan per SCAG's notice to the Department (April 5, 2012) with the date rounded to the nearest start/end of month for projection purposes. The end of the planning period was calculated pursuant to GC 65588(e)(3)(A), 18 months after the adoption of the second RTP, provided that it is not later than eight years from the adoption of the previous housing element. If the actual RTP adoption date differs from the estimated date, the RHNA determination and the projection period will not change, however the housing element due date, and implicitly, the planning period would change.

I. SCAG RHNA Allocation to Jurisdictions and Related Reports

Final RHNA Allocation to Jurisdictions is anticipated for release in October 2012.

J. Compass Blueprint Program

The Southern California Association of Governments (SCAG) is the largest regional planning agency in the country; encompassing over 38,000 square miles, and serving a population of 19 million people. SCAG Compass Blueprint policies reflect deep engagement between SCAG, as the regional MPO and regional planning agency, and its member jurisdictions and agencies. The Compass Blueprint Growth Vision for the region is based on four guiding principles: mobility, livability, prosperity, and sustainability.

Compass Blueprint Demonstration Projects

SCAG offers direct funding of innovative planning initiatives for member agencies through the Compass Blueprint Demonstration Projects. SCAG manages all of the funding and administrative duties, enabling the municipalities to craft forward-thinking planning efforts.

Since 2005, the program has grown rapidly from nine projects in the first year to 49 projects funded for the 2011-2012 fiscal year. Projects have been approved or are currently underway in over 50 percent of the cities in the SCAG region. In addition to local municipalities, SCAG has worked in collaboration with county planning departments, County Transportation Commissions, as well as sub-regional Councils of Governments.

TOD & Station Area Planning

One of the earliest Compass Blueprint Demonstration Projects comprised of a collection of discrete projects to assist the Western Riverside Council of Governments, a regional partner, in studying the planned Metrolink Perris extension transportation corridors. SCAG provided WRCOG with station area planning around existing and planned Metrolink stations, and a Bus Transit Station in the City of Temecula. SCAG has continued to work with regional Councils of Governments, and other coalitions of cities to provide regional context, and corridor level planning assistance.

Since then, SCAG has continued to assist cities, transportation agencies, and coalitions of agencies in planning for higher density, mixed-use, and transit supportive land uses within station areas. An important evolution in planning for transit-supportive activity has been to expand the definition of Transit Oriented Development (TOD). Originally, TOD referred to building higher density housing adjacent to stations. However, due to the diversity of characteristics of stations in the region, from populated urban centers to suburban sending stations, regional planners are now focusing on holistic visions for the entire ½ mile radius in and around the station. In addition planners are focusing on employment and light industrial around stations, as employment preservation and office TOD become more important in the region.

WRCOG METROLINK PERRIS LINE EXTENSION VISION PLANNING

Corona Metrolink Station

This study was conducted on the Corona Metrolink Station in order to guide the transition of the area from a stand-alone train station to a vibrant transit village.

Hemet Metrolink Station Area Plan

This Demonstration Project enabled City of Hemet to envision a plan for a new transit village that would connect new development to the regional transit system.

March AFB/Moreno Valley Metrolink Station Concepts

The City of Moreno Valley and the March Air Force Base redevelopment authority teamed up with the Western Riverside Council of Governments and Compass Blueprint to plan for integrated development around their new Metrolink station.

Riverside Metrolink Station Area Plan

The City of Riverside, the Western Riverside Council of Governments and Compass Blueprint teamed up to plan a development vision around the existing Downtown Riverside Metrolink Station area.

Perris Metrolink Station Area Plan

The Perris Station Demonstration Project analyzed the existing conditions and the development potential of the project site.

Temecula Transit Station

The City of Temecula, the Western Riverside Council of Governments and Compass Blueprint teamed up to look at development options and opportunities around a proposed Bus transit station.

TRANSIT ORIENTED DESIGN & STATION AREA PLANNING

South Pasadena Mission Street Gold Line Station

The Gold Line light rail came to South Pasadena in 2003. This station represents a major public investment, and rail station areas are of strategic importance to the region. This feasibility study serves as a model for local communities to calculate return on investment and transit-conducive design in conjunction.

Montclair North Montclair Parking Analysis

The City of Montclair worked with Compass Blueprint to analyze key development and logistical issues for the North Montclair Specific Plan, including, shared and reduced parking requirements.

San Bernardino E Street Station Plan

A New Public Transit station being built in downtown San Bernardino opens up the opportunity to create new, retail and mixed-use development.

SANBAG Transportation Land Use Integration

The San Bernardino Associated Governments (SANBAG) worked with six cities to identify sites near potential transit station locations for transit-oriented development (TOD). This study represented an innovative approach to TOD by preparing TOD proformas to better plan for the type of density that could be expected in a traditionally dispersed area.

Los Angeles Expo Light Rail Station Areas

In 2007 The City of Los Angeles Planning Department and Compass Blueprint prepared a vision report for the proposed station areas in order to visualize TOD, terms of scale and mass of new transit supportive development.

NORTH ORANGE COUNTY CITIES COALITION PROJECTS

This next set of projects, completed in 2008, represented an important innovation in Compass Blueprint Demonstration projects. Like the earlier WRCOG Metrolink stations, these were all part of one demonstration. These four cities established an informal coalition in order to pursue OCTA Go Local, transportation funding. They leveraged this relationship and secured funding for four separate, different approaches to what TOD means at the local level. Examining Industrial, arterial corridor and station placement.

Brea Bus Rapid Transit Concepts

This project received grant funding to explore opportunities for transit-oriented development surrounding proposed Bus Rapid Transit (BRT) stations near the Brea Mall.

Fullerton Southeast Industrial Area

This project explored opportunities for transit-oriented development around an emerging high-capacity transit system in the Southeast Industrial Area (SIA) in the City of Fullerton.

Placentia Metrolink Concepts

Compass Blueprint provided the City of Placentia with urban design concepts and strategies for a proposed Metrolink station in the Placita Santa Fe district.

La Habra Boulevard Corridor

This Demonstration Project provided design concepts and policy recommendations to improve the economic performance, functionality, and identity of the La Habra Boulevard corridor.

TOD DISTRICTS & STATION AREA PLANNING

Azusa Citrus Station TOD Concepts

The intent of this demonstration project was to examine the potential market demand for commercial development around the Citrus Station and identify the most appropriate mix of uses.

Culver City Washington/National Catalytic Projects

The project assisted Culver City to analyze a study area that includes specific catalytic project sites and commercial corridors adjacent to the future Exposition Light Rail Transit Line.

Los Angeles La Cienega / Jefferson Station Area TOD

In 2007, Compass Blueprint partnered with the City of Los Angeles to develop the first ever comprehensive Transit-Oriented District (TOD) plan for the City.

Laguna Niguel Gateway Specific Plan

Compass Blueprint assisted the City of Laguna Niguel with an update to the Specific Plan for the area around Laguna Niguel's Metrolink station.

Long Beach Boulevard Corridor Study

Long Beach has a long-term goal of developing more mixed-use and transit oriented neighborhoods in growing areas of the City.

Fontana Downtown Overlay District

This project conducted an opportunities analysis for TOD redevelopment in the Downtown Overlay District to capitalize on Downtown Fontana's Metrolink commuter rail station.

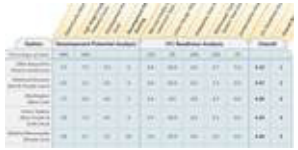
Los Angeles Tarzana Crossing

This Demonstration Project provided site analysis, open space and connectivity design opportunities, development prototypes, and parking and market analysis to create a transit oriented development district.

Santa Clarita North Newhall Specific Plan

This project will assist in developing a Specific Plan focused on transit-oriented and mixed-use development, walkable and bike-friendly land use, and economic and redevelopment opportunities.

Los Angeles Sustainable Transit Communities



This report describes and rates the key principles for creating successful Sustainable Transit Communities (STCs) in the City of Los Angeles.

SR-60 Coalition of Cities Gold Line Corridor Study

The SR-60 Coalition, made up of the cities of Monterey Park, Montebello, Rosemead, El Monte, South El Monte, and the City of Industry, initiated a study of potential freeway adjacent TOD Districts.

General Land Use & Suburban Retrofits

The following projects include early-stage vision plans, as well as land use plans in process of adoption, that reflect a desire on the part of these communities to facilitate density, encourage infill, and link to nearby transit networks. The following projects are grouped into four broad categories: Vision Studies & Scenario Planning, Land Use Studies & Plans, Visualizations & Graphical Tools, and Economic Development & Feasibility Studies. In this section, Vision Studies & Scenario Planning refer to public outreach efforts, and design charrettes intended to foster a publicly supported vision for local and sub-regional communities. They often arrive at policy recommendations to be taken forward for further study and official adoption. Land Use Studies & Plans refer to official planning documents such as Specific Plans, overlay districts, and other planning and zoning tools. These plans are generally adopted by local elected officials, and may require environmental compliance provided by the local agency.

This section also contains innovative uses of photo-simulations and graphical visualization tools. Compass Blueprint projects usually produce visualizations. The selected projects in this section highlight uniquely innovative approaches to using visualizations. These tools can be used to provide laypersons with a more understandable picture of what these plans may produce. However, these visualizations are more than pretty pictures, they serve to test concepts, and give local leaders a sense of design needs. Finally this section contains economic development and economic feasibility studies aimed at further testing and refining communities' abilities to realize their visions.

VISION STUDIES AND SCENARIO PLANNING

Inland Empire ULI Visioning Workshop

In 2006, the Western Riverside Council of Governments, the Urban Land Institute and Compass Blueprint held a visioning workshop and Inland Empire residents came together to share a vision of future growth.

Compton General Plan Update and Small-Area Visioning

The Compass Blueprint Program facilitated a visioning process for the City of Compton that engaged residents, community leaders and other stakeholders to outline priorities for the City's future. The study identified community vetted funding priority areas in the city.

Coachella Sphere of Influence Sustainability Project

Once a small farming town, Coachella is currently the sixth fastest growing city in California. This study studied the implications of various settlement patterns for areas that will eventually be incorporated into the city. The study helped identify sustainable connectivity needs in the study area.

Los Angeles County Florence Firestone (Phase 1)

In 2009, hundreds of residents, businesses, and other stakeholders in Florence-Firestone came together to develop a comprehensive, long-term vision for their community.

WRCOG I-15 Smart Growth Concept Map

This Compass Blueprint project developed land use and transit planning factors that support smart growth opportunities centered on the I-15 and I-215 freeway corridors. The study produced a set of land use characteristics and related them to relevant transit services and investments.

Desert Hot Springs Citywest Visioning Plan

The project provided a plan to develop the CityWest Area within Desert Hot Springs to responsibly accommodate anticipated growth in both housing and employment.

Los Angeles County Vision Lennox

This project created a Vision Plan for the unincorporated community of Lennox to help guide the changes and improvements sought by the people who live and work in the area.

Ventura County Compact for a Sustainable Ventura County (Phase 1 & 2)

Ventura County is a region that has always valued preserving its natural heritage and maintaining livability. Residents, community leaders, local officials, and public agency staff met and developed a coherent vision of sustainable growth for the region.

SBCCOG Shared Vision for a Sustainable South Bay

The purpose of this project was to assist the SBCCOG with a series of workshops to refine, present and build local government support for a “Sustainable South Bay Strategy.” There are many components to sustainability, and the process of developing the vision was based on the values and needs of the unique area. The resulting Neighborhood Oriented Design model is one relevant to 2nd generation suburbs based on the extended arterial grid.

Alhambra Vision 2035

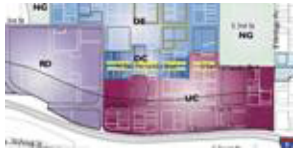
This current project will provide the City of Alhambra with a shared vision that will help guide the city’s future growth and related policies.

LAND USE STUDIES, PLANS AND CODES

Ontario New Model Colony

This demonstration project analyzed several future scenarios for the New Model Colony (NMC) General Plan Amendment.

Burbank Downtown Development Standards



This project evaluated the potential for revised zoning to accommodate residential, mixed-use, and live-work development in commercial and light industrial areas in Downtown Burbank and along two corridors in the downtown.

Rolling Hills Estates Peninsula Village Specific Plan

Through the demonstration project, a study was done to test the application, feasibility and appropriateness of the proposed Peninsula Village Overlay Zone.

Chino Focus Area Revitalization Strategy

This project quantified the feasibility of redeveloping six opportunity sites under the envisioned mixed-use development standards provided in the current General Plan update.

Holtville Economic Development and Master Plan

Compass Blueprint worked with the City of Holtville to assess the historic downtown district's economic viability and develop a master plan to guide the future of Holtville and its downtown.

Banning Paseo San Gorgonio

This Demonstration Project provided technical planning services for codifying and implementing the policies in the Paseo San Gorgonio Specific Plan and the City's General Plan policies.

Coachella Pueblo Viejo Revitalization

This Coachella Pueblo Viejo project assisted in the revitalization of the "heart" of the City's downtown in concert with the city-wide General Plan update underway. The city used the results to secure and implement downtown façade renovation program funding.

Brawley Downtown Overlay District

This Demonstration Project enabled the development of a Downtown Brawley Specific Plan that evaluates development options in the City's new Downtown Overlay District.

Los Angeles County Florence Firestone (Phase 2)

The strategies identified in the Florence Firestone Vision Study process were further developed to create the Florence-Firestone Community Plan which will guide the future development of the area.

Grand Terrace Business Corridor Specific Plan

This Demonstration Project served to update the Barton Road Specific Plan with a focus on economic development in order to reduce congestion and improve the jobs-housing balance in south western San Bernardino.

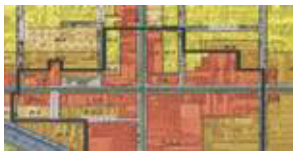
Redlands Transferring Development from Greenfields to Infill

The City of Redlands is faced with a series of choices about how it will grow in terms of population, housing and employment.

Los Angeles County Antelope Valley Area Plan Update

This Demonstration Project assisted in the development of a rural smart growth and preservation strategy through new land use designations in the Antelope Valley Area Plan update.

Bellflower Alondra Mixed-Use Overlay Zone



The City of Bellflower developed a clear vision and set of development standards aimed at attracting and managing growth in this underserved area adjacent to the downtown area and the West Santa Ana Branch transit station.

VISUALIZATIONS AND GRAPHICAL TOOLS

El Centro Project SHAPE Downtown

El Centro, a fast growing town near the Mexican border and the hub of the agriculturally rich Imperial Valley, prepared a plan to draw investment into its historic downtown. Using dramatic visualizations to envision a much higher density than has been traditional, the city discovered wide acceptance for the images in the community.

Fullerton Downtown 3D Model & Database

This Demonstration Project provided funding for the creation of a three-dimensional digital model and database of the Downtown Fullerton area. The three dimensional model will help the city with a wide range of analyses and scenario planning for the burgeoning downtown.

San Gabriel Visualizations and Tipping Point Analysis

Compass Blueprint provided the City of San Gabriel with an analysis of the financial feasibility of various development scenarios at a site in the City's mission District. The project produced high quality visualizations of the kind of development that would be feasible and desirable.

Lake Elsinore Key to Downtown Design Guidelines

The City of Lake Elsinore to created design standards and visualization products for the planned development of a new Civic Center and focal point for a larger downtown revitalization master plan.

Calexico Gateway to Mexico

The Calexico demonstration project helped the City to prepare a Master Plan that assesses the historic downtown district's economic viability. As in El Centro, the visualization helped residents imagine a much denser historic core in keeping with existing architectural styles.

ECONOMIC DEVELOPMENT AND FEASIBILITY STUDIES

Upland Downtown Infill Study

The Downtown Upland Infill Study provided Tipping Point/ROI analysis, visualizations, site planning and parking analysis focused on two city-owned downtown parking lots, in close proximity to established civic uses and the Metrolink station.

Los Angeles HACLA Jordan Downs Specific Plan

This project assisted in the development of the Jordan Downs Specific Plan, and provided sustainability strategies for green building and GHG reductions.

Fillmore Business Park Feasibility Study

Compass Blueprint worked with the City of Fillmore to analyze the financial feasibility of a potential business park proposed to achieve more balanced employment and housing opportunities.

Upland College Heights Economic Development Strategy

The City of Upland is developing a sustainable economic development strategy for this recently fully incorporated area that will address job and industry creation awareness in the sub-regional market.

Corona Downtown Redevelopment

This Demonstration Project analyzed land use conditions and the market feasibility for specific redevelopment project sites within Downtown Corona.

El Monte Economic Development Plan

This Demonstration Project created a plan that enables the City to foster compact development, enabling a more synergistic approach to the future of El Monte.

Transportation Network Integration

Since the beginning of the Demonstration Program in 2005, integrating land use and the transportation network has been an important aspect of planning according the Compass Blueprint principles of Mobility, Livability, Sustainability, and Prosperity. As was noted above, the definition of Transit Oriented Development has expanded to include the wider community beyond the station. Local cities and agency have become concerned with improving livability and reducing vehicle miles traveled (VMT) throughout the region, including areas not service by rail transit. Finally, local agencies have become interested in solving the so-called "First mile/ Last mile" problem. This refers to how people, in a disperse region such as Southern California, access the local and regional transit systems. All of these subjects are being studied in communities throughout our region as part of the Compass Blueprint Demonstration Project Program.

The following projects are grouped in the following sub categories: Freeway Trench Capping Projects, Multi-Mobility & Living Streets Planning, and Suburban Arterial Retrofitting. Freeway Capping Projects are local visions for transforming urban areas by providing new urban park spaces, and reconnecting communities divided by freeways decades ago. The vision is to improve freeways where the right of way is in trench, cover the trench and create park space and developable land in return. Multi-Mobility Planning refers to planning for all the other modes of travel besides single-occupant vehicle (SOV). These include bike and pedestrian planning, Bus Rapid Transit, and local neighborhood electric vehicles. Finally, a number of projects can best be categorized as suburban retrofitting. Understanding that many people choose to live in traditional suburban settings, these communities are studying how to retrofit an arterial roadway network designed for the automobile to allow for more mixed land uses and types of transportation.

FREEWAY TRENCH CAPPING PROJECTS

Los Angeles Hollywood Freeway Central Park

This project evaluated the potential for a public park that would be built on a deck constructed over the below-grade portion of the Hollywood Freeway (US-101) from Bronson Avenue to Wilton Place.

Ventura Freeway Cap Project

The City of Ventura is a beautiful coastal city in Ventura County that is developing a plan to make the downtown area more livable and prosperous by connecting the downtown and the waterfront area.

Los Angeles PARK101 (Phase 1 & 2)

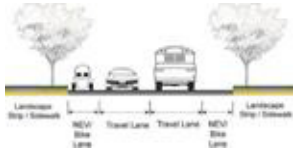
This project assesses the feasibility of "capping" the US-101 freeway as it passes through downtown Los Angeles.

MULTI-MOBILITY AND LIVING STREETS PLANNING

El Centro Project SHAPE Parking and Circulation Plan

El Centro, a fast growing town near the Mexican border and the hub of the agriculturally rich Imperial Valley, needed a plan to draw investment into its historic downtown. The second part of this project was a park-once strategy, and pedestrian friendly circulation vision for the downtown area.

WRCOG Neighborhood Electric Vehicles Plan



This project assisted in a plan for a network of 35 mph speed limit streets suitable for the deployment of Neighborhood Electric Vehicles (NEV) in the cities of Riverside, Corona, Norco and Moreno Valley.

Los Angeles Sunset Junction Streetscape Vision

This project helped the Los Angeles County Metropolitan Transportation Authority identify streetscape improvements for the Sunset Junction area. This vision was awarded Metro Call for Projects funding, and will be implemented in 2012.

WRCOG Bus Rapid Transit Plan

This report provided a conceptual analysis of Bus Rapid Transit (BRT) services for potential corridors within Western Riverside.

Victorville Non-Motorized Transportation Plan

This project assisted in creating a Non-motorized Transportation Plan for the City of Victorville to provide connectivity for residents and visitors to public facilities.

Palm Springs Airport to Downtown Shuttle

This Palm Springs Airport-Downtown Shuttle project evaluated a new Shuttle service that would serve visitors to Palm Springs Hotels via the International Airport.

WRCOG Non-Motorized Transportation Plan

This Compass Blueprint project enabled the development of a Non-Motorized Transportation Plan (NMTP) to support a regional network of bicycle and pedestrian

facilities throughout the WRCOG region. The study identified facilities for both commuter and recreation use.

Anaheim Outdoors Master Plan

The City of Anaheim wishes to develop a network of green corridors within the Platinum Triangle that will provide non-motorized linkages between transit and the places where people live, work, shop, and play.

Calimesa Creek Riverwalk Master Plan

The City of Calimesa project will develop a vision and master plan to create a pedestrian-oriented Riverwalk to repair, revitalize, and leverage the place-making qualities of a storm water channel.

SUBURBAN ARTERIAL RETROFITTING

San Gabriel Valley Arrow Highway Corridor

This demonstration project allowed for collaborative planning between multiple jurisdictions situated along the Arrow Highway corridor. The study produced a vision for development nodes along the corridor which will enable cities to collaborate on supportive improvements to the corridor.

Indio Highway 99 / Indio Boulevard Study

Compass Blueprint worked with the City of Indio to prepare a revitalization plan for Indio Boulevard, based on the vision the City has for downtown of offering new mixed-use developments.

Calimesa Boulevard Downtown Revitalization Project

The City of Calimesa project provided development codes and design guidelines to create a pedestrian-oriented atmosphere consistent with traditional Southern California architectural styles.

Cathedral City Date Palm Drive Connector Plan (Phase 1 & 2)

This Demonstration Project served to provide direction for future Cathedral City public investments, private development, and community action. Phase 2 codified the improvements and developed implementation strategies for the vision.

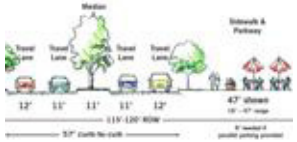
La Mirada Imperial Highway Corridor Specific Plan

The Imperial Highway Specific Plan established comprehensive policy and a regulatory guidance document for all properties within the Imperial Highway Specific Plan area.

Moreno Valley Alessandro Boulevard Corridor Vision

This project evaluated the potential for transit-oriented development around a proposed Metrolink station at Alessandro Boulevard, and the revitalization of the corridor area. Phase 2 codified the vision in a corridor specific plan, a mixed-use designation, and more specific recommendations for the roadway right of way.

Los Alamitos Commercial Corridors Plan



This Demonstration Project provided the City of Los Alamitos with funding to assess the revitalization potential of the intersection of Katella and Los Alamitos corridors.

K. Compass Blueprint Recognition Awards

The annual Compass Blueprint Recognition Awards serves as an important forum for showcasing smart growth planning practices, attended by elected officials and planning staff from across the 191 member cities. Excellence and achievement awards are granted in four categories: mobility, livability, prosperity, and sustainability along with an award for overall excellence.

TABLE K1 Compass Blueprint Awards

Project Name	City	Year	County
General Plan Update Small Area Visioning	Compton	2007	Los Angeles
Downtown Specific Plan and Mobility Study	Glendale	2007	Los Angeles
Olive Court	Long Beach	2007	Los Angeles
Valley Vision: Valley Boulevard Neighborhoods Sutainability Plan	San Gabriel	2007	Los Angeles
San Dimas Grove Station	San Dimas	2007	Los Angeles
Westgate Pasadena	Pasadena	2007	Los Angeles
San Bernardino Transit Village	San Bernardino	2007	Los Angeles
Grand Avenue Project	Los Angeles	2007	Los Angeles
Artesia Corridor Specific Plan	Gardena	2007	Los Angeles
The Santa Monica Collection	Santa Monica	2007	Los Angeles
Fullerton Transportation Center	Fullerton	2007	Orange
Platinum Triangle	Anaheim	2007	Orange
Santiago Street Lofts	Santa Ana	2007	Orange
Transit Oriented Development Projects	WRCOG	2007	Riverside
Project SHAPE	El Centro	2008	Imperial
Arrow Highway Corridor	Arrow Highway Corridor	2008	Los Angeles
Central District Specific Plan	Pasadena	2008	Los Angeles

Project Name	City	Year	County
General Plan and Form-Based Development Code	Azusa	2008	Los Angeles
Park View Terrace	Bell Gardens	2008	Los Angeles
Claremont Village Expansion Project	Claremont	2008	Los Angeles
Sportsplex Mixed-Use Project	West Covina	2008	Los Angeles
South Brea Lofts	Brea	2008	Orange
Irvine Housing Strategy	Irvine	2008	Orange
Buena Park Transit Village	Buena Park	2008	Orange
Coachella Sphere of Influence Sustainability Project	Coachella	2008	Riverside
General Plan 2025 Program	Riverside	2008	Riverside
Dos Lagos Residential Mixed-Use Village	Corona	2008	Riverside
New Model Colony Phase 2	Ontario	2008	San Bernardino
SANBAG – Transportation Land Use Integration	SANBAG	2008	San Bernardino
Town Center Project	Ontario	2008	San Bernardino
Compact for a Sustainable Ventura County	Ventura	2008	Ventura
Downtown Specific Plan	Ventura	2008	Ventura
Holtville Master Plan	Holtville	2008	Imperial
Florence-Firestone Visioning Project	Los Angeles County	2009	Los Angeles
The South Collection: Eleven, Luma, and Evo	Los Angeles	2009	Los Angeles
Los Angeles Community College District Sustainability Building Program	Los Angeles	2009	Los Angeles
2008–2014 Housing Element	Santa Monica	2009	Los Angeles
El Monte Transit Village Specific Plan	El Monte	2009	Los Angeles

Project Name	City	Year	County
Studio One Eleven/Interstices Courtyard Lofts	Long Beach	2009	Los Angeles
Downtown Lancaster Specific Plan	Lancaster	2009	Los Angeles
Adams Square Revitalization Program	Glendale	2009	Los Angeles
Transit Village Specific Plan	Palmdale	2009	Los Angeles
Cross Creek Road Improvement Project	Malibu	2009	Los Angeles
Highway 99 / Indio Boulevard Study	Indio	2009	Riverside
I-15 Interregional Partnership	WRCOG	2009	Riverside
Coachella Valley Workforce Housing Trust	Coachella Valley	2009	Riverside
The Village at Oxnard	Oxnard	2009	Ventura
Expansion, Mobility, and Sustainability Program	Imperial	2010	Imperial
Jordan Downs Specific Plan	Los Angeles	2010	Los Angeles
Station Square Transit Village Specific Plan	Monrovia	2010	Los Angeles
Las Virgenes Creek Restoration	Calabasas	2010	Los Angeles
Land Use and Circulation Element (LUCE)	Santa Monica	2010	Los Angeles
Calabasas General Plan	Calabasas	2010	Los Angeles
Gardens Specific Plan	Beverly Hills	2010	Los Angeles
Downtown Business Corridor Plan	Calabasas	2010	Los Angeles
Anaheim Regional Transportation Intermodal Center (ARTIC)	Anaheim	2010	Orange
City Place Mixed-Use Development	Santa Ana	2010	Orange
Great Park Comprehensive Master Plan	Orange County	2010	Orange
Section 19 Specific Plan	Rancho Mirage	2010	Riverside

Project Name	City	Year	County
North City Specific Plan	Cathedral City	2010	Riverside
The Ontario Plan	Ontario	2010	San Bernardino
Crossroads Mixed-Use Project	Rialto	2010	San Bernardino
The Shoppes Specific Plan	Chino Hills	2010	San Bernardino
Downtown Overlay District	Brawley	2011	Imperial
America Fast Forward, 30/10 Plan Sustainable Transit Communities	Los Angeles	2011	Los Angeles
Climate Action Plan	West Hollywood	2011	Los Angeles
Metro Blue Line Bicycle & Pedestrian Access Plan	Long Beach	2011	Los Angeles
Dowtown Downey Specific Plan	Downey	2011	Los Angeles
Commercial Corridors Plan	Los Alamitos	2011	Orange
Transit Zoning Code	Santa Ana	2011	Orange
Transferring Development from Greenfields to Infill	Redlands	2011	San Bernardino
Regional Energy Efficiency Program	San Bernardino	2011	San Bernardino
Addressing Foreclosure Crisis and Stabilizing Neighborhoods	Rialto	2011	San Bernardino

L. 2012–2035 RTP/SCS Supportive Local Model Planning/Development Projects

The following table lists other projects within the SCAG region that support the goals and objectives of the 2012–2035 RTP/SCS. The projects identified focus on economic feasibility studies, sustainable design, small-lot housing, mixed-use commercial and residential development, Transit Oriented Development (TOD), parks and community space, all modes of non-automobile transportation, parking systems management, transportation demand management (TDM), transportation systems management (TSM), and other innovative practices.

These projects demonstrate the breadth and depth of sustainable communities supportive planning, and development that has been occurring in Southern California. These projects demonstrate the market demand, and public sector responsiveness for strategies that involve reducing per capita GHG emissions across all parts of the SCAG region.

TABLE L1 2012–2035 RTP/SCS Supportive Non-Compass Projects

Project Name	City	Year	County
Regional Integration of Paratransit Resources	Access Services	2007	Los Angeles
Arcadia Arterial ITS Development Project	Arcadia	2007	Los Angeles
South Street Pedestrian, Bikeway and Transit Improvement	Artesia	2007	Los Angeles
Country Club Drive Bikeway Improvement Project	Avalon	2007	Los Angeles
Baldwin Park Metrolink Pedestrian Overcrossing	Baldwin Park	2007	Los Angeles
Baldwin Park Metrolink Transit Center	Baldwin Park	2007	Los Angeles
City of Bell Gardens Signage Program	Bell Gardens	2007	Los Angeles
Santa Monica Boulevard Signal Synchronization	Beverly Hill	2007	Los Angeles

Project Name	City	Year	County
Pedestrian Improvements for Intersections with Bus Stops	Beverly Hills	2007	Los Angeles
I-5/SR-134 Congestion Management Project	Burbank	2007	Los Angeles
San Fernando Bikeway	Burbank	2007	Los Angeles
City of Cerritos Transit Amenities	Cerritos	2007	Los Angeles
Claremont Portion of the Citrus Regional Bikeway	Claremont	2007	Los Angeles
Eastside Light Rail Bike Interface Project	County of Los Angeles	2007	Los Angeles
Real-Time Motorist Parking Information System Demonstration	Culver City	2007	Los Angeles
Emerald Necklace Bike Trail Project	Duarte	2007	Los Angeles
El Monte Transit Cycle Friendly	El Monte	2007	Los Angeles
Crenshaw Boulevard Improvement Project	Hawthorne	2007	Los Angeles
Pedestrian/Equestrian Crosswalks: Descanso and Verdugo	La Canada Flintridge	2007	Los Angeles
Atlantic Ave. Signal Synchronization and Enhancement Project	Long Beach	2007	Los Angeles
Bicycle System Gap Closures & Improved LA River Bike Path	Long Beach	2007	Los Angeles
San Gabriel River Bike Path Gap Closure at Willow Street	Long Beach	2007	Los Angeles
Willow Street Pedestrian Improvement Project	Long Beach	2007	Los Angeles
San Fernando Road-Fletcher Drive to SR-2, Elm Street to I-5 Freeway	Los Angeles	2007	Los Angeles
Victory Boulevard Widening from Topanga Canyon Boulevard to De Soto Avenue	Los Angeles	2007	Los Angeles

Project Name	City	Year	County
Highway Rail Grade Crossing Improvement System	Los Angeles	2007	Los Angeles
ATSAC/ATCS Pacific Palisades Canyons Project	Los Angeles	2007	Los Angeles
Hollywood Integrated Modal Information System	Los Angeles	2007	Los Angeles
ExperienceLA.com Web 2.0 Interactive Transit Mapping & WiFi	Los Angeles	2007	Los Angeles
Downtown LA Alternative Green Transit modes Trial Program	Los Angeles	2007	Los Angeles
San Fernando Rd. Bike Path Phases IIIA Construction	Los Angeles	2007	Los Angeles
Bicycle Wayfinding Signage Program	Los Angeles	2007	Los Angeles
Imperial Highway Bike Lanes	Los Angeles	2007	Los Angeles
Manchester Avenue Bike Lanes & Island Reduction	Los Angeles	2007	Los Angeles
LA City College Pedestrian Enhancements	Los Angeles	2007	Los Angeles
Los Angeles Trade-Tech Intermodal Links with Bus and Metro	Los Angeles	2007	Los Angeles
Washington Boulevard Transit Enhancments	Los Angeles	2007	Los Angeles
Century City Urban Design and Pedestrian Connection Plan	Los Angeles	2007	Los Angeles
Sunset Junction Transit Plaza (first phase)	Los Angeles	2007	Los Angeles
Los Angeles Valley College (LAVC) Bus Station Extension	Los Angeles	2007	Los Angeles
Solano Canyon-Zanja Madre-Chinatown-Broadway Bus Stop Improvements	Los Angeles	2007	Los Angeles
Eastside Light Rail Pedestrian Linkages	Los Angeles	2007	Los Angeles

Project Name	City	Year	County
Expo Line Station Streetscape Project – East Crenshaw to Jefferson	Los Angeles	2007	Los Angeles
Hollywood Pedestrian/Transit Crossroads Phase II	Los Angeles	2007	Los Angeles
Main Street Bus Stop and Pedestrian Improvements	Los Angeles	2007	Los Angeles
Cesar Chavez Transit Corridor (110 Fwy. To Alameda)	Los Angeles	2007	Los Angeles
Fashion District Streetscape Phase II	Los Angeles	2007	Los Angeles
Los Angeles Pierce College (LAPC) Bus Rapid Transit Station Extension	Los Angeles	2007	Los Angeles
Olive/Pico Bus Stop Improvement	Los Angeles	2007	Los Angeles
Branching Out	Los Angeles	2007	Los Angeles
Los Angeles City College Red Line Station Extension	Los Angeles	2007	Los Angeles
San Gabriel Valley Forum Traffic Signal Corridors Project	Los Angeles County	2007	Los Angeles
South Bay Forum Traffic Signals Corridor Project	Los Angeles County	2007	Los Angeles
Gateway Cities Forum Traffic Signal Corridors Project Phase V	Los Angeles County	2007	Los Angeles
Information Exchange Network Phase II	Los Angeles County	2007	Los Angeles
El Pueblo Pedestrian Improvements Phase I, II, III & IV (Wayfinding signs ONLY)	Los Angeles County	2007	Los Angeles
Fiji Way Bicycle Lane Project	Los Angeles County	2007	Los Angeles
El Pueblo Pedestrian Improvements Phase I, II, III & IV	Los Angeles County	2007	Los Angeles

Project Name	City	Year	County
Florence Avenue Pedestrian Improvement Project (Phase I)	Los Angeles County	2007	Los Angeles
Wayfinding Program	Monterey Park	2007	Los Angeles
Firestone Boulevard Bridge Widening over San Gabriel River	Norwalk	2007	Los Angeles
North County Traffic Forum ITS Expansion	Palmdale	2007	Los Angeles
Palmdale Transportation Center-Wayfinding Signage Program	Palmdale	2007	Los Angeles
6th Street East Bikeway Extension	Palmdale	2007	Los Angeles
Avenue S Bikeway Phase 2	Palmdale	2007	Los Angeles
East Colorado Boulevard Pedestrian Enhancement (Phase I)	Pasadena	2007	Los Angeles
Bike Compatibility Roadway Safety and Linkage on Palos Verdes Dr	Rancho Palos Verdes	2007	Los Angeles
Pedestrian Safe Bus Stop Linage	Rancho Palos Verdes	2007	Los Angeles
Palos Verdes Drive North Bike Lanes	Rolling Hills Estates	2007	Los Angeles
Bikeway Improvements on Foothill Blvd. at San Dimas Wash	San Dimas	2007	Los Angeles
San Fernando Pacoima Wash Bike Path	San Fernando	2007	Los Angeles
San Fernando Downtown Pedestrian Improvement Project	San Fernando	2007	Los Angeles
San Gabriel City-Wide Bus Shelter Installation	San Gabriel	2007	Los Angeles
Las Tunas Drive Landscaping Enhancement Project	San Gabriel	2007	Los Angeles
Citywide Public Information Relay System	Santa Clarita	2007	Los Angeles

Project Name	City	Year	County
Santa Clarita Transit Bus Stop Expansion & Amenities	Santa Clarita	2007	Los Angeles
Norwalk/Santa Fe Springs Transportation Center Improvements	Santa Fe Springs	2007	Los Angeles
Santa Monica Real Time Beach Parking Signs	Santa Monica	2007	Los Angeles
Downtown Santa Monica Bike Transit Station	Santa Monica	2007	Los Angeles
Bike Technology Demonstration	Santa Monica	2007	Los Angeles
Route 101/Lindero Canyon Road Interchange Improvements	Westlake Village	2007	Los Angeles
Baldwin Avenue & Duarte Road Intersection Improvement Project	Arcadia	2009	Los Angeles
Arcadia Gold Line Station Pedestrian Linkage Project	Arcadia	2009	Los Angeles
Arcadia Gold Line Station Transit Plaza	Arcadia	2009	Los Angeles
Azusa Intermodal Transit Center	Azusa	2009	Los Angeles
Azusa Gateway Project	Azusa	2009	Los Angeles
Metrolink Parking Resource Management Demonstration Project	Baldwin Park	2009	Los Angeles
South Baldwin Park Commuter Bikeway Project	Baldwin Park	2009	Los Angeles
Information Exchange Network Phase III	County of Los Angeles	2009	Los Angeles
North County Bikeways	County of Los Angeles	2009	Los Angeles
Culver Boulevard Realignment Project	Culver City	2009	Los Angeles
Real-Time Bus Arrival Information System	Culver City	2009	Los Angeles
Arroyo Verdugo Commute Manager System	Glendale	2009	Los Angeles

Project Name	City	Year	County
Advanced Wayfinding and Guidance System	Glendale	2009	Los Angeles
Hawthorne Boulevard Mobility Improvement Project	Hawthorne	2009	Los Angeles
Florence Avenue Regional Transportation Corridor Improvement Project	Inglewood	2009	Los Angeles
The Old Road Widening: Magic Mountain Parkway to Turnberry Lane	LA County	2009	Los Angeles
Willlowbrook Area Access Improvements	LA County	2009	Los Angeles
Willowbrook Area Bikeway Improvements	LA County	2009	Los Angeles
Willowbrook Area Access Improvements to MLK MACC	LA County	2009	Los Angeles
Del Amo Boulevard Bridge Replacement Improvements	Lakewood	2009	Los Angeles
Avenue L Widening, 15th to 30th Streets West	Lancaster	2009	Los Angeles
Downtown Lancaster Gateway and Roundabout Project	Lancaster	2009	Los Angeles
City of Long Beach Bike Share Program	Long Beach	2009	Los Angeles
Parking Guidance and Wayfinding Systems (PGS)	Long Beach	2009	Los Angeles
Daisy Corridor and 6th St Bike Boulevard	Long Beach	2009	Los Angeles
Long Beach Bl Pedestrian Improvement Project	Long Beach	2009	Los Angeles
North Main St Grade Separation	Los Angeles	2009	Los Angeles
Intelligent Transportation System (ITS) Communication Systems Upgrade Project	Los Angeles	2009	Los Angeles

Project Name	City	Year	County
City I County Traffic Management Integration Phase 2 Project	Los Angeles	2009	Los Angeles
Downtown LA Transit Information and Wayfinding	Los Angeles	2009	Los Angeles
First and Last Mile Transit Connectivity Options	Los Angeles	2009	Los Angeles
Exposition-West Bikeway	Los Angeles	2009	Los Angeles
San Fernando Rd Bike Path IIIB Construction	Los Angeles	2009	Los Angeles
LA River Bike Path Phase IV	Los Angeles	2009	Los Angeles
Figueroa Corridor Bike Station & Cycling Enhancements	Los Angeles	2009	Los Angeles
Boyle Heights Chavez Ave Streetscape/pedestrian	Los Angeles	2009	Los Angeles
Menlo AvlMLK Vermont Expo Station Pedestrian Improvements	Los Angeles	2009	Los Angeles
West Third St Pedestrian Improvement Project	Los Angeles	2009	Los Angeles
Eastside Light Rail Pedestrian Linkages, Phase II	Los Angeles	2009	Los Angeles
LAN1 – Evergreen Park Street Enhancement Project	Los Angeles	2009	Los Angeles
Central Av Historic Corridor Streetscape	Los Angeles	2009	Los Angeles
Beverly 81 Transportation Enhancements	Los Angeles	2009	Los Angeles
Arts DistrictlLittle Tokyo Gold Line Station Linkages	Los Angeles	2009	Los Angeles
Westlake MacArthur Park Pedestrian Improvement Project	Los Angeles	2009	Los Angeles
Broadway Historical Theater District Pedestrian Enhancements (4th-6th Sts)	Los Angeles	2009	Los Angeles
Western Avenue Bus Stop & Pedestrian Improvement Project	Los Angeles	2009	Los Angeles
Stocker MLK Crenshaw Access to Expo LRT Station	Los Angeles	2009	Los Angeles
Sunset Junction Phase 2	Los Angeles	2009	Los Angeles
What A Re-Leaf	Los Angeles	2009	Los Angeles
Watts Streetscape Enhancements	Los Angeles	2009	Los Angeles
Sunset Junction Phase 2	Los Angeles	2009	Los Angeles
Nowalk/Santa Fe SpringslMetro-link Pedestrian Plaza Upgrade	Norwalk	2009	Los Angeles
Pioneer Arterial Transportation Enhancement	Norwalk	2009	Los Angeles
Huntington Park	Pacific Blvd Pedestrian Improvement Project	2009	Los Angeles
Avenue S Widening Phase II	Palmdale	2009	Los Angeles
Metro Gold Line At-Grade Cross-ing Mobility Enhancements	Pasadena	2009	Los Angeles
Fold-n-Go Pasadena – Folding Bicycle Demonstration Program	Pasadena	2009	Los Angeles
Pasadena ARTS Enhanced Passenger Information	Pasadena	2009	Los Angeles
Pasadena's Wayfinding System	Pasadena	2009	Los Angeles
Zero Emissions Vehicle Charging Stations	Pasadena	2009	Los Angeles
Cordova Street Road Diet	Pasadena	2009	Los Angeles
Bike Loops for Intersections	Pasadena	2009	Los Angeles
North Fair Oaks Avenue Pedestrian Improvements	Pasadena	2009	Los Angeles
East Colorado Bl pedestrian Improvements	Pasadena	2009	Los Angeles
Pasadena Av Ped Connection to Gold Line Heritage Square Station	Pasadena	2009	Los Angeles

Project Name	City	Year	County
Pedestrian Bridge along Rosemead Boulevard	Pico Rivera	2009	Los Angeles
Bicycle Transportation Plan Implementation	Redondo Beach	2009	Los Angeles
Redondo Beach Intermodal ransit Center	Redondo Beach	2009	Los Angeles
Riviera Village Enhancement Project	Redondo Beach	2009	Los Angeles
Intersection Improvements on Bonita Av at Cataract Av	San Dimas	2009	Los Angeles
City of San Fernando Transit Wayfinding	San Fernando	2009	Los Angeles
San Fernando Rd Downtown Pedestrian Improvement Project	San Fernando	2009	Los Angeles
McBean Parkway Bridge Widening and Gap Closure over Santa Clara River	Santa Clarita	2009	Los Angeles
Citywide Wayfinding Program for Pedestrians and Bicyclists	Santa Clarita	2009	Los Angeles
Newhall Gateway Roundabout	Santa Clarita	2009	Los Angeles
Nowalk/Santa Fe Springs Transportation Center Phase II Parking	Santa Fe Springs	2009	Los Angeles
A 'No Net New Trips' Rideshare Toolkit	Santa Monica	2009	Los Angeles
Multi-Modal Wayfinding System	Santa Monica	2009	Los Angeles
Bike Network Linkages to Expo Line	Santa Monica	2009	Los Angeles
Colorado Pedestrian Promenade: LRT Station to PierlBeach	Santa Monica	2009	Los Angeles
Downtown Torrance Pedestrian Improvement Project	Torrance	2009	Los Angeles
Pedestrian Signal Upgrades	West Hollywood	2009	Los Angeles
La Brea Streetscape Project	West Hollywood	2009	Los Angeles

Project Name	City	Year	County
City of Whittier Bus Stop Improvement Plan	Whittier	2009	Los Angeles
Greenway Trail Directional Signage and Scenic Beautification	Whittier	2009	Los Angeles
Burbank Traveler Information and Wayfinding Systems	Burbank	2011	Los Angeles
Los Angeles River Bridge	Burbank	2011	Los Angeles
Garfield Av/Washington Bl Multimodal Int. Improvement	Commerce	2011	Los Angeles
Avenue L Roadway Widening Project	County of Los Angeles	2011	Los Angeles
Fullerton Road at Pathfinder Road	County of Los Angeles	2011	Los Angeles
Colima Rd Improvements	County of Los Angeles	2011	Los Angeles
Ramona Blvd/Badillo St/Covina Blvd TSSP/BSP	County of Los Angeles	2011	Los Angeles
Metro Green Line Vermont Station Wayfinding Signage	County of Los Angeles	2011	Los Angeles
Vermont Av Bike Lane, Manchester Bl to El Segundo Bl	County of Los Angeles	2011	Los Angeles
Florence Metro Blue Line Station Bikeway Access Improvements	County of Los Angeles	2011	Los Angeles
Arrow Highway Bus Stop Improvement Plan	County of Los Angeles	2011	Los Angeles
Covina Bicycle Network Phase II	Covina	2011	Los Angeles
Culver City Adaptive Control System Implementation Project	Culver City	2011	Los Angeles
Telegraph Rd Traffic Throughput Enhancement Project	Downey	2011	Los Angeles
Duarte Gold Line Station Pedestrian Improvements	Duarte	2011	Los Angeles
Ramona Boulevard & Valley Boulevard Intersection Improvement	El Monte	2011	Los Angeles

Project Name	City	Year	County
Shared Parking Program/TOD Smart Parking Detection System	El Monte	2011	Los Angeles
Civic Center & Interjurisdictional Bikeways	El Monte	2011	Los Angeles
Glendale Subregional Traffic Management Center Implementation Project	Glendale	2011	Los Angeles
El Segundo Bl Improvement Project	Hawthorne	2011	Los Angeles
SR 57/60 Confluence, Grand Av at Golden Springs Dr	Industry	2011	Los Angeles
City of Inglewood ITS- Phase IV Improvement Project	Inglewood	2011	Los Angeles
Foothill Bl Link Bike/Ped Greenbelt Project	La Canada Flintridge	2011	Los Angeles
10th St West Road Diet and Bikeway Improvements	Lancaster	2011	Los Angeles
Av I Corridor Improvements, 15th Street W to 10th Street W	Lancaster	2011	Los Angeles
City of Long Beach Phase II Bike Share Program	Long Beach	2011	Los Angeles
Downtown Long Beack Pine Av Streetscape Improvement	Long Beach	2011	Los Angeles
Atlantic Av Streetscape Enhancements	Long Beach	2011	Los Angeles
ITS Platform Upgrades	Los Angeles	2011	Los Angeles
Bicycle Corral Program Launch	Los Angeles	2011	Los Angeles
L.A. River Bike Path, Headwaters Section	Los Angeles	2011	Los Angeles
Bicycle Corral Program Launch	Los Angeles	2011	Los Angeles
Expo Line Bike Hubs in South Los Angeles	Los Angeles	2011	Los Angeles
Bicycle Friendly Streets	Los Angeles	2011	Los Angeles
Washington Boulevard Pedestrian Transit Access (Hooper/Alameda) Phase II	Los Angeles	2011	Los Angeles
Hollywood/Western Streetscape Public Improvements	Los Angeles	2011	Los Angeles
Orange Line Extension Sherman Way Station Pedestrian Links	Los Angeles	2011	Los Angeles
Expo Line Transit/Pedestrian Linkages	Los Angeles	2011	Los Angeles
Valencia Triangle Landscape Beautification Plaza	Los Angeles	2011	Los Angeles
Malibu Bus Stop Improvements along PCH	Malibu	2011	Los Angeles
Grant Av Signal Improvements	Redondo Beach	2011	Los Angeles
Valley Bl Capacity Enhancement Project	Rosemead	2011	Los Angeles
San Gabriel Bl Gateway Corridor Improvements Project	San Gabriel	2011	Los Angeles
Golden Valley Rd Widening/Gap Closure over State Route 14	Santa Clarita	2011	Los Angeles
Intelligent Transportation System (ITS) Phase V	Santa Clarita	2011	Los Angeles
Tourney Rd Bike Lane & Orchard Rd Bike Route	Santa Clarita	2011	Los Angeles
Bikeshare: First and Last Mile Connections to Expo	Santa Monica	2011	Los Angeles
Citywide Bus Shelter Upgrades with Electronic Kiosks	Signal Hill	2011	Los Angeles
South Pasadena's ATMS, Central TCS and FOIC for Fair Oaks Av	South Pasadena	2011	Los Angeles
Rosemead Boulevard Safety Enhancement and Beautification Project	Temple City	2011	Los Angeles

Project Name	City	Year	County
Holtville Master Plan	Holtville	2009	Imperial
Expansion, Mobility, and Sustainability Program	Imperial	2010	Imperial
Street Tree Master Plan	Beverly Hills	1912	Los Angeles
Congregate Care Overlay Zone	Beverly Hills	1984	Los Angeles
Senior Housing Incentive Program	Beverly Hills	1984	Los Angeles
Small Lot Assembly Incentive Program	Beverly Hills	1984	Los Angeles
East Los Angeles Civic Center Urban Design and Existing Facility Renovation	East Los Angeles	2001	Los Angeles
Commercial Retail Planned Development Overlay	Beverly Hills	2002	Los Angeles
Senior Housing Project	Beverly Hills	2002	Los Angeles
Los Angeles to Pasadena Metro Gold Line Project Architecture & Design	Los Angeles/ Pasadena	2003	Los Angeles
Monterey Park Mixed-Use Pedestrian Linkage Project and Zoning Ordinance	Monterey Park	2003	Los Angeles
Second Unit Program	Beverly Hills	2003	Los Angeles
Lincoln Corridor Mobility and Urban Design Study	Los Angeles	2004	Los Angeles
Beverly Hills Triangle Revitalization Master Plan	Beverly Hills	2004	Los Angeles
Snieder Housing Project	Beverly Hills	2004	Los Angeles
Sunrise Housing Project	Beverly Hills	2004	Los Angeles
East Pasadena Specific Plan Revisions	Pasadena	2005	Los Angeles
Beverly Hills Gardens Specific Plan	Beverly Hills	2005	Los Angeles
Village Walk at Tarzana, Phases I, II and III	Los Angeles	2006	Los Angeles
Mid-City/Exposition Corridor Light Rail Transit Project	Los Angeles	2006	Los Angeles
Metro Orange Line Canoga Extension	Los Angeles	2007	Los Angeles
Pallihouse Condo Hotel	West Hollywood	2007	Los Angeles
Green Building Ordinance	West Hollywood	2007	Los Angeles
8600 Wilshire	Beverly Hills	2007	Los Angeles
9200 Wilshire	Beverly Hills	2007	Los Angeles
Entertainment Office Planned Development Overlay	Beverly Hills	2007	Los Angeles
Beverly Hills Green Building Program	Beverly Hills	2007	Los Angeles
Downtown Specific Plan and Mobility Study	Glendale	2007	Los Angeles
Olive Court	Long Beacb	2007	Los Angeles
Valley Vision: Valley Boulevard Neighborhoods Sutainability Plan	San Gabriel	2007	Los Angeles
San Dimas Grove Station	San Dimas	2007	Los Angeles
Westgate Pasadena	Pasadena	2007	Los Angeles
San Bernardino Transit Village	San Bernardino	2007	Los Angeles
Grand Avenue Project	Los Angeles	2007	Los Angeles
Artesia Corridor Specific Plan	Gardena	2007	Los Angeles
The Santa Monica Collection	Santa Monica	2007	Los Angeles
Central District Specific Plan	Pasadena	2008	Los Angeles
General Plan and Form-Based Development Code	Azusa	2008	Los Angeles
Park View Terrace	Bell Gardens	2008	Los Angeles
Claremont Village Expansion Project	Claremont	2008	Los Angeles
Sportsplex Mixed-Use Project	West Covina	2008	Los Angeles
Hancock Mixed-Use Project	West Hollywood	2009	Los Angeles

Project Name	City	Year	County
Formosa Condo/Pocket Park	West Hollywood	2009	Los Angeles
8601 Wilshire "Blue Apartments"	Beverly Hills	2009	Los Angeles
The South Collection: Eleven, Luma, and Evo	Los Angeles	2009	Los Angeles
Los Angeles Community College District Sustainability Building Program	Los Angeles	2009	Los Angeles
2008-2014 Housing Element	Santa Monica	2009	Los Angeles
El Monte Transit Village Specific Plan	El Monte	2009	Los Angeles
Studio One Eleven/Interstices Courtyard Lofts	Long Beach	2009	Los Angeles
Downtown Lancaster Specific Plan	Lancaster	2009	Los Angeles
Adams Square Revitalization Program	Glendale	2009	Los Angeles
Transit Village Specific Plan	Palmdale	2009	Los Angeles
Cross Creek Road Improvement Project	Malibu	2009	Los Angeles
Sierra Bonita Affordable Housing	West Hollywood	2010	Los Angeles
Havenhurst Condo/Pocket Park	West Hollywood	2010	Los Angeles
Station Square Transit Village Specific Plan	Monrovia	2010	Los Angeles
Las Virgenes Creek Restoration	Calabasas	2010	Los Angeles
Land Use and Circulation Element (LUCE)	Santa Monica	2010	Los Angeles
Calabasas General Plan	Calabasas	2010	Los Angeles
Gardens Specific Plan	Beverly Hills	2010	Los Angeles
Downtown Business Corridor Plan	Calabasas	2010	Los Angeles
Safe and Healthy Streets Plan	Glendale	2011	Los Angeles
Model Design Manual for Living Streets	County of Los Angeles	2011	Los Angeles
Bicycle Transportation Plan	Glendale	2011	Los Angeles
Master Plan of Trails and Bikeways	Lancaster	2011	Los Angeles
Gateway Cities SCS	Paramount	2011	Los Angeles
Bicycle Transportation Plan	Pasadena	2011	Los Angeles
West Hollywood General Plan 2035	West Hollywood	2011	Los Angeles
West Hollywood Climate Action Plan	West Hollywood	2011	Los Angeles
TOD Planning Grants	Los Angeles County	2011	Los Angeles
Transit Access Study and Strategy	Los Angeles County	2011	Los Angeles
Beverly Hills Bicycle Routes	Beverly Hills	2011	Los Angeles
America Fast Forward, 30/10 Plan Sustainable Transit Communities	Los Angeles	2011	Los Angeles
Climate Action Plan	West Hollywood	2011	Los Angeles
Metro Blue Line Bicycle & Pedestrian Access Plan	Long Beach	2011	Los Angeles
Dowtown Downey Specific Plan	Downey	2011	Los Angeles
Sustainable Communities Planning Framework	Los Angeles County	2012	Los Angeles
FasTrak Tolling/Interoperability Technology	Orange County	1993	Orange
Upper Chiquita Canyon	Orange County	1996	Orange
Anaheim Resort Transit	Anaheim	1998	Orange
Ladera Ranch and the Ranch Plan Planned Communities	Orange County	1998	Orange
Laguna Hills Urban Village Specific Plan	Laguna Hills	2002	Orange
Tustin Legacy	Tustin	2003	Orange
Anaheim Platinum Triangle	Anaheim	2004	Orange

Project Name	City	Year	County
Irvine Business Complex and Vision Plan	Irvine	2004	Orange
Live Oak Preservation Area	Orange County	2005	Orange
Costa Mesa Urban Plans	Costa Mesa	2006	Orange
Fullerton Transportation Center	Fullerton	2007	Orange
Platinum Triangle	Anaheim	2007	Orange
Santiago Street Lofts	Santa Ana	2007	Orange
South Brea Lofts	Brea	2008	Orange
Bonita Creek Mitigation Site	Orange County	2008	Orange
Irvine Housing Strategy	Irvine	2008	Orange
Buena Park Transit Village	Buena Park	2008	Orange
Beach Boulevard Signal Synchronization	Anaheim, Buena Park, Fullerton, Huntington Beach, La Habra, Stanton, and Westminster	2010	Orange
Santa Ana Transit Zoning Code	Santa Ana	2010	Orange
Beach and Edinger Corridors Specific Plan	Huntington Beach	2010	Orange
Cactus Wren Habitat Linkage	Orange County	2010	Orange
Orange 2010 General Plan Update	Orange	2010	Orange
Anaheim Regional Transportation Intermodal Center (ARTIC)	Anaheim	2010	Orange
City Place Mixed-Use Development	Santa Ana	2010	Orange
Great Park Comprehensive Master Plan	Orange County	2010	Orange
Laguna Niguel Gateway Specific Plan	Laguna Niguel	2011	Orange
City of Aliso Viejo Green City Initiative	Aliso Viejo	2011	Orange
Robinson Ranch Road Traffic Calming Project	Rancho Santa Margarita	2012	Orange
Sustainable Transportation at UC Irvine	Irvine		Orange
TUMF	WRCOG	2001	Riverside
Goods Movement Analysis	WRCOG	2001	Riverside
Rail Crossing Priority Analysis	WRCOG	2001	Riverside
Workers Ahead	WRCOG	2003	Riverside
Homes for Calif. families – Dialogue	WRCOG	2005	Riverside
Mixed-Use Housing Video	WRCOG	2005	Riverside
Infill Capacity Model/Study	WRCOG	2006	Riverside
Compass Outreach	WRCOG	2006	Riverside
Transit Oriented Development Projects	WRCOG	2007	Riverside
Transit Oriented Development	Corona, Riverside, Perris, March AFB, Hemet and Temecula	2007	Riverside
General Plan 2025 Program	Riverside	2008	Riverside
Dos Lagos Residential Mixed-Use Village	Corona	2008	Riverside
Coachella Valley Workforce Housing Trust	Coachella Valley	2009	Riverside
Goods Movement	WRCOG	2009	Riverside
Section 19 Specific Plan	Rancho Mirage	2010	Riverside
North City Specific Plan	Cathedral City	2010	Riverside
Bike and Ride Program	San Bernardino County	1996	San Bernardino
Alternative Fuels Fleet	San Bernardino County	2000	San Bernardino
Fontana Transit Center	Fontana	2002	San Bernardino
Chino Transit Center	Chino	2004	San Bernardino
Rialto Metrolink	Rialto	2004	San Bernardino

Project Name	City	Year	County
Chino-Ontario Community Based Transportation Plan	Chino, Ontario	2005	San Bernardino
Redlands Passenger Rail Station Area Plan	San Bernardino	2006	San Bernardino
Bus Stop Design Guidelines	San Bernardino County	2006	San Bernardino
Town Center Project	Ontario	2008	San Bernardino
OmniGo Program	Yucaipa, Grand Terrace, and Chino Hills	2010	San Bernardino
Yucaipa Transit Center	Yucaipa	2010	San Bernardino
Chaffey College Transit Center	Rancho Cucamonga	2010	San Bernardino
The Ontario Plan	Ontario	2010	San Bernardino
Crossroads Mixed-Use Project	Rialto	2010	San Bernardino
The Shoppes Specific Plan	Chino Hills	2010	San Bernardino
Go Smart Program	San Bernardino County	2011	San Bernardino
Addressing Foreclosure Crisis and Stabilizing Neighborhoods	Rialto	2011	San Bernardino
Bus Arrival Prediction Information Systems (BAPIS) Project	San Bernardino County	2012	San Bernardino
Downtown Specific Plan	Ventura	2008	Ventura
The Village at Oxnard	Oxnard	2009	Ventura

REGIONAL TRANSPORTATION PLAN
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SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future

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