Health Impact Assessment

California's SB 375 and its Impact on Fresno County's Disadvantaged Unincorporated Communities and Low Income Urban Neighborhoods

Veronica Garibay and Phoebe Seaton
Leadership Counsel for Justice and Accountability

With Technical Support From

Dana RowanGould and Alex Karner
University of California Davis, Center for Regional Change

Victor Rubin, Shireen Malekffzali, Chione Flegal, Danielle Bergstrom
PolicyLink

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Executive Summary

California's landmark climate change law, SB 375, directs Metropolitan Planning Organizations (MPOs) to develop and incorporate a Sustainable Community Strategy (SCS) in their Regional Transportation Plan (RTP). The SCS must set forth a forecasted development (housing and employment growth) pattern that, when integrated with the region's transportation networks and other transportation measures and polices, will reduce greenhouse gas emissions generated by automobiles and light trucks to achieve the greenhouse gas emission reduction targets approved by the California Air Resources Board.[1]

This Health Impact Assessment (HIA) focuses on potential impacts of SB 375 implementation in four Fresno County communities – Lanare, Riverdale, Laton and West Fresno. Lanare, Riverdale, and Laton are considered disadvantaged unincorporated communities while West Fresno, a neighborhood within the City of Fresno, is considered to be a low income urban neighborhood. The scope of the HIA was developed in partnership with community residents and stakeholders through the Community Equity Coalition. Through this process, we sought to identify potential impacts based on the following two questions:

1. How does the SCS change the quality and accessibility of public transit and access to destinations in disadvantaged unincorporated communities and low income urban neighborhoods?
2. Will Fresno's SCS increase the availability of community resources to residents of disadvantaged unincorporated communities and low income urban neighborhoods?

Findings

A person's health and economic wellbeing is influenced by *accessibility* – the ease with which desired destinations can be reached within a particular land use-transportation system. The ease with which they can get from home to job, the time it takes to get from home to a health clinic, or the reliability of transportation from home to school, to suggest a few examples. Our prior work has shown that residents of disadvantaged unincorporated communities (DUCs) in Fresno County typically enjoy far less accessibility than residents positioned closer to the urban core communities of Fresno. Additionally, even those DUCs located closer to the urban core communities lack of access to public transit options. This is especially problematic because residents of DUCs generally have lower rates of automobile ownership than the counties in which they reside.

Our analysis found that transit access in the DUCs and other rural areas in all proposed SCS scenarios is much lower than in the City of Fresno, and also lower than several outlying cities located at similar distances from the City of Fresno. Notably, the differences in transit access (and transit access to services) in all SCS scenarios for DUCs are slight; this reflects the modest differences among land use patterns set forth in each scenario as well as the lack of variation in transit infrastructure projects among and between scenarios.

We also looked at how rates of non-motorized (walking/biking) travel outcomes correlate with neighborhood demographics and land uses: wealthier areas will tend to have higher automobile ownership and lower non-motorized travel, areas with mixed land uses and high accessibility will have higher non-motorized travel. The results show very little difference in rates of non-motorized transportation within communities. In general, Lanare and West Fresno have the highest rates of non-motorized travel amongst all four study areas. West Fresno is relatively urban, with higher accessibility than the more isolated DUCs, and Lanare is relatively poor, which likely contributes to its high rates. On the other hand, Laton's relative wealth likely contributes to its low rates of walking and biking.

This accessibility analysis represents a substantial advancement over existing practice that typically only considers accessibility at a highly aggregate level of geography. Drilling down to individual communities allows the data to show how conditions are expected to change on the ground for small communities, given expected changes in demographics, transportation infrastructure, and land uses.

Major Recommendations

1. The Fresno Council of Governments should Conduct a Need Assessment and Develop a Grants Program

The Fresno Council of Governments (Fresno County's MPO) should establish a needs assessment program and a sustainable planning and infrastructure grant program. The needs assessment program would evaluate existing needs in Fresno's disadvantaged communities. The sustainable planning and infrastructure grant program would support implementation of the SCS by pooling transportation funds and distributing funds to projects based on their potential performance outcomes (e.g., health, equity, air quality, and sustainability). Policies and implementation programs supporting these actions should be incorporated in the 2014 RTP.

2. Support Investments in Low Income Communities

FCOG should allocate flexible spending dollars to support planning and capital investment projects in the study communities and similar neighborhoods. In addition to regional funding sources, emerging state funding programs, such as the Active Transportation Program and funding through the cap-and-trade program, also provide opportunities for increased investment in low income, rural communities, which may help close infrastructure and housing gaps in low-income areas.

3. Invest in Existing Communities First

FCOG should incorporate a policy in its RTP that investments must first serve the needs of existing neighborhoods and communities before any discretionary funding is used to support and/or serve new town development. Funding should first be spent in neighborhoods and communities with the highest demonstrated needs as identified by the needs assessment.

4. FCOG Should Explore the Impact of Different Transportation Investments.

The SCS/RTP process provides a unique opportunity to coordinate land use and transportation plans across the region and the RTP continues to provide a powerful opportunity to thoughtfully plan regional transportation investments. A crucial component of the RTP process is to evaluate the outcomes of various transportation planning strategies in order to inform the selection of a preferred land use and transportation scenario and the list of transportation projects that will be funded. Thus, the COG should evaluate various transportation schemes to assess how best to invest our funds in a sustainable and equitable transportation system.

5. Explore Visionary Scenarios

In order to address the environmental and health impacts of land use and transportation plans in Fresno County, it is important to explore a full range of land use and transportation scenarios. In the analysis of the health impacts of accessibility and walkability under each FCOG SCS scenario, we found little variation in outcomes among scenarios. This is due in large part to a lack of variation in transportation investments, and also to the moderate level of variation in land use plans under each scenario.

Acknowledgement

We sincerely thank community residents for their invaluable input throughout this process and writing of the report. Community resident participation is critical and of utmost importance in decision making processes that impact the health and sustainability of our communities.

We also thank the following organizations for their time, contributions and participation in the Steering Committee:

Community United in Lanare

Laton Community Council

Concerned Citizens of West Fresno

Latinos United for Clean Air

Central California Environmental Justice Network

California Rural Legal Assistance Foundation

Fresno Metro Ministry

Central California Regional Obesity Prevention Program

Central Valley Air Quality Coalition

Fresno Interdenominational Refugee Ministries

Centro Binacional para el Desarrollo Indígena Oaxaqueño

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Policy Link Central Valley Health Policy Institute UCD Center for Regional Change

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I. Introduction

In 2008, California passed the Sustainable Communities and Climate Protection Act (Senate Bill 375 or SB 375), to further the statewide effort to reduce greenhouse gas emissions. This novel policy will help California meet state climate goals by improving the integration of regional transportation spending, housing allocations and land use planning. SB 375 will support California's goals to combat climate change by reducing greenhouse gas emissions to 1990 levels by 2020 as set out by Assembly Bill 32, the Global Warming Solutions Act of 2006. The transportation sector is the single largest contributor to greenhouse gases of any sector: automobiles and light trucks contribute almost 30% alone. SB 375 requires the California Air Resources Board (CARB) to set greenhouse gas reductions targets for each federally designated Metropolitan Planning Organizations. [2] See Appendix A for Glossary and Key Terms.

In order to meet the statewide goal of reduced greenhouse gas emissions, among other requirements, SB 375 requires Metropolitan Planning Organizations (MPOs) to include a Sustainable Community Strategy (SCS) in their Regional Transportation Plan (RTP). The SCS will serve as a set of planning strategies that can be followed to meet emissions reduction targets. Before an SCS can be adopted, MPOs must develop a series of scenarios that detail land use and transportation investments and that attempt to meet greenhouse gas targets set by the state; at the conclusion of this process, the local government will vote on their preferred scenario, which will be used and analyzed in the development of the SCS. Though an adopted SCS is not itself legally enforceable, a city or county may choose to adopt the SCS into a legally enforceable format, such as a general plan. Thus, within the SCS exists the potential to promote community equity through policy decisions throughout the region.

In each region the SCS shall:

1. Identify the general location of uses, residential densities, and building intensities with the region;
2. Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the RTP, taking into account net migration in the region, population growth, household formation and employment growth;
3. Identify areas within the region sufficient to house an eight year projection of the regional housing need, and;
4. Identify a transportation network to service the transportation needs of the region.[3]

This is the first time that MPOs in California will integrate land use and transportation planning, making implementation of SB 375 critically important for health outcomes. SB 375 provides decision makers with important opportunities to grow and invest in more strategic and healthier ways. A strong SCS that prioritizes walking, biking, transit and infill development could see significant reductions in respiratory

health impacts and costs related to traffic pollution, for example.[4] The implications of SB 375 implementation on health will be discussed in further detail throughout this report.

This Health Impact Assessment (HIA), focused on SB 375 implementation in Fresno, is an analysis of the potential health impacts on low income communities of color based on FCOG's proposed SCS. Discussions on land use and transportation planning in Fresno County rarely incorporate discussions on impacts to residents' health despite the region's long standing history of demonstrated negative health outcomes. This HIA allowed the project team to engage decision makers in regional discussions on the intersections of land use, transportation and health. Without a holistic approach to land use and transportation planning that includes discussions of health, these communities are at greater risk of continued neglect and disinvestment while other, wealthier, communities reap the benefits of smart growth planning.

II. SB 375 in the San Joaquin Valley

The San Joaquin Valley (SJV) is a region that brings into stark relief the many, often conflicting, realities of California. It is a region of great wealth: it farms for our nation, it is rich in natural resources, and it is one of the most geographically varied areas in the state. Despite its tremendous assets, the region faces enormous challenges. The region has been labeled the "Appalachia of the West" and is home to some of the most concentrated poverty in the country. The SJV contains our nation's dirtiest air. Education levels are much lower than other parts of the state, and unemployment levels are significantly higher than the rest of California. The region experiences extremely high rates of food insecurity and health outcomes for the region's residents vary tremendously depending on race, ethnicity, income, and where you live. Poor planning practices, institutionalized racism, and entrenched agricultural, industrial and development interests have led to growth patterns that put great strain on the natural environment and have perpetuated historic patterns of disinvestment in low income communities and communities of color.

SB 375 provides a unique opportunity for this region to direct future infrastructure investments into the low income and communities of color that struggle each day to make their neighborhoods healthy, vibrant and sustainable places to live. It also provides MPOs with opportunities to invest in and revitalize communities that have been historically overlooked and excluded from the benefits of short and long term planning. However, if business as usual policies and practices predominate through implementation of SB 375, low income communities of color – already the most negatively impacted by historic planning decisions - stand to be harmed the most.

Implementing SB 375 in Fresno County

Fresno County is characterized by rapidly changing demographics and is, in particular, home to a fast growing Latino population. The total population is projected to grow to 1,521,000 residents by 2050[5] and, notably, the white non-Hispanic population is expected to decline while the Hispanic population grows by 2.1% each year. (See Figure 1 for race and ethnicity forecasts) The Fresno Council of

Government (FCOG) projected that it must accommodate population and employment growth of 388,076 and 102,866, respectively in its first ever SCS.[6]

Figure 1: Fresno County- Summary of Race and Ethnicity Forecast, 2010-2050.

	White alone non-Hispanic	Hispanic all races	Black or African American alone non-Hispanic	American Indian and Alaska Native alone non-Hispanic	Asian alone non-Hispanic	Native Hawaiian and other Pacific Islander alone non-Hispanic	Some other race or in combination non-Hispanic
2010	304,522	442,992	45,005	5,979	86,856	1,066	44,030
2050	159,100	1,044,444	65,630	3,195	220,155	3,283	65,193
Increase	-145,422	561,452	20,625	-2,784	133,299	2,217	21,163
Annual Rate	-1.6%	2.1%	0.9%	-1.6%	2.4%	2.9%	1.0%

Source: The Planning Center/DC&E, San Joaquin Valley Demographic Forecasts, 2010-2050.

As discussed in the introduction, thousands of residents in low income communities stand to be negatively impacted if FCOG does not implement SB 375 in a way that equitably distributes the benefits of smart growth planning. Through the process of developing this HIA, residents identified systematic neglect via historic planning and investment policies as obstacles to health and sustainability. Such policies, residents noted, have resulted in inadequate access to public transit, lack of sidewalks and paved roads, unsafe drinking water and dilapidated septic systems, and little to no access to basic services and affordable housing.

A growing body of research indicates that land use and transportation decisions can promote an active lifestyle and improve overall health. Communities that promote public transportation, walking, and biking contribute to improved air quality and increase access to: health care, education, social services, healthy food, and places for recreation and physical activities. Together these factors are often described as the "social determinants of health." The World Health Organization defines social determinants of health as "the conditions in which people are born, grow, live, work and age."[7] In Fresno County, both social determinants of health and health outcomes are far from stellar. The City of Fresno ranks as the second most polluted American city by deadly particulates. 23.6% of Fresno County children have been diagnosed with asthma and 40% are obese. The county's death rate due to heart

diseases is higher than the state average and it has the 7th highest rate of death among California counties due to diabetes.[8]

Investment in existing communities and high quality transportation systems, meanwhile, do not extend the benefits of active transportation and transit options equitably throughout the region. Other regions in California have complied with SB 375 by developing land use scenarios that concentrate growth and resource allocation in areas that already have high quality transportation systems or are in physical proximity of housing to jobs, schools, health care centers and commerce. This approach inevitably makes certain neighborhoods and communities attractive for investment, while leaving others at a disadvantage. Low income, especially those in rural settings, often lack the basic features of healthy, sustainable neighborhoods – potable water, sewer systems, quality and quantity of affordable housing, adequate public transit, complete streets and essential services. Maximizing opportunities for all communities, particularly those that are most vulnerable, and addressing existing inequality will create a healthier, more sustainable region.

While MPOs are tasked with developing an SCS that forecasts projected development pattern, cities and counties maintain sole land use decision-making authority. Key to making projected growth and investment a reality in existing low income communities will be the billions of transportation and planning dollars that will be distributed via the RTP, the master planning document that houses the SCS. Fresno COG estimates that a total of 6.4 billion dollars will be available through the 25-year life of the 2014 RTP.[9] Existing law requires the various elements of the RTP to maintain internal consistency. As such, if the SCS directs housing and employment growth and transit investments (transit service and active transportation) to low income communities, then projected revenues in the financial element of the RTP must follow that trend. Growth and transit investments in low income communities will help reverse decades of disinvestment by directing financial resources to support communities in becoming healthy and sustainable.

III. Overview of the Fresno County HIA Project

Leadership Counsel for Justice and Accountability (Leadership Counsel), Central Valley Health Policy Institute (CVHPI) and UC Davis Center for Regional Change (CRC) (the project team, or team) partnered to conduct an HIA on SB 375 implementation in Fresno County. PolicyLink also received supported to provide technical assistance to the project team. The project is breaking new ground in California by analyzing the impact of SB 375 on more rural regions and communities. Traditionally, SB 375 analyses have adopted the assumption that most reduction of greenhouse gas emissions would come about by encouraging land use and transportation planning strategies in city neighborhoods and communities in which infrastructure already exists and where diverse land use patterns, e.g. mixed use development, are in place. Therefore, analyses have focused on the impacts of SB 375 on those places. But small, spatially isolated, often unincorporated rural communities that lack such infrastructure also have a great deal at stake in this process, and, this team decided to conduct an analysis that would inform decision makers of regional impacts to the health of residents living in these communities along with urban, low income areas.

Leadership Counsel for Justice and Accountability has managed this project, with funding support from CRLA. The project partners developed educational materials and conducted community education workshops on SB 375 to build and support engagement of community residents in the decision making process. The project partners convened the Fresno HIA steering committee, composed of local community partners to develop the scope of the HIA. In 2013 Leadership Counsel consolidated the steering committee with the Fresno County Community Equity Coalition (Coalition) and invited additional partners to engage in direct policy advocacy and to educate decision makers throughout development of the RTP and this HIA. CVHPI and the UCD CRC served as technical partners, conducting research and analysis and providing technical assistance. PolicyLink advised the project partners on HIA methods, provided additional data on some of the communities, and reviewed and edited drafts of the reports.

The Fresno HIA team launched the project's full partners' meeting in January of 2012 to begin workplan activities, assess the FCOG decision making timeline and identify community partners to form the initial steering committee. The project ended in March of 2014 in time to utilize findings and recommendations during the public review period of the 2014 Draft RTP/SCS Environmental Impact Report (EIR).

This HIA includes the following components:

- Background: details information about the demographics and characteristics of target communities.
- Methodology: process used to implement HIA and description of data sources and research methods.
- SB 375 analysis: describes proposed implementation and potential challenges and opportunities for target communities.
- Assessment: existing conditions of target communities and potential health impacts relative to existing conditions.
- Recommendations: describes a set of policy recommendations as a result of assessment findings.
- Monitoring Plan: identifies strategies to monitor impacts of implementation based on priorities developed by the Community Equity Coalition.

IV. Background and Screening

What is an HIA?

A Health Impact Assessment is "a systematic process that uses an array of data sources and analytic methods, and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. The HIA provides recommendations on monitoring and managing those effects."[10] This

allows for the thorough and thoughtful deliberation of potential impacts of proposed policies or plans before final policies or plans are adopted. HIAs tend to focus on the "social determinants of health." The World Health Organization defines these as "the conditions in which people are born, grow, live, work and age. . .These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels. The social determinants of health are responsible for a wide range of health inequities – the unfair and avoidable differences in health status seen within and between countries".[11]

Steps in a typical HIA:

- Screening – involves determining whether an HIA is feasible, timely and would add value to the decision making process
- Scoping involves creating a plan and timeline for conducting and HIA that defines priority issues, research questions and methods and participant roles.
- Assessment involves creating an existing conditions report for geographic area and/or population in order to understand baseline conditions and to be able to predict changes in health outcomes. This step also involves evaluating potential health impacts.
- Recommendations are developed to improve the project, plan or policy and/or to mitigate any negative health impacts.
- Reporting involves communicating the results with decision makers.
- Monitoring involves tracking the impacts of the HIA on the decision making process and the decision, the implementation of the decision, and the impacts of the decision on health determinants.[12]

V. Development of the SCS in Fresno

The Fresno Council of Governments is directed by a Policy Board of Directors composed of the mayors from each of the 15 cities in the county and one county supervisor. This is ultimately the group of elected leaders responsible for adopting the 2014 RTP that will include the region's first SCS. The Policy Board is expected to formally approve the 2014 RTP in June of 2014. The RTP contains a number of elements (Policy, Action and Financial) and the SCS, which combined will guide transportation planning and investment throughout Fresno County.

Efforts to implement SB 375 in Fresno began in November 2011 when FCOG staff convened planning staff from all 15 cities, the county and interested stakeholders representing environmental justice, housing, the building industry, air quality, tribal interests and business sectors to develop target setting scenarios. FCOG convened the SB 375 taskforce to provide input and help to develop:

- Building prototypes
- Development/place types
- Land use scenarios
- Financially constrained transportation projects within land use scenarios

- Performance indicators
- Recommendations regarding Valley-wide vs. single county target options
- Recommended preferred scenario that meets greenhouse gas reduction targets.[13]

The work of the SB 375 taskforce was deemed complete after a series of meetings in which taskforce members helped develop target setting scenarios that would meet the greenhouse gas reduction targets as set by CARB (5% reduction by 2020 and 10% by 2035).

Target setting scenarios were carried into a newly formed committee also convened by FCOG staff, the Regional Transportation Plan Roundtable (RTP Roundtable). The RTP Roundtable was also composed of staff from member jurisdictions and interested stakeholders from diverse issue areas.[14] The purpose of this roundtable was to support COG staff in the development of the 2014 RTP/SCS. Through both roundtable meetings and public workshops COG staff sought input into the development of land use scenarios, that when integrated with the transportation network, would meet GHG reduction targets.

The RTP Roundtable process resulted in three land use scenarios that met the 5 and 10% reduction targets. Scenarios A, B and C were developed with input from roundtable members, project team partners, community workshops, the Community Equity Coalition and the building industry.

The three scenarios that initially emerged from Fresno's SCS development process included the following:

Scenario A: Based on 1 community workshop held in November of 2012, this scenario allocated relatively more growth to some small rural communities.

Scenario B: Based on existing general plans, general plan updates, proposed land uses and latest planning assumptions. This scenario allows for new towns.

Scenario C: Allocated more growth to the City of Fresno along Bus Rapid Transit Corridors and growth in unincorporated communities was constrained to 10 unincorporated communities. No new town development would occur.

It is important to note that while Scenarios A, B and C contain slight differences in projected housing and employment growth, they all shared the same transportation project list (i.e. no change in the transportation network – public transit and active transportation- across all scenarios).

In one of the first major successes of the Community Equity Coalition, advocates successfully argued that miscommunication in committee meetings on scenario parameters and feedback on scenarios from the public merited introduction of Scenario D into the process. Scenario D's defining characteristics included higher densities for new growth and re allocated new growth from foothill areas and new town development to existing cities and communities. Scenario D did not allow for the allocation of new housing and employment growth outside of existing built communities.

On November 21st, 2013 the FCOG Policy Board unanimously adopted Scenario B as the preferred SCS scenario despite significant opposition from Community Equity Coalition partners and community residents. Scenario B directs new housing growth to foothill areas and in undeveloped open space. As previously discussed, billions of dollars will be spent according to the preferred SCS because of internal consistency requirements of the RTP. Scenario B directs minimal growth to low income communities of color that, to the detriment of these communities, translates into fewer resources.

Despite a unanimous vote at the Policy Board for Scenario B, decision makers and staff have shown genuine interest in learning about the potential impacts of a deficient scenario on low income communities as they move closer to scenario adoption. For example, the Policy Board also decided, by a unanimous vote, to direct staff to assess the feasibility of and further develop the following Community Equity Coalition preliminary recommendations:

- Establish a regional policy in the Regional Transportation Plan Policy Element that (1) prioritizes transportation projects in existing communities, particularly, those with highest demonstrated need, and that (2) does not allow investment of discretionary funds in new towns or greenfield areas;
- Create a grant program to support existing communities in planning for and implementing projects that promote smart growth, complete streets, affordable housing, improved public transit, parks, open space and farmland protection and economic opportunity;
- Conduct a needs assessment to catalogue health outcomes based on defined indicators, infrastructure deficiencies, and potential funding sources, particularly for disadvantaged communities. Further, these findings would be able to help draw federal, state, and local funding sources to close infrastructure gaps in the most disadvantaged places;
- Adopt a Natural and Working Lands Conservation Policy, one component of which sets an expectation for one-to-one mitigation for impacts to agricultural lands by transportation projects.

This HIA has the potential to inform FCOG efforts by bringing health equity to the forefront of the SCS process and by offering insight into potential health outcomes of SCS scenarios.

Importance of Health in SB 375 Implementation

The stakes in SB 375 are very high for low - income communities, and for rural communities more specifically. If housing and employment growth and transit investments are equitably allocated, SB 375 creates new opportunities for improving the health of low income neighborhoods and low income rural communities. Implemented poorly, the consequences for these neighborhoods and communities could be disastrous, further exacerbating regional inequities that lead to significant health disparities. In its report, Public Health Crossroads: Sustainable Growth for Healthier Fresno Neighborhoods, the American Lung Association in California notes that a future in which new growth in Fresno County is 40 percent more walkable and interconnected with existing built neighborhoods could reduce traffic-pollution health impacts by 27 percent and reduce health costs by $83 million in 2035 alone. Lack of access to

basic services (groceries, medical care, and employment), infrastructure deficiencies that prohibit walkability and physical activity and little to no access to public transit can contribute significantly to negative health outcomes.

As previously noted, the RTP process requires agencies to integrate land use and transportation planning for the first time. This task can prove difficult, yet manageable and successful if decision makers engage with community in meaningful discussions about the intersections of land use, transportation and health. Such discussions can lead to policy development that can address the many challenges faced by low income communities of color. Land use mix,[15] street and pedestrian connectivity,[16] pedestrian and cyclist infrastructure[17] and parks and open spaces[18] are neighborhood features that support walkability and are positively associated with physical activity. Though walkability has had numerous definitions in literature, it can generally be understood as a measure of an environment's ability to promote and increase access to pedestrian oriented activity, such as walking or bicycling. Because walkability has been positively associated with physical activity,[19] highly walkable neighborhoods can significantly improve health outcomes of neighborhood residents. Physical activity can help reduce the risks of several adverse health conditions associated with physical inactivity, including heart disease, type 2 diabetes, colon cancer, breast cancer, and mortality[20]. The importance of physical activity is reinforced by the World Health Organization's (WHO) decree that physical inactivity is among the top 15 risk factors for the Global Burden of Disease[21].

Public transportation policies have the potential to impact health outcomes[22] and remedy inequality in access to resources between and among populations. Public transportation allows access to transportation for populations without vehicles, enabling access to employment, economic, and social opportunities as well as to essential services (such as healthcare), which are all critically linked with positive health outcomes. While vehicle ownership has been shown to correlate with improved health, public transportation has the potential to serve as its functional equivalent[23] and offer the benefits of vehicle ownership to those unable to afford or access vehicles. The significance of this role of transit as a connector is underscored by findings that inadequate transport access has been linked to a higher risk for social exclusion, particularly for the unemployed, elderly, sick, low incomes, and women[24].

In addition to providing access to opportunities and services, public transportation policies have the potential to improve air quality. Because personal vehicles significantly contribute to air pollutants,[25] increasing public transportation and promoting ridership could reduce the number of vehicles on the road, thus reducing the volume of harmful emissions[26] and improving the air quality and health outcomes of the region.

Does the HIA Add Value in this Process?

To date, discussion on the impacts on community health in the development of the Fresno SCS have been driven by members of the Community Equity Coalition, themselves bolstered by this HIA. Community residents and partners recognized the importance of conducting a health impact

assessment to ensure the inclusion of health in the context of regional planning and resource allocation and this HIA has helped ensure inclusion of health in public discourse.

Goals and Determining Scope

Through a series of meetings, the Steering Committee identified project goals to guide the implementation of the HIA. The goals of this project were to:

1. Ensure the economic conditions that determine health, such as income, wealth and economic opportunity, are maximized for the most disadvantaged populations in Fresno County and low income communities through the SCS.
2. Ensure that disadvantaged communities and their health are valued in the SCS process and are viewed as viable targets for investment.
3. Ensure the robust consideration of conditions that determine health for disadvantaged, especially disadvantaged rural communities, throughout the SCS planning process.
4. Empower and ensure participation of disadvantaged communities within the SCS process in Fresno County.

Developing the Community Equity Coalition (CEC)

The project team met in January of 2012 to identify partners to help guide the development and ultimate implementation of this HIA. Partners were identified based on their expertise on issues impacting low income communities of color and level of engagement and organizing activities in these communities.

The first steering committee meeting was convened on February 20, 2012 to introduce the HIA project, review the steps in an HIA, and build a shared understanding of SB 375 and implementation timeline and to discuss the role of the committee. Representatives from eleven community based organizations and community groups participated in this initial meeting. Participation in this process was voluntary throughout the implementation of the HIA. Given limited staff capacity and resources, PolicyLink awarded a series of mini grants to support the engagement of small community based organization in this process. As previously mentioned, the steering committee was consolidated with the Community Equity Coalition in 2013.

The Steering Committee identified the following values to help guide the implementation of the Fresno HIA project:

- Equity*
- Empowerment and self-determination of local disadvantaged communities
- Collaboration
- Accountability
- Scientific Integrity

*Defined by the community advisory committee to include: equitable distribution of economic opportunity; the notion that all communities are viable options for investment and deserve to live in dignity, and; embracing cultural diversity.

Developing the Scope of the Fresno HIA Project

The project partners led the steering committee through a series of visioning exercises to identify possible areas of focus for this HIA. At the initial steering committee meeting, project partners engaged participants in a discussion on the intent and goals of SB 375 as some steering committee members were not familiar with this new mandate. Upon building a shared understanding of SB 375 mandates, steering committee members were asked to share aspects of their advocacy efforts that had some relation to the goals of this policy. Finally, the steering committee was asked to identify broad issue areas that have health and equity implications related to SB 375. The result of this process was the identification of seven broad issue areas and a number of sub categories that could potentially impact health outcomes in low income communities:

Figure 2: Steering Committee Priorities I

Broad Issue Area	*Sub Categories*
Transportation	• Access to public transit for transit-dependent populations • Transit affordability • Proximity to jobs, schools, housing and services • Increased investment in transit and pedestrian bicycle infrastructure
Affordable Housing	• Development of new affordable housing • Proximity to transit hubs
Land Use	• Health and equity in Fresno downtown plan and city general plan • Walkable communities • Open space and parks • Employment centers • Investment in existing versus new communities • Connect HIA to other regional planning efforts
Clean Air	• Reduce greenhouse gas emissions • Less driving • Pedestrian infrastructure that is targeted to important employment and community locations
Access to Services	• Health centers • Grocery stores • Clinics • Schools
Economic Development	• Deconcentration of poverty
Address rural and urban dynamic	• Careful planning for both types of communities

Priority Areas for HIA Analysis and Advocacy

Broad Issue Area	*Sub Categories*	*Additional Sub Categories*
Transportation	• Access to public transit for transit-dependent populations • Transit affordability • Proximity to jobs, schools, housing and services • Increased investment in transit and pedestrian bicycle infrastructure	• Increased access to for urban and rural disadvantaged communities • Rural transit oriented development • High speed rail • Transit access to educational opportunities • Low fare or discounted fares
Affordable Housing	• Development of new affordable housing • Proximity to transit hubs	• Mixed income housing
Land Use	• Health and equity in Fresno downtown plan and city general plan • Walkable communities • Open space and parks • Employment centers • Investment in existing versus new communities • Connect HIA to other regional planning efforts	• High speed rail • Eminent domain • Affordable housing • Basic infrastructure (sidewalks, roads, curb and gutter, lighting) • Drinking water and wastewater service • Siting of polluting and toxic uses • Access to unhealthy foods
Clean Air	• Reduce greenhouse gas emissions • Less driving • Pedestrian infrastructure that is targeted to important employment and community locations	•
Access to Services	• Health centers • Grocery stores • Clinics • Schools	• No additional sub category.
Economic Development	• De-concentration of poverty	• Employment and workforce development opportunities

		• Educational attainment compared to workforce opportunity • Disadvantaged business enterprises • Additional opportunities in agricultural industry
Address rural and urban dynamic	• Careful planning for both types of communities	• No additional sub category

On April of 2012 the project team reconvened the Steering Committee to initiate the scoping process. The committee was convened to a) identify the top two priority areas for the HIA, and b) prioritize two objectives within each priority area based on initial visioning exercises. Each topic area, including sub categories were displayed on the wall and the committee members were asked to identify gaps. Following this activity, additional sub categories were added to include:

Figure 3: Steering Committee Priorities II

Broad Issue Area	*Sub Categories*	*Additional Sub Categories*
Transportation	• Access to public transit for transit-dependent populations • Transit affordability • Proximity to jobs, schools, housing and services • Increased investment in transit and pedestrian bicycle infrastructure	• Increased access to for urban and rural disadvantaged communities • Rural transit oriented development • High speed rail • Transit access to educational opportunities • Low fare or discounted fares
Affordable Housing	• Development of new affordable housing • Proximity to transit hubs	• Mixed income housing
Land Use	• Health and equity in Fresno downtown plan and city general plan • Walkable communities • Open space and parks • Employment centers • Investment in existing versus new communities • Connect HIA to other regional planning efforts	• High speed rail • Eminent domain • Affordable housing • Basic infrastructure (sidewalks, roads, curb and gutter, lighting) • Drinking water and wastewater service • Siting of polluting and toxic uses • Access to unhealthy foods
Clean Air	• Reduce greenhouse gas emissions • Less driving • Pedestrian infrastructure that is targeted to important employment and community locations	•
Access to Services	• Health centers • Grocery stores • Clinics • Schools	• No additional sub category.
Economic Development	• Deconcentration of poverty	• Employment and workforce development opportunities • Educational attainment compared to workforce opportunity • Disadvantaged business enterprises • Additional opportunities in agricultural industry
Address rural and urban dynamic	• Careful planning for both types of communities	• No additional sub category

The project partners then facilitated a priority setting exercise with the Steering Committee. Participants were reminded to use the following set of criteria in their prioritization including: a) relevance to SB375 implementation, b) impacts on health and equity, and c) whether, absent this groups attention, the issue would be considered in the debate.

The Committee decided that affordable housing could be housed within the land use issue area, clean air is an outcome of all topic areas, and that the final priorities would include a comparison of rural vs. urban communities. Through this exercise, the Committee selected their top two priority areas and identified two objectives within each area:

Priority #1: Land Use/Infrastructure

- Objective 1: Basic Infrastructure
- Objective 2: Polluting and toxic sources (industry, agriculture, pesticide application)

Priority #2: Transportation Access

- Objective 1: Increased access to transit for disadvantaged populations
- Objective 2: Increased connectivity of transit system to access jobs, education and important goods and services

While the project partners aspired to analyze as many community objectives as possible, resources, time and staff capacity would place constraints on the ability to analyze all objectives as identified. Project partners informed steering committee members that the selected priorities would be tentative while project partners assessed internal capacity and available resources.

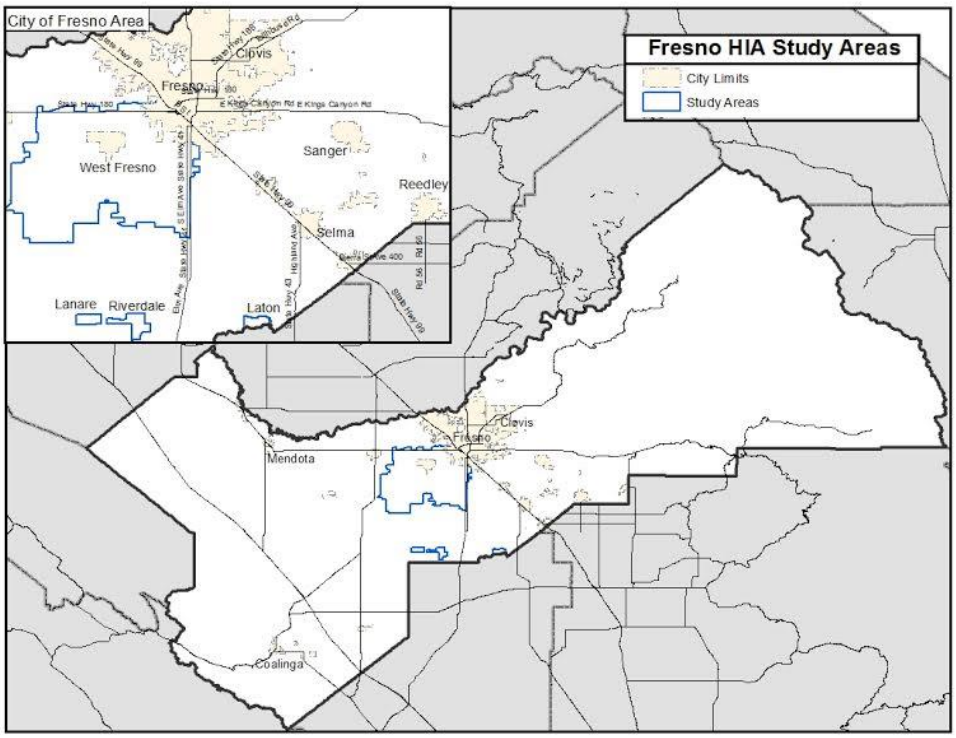
Geographic Area of Focus

The project team asked the Steering Committee to identify the geographic parameters of this project. Per the 2010 U.S Census, Fresno County consists of 930,450 residents. The demographic breakdown is as follows: 50.3% Hispanic/Latino, 32.7% White Non-Hispanic, 4.8% African American, 9.3% Asian alone, .6% American Indian, 0.1% Native Hawaiian, 0.2% some other race alone, and 1.8% two or more races. According to the latest American Community 5 year estimate, the median household income in Fresno County is $45,741 and 20% of all families are living below the poverty level for the last 12 months.[27]

While SB 375 implementation will impact all of Fresno County residents, the Committee decided to focus on those communities that stand to be most impacted. The Coalition identified target communities based on existing relationships with community residents and engagement in advocacy efforts related to SB 375. The communities identified, predominantly Latino and African American, demonstrated needs, such as safe and quality housing, clean drinking water, wastewater service, adequate public transit and opportunity for active travel. Low income, especially rural, communities often lack the basic features of healthy, sustainable neighborhoods – potable water, sewer systems, quality and quantity of affordable housing, adequate public transit, complete streets and essential services. The target disadvantaged unincorporated communities (DUC) included Laton, Riverdale and Lanare – all located in southwest Fresno County and along the Mount Whitney Corridor. The HIA also

focused on the West Fresno neighborhood, identified by the 93706 zip code, located entirely within the City of Fresno.

Figure 4. Map of HIA Study Communities



Residents of DUCs and low income urban neighborhoods have limited means of transportation to reach basic daily necessities including employment, healthy food providers, healthcare services, etc. The Committee's (and subsequently the Coalition's) priorities are based on a recognition that in our region a disproportionate amount of people of color, recent immigrants, and low income people live in rural and urban fringe unincorporated and/or severely under resourced communities that lack basic infrastructure and essential services, and demonstrate worse health outcomes than more developed and better resourced urban and suburban communities in the region. Flowing from this perspective, the coalition's vision, goals, and priorities emphasized a desire for the adoption of SCS elements that explicitly address and plan for transportation investments and land use choices that will improve health outcomes in traditionally excluded and under-served communities.

VI. HIA Research Questions & Description of Health Pathways

Following the April 2012 Steering Committee meeting, the project team met to develop a proposed research agenda based on identified priorities. After discussing availability of resources, organizational capacity, relevance to SB 375 and data availability, the project team narrowed the priority areas and objectives to include:

Priority 1: Transportation

- Objective 1: Increased access to public transportation in disadvantaged unincorporated communities and low income urban communities

Priority 2: Land Use

- Objective 1: Increased access to basic community resources in disadvantaged unincorporated communities and low income urban communities
- Objective 2: Increased walkability in disadvantaged unincorporated communities and low income urban communities.

The project partners met with the Steering Committee to discuss and explain modification to HIA priorities. The Committee agreed and approved to continue to develop the scope of the HIA based on the project team recommendations.

SB 375 and Transit Access, Access to Resources, and Walkability

The RTP has long provided an opportunity to influence transportation infrastructure in the region, which leads directly to transit access, access to resources, and walkability. The other side of the access and walkability equations is land use. Though the specifics of land use decisions are enforceable only through other means, such as zoning ordinances and general plans, the SCS still presents an important opportunity for local governments to influence future planning decisions, as decisions outlined in the SCS have the potential to serve as the foundation for, and incentives for jurisdictions to develop, more sustainable growth patterns. Thus, it is of great importance for the SCS to encompass land use decisions that promote health in all communities, including those urban and rural communities that have experienced a distinct lack of investment in the past several decades or more. It is important to note, that despite a shared history of neglect and under-investment, DUCs and low-income urban neighborhoods face a different set of land use issues in the implementation of SB 375. For this reason, this HIA focuses on both those urban communities and DUCs in an effort to identify health impacts for Fresno's diverse geographies.

Improved Access to Public Transportation

Accessibility – the ease with which an individual can reach opportunities, goods and services - affects a person's health, economic wellbeing and quality of life. The quality of a transit system can directly affect residents' access, in particular for households without a personal vehicle. While the quality of the transit system is a primary determinant, changes in land use can also affect the types of destinations that residents can access through public transport.

Transit accessibility and neighborhood design can also play an important role in facilitating walking and bicycling. Many studies have found a correlation between walkability and walking for transportation.[28] These effects of the built environment are likely to persist even when controlling for individual preferences and particular types of neighborhoods.[29] Creating neighborhoods that support the use of non-motorized modes can therefore facilitate physical activity and resulting health benefits.

To meet the priorities of the steering committee, the HIA team suggested exploring this area of focus using the following research question:

- Will the SCS increase access to public transit in DUCs and low income urban neighborhoods? To what extent will transit access change under the SCS scenarios?

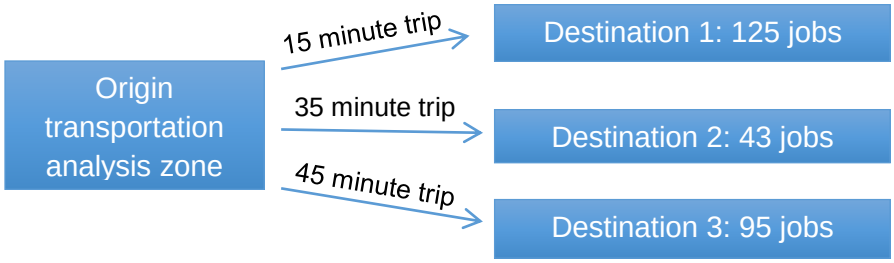
Objective 1: Increased Access to Public Transit in rural DUCs and low income urban communities

For this objective, we first characterized the existing public transit systems serving DUCs and low-income urban communities by examining survey data, the location and frequency of existing transit services, and the proximity of residents to transit stops. This descriptive analysis will illustrate the extent to which transit currently meets (or does not meet) the needs or residents of these communities.

We will then quantify transit access in terms of travel times to destinations for current conditions and in 2035 under each SCS scenario. The analysis of existing conditions relies on travel demand model outputs for 2005 conditions and for 2035 conditions under each SCS Scenario. In order to provide an overall estimate of destinations that are available by transit, we use access to jobs (of all types) as a proxy for destinations. Jobs represent economic opportunities as well as amenities, goods and services, and the greater the number of jobs accessible by transit, the greater the accessibility. Specifically, we estimate transit access as the number of jobs that can be reached from particular communities within a 45 minute[30] transit trip during the peak morning commute. The transit travel time estimate includes in-vehicle travel time, walk access times (at origins and destinations and at transfers), and wait times (at the origin and at transfers). Job locations and transit travel times are available at the transportation analysis zone (TAZ) level using data provided by FCOG; these values are combined in order to provide an estimate of accessible jobs at each travel time interval for each origin TAZ.

The process of combining travel times and job locations is illustrated in the hypothetical figure below. For the particular origin TAZ shown, three destination TAZs are available within a 45 minute transit trip. Summing over all of the available jobs in the three destination zones results in 263 total jobs accessible in 45 minutes. This result gets associated with the origin TAZ. Ultimately, TAZs are aggregated[31] to the corresponding DUCs and low income urban communities in order to obtain accessibility estimates for those areas.

Figure 5: Combined Travel Times and Job Locations



To more closely examine the localized access impacts of the SCS in each community, we also examine the growth in jobs allocated to DUCs and low income urban communities in each FCOG SCS scenario and compare it to existing conditions.

Existing Conditions:

- What is the overall quality and accessibility of existing public transit in DUCs, low income urban communities, and the county as a whole?
- Does public transit adequately connect people living in DUCs and low income urban communities to destinations?

Forecasting question:

- How does each scenario change the quality and accessibility of public transit and access to destinations in DUCs and low income urban communities?

Indicators

1. Survey of residents' transit access (existing conditions, Lanare only)
2. Location of stops, schedule and frequency of transit systems serving target areas (existing conditions)
3. Number of jobs that can be accessed by transit trips of 45 minutes or less during the peak morning commute period (existing conditions and forecasting)
4. Number of jobs that are located in each community (existing conditions and forecasting)

Land Use: Improved Access to Basic Resources and Walkability

Land use decisions made at regional levels have the capacity to promote health in a number of ways, including through allocating investment into development of basic resources, such as employment, affordable housing, healthy food, and healthcare facilities and services; access to these resources have a strong influence on the health outcomes of communities. In other regions, proximity and the ease of travel to health care services has been found to influence health care decisions, where long travel times hinder the effective use of health services.[32] Similarly, rurality has been associated with increased travel distances, times, and decreased frequency of medical visits overall and to specialists relative to urban areas.[33] Licensed drivers and those with access to rides through their families made significantly more

health-service related trips.[34] These studies of other regions illustrate the importance of considering rural access to health care during the transportation planning process.

Because DUCs and low income urban communities often do not offer adequate access to resources, the SCS can initiate and encourage the development such that existing communities become more livable ad sustainable by including policies that allocate appropriate development in DUCs and low income urban communities. Such development will both increase resources, and if done sustainably, can add residents to help support those resources.

At the same time, this development has the potential to reduce VMT and improve air quality; residents of these communities will have the option to decrease or eliminate vehicle trips, if amenities are available in their communities. Simultaneously residents will be exposed to fewer of the effects of vehicle travel, including emissions and accidents. Thus, the SCS can potentially further the mission of SB 375 of reducing VMT, while at the same time promoting a vision of community equity, improving the health of DUCs and low income urban communities, and the region as a whole.

Inadequate pedestrian infrastructure, including unmaintained sidewalks and bike lanes (or an absence of either or both from the community), single-use housing, and lack of curb cuts hinders walkability in DUCs and many low income urban neighborhoods. Without adequate pedestrian infrastructure, residents are less likely to walk to obtain goods and services. Further, because several residents of these communities are unable to afford a personal vehicle, adequate pedestrian infrastructure would increase access to resources that promote health, such has health care centers, fresh foods and other activities. Inadequate pedestrian infrastructure likely decreases pedestrian activity, which then, as noted above, contributes to negative health outcomes, such as cardiovascular disease and diabetes.

Though neighborhood walkability and access to resources can be key promoters of community health and an opportunity for community equity through investment in historically overlooked neighborhoods, they also have the potential to further the mission of SB 375. Increasing walkability promotes pedestrian mobility. When residents feel they do not have to use a vehicle in their neighborhoods, they may choose not to, leading to a decrease in county wide VMT. Thus, to inform implications of this RTP on health, we focus on analyzing the potential for increased access to services and walkability in low-income urban neighborhoods.

To meet the priorities of the coalition, the HIA project team suggests exploring this area of focus using the following research questions:

- Will the SCS increase access to basic community necessities in DUCs and low income urban communities? To what extent will the SCS change basic access to resources in DUCs and low income urban communities?
- Will the SCS increase walkability in DUCs and low income urban communities? To what extent will the SCS change walkability in the DUCs and low income urban communities?

Objective 1: Increased Access to Basic Community Resources in DUCs

For this objective, we first characterized the availability of basic resources in DUCs and low income urban communities. Basic resources include stores offering healthy, fresh foods; healthcare facilities and services and early education child care centers.

We then evaluated existing access to educational, governmental, and health care services by using the methods similar to those used for transit access above. In other words, we used travel demand model data available for 2005 and in each scenario in 2040 to evaluate access to services using access to jobs of three types: educational, medical, and government as a proxy for access to specific facility locations (which are unavailable for future years). Unfortunately, data about stores offering healthy food were unavailable for this part of the evaluation.[35] We used the same method described above to estimate jobs of each type accessible within a 45 minute trip by transit during the peak morning commute period, except that we split the analysis by job type rather than estimating access to all jobs. We also conducted the analysis for automobile access for a 45 minute trip to provide a point of comparison and to glean accessibility for those with access to a car, but we note that residents without access to vehicles don't benefit from auto access.

To more closely examine the localized impact of the SCS in each community, we also examined the growth in educational, governmental, and health care jobs allocated to DUCs and low income urban communities in each FCOG SCS scenario and compared it to existing conditions.

Existing Conditions:

- To what extent are basic community resources available in DUCs and low income urban communities?

Forecasting Question:

- Will Fresno's SCS increase the availability of community resource to residents of disadvantaged unincorporated communities and low income urban communities?

Indicators

1. Number and location of places offering fresh food, healthcare facilities, and child care/other social service facilities within DUCs and low income urban communities (existing conditions)
2. Number of government, health care, or educational jobs that can be accessed by transit or auto trips of 45 minutes or less during the peak morning commute period (existing conditions and forecasting)
3. Number of government, health care, or educational jobs that are located in each community (existing conditions and forecasting)

Objective 2: Increased Walkability in DUCs and Low-Income Urban Neighborhoods

For this objective, we assessed the walkability of DUCs and low income urban neighborhoods using a measure of the level of active travel, or how much people walk or bike for non-recreational travel. We obtained these measures under existing conditions as well as forecasted under each SCS scenario based on outputs from the FCOG travel demand model.

Due to limitations in the travel demand model, the differences we observe do not reflect changes in the quality of pedestrian infrastructure (e.g. presence of curb cuts, sidewalk maintenance, lighting, etc.) or additional pedestrian infrastructure that is built along existing roadways (e.g. a new sidewalk along an existing road). If the SCS scenarios vary in terms of transportation infrastructure that the model captures - by changing transit service or modifying or adding potential routes – the modeled impacts of those changes will be reflected in the measured active travel levels. Additionally, we expect the active travel measure to reflect the modeled impacts of changes in demographics (e.g. age, household characteristics, income, etc.). It will also reflect the modeled impacts of land use changes (e.g. location of residents or jobs and services).

Once we measured changes in active travel under each scenario, we converted them to health outcomes using a modified form of a comparative risk assessment (CRA) methodology developed by Dr. James Woodcock and his colleagues, and applied in California by Dr. Neil Maizlish[36]. Using this method, we looked at differences in health outcomes (mortality and disability-adjusted life years) that are expected to result from changes in active travel levels under each SCS scenario. We focused on mortality outcomes in this report, but additional information about disability-adjusted life years is included in Appendix C, Active Travel. The health outcomes of active travel in each scenario are presented as the change in expected outcomes when compared to existing conditions.

Overall, these results provided an indication of the health impacts that will result from changes in active travel levels under each SCS scenario. We determined whether FCOGs SCS scenarios improve active travel in disadvantaged unincorporated communities and low-income urban neighborhoods.

Existing Conditions:

- To what extent do DUCs and low-income urban neighborhoods foster active transportation?

Forecasting question:

- Will the adopted SCS increase active travel levels in DUCs and low income urban neighborhoods?

Indicators

1. Walkability: Non-recreational walk and bike travel (minutes per person per day and miles per person per day) (existing conditions and forecasting)
2. Health effects of active travel:

a. Existing conditions: Age-standardized mortality rate (from cardiovascular disease, dementia, diabetes, depression, colon cancer, and breast cancer.)
b. Forecasted conditions: Reduction in mortality as a result of changes in active travel (from cardiovascular disease, dementia, diabetes, depression, colon cancer, and breast cancer.)

Geographic boundaries, Data Sources and Limitations in Available Data

Most target communities included in our active travel health analysis had not been individually studied. Available data sources provide us with limited information as they account for entire zip codes that encompass our study communities, as well as other communities, and fail to account for and reflect differences in income levels, levels of community development and diverse land-use patterns within the same zip code. The baseline profile therefore includes zip code data for areas in Fresno County, with a primary focus on low income urban neighborhoods and rural disadvantaged unincorporated communities (DUCs).

For example, while data sources on mortality and birth outcomes that capture large zip codes may provide information that is representative of the zip code as a whole, it may not necessarily be an accurate representation of our study community. Similarly, The California Health Interview Survey provides information for low-income populations (< 200% of the Federal Poverty Line) however data is only available on a countywide basis. Further, small populations in some of the selected communities make it difficult to identify reliable data on community resources and population health. Throughout the report, we will note when data limitations may influence interpretation of findings.

The forecasted analyses of active transportation and accessibility both rely directly on travel demand model outputs, so are limited by the precision and accuracy of those models. Travel demand models are complex and data intensive, and it takes time to update them to reflect the contemporary challenges addressed under SB375. For example, modeled drive to transit trips may be overestimated in Fresno County, while walk to transit trips may be underestimated. Performing an independent verification of the model precision and accuracy in different areas and for different types of trips is beyond the scope of this work; however where known or suspected issues arise we so note in our discussion.

VII. Assessment of Existing Conditions and SCS Outcomes

Demographics of Target Communities

To provide necessary context about the disadvantaged unincorporated and low-income urban communities evaluated in this assessment, we first review the characteristics of these target communities for existing conditions and for forecasts of each SCS Scenario.

Demographics for each of the three DUCs (Lanare, Riverdale, and Laton), the low-income urban neighborhood (West Fresno), Fresno County, and California as a whole, taken from the 2010 Census and the American Community Survey (ACS) 2007 – 2011 five year estimates are summarized in the table

below. Most of the areas identified for analysis evidence substantial disadvantage, with each reported indicator exhibiting vulnerability relative to both the county and the state. Three identified areas demonstrate relatively high poverty, linguistic isolation and low per-capita income: Lanare, Riverdale, and West Fresno. All four study communities exceed the statewide and countywide proportions of people of color, as well. Data on non-single occupancy vehicle (SOV) mode share are more limited due to the limitations of the ACS data, but in areas with reliable estimates, commuting by SOV appears to be less common than would be expected based on the county or statewide values highlighting a potential link between transport disadvantage and social disadvantage.

Laton generally demonstrates more social advantage than county and state averages based on the indicators identified above. It is still of interest based on community's indication that there is in fact a high incidence of social disadvantage in the community. A relatively affluent segment of the population is likely driving the overall mean indicators, thus presenting a less vulnerable community than may in fact exist. Additionally Laton demonstrates that conditions within unincorporated areas are not homogeneous. Including relatively wealthier unincorporated areas in the analysis can provide an important point of comparison.

Figure 6: Key Demographic Indicators of Study Communities **Missing data indicate a margin of error greater than or equal to 50% of the estimate.**

	Population[a]	Poverty (%)[b]	Per capita HH income (2011$)[b]	People of color (%)[a]	Non-SOV commute mode share (%)[b]	Linguistic isolation (%)[b,c]
Lanare CDP	589	36.5	10,581	98.5	-	43.4
Riverdale CDP	3,153	30.3	14,542	70.8	-	35.2
Laton CDP	1,824	4.7	20,941	77.6	-	14.8
West Fresno[d]	39,076	41.2	11,860	89.0	37.5	29.1
Fresno county	**930,450**	**23.4**	**20,638**	**67.3**	**23.3**	**19.2**
Statewide	**36,995,499**	**14.4**	**29,634**	**59.9**	**27.0**	**19.7**

[a]Source: Census 2010, Summary File 1.

[b]Source: American Community Survey, 2007 – 2011 five year estimates.

[c]Defined as those speaking English less than "very well."

[d]Defined as Zip Code Tabulation Area 93706; all data from the American Community Survey, 2007 – 2011 five year estimates.

The table below summarizes the total population, employment, households, and household income in 2005, 2035 baseline, and for each scenario in each of the four evaluation areas and for Fresno County overall. The forecasted demographic summaries are based on data provided by FCOG. Riverdale, for example, adds substantial numbers of new households in each scenario as compared to 2035 business as usual projections, but does not receive concomitant increases in employment in almost all scenarios

(again as compared to business as usual projections) . These population and land use changes indicate reduced per capita access and walkability as new residents must leave the community to travel to work and there is no indication that there will be greater access to goods and services. Similarly, Lanare receives population increases as compared to 2035 projections in each of the four scenarios, but employment opportunities only increase in Scenario A. In order to achieve increases in access to resources and non-motorized mode share in the study areas, employment opportunities must increase to improve accessibility.

Figure 7: Total Population, Employment, Household and Household Income

Population	2005	2035	A	B	C	D
Lanare	628	735	796	747	741	834
Laton	1,290	2,130	2,720	2,310	2,300	3,390
Riverdale	2,890	3,240	4,850	3,900	3,890	4,930
West Fresno	47,600	95,300	90,100	100,200	107,000	103,000
Fresno County	860,000	1,264,000	1,246,000	1,249,000	1,245,000	1,280,000
Total employment						
Lanare	217	230	265	230	230	230
Laton	327	526	447	572	499	705
Riverdale	660	905	1,090	906	844	952
West Fresno	19,300	26,100	26,500	26,200	25,600	27,700
Fresno County	327,000	428,000	428,000	428,000	428,000	428,000
Total households						
Lanare	184	215	239	218	217	243
Laton	377	634	789	674	671	1046
Riverdale	865	969	1490	1160	1157	1516
West Fresno	14,700	29,200	28600	31,800	34,800	33,800
Fresno County	291,000	424,000	427,000	424,000	426,000	440,100
Mean household income ($10,000)[a]						
Lanare	40	41	39	41	41	41
Laton	64	62	63	62	62	56
Riverdale	46	45	43	45	45	43
West Fresno	41	42	39	39	38	37

Priority 1 Objective 1: Access to Public Transportation in Disadvantaged Unincorporated Communities and Low Income Urban Neighborhoods

Indicator: Survey of residents' transit access (existing conditions)

To date, the exact number of target area residents who regularly utilize public transit has not been shared by the transit agencies that service the studied communities. Despite lack of access to data, primary data findings indicate low ridership of existing bus lines due to lack of reliability and availability. A Community Needs Survey for the community of Lanare, conducted by California Rural Legal Assistance, Inc. and PolicyLink in 2011 found that when public transit is available, residents avoid using these services due to inconvenient scheduling, limited stop locations, and high prices. Over 60% of households (91 of 150) that participated in the survey described the available public transit network as consisting of a single bus stop with service into the City of Fresno only once per day.

Indicator: Location of stops, schedule and frequency of transit serving target areas (existing conditions)

An analysis of the available route maps and schedules in the study communities demonstrates inadequate public transportation options similar to those reported in Lanare surveys. Public transit networks in the unincorporated study communities consist of one bus departure in the early morning and one bus return in the late afternoon with service to either the City of Fresno or Hanford. Public transit is not a viable transportation option for those looking to commute to work as the timing fails to align with typical work hours. Additionally, transportation to grocery stores and medical appointments is burdensome as network hours force riders to allocate an entire day for travel to and from one appointment, and, moreover, limited stop locations often do not coincide with places of employment, goods and services. While the table below indicates that a majority of residents live in close proximity to a transit line, this does not indicate frequency of transit service.

Transportation options for the low-income, urban neighborhoods in South West Fresno are very limited. While a small portion of the area that makes up West Fresno is served by a single public transit provider, most of the area is not served by any public transit. Many other neighborhoods in the City of Fresno, in contrast, enjoy public transit services from several different providers. Most transit networks offer frequent service to downtown Fresno and the area surrounding it; however, service to areas outside of downtown are limited.

Figure 8: Population residing within ½ and ¼ of a Mile of a Transit Line

Geography		Pop (2010)	Population within 1/4 mi of transit line	% population within 1/4 mi of transit line	Population within 1/2 mi of transit line	% population within 1/2 mi of transit line
		blocks	*from ppl/parc*		*from ppl/parc*	
Lanare	CDP	589	341	57.9%	476	80.8%
Laton	CDP	1,818	693	38.1%	1,621	89.2%
Riverdale	CDP	3,153	1,423	45.1%	3,001	95.2%
West Fresno (93706)	ZCTA	41,087	12,281	29.9%	23,587	57.4%

Source: PolicyLink, 2013.

Indicator: Number of jobs that can be accessed by transit trips of 45 minutes or less during the peak morning commute period (existing conditions and forecasting)

The table below shows transit access for each of the study areas and for the region as a whole, for 2005, 2035 baseline, and scenarios A, B, C, and D in 2035. Transit access values are represented as the number of jobs accessible within 15, 30, and 45 minutes. For areas with more than one TAZ, the median and range (minimum to maximum values) are shown.

All areas have a median value of zero jobs accessible at 15, 30, and 45 minutes. In West Fresno there are some pockets with some transit access in the northeast corner of the area. This is reflected in the maximum values shown, which show that in West Fresno Scenario D reflects the most transit accessibility, followed by Scenario B. In the unincorporated portions of Fresno County, the upper end of the range reflects some transit accessibility, with Scenario D reflecting the highest transit access. For comparison, the upper end of the range shown for the region likely reflects transit access in downtown Fresno, which is far higher than in any of the DUCs. Note that for all years and scenarios, while no jobs are modeled as accessible by transit in the area covered by the DUCs, minor differences in jobs that may be accessible by foot can be gleaned from the jobs located in target areas described below, at least in the smaller DUCs of Lanare, Riverdale, and Laton.[37]

Figure 9: Transit Access (jobs accessible for 15, 30, and 45 minute trips.

Transit Access (jobs accessible for 15, 30, and 45 minute trips, shown as median [range])*							
Travel Time	**Location**	**2005 Baseline**	**2035 Baseline**	**2035 Scenario A**	**2035 Scenario B**	**2035 Scenario C**	**2035 Scenario D**
15 min	Lanare	0	0	0	0	0	0
	Laton	0	0	0	0	0	0
	Riverdale	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
	West Fresno	0 [0 - 15,238]	0 [0 - 17,651]	0 [0 - 21,003]	0 [0 - 22,572]	0 [0 - 22,435]	0 [0 - 30,424]
	Region	0 [0 - 24,136]	0 [0 - 30,112]	0 [0 - 36,649]	0 [0 - 38,816]	0 [0 - 38,849]	0 [0 - 50,383]
30 min	Lanare	0	0	0	0	0	0
	Laton	0	0	0	0	0	0
	Riverdale	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
	West Fresno	0 [0 - 79,974]	0 [0 - 96,707]	0 [0 - 111,874]	0 [0 - 111,258]	0 [0 - 112,859]	0 [0 - 122,332]
	Region	0 [0 - 106,317]	0 [0 - 144,418]	0 [0 - 178,716]	0 [0 - 170,558]	0 [0 - 171,307]	0 [0 - 180,067]
45 min	Lanare	0	0	0	0	0	0
	Laton	0	0	0	0	0	0
	Riverdale	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]	0 [0 - 0]
	West Fresno	0 [0 - 181,851]	0 [0 - 225,527]	0 [0 - 241,380]	0 [0 - 233,393]	0 [0 - 238,040]	0 [0 - 243,512]
	Region	0 [0 - 199,111]	0 [0 - 251,670]	0 [0 - 273,875]	0 [0 - 267,894]	0 [0 - 272,055]	0 [0 - 275,970]

* Med median and range (minimum to maximum) of all Travel Analysis Zones (TAZ, the units of analysis modeled) are shown for each area. Lanare and Laton correspond to just one TAZ so no range is provided.

Maps of the region also illustrate transit access. Appendix B of the Accessibility Appendix includes six maps showing transit access in Fresno County in the 2005 baseline, the 2035 baseline compared to the 2005 baseline, and scenarios A, B, C, and D in 2035 compared to the 2035 baseline. As seen in the map of the 2005 Baseline transit accessibility, no jobs are accessible from most of the target areas (and the County beyond the City of Fresno generally) for transit trips of 45 minutes or less; the exception is the northeast corner of West Fresno. The majority the City of Fresno benefits from much higher transit

access, while Clovis has moderate transit access, and a few outlying cities such as Selma, Reedley, and Sanger experience *slightly* greater transit access than the DUCs.[38]

The 2035 baseline transit accessibility map shows the difference between the 2035 Baseline and the 2005 Baseline. In most of the county, including many of the DUCs, there is no change in transit access in the 2035 baseline; the exception is the northeast corner of West Fresno which experiences gains. The City of Fresno experiences some change in transit access, largely positive. Other cities such as Selma, Reedley, Sanger, and Coalinga experience slight increases in transit access. We can then compare each scenario to the 2035 Baseline (see the Scenario A, B, C, and D maps which show the difference between each scenario in 2035 and the 2035 Baseline). Under Scenario A, Fresno experiences more growth in transit access than in the 2035 baseline, while Selma and parts of Clovis, Sanger, and Reedley experience less transit access than under baseline. Part of West Fresno (the northeast corner) experiences an increase in transit access, although the rest of West Fresno and the other target areas experience no change. Scenarios B and C are similar to Scenario A, with slightly more transit accessibility in Clovis and Parlier and slightly less accessibility in Sanger. Scenario D is also similar to A, B, and C, with slightly more accessibility in the northeast portion of West Fresno and in Selma, Sanger, and Reedley.

Indicator: Number of jobs that are located in each community (existing conditions and forecasting)

The table below summarizes the population and job characteristics of each SCS scenario, with shading indicating differences between 2035 Baseline values and each 2035 alternative scenario (green indicates more population or jobs than the baseline, red indicates fewer population or jobs). In the smaller areas of Lanare, Laton, and Riverdale, these job values may be the best proxy for access to amenities and services by foot or bike. They may also provide an indication of walk/bike access in parts of West Fresno.

As illustrated in Figure 10, Scenario D anticipates greater population increases in most of the study areas than the other scenarios, with the exception of West Fresno, which adds the most population under Scenario C. Under Scenario D, total jobs also increase in most communities of interest. Scenario A also generally directs more job growth into the study communities, with the exception of Laton. Scenario C provides the least job growth to the communities of interest.

Figure 10. Population and Job Characteristics of each SCS Scenario.

	2005 Baseline	2035 Baseline	2035 Scenario A	2035 Scenario B	2035 Scenario C	2035 Scenario D
Population						
Lanare	628	735	796	747	741	**834**
Laton	1,291	2,126	2,723	2,309	2,299	**3,389**
Riverdale	2,894	3,243	4,846	3,903	3,894	**4,933**
West Fresno	47,551	95,328	90,141	100,208	**106,714**	103,166
Total Jobs						
Lanare	217	230	**265**	230	230	230
Laton	327	526	447	572	499	**706**
Riverdale	660	905	**1,085**	906	844	952
West Fresno	19,287	26,094	26,469	26,163	25,610	**27,683**

Key:

higher than 2035 baseline

lower than 2035 baseline

highest in 2035

Summary of Transit Access under SCS Scenarios

The table that follows provides a qualitative summary of the transit accessibility findings. The table is shaded to provide an indication of relative access across areas and scenarios. The shading in the transit section should not be compared to the shading in the walk/bike section; in reality far less is accessible by walking and biking.

Overall, for the three DUCs (Lanare, Laton, and Riverdale), no scenario provides transit access to opportunities or services as measured by trips of 45 minutes or less. The northeast corner of West Fresno experiences higher levels of transit access, with the highest levels shown in Scenario D. The remainder of West Fresno does not enjoy transit access in any scenario.

The transit access estimates do not provide a good estimate of opportunities and services that are accessible in close proximity to residents, so we include a rough estimate of access by walk or bike, which is simply based on how much job growth is channeled into each area. In smaller communities of Lanare, Laton, and Riverdale, these estimates are a reasonable proxy for access by foot or bike. Because the area covered by West Fresno is much larger, walk/bike access indicated by job growth is less precise. Based on this analysis the target areas experience some walk / bike access, with Lanare and Riverdale demonstrating the greatest access in Scenario A, and Laton and parts of West Fresno experiencing the greatest access in Scenario D.

Note that the modeled changes in transit access to services in 2035 (when compared to 2005) may be a function of changes in transit service in 2035, changes in land use (which may affect traffic and therefore transit travel times) and the locations of jobs in 2035. On the other hand, the differences among scenarios (when compared to the 2035 baseline) are largely due to differences in the location of jobs (representing economic opportunities and goods and services) and small differences in transit travel times (e.g. from changes in traffic caused by variations in land use) rather than differences in transit service itself, since the 2035 scenarios do not vary in terms of the transportation projects included, rather transportation projects remain constant across all scenarios.

Overall we find that transit access in the DUCs and other rural areas in all scenarios is much lower than in the City of Fresno, and also lower than several outlying cities located at similar distances from the City of Fresno. Finally, we note that the differences in transit access among scenarios in the target areas are modest; this likely reflects the modest differences between land use in each scenario as well as the lack of variation in transit infrastructure projects across scenarios.

Figure 11: Access to Opportunities and Services by Transit, Walk, Bike

Location	Access to opportunities and services (represented by access to jobs)* 2005	2035 baseline	2035 Scenario A	2035 Scenario B	2035 Scenario C	2035 Scenario D
	By Transit (within 45 minutes)					
Lanare	None	None	None	None	None	None
Laton	None	None	None	None	None	None
Riverdale	None	None	None	None	None	None
West Fresno	Moderate	Slightly higher than 2005	Higher than 2035 base	Higher than 2035 base	Higher than 2035 base	Highest (by a little)
	By Walk or Bike (very roughly estimated based on jobs in the immediate area)					
Lanare	Low	Slightly higher than 2005	Highest in 2035	Same as 2035 baseline	Same as 2035 baseline	Same as 2035 baseline
Laton	Low	Higher than 2005	Lowest in 2035	Slightly higher than 2035 base	Lower than 2035 base	Highest in 2035
Riverdale	Moderate	Higher than 2005	Highest in 2035	Nearly same as 2035 baseline	Lowest in 2035	Slightly higher than 2035 base
West Fresno	High (some areas only)	Higher than 2005	Lowest in 2035 (some areas only)	Slightly higher than 2035 baseline	Slightly higher than 2035 baseline	Highest in 2035

*Colors are qualitative indicators of how high accessibility is, determined relative to other areas and other time periods for the same category (transit colors are relative to other fields in the transit table, while walk/bike colors are relative to others in the walk/bike table). Dark green indicates more access, light green indicates less access, and pink indicates no access.

Priority 2 Objective 1: Access to Basic Resources in Disadvantaged Unincorporated Communities and Low Income Urban Neighborhoods

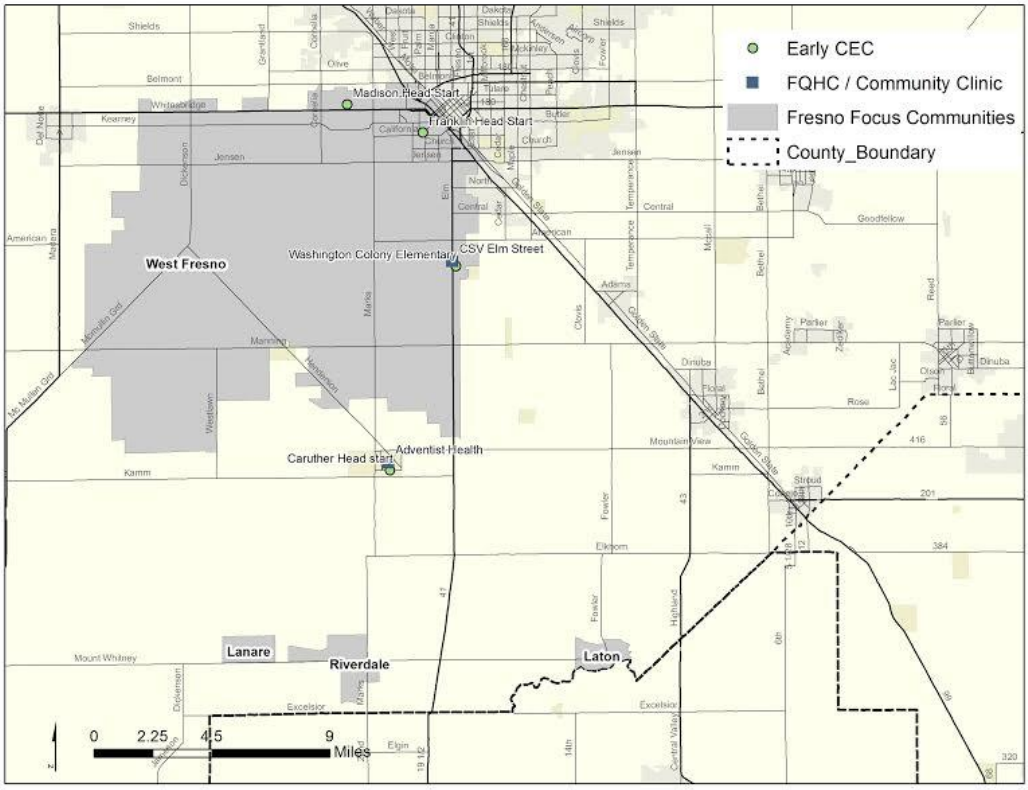
Indicator: Number and location of places offering fresh food, healthcare facilities, and child care/other social service facilities within DUCs and low income urban communities (existing conditions)

Access, or lack thereof, is indicated by proximity to essential resources, identified in this analysis as: grocery stores offering fresh fruits and vegetables, adequate primary health care provided by, or comparable to, a Federally Qualified Health Center (FQHC), and early childhood education programs. Resources were identified using ***HealthyCity.org***. All identified grocery stores within the study communities were individually contacted to verify availability of fresh fruits and vegetables and only those that reported carrying fresh fruits and vegetables were included in our final analysis as an essential resources. Adequate healthcare centers and early childhood education availability was verified using corporate web sites and by conducting investigations by phone.

Figure 12 identifies the location of essential resources in both the rural and urban study communities. Our analysis shows severe deficiencies in essential resources for target areas as the entire study area is served by: five grocery stores, three early childhood development programs and only three healthcare centers. While the location of essential resources varies, most facilities are not located within the subject communities.

South West Fresno is deficient with regards to grocery store availability in absolute terms and as compared to neighborhoods in northern parts of the City of Fresno. Further, grocery stores in 93706 are concentrated in the northeast portion of the zip code, with none existing in the rest of the neighborhood. There are several early childhood education programs serving 93706, including Head Start programs at the Franklin and Madison school sites.

Figure 12: Location of Essential Services in Study Communities



Source: PolicyLink, 2013.

Indicator: Number of government, health care, or educational jobs that can be accessed by transit or auto trips of 45 minutes or less during the peak morning commute period (existing conditions and forecasting)

Medical services

Estimates of access to medical services can be visualized using maps of the region. Appendix C of the Accessibility Appendix includes six maps showing transit access to services in Fresno County in the 2005 baseline, the 2035 baseline compared to the 2005 baseline, and Scenarios A, B, C, and D in 2035 compared to the 2035 baseline; Appendix D of the Accessibility Appendix shows six maps of the same, but using auto access to services.

Looking at transit access to services in the 2005 baseline, we see that with the exception of the northeast corner of West Fresno, the target areas lack access to medical services as measured by transit trips of 45 minutes or less. Outlying cities such as Selma, Sanger, Reedley, Coalinga, and Parlier have low levels of access to medical services by transit, and areas in and around the City of Fresno experience much higher levels of access to medical services by transit. In the 2035 baseline, transit access to medical services increases most substantially in the City of Fresno, and to a small extent in the areas that already had low levels of access in 2005. Comparing Scenario A to the 2035 baseline reveals that Scenario A increases transit access to medical services in the City of Fresno and most areas of Clovis, slight increases in Sanger and Coalinga, mixed effects in Reedley and Parlier, and slight decreases in Selma. Scenarios B and C are very similar to Scenario A, except that Reedley and Clovis fare slightly better. Scenario D is similar to B and C, except that Selma and West Fresno fare slightly better.

As noted above, the modeled transit access largely omits access to services that are located within the target areas themselves. To gain a better understanding of access to medical services within each target area, we look at the jobs that are located within each target area in each scenario. This analysis is presented in the discussion of the next indicator, discussed below.

Looking at access to medical services by car, the 2005 baseline shows high levels of access for several miles around Fresno, including West Fresno, Laton, and Riverdale, but in Laton access by car (measured by a trip of 45 minutes or less) begins to drop off. In 2035, access to medical services is higher across the region, with the biggest gains in the area around Fresno. Compared to the 2035 baseline, all Scenarios demonstrate an increase in access to medical services by car throughout the county and in particular in the area around Fresno, with Scenarios A and D adding the most access.

Educational services

Maps of the region help illustrate access to educational services. Appendix E of the Accessibility Appendix includes six maps showing transit access to educational services in Fresno County in the 2005 baseline, the 2035 baseline compared to the 2005 baseline, and Scenarios A, B, C, and D in 2035 compared to the 2035 baseline; Appendix F of the Accessibility Appendix shows six maps of the same, but using auto access to services.

Transit access to educational services in the 2005 baseline is not existent in the DUCs of Laton, Lanare and Riverdale; of the areas examined, only the northeast corner of West Fresno experiences access by transit as measured by trips of 45 minutes or less. The City of Fresno enjoys the best access to educational services by transit, with moderate access for Clovis, and limited access for Selma, Sanger, Reedley, Parlier, and Coalinga. The 2035 baseline scenario brings a patchwork of more and less access to the northeast corner of West Fresno and does not bring access to the remainder to the DUCs. Many parts of Fresno, Clovis, Selma, Sanger, Reedley, and Parlier experience slightly more access to educational services by transit in 2035; however in most of these cities those gains are offset by decreases in access in several areas. Under Scenarios A, B, C, and D, the northeast corner of West Fresno experiences nearly identical outcomes: some slight losses and some slight gains. Comparing scenarios A,

B, C, and D to the 2035 baseline shows that the four scenarios fare very similarly: most of Fresno experiences greater access, Clovis experiences a mix of gain and loss, and outlying cities experience no change or very slight increases.

As noted above, the modeled transit access largely omits an analysis of access to services that are located within the target areas of Laton, Lanare, and Riverdale. That analysis is presented in the discussion of the next indicator, discussed below.

Looking at access to educational services by car, the pattern in the baseline case looks similar to access to medical services by car, with the greatest access in the area around Fresno including the study communities, although in 2005 access drops off as distance from Fresno increases. Under the 2035 baseline, there are slight increases in educational access across the region, with the exception of the areas adjacent to Laton and Riverdale, which experience slight decreases. Scenarios A, B, C, and D result in slight but varied outcomes in the subject communities. In the DUCs, Laton fares slightly better in Scenario A while it fares slightly worse in Scenarios B, C, and D. Lanare fares slightly better in Scenario B, C, and D and slightly worse in A. West Fresno has mixed outcomes in all scenarios, and Riverdale fares slightly better in Scenarios A and D and has mixed outcomes in Scenarios B and C. All of the variation shown in the 2035 baseline and 2035 scenarios is slight relative to the level of job access in the 2005 baseline scenario; in other words, access to educational services by car changes only marginally in any of the future scenarios.

Government services

Maps of the region also provide estimates of access to government services. Appendix G of the Accessibility Appendix includes six maps showing transit access to services in Fresno County in the 2005 baseline, the 2035 baseline compared to the 2005 baseline, and Scenarios A, B, C, and D in 2035 compared to the 2035 baseline; Appendix H of the Accessibility Appendix shows six maps of the same, but using auto access to services.

In the 2005 Baseline, there is transit access to government services in the northeast corner of West Fresno, but the DUCs of Laton, Lanare, and Riverdale lack access to government services by transit. The City of Fresno has high levels of access, while Clovis, Selma, Sanger, Reedley, Coalinga, and Parlier experience low levels of access. Comparing the 2035 baseline to the 2005 baseline, we see that in 2035 areas that already enjoyed transit access to government services experience increases in access for the most part (this includes the northeast corner of West Fresno and particularly large gains in the City of Fresno), while areas that lacked that access in 2005 do not seem to gain access. Most parts of the northeast corner of West Fresno experience gains in access in all four scenarios, but the gains are greatest in Scenario D. The DUCs do not experience any transit access to government services as measured by trips of 45 minutes or less in any of the 2035 scenarios. Scenarios A, B, and C all show decreases in transit access to government services for large swaths of the City of Fresno (compared to the 2035 baseline); in Scenario D the extent of these losses is much smaller. In all four scenarios, Coalinga and Sanger experience slight increases in transit access to government services, Selma

experiences losses (though those losses are offset by gains in Scenario D), and Reedley and Parlier experience small gains in Scenarios B, C, and D, while in Scenario A they experience a mix of small gains and small losses.

As noted above, the modeled transit access largely omits access to services that are located within each target area itself. To gain a better understanding of access to government services, we look at the related jobs that are located within each target area in each scenario; this analysis is presented in the discussion of the next indicator, discussed below. Looking at access to government services by car, the baseline again shows a similar pattern as access to medical and educational services by car, with the best access in the area around Fresno (including the most target communities but beginning to attenuate near Lanare). In the 2035 baseline case, access to government services increases across the county, in particular in the area around Fresno. In Scenarios A, B, and C much of that increased access diminishes; it diminishes under scenario D as well, but to a lesser extent.

Indicator: Number of government, health care, or educational jobs that are located in each community (existing conditions and forecasting)

The table below summarizes the population and medical, health care, and educational job characteristics of each SCS scenario, with shading indicating changes from the 2035 baseline values for each 2035 scenario (green indicates more population or jobs than the baseline, while red indicates fewer population or jobs). In the smaller areas of Lanare, Laton, and Riverdale, these job values may be the best proxy for access to amenities and services by foot or bike. They may also provide an indication of walking and bicycle access in some parts of West Fresno.

All scenarios demonstrate growth in most services when compared to the 2005 baseline, but comparisons to the 2035 baseline indicate that educational activities remain constant under the four alternative scenarios as compared to the 2035 baseline, government services decrease in most communities, and access to medical services increases in some scenarios and decreases in others, exhibiting the most growth in Scenarios A and D.

Figure 13: Population and Medical, Health Care, and Education Job Characteristics

	2005 Baseline	2035 Baseline	2035 Scenario A	2035 Scenario B	2035 Scenario C	2035 Scenario D
Population						
Lanare	628	735	796	747	741	**834**
Laton	1,291	2,126	2,723	2,309	2,299	**3,389**
Riverdale	2,894	3,243	4,846	3,903	3,894	**4,933**
West Fresno	47,551	95,328	90,141	100,208	**106,714**	103,166
Medical Jobs						
Lanare	-	-	**7**	-	-	-
Laton	5	28	28	49	26	**100**
Riverdale	15	71	**93**	64	61	74
West Fresno	782	1,913	**2,287**	1,871	1,961	2,181
Educational Jobs						
Lanare	-	-	-	-	-	-
Laton	268	284	284	284	284	284
Riverdale	283	300	300	300	300	300
West Fresno	1,724	1,826	1,826	1,826	1,826	1,826
Government Jobs						
Lanare	-	-	**6**	-	-	-
Laton	1	15	15	28	14	**35**
Riverdale	4	**39**	34	33	32	23
West Fresno	1,709	**3,361**	2,541	2,562	2,636	2,954

Key:

higher than 2035 baseline

lower than 2035 baseline

highest in 2035

Summary of Access to Resources under SCS Scenarios

Overall, transit access to services is greatest in Fresno and its immediate surroundings. In three of the target areas (Lanare, Laton, and Riverdale), no scenario provides transit access to services as measured by trips of 45 minutes or less. The northeast corner of West Fresno experiences higher levels of transit access to medical services, with moderate to high improvements from the 2035 baseline in Scenarios A, B, and C, and slightly higher access in Scenario D. Looking at transit access to educational services, the northeast corner of West Fresno experiences modest improvements in Scenarios A, B, C, and D. In terms of transit access to government services, Scenarios A, B, and C bring moderate improvements to the northeast corner of West Fresno, though these are partially offset by slight decrease in access. Scenario D brings the greatest improvements in transit access to government services to the northeast corner of West Fresno.

Estimates of access to services by transit do not provide a good estimate of opportunities and services that are accessible due to their proximity to residents, so we include a rough estimate of increased

access by foot or bike, which is simply based on projected job growth in each area. In the smaller communities of Lanare, Laton, and Riverdale, these estimates are a reasonable proxy for access by non-motorized transport but because West Fresno is much larger, job growth is a less precise indicator of walk- /bike-abiity. Overall, the target areas experience some increased access based on this analysis. In terms of access to medical services, Lanare, Riverdale, and West Fresno experience the most access under Scenario A, while Laton has the most access under Scenario D. Access to educational services within the target areas does not vary by scenario. Access to government jobs is greatest in Lanare under Scenario A, in Laton under Scenario D, and in Riverdale and West Fresno in the 2035 baseline scenario.

As noted earlier, the differences among alternative scenarios (when compared to the 2035 baseline) are largely due to differences in the location of jobs (representing economic opportunities and goods and services) and small differences in transit travel times (e.g. from changes in traffic caused by variations in land use) rather than differences in transit service itself, since the 2035 scenarios do not vary in terms of the transportation projects included, rather transportation projects remain constant across all scenarios.

As with the evaluation of transit access, we note that the differences in transit access to services among scenarios in the target areas are modest; this likely reflects the modest differences among land use models in each scenario as well as the static compilation transit infrastructure projects across scenarios.

We also evaluate auto access to services for trips taking at least 45 minutes. In all cases, auto access to services is greatest for the Fresno area. Note, too, that the scale of access to services for residents with a car is far greater than transit access to services across the region, especially in rural areas. However, for residents that do not have access to a car, poor transit access may be the only option. Last, the 45 minute trip duration leads to a somewhat dramatic drop off in modeled auto access to services (beginning in the area around Laton); a gravity model would provide a more nuanced result, however no gravity model is available for this region at this time.

Priority 2 Objective 2: Walkability in DUCs and Low Income Urban Neighborhoods

Indicator: Walkability: Non-recreational walk and bike travel (minutes per person per day and miles per person per day) (existing conditions and forecasting)

Non-motorized travel outcomes result from neighborhood demographics and land uses: wealthier areas will tend to have higher automobile ownership and lower non-motorized travel, areas with mixed land uses and high accessibility will have higher non-motorized travel. The results show very little difference in rates of non-motorized transportation within communities. In general, Lanare and West Fresno have the highest rates of non-motorized travel amongst the four study areas. West Fresno is relatively urban, with higher accessibility than the more isolated DUCs and Lanare is relatively poor, which likely contributes to its higher rates. On the other hand, Laton's relative wealth likely contributes to its low rates of walking and biking.

Figure 14: Existing Conditions: Non-recreational Walk and Bike Travel

		person-miles per day per person*		minutes per day per person*	
		walk	bike	Walk	bike
2005	Fresno County	0.300	0.191	7.32	2.08
	Lanare	0.347	0.247	8.47	2.70
	Laton	0.089	0.134	2.17	1.47
	Riverdale	0.163	0.144	3.98	1.57
	West Fresno	0.353	0.242	8.61	2.64

**Estimated based on travel model data provided by FCOG. See Active Travel Appendix C for details.*

The table below shows rates of walk and bike travel for each SCS scenario for each analysis area and for Fresno County as a whole. The results show very little difference in rates of non-motorized transportation within communities across scenarios. While most rates increase from the 2035 baseline to each of the four scenarios, some decrease. Riverdale sees decreases in per-capita non-motorized travel in all scenarios and Laton sees decreases in all scenarios except for Scenario D. The lack of variation among scenarios A, B, C, and D indicates that the range of scenarios and variables examined is relatively modest. As noted above, and of significant significance, the scenarios do not vary in terms of the included transportation investments.

Note that comparing these data to observed walking and biking rates in the San Joaquin Valley (see Active Travel Appendix) suggests that the model results generally show higher rates of bicycling than actual travel patterns for the eight county region suggests. This is a known problem with the travel demand model. Consultants Fehr & Peers, report that the bicycling is chosen as a mode of transportation approximately three times more often in the model than it is by actual travelers.[39]

Figure 15: Forecast Conditions: Rates of Walk and Bike T ravel by SCS Scenario

		person-miles per day per person		minutes per day per person	
		walk	Bike	walk	bike
2035	Fresno County	0.288	0.196	7.02	2.14
	Lanare	0.361	0.264	8.79	2.88
	Laton	0.113	0.157	2.76	1.71
	Riverdale	0.179	0.148	4.37	1.62
	West Fresno	0.322	0.233	7.86	2.55
A	Fresno County	0.316	0.201	7.71	2.20
	Lanare	0.369	0.269	9.01	2.94
	Laton	0.099	0.153	2.40	1.67
	Riverdale	0.175	0.127	4.27	1.39
	West Fresno	0.370	0.242	9.01	2.64
B	Fresno County	0.308	0.201	7.52	2.20
	Lanare	0.337	0.249	8.23	2.72
	Laton	0.110	0.155	2.68	1.69
	Riverdale	0.155	0.134	3.79	1.47
	West Fresno	0.359	0.241	8.76	2.63
C	Fresno County	0.315	0.202	7.68	2.20
	Lanare	0.336	0.248	8.20	2.71
	Laton	0.107	0.154	2.61	1.69
	Riverdale	0.156	0.142	3.79	1.55
	West Fresno	0.366	0.245	8.94	2.68
D	Fresno County	0.319	0.202	7.77	2.21
	Lanare	0.327	0.246	7.98	2.69
	Laton	0.144	0.172	3.51	1.88
	Riverdale	0.169	0.133	4.11	1.46
	West Fresno	0.387	0.246	9.45	2.69

**Estimated based on travel model data provided by FCOG. See Active Travel Appendix for details*

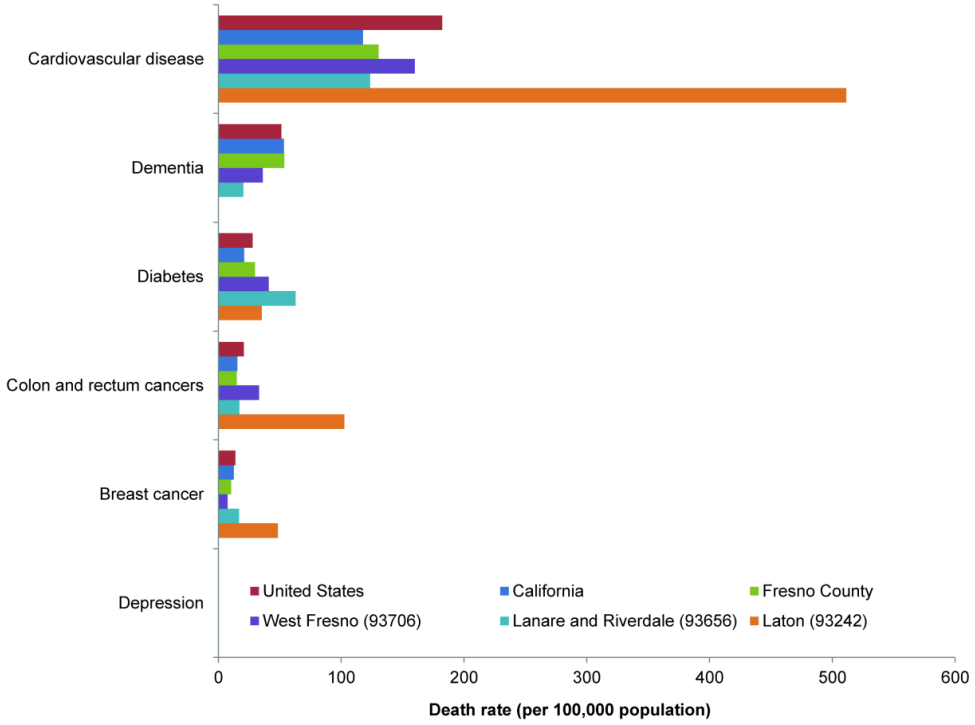
Indicator: Health effects of Active Travel: Age-adjusted mortality rates (from cardiovascular disease, dementia, diabetes, depression, colon cancer, and breast cancer) (existing conditions)

Figure 16 illustrates disease rates for six key diseases in the US, California, Fresno County and the study areas. Both Fresno County and California generally have lower death rates than the US, but there are exceptions for some diseases and some communities. Diabetes death rates, for example, are higher in Fresno County and all four study areas than California and the US. Prior work using data from various years of the California Health Interview Survey has shown elevated rates of diabetes prevalence in all eight San Joaquin Valley counties and overall race and income based disparities across the state.[40]

Increased physical activity can reduce the incidence of diabetes,[41] making transportation plans that promote active travel especially important in Fresno and its DUCs.

Study areas were each quantified using their zip codes, which, as previously discussed, is a limitation of the California Department of Public Health's vital statistics dataset. Notwithstanding this limitation, each community generally shows death rates elevated above the values for California and Fresno County for most diseases. The particularly high rates for Laton's zip code should be regarded skeptically as the population of its zip code is relatively young, which tends to inflate the age-standardized death rates.

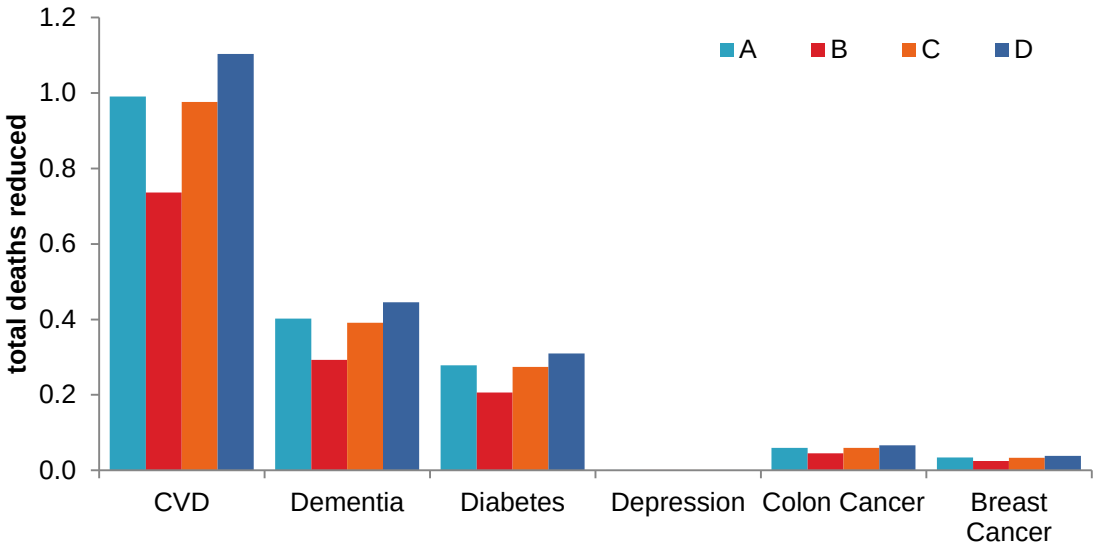
Figure 16: Health Effects of Active Travel: Age-Adjusted Mortality Rates



Indicator: Health effects of Active Travel: Reduction in mortality as a result of changes in active travel (from cardiovascular disease, dementia, diabetes, depression, colon cancer, and breast cancer.) (Forecasting)

We found that the total incidence of physical activity-related diseases in Fresno County is reduced in each of the SCS planning scenarios at the regional level. Those scenarios that predict additional active travel result in greater reductions in deaths and disease burden. Results for reductions in deaths in Fresno County are shown in the figures below. Similar results are reported for disability adjusted life years (DALYs) in the Active Travel Appendix.

Figure 17: Health Effects of Active Travel: Reduction in Mortality as a Result of Changes in Active Travel



Changes in disease burden associated with cardiovascular disease, dementia, and diabetes, represent the largest overall gains in health across all four scenarios. Scenario D provides the largest health gains, while scenario B generally provides the least. The CRA shows that, across all six disease types, Scenario D results in 0.7 fewer deaths than scenario B. Other diseases whose incidence is reduced through physical activity would show similar benefits, so the results reported here represent a lower bound.

In order to get a sense for the magnitude of the changes shown above, we can also look at the Fresno County results normalized to the total incidence of disease in Fresno County, as in the table below. The attributable fraction measures the proportion of disease burden attributable to a specific risk factor, in this case physical activity. The results again show small differences among scenarios, with scenario D generally showing the largest proportional reductions in disease burden and scenario B showing the least. The magnitude of the values is quite low even when compared to a similar analysis of the least ambitious scenario in a group of visionary scenarios modeled in the San Francisco Bay Area.[42] The Fresno regional results based on SCS modeling show rather modest differences among scenarios in line with modest increases in non-motorized travel behavior in each of the planning scenarios. Because of these factors, changes in health outcomes among potential scenarios are relatively small.

Figure 18: Fresno County – Total Incidence of Disease

Deaths (fraction attributable to changes in active travel)

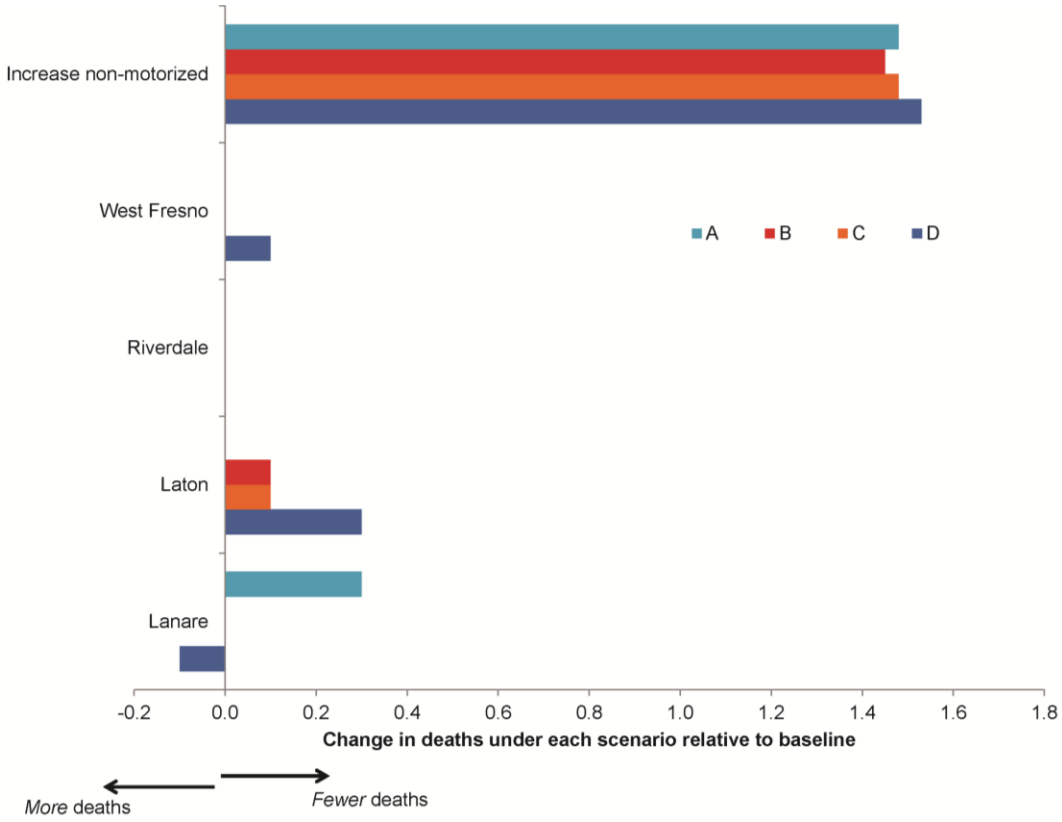
	Breast Cancer	Colon Cancer	CVD	Depression	Dementia	Diabetes
A	0.0%	-0.1%	-0.3%	0.0%	-0.1%	-0.1%

B	0.0%	0.0%	-0.3%	0.0%	-0.1%	-0.1%
C	0.0%	-0.1%	-0.3%	0.0%	-0.1%	-0.1%
D	0.0%	-0.1%	-0.4%	-0.1%	-0.1%	-0.1%

We can then break these results down to estimate impacts for the study communities. Because of the relatively modest changes in travel behavior at the regional and study-area level (described above), we also illustrate the impacts of increased non-motorized travel by synthesizing a hypothetical scenario based on two of the study areas. In the figures below, the additional analysis is referred to as "Increase non-motorized." In order to represent a hypothetical scenario with more dramatic differences in non-motorized travel, we combine baseline levels of non-motorized travel in Riverdale with the forecasted scenario levels from West Fresno. The resulting "increase non-motorized" illustrates the health effects of approximately doubling non-motorized travel time and distance in the representative population. For example, whereas in Lanare people walk only marginally more under Scenario A than under the 2035 baseline (0.369 vs 0.362 person miles per day per person, [Figure 15]), in the hypothetical "increase non-motorized" case, people walk nearly twice as much under Scenario A than under the 2035 baseline (0.370 vs 0.179 person miles per day per person, from Riverdale 2035 baseline and West Fresno Scenario A values in Figure 15).

Results for changes in total deaths (summing changes for all six disease types) for each area and scenario are shown in the figures below. Similar results are reported for disability adjusted life years (DALYs) in the Active Travel Appendix. Unlike at the regional level, changes in non-motorized transportation for all study areas are not uniformly positive, resulting in *increases* in expected deaths for some areas under some scenarios. For example, Lanare's mortality increases in Scenario A. Both Laton and West Fresno show some health gains in each scenario, but again the changes are relatively small. In all cases, the health gains in the aggregated "Increase non-motorized" case far exceed those envisioned based on Fresno COG's scenarios (A, B, C, and D). This result illustrates the substantial health benefits that could be realized when non-motorized transportation rates increase from relatively low baseline levels.

Figure 19: Results from Changes in Total Deaths



We can normalize these results into the fraction attributable to changes in active travel, which demonstrates that the changes in health outcomes in each study area are small relative to all the factors at work. See Active Travel Appendix for these details.

Summary of Active Travel under SCS Scenarios

Overall, the detailed examination of four study areas revealed very small changes between the baseline forecast and each of the SCS scenarios in terms of non-motorized travel. Even though increasing population growth was allocated to some study areas in Scenario D, employment growth was not similarly allocated, which would have simultaneously increased local accessibility and the use of non-motorized modes. The core values of Scenario D, including reducing urban fringe growth and redirecting resources to the study areas are extremely valuable, but quantifying its benefits using a comparative risk assessment and travel demand model results is challenging. More visionary scenarios would go a long way to show what types of walk and bike mode shares and travel patterns – and attendant health benefits – are possible in the study areas. It's evident that large gains in health are possible, but not at the scale and scope of current or anticipated transportation investment and land use planning.

VIII. Recommendations and Next Steps

In this section, we first summarize general land use and transportation planning concepts as they relate to the Fresno County context as well as those drawn from the findings from this HIA. We then present recommendations related to FCOG activities that should be used to implement land use and planning principles in the regional planning context.

Land use and transportation planning concepts:

A number of resources provide land use and transportation planning principles, but few provide insights applicable to rural areas in particular. Livability principles are discussed in the context of rural communities in the 2011 Partnership for Sustainable Communities report, "Supporting Sustainable Rural Communities".[43] These principles are summarized below, and can be applied in Fresno County:

- **Enhance existing communities.** Conserving working and natural lands and channeling development in small towns should enhance communities without eroding the landscape, e.g. by investing in existing main streets in rural communities or improving water and wastewater systems.

- **Provide non-auto oriented transportation choices and community design.** Providing bike, pedestrian, and transit facilities, and compact, mixed use communities can improve residents' quality of life and access to resources and opportunities, and can promote economic growth. Town centers are good locations for transit services that provide access to other cities and the rest of the region.

- **Promote equitable, affordable housing in proximity to jobs, goods and services.** Communities with a variety of housing options (including single family and multifamily units at a range of price points) in locations that are proximate to jobs, businesses, and services, can improve quality of life for all age groups, and can reduce residents' housing and transportation costs.

- **Foster economic opportunities.** Communities need strong employment opportunities to thrive. Rural communities have unique economic opportunities that may stem from agricultural, energy production, recreational, or other resources. Community specific planning and investment can enhance economic competitiveness of rural communities and small towns.

- **Leverage Federal opportunities.** Federal investments and policies can help support communities'' efforts to achieve economic, community environmental, housing, and transportation goals. Projects or plans that coordinate or address multiple objectives can bring better outcomes to communities.

- **Value each community.** Rural communities and towns have unique characteristics, resources, and histories. Thoughtful plans and projects that value this character can strengthen communities while helping to revitalize them.

In addition to the rural planning concepts discussed above, we draw from the results of this HIA to highlight two planning principles that are particularly relevant to the SCS process in Fresno County:

- **Climate, health, and equity objectives are interrelated.** Increasing transit, walking, and biking mode shares and increasing access to jobs and services in communities across the region can increase active travel, reduce VMT and improve health and quality of life. Investments in transit (more bus service, vanpools, etc.) and bicycle and pedestrian infrastructure improvements can increase those mode shares. Similarly, balancing growth in affordable housing, employment, and services in communities can improve access to economic opportunities and resources, improving health and quality of life. Low-income urban communities and unincorporated communities often have a greater need for these improvements but lack the resources needed to plan or build them.

- **Invest in existing communities.** This principle is also mentioned in the Partnership for Sustainable Communities report summarized above, but we reiterate it because the HIA results indicate that it is particularly important in the Fresno County RTP/SCS planning context. Existing communities can be strengthened with thoughtful channeling of transportation investments, planning efforts, and balanced growth in those communities. As described in "Smart Growth in Rural California: a working paper outlining A Land Use and Investment Plan For all California"[44], SB375's emphasis on developing areas in proximity to high frequency transit routes may make sense in an urban context, but it largely leaves existing rural communities out of regional growth plans. When paired with greenfield development that planned for areas outside of existing communities, there is seemingly little future for existing communities. Instead of focusing growth exclusively on existing urban centers and new suburban or exurban areas, channeling growth into existing urban and rural communities can improve environmental, health, and economic outcomes across the region.

Recommendations: Implementation in the Fresno COG Regional Planning Context

In light of the principles highlighted by Partnership for Sustainable Communities and the HIA analysis (described above), in this section we present recommendations for planning in the Fresno County context. While MPOs do not have direct authority to move the region towards more sustainable land use planning, they do control billions of dollars that can be utilized to incentivize cities and counties to grow in healthier, more sustainable ways. Please note that in some instances MPOs are constrained on allowable uses for projected revenues due to restrictions that accompany some state and federal funding sources. The land use designations that are the focus of the SCS ultimately fall under the authority of city and county. However, in many cases the MPO plays an important role in analyzing the outcomes of potential projects and plans and informing the community about those outcomes, potentially shifting the conversation about those projects and plans in jurisdictions throughout the region.[45]

As Fresno County moves forward, recognizing this potential tension and identifying potential avenues to increase the relevance of SCS/RTP planning processes may foster the proactive capacity of FCOG and help tie the region's outcomes to the regional visioning process. Below, we discuss several avenues to harness the expertise and resources of FCOG to move Fresno County to a healthier, safer, and more sustainable future.

1. **FCOG should conduct a Needs Assessment and develop a Grants Program.**

As proposed by the Community Equity Coalition, FCOG should establish a needs assessment program and a sustainable planning and infrastructure grant program. The needs assessment program would evaluate existing needs in Fresno's disadvantaged communities. The sustainable planning and infrastructure grant program would support implementation of the SCS by pooling and distributing transportation funds based on need as identified in the needs assessment for their potential performance (e.g., health, equity, air quality, and sustainability) outcomes. The 2014 RTP should incorporate policies to support the needs assessment and grants program in its Policy Element, implementation program in its Action Element, and allocate projected revenues in its Financial Element

Support efforts to fund investments and planning in rural communities.

One potential challenge to implementing the grants program is the lack of flexibility of funding streams. Local governments (cities, counties, or MPOs) with identified planning needs or project proposal in rural areas may seek funding from state, federal, and NGO sources. The following three reports provide comprehensive lists of programs that provide support for sustainable and healthy community plans and projects:

- The 2011 report "Supporting Sustainable Rural Communities"[46] describes a number of sources of Federal programs and funds available to rural communities through USDA, HUD, DOT, and EPA.

- A 2012 report issued by US DOT[47] provides a list of Federal programs and funding sources available to communities wishing to engage in healthy transportation planning (including those provided by US DOT, US DOT partners, the US Department of Health and Human Services, the US Department of the Interior, USDA, USEPA, and several others).

- The Local Government Commission's report[48] also lists a number of potential programs and funds, that can be used to implement healthy communities in the San Joaquin Valley, including Safe Routes to Schools, FHWA funding sources, Caltrans funds, California Department of Public Health funds, and foundation funds (e.g. from the California Endowment and the Robert Wood Johnson Foundation).

Emerging state funding programs, such as the Active Transportation Program and funding through the cap-and-trade program also provide opportunities for increased investment in low income, rural communities. Fresno COG and its member jurisdictions should actively pursue state level funding sources to help close infrastructure and housing gaps in low income areas.

FCOG's can offer its staff and expertise to assist smaller communities that may lack capacity and experience to access and harness these funds, either through the grant program or through technical assistance for community planners.

2. **Invest in Existing Communities First.**

FCOG should incorporate a policy that RTP investments must first serve the needs of existing

neighborhoods and communities before any discretionary funding is used to support and/or serve new town development. Funding should first be spent in neighborhoods and communities with the highest demonstrated needs as identified by the needs assessment.

FCOG should create a new classification for communities that demonstrate high levels of need to ensure that investments and resources are allocated to the right communities. These communities can be identified as Priority Investment Areas to ensure that they are targeted for investment first. FCOG should also outline action steps, and identity funding sources to support those, that will lead to healthier and more sustainable communities.

3. **FCOG should explore the impact of different transportation investments.**

The SCS/RTP process provides a unique opportunity to coordinate land use and transportation plans across the region. While the SCS component provides a new avenue to tie land use to transportation, the RTP continues to provide a powerful opportunity to thoughtfully plan regional transportation investments. A crucial part of the RTP process is evaluating the outcomes of various land use and transportation planning strategies in order to inform the selection of a preferred land use and transportation scenario and the list of transportation projects that will be funded.

A lack of variation in the transportation plans under each scenario is particularly concerning because the MPO's authority is limited to determining the list of transportation projects to fund. In other words, while the visionary land use piece of the SCS planning process is an important step in ensuring that the region articulates a coherent vision for development, the city and county jurisdictions have the ultimate authority over land use projects. So the primary piece, and most powerful piece, of the RTP falls under the MPO's authority over the transportation project list.

4. **FCOG should explore visionary scenarios.**

In order to address the environmental and health impacts of land use and transportation plans in Fresno County, it is important to explore a full range of scenarios. In the analysis of the health impacts of accessibility and walkability under each FCOG SCS scenario, we found little variation in outcomes between scenarios. This is due in large part to a lack of variation in transportation investments, and also to the moderate level of variation in land use plans under each scenario.

In the walkability analysis, we found that the non-motorized share of travel (and the concomitant health benefits) in each scenario changed very little. While Scenario D provided the greatest health benefits, the differences were marginal; to affect greater change in active travel and great reductions in disease and death, the scenarios would need to vary more substantially. To increase the walkability of the study areas examined, employment alone would need to grow, or employment and populations would need to grow together. Similarly, other auto-oriented areas in the region need a balance of housing and employment in close proximity in order to achieve walkability. In areas lacking appropriate bicycle and pedestrian infrastructure, investing in improved bicycle and pedestrian facilities can also increase the share of active travel.

In the accessibility analysis in this HIA, we found that most of the study communities do not benefit from transit access to jobs or resources within a period of 45 minutes. This lack of access is in contrast to a basic level of access available in some other communities located at similar distances from Fresno. In the study areas and in other areas lacking transit access to jobs and resources, access can be improved by improving transit service (e.g. by increasing transit frequencies and providing more direct access to jobs centers). Improved access to jobs and resources can also come from land use change within a community. We found that the SCS scenarios did vary by moderate amounts in terms of the number of jobs and services that would be located in each community; however as pointed out in the accessibility analysis these changes did not always keep up with increases in population. A balance of housing and employment and services in each community can lead to improved access to jobs and services, as well as increased walkability.

While it may be possible to make changes to the projected pattern of development and transportation investments included in each scenario for the 2014 RTP, we recommend that future SCS/RTP efforts include a range of land use scenarios and a range of transportation scenarios, with at least some aimed at achieving a greater degree of walkability and accessibility across the region, both of which have the potential to greatly increase residents' health. Evaluations of a wider range of scenarios will provide more information to decision makers and community members working to achieve substantial quality of life improvements in the region.

IX. Conclusion

We recognize and commend the tremendous amount of effort of Fresno COG staff to develop the region's first SCS. This process has proven to be a challenging, yet exciting, experience that we have all learned from. We hope to partner with FCOG, its member jurisdictions, community residents, community partners and decision makers to both implement this plan and prepare for its next iteration in 2018. Our hope is to work with FCOG staff and decision makers to further improve the draft plan to ensure that the needs of our most vulnerable communities are adequately met. We will continue to meet with community residents and decision makers during this public review period and leading up to the June 26, 2014 vote to adopt the final plan. Land use and transportation planning are inextricably tied to community health outcomes and our goal is to help improve short and long term land use planning documents such as the RTP to build a healthy and sustainable Fresno region.

[1] Cal Government Code Section 65080
[2] Cal Government Code Section 65080
[3] Cal Government Code Section 65080
[4] American Lung Association, Public Health Crossroads: Sustainable Growth for Healthier Fresno Neighborhoods
[5] The Planning Center DC&E, 2012
[6] FCOG , March 2013 SCS presentation
[7] Webiste for the World Health Organization, available at http://www.who.int/social_determinants/en/
[8] American Lung Association, Public Health Crossroads: Sustainable Growth for Healthier Fresno Neighborhoods

[9] Budget of the Fresno Council of Governments, on file with authors
[10] National Research Council. *Improving Health in the United States: The Role of Health Impact Assessment*. Washington, DC: The National Academies Press, 2011.
[11] World Health Organization, 2009. http://www.who.int/social_determinants/en/.
[12] Human Impact Partners, 2011. http://www.humanimpact.org/component/jdownloads/finish/11/81
[13] Fresno COG Agenda, 2012. On file with authors
http://agendas.fresnocog.org/itemAttachments/28/Mission_for_the_Task_Force_for_2012_target_setting.pdf
[14] Fresno COG, 2012. http://agendas.fresnocog.org/itemAttachments/86/RTP_RT-2012-13_Guidelines.pdf
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[19] Contributions of built environment to childhood obesity. Rahman T, Cushing RA, Jackson RJ. Mt Sinai J Med. 2011 Jan-Feb;78(1):49-57; Neighborhood environment and physical activity among youth a review. Ding D, Sallis JF, Kerr J, Lee S, Rosenberg DE Am J Prev Med. 2011 Oct;41(4):442-55; Health impacts of the built environment: within-urban variability in physical inactivity, air pollution, and ischemic heart disease mortality. Hankey S, Marshall JD, Brauer M. Environ Health Perspect. 2012 Feb;120(2):247-53. Epub 2011.
[20] Impacts of the Built Environment: Within-Urban Variability in Physical Inactivity, Air Pollution, and Ischemic Heart Disease Mortality Steve Hankey Julian D. Marshall and Michael Brauer Health Environ Health Perspect. 2012 February; 120(2): 247–253 citing Colditz GA, Cannuscio CC, Frazier AL. Physical activity and reduced risk of colon cancer: implications for prevention. Cancer Causes Control. 1997;8(4):649–667, Kelley D, Goodpaster B. Effects of exercise on glucose homeostasis in type 2 diabetes mellitus. Med Sci Sport Exer. 2001;33(6) suppl:S495–S501, Kohl KW. Physical activity and cardiovascular disease: evidence for a dose response. Med Sci Sport Exer. 2001;33(6) suppl:S472–S483, Verloop J, Rookus MA, van der Kooy K, van Leeuwen FE. Physical activity and breast cancer risk in women aged 20–54 years. J Natl Cancer Inst. 2000;92(2):128–135.
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[30] Originally the analysis included 15 and 30 minute transit accessibilities, but for the purposes of simplifying comparisons, capturing a reasonable one-way travel time, and capturing variation for the analysis areas, the 45 minute distance is most suitable and is the focus of this analysis (although some data are reported at 15 and 30 minute intervals). A longer transit commute time would capture more jobs and potentially more variation, but a transit commute time that is too long would fail to indicate reasonable accessibility. A spot check of the model reveals that modeled transit times from Riverdale to downtown Fresno are approximately 90 minutes, however using 90 minutes as a one-way travel time does not represent an ease of access, so this travel time is not used. We did not estimate accessibility using a gravity model (which uses a calibrated algorithm to discount access at increasingly long travel times to provide one metric for access at various trip durations), as region-specific calibrated coefficients would be needed, and one is not known to have been previously specified for the Fresno COG travel model (email. comm., 2/19/2014, Kai Han).

[31] Where a target area contains more than one TAZ, TAZ level data are aggregated.

[32] McLafferty, GIS and health care, Annu. Rev. Public Health 2003. 24:25–42

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[34] Arcury, T. A., J. S. Preisser, W. M. Gesler and J. M. Powers (2005). "Access to Transportation and Health Care Utilization in a Rural Region." The Journal of Rural Health **21**(1): 31-38

[35] The model outputs provide the locations of nine job categories: industrial, retail, office, educational, medical, services, food, government, and other. All job types listed represent access to economic opportunities. However in terms of access to resources and services, some of these job types have explicit value (e.g. medical and educational facilities clearly fill a need), while others have value that is obscured by the aggregate nature of the data ('retail'

indicates grocery stores as well all other retail opportunities), and still others may indicate potential disbenefits (e.g. industrial facilities that are in very close proximity may correlate to undesirable environmental exposures, even while they may provide economic opportunities). We focus medical, educational, and government jobs but can provide information about other job categories upon request. See Appendix A for a full description of what each job category includes.

[36] See Appendix C for details about the active travel analysis.

[37] Looking more closely at the model outputs, this result of zero is better understood in combination with the information presented above about jobs located within each target area. The jobs within the target areas are not counted in the transit accessibility analysis because transit travel times within and between zones of a particular target area (or even between, e.g. Riverdale and Lanare) are either zero or greater than 45 minutes; however note that in some cases the jobs within the target area itself may be accessible on foot or by bike. The West Fresno area analyzed is large enough that this measure is not a good measure of access by foot or bike.

[38] Note that the color scale on maps is divided into bins of equal spacing with an extra category for zero values. This allows job access just above zero to be visible and distinct from zero.

[39] Fehr and Peers, "Technical Summary for the Fresno Council of Governments Traffic Model to Meet the Requirements of SB 375," (2013), 27.

[40] Allison L. Diamant et al., "Diabetes in California: Nearly 1.5 Million Diagnosed and 2 Million More at Risk," (Los Angeles, CA: UCLA Center for Health Policy Research, 2003); Allison L. Diamant et al., "Diabetes: The Growing Epidemic," (Los Angeles, CA: UCLA Center for Health Policy Research, 2007).

[41] Christie Y. Jeon et al., "Physical Activity of Moderate Intensity and Risk of Type 2 Diabetes: A Systematic Review," *Diabetes Care* 30, no. 3 (2007).

[42] Neil Maizlish et al., "Health Co-Benefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the Bay Area: Technical Report," (California Department of Public Health, 2012), 38-39.

[43] Issued by the Partnership for Sustainable Communities (HUD, DOT, EPA, USDA) in Fall 2011. Available at http://www.epa.gov/smartgrowth/pdf/2011_11_supporting-sustainable-rural-communities.pdf

[44] Authored by Anne Bellows, Phoebe Seaton, and Veronica Garibay through Leadership Counsel for Justice and Accountability, available at http://www.leadershipcounsel.org/#!publicatons-and-resources/csgp.

[45] For example, the role of MPOs in equitable transportation planning is discussed in Lowe, Kate. "Bypassing Equity? Transit Investment and Regional Transportation Planning." Journal of Planning Education and Research 2014 34: 30

[46] Issued by the Partnership for Sustainable Communities (HUD, DOT, EPA, USDA) in Fall 2011. Available at http://www.epa.gov/smartgrowth/pdf/2011_11_supporting-sustainable-rural-communities.pdf

[47] US DOT, 2012. Metropolitan Transportation Planning for Healthy Communities. Available at http://www.planning.dot.gov/documents/Volpe_FHWA_MPOHealth_12122012.pdf

[48] Available at http://www.lgc.org/healthy-communities-design-toolkit.