metroplan orlando
A REGIONAL TRANSPORTATION PARTNERSHIP

SR 50 BUS RAPID TRANSIT **HEALTH IMPACT ASSESSMENT**

MARCH 2016

CONTENTS

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EXECUTIVE SUMMARY 7
Summary of Existing Conditions 8
Summary of Findings 10
Summary of Recommendations 13

INTRODUCTION 17
Background 17
What are Health Impact Assessments? 18
About the SR 50 HIA 20
Previous Studies 22
SR 50 HIA Partnerships & Community Outreach 23

STUDY CORRIDOR OVERVIEW 25
Corridor Context 25
Socio-Economic Characteristics 26
Walking Audits 38
Health Characteristics 42

SR 50 HIA GOALS AND OBJECTIVES 47
Pathway Diagram 47

HEALTH INDICATORS 51
How Transit Can Influence Physical Activity 52
How Transit Can Influence Safety 54
How Transit Can Influence Quality Of Life 60
How Transit Can Influence Land Use 65

TARGET DEMONSTRATION AREAS 67
Policy Review of Target Demonstration Areas 67
SR 50/Pine Hills Road Target Demonstration Area 70
SR 50/SR 436 Target Demonstration Area 77
SR 50/SR 434 Target Demonstration Area 85

RECOMMENDATIONS 93

MONITORING 101

REFERENCES 105

APPENDICES
Appendix A: Walking Audits
Appendix B: Land Use Policy review
Appendix C: Quality of Life Survey

FIGURES & TABLES

FIGURE 1	Study Corridor	9
FIGURE 2	Study Corridor Sectors	21
FIGURE 3	Median Age	29
FIGURE 4	Population Breakdown by Race	30
FIGURE 5	Minority Population	31
FIGURE 6	Median Income Across Sectors	32
FIGURE 7	Poverty Rate	33
FIGURE 8	Zero-Vehicle Households	35
FIGURE 9	Population Density	37
FIGURE 10	Walking Audit Summary in SR 50/Fashion Square Mall Area	38
FIGURE 11	UCF Students' Walking Audit Locations	39
FIGURE 12	SR 50 HIA Pathway Diagram	48
FIGURE 13	Frequency of Pedestrian & Bicyclist Crashes with Injuries	55
FIGURE 14	Frequency of Pedestrian & Bicyclist Crashes Resulting in Fatalities	56
FIGURE 15	2012 Study Corridor Household Income	62
FIGURE 16	How Neighborhood Features Influence Transportation Costs	64
FIGURE 17	Example Relationship of Zoning & Land Use Policies to the Health Indicators	67
FIGURE 18	SR 50/Pine Hills Road Station Area	70
FIGURE 19	SR 50/Pine Hills Road Station Area Existing Street Network	70
FIGURE 20	SR 50/Pine Hills Road Station Area Existing Block Structure	70
FIGURE 21	SR 50/Pine Hills Road Station Area Existing Land Uses	71
FIGURE 22	SR 50/Pine Hills Road Station Area Underutilized Parcels	71
FIGURE 23	SR 50/Pine Hills Road Short-Term Illustrative Scenario	72
FIGURE 24	SR 50/Pine Hills Road Short-Term Potential Street Network	73
FIGURE 25	SR 50/Pine Hills Road Short-Term Potential Block Structure	73
FIGURE 26	SR 50/Pine Hills Road Illustrative Long-Term Scenario	74
FIGURE 27	SR 50/Pine Hills Road Potential Long-Term Street Network	75

FIGURE 28 SR 50/Pine Hills Road Potential Long-Term Block Structure 75
FIGURE 29 SR 50/SR 436 Station Area 77
FIGURE 30 SR 50/SR 436 Station Area Existing Street Network 78
FIGURE 31 SR 50/SR 436 Station Area Existing Block Structure 78
FIGURE 32 SR 50/SR 436 Station Area Existing Land Uses 79
FIGURE 33 SR 50/SR 436 Station Area Underutilized Parcels 79
FIGURE 34 SR 50/SR 436 Illustrative Short-Term Scenario 80
FIGURE 35 SR 50/SR 436 Station Area Short-Term Street Network 81
FIGURE 36 SR 50/SR 436 Station Area Short-Term Block Size 81
FIGURE 37 SR 50/SR 436 Station Area Illustrative Long-Term Scenario 82
FIGURE 38 SR 50/SR 436 Station Area Potential Long-Term Street Network 83
FIGURE 39 SR 50/SR 436 Station Area Potential Long-Term Block Structure 83
FIGURE 40 A SR 50/SR 434 Station Area 85
FIGURE 41 SR 50/SR 434 Station Area Existing Street Network 85
FIGURE 42 SR 50/SR 434 Station Area Existing Block Structure 85
FIGURE 43 SR 50/SR 434 Station Area Existing Land Uses 86
FIGURE 44 SR 50/SR 434 Station Area Underutilized Parcels 86
FIGURE 45 SR 50/SR 434 Station Area Illustrative Short-Term Scenario 87
FIGURE 46 SR 50/SR 434 Station Area Short-Term Potential Street Network 88
FIGURE 47 SR 50/SR 434 Station Area Short-Term Potential Block Structure 88
FIGURE 48 SR 50/SR 434 Station Area Illustrative Long-Term Scenario 89
FIGURE 49 SR 50/SR 434 Station Area Potential Long-Term Street Network 90
FIGURE 50 SR 50/SR 434 Station Area Long-Term Block Structure 90

TABLE 1 Key Steps in the HIA Process 19
TABLE 2 Demographic Characteristics of SR 50 HIA Study Corridor 27
TABLE 3 Population and Household Densities 36
TABLE 4 Chronic Condition Rates 42
TABLE 5 Obesity Rates by Race & Ethnicity 43
TABLE 6 Obesity Rates by Income 43
TABLE 7 Asthma Rates by Race & Ethnicity 44
TABLE 8 Asthma Rates by Income 44
TABLE 9 Cardiovascular Disease Rates by Race & Ethnicity 44
TABLE 10 Cardiovascular Disease Rates by Income 44
TABLE 11 Diabetes rates by Race & Ethnicity 45
TABLE 12 Diabetes Rates by Income 45
TABLE 13 COI Calculations by Chronic Disease 53
TABLE 14 Health Care Expenses in the Study Corridor based on COI 53
TABLE 15 Crash Severity and VSL 57
TABLE 16 2009 to 2014 Corridor Crashes and VSL Calculations 57
TABLE 17 2014 Corridor Crashes and VSL Calculations 58
TABLE 18 Potential Reduction on 2014 Pedestrian & Bicycling Crashes & Associated Costs Based on VSL 58
TABLE 19 Benefits of Transportation Demand Strategies 59
TABLE 20 Comparison of Roadway Expansion & Complete Street Projects 60
TABLE 21 Quality of Life Survey Results 61
TABLE 22 Corridor Segment Income Levels Compared to the Region & State 62
TABLE 23 Populations Living in Poverty & ALICE Threshold 63
TABLE 24 Educational Attainment by Corridor Segments 63
TABLE 25 Summary of Policy Review Findings by Design Regulation Categories 69
TABLE 26 SR 50/Pine Hills Road Demonstration Area Metrics 76
TABLE 27 SR 50/SR 436 Demonstration Area Metrics 84
TABLE 28 SR 50/SR 434 Demonstration Area Metrics 91

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

MetroPlan Orlando, in collaboration with the University of Central Florida Urban and Regional Planning Program and the Winter Park Health Foundation, commissioned a Health Impact Assessment (HIA) on the proposed State Road (SR) 50 Bus Rapid Transit (BRT). The HIA's objectives are to examine how the proposed service might affect the well-being of area residents, as well as to incorporate health considerations into the transportation planning process. HIAs bring a health focus into the transportation planning process so that policy and infrastructure investment decisions take into account the health of the population served by the transportation investments.

HIA is an emerging practice in the United States and is widely promoted by the Centers for Disease Control and Prevention (CDC) as a tool that identifies and measures potential health impacts, both positive and negative, that may result from a particular policy or project. The HIA begins with a broad definition of "health" from the World Health Organization: "a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity"[1]. HIA is commonly defined as "a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population"[1]. HIAs evaluate the impact that a specific plan, policy, or project would have on the health of individuals, and suggests ways to improve the health outcomes as a result of the policy, plan, or project in question. HIA analyses can inform decision makers as they make policy changes and project choices that affect the communities in which they live and work.

The SR 50 HIA findings show that the SR 50 BRT could have positive impacts on the health of workers and residents along the SR 50 Study Corridor. The findings support the construction and operation of the SR 50 BRT because of its potential public health benefits. The magnitude of the project's impacts on health and who is impacted critically depend on associated land use changes and strategies to optimize the advantages of the proposed BRT.

The SR 50 BRT HIA Steering Committee provided guidance of the HIA and feedback at each stage of the study process. The Committee consisted of representatives of agencies and local governments, community organizations, public health practitioners and researchers, and professional planners . The committee identified the goal of the study which was **"to better understand the impacts of the BRT on the overall health of the communities along the SR 50 Study Corridor."** This would include potential impacts of SR 50 BRT on the physical, social, and emotional health of community members through the following four themes:

Four themes of potential health benefits of SR 50 BRT.

1 World Health Organization, 2015

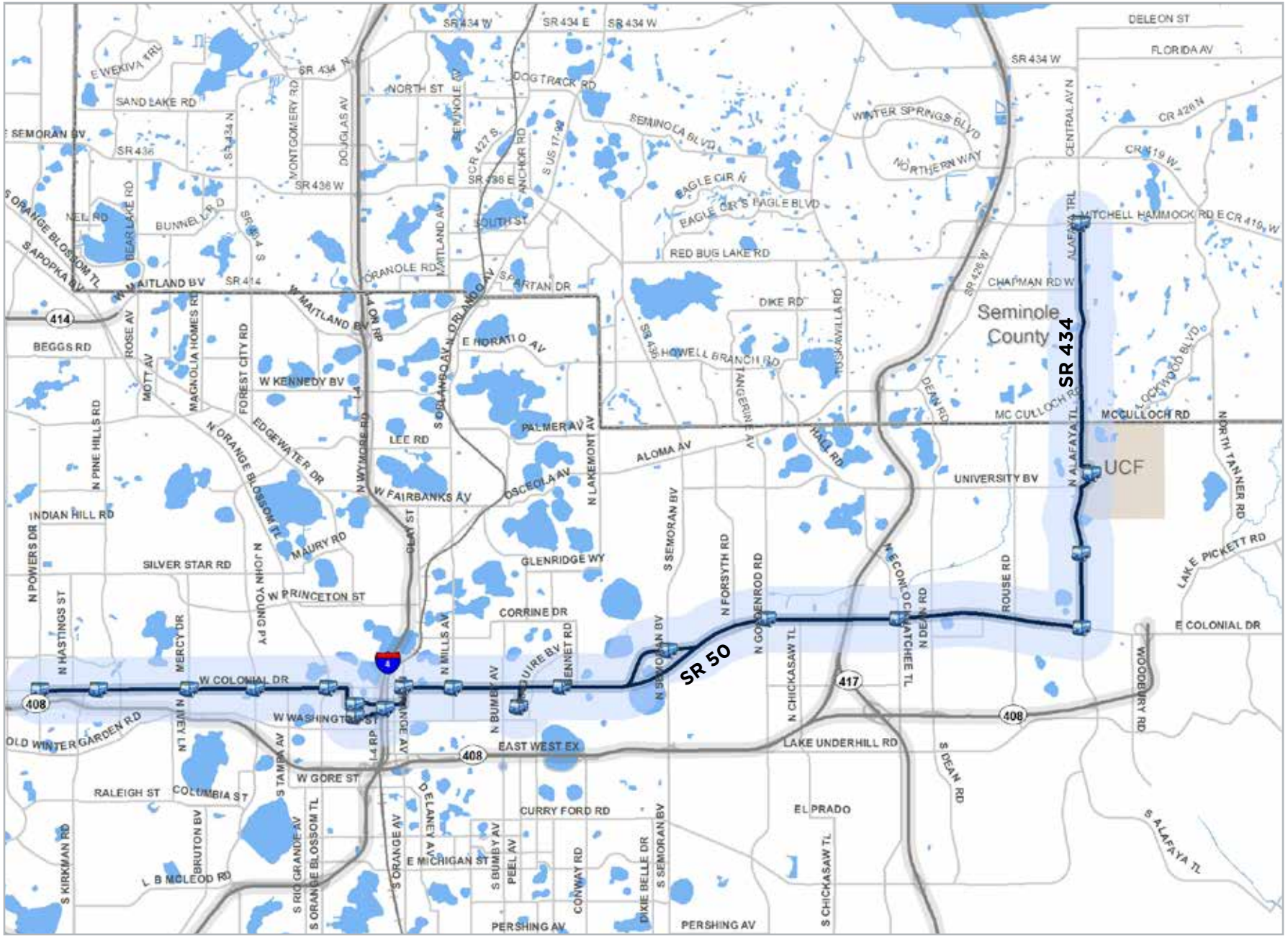
SUMMARY OF EXISTING CONDITIONS

The HIA study corridor covers SR 50 (Colonial Drive) from Powers Drive on the west, past Creative Village and downtown Orlando, continuing east along SR 50 and then north along SR 434 next to the University of Central Florida (UCF) Main Campus and terminating at Mitchell Hammock Road in the City of Oviedo in Seminole County. The Study Corridor is 22 miles long and is primarily located within unincorporated Orange County boundaries while areas within the City of Orlando, City of Oviedo and unincorporated portions of Seminole County were also studied. Figure 1 displays the Study Corridor.

SR 50 is a major east-west corridor through the Region and forms a key economic lifeline of Central Florida. From the western county line to UCF, the Corridor holds more than 130,000 jobs within its two-mile buffer and links the largest regional economic and educational centers. The Corridor also ties together a series of distinctive communities, representing the Region's most racially and ethnically diverse cross-section of the population. SR 50 is also a key regional transit link currently serving some of the highest performing transit routes and providing an important east-west feeder connection to the SunRail Commuter Rail corridor.

Many indicators point to the benefits of increased transit investment along SR 50, from both a Corridor need and an opportunity. The Study Corridor mirrors the overall demographic trend of Central Florida with more than three quarters being younger residents (Millennials and Generation X), a population group that has a higher propensity to use transit. The Corridor also has demographic characteristics that indicate that transit is critical basic need to residents' mobility and daily living. Many of the Corridor segments have lower household median income, higher poverty rates, and more households without access to vehicles when compared to the rest of the Region. From a health perspective, SR 50 has similar or worse health conditions commonly prevalent in population sub-groups when accounting for race, ethnicity, and income. Compared to Region-wide and Statewide averages, the Corridor has equally high or slightly higher rates of obesity, asthma, cardiovascular disease, and diabetes.

FIGURE 1 STUDY CORRIDOR



Due to the length of the corridor and the diversity along the corridor, the Study Corridor was divided into six sectors: Pine Hills, Downtown, Azalea Park, Union Park, UCF, and Oviedo. Figure 2 displays the Study Corridor sectors.

SUMMARY OF FINDINGS

Overall, the HIA findings suggest that the proposed SR 50 BRT could not only improve the physical, social, and mental health of the community, but it may also improve bicycle and pedestrian safety. The infrastructure and land use improvements associated with the enhanced transit service would enhance safety for bicyclists and pedestrians. Through increased opportunities for physical activity, transit-supportive land uses, and access to goods and services that support a healthy lifestyle, many chronic diseases can be prevented at the community and individual level. The summary table below presents the final health indicators selected for the Study, their impact on the community (positive or negative), and the distribution of their effects on Study Corridor populations. Discussion of the magnitude and details related to each indicator follows in the succeeding paragraphs after the summary table below.

HEALTH INDICATORS OF SR 50 BRT'S POTENTIAL IMPACT

	Impact (+/-)	Magnitude	Distribution
PHYSICAL ACTIVITY	+	Medium	Relatively higher effect on low-income, transit-dependent communities
PEDESTRIAN & BICYCLE SAFETY	+	Medium/ High	Affect the whole area relatively equally
QUALITY OF LIFE	+	Medium	Relatively higher effect on low-income and lower education populations
TRANSIT SUPPORTIVE LAND USES	+	High	Immediate & stronger influence around the areas near the proposed transit stations

HOW TRANSIT CAN INFLUENCE PHYSICAL ACTIVITY

Throughout the Study Corridor, the obesity rate is approximately 25 percent and is estimated to affect 46,000 out of 182,000 adults. In contrast to the overall obesity rate, the rate is higher among the Hispanic population (27 percent rate) and the African American population (27 percent rate). Among year-around, full-time workers, the income bracket with the highest obesity rate is the $35,000-$49,999 range at 39 percent within the corridor. Evidence-based research maintains obesity is associated with significantly increased risk of more than 20 chronic diseases and health conditions that cause devastating consequences and increased mortality.[2] Some of these chronic conditions are diabetes, hypertension, high cholesterol, stroke, heart disease, certain cancers, and asthma.[3] Asthma has a 14 percent rate (25,000 affected adults) within the SR 50 Study Corridor, diabetes has a 10 percent rate (18,000 affected adults) and cardiovascular disease has a 8 percent rate (13,000 affected adults).

The prevalence of these health conditions has a negative impact on an individual's income and the economic health of the community. To estimate that cost, economists use Cost-of-Illness modeling, to assess the financial burden associated with an illness. The health impacts for the four conditions analyzed in this study – obesity, cardiovascular disease, diabetes, and asthma – total $489,200,000 for the Orlando MSA and $55,920,000 for the Study Corridor.

2 Malnick SD, Knobler H. (2006) The medical complications of obesity. QJM. 99(9): 565-579.

3 Delgado J, Barranco P, Quirce S. (2008) Obesity and Asthma. J Investig Allergol Clin Immunol. 18(6):420-5.

HOW TRANSIT CAN INFLUENCE SAFETY

The SR 50 Study Corridor has many issues when it comes to bicycle and pedestrian safety. Between 2009 and 2014, there were 509 pedestrian and bicycle crashes in the 22-mile Study Corridor, with 101 of those crashes leading to incapacitating injuries and 38 leading to fatalities. Pedestrian injuries –both moderate and incapacitating– were concentrated in Pine Hills, Azalea Park, Union Park, and the UCF area. Bicyclist injuries were concentrated in the Pine Hills, Union Park, and UCF neighborhoods. The 2014 data included 100 pedestrian and bicyclist crashes, with 28 sustaining incapacitating injuries and 10 ending in fatalities.[4]

When utilizing U.S. Department of Transportation's Value of a Statistical Life (VSL) tool, which quantifies additional cost that individuals would be willing to bear for safety improvements, over $1.1 billion dollars in cost-effective pedestrian and bicycle safety roadway improvements could have been made based on the magnitude of Corridor pedestrian and bicycling crashes. Supposing that strategic bicycle and pedestrian improvements could cut down on Corridor crashes by 32 percent, a conservative assumption that reflects the average crash reduction potential of infrastructure improvements targeted for safety; the Corridor could have seen $87.2 million savings in a single year (based on 2014 crashes).

4 Florida Signal Four Analytics, 2015

HOW TRANSIT CAN INFLUENCE QUALITY OF LIFE

Quality of life is defined by the World Health Organization as "an individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." Much of the cultural satisfaction in a community can be attributed to an individual's level of connectedness to their community. Based on a community survey conducted by UCF's Planning Healthy Communities class along the Corridor, approximately 60 percent of survey respondents do not feel connected to their community and neighbors.

In addition, a vast majority of the Study Corridor reflects underserved communities having low median household income, high levels of poverty, and low levels of education. Azalea Park, Union Park and Pine Hills are the sectors of the Study Corridor with the lowest incomes and could potentially see the most significant improvements to their quality of life with the proposed SR 50 BRT. The only Study Corridor sector that surpassed the MSA's median household income is Oviedo ($67,326). The Downtown Orlando sector fell just below the median ($58,304).

Compared to the United Way's Asset Limited, Income Constrained, Employed (ALICE) threshold, the Study Corridor held a higher than average number of households living below the ALICE threshold of $45,000/year. In total, 99,700 households in the Study Corridor (50 percent) are struggling to support themselves, which is five percentage points higher than the state average ALICE population. The Azalea Park Census Designated Places (CDP) has the highest share of households living in poverty followed by the Pine Hills CDP under the ALICE threshold.

HOW TRANSIT CAN INFLUENCE LAND USE

With the exception of Downtown Orlando and the areas immediately adjacent to the University of Central Florida, the Study Corridor is primarily composed of single-use commercial and low-density residential parcels. In addition, block sizes along the corridor are typically much larger than the conventional walkable block size. The wide travel lanes along much of the corridor tend to encourage a higher speed vehicular environment. The existing activity centers in the Study Corridor, though not currently in a pattern and density supportive of transit, can redevelop to anchor future transit-oriented development (TOD).

To advance this, local governments are already working towards land use policies that will encourage TOD. For instance, Orange County is embarking on a rewrite of their land development regulations. Their goal is to develop a code that supports and reflects smart growth requirements. The County is developing a TOD module of the code that would require or encourage a mixture of land uses, pedestrian supportive design and development patterns, and sufficient intensity and density that will be more supportive of transit.

SUMMARY OF RECOMMENDATIONS

The HIA Steering Committee developed a series of recommendations that could positively influence four health indicators evaluated in the Study. The recommendations are drawn from the findings and are intended to maximize health benefits while minimizing risks. However, two primary actions must begin taking place before the HIA recommendations could be implemented. Those primary recommendations are:

PRIMARY RECOMMENDATION # 1

FOR ORANGE COUNTY AND PARTNERING AGENCIES TO FUND CAPITAL AND OPERATING EXPENSES OF THE SR 50 BUS RAPID TRANSIT

Overview	***Related Literature Findings that Support Recommendation***
Public transportation is a critical component to the Region's transportation system and is essential to the economic and quality of life of our citizens. Investment in the SR 50 BRT could provide access to job markets and educational facilities, increase transportation options for residents, and improve mobility of people, goods, and services along SR 50.	*Every $10 million in capital and/or operating investment in transit yields $30 to $32 million in increased business sales. (APTA, 1999)* *The Cleveland HealthLine BRT has catalyzed $4.3 billion in development, while the Boston Silver Line corridor tax base has grown 250 percent compared to 150 percent citywide. (SGA, 2011)*

PRIMARY RECOMMENDATION # 2

FOR FDOT, PARTNERING AGENCIES, AND GOVERNING BODIES TO ADOPT AND IMPLEMENT COMPLETE STREETS POLICIES ALONG THE SR 50 STUDY CORRIDOR

Overview	***Related Literature Findings that Support Recommendation***
Implementing a successful premium transit service requires investing in safe, quality pedestrian and bicycling access. Complete Streets policies focus on safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.	*Between 2009 and 2014, the Study Corridor had 509 bicycle and pedestrian crashes with 40 fatalities. (MetroPlan Orlando Analysis, 2015)* *Out of 37 Complete Street Projects nationwide, approximately 56 percent experienced a reduction in injuries in post project implementation. (SGA, 2015)*

In addition to the two primary recommendations, the HIA Steering Committee developed a comprehensive list of recommendations that would enhance the proposed transit service's positive impacts. The full list of secondary recommendations, as they relate to the SR 50 BRT goals, can be found in the "Recommendations" section of this report.

HIA STUDY RECOMMENDATIONS

ACCESS TO JOBS AND EDUCATION

Collaborate with educational institutions along the corridor to understand and address any opportunities for SR 50 BRT to support staff and student needs, including off-peak hour activities or evening classes. Encourage Florida State Legislature to allow "colleges" (Valencia College, Seminole State College) to provide transit subsidies for students.

Implement transit services that matches users' needs (include weekend and evening workers, consider shift schedules).

ACCESS TO GOODS AND SERVICES

Promote transit connections to recreational opportunities by posting park and recreation maps in LYNX facilities, vehicles, and website; and posting LYNX bus route maps at Corridor recreational facilities, maps, and websites.

Promote the development of community hubs (civic, health, healthy food, and recreational services) and program community and health-oriented events (farmer's market, health fairs, food trucks, etc.) within station areas.

INCREASE NON-AUTO TRAVEL

Improve bike and pedestrian infrastructure around station areas to connect to major destinations/origins (schools, hospitals, parks, community centers, etc.), including sidewalks, crosswalks, pedestrian paths and bike paths.

Maintain quality levels of service for transit (i.e. acceptable frequency, reliable, effective transit schedule communication, etc.).

INCREASE ECONOMIC DEVELOPMENT

Consider zoning and regulatory changes (i.e. encouraging mix-use patterns, cross-access standards, reduction in parking minimums, safe pedestrian connections, etc.)

Implement strategies to incentivize developers and property owners to consider Transit-Oriented Development (i.e. streamlined permitting, planning guidance as part of development review)

Preserve existing attainable housing and support the development of new attainable and mixed-income housing around station areas

Active commuting via BRT has the potential to facilitate positive health outcomes, but it is not the sole solution to the obesity and chronic illnesses epidemic. Diet, genetic disposition, and distinct social and environmental barriers may enhance the health benefits of active commuting, especially for lower-income communities. Even still, implementing a BRT system along SR 50 could improve existing riders' access to jobs, education and healthy food among other resources. Active commuting is likely to have the most impact on potential riders who currently engage in little to no physical activity as they commute to work, school, social events, and run errands. The proposed SR 50 BRT system will improve the transit experience of existing riders (i.e. enhanced access to jobs, education, and other community resources) while also incentivizing potential riders to change their primary mode of transportation from personal vehicle to walking, biking and/or riding transit by providing a more premium-type service.

INTRODUCTION

INTRODUCTION

BACKGROUND

Our transportation context is changing. While the Orlando Metro Region (Region) continues to be one of the fastest growing metropolitan areas in the U.S., our Region's transportation network is being asked of to meet increasing demands. In the last decade, Central Florida experienced growth unparalleled in any time in the Region's history. From 2000 to 2010, Orange County added almost 300,000 people, a third of its population in 2000. Although this growth slowed down during the economic recession, population growth has been steady in the last five years. According to MetroPlan Orlando's Long Range Transportation Plan (LRTP), by 2040, the Study Corridor will experience over 60 percent increase in population and a corresponding increased demand for regional and local mobility.

Regional and community leaders understand this reality and have been working hard to advance a full menu of transportation solutions to address this coming challenge, including a substantial investment in transit infrastructure and service. The Region has already invested in SunRail, the first commuter rail line through Central Florida. To support and leverage this investment, a network of regional and local transit service is necessary. Today, Central Florida is faced with a unique opportunity to bring premium transit through the heart of Orange County. The proposed State Road 50 (SR 50) Bus Rapid Transit (BRT) project will provide an effective east-west transit service for residents and workers throughout the Region while helping to create healthy places to live, work, and play.

With chronic diseases, such as diabetes and cardiovascular disease, on the rise, the built environment has become an important aspect of health-promotion strategies. Health, in this Study's context, is viewed as not merely the absence of disease or infirmity, but as "a state of physical, mental, and social well-being".[5] A well-planned and designed transportation investment, such as the SR 50 BRT, can go beyond its primary purpose of moving people along the corridor to positively influencing the future health of communities and the residents, workers, and businesses within.

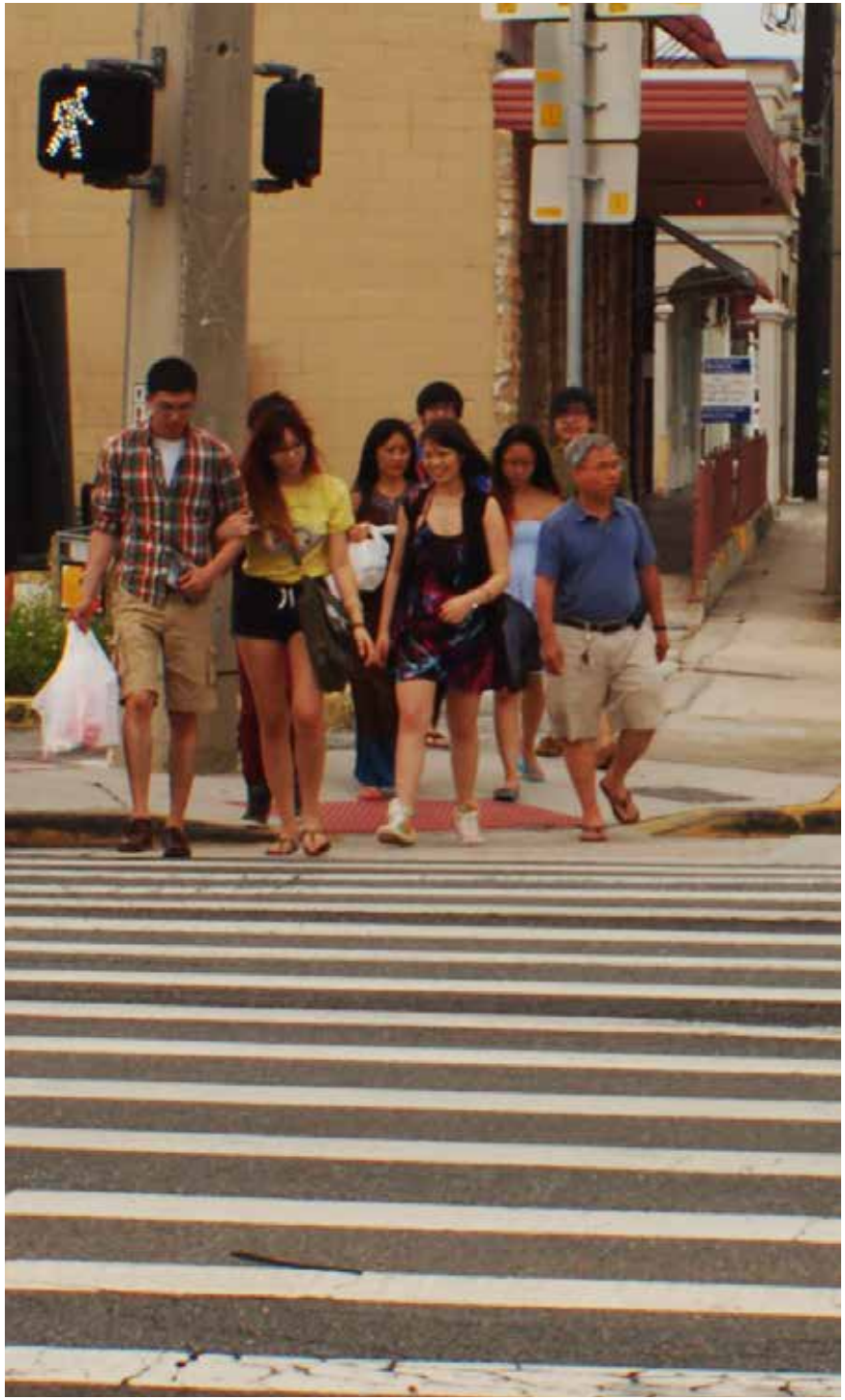
The SR 50 BRT also presents MetroPlan Orlando with a unique opportunity to advance healthy community planning into the transportation planning process. As such, MetroPlan has partnered with the Winter Park Health Foundation (WPHF) and the University of Central Florida (UCF) to conduct a Health Impact Assessment (HIA) on the proposed SR 50 BRT Project. An HIA can help link transportation and health planning by giving policymakers more information about how the proposed BRT can affect the health conditions of communities that will be served by the BRT. At the same time, the HIA offers the opportunity to influence planning and design decisions for the BRT project to capture the maximum potential health benefits of the BRT investment. In addition, the community outreach, literature review, and data collection and analysis that are part of the HIA process can provide policy and decision makers with information on health, environmental, and economic matters that may not have been part of conventional transportation planning or health planning discussions. **The HIA will equip our region's leaders with critical information to enable the SR 50 BRT to be an infrastructure investment that not only improves mobility in the Region, but also provides an opportunity to create more economically competitive and healthy communities along the SR 50 Corridor.**

5 WHO, 1946.

WHAT ARE HEALTH IMPACT ASSESSMENTS?

A Health Impact Assessment is a formal evaluation process that incorporates scientific data, health expertise, and public input to assess a proposed project or policy's impact on the health of a population and the distribution of those effects within the population. The primary goal of a HIA is to identify the potential health impacts of a project or policy and encourage informed decisions related to the project that will positively influence a population's health.

An HIA is similar to the more familiar "environmental impact assessments" conducted for more than three decades under the National Environmental Policy Act (NEPA). The key difference is that while NEPA evaluations focus on the environmental effects of a project, HIAs focus on how a project is likely to affect human health. It is a tool to help decision-makers recognize the health consequences of the decisions they make so they can refine community investments and policies towards a healthier living environment. HIAs outline anticipated potential consequences for decision-makers and conclude with a set of policy and design/planning recommendations intended to minimize health risks and maximize health benefits. HIAs are based on the best available evidence, both quantitative (such as health surveys and data) and qualitative (such as in-depth interviews with stakeholders). HIAs are a useful way to ensure that health needs and opportunities are considered in policy decision-making processes.



THE HIA PROCESS

The HIA process can vary depending on the subject matter, study time that is available, and stakeholders involved. The process is generally comprised of six key stages: 1) Screening, 2) Scoping, 3) Assessment, 4) Recommendations, 5) Reporting, and 6) Monitoring and Evaluation. The SR 50 BRT HIA completed stages 1 to 5. The details of the sixth and final stage, Evaluation and Monitoring, will be addressed during and after the implementation of the SR 50 BRT Project.

TABLE 1 KEY STEPS IN THE HIA PROCESS

1 SCREENING	Determine whether a HIA is feasible, timely, and would add value to the decision-making process.
2 SCOPING	Identify the health indicators that the project will likely impact, identify the study area and affected populations, prioritize research questions, identify evidence and research methods, establish stakeholder roles, and establish a timeline for the process.
3 ASSESSMENT	Create an existing conditions profile for the study area in order to understand baseline conditions and to be able to predict change. Assess potential health impacts, including the magnitude and direction of impacts, using quantitative and qualitative research methods and data.
4 RECOMMENDATIONS	Develop recommendations to improve the project, plan or policy's health benefits and/or to mitigate any negative health impacts.
5 REPORTING	Create a written or visual documentation of the HIA results and recommendations, which take many forms including written reports, presentations, and comment letters. Communicate the results within the decision-making process. A communications plan can include media outreach and public input.
6 MONITORING AND EVALUATION	Track the impacts of the HIA on the decision-making process, the implementation of the decision, and the impacts of the decision on health indicators. Evaluate the HIA process.

Sources: Health Impact Partners and National Research Council

ABOUT THE SR 50 HIA

The SR 50 HIA is the first transportation-related HIA in the Region. The goal of the SR 50 HIA is to help inform decision-makers, planners, community members, and other stakeholders about the likely health, social, economic and environmental impacts associated with the proposed SR 50 BRT service. The HIA includes evaluation of the potential changes in community physical activity levels, job access, housing and transportation costs, traffic safety, education access, and access to healthy foods.

The HIA study corridor covers SR 50 (Colonial Drive) from Powers Drive on the west, through downtown Orlando and the proposed Creative Village, continuing east through the Union Park and Azalea Park areas, and then turning north on SR 434 running next to UCF and ending at Mitchell Hammock Road in the City of Oviedo (Seminole County). The Study Corridor is 22 miles long, with a majority of the corridor within Orange County. Figure 2 illustrates the Study Corridor sectors.

Pine Hills – This is one of the most ethnically diverse neighborhoods in the Region with a large minority population. The populations of African American and Hispanic residents are significantly above the County average. There is also a large Asian population of Vietnamese, Koreans, and Cambodians. This diversity is evident along Pine Hills Road where many immigration offices, Caribbean and Asian restaurants, and West Indian grocery stores are located.

Downtown – Downtown Orlando is the historic core and central business district of the Region. It is home to commercial centers, large concentrations of residents and workers, large-scale community venues, and many other regional destinations. Downtown also has the Region's most robust transportation and transit investments including SunRail, local transit circulators (LYMMO), and a network of local and regional roadways. Around Downtown Orlando and along SR 50 are several historic neighborhoods including Lake Lorna Doone, Parramore, Lake Eola Heights, and Colonial Town.

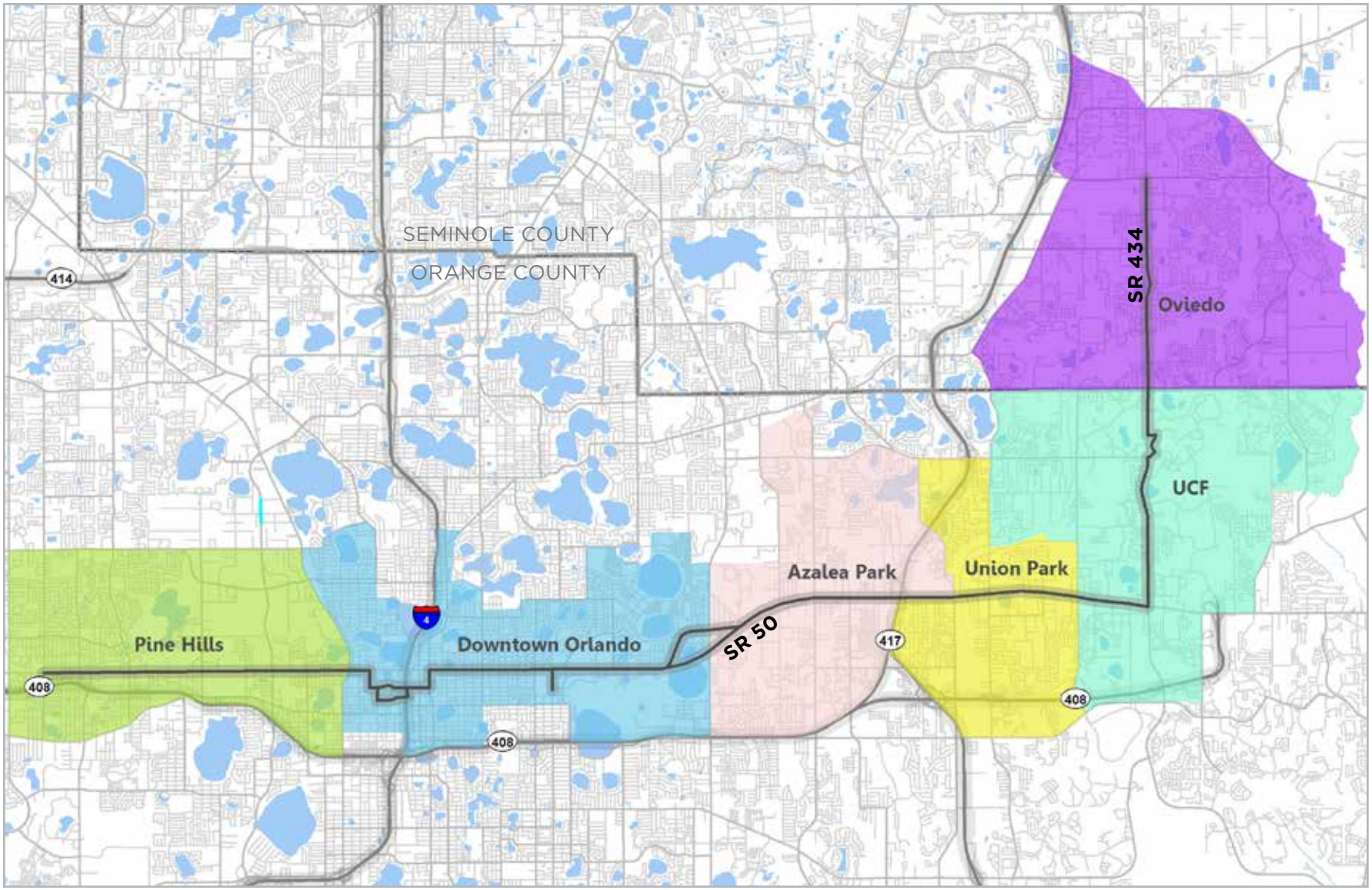
Azalea Park – Built in the 1950s, Azalea Park is a modest, primarily low-density residential community with architecture and mature landscaping, characteristic of Orlando's first suburbs. SR 50 through Azalea Park is a commercial corridor with a wide variety of low-density commercial uses such as auto dealerships, home repair stores, and small family-owned businesses. Azalea Park is part of unincorporated Orange County.

Union Park – Similar to Azalea Park, Union Park is a primarily low-density residential and commercial area of unincorporated Orange County. Due to its proximity to Valencia State College and UCF, residential development expanded in the 1980s with a little over a third of the homes in the sector being renter occupied.

UCF – Hosting the second largest university in the country, the UCF sector primarily caters to the young population attending the university. Over 47,000 students attend classes at UCF's main campus. The campus housing accommodates approximately 10,000 students and several thousand students live in housing units located near the campus. In addition, directly south of the UCF main campus is Central Florida Research Park, the seventh-largest research park in the nation and the largest in Florida. Comprised of more than 1,000 acres, it houses over 125 companies providing more than 9,500 jobs.

Oviedo – Just north of UCF, the City of Oviedo has become a popular home location for UCF faculty and staff and Research Park employees. The City boasts an exceptional educational system with A-Rated schools and numerous recreational amenities close to resident's homes. The City's new town center, Oviedo in the Park, has single-family homes, town homes and apartments, a commercial business district, and retail uses. The development also includes urban public amenities such as an amphitheater, entertainment areas, and park spaces all within walking or bicycling distance to historic downtown Oviedo.

FIGURE 2 STUDY CORRIDOR SECTORS



PREVIOUS STUDIES

Two transit-related studies were recently conducted in SR 50 HIA Study Corridor and are described below:

THE SR 50/UCF CONNECTOR ALTERNATIVES ANALYSIS

The SR 50/UCF Connector Alternatives Analysis (AA) presented a great opportunity for LYNX and its partner agencies to address the challenges of increased mobility needs and to demonstrate our Region's commitment to focusing transit investments in growth corridors. Funded through a grant administered by the Federal Transit Authority (FTA), this study brought together the regional transit vision for SR 50, and served as a venue for understanding the land use goals of local communities and how transit can play a part in realizing those goals.

The AA included a two-mile wide east-west corridor following SR 50, bound by the Orange County/Lake County line on the west side and to Alafaya Trail/State Road 434 (SR 434) to the east. The Study Corridor also included a two-mile wide north-south corridor along Alafaya Trail/SR 434 north of SR 50, extending to UCF and ending at the Seminole County Line. The study provided a clear understanding of the Corridor's transit needs, the range of potential solutions, and the potential benefits and impacts of the solutions. The Study process relied on input and participation by public agencies at the local, regional, state, and federal levels; by community groups, residents, and travelers; and by businesses, employers, and institutions in the corridor.

The Study Team developed seven alternatives and evaluated them based on the major needs, goals, and objectives of the corridor. The chosen Locally Preferred Alternative (LPA) for the SR 50 is a new BRT service traveling in mixed-traffic. The project will be implemented in two phases. Phase 1 will initially provide BRT along SR 50 between Powers Drive and Goldenrod Road, a total of approximately 12.2 miles. This new BRT line would interface with the existing local bus routes and is projected to serve approximately 14,300 corridor riders per day. Phase 1 is proposed to operate at 10-minute frequencies during peak times and 15-minute frequencies during off-peak times while maintaining the existing local service routes along SR 50. The BRT will include premium transit features such as enhanced stations, unique bus branding, transit signal priority, off-board ticketing, and user amenities such as free Wi-Fi on the bus. Phase 1 is coupled with an enhanced connection between two of the biggest activity centers in the Region, Downtown Orlando and the UCF area, through an Express Bus Service. Phase 2 is BRT service along the rest of the SR 50 Study Corridor.

REGIONAL NORTHEAST CORRIDOR STUDY

MetroPlan Orlando, in collaboration with Seminole County and the cities of Sanford, Winter Springs, and Oviedo conducted the Regional Northeast Corridor (RNC) Concept Study to evaluate the existing conditions along the Aloma Rail Spur. The report explored the existing conditions, opportunities, and challenges in the corridor, which ran from downtown Sanford through Seminole County into the City of Winter Springs and the City of Oviedo, and extended into Orange County to the UCF campus.

The report focused on the possibility of the Florida Department of Transportation (FDOT) exercising their right to purchase the Aloma Spur from CSX Corporation, an opportunity given to FDOT through the purchase of the SunRail Main Line. The study addressed six topics: socio-demographic characteristics, economic vitality, land use, mobility, travel demand, and environmental constraints.

One of the primary findings of the study was that there is high travel demand between the City of Oviedo and UCF. The travel demand model identified more than 20,000 daily trips between the Oviedo travelshed and UCF/Research Park travelshed, representing over 25 percent of the study's origin and destination pairs. This high travel demand prompted the inclusion of this area into this HIA study.

SR 50 HIA PARTNERSHIPS & COMMUNITY OUTREACH

Incorporating community input throughout the HIA process and soliciting feedback on HIA outcomes are core components of the HIA practice. The SR 50 HIA process involved the formation of the HIA Leadership Team, and the Steering Committee (an advisory body of transit and public health experts, and stakeholders). In addition, various outreach activities were conducted including a community survey and targeted meetings with community organizations.

LEADERSHIP TEAM

As part of the HIA's leadership team, MetroPlan Orlando enlisted the help of the WPHF, UCF, and the Kittelson & Associates Team. The WPHF is one of the leading health advocacy agencies in Central Florida. They have formed a regional HIA Steering Committee of community stakeholders primarily interested in furthering the use of HIAs in our community. This regional Steering Committee is made up of leaders in urban and transportation planning, health practitioners, and private sector health advocates.

In partnership with UCF's Urban and Regional Planning (URP) Program, the SR 50 HIA was incorporated into the Planning Healthy Communities course during the Spring 2015 semester. The students assisted in literature review, completed walking audits around the proposed SR 50 BRT stations, conducted transit user surveys along the corridor, and provided recommendations based on walking audits and survey results.

MetroPlan Orlando also sought the counsel of the Kittelson & Associates Team to assist throughout the HIA. The KAI Team worked on the LYNX SR 50 AA and is familiar with the Corridor and its stakeholders.

STEERING COMMITTEE

The SR 50 HIA Steering Committee set the direction of the HIA and provided feedback on each stage of the process. The Committee consisted of representatives of community organizations, public health practitioners, transportation and land use planners, and the HIA Leadership Team. The Steering Committee met four times throughout the HIA. The SR 50 HIA goals, themes, and indicators are the result of the Steering Committee's efforts and direct input. A list of Committee members can be found in the acknowledgments section at the beginning of the report.

COMMUNITY OUTREACH

A primary goal of the SR 50 HIA was to ensure the process was inclusive and reached a diverse audience. The outreach effort was focused on encouraging participation that is representative of the diverse population of the SR 50 Study Corridor. In order to accomplish this, the outreach effort employed several strategies including:

- Using traditional and technology based methods to inform the public about the project and associated events, as well as to solicit input;
- Distributing surveys and arranging input forums to allow active communication with SR 50 HIA stakeholders;
- Enhancing interactive engagement through social media tools such as Facebook, Twitter and MetroPlan Orlando's website;
- Attending a variety of community organized events allowing informal and accessible conversations with the public related to the SR 50 BRT. These include:
  - Mills 50 Board of Directors – May 12, 2015
  - Lake Eola Heights Neighborhood Association – May 14, 2015
  - Semoran Business Partnership – May 21, 2015
  - West Orange Chamber of Commerce – May 22, 2015
  - Pine Hills Neighborhood Improvement District – June 2, 2015
  - Azalea Park Safe Neighborhood Association – June 8, 2015
- At each event, staff provided informational materials describing the SR 50 BRT project, the goals of the SR 50 HIA, and the indicators the study was addressing. Staff also promoted the project website, and distributed surveys allowing participants to share their thoughts on the SR 50 HIA.

STUDY CORRIDOR OVERVIEW

STUDY CORRIDOR OVERVIEW

CORRIDOR CONTEXT

SR 50 is a major east-west corridor in Orange County passing through the City of Orlando extending from Bithlo to Clermont and ultimately to both the east and west coasts of the state of Florida. The corridor forms a key economic lifeline of the Region, including about 130,000 jobs within its two-mile buffer, and connecting the largest regional economic and educational centers.

Between the western edge of Orange County and UCF, the Study Corridor ties a number of city centers and activity nodes and transitions through various land uses and development patterns. Traversing through the heart of Orange County, SR 50 serves the Country's second largest university (University of Central Florida), Orlando's Central Business District (CBD), a growing college (Valencia College), thriving business centers (Central Florida Research Park and other business parks), two regional malls, an executive airport, and a growing hospital (Orlando Health Central). The corridor also ties together a series of distinctive communities, representing the Region's most racially and ethnically diverse cross-section of the population. The diversity of the Corridor is apparent not just in the land use mix but also in the age of development and the neighborhood types/population groups served by the Corridor. The growth and development of SR 50 can almost be traced chronologically as one travels out from Downtown Orlando to either side of the corridor, where the age, densities and intensities slowly decrease with distance from the most urban area of Downtown Orlando.

UCF is actively working with the City of Orlando and the State to build a new Downtown Campus within the Creative Village mixed-use development. Between UCF and its partner, Valencia Community College, the new campus is expected to bring about 10,000 to 13,000 students to Downtown Orlando over the next 8-10 years[6].

Supporting this significant function, SR 50 is also a key link of the regional transportation system currently serving some of the highest performing transit routes – totaling 12,000 riders per day among the six corridor routes – and providing an important connection to the SunRail Commuter Rail Corridor. LYNX's 2010 Five-Year Strategic Plan ranked SR 50 as one of the highest priorities for implementing premium transit among its high-capacity transit corridors. The region's 2040 Long Range Transportation Plan also lists the SR 50 as a transit emphasis corridor that will continue to see employment and residential growth.

FDOT classifies SR 50 as a Class 5 access highway throughout the Study Corridor. Between Powers Drive and Tampa Avenue, Colonial Drive is a six-lane divided arterial. From there and throughout the Downtown area, the road narrows to four lanes with a center turn lane until approaching Bumby Avenue. East of Bumby Avenue it is a six-lane divided arterial until Dean Road. East of Dean Road, SR 50 narrows back down to four travel lanes to Alafaya Trail, but is currently being widened to six-travel lanes with left and right turn lanes. The Study Corridor continues north to Alafaya Trail, which is classified as an urban principal arterial road. From SR 50 to Mitchell Hammock Road, the road is a six-lane divided arterial with separated left and right turn lanes. The posted speed along the corridor varies from 40 mph to 50 mph.

Based on the Corridor's physical and planning contexts, there is now a need to address enhanced transit connectivity along the Corridor. Thoughtful investment in transportation and transit service along SR 50 will provide the necessary infrastructure to support current and future economic development for the Corridor and the rest of the Region. It will also leverage Central Florida's collective investments and policies to achieve economic competitiveness and enhance residents' quality of life.

6 Orl,ando Sentinel, 2015.

SOCIO-ECONOMIC CHARACTERISTICS

Many factors affect the health of individuals and communities. The degree to which people have access to food resources, employment, health care, recreational and educational facilities, etc. influences families and individuals lifestyles. In order to fully understand the community's socioeconomic, demographic and health status, data was collected from the 2010 U.S. Census, the 2009-2013 American Community Survey, and the 2013 Florida Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a county-level, self-reported survey available through the Florida Department of Health.

POPULATION

SR 50 is one of the most diverse corridors in the Orlando metropolitan area. Beginning from the west, the Pine Hills historic neighborhood is a predominantly African-American community. A few miles to the east lies downtown Orlando, the employment hub of the metro area. Immediately to the east of downtown are the historic neighborhoods of Lake Eola Heights and Colonial Town as well as the Mills 50 business district. Continuing east, the residential neighborhoods of Azalea Park and Union Park hold a high concentration of Hispanic population and low-density commercial development. Heading north on Alafaya Trail, residential and commercial development primarily serves the UCF and Valencia Community College students. And finally, just north of UCF is the city of Oviedo. Table 2 provides a breakdown of demographic characteristics of the Study Corridor by sector.

TABLE 2 DEMOGRAPHIC CHARACTERISTICS OF SR 50 HIA STUDY CORRIDOR

	Study Corridor	Pine Hills	Downtown Orlando	Union Park	Azalea Park	UCF	Oviedo
POPULATION	**228,667**	36,648	36,885	26,956	37,574	51,817	38,787
HOUSEHOLD UNITS	**876**	13,821	21,841	10,260	16,541	16,401	14,019
AVERAGE HOUSEHOLD SIZE	**2.7**	3.1	2.0	2.9	2.8	2.7	3.2
MEDIAN AGE	**35.5**	37	32	33	31	24	35
MALE (%)	**49.7%**	48%	50.4%	47.7%	52.4%	49.9%	49.2%
FEMALE (%)	**50.3%**	52%	49.6%	52.6%	47.6%	50.1%	50.8%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

MEDIAN AGE

The Study Corridor population includes a wide range of median age groups. For the purpose of this study, the median age population has been grouped by American generational cohorts: Millennials (individuals between 20 and 38), Generation X (individuals between 39 and 50) and Baby Boomers (individuals between 51 and 69) as they represent three distinct population groups that are seeking mobility choices but for different reasons.

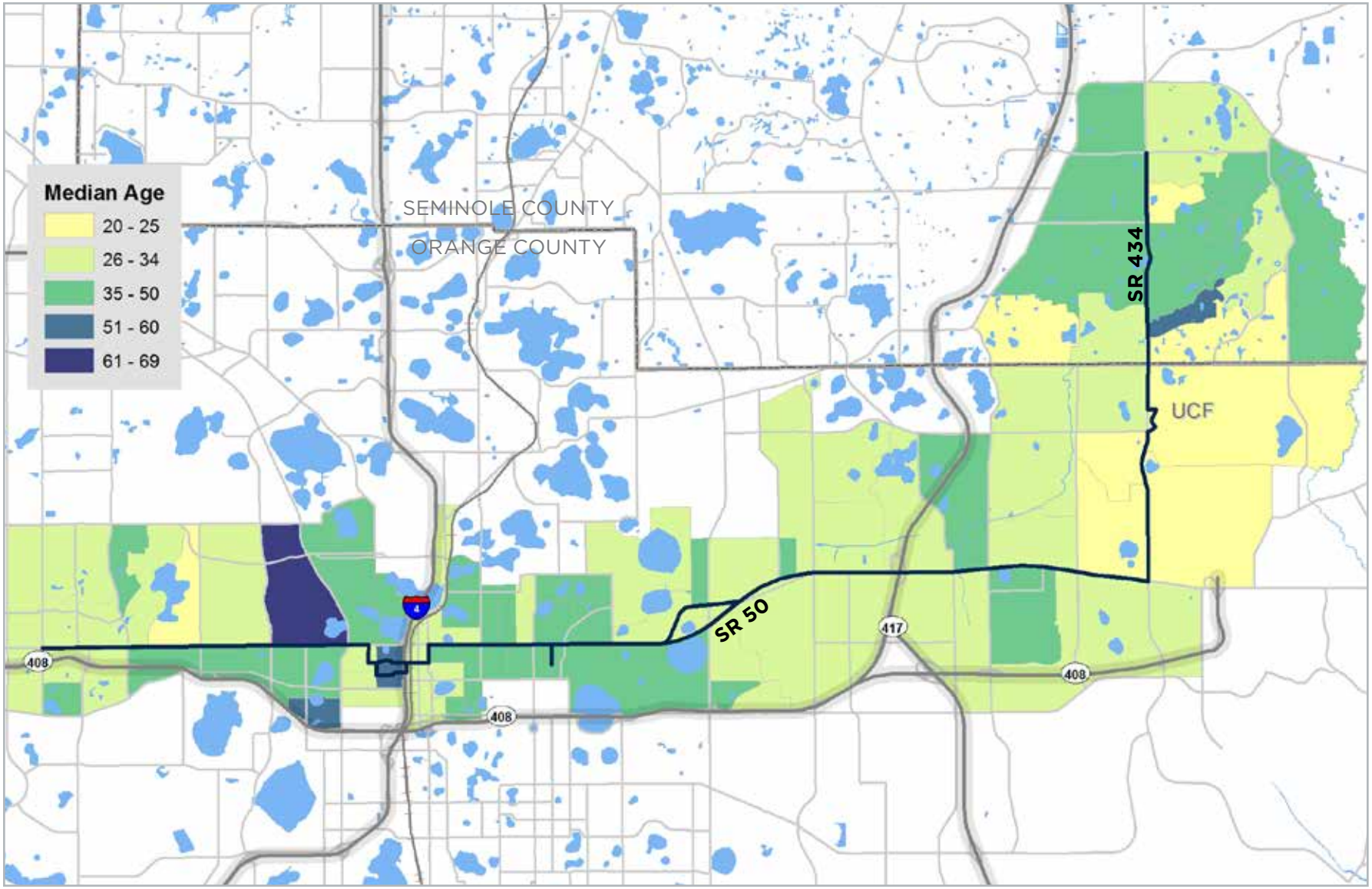
As expected, there is a high concentration of Millennials in the areas surrounding UCF. However, remarkably, the median age group throughout the majority of the Study Corridor (75 percent) is also made up of Millennials. Azalea Park, Union Park, and portions of Pine Hills have a high concentration of individuals between 20 and 34. Research indicates that this generation seeks mobility choices (driving, transit, bicycle, or walk) because finances and quality of travel (availability, comfort, and convenience) are important to their daily lifestyle.[7]

Generation X, individuals born between 1965 and 1980, make up the second largest generational cohort in the Study Corridor. With 24 percent, the highest concentration of this cohort is in the Downtown area and in Oviedo. Generation X is also shifting away from private vehicles in nearly equal numbers as Millennials based on national trends.[8]

Comprising only 1 percent of the total Study Corridor population, the Boomer generation (individuals between 51 and 69) hold a small share of the Study Corridor. Their concentration is in small sectors of Oviedo and East of Downtown Orlando, with its largest in the Pine Hills area. This generation prizes their mobility and active lifestyles and want to maintain them as long as possible.[9] For many older people, driving remains the safest, easiest and most convenient means of transportation. However, this aging population will soon face significant transportation challenges, including a transportation system that likely can not accommodate the level of mobility and safety that they desire and expect.

7 APTA Millennials & Mobility: Understanding the Millennial Mindset (2013)
8 Kane, 2014
9 TRIP, 2012

FIGURE 3 MEDIAN AGE



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

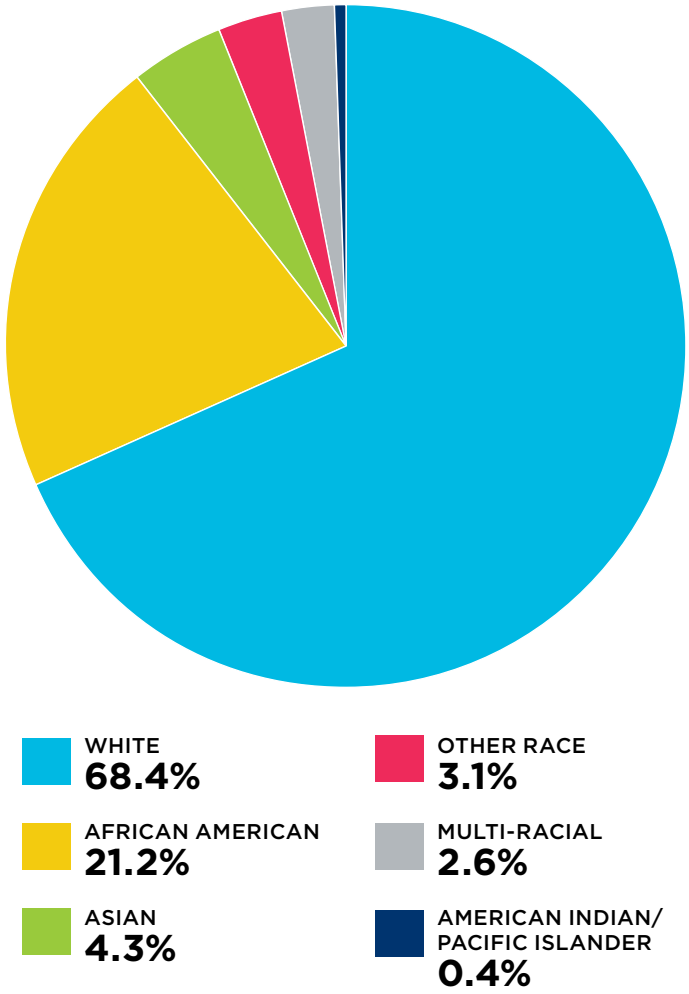
MINORITY POPULATIONS

The face of the Orlando metropolitan area is changing and the SR 50 HIA Study Corridor mirrors that demographic change. About half of the Study Corridor, 52 percent, considers themselves as a minority. Minorities, as defined by the US Census Bureau, are composed of several different race categories—African American, American Indian, Asian, Pacific Islander, Other, and population groups with two or more races. Hispanic or Latino is defined by the US Census Bureau as an ethnicity rather than a race but are also considered a minority.

Based on the latest US Census data, minority populations are concentrated in the Pine Hills, Azalea Park, and Union Park neighborhoods. These are diverse neighborhoods with African American, Hispanic, and Asian populations. This diversity is demonstrated by the variety of Caribbean and Asian retail shops and restaurants along segments of the Corridor.

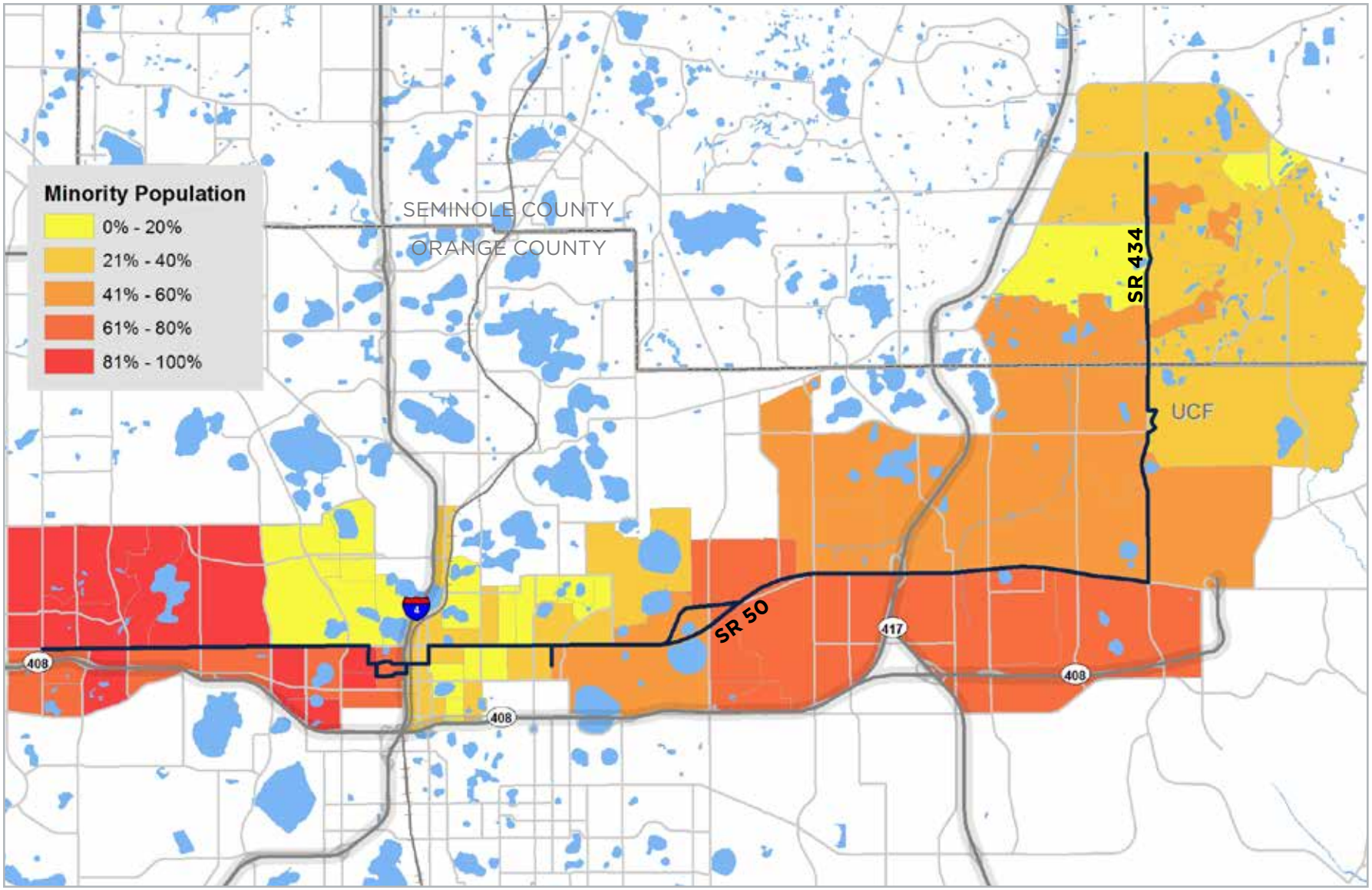
About 68.4 percent of Study Corridor residents are White, 21.2 percent African American, 2.6 percent multi-racial, and 3.1 percent other. Of the total Study Corridor population, 20 percent consider themselves Hispanic. Looking at individual HIA sectors, Union Park and Azalea Park have the largest concentration of Hispanic population, Pine Hills the largest concentration of African American, while Downtown Orlando and Oviedo have a large concentration of White population.

FIGURE 4 POPULATION BREAKDOWN BY RACE



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

FIGURE 5 MINORITY POPULATION



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

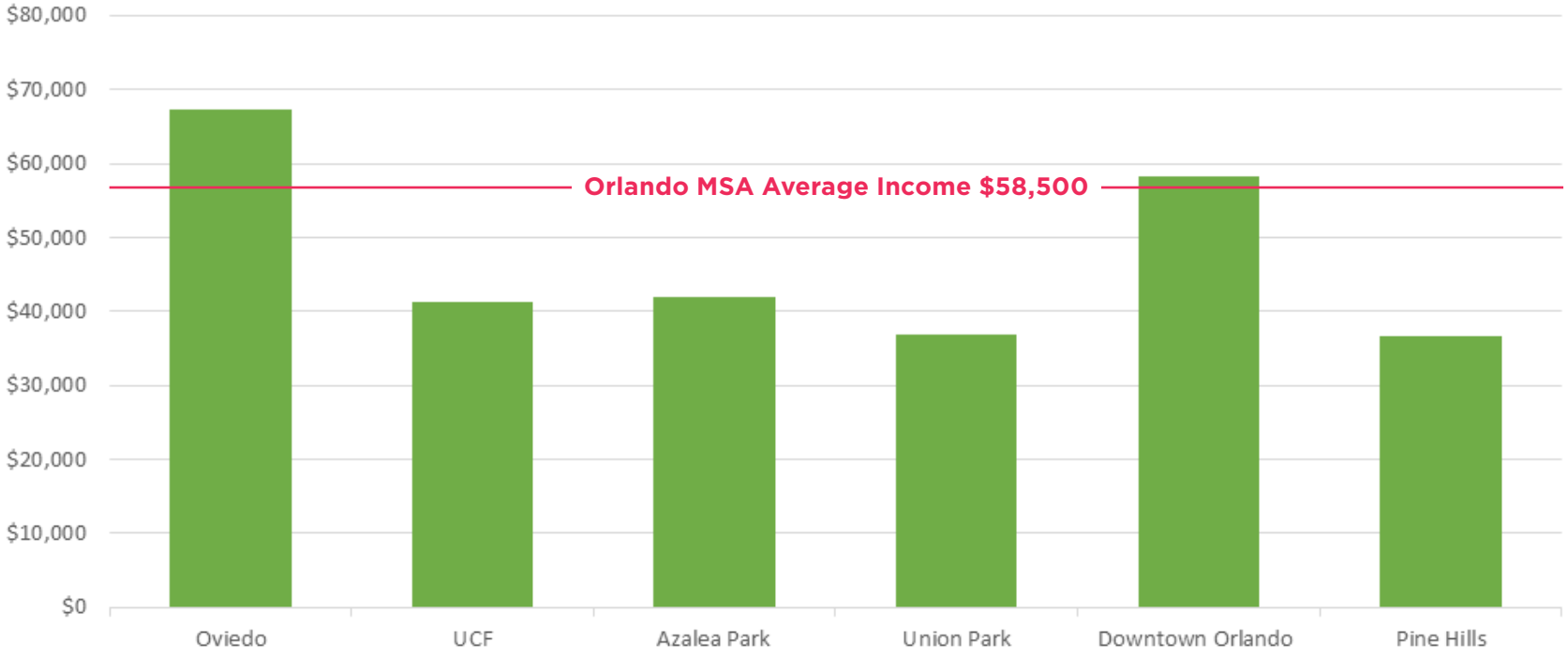
INCOME

The 2013 median income for households in the SR 50 HIA Study Corridor ($50,950) was considerably lower than the Orlando MSA ($58,500) average. However, as with the other demographic indicators reviewed, there are notable differences among the HIA sectors. Downtown Orlando ($58,304) and Oviedo ($67,326) brought up the average median household income for entire area. The rest of the sectors were not only below the region's median income, they were also below income guidelines for housing assistance. The median income in the UCF, Azalea Park, Union Park, and Pine Hills were below $42,000.

POVERTY LEVELS

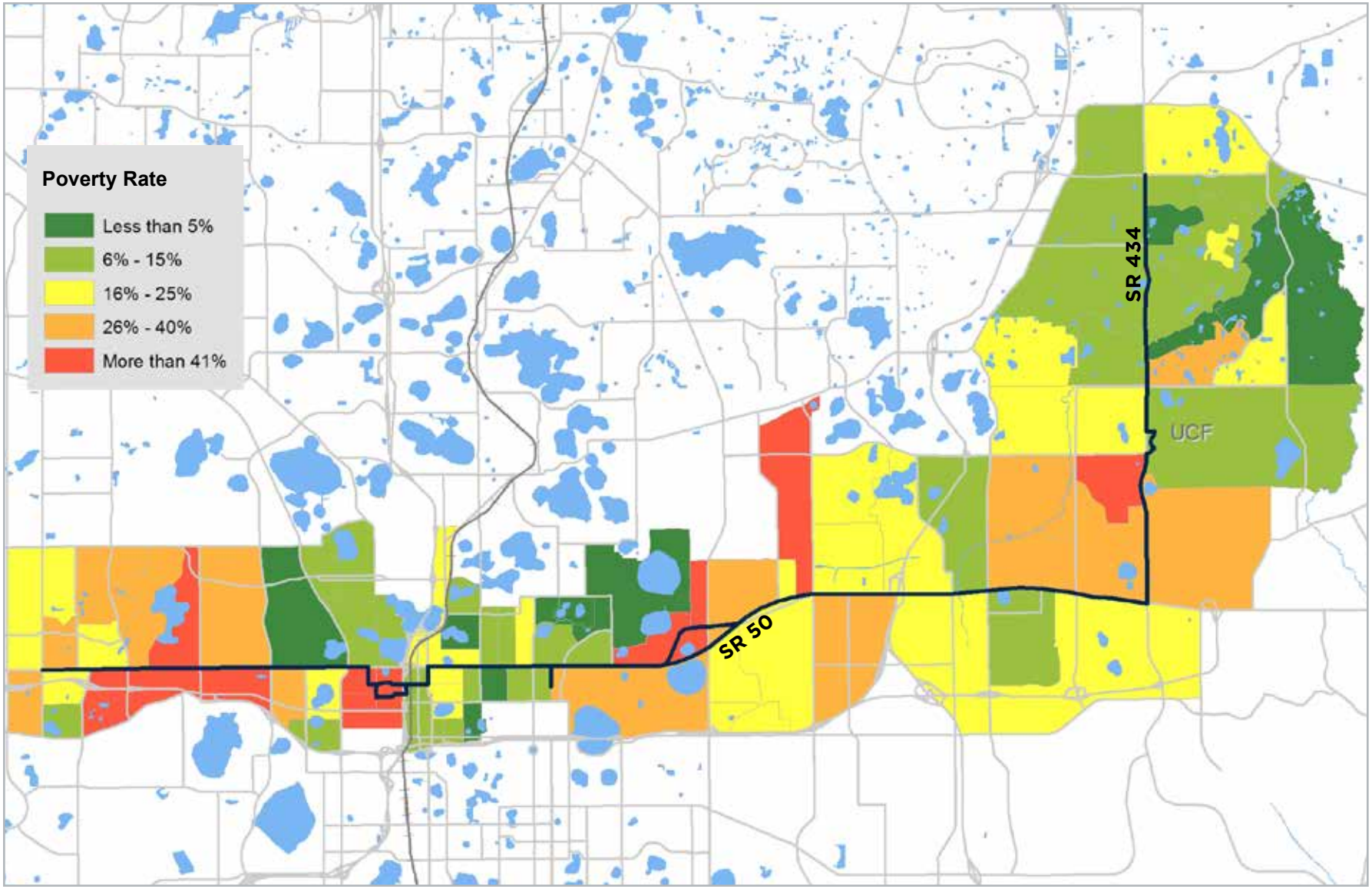
Poverty levels across the Study Corridor were high in 2013, with about 20 percent of the population living below poverty level. In 2013, Orange County's poverty rate was 18 percent, which was higher than the national poverty rate of 16 percent. Of the 89 census blocks in the Study Corridor, 11 are very high poverty (40 percent or more of the population is below poverty line) and 32 are high poverty (20 to 40 percent of the population is below poverty line). The Study Corridor sectors with the highest concentrations of poverty are UCF (29 percent), Pine Hills (28 percent), Azalea Park (24 percent), and Union Park (20 percent). The Oviedo and Downtown Orlando sectors were the only two areas that fell below the national poverty levels.

FIGURE 6 MEDIAN INCOME ACROSS SECTORS



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

FIGURE 7 POVERTY RATE



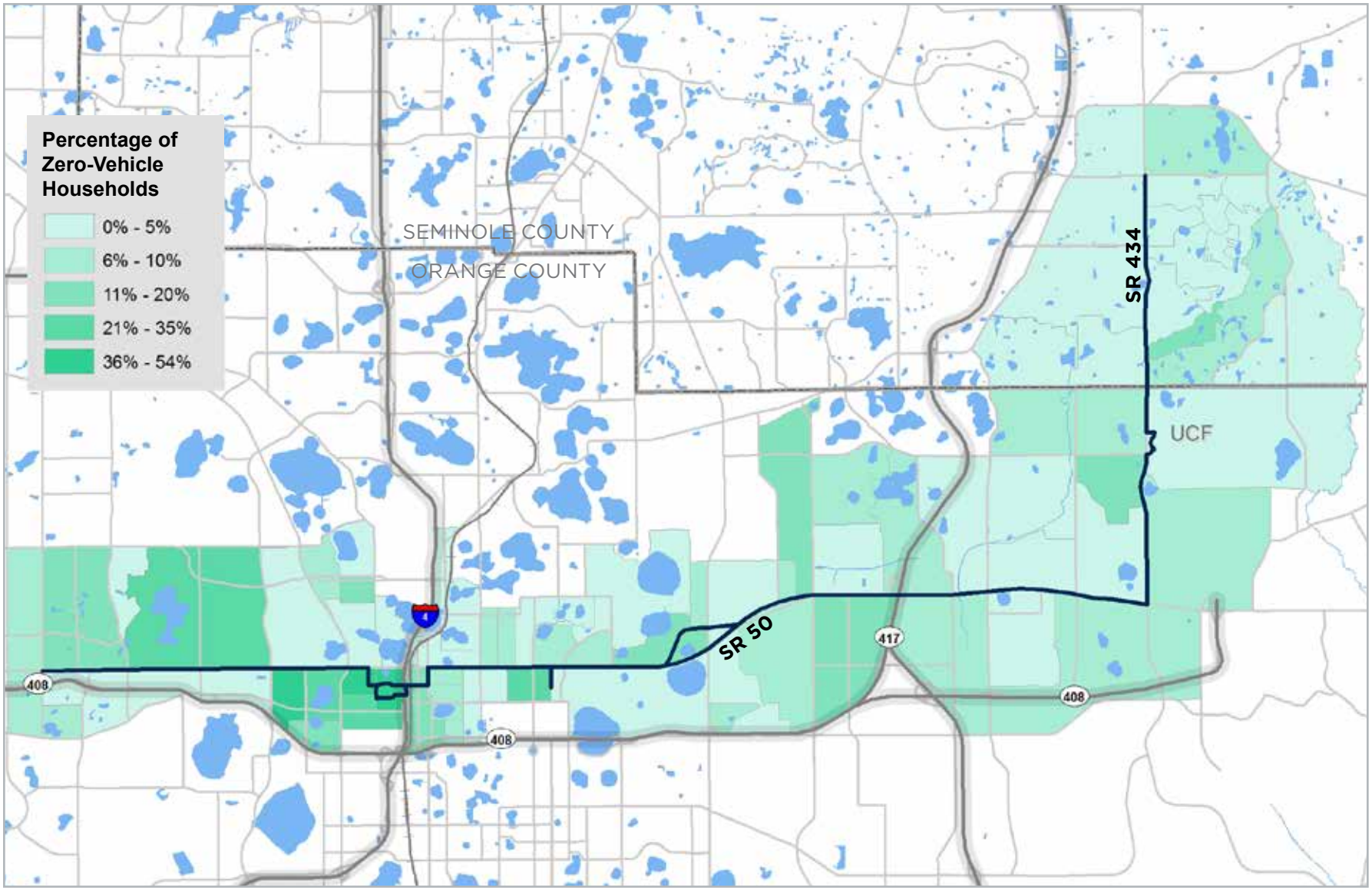
Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

ZERO-VEHICLE HOUSEHOLDS

One of the key indicators of multi-modal demand is a household's access to a personal motor vehicle. This indicator may represent households who are unable to own a car or are unable to drive because of disability, as well as households with individuals who choose not to own a car.

Six percent of the Study Corridor households do not have a personal motor vehicle. As shown below in Figure 8, the Pine Hills (11.5 percent) and Union Park (6.4 percent) sectors stand out as having the highest concentration of "zero-vehicle" households. These sectors line up with the sector groups having the lowest median household income. Interestingly, with 6.4 percent, the Downtown Orlando sector also held a concentration of zero-vehicle households likely corresponding with behaviors of Generation X and Millennials.

FIGURE 8 ZERO-VEHICLE HOUSEHOLDS



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

POPULATION AND HOUSEHOLD DENSITIES

Figure 9 shows the existing geographic distribution of the Study Corridor's residential density. For the purposes of this study, population density is expressed as a function of total number of individuals per acre and is based on Census 2013 block group data. The highest population density is in Downtown Orlando and Azalea Park with several census blocks showing more than 12 individuals per acre. The Pine Hills, UCF, and Union Park sectors also show medium density levels, averaging 6 individuals per acre.

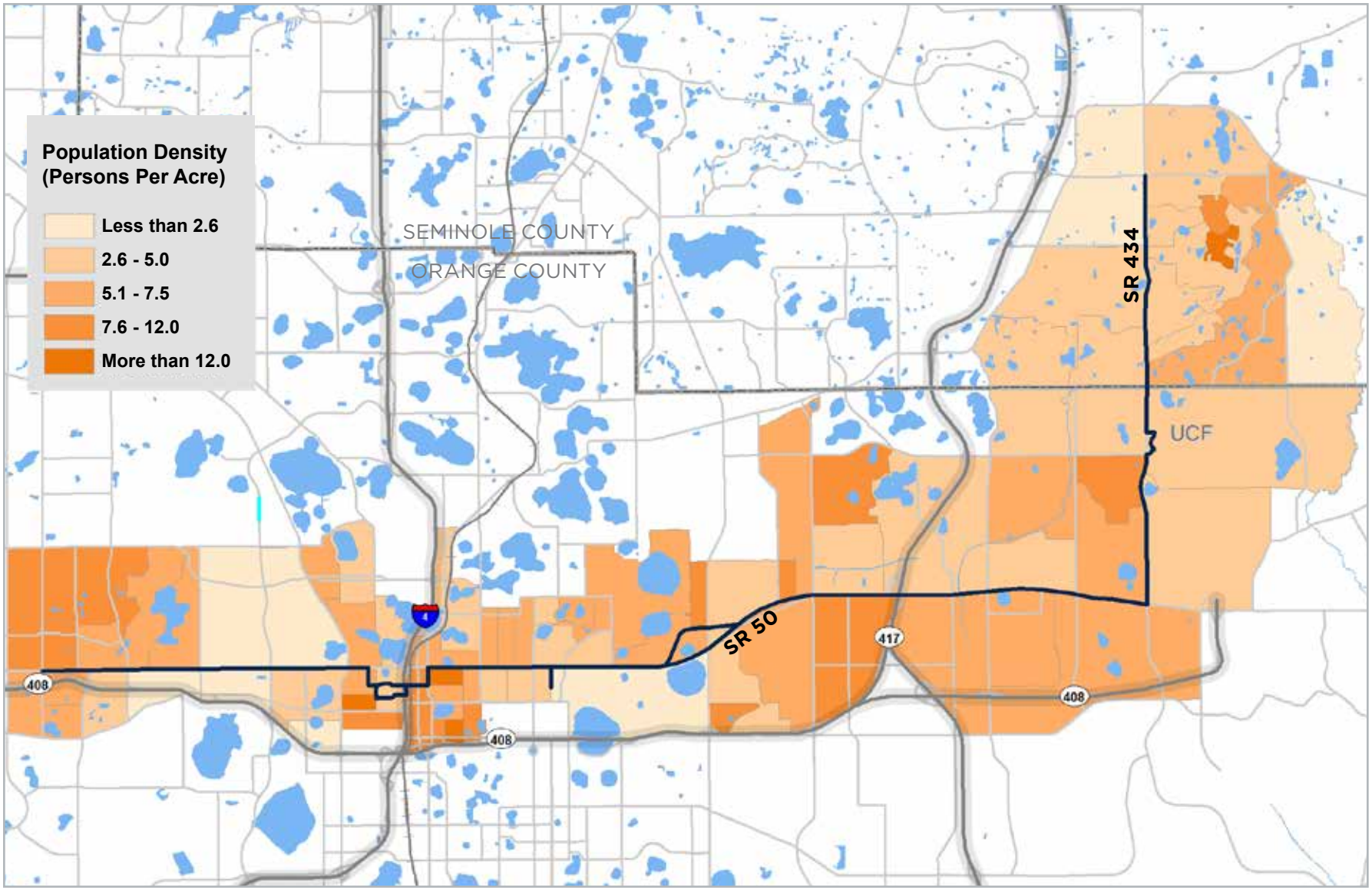
Household density was also analyzed to determine the highest concentration of household units. Relatively higher levels of population and household densities must exist in a corridor in order to support a successful transit service. Florida Department of Transportation (FDOT) Transit Oriented Development (TOD) Handbook states that an area with less than 5 dwelling units per acre can support hourly bus service (local bus service), 6 to 7 can support 30 minute service (intermediate bus service), 8 to 15 units can support 10 minute service (premium bus service), and anything above can support light rail service. The 2013 Census data indicates that the Study Corridor has an average of 2 household units per acre, with the highest concentration in the Downtown Orlando, Union Park, and Azalea Park sectors. Table 3 provides the population and household densities breakdown by HIA sector.

TABLE 3 POPULATION AND HOUSEHOLD DENSITIES

	POPULATION DENSITY (PERSONS PER ACRE)	HOUSEHOLD DENSITY (HOUSEHOLD PER ACRE)
Study Corridor	6.0	2.0
Pine Hills	5.7	1.8
Downtown Orlando	6.6	2.8
Union Park	6.3	2.5
Azalea Park	5.8	2.2
UCF	5.6	1.7
Oviedo	5.1	1.3

Source: U.S. Census Bureau, 2013 American Community Survey 5-year Estimates

FIGURE 9 POPULATION DENSITY



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

WALKING AUDITS

The UCF Healthy Community Planning class conducted walking audits for ten locations along SR 50, during the day and early evening hours. These locations were potential station areas identified by the LYNX SR 50/UCF Connector AA and are shown in Figure 11.

The purpose of the walking audit was to assess pedestrian and bicycling facilities and walking conditions near and around the proposed station areas. Students utilized the Center for Disease Control's (CDC) Walkability Audit Tool to evaluate the safety or attractiveness of the walking routes. The Tool evaluates the sectors of an area using the ten features, listed below. Each feature has an associated value of high, medium, and low importance. The CDC Tool places safety considerations as the most important, followed by factors like accessibility and aesthetics (medium importance) and shade (least important).

CDC WALKING AUDIT TOOL FEATURES

HIGH IMPORTANCE

Pedestrian Facilities | Pedestrian Conflicts | Crosswalks

MEDIUM IMPORTANCE

Maintenance | Buffer | Accessibility

Path Size | Universal | Aesthetics

LOW IMPORTANCE

Shade

The evaluation results in a numerical score for each sector, thus creating the walking audit score. An example walking audit summary developed by the UCF class is shown in Figure 10. The scores were rated qualitatively as follows:

- 0–39 points indicates high risk and unattractive environment (red)
- 40–69 points indicates medium-risk and average or non-descript (yellow)
- 70 and above points indicates low-risk and pleasant (green)

FIGURE 10 WALKING AUDIT SUMMARY IN SR 50/FASHION SQUARE MALL AREA

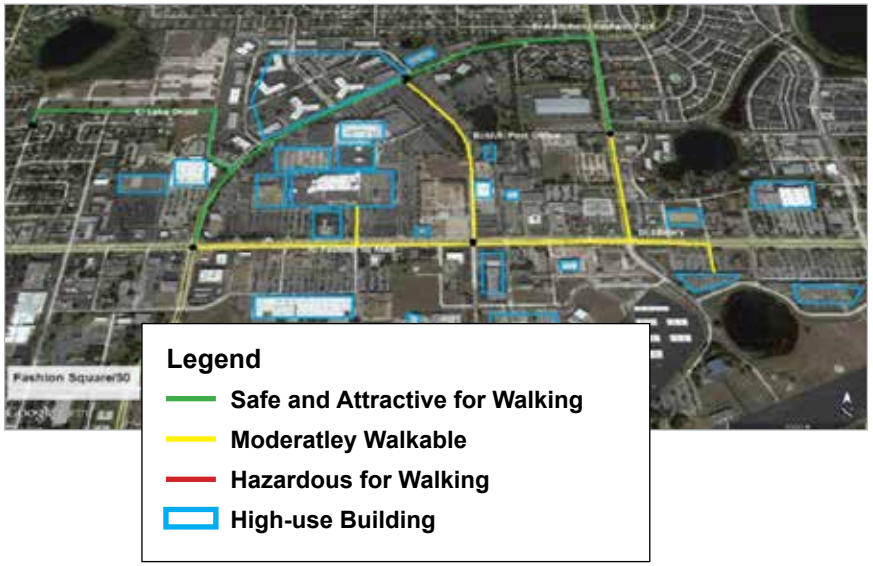
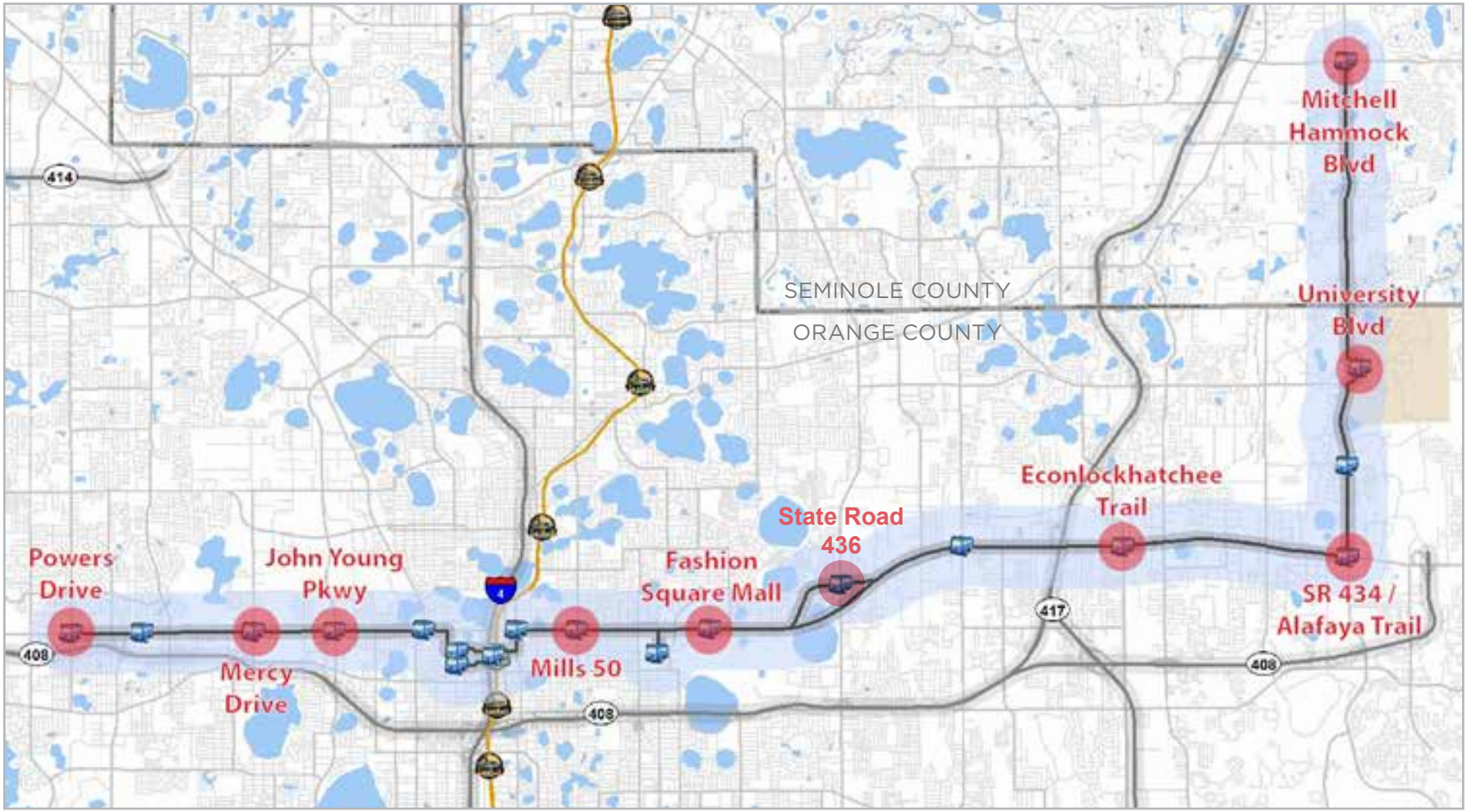


FIGURE 11 UCF STUDENTS' WALKING AUDIT LOCATIONS



The majority of the corridor scored as 'medium risk and average attractiveness' with a few locations scoring as 'low risk'. Below is a summary of the walking audit results. This research agrees with Walk Score, an online tool that ranks cities and neighborhoods according to access to transit, density, and other walkable community characteristics. According to Walk Score, Orlando has an average Walk Score of 39 which classifies it as a "car-dependent" and somewhat bikeable city. Detailed description of the SR 50 Walkability Audits can be found in Appendix A.

The majority of the Study Corridor is comprised of low-density residential and single use commercial land uses, characterized by large block sizes. These large block sizes make many trips inconvenient and uncomfortable for walking, especially with limited streetscaping to provide buffer and shade. In addition, there is a high concentration of vacant or underutilized parcels adjacent to SR 50 between Semoran Boulevard and SR 417. Although there are sidewalks and crosswalks at intersections, high speeds frequently seen throughout the corridor contribute to a poor level of pedestrian comfort and safety. Additional information on the safety issues in the Study Corridor can be found in the 'Health Indicators' section of this report.

LOW RISK & PLEASANT

- SR 50 and John Young Parkway
  - North and south on John Young Parkway
- SR 50 and Mercy Drive
  - North and south on Mercy Drive
- SR 50 and Mills Avenue
  - East on SR 50 to Shine Avenue
  - East on Marks, north on Eola Drive, and east on Park Lake Street
  - North on Summerlin Avenue
  - North on N. Hyer Avenue
- SR 50 and Fashion Square Mall
  - Maguire and Herndon Avenue
- Mitchell Hammock Road and SR 434
  - By the Alafaya Woods Apartment Homes

HIGH RISK & UNATTRACTIVE

- SR 50 and John Young Parkway
  - SR 50
  - S. John Young Parkway
  - Trailer Park on the south end
- SR 436 and Old Cheney Highway
  - SR 436 from Bravo Supermarket to divided highway section
- SR 50 and N Econlockhatchee Trail – Foxbower Road
- SR 50 and SR 434
  - East on SR 50 to Sophia Boulevard
  - West on SR 50 to Big Lots

HEALTH CHARACTERISTICS

Health data can provide a picture of current health conditions, trends and disparities within the Study Corridor. This information can help inform planners and community leaders on the best 'infrastructure' solutions for their communities and can allow them to track how changes to the built environment are helping or harming their communities. The Behavioral Risk Factors Surveillance Survey (BRFSS) was used to document current rates of conditions and behaviors associated with the selected health indicators. Much of the health data was not available at the U.S. Census tract or block group level, so Study Corridor percentages were calculated using the percentage share of the countywide BRFSS applied according to the population, socio-economic, and ethnicity composition of each census tract. Although this methodology comes with limitations, it provides an overview on the existing health characteristics of the Study Corridor.

Rates for obesity and chronic illness such as asthma, cardiovascular disease, and diabetes were analyzed to evaluate the existing health characteristics within the SR 50 HIA Study Corridor. Detailed summaries of the data on the existing health characteristics of the SR 50 HIA Study Corridor are provided in Table 4 below.

TABLE 4 CHRONIC CONDITION RATES

	POPULATION			OBESITY PREVALENCE		ASTHMA PREVALENCE		CARDIOVASCULAR DISEASE (CVD) PREVALENCE		DIABETES PREVALENCE	
	Overall Population	18+ Adults Percentage	Population	Rate	Population	Rate	Population	Rate	Population	Rate	Population
STUDY CORRIDOR	229,948	78.7%	181,038	25.3%	45,771	13.7%	24,865	7.3%	13,265	10.1%	18,277
ORANGE COUNTY	1,175,416	76.7%	901,544	25.0%	225,386	14.3%	225,386	7.5%	225,386	10.3%	225,386
SEMINOLE COUNTY	427,184	77.6%	331,495	26.8%	88,841	10.7%	88,841	6.4%	88,841	9.0%	88,841
FLORIDA	19,091,156	79.0%	15,082,013	26.4%	3,981,651	13.5%	2,036,072	10.3%	1,553,447	11.2%	1,689,185
UNITED STATES	311,536,591	76.3%	237,702,419	28.9%	68,695,999	14.1%	33,516,041	8.6%	20,442,408	9.8%	23,294,837

OBESITY AND CHRONIC ILLNESS RATES

Obesity and chronic illness rates vary for sub-groups of the population when accounting for race, ethnicity, and income. Inadequate education and living conditions (such as low income and unhealthy neighborhood conditions) can harm health through complex pathways. US adults living in poverty are more than five times as likely to report being in fair or poor health as adults with incomes at least four times the federal poverty level.[10] These sub-group rates provide additional insight into the population distribution of those with obesity and chronic illness throughout the Corridor.

When comparing the Study Corridor to many of the state and national averages, the Study Corridor had average to below average levels of obesity, asthma, cardiovascular disease, and diabetes. However, when comparing these health characteristic rates among race, ethnicity, and income groups, higher than average rates can be observed throughout the SR 50 HIA Study Corridor.

Below is an overview of the various chronic conditions rates for the SR 50 HIA Study Corridor by race, ethnicity, and income level. County-wide data was used as a reference in the absence of finer grain data.

OBESITY PREVALENCE

The Hispanic population has the highest obesity rate in the SR 50 HIA Study Corridor at 27.3 percent followed by the African American population at 26.8 percent and the White population at 24.3 percent. The Hispanic population obesity rate is higher in the Study Corridor than the statewide average of 26.4 percent.

The $35-49,999 income bracket has the highest obesity rate in the SR 50 HIA Study Corridor at 39.1 percent and the $25-34,999 income bracket has the lowest rate at 22.6 percent. The obesity rate of the $35-49,999 income bracket is 10 percent greater than the state and nation-wide averages. Statewide and nationally, the $0-14,999 income bracket has the highest obesity rate and $50,000 or more income bracket has the lowest obesity rate.

TABLE 5 OBESITY RATES BY RACE & ETHNICITY

	OVERALL	AFRICAN AMERICAN	HISPANIC	WHITE
Study Corridor	25.3%	26.8%	27.3%	24.3%
Orange County	25.0%	25.7%	27.4%	24.1%
Seminole County	26.8%	43.5%	25.9%	25.2%
Florida	26.4%	34.2%	26.4%	25.1%
United States	28.9%	37.9%	31.2%	27.3%

TABLE 6 OBESITY RATES BY INCOME

	Overall	$0-14.99K	$15-24.99K	$25-34.99K	$35-49.99K	$50,000 or more
Study Corridor	25.3%	28.1%	23.0%	22.6%	39.1%	23.9%
Orange County	25.0%	27.5%	21.7%	21.8%	40.9%	24.3%
Seminole County	26.8%	32.9%	32.9%	28.5%	32.3%	22.6%
Florida	26.4%	33.7%	27.2%	26.5%	28.7%	24.6%
United States	28.9%	33.3%	32.6%	30.1%	29.9%	26.8%

10 Analysis of the 2013 Florida CHARTS BRFSS health data against 2013 Census socio-demographic data was used to estimate averages according to ethnicity and income.

ASTHMA PREVALENCE

The overall asthma rate in the SR 50 HIA Study Corridor (13.7 percent) is just above the statewide average of 13.5 percent. It is highest among the African American population at 16 percent, followed by the Hispanic population (14.3 percent), and the White population (14.2 percent). The Study Corridor rate among African Americans is higher than both the state and nation-wide averages. In Florida, the asthma rate is highest among the Hispanic population and the African American population.

TABLE 7 ASTHMA RATES BY RACE & ETHNICITY

	OVERALL	AFRICAN AMERICAN	HISPANIC	WHITE
Study Corridor	13.7%	16.0%	14.3%	14.2%
Orange County	14.3%	16.1%	14.4%	15.5%
Seminole County	10.7%	13.6%	13.4%	9.6%
Florida	13.5%	14.2%	14.6%	13.2%
United States	14.1%	15.4%	10.2%	13.4%

The highest incidence of asthma by income bracket in the Study Corridor is among the lowest income, more than five percent greater than both the state and nation-wide averages. The Study Corridor rate among the $50,000 and more range is also above the state (11.5 percent) and nation-wide averages (12.2 percent). The Study Corridor's asthma rates by income are more varied compared to state and national estimates, which indicate an inverse correlation between asthma and income. Across Florida and the United States, as income increases, asthma rates decrease.

TABLE 8 ASTHMA RATES BY INCOME

	Overall	$0-14.99K	$15-24.99K	$25-34.99K	$35-49.99K	$50,000 or more
Study Corridor	13.7%	26.7%	10.5%	5.9%	13.6%	12.8%
Orange County	14.3%	29.1%	9.5%	6.6%	13.8%	14.8%
Seminole County	10.7%	7.7%	18.0%	1.1%	12.8%	7.0%
Florida	13.5%	20.1%	17.1%	13.0%	13.5%	11.5%
United States	14.1%	19.7%	15.0%	13.0%	12.9%	12.2%

CARDIOVASCULAR DISEASE PREVALENCE

The White population has the highest cardiovascular disease rate in the Study Corridor at 9.4 percent followed by the Hispanic population at 6.5 percent (only includes Orange County data) and the African American population at 4.8 percent. On the state level, the White population has the highest rate followed by the African American population and the Hispanic population. Nationally, the African American and White populations have the highest rates of cardiovascular disease.

TABLE 9 CARDIOVASCULAR DISEASE RATES BY RACE & ETHNICITY

	OVERALL	AFRICAN AMERICAN	HISPANIC	WHITE
Study Corridor	7.3%	4.8%	N/A	9.4%
Orange County	7.5%	4.9%	6.5%	9.9%
Seminole County	6.4%	3.8%	N/A	7.6%
Florida	10.3%	10.0%	6.8%	12.2%
United States	8.6%	9.5%	6.0%	9.3%

The $15-24,999 income bracket has the highest cardiovascular disease rate at 12.4 percent and the $50,000 or more income bracket has the lowest at 2.8 percent. The $15-24,999, $0-14,999, and $35-49,999 income brackets have higher rates than the Study Corridor's overall rate. On the state and national level, the cardiovascular disease rate is inversely correlated with income.

TABLE 10 CARDIOVASCULAR DISEASE RATES BY INCOME

	Overall	$0-14.99K	$15-24.99K	$25-34.99K	$35-49.99K	$50,000 or more
Study Corridor	7.3%	10.6%	12.4%	5.1%	7.9%	2.8%
Orange County	7.5%	11.1%	12.2%	5.3%	8.7%	2.3%
Seminole County	6.4%	7.1%	13.6%	3.9%	4.7%	4.1%
Florida	10.3%	16.5%	12.7%	12.4%	10.5%	7.5%
United States	8.6%	13.5%	12.0%	10.2%	8.3%	5.1%

DIABETES PREVALENCE

The diabetes rate is the highest in the Study Corridor among the Hispanic population at 13.9 percent. This is followed by the White population at 10.6 percent and the African American population at 6.6 percent. Diabetes rates among the Hispanic population is also above the state and nation-wide averages. While the African American population has the lowest rate in the Study Corridor, this population exhibits the highest rates statewide and nationwide.

TABLE 11 DIABETES RATES BY RACE & ETHNICITY

	OVERALL	AFRICAN AMERICAN	HISPANIC	WHITE
Study Corridor	10.1%	6.6%	13.9%	10.6%
Orange County	10.3%	6.4%	15.0%	10.6%
Seminole County	9.0%	10.4%	4.1%	10.7%
Florida	11.2%	12.3%	10.8%	11.4%
United States	9.8%	13.9%	8.9%	9.1%

By income bracket, the $0-14,999 income bracket has the highest diabetes rate in the Study Corridor at 15.8 percent while the $50,000 or more bracket has the lowest rate at 5.1 percent. Across Florida and the United States, the diabetes rate is typically highest among lower income workers and is inversely correlated with income.

TABLE 12 DIABETES RATES BY INCOME

	Overall	$0-14.99K	$15-24.99K	$25-34.99K	$35-49.99K	$50,000 or more
Study Corridor	10.1%	15.8%	10.9%	8.1%	9.4%	5.1%
Orange County	10.3%	16.4%	11.1%	7.7%	9.7%	5.2%
Seminole County	9.0%	10.7%	9.7%	11.1%	8.2%	4.7%
Florida	11.2%	16.4%	13.6%	12.6%	11.2%	7.5%
United States	9.8%	14.6%	13.2%	11.5%	9.6%	6.8%

SR 50 HIA
GOALS & OBJECTIVES

SR 50 HIA GOALS AND OBJECTIVES

The HIA Steering Committee members jointly developed the HIA goals at one of the committee meetings.

THE GOAL OF THE HIA IS TO BETTER UNDERSTAND THE IMPACTS OF THE SR 50 BRT ON THE PHYSICAL, SOCIAL, AND EMOTIONAL HEALTH OF COMMUNITY MEMBERS THROUGH IMPROVED:

PATHWAY DIAGRAM

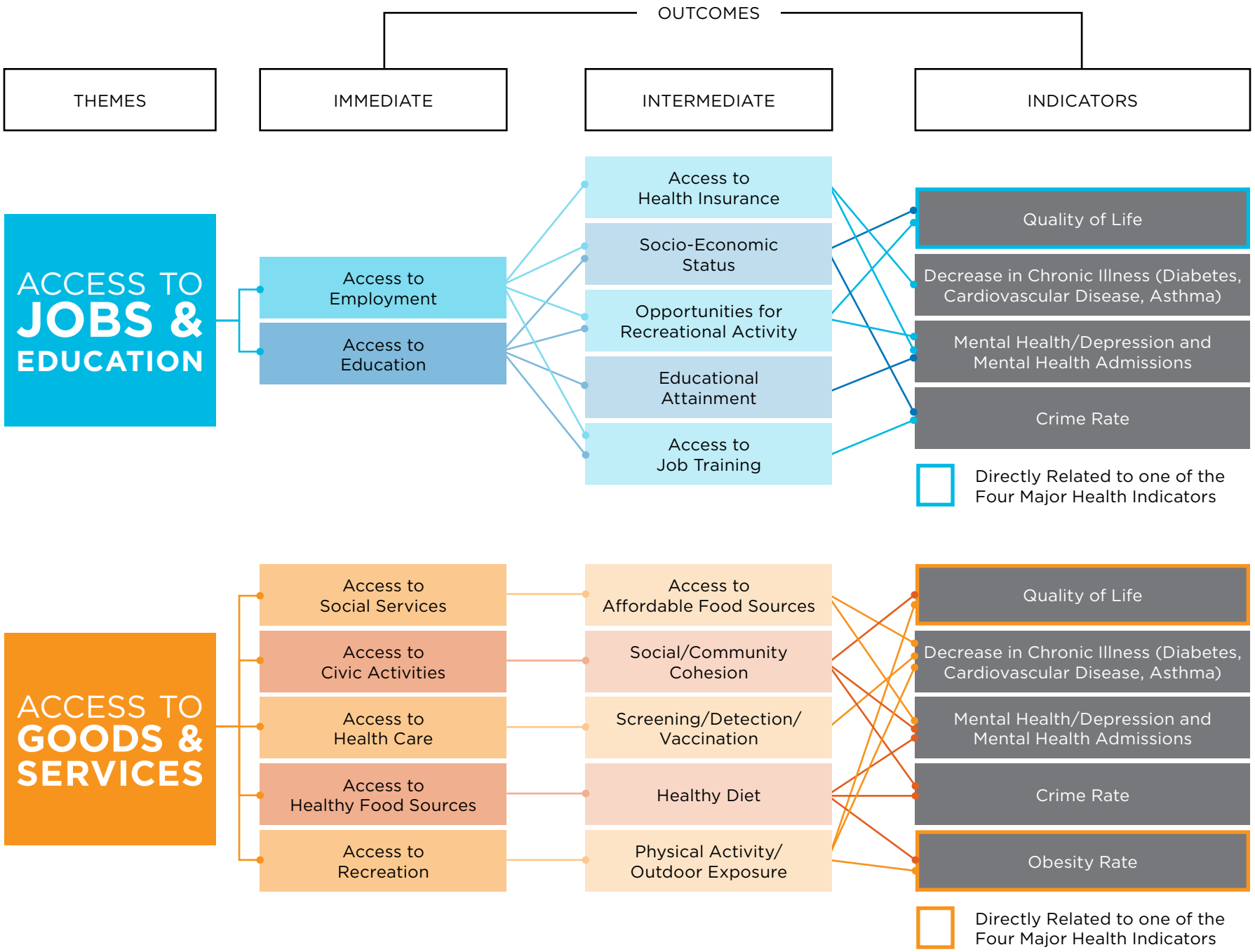
As part of the HIA process, the Steering Committee developed a pathway diagram in order to outline potential connections between the SR 50 BRT and health outcomes (see Figure 12). The pathway diagram is a critical element of the HIA process and is intended (1) to encourage considerations of potential health impacts of the SR 50 BRT outside recognized or traditional connections, (2) to illustrate the various pathways through which the SR 50 BRT affects health outcomes, and (3) to shift from focusing on individual impacts toward a community-level approach that reflects complex and dynamic relationships among the potential health impacts.

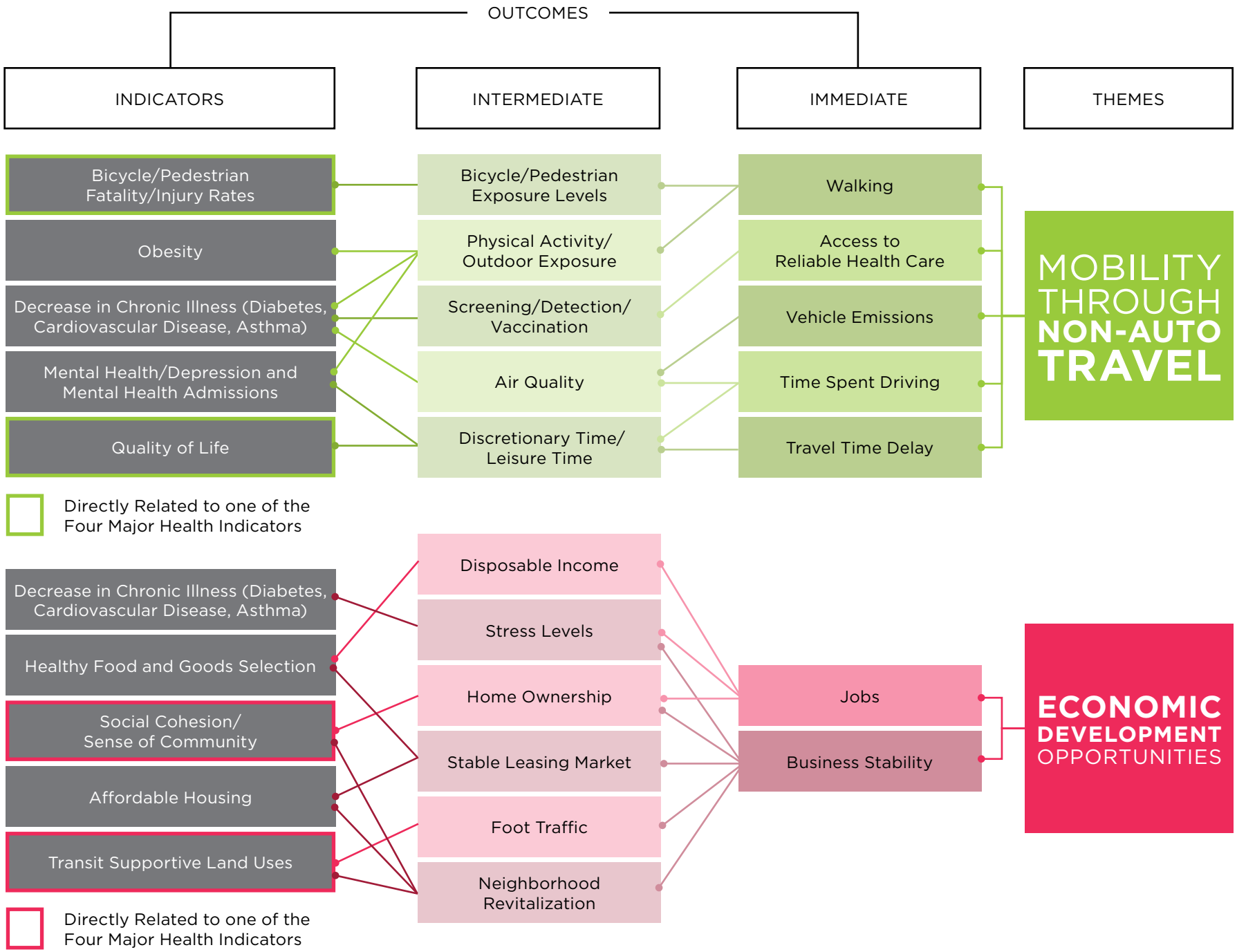
Drawing on the collective knowledge of the HIA Steering Committee, a number of pathways were identified. The HIA Leadership Team reviewed the findings and prioritized them based on the best available evidence and the level of Steering Committee concern. The health indicators were organized by the following four themes encompassed in the HIA goal: access to goods and services, access to jobs and education, increased non-automobile travel, and encouraging economic development. Based on these themes, the Steering Committee identified the immediate and intermediate health outcomes that could be affected through the implementation of the SR 50 BRT.

The immediate benefits and impacts of increasing access to jobs and education could include access to health insurance, opportunities for recreational activity, higher educational attainment, and increase in socio-economic status. The benefits and impacts of increased access to services could include access to civic activities leading to greater social and community cohesion, access to healthy food sources leading to healthier diets, and access to recreational opportunities leading to increased physical activity. The benefits and impacts for increased non-auto travel could include an increase in walking leading to bicyclist/pedestrian exposure and increased physical activity, a decrease in vehicle emissions leading to an increase in air quality, and less time spent driving could lead to more discretionary/leisure time. Lastly, economic development could lead to more jobs which would affect stress levels and disposable income, and increased business stability could affect foot traffic, and neighborhood and business stability.

Ultimately, the Steering Committee agreed on a set of health indicators that will be monitored prior to and after the implementation of the BRT project to measure how well the project influences health outcomes. **These indicators are physical activity, bicycle and pedestrian safety, quality of life, levels of transit supportive land uses, decrease in chronic illness, mental health/ depression cases, crime rate, obesity rate, healthy food and goods selection, social cohesion, and affordable housing.**

FIGURE 12 SR 50 HIA PATHWAY DIAGRAM




OUTCOMES
INDICATORS
INTERMEDIATE
IMMEDIATE
THEMES
Bicycle/Pedestrian Fatality/Injury Rates
Obesity
Decrease in Chronic Illness (Diabetes, Cardiovascular Disease, Asthma)
Mental Health/Depression and Mental Health Admissions
Quality of Life
Bicycle/Pedestrian Exposure Levels
Physical Activity/ Outdoor Exposure
Screening/Detection/ Vaccination
Air Quality
Discretionary Time/ Leisure Time
Walking
Access to Reliable Health Care
Vehicle Emissions
Time Spent Driving
Travel Time Delay
MOBILITY THROUGH NON-AUTO TRAVEL
Directly Related to one of the Four Major Health Indicators
Decrease in Chronic Illness (Diabetes, Cardiovascular Disease, Asthma)
Healthy Food and Goods Selection
Social Cohesion/ Sense of Community
Affordable Housing
Transit Supportive Land Uses
Disposable Income
Stress Levels
Home Ownership
Stable Leasing Market
Foot Traffic
Neighborhood Revitalization
Jobs
Business Stability
ECONOMIC DEVELOPMENT OPPORTUNITIES
Directly Related to one of the Four Major Health Indicators

HEALTH INDICATORS

HEALTH INDICATORS

A growing body of scientific evidence has shown that the built environment can have significant effects on both physical and mental health, particularly among minority and low-income populations already burdened with disproportionate rates of illness and morbidity. The combination of lack of infrastructure (e.g., sidewalks, bike paths, and parks), affordable housing, and supermarkets with access to healthy food increases the risks of both physical and mental illnesses.[11]

11 Hood, 2005

The HIA process is driven by evidence published in the scientific and medical literature that link transportation design and operations to direct, indirect, or cumulative health impacts and benefits. The health indicators, identified by the Steering Committee through the Pathway Diagram, were evaluated based on the availability of data and information related to each indicator. Four major indicators were chosen to be the focus of the SR 50 HIA. These indicators are described in detail to establish the Corridor's baseline conditions in the succeeding pages. Each of the indicators is discussed based on literature linking positive health outcomes with implementation of premium transit such as BRT.

"WHETHER PEOPLE ARE HEALTHY OR NOT, IS DETERMINED BY THEIR CIRCUMSTANCES AND ENVIRONMENT. TO A LARGE EXTENT, FACTORS SUCH AS WHERE WE LIVE, THE STATE OF OUR ENVIRONMENT, GENETICS, INCOME, EDUCATION LEVEL, RELATIONSHIPS WITH FRIENDS, AND FAMILY ALL HAVE CONSIDERABLE IMPACTS ON HEALTH. WHEREAS THE MORE COMMONLY CONSIDERED FACTORS SUCH AS ACCESS AND USE OF HEALTH CARE SERVICES OFTEN HAVE LESS OF AN IMPACT ON HEALTH.

- World Health Organization on Health Impact Assessments, http://www.who.int/hia/evidence/doh/en/

HOW TRANSIT CAN INFLUENCE PHYSICAL ACTIVITY

THE OBESITY EPIDEMIC

The U.S. is faced with a health crisis. More than one-third of adults and 17 percent of youth in the United States are obese.[12] Obesity is a condition in which an individual has excess body fat (a Body Mass Index or BMI of 30 or greater), that can be harmful to their health often caused by social and environmental factors and/or genetic disposition. Obesity-related health conditions include heart disease, stroke, Type-2 diabetes, asthma and certain types of cancer — some of the leading causes of preventable death.[13,14]

The prevalence of obesity has reached epidemic proportions in the United States with the national obesity rate doubling over the past 35 years. The average American is 24 pounds heavier today than in 1960.[15] The direct and indirect economic costs of obesity total between $190 and $215 billion annually in the U.S.[16,17] This equates to approximately 21 percent of healthcare costs nationwide.

OBESITY AND OBESITY-RELATED CHRONIC ILLNESS

Throughout the SR 50 Study Corridor, the overall obesity rate is approximately 26 percent and obesity is estimated to affect approximately 45,800 out of 183,930 adults. Of the obesity-related chronic illnesses, asthma has a 14 percent rate (25,000 affected adults), diabetes has a 10 percent rate (18,000 affected adults) and cardiovascular disease has a 7 percent rate (13,300 affected adults)[18].

Although the Study Corridor obesity rate is below state and national averages, there are particular sectors along the Corridor that likely have higher obesity rates because of concentrations of race and ethnicity factors that tend to be indicators of high obesity rates. For instance, the nation-wide obesity rate is higher for Hispanic and African American populations (27 percent rate). A higher concentration of Hispanics are located in Azalea Park and Union Park sectors and there is a higher concentration of African Americans in the Pine Hills sector.

In the Study Corridor, among year-around, full-time workers, the income bracket with the highest obesity rate is the $35-49,999 range at 39 percent. There is a higher concentration of this income range in the Downtown Orlando, University Park, and Oviedo sectors. The $0-14,999 income bracket has the second highest obesity rates at 28 percent. On the state level, the $0-14,999 income bracket has the highest rate of obesity followed by the $35-49,999 income bracket. The $50,000 or more range is the only income bracket with a statewide obesity rate that is lower than the overall state obesity rate. Nationally, the obesity rate decreases as income increases[19].

HEALTH COSTS

Cost-of-illness (COI) modeling is routinely used by health economists to understand cost-effectiveness and to forecast national costs of a disease given its prevalence and treatment trends.[20] COI estimates the financial burden associated with an illness by identifying the direct (payments to doctors, hospitals and pharmacies) and indirect (lost income and productivity) costs associated with an illness. COI is utilized by many government agencies and national disease associations including the Environmental Protection Agency, CDC, American Heart Association, and American Diabetes Association to track specific diseases.

Literature review of governmental guidance and national medical association publications was conducted to compare national COI information to the Region and Study Corridor. Tables 13 & 14 provide estimates of national COI by disease, adjusted to 2010 dollars and scaled by the proportion of the U.S. population living within the Orlando Metropolitan Statistical Area in 2010 (0.7 percent). The COI health impacts total $489,200,000 for the Orlando MSA and $55,920,000 for the Study Corridor. In the Study Corridor, obesity-related health costs total over $69 million annually. Even just stabilizing the obesity rate will save health care costs and other expenses linked to obesity. If the obesity rate increases by five percent over the next decade, the Study Corridor will potentially incur over $1 billion in healthcare expenses related to obesity.

12 Cynthia L. Ogden, Margaret D. Carroll, Brian K. Kit, & Katherine M. Flegal, 2014
13 Shore, 2013
14 Ogden et al., 2014
15 APTA Millennials & Mobility: Understanding the Millennial Mindset (2013)
16 Hammond and Levine, 2010
17 Cawley and Meyerhoefer, 2012
18 These rates are based on countywide, 2013 Behavioral Risk Factors Surveillance System (BRFSS) health data by the Florida Department of Health and the Centers for Disease Control and Prevention.
19 This data does not account for part-time, seasonal, retired, or unemployed workers or those who are unable to work due to age, disability or some other circumstance. It also does not account for household dynamics such as spousal income, financial dependents, etc.
20 U.S. Environmental Protection Agency, 2007

TABLE 13 COI CALCULATIONS BY CHRONIC DISEASE

CONDITION	NATIONAL COI* (BILLIONS)	ORLANDO MSA COI* (MILLIONS)	STUDY CORRIDOR COI* (MILLIONS)	SOURCE
OBESITY	$148.8	$104.1	$11.9	Centers for Disease Control and Prevention, 2010
CARDIOVASCULAR – STROKE	$33.6	$23.5	$2.7	American Heart Association, 2015
CARDIOVASCULAR – HEART DISEASE	$21.6	$150.9	$17.2	American Heart Association, 2015
DIABETES	$245.0	$171.5	$19.6	American Diabetes Association, 2015
ASTHMA	$56.0	$39.2	$4.5	Asthma and Allergy Foundation of America, 2015
	Total	$489.2	$55.9	

** Based on 2010 dollars.*

Using the national COI as a basis, the Study Corridor has an estimated cost of over half a billion dollars as a result of obesity, cardiovascular disease, diabetes, and asthma in 2012. Diabetes and cardiovascular disease had the largest share of total cost relative to the other diseases (almost $360 million) although these two health conditions hold the lowest prevalence share within the Study Corridor. Obesity, which has a 25 percent rate in the Study Corridor is estimated to have resulted in over $68 million dollars in cost based on the COI calculations. The areas that have likely experienced the most financial impact are those that have race, ethnic, and income characteristics linked to these chronic conditions including Pine Hills, Azalea Park, and Union Park.

TABLE 14 HEALTH CARE EXPENSES IN THE STUDY CORRIDOR BASED ON COI

		STUDY CORRIDOR			
CONDITION	NATIONAL EXPENSES PER PERSON*	POPULATION	HEALTH EXPENSES*	RATE OF DISEASE	PERCENTAGE OF COST RELATED TO CHRONIC DISEASE
OBESITY	$1,500	45,800	$68,015,700	25%	14%
CARDIOVASCULAR – HEART DISEASE & STROKE	$8,200	13,300	$108,693,400	8%	21%
DIABETES	$13,700	18,300	$250,394,900	10%	49%
ASTHMA	$3,300	24,900	$82,054,500	14%	16%
	Total	102,200	$509,158,500		

** Based on 2012 dollars.*

ACTIVE COMMUTING AS A COMMUNITY TOOL TO REDUCE OBESITY AND OBESITY-RELATED CHRONIC ILLNESS

Healthcare professionals attribute a decrease in physical activity and an increase in poor nutrition as two of the major causes of the obesity epidemic. Additionally, increased car dependency over the past century has led to many Americans driving more and walking less even for short-distances. Walking to and from public transportation can help physically inactive populations, especially low-income and minority groups, attain the recommended level of daily physical activity. Therefore, increased access to public transit may help promote and maintain active lifestyles.

Physical activity is defined by the World Health Organization as "bodily movement produced by skeletal muscles that requires energy expenditure". Adults need at least 150 minutes of moderate-intensity aerobic activity (i.e., brisk walking) every week. A daily, 20-minute walk can reduce the risk of early death between 16 and 30 percent.[21] Studies have demonstrated that commuters who ride public transportation tend to walk at least 20 blocks a month and 240 blocks a year. Additionally, those who used a BRT service identified higher average self-reported distances walked versus the local bus.[22]

Public transit encourages active commuting such as walking and biking. Transit availability combined with bicyclist and pedestrian-supportive infrastructure is a critical component of active commuting. Incorporating physical activity into a commuter's daily routine can help reduce the risk of developing several leading chronic illnesses, including cardiovascular disease (e.g., heart attacks, strokes), colon cancer, and non-insulin-dependent diabetes, as well as their precursors (e.g., high blood pressure, hypertension). In the US, 29 percent of those who use transit are physically active for 30 minutes or more each day, solely by walking to and from public transit.[23]

21 University of Cambridge, 2015
22 Kristen Day, 2014
23 Kaiser Permanente , 2015

HOW TRANSIT CAN INFLUENCE SAFETY

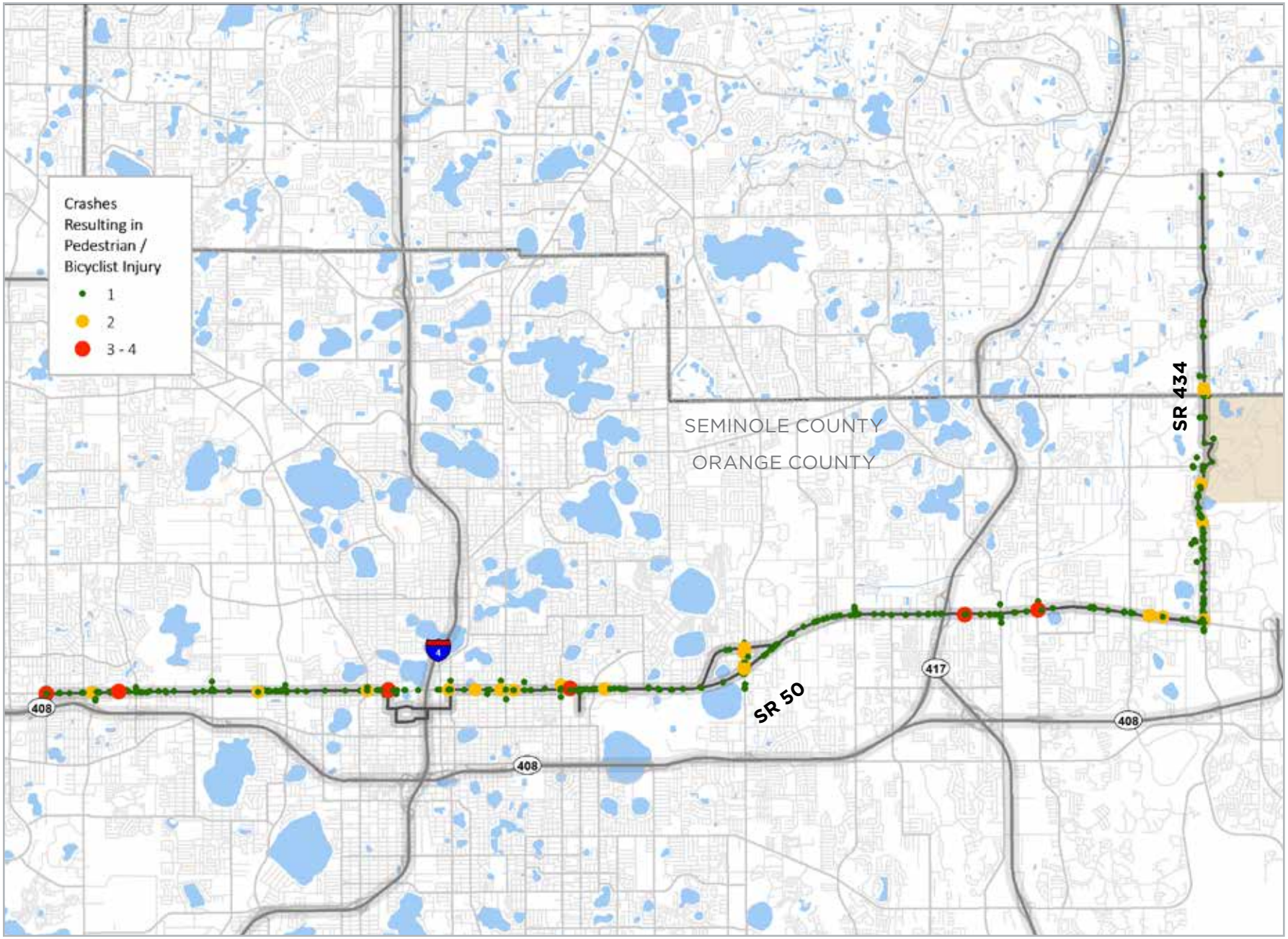
For all modes, individuals need a basic level of safe infrastructure in order to have access to work, school, healthcare facilities, grocery stores, recreation, etc. Safety is even more important for the vulnerable users of our transportation system, including pedestrians and cyclists, and younger and older population groups. Our Region is particularly challenged with this issue with the Orlando Metro Area being ranked as the most dangerous for pedestrians.[24]

Between 2009 and 2014, 509 pedestrian and bicycle crashes occurred in the 22-mile Study Corridor, with 101 of those crashes leading to incapacitating injuries and 40 leading to fatalities. As shown in Figures 13 & 14, pedestrian injuries –both moderate and incapacitating– were concentrated in Pine Hills, Azalea Park, Union Park, and the UCF Study Corridor sectors. Bicyclist injuries were focused in the Pine Hills, Union Park, and UCF sectors. The 2014 data indicated this area had 100 pedestrians and bicyclist crashes, with 28 sustaining incapacitating injuries and 10 ending in fatalities occurred along the Corridor.

Various research studies indicate that transit is one of the safest forms of transportation. In general, buses and trains have lower risks than light duty vehicles for passenger deaths when evaluated based on passenger miles of travel. In 2012, the passenger death rate in light duty vehicles (includes passenger cars, light trucks, vans and sports utility vehicles) was 0.49 per 100 million passenger-miles. The rates for buses and trains were 0.04 and 0.02 respectively.[25] This means that as SR 50 BRT riders shift their travel mode from cars to transit, they are also reducing their exposure to the greater risks of injury and death associated with driving or riding in a car.

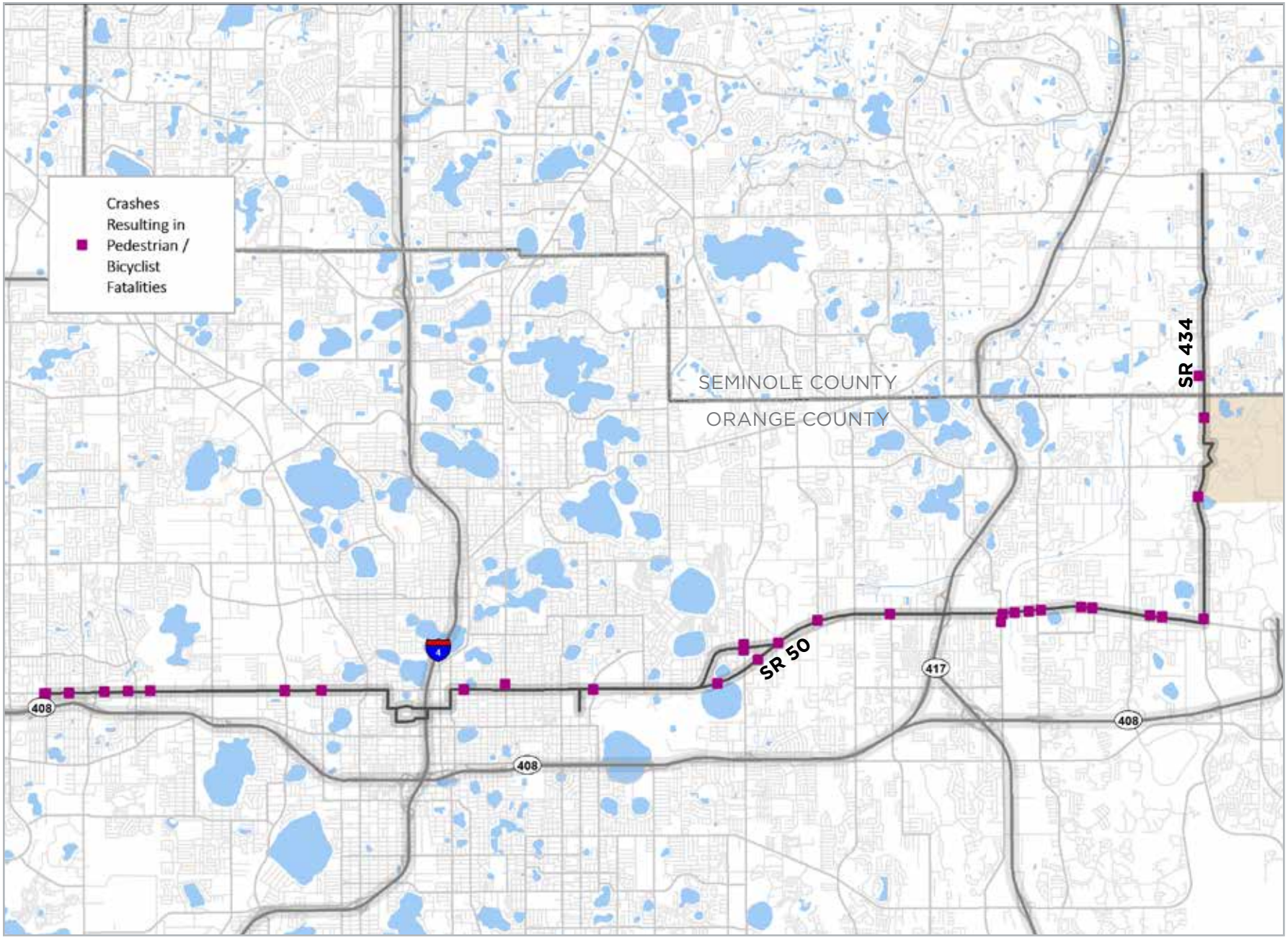
24 Dangerous by Design, Smart Growth America, 2014
25 National Safety Council, 2015

FIGURE 13 FREQUENCY OF PEDESTRIAN & BICYCLIST CRASHES WITH INJURIES



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

FIGURE 14 FREQUENCY OF PEDESTRIAN & BICYCLIST CRASHES RESULTING IN FATALITIES



Source: US Census Bureau, 2009-2013 American Community Survey 5-year Estimates

VALUE OF A STATISTICAL LIFE

The prevention of injury and loss of life plays a significant factor in many transportation planning decisions, projects, and policies. Every infrastructure improvement, including the placement of sidewalks, bicycle lanes and crosswalks, goes through extensive analysis to determine the solution that would maximize safety for all users. Transportation engineers and planners have a variety of tools available to calculate the cost-effectiveness of a potential transportation project. One of those tools is the US Department of Transportation (USDOT) Value of a Statistical Life (VSL). The Office of the Secretary of Transportation is required by executive order to evaluate in monetary terms the cost and benefits of the Department's regulations and investments. Since 1993, USDOT has published guidance on the "value" of safety and preventing a fatality. VSL is defined as "the additional cost that individuals would be willing to bear for improvements in safety". VSL does not put a value on a life, but the valuation of reduction in risk.[26] VSL is the aggregation of many individuals' "willingness to pay" for a reduction in mortality risk and does not represent actual costs having to be endured by any particular party. In June 2015, USDOT updated the VSL estimates to account for changes in prices and changes in real incomes and increased the VSL to $9.4 million.

Nonfatal injuries are far more common than fatalities and vary widely in severity, as well as probability. In principle, the resulting losses in quality of life, including both pain and suffering and reduced income, should be estimated and valued into the equation. USDOT rates each type of accidental injury (in terms of severity and duration) on a scale of quality-adjusted life years, in comparison with the alternative of perfect health. These scores are grouped into five levels: minor, moderate, serious, severe, and critical. Each level yields a coefficient that can be applied to VSL to assign each injury class a value corresponding to a fraction of a fatality.

TABLE 15 CRASH SEVERITY AND VSL

SEVERITY	FRACTION OF VSL
MINOR	0.003
MODERATE	0.047
SERIOUS	0.105
SEVERE	0.266
CRITICAL	0.593
FATAL	1.00

An analysis of the VSL equivalent of crashes along the Corridor was conducted. Based on a review of the crash reports from 2009 to 2014, fatal crashes were given a full VSL value, minor injury crashes were give a "moderate" rating, and incapacitating crashes were given a "critical" rating. VSL guidance suggests that $1.1 billion dollars' "worth" of pedestrian and bicycling crashes occurred in the five-year span. It could be surmised that this amount is equivalent to the potential resources that could have been invested in targeted safety roadway improvements that could have prevented these crashes. The analysis of the VSL cost and figures are shown below.

TABLE 16 2009 TO 2014 CORRIDOR CRASHES AND VSL CALCULATIONS

CRASH SEVERITY	NO. OF CRASHES	USDOT VSL PER CRASH TYPE	POTENTIAL COSTS OF SAFETY IMPROVEMENTS BASED ON VSL
PEDESTRIAN			
MINOR INJURIES	179	$441,800	79,082,200
INCAPACITATING INJURIES	63	$5,574,200	$351,174,600
FATAL	32	$9,400,000	$300,800,000
TOTAL	274		$731,056,800
BICYCLE			
MINOR INJURIES	191	$441,800	$84,383,800
INCAPACITATING INJURIES	38	$5,574,200	$211,819,600
FATAL	6	$9,400,000	$56,400,000
TOTAL	235		$352,603,400

POTENTIAL TOTAL COST OF COUNTER MEASURES BASED ON VSL **$1,083,660,200**

26 U.S. Department of Transportation, 2015

In 2014, the Study Corridor had a total of 100 crashes involving pedestrian and bicyclists. Applying VSL, the area could have seen $277 million worth of improvements that could have reduced these crashes. However, it is recognized that safety is a complex issue and no single solution can completely address an identified safety problem. If a 32 percent bicycle and pedestrian crash reduction factor is assumed[27], up to $87 million worth of crashes could have been reduced. The $87 million statistical cost of these bicycle and pedestrian crashes could have otherwise been invested in targeted safety improvements for pedestrians and bicyclists.

TABLE 17 2014 CORRIDOR CRASHES AND VSL CALCULATIONS

CRASH SEVERITY	NO. OF CRASHES	USDOT VSL PER CRASH TYPE	POTENTIAL COSTS OF SAFETY IMPROVEMENTS BASED ON VSL
PEDESTRIAN			
MINOR INJURIES	34	$441,800	$15,021,200
INCAPACITATING INJURIES	16	$5,574,200	$89,187,200
FATAL	8	$9,400,000	$75,200,000
TOTAL	58		$179,408,400
BICYCLE			
MINOR INJURIES	28	$441,800	$12,370,400
INCAPACITATING INJURIES	12	$5,574,200	$66,890,400
FATAL	2	$9,400,000	$18,800,000
TOTAL	42		$98,060,800
POTENTIAL TOTAL COST OF COUNTER MEASURES BASED ON VSL			**$277,469,200**

TABLE 18 POTENTIAL REDUCTION ON 2014 PEDESTRIAN & BICYCLING CRASHES & ASSOCIATED COSTS BASED ON VSL

CRASH REDUCTION FACTOR = 32%			
CRASH SEVERITY	NO. OF CRASHES	USDOT VSL BY CRASH TYPE	POTENTIAL COSTS OF SAFETY IMPROVEMENTS BASED ON VSL
MINOR INJURIES	20	$441,800	$8,836,000
INCAPACITATING INJURIES	9	$5,574,200	$50,167,800
FATAL	3	$9,400,000	$28,200,000
POTENTIAL TOTAL COST OF COUNTER MEASURES BASED ON VSL			**$87,203,800**

27 Based on a sample of pedestrian improvement Crash Reduction Factors taken from FHWA CMF Clearinghouse

INFRASTRUCTURE IMPROVEMENTS AS A TOOL TO IMPROVE SAFETY

Providing safe streets for all users is an important component of a healthy and economically vibrant community. Pedestrian and bicycling infrastructure improvements (such as wayfinding, crosswalk improvements, wider sidewalks, etc.) to connect to transit and transit-oriented development can provide large but often overlooked health benefits. Studies have shown that 43 percent of people with safe places to walk within ten minutes of home achieve their daily physical activity targets, compared to just 27 percent for residents of less walkable areas achieving physical activity targets.[28]

Transit supportive infrastructure improvements can be achieved with the implementation of Complete Streets policies. Complete Streets is a set of policies and planning practices intended to ensure that roadways accommodate diverse users and uses including walking, cycling, public transport, and automobile travel.[29] Complete Streets are designed with its community context at the forefront. For instance, in a rural setting a Complete Street would look much different than a Complete Street in an urban setting.

In the Study Corridor, Complete Streets improvements on the western portions of SR 50 between Powers Drive and Orange Blossom Trail, where AADTs range between 20,000 to 30,000 and has wider Right-Of-Way (ROW) availability, could consider wider sidewalks, pedestrian safety islands, additional streetscaping, lane reduction, among other improvements. Complete Streets improvements on the eastern portion of the Study Corridor, where AADT range between 40,000 to 50,000 but has limited ROW, could consider pedestrian oriented intersection improvements, such as raised crossings, curb extensions, enhanced crosswalks, and bus bulbs.

North Carolina DOT completed a half-million dollar road diet project on the section of East Boulevard between the East /West Boulevard light rail station and the Little Sugar Greenway in Charlotte. Travel lanes were reduced along eight blocks of the thoroughfare from four to three lanes, bicycle lanes added, sidewalks widened, and landscaping added. After the improvements, crashes decreased by 6 percent and crashes with injuries fell by 39 percent. This happened during a time when automobile traffic along the corridor increased slightly by 2 percent.[30]

Along the entire Study Corridor, the fundamental focus of Complete Streets is balancing the transportation needs of an entire community. Implementing Complete Streets elements in a corridor like SR 50, which has a high level pedestrian and bicyclist crashes, could have significant positive impacts on the overall safety of the Corridor.

Investing in successful premium transit requires addressing the last mile connection and investing in safe, quality pedestrian and bicycling access to and from transit. The Victoria Transport Policy Institute compared the impacts of various transportation safety strategies. Transportation demand management (TDM) strategies offer travelers options to choose the most efficient option for each trip, tend to provide multiple public health benefits and support other planning objectives.[31]

TABLE 19 BENEFITS OF TRANSPORTATION DEMAND STRATEGIES

STRATEGIES	MAGNITUDE OF SAFETY BENEFITS	OTHER IMPACTS
TRAFFIC CALMING	Large	
ACTIVE TRANSPORT (PEDESTRIAN AND BICYCLING) IMPROVEMENTS	Medium to Large	Reduced Traffic and Parking Congestion
PUBLIC TRANSIT IMPROVEMENTS	Large	Reduced Congestion
TRANSPORT PRICING REFORMS		
MOBILITY MANAGEMENT MARKETING	Small to Medium	
COMPLETE STREETS	Large	Multiple
SMART GROWTH DEVELOPMENT POLICIES		Open Space Preservation, More Efficient Public Services

Source: Litman, Comprehensive Analysis Of Traffic Congestion Costs and Congestion Reduction Benefits, 2013

28 Litman, Evaluating Public Transportation Health Benefits, 2010
29 Litman, Evaluating Public Transportation Health Benefits, 2010
30 Smart Growth America, 2015
31 Litman, Comprehensive Analysis Of Traffic Congestion Costs and Congestion Reduction Benefits, 2013

Conventional strategies, such as roadway expansion, generally achieve only one or two planning objectives. Moreover, as roadway widening projects induce additional vehicle travel, the results of these projects may tend to contradict some other community objectives. On the other hand, Complete Street strategies tend to achieve multiple planning objectives and are generally more cost-effective than conventional single-focused roadway projects.

TABLE 20 COMPARISON OF ROADWAY EXPANSION & COMPLETE STREET PROJECTS

PLANNING OBJECTIVE	ROADWAY EXPANSION	COMPLETE STREETS
USER CONVENIENCE AND COMFORT	+	+
CONGESTION REDUCTION	+	+
PARKING COST SAVINGS	-	+
ROADWAY FACILITY COST SAVINGS	-	+
CONSUMER COST SAVINGS	-	+
REDUCED TRAFFIC CRASHES	-	+
IMPROVED MOBILITY OPTIONS	-	+
LAND USE OBJECTIVES	-	+
POLLUTION REDUCTION	-	+
PHYSICAL AND FITNESS HEALTH	-	+

Source: Litman, Comprehensive Analysis of Traffic Congestion Costs and Congestion Reduction Benefits, 2013

People who live or work in communities with high quality public transportation tend to drive significantly less and rely more on alternative modes (walking, cycling and public transit) than they would in more automobile-oriented areas. This reduces traffic crashes, increases physical fitness and mental health, and provides access to medical care and healthy food. Streetscape and roadway improvements can also positively influence the propensity to walk, bicycle, and take the bus to transit stations.[32]

32 Weinzimmer, Sanders, Dittrich, & Cooper, 2014

HOW TRANSIT CAN INFLUENCE QUALITY OF LIFE

Quality of life is defined by the World Health Organization as "an individual's personal satisfaction with the cultural or intellectual conditions under which they live." The degree to which people have access to employment, health care, food sources, and educational facilities influences the quantity and quality of lifestyle choices they can make. Increasing transportation choices can help residents participate in the communities and gives them essential and equitable access to goods, services, education, and employment. In addition, financial prosperity can affect the emotional and mental well-being of community individuals. Aside from providing increased mobility to the transit-dependent population along the Corridor, the SR 50 BRT could also provide a valuable alternative to automobile use for residents and workers which can consequently improve the quality of life in a community.

QUALITY OF LIFE SURVEY

In partnership with UCF's Urban and Regional Planning Program, a survey was conducted along the Study Corridor to assess different quality of life indicators. Although the survey approach was not meant to capture a statistically significant sample, the responses gave insight into the current levels of perceived quality of life among residents and provided input on how the SR 50 BRT could impact the quality of life of both transit-dependent and choice riders. The students conducted two surveys over a two-week period: one was targeted to individuals near the proposed transit stops (station areas) and another targeted to individuals who either reside, run a business, or work along the Study Corridor (broader community). A total of 244 survey responses were collected for both surveys.

TABLE 21 QUALITY OF LIFE SURVEY RESULTS

	BROADER COMMUNITY	STATION AREAS
GENDER		
Male	54%	59%
Female	46%	41%
RACE		
Caucasian	78%	29%
African American	9%	39%
Hispanic	10%	26%
Other	4%	5%
AGE		
Average Age	50	33
OTHER QUESTIONS		
Respondents who have a car	80%	20%
Respondents who get around by bus	7%	63%
How respondents get to the grocery store	84% Private Vehicle	31% Bus
Respondents said they often have trouble accessing health care service because of transportation problems	9%	21%
Respondents said they often miss or late to work because of transportation problems	14%	39%
Respondents who feel it is important to live near a transit stop	24%	53%
Respondents who feel connected to neighbors	27%	42%

Source: 2015 MetroPlan SR 50 BRT HIA Quality of Life Survey

The survey showed that the diversity of the SR 50 Study Corridor requires a transit option that will improve quality of life for both existing transit riders and potential riders. It was seen that approximately 60 percent of corridor individuals do not feel connected to their community and neighbors. Although 80 percent of the broader community survey respondents had a car, 24 percent still felt important to live near a transit stop. In addition, 14 percent of respondents had challenges getting to work even with having a private vehicle in the household. These results indicate the desire of respondents to have mobility options.

On the other hand, Station Area survey respondent results reflect the impact that unreliable transportation can have on an individual. 39 and 21 percent of respondents have been unable to get to work or health care services because of transportation. However, 42 percent said they feel connected to their neighbors. Research shows that high quality public transit can reduce emotional stress by improving people's access to education and employment activities, improving community cohesion, and improving access to social and recreational activities; and that commuters find high quality public transit travel less stressful than driving.[33]

A Region-wide survey was also conducted in 2014 called "Understanding the Values and Priorities of Central Floridians". One in six respondents to this survey identified traffic and their ability to get to and from place to place as the factor that most impacts their quality of life. In addition, Central Florida residents prefer reducing traffic congestion by improving transportation and transit options important to the future of the region.[34]

33 Litman, Evaluating Public Transportation Health Benefits, 2010

34 Heart+Mind Strategies, 2014

The poorest sectors in the Study Corridor (Azalea Park, Union Park and Pine Hills) could potentially see significant improvement to their quality of life. Putting or keeping public transportation in communities with high unemployment produces up to 2.5 times more jobs than putting public transportation in communities with low unemployment.[35]

TABLE 22 CORRIDOR SEGMENT INCOME LEVELS COMPARED TO THE REGION & STATE

	MEDIAN HOUSEHOLD INCOME	PERCENTAGE OF POPULATION LIVING IN POVERTY
OVIEDO	$67,326	12%
UCF	$41,341	29%
AZALEA PARK	$36,919	24%
UNION PARK	$41,993	20%
DOWNTOWN ORLANDO	$58,304	17%
PINE HILLS	$36,648	28%
ORLANDO MSA	$58,500	18%
FLORIDA	$46,956	16%

Source: 2013 U.S. Census American Community Survey

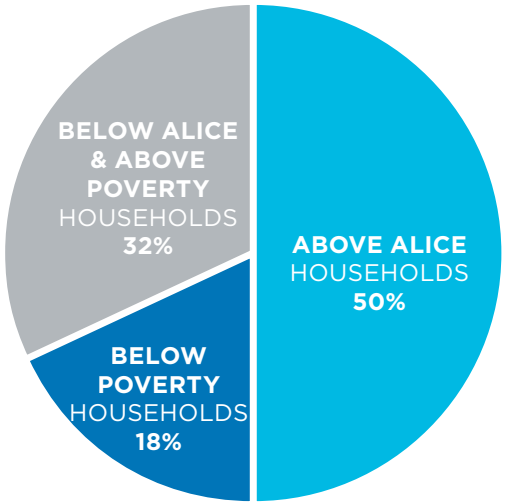
ALICE THRESHOLD

In 2014, the United Way released the Asset Limited, Income Constrained, Employed (ALICE) report which presented a broad picture of the financial insecurity that millions of Americans deal with at the county and town level. The report includes findings on households that earn below the ALICE threshold, which consist of the cost of basic household necessities by county, but are above the federal poverty level.[36] ALICE households include individuals and families who work hard, live above what is considered "poverty" level but are still facing financial challenges to afford the basic necessities of housing, food, child care, health care, and transportation.

The Household Survival Budget used in the report follows the original intent of the U.S. poverty rate as a standard for temporary sustainability.[37] This budget identifies the minimum cost option for each of the basic household necessities (housing, child care, food, transportation, health care, and taxes) along with a miscellaneous line item. Additionally, the report analyzes survival budgets for a single adult ($20,776) as well as for a family with children ($49,635). Based on ALICE calculation, on top of the 18 percent of Orange County households (67,838) that fall under the federal poverty guidelines, 32 percent of Orange County households (199,274) are struggling to afford the basic needs.

The Study Corridor has a higher average number of households living below the ALICE threshold than Orange County. In total, more than 99,000 households in the Corridor– 50 percent (five points higher than the State) are struggling to support themselves. The Azalea Park and Orlovista Census Designated Places (CDP) have the highest share of households living in poverty and under the ALICE threshold. The Pine Hills CDP comes in third at 57 percent. Although the United Way report showcases Census 2012 numbers and the municipal-level boundary data may overlap, these findings still remain consistent with the 2013 Census ACS poverty numbers previously discussed.

FIGURE 15 2012 STUDY CORRIDOR HOUSEHOLD INCOME



35 Smart Growth America, 2011
36 United Way, 2014
37 Blank, 2008

TABLE 23 POPULATIONS LIVING IN POVERTY & ALICE THRESHOLD

	TOTAL HOUSEHOLD	PERCENT BELOW POVERTY THRESHOLD	PERCENT BELOW ALICE & ABOVE POVERTY THRESHOLD	PERCENT BELOW ALICE THRESHOLD
OVIEDO	10,088	7%	20%	27%
UNION PARK CCD	72,791	15%	25%	40%
AZALEA PARK CDP	4,324	22%	38%	60%
ORLANDO	98,965	18%	35%	51%
ORLOVISTA CDP	2,189	26%	35%	60%
PINE HILLS CDP	20,144	21%	36%	57%
STUDY CORRIDOR AVG.	599,870	18%	32%	50%
ORANGE COUNTY	423,987	16%	31%	47%
FLORIDA	7,197,943	15%	30%	45%

Source: United Way, ALICE Report, Fall 2014

EDUCATIONAL ATTAINMENT BY CORRIDOR SEGMENTS

Obtaining a higher salary or advanced trainings can be a crucial decision for the 100,000 households living below the ALICE threshold. With the possibility of UCF and Valencia Community College opening a new downtown campus, the SR 50 BRT may increase access to the 50,000 residents that live along the Corridor that have obtained a high school diploma but do not have a bachelor's degree or the 25,000 residents that have some college education or have obtained an Associate degree. Research indicates that an additional four years of education lowers the risk of mortality by 1.8 percent; it also reduces the risk of heart disease by 2.2 percent, and the risk of diabetes by 1.3 percent.[38]

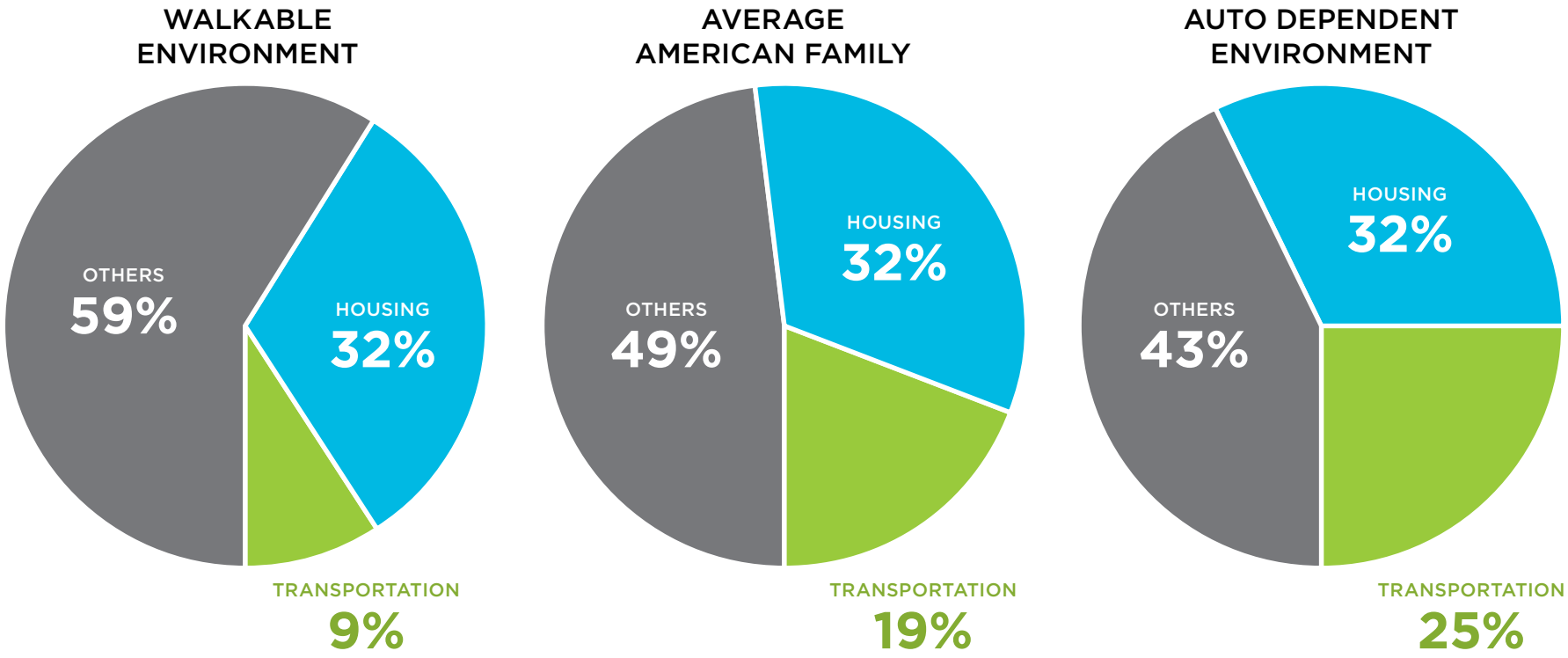
TABLE 24 EDUCATIONAL ATTAINMENT BY CORRIDOR SEGMENTS

	PERCENT OF POP. WITH HIGH SCHOOL DEGREE	PERCENT OF POP. WITH SOME COLLEGE EDUCATION	PERCENT OF POP. WITH BACHELOR'S DEGREE	PERCENT OF POP. WITH BACHELOR'S & POST GRADUATE
OVIEDO	56%	17%	17%	27%
UCF	38%	14%	10%	16%
AZALEA PARK	48%	19%	8%	12%
UNION PARK	53%	20%	11%	15%
DOWNTOWN ORLANDO	71%	20%	23%	37%
PINE HILLS	44%	16%	5%	6%

Source: 2013 U.S. Census American Community Survey

38 David M. Cutler, June 2006

FIGURE 16 HOW NEIGHBORHOOD FEATURES INFLUENCE TRANSPORTATION COSTS



Source: Center for Transit Oriented Development (2008) "The Affordability Index Toolbox" (Oakland, CA: Reconnecting America).

HOW TRANSIT CAN INFLUENCE LAND USE

Transportation and land use are intricately related. Development patterns can affect a person's travel to/from commercial and employment centers, encourage physical activity, facilitate access to services, and provide recreational opportunities. It can also present obstacles to improved health, or even contribute to negative outcomes by subjecting individuals to unsafe streets and limiting access to goods and amenities. Zoning and land use policies can help either support or inhibit healthy lifestyles within a community. Furthermore, a successful public transit system requires well-developed areas with mixed land uses and significant population density.

A premium transit system, such as the SR 50 BRT, can be a catalyst for redevelopment along the Corridor. Several studies have demonstrated the ability of BRT projects in promoting economic development all across the county. In fact, when comparing BRT investment versus light rail, per dollar of transit investment and under similar conditions, BRT has resulted in more TOD than light rail transit or streetcars.[39] The Cleveland HealthLine BRT has catalyzed $4.3 billion in development. The tax base along the Boston Silver Line has grown by 250 percent compared to 150 percent citywide since 2008.[40] In Central Florida, more than $2.9 billion dollars of private investment have been spurred and close to 28,000 jobs have been created a quarter mile from the LYNX's LYMMO Orange Line (the first BRT in the U.S.).

It is important to critically examine existing zoning codes and comprehensive plans to determine if these create barriers to development of optimum healthy environments in a community. Policies and transportation infrastructure should allow for individuals to make the choice to incorporate healthy decisions (such as active commuting) into their daily routines. At the same time, communities that desire to see more and higher quality land development that could bring good paying jobs, increased property tax values, and commercial and housing revitalization, should have the appropriate transit-supportive zoning codes and economic development incentives in place.

39 Walter Hook, 2013
40 Petrie, 2013

THE IMPACTS OF ECONOMIC VITALITY ON THE COMMUNITY

Improved community health and economic development are mutually-supportive interests. Economic development policies are designed to improve the quality of life for a community by creating and retaining jobs and supporting individual incomes and the overall tax base. As planned redevelopment begins to occur along the SR 50 BRT corridor, residents will have better access to jobs and educational opportunities.

Neighborhood design features that support transit also tend to support public health. Of people with safe places to walk within ten minutes of home, 43 percent achieve physical activity targets, compared with just 27 percent of less walkable area residents (see Figure 16). As shown under 'Transit + Physical Activity' section, poor health and illness generate an economic burden to individuals and regions. An unhealthy population increases the cost of preventable health care. Implementing economic development strategies will improve the business environment along the Corridor and will support public investments that create high value jobs. An economically thriving community strengthens education, social networks, and community resources and, in turn, contributes to positive health outcomes.

Local governments must establish guidance and policies that will incentivize redevelopment that occur in a pattern and intensity that supports transit. Policy improvements for TOD have been occurring throughout the U.S. and in Florida for over ten years. Orange County is currently re-writing their land development regulations and will be developing a new sustainable code including a module on TOD. The FDOT has also published a Florida TOD Guidebook for municipalities to consider integrating in their comprehensive plans and land development regulations.

All of the site design elements outlined in the land use policy analysis included in this HIA would create a successful TOD form of development. It is important to note that if a local municipality is not comfortable regulating all of the site design elements, then there should be a careful evaluation on the interrelationship and influences of each element outlined in the policy review (see page 67). For example, increasing the density, intensity and mix of uses within an area would not benefit a TOD without the regulation of the block size. The relationship of intensity and block size are essential in creating walkable environments. If only intensity and a mix of uses are implemented without a more urban block pattern, a healthy pedestrian environment is less likely to be created.

TARGET DEMONSTRATION AREAS

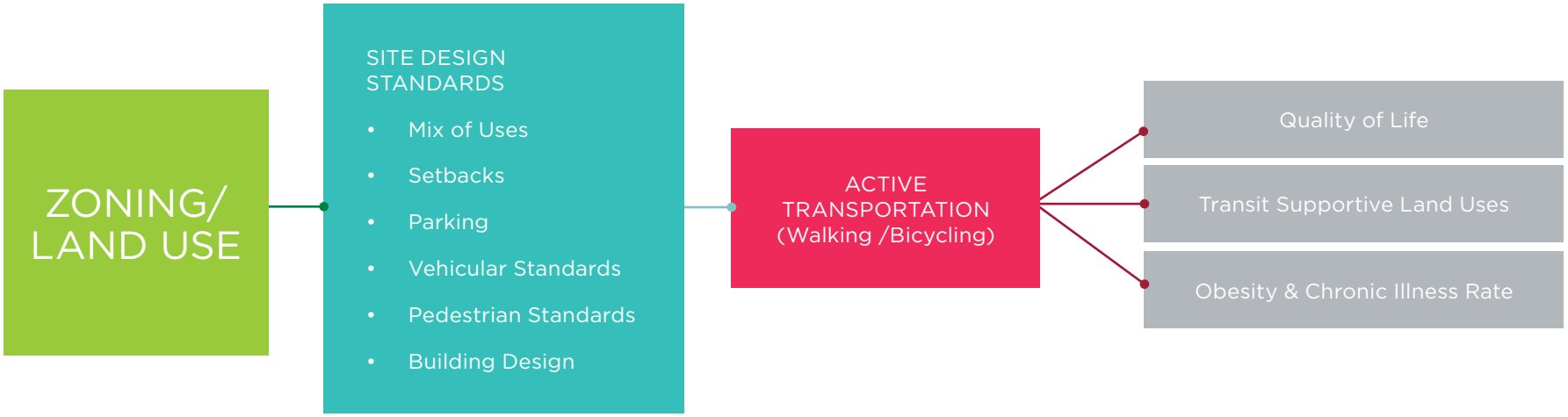
TARGET DEMONSTRATION AREAS

Analyzing specific target demonstration areas in more detail can help provide insights on how the new transit investment and varying land use patterns can impact community health. The HIA Leadership Team selected three demonstration areas that were previously identified during the LYNX SR 50/UCF Connector AA Study as potential station locations. The three target areas are located within Orange County, with a small portion of the SR 436/SR 50 target area within the City of Orlando. For each demonstration area, the team conducted a review of existing land use conditions and developed illustrative concepts of potential future land use scenarios within a half-mile of the potential station. Two future scenarios were developed for each target area: short-term scenario, and long-term scenario. The future scenarios illustrate how transit may influence development patterns and densities. Each target demonstration area was evaluated based on how well the various health indicators perform compared to current conditions. The three target demonstration areas are: (1) SR 50/Pine Hills Road, (2) SR 50/SR 436, and (3) SR 50/SR 434.

POLICY REVIEW OF TARGET DEMONSTRATION AREAS

Zoning and Land Use policies can help support or inhibit the potential for the SR 50 BRT to influence the health indicators identified by the HIA. Existing policies can remove barriers, if any, to the establishment of a healthy growth pattern in a community or limit the establishment of unhealthy destinations within a community. For example, a more pedestrian-friendly environment connects to three of the four final indicators presented in the HIA – obesity and chronic illness, quality of life, and transit-supportive land uses (see Figure 17). As part of the demonstration area evaluation, the Leadership Team conducted a detailed policy audit of the municipalities' future land use categories, relevant zoning districts, and special area plans. The Land Use Policy Memorandum (Appendix B) outlines the results of the audit for each municipality. The audit reviewed six site and building design regulation categories that may support and/or inhibit a healthy community with TOD - uses, setbacks, parking, vehicular standards, pedestrian standards, and building features. Each of these major categories can be regulated in a variety of ways to influence the overall health of the SR 50 Corridor communities based on the health indicators identified for this HIA.

FIGURE 17 EXAMPLE RELATIONSHIP OF ZONING & LAND USE POLICIES TO THE HEALTH INDICATORS



These six regulatory standards were evaluated because of the following specific influences on community health:

1. **Uses**

    a. A mix of uses in an area provides for an environment that promotes walking and allows for a variety of activities to occur without the need to use an automobile.

    b. A municipality can encourage healthy related use/types by prohibiting uses that are not consistent with a healthy environment (i.e., auto-oriented uses, fast food restaurants, liquor stores) while permitting uses that support a healthy environment (i.e., farmers markets, urban farms, agriculture uses in residential areas).

2. **Setback (from the roadway):** Buildings, and where they are sited on a parcel, provide the greatest site design opportunity to support the pedestrian network. The farther a building is setback from the roadway, the more challenging it is for a pedestrian and transit rider, in terms of general walkability and access, to surrounding land uses.

3. **Parking Requirements**

    a. Minimum and maximum standards - By establishing maximum parking ratios, a development will not exceed typical "minimum" standards. High minimum parking standards are typically associated with more auto-oriented uses and does not encourage the use of other modes.

    b. Location - Regulations that permit buildings to "face" a parking lot can prohibit and limit a pedestrian experience.

    c. On-street - On-street provides opportunities for a more walkable roadway design.

    d. Shared - Permitting shared parking between uses allows for a reduction in parking standards.

    e. Bicycle - Requiring or allowing bicycle parking in lieu or in addition to vehicular parking.

4. **Vehicular Standards**

    a. Block Standards - Regulating block size creates a walkable area that provides for safe pedestrian access and linkages to and from transit areas.

    b. Cross Access - Cross access can create a more connected network of vehicular and pedestrian access that will allow for movement internal to adjacent sites without access to a more regional road to get to transit.

    c. Landscape - Landscape features provide both comfort and buffers from roadways and drive aisles for pedestrian comfort and safety.

5. **Pedestrian Standards**

    a. Sidewalks - Sidewalk placement and size will affect the walkability and pedestrian activity along SR50.

    b. Connections - Continuous pedestrian networks within a development or connections to adjacent developments are important to access a transit stop.

    c. Lighting - Well-lit pedestrian walkways and sidewalks improve pedestrian safety.

    d. Landscape - Landscaping along pedestrian walkways can offer a sense of security and safety from vehicles, while providing shade for pedestrians.

6. **Building Features:** The design of a building can provide shelter; visual interest, safety and can increase the legibility of the entire pedestrian network. The three key building features to regulate are:

    a. Entryways - Entryways that are facing the street, and or the pedestrian connections contribute to a walkable area.

    b. Transparency - Transparency can make connections with the inside of the building (seeing people, various activities, window shop) with the pedestrians walking on the sidewalk. Providing "eyes" on the street and contributes to the walking environment of an area.

    c. Facade - A good facade adds interest to the walking and bicycling trip to access transit, and can entice people to walk or bicycle farther. Building awning and facade elements can also provide shelter to pedestrians.

The three target demonstration areas are mostly located within Orange County, and a small portion of the SR 436/SR 50 target area is within the City of Orlando. Table 25 summarizes the existing policies that may influence transit use and transit-oriented development for each municipality:

TABLE 25 SUMMARY OF POLICY REVIEW FINDINGS BY DESIGN REGULATION CATEGORIES

REQUIREMENTS	FINDINGS
USES	Both the City of Orlando and Orange County have sufficient land use intensity allowed within the Target Demonstration Areas. However, Orange County does not permit residential uses in their commercial land use categories which make up the predominant land use category in each target area.
SETBACKS	Neither municipality provides a maximum setback provision.
PARKING STANDARDS	Both City of Orlando and Orange County provide for bicycle parking. No location requirements or maximum parking provisions are in either jurisdiction. Shared parking is permitted with some requirements.
VEHICULAR STANDARDS	The City of Orlando has a maximum block standard supportive of walkability; the County does not have maximum block size standards.
PEDESTRIAN STANDARDS	Orange County requires pedestrian walkways, but does not include specific parameters on what an applicant should provide.
BUILDING FEATURES	Orange County has overall design requirements for commercial development. The City of Orlando does not have any additional design requirements outside of the city's "traditional city overlay" and majority of the Study Corridor is outside of this overlay.

In addition to the overall zoning regulatory requirements, there are Planned Unit Developments (PUD) and one Special Area Plan within the three target demonstration areas. The PUDs are mostly located within the Alafaya Trail/SR 50 Target Area and they are all already built-out based on the PUD provisions.

The SR 436/SR 50 Special Area Plan covering the SR 436/SR 50 station area was implemented through the County's Special Area Planning Policy. The Special Area Plan is generally supportive of the overall vision of the SR 50 Study Corridor for BRT. However, specific design standards and parameters have not yet been adopted in the County's land development code.

SR 50/PINE HILLS ROAD TARGET DEMONSTRATION AREA

The following illustrates potential development scenarios for SR 50 and Pine Hills Road station area. **These scenarios are not meant to indicate any approved or proposed plans but to illustrate a possible and hypothetical development scenario and to understand how transit and transit-supportive development can influence the health of the community around the stations.**

CURRENT CONDITIONS

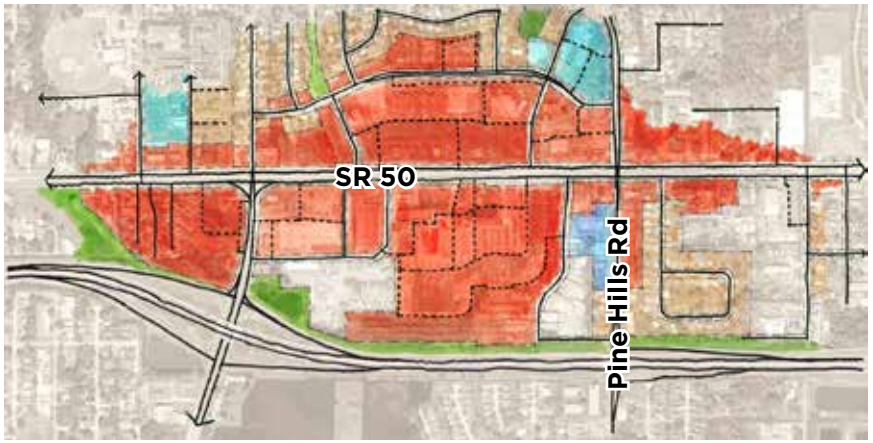
As seen in Figure 19, the Pine Hills Road station area has a limited street network with a limited amount of full intersections and through streets. The land uses are primarily single-use commercial with large shopping plaza parking lots facing the roadway. In addition, the Pine Hills Trail runs to the northwest section of the site, creating a potential connection to the regional bike-pedestrian trail system. SR 50 through this area has a wide cross section, exhibiting six 12' lanes with a wide center median, buffered bike lane and posted speed of 45 mph. This makes for a difficult and often uncomfortable pedestrian environment through the heart of the station area. Block sizes along this sector are, on average, two and three times the size of standard blocks sizes with the largest blocks in the area being more than five times the size of a typical city block (Figure 21). The limited connections and an environment that encourages higher vehicular speeds have caused motorists and pedestrians to utilize parking aisles as "streets" to cut through the large blocks (Figure 20).

FIGURE 18 SR 50/PINE HILLS ROAD STATION AREA

FIGURE 19 SR 50/PINE HILLS ROAD STATION AREA EXISTING STREET NETWORK

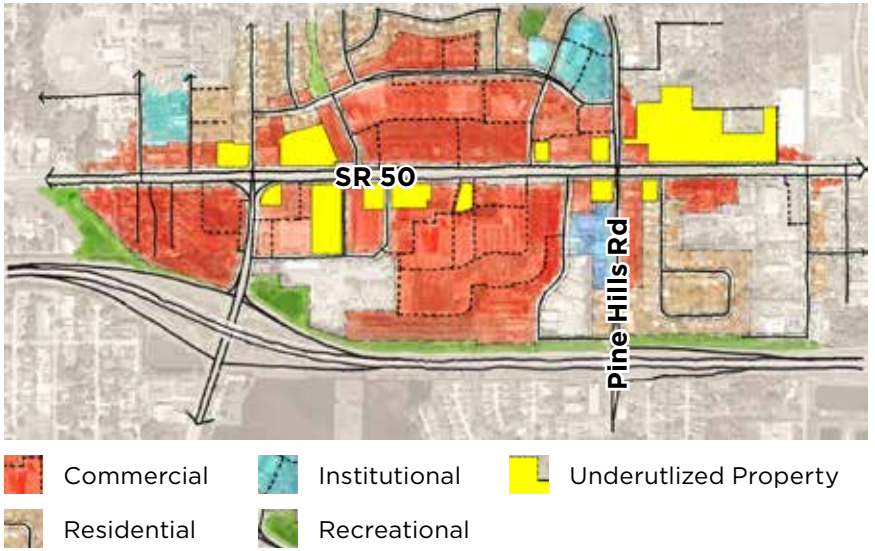
FIGURE 20 SR 50/PINE HILLS ROAD STATION AREA EXISTING BLOCK STRUCTURE

FIGURE 21 SR 50/PINE HILLS ROAD STATION AREA EXISTING LAND USES



An analysis of underutilized parcels determined there are several parcels that currently do not reach their maximum land use potential (Figure 22). A property is considered underutilized when its improvement value is at a threshold that may encourage the property owner to re-invest in the property (for the purposes of this study, underutilized properties are those that have improvement values that are less than 40% of the total building plus land value). These parcels have the highest likelihood for redevelopment and could serve as the catalyst for TOD to occur.

FIGURE 22 SR 50/PINE HILLS ROAD STATION AREA UNDERUTILIZED PARCELS



SR 50/PINE HILLS ROAD STATION AREA ILLUSTRATIVE SHORT-TERM SCENARIO

In this scenario, the Pine Hills Trail could be extended through a linear park to the SR 50 signalized intersection in front of the shopping plazas to encourage safe bike and pedestrian crossings. The existing Chinatown character could be carried through, creating a park around the existing gateway arch and fronting it with infill development. Redevelopment could occur in the short-term as individual infill of properties and likely on the underutilized parcels. As redevelopment occurs, some of the parking aisles can be rebuilt as streets. The new open space created by the trail can be utilized to create new development blocks. This will increase connectivity, break-up the large blocks, and improve overall walkability. The redevelopment could use this opportunity to create new shared community open space areas that could encourage increased physical activity.

FIGURE 23 SR 50/PINE HILLS ROAD SHORT-TERM ILLUSTRATIVE SCENARIO

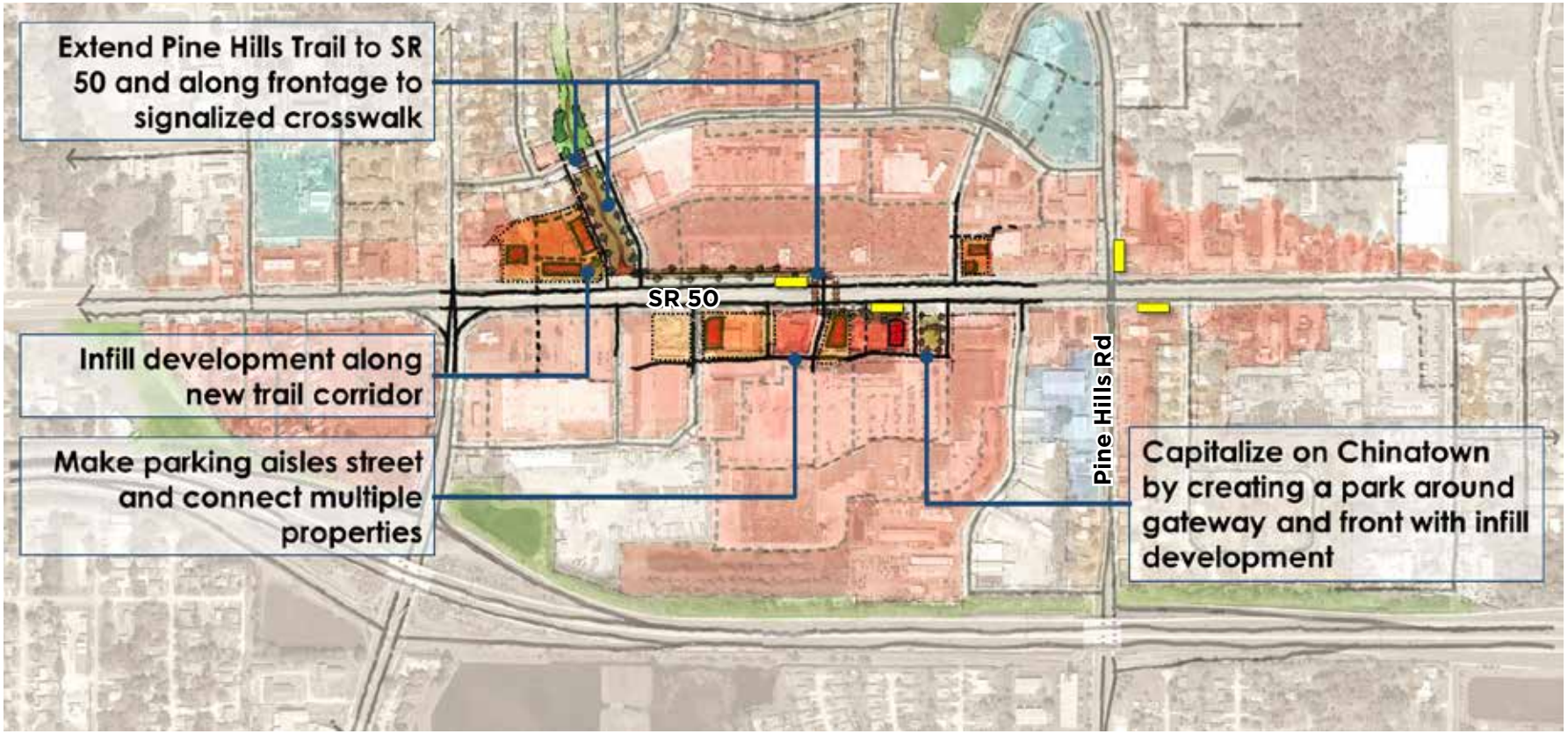
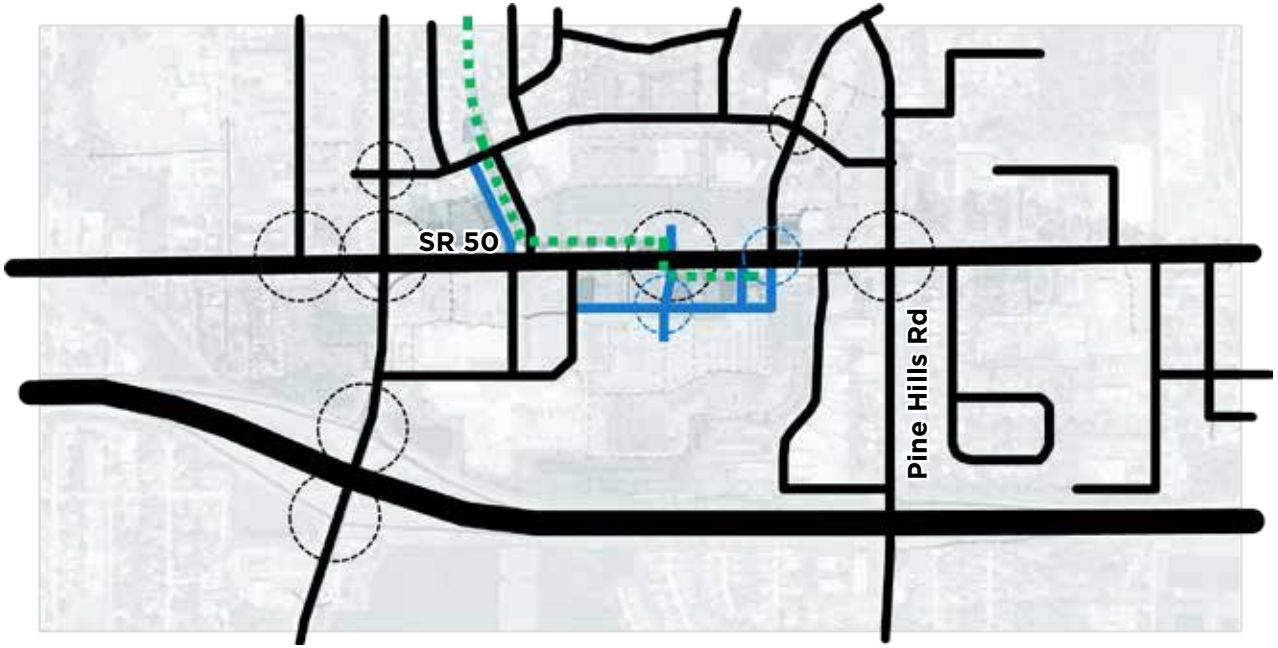


FIGURE 24 SR 50/PINE HILLS ROAD SHORT-TERM POTENTIAL STREET NETWORK



Pine Hills Trail Extension

New Roadway

Existing Signalized Intersection

Existing Four-Way Unsignalized Intersection

New Four-Way Unsignalized Intersection

FIGURE 25 SR 50/PINE HILLS ROAD SHORT-TERM POTENTIAL BLOCK STRUCTURE

New Block Created by New Network

New Open Space Created by New Network

NOTE: The scenarios presented on pages 72 & 73 are meant to illustrate a possible and hypothetical development scenario and provide tools to help understand how transit and transit-supportive development can influence the health of the community around the stations. These are not meant to indicate any approved or proposed plans.

SR 50/PINE HILLS ROAD STATION AREA ILLUSTRATIVE LONG-TERM SCENARIO

In the long-term, as redevelopment continues, the area may see additional streets connections and new intersections. The Pine Hills Trail could be connected all the way through the site and to the south. Parking could be placed internal to the site, with street alleys serving various land uses. SR 408 could be buffered by establishing taller office buildings to the south. The additional new streets will create significantly smaller sized blocks, more typical of an urban environment, forming a more walkable development pattern. The new development may incorporate shared green spaces of various sizes and may consists of a mix of uses, heights, and densities.

FIGURE 26 SR 50/PINE HILLS ROAD ILLUSTRATIVE LONG-TERM SCENARIO

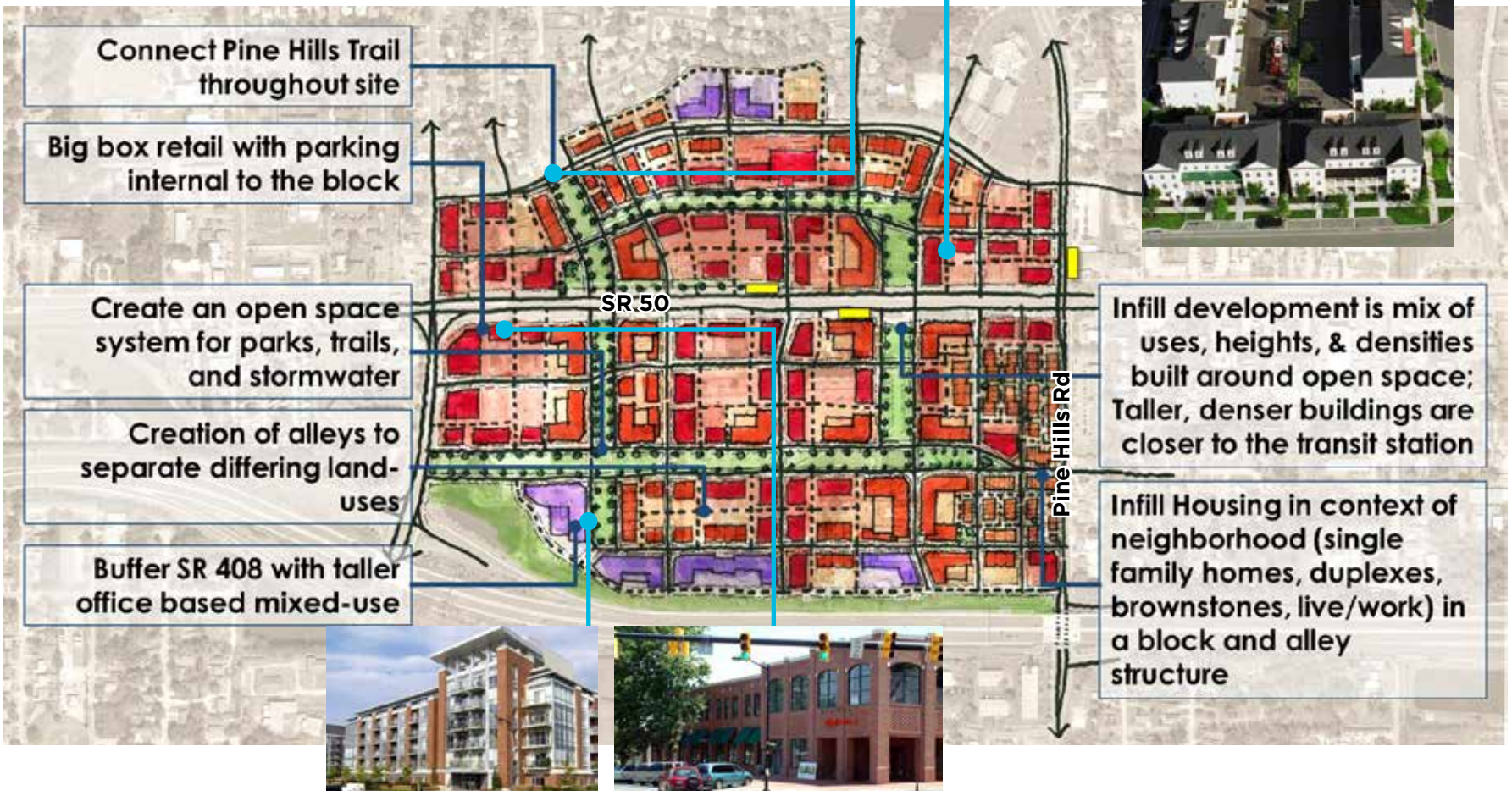
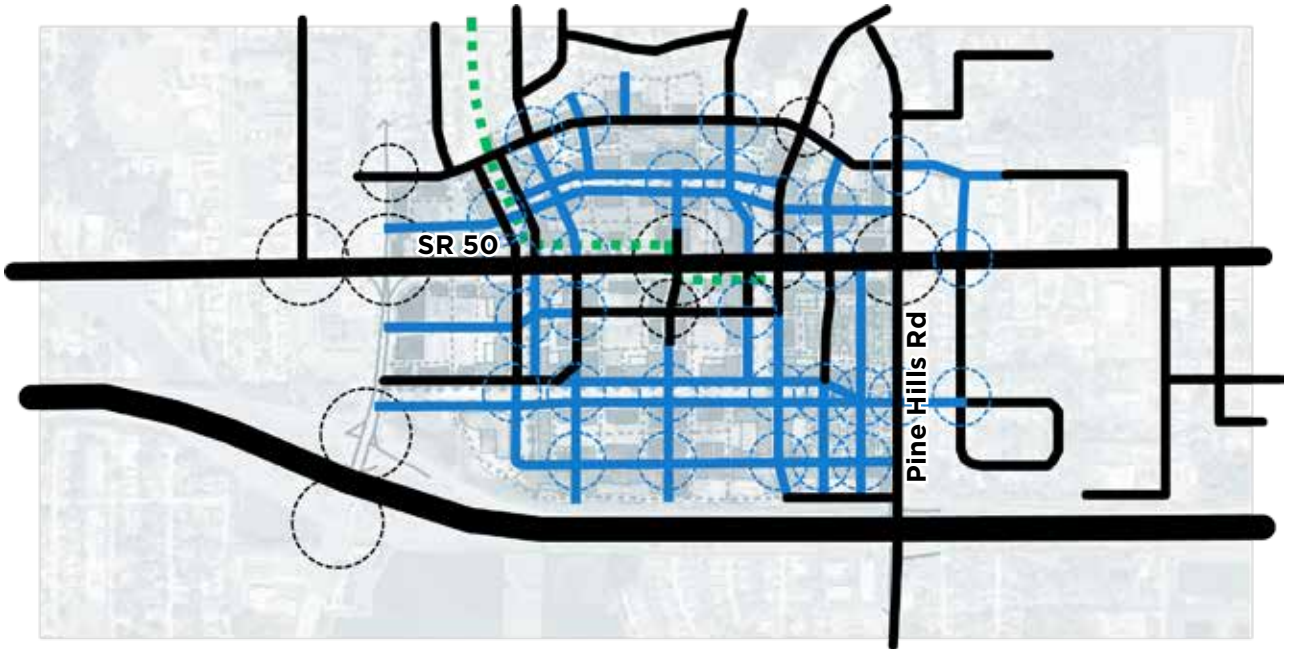


FIGURE 27 SR 50/PINE HILLS ROAD POTENTIAL LONG-TERM STREET NETWORK



Pine Hills Trail Extension

New Roadway

Existing Signalized Intersection

Existing Four-Way Unsignalized Intersection

New Four-Way Unsignalized Intersection

FIGURE 28 SR 50/PINE HILLS ROAD POTENTIAL LONG-TERM BLOCK STRUCTURE

New Block Created by New Network

New Open Space Created by New Network

NOTE: The scenarios presented on pages 74 & 75 are meant to illustrate a possible and hypothetical development scenario and provide tools to help understand how transit and transit-supportive development can influence the health of the community around the stations. These are not meant to indicate any approved or proposed plans.

The short and long-term illustrative scenarios were evaluated to gauge how each scenario can influence the outcomes of the various health indicators. Table 26 provides a summary of measures related to each health indicator when comparing the short and long-term scenarios to the current conditions. The short and long-term scenarios resulted in significant increases in housing density, street connectivity, and green space; a significant decrease in average block size, and a modest traffic volume growth compared to the population and tax base added to the community. The development of a network of slower speed roads can also result in a lower potential for severe bike and pedestrian crashes.

TABLE 26 SR 50/PINE HILLS ROAD DEMONSTRATION AREA METRICS

HEALTH INDICATORS	METRIC		EXISTING	ILLUSTRATIVE SCENARIOS	
	TYPE	UNIT		SHORT-TERM	LONG-TERM
TRANSIT SUPPORTIVE LAND USES	Housing density	dwelling unit per acre	0.00	0.00	17
	Employees	number of employees	2,600	2,900	8,100
	Housing units	number of units	4	14	1,650
	Public streets linking north-south direction	linear feet	12,500	23,600	23,300
	Public streets linking east-west direction	linear feet	9,700	11,100	22,700
	Peak hours trip generated (traffic volume generated during peak hour)	trips	3,690	3,960	9,350
	Overall street connectivity	number of intersections	29	37	91
QUALITY OF LIFE/ SOCIAL COHESION	Publicly accessible parks and open space	acres	0	1.6	9.9
	Amount of Trails	linear feet	0	1,800	3,800
	Diversity of land use types per building	number of uses	1	2	3
	Diversity of housing types	number of housing types	1	2	3
	Average block size	acres	15	9	2
	Ability to allow land-use changes	number of blocks	8	13	38
OBESITY RATE	Average block perimeter (walkability)	linear feet	3,300	2,300	1,100
	Streets w/ ped/bike facilities	linear feet	22,000	24,800	46,300
	Streets w/ fronting uses/street trees	linear feet	0	7,800	237,900
PED/BIKE FATALITY/ INJURY RATE	Streets w/ 30 mph or less	linear feet	38,260	47,110	194,650
	Percentage of network with high potential for ped/bike incidents (no bike lanes, high speeds)	percentage	52%	47%	18%
	Percentage of network with low potential for ped/bike incidents (bike lanes, lower speeds)	percentage	48%	53%	82%

SR 50/SR 436 TARGET DEMONSTRATION AREA

The following illustrates a potential short-term and long-term development scenario for SR 50 and SR436 area. This station area is the western boundary of the Azalea Park district and it has the highest levels of pedestrian fatalities among all intersections in the SR 50 Study Corridor.

FIGURE 29 SR 50/SR 436 STATION AREA

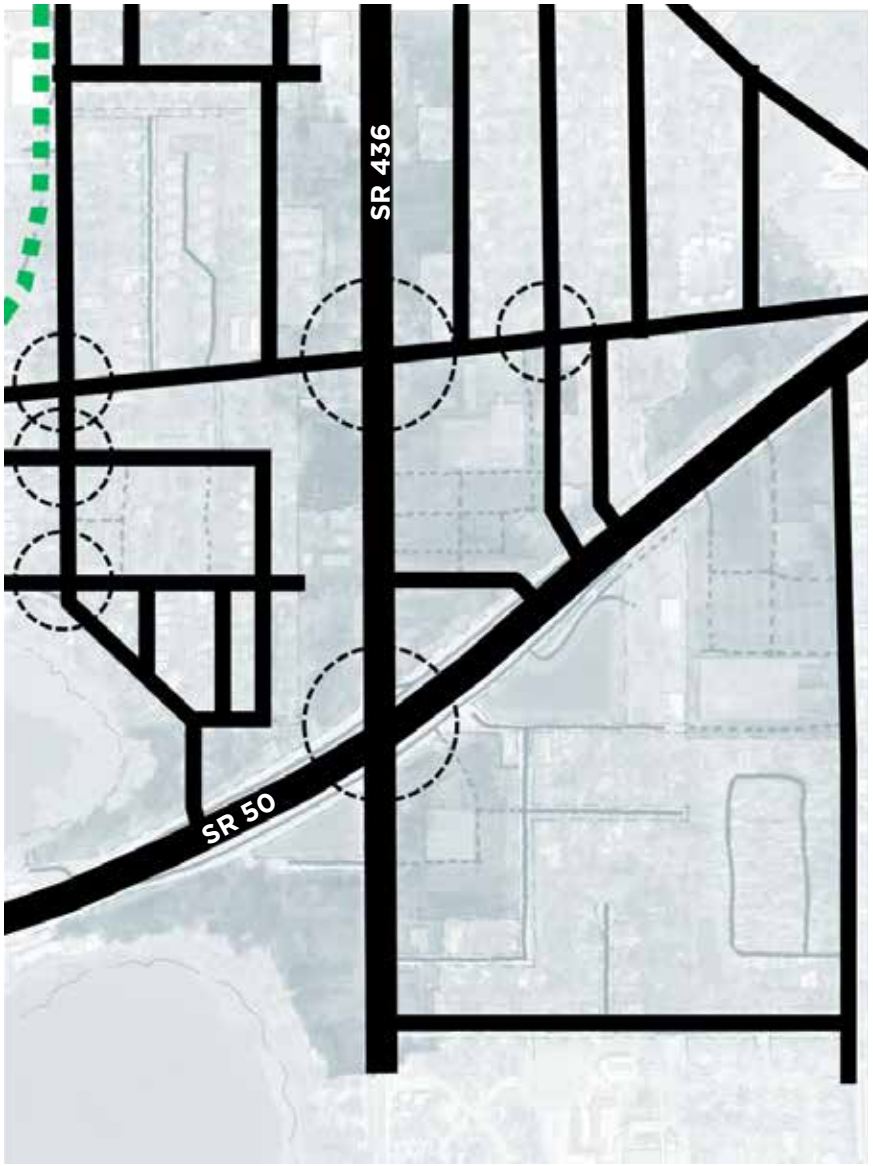
CURRENT CONDITIONS

Even though the majority of the SR 50 and SR 436 demonstration area currently holds a Special Area Plan designation, additional land use regulations defining what the County seeks in new development would further encourage land use patterns and mixes that could positively influence the HIA health indicators.

Block sizes along this sector are on average three times the size of standard block sizes (Figure 31). The land uses are primarily single-use commercial with large parking lots facing the roadway. In addition, the recent construction of the SR 50/SR 436 interchange has further created a hostile pedestrian environment. Several full intersections up and downstream of the interchange have been converted into "right-in, right-out" intersections, creating limitations in both pedestrian and vehicular connectivity. The limited connections and an environment that encourages higher vehicular speeds have caused motorists to utilize parking aisles as "streets" to cut through the large blocks (Figure 30).

An analysis of underutilized parcels determined there are several parcels that currently do not reach their maximum potential (Figure 33). A property is considered underutilized when its improvement value is at a threshold that may encourage the property owner to re-invest in the property (for the purposes of this study, underutilized properties are those that have improvement values that are less than 40% of the total building plus land value). These parcels have the highest likelihood for redevelopment and could serve as the catalyst for TOD to occur.

FIGURE 30 SR 50/SR 436 STATION AREA EXISTING STREET NETWORK



Existing Signalized Intersection

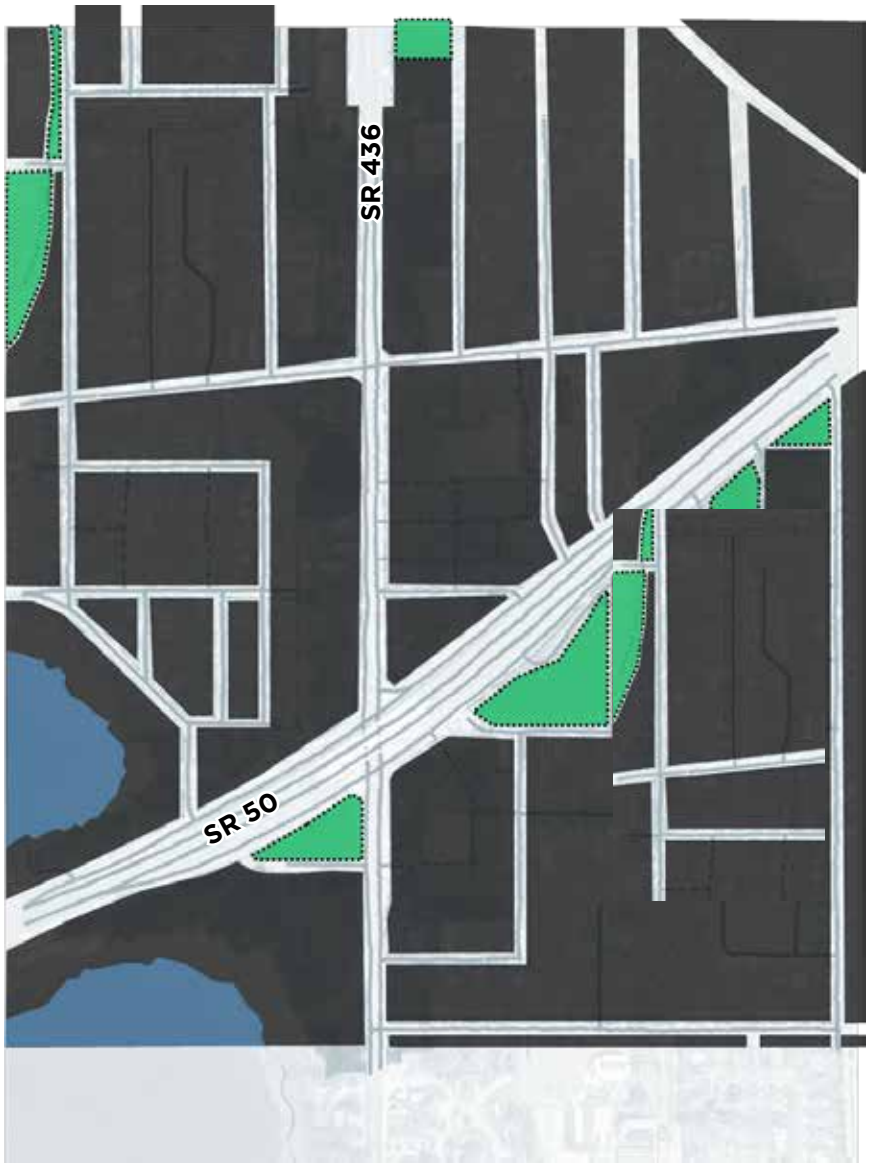
Existing Four-Way Unsignalized Intersection

Cady Way Trail Extension

New Roadway

New Four-Way Unsignalized Intersection

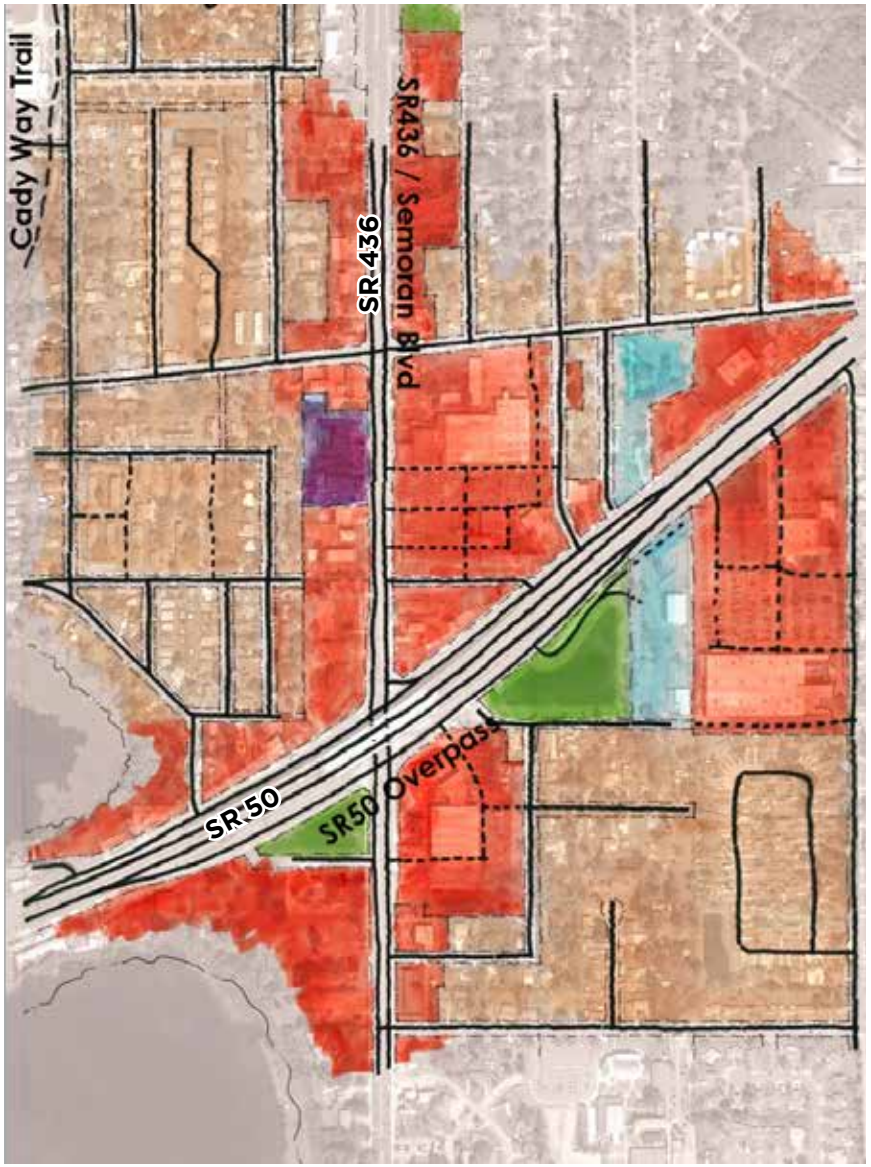
FIGURE 31 SR 50/SR 436 STATION AREA EXISTING BLOCK STRUCTURE



New Block Created by New Network

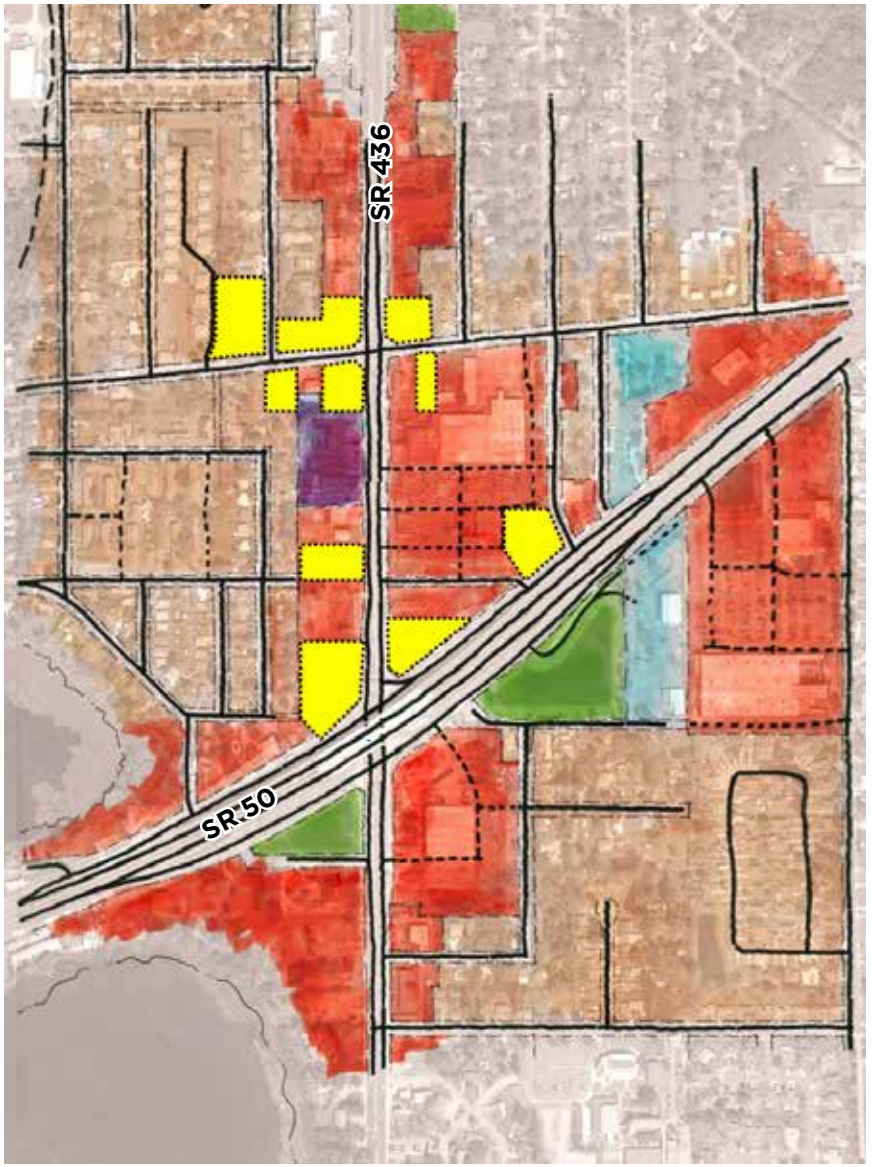
New Open Space Created by New Network

FIGURE 32 SR 50/SR 436 STATION AREA EXISTING LAND USES



Commercial
Residential
Institutional
Recreational
Underutlized Property

FIGURE 33 SR 50/SR 436 STATION AREA UNDERUTILIZED PARCELS



SR 50/SR 436 STATION AREA ILLUSTRATIVE SHORT-TERM SCENARIO

Redevelopment could occur in the short-term as individual infill of properties and likely on the underutilized parcels. As redevelopment occurs, some of the parking aisles can be rebuilt as streets. This will increase connectivity, break-up the large blocks, and improve overall walkability. The redevelopment could use this opportunity to create new shared open space/green space areas that could encourage physical activity.

FIGURE 34 SR 50/SR 436 ILLUSTRATIVE SHORT-TERM SCENARIO

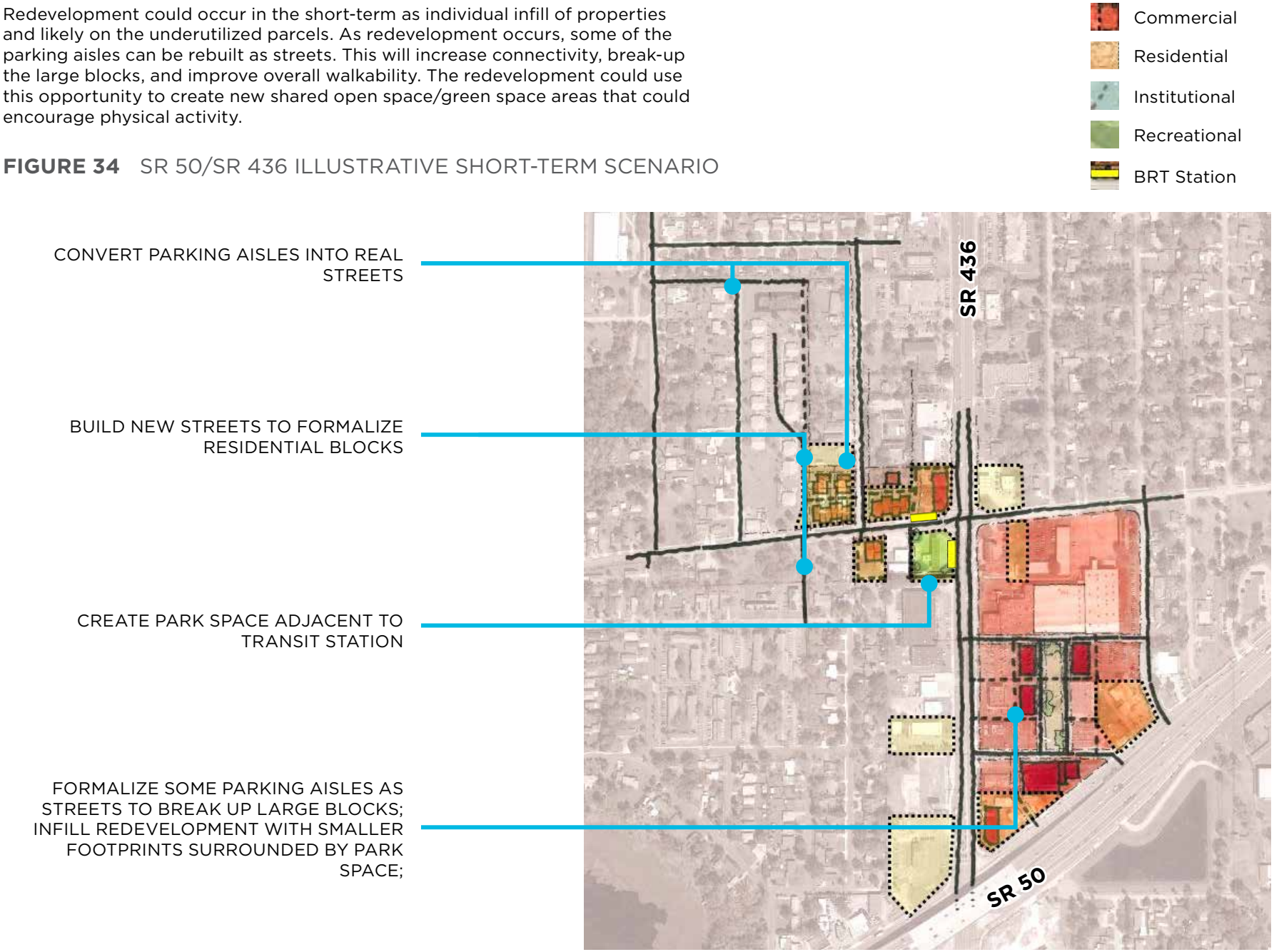
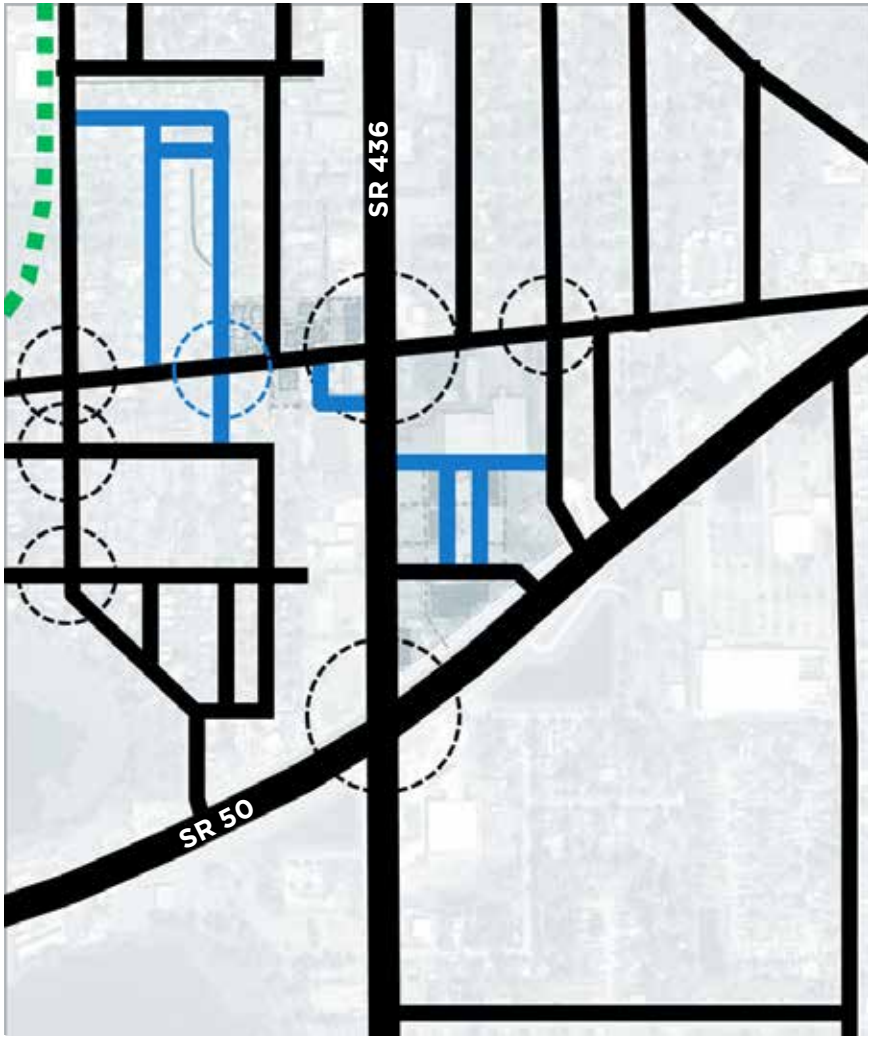


FIGURE 35 SR 50/SR 436 STATION AREA
SHORT-TERM STREET NETWORK



Existing Signalized Intersection

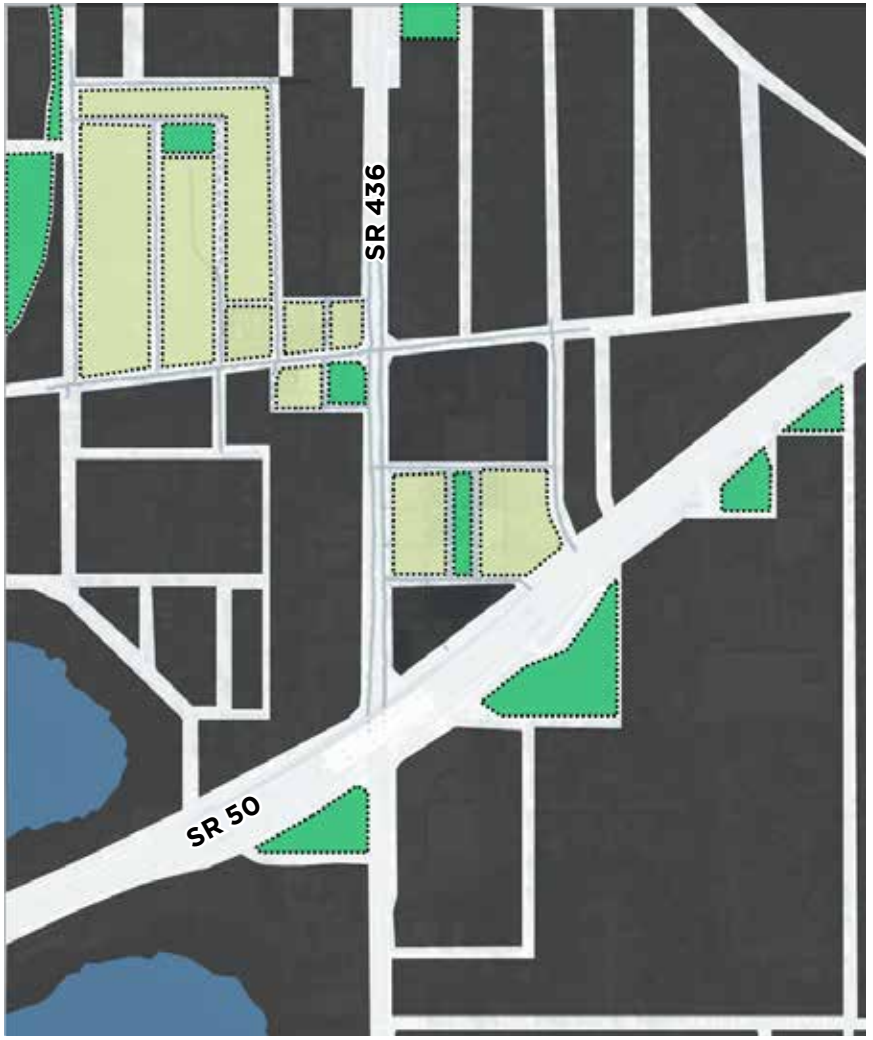
Existing Four-Way Unsignalized Intersection

Cady Way Trail Extension

New Roadway

New Four-Way Unsignalized Intersection

FIGURE 36 SR 50/SR 436 STATION AREA
SHORT-TERM BLOCK SIZE



New Block
Created by New Network

New Open Space
Created by New Network

NOTE: The scenarios presented on pages 80 & 81 are meant to illustrate a possible and hypothetical development scenario and provide tools to help understand how transit and transit-supportive development can influence the health of the community around the stations. These are not meant to indicate any approved or proposed plans.

SR 50/SR 436 STATION AREA ILLUSTRATIVE LONG-TERM SCENARIO

As redevelopment continues, the area may see additional streets connections and new intersections. The new streets will create smaller sized blocks forming a more walkable development pattern. The new development may incorporate shared green spaces of various sizes. This new green network can connect to the existing Cady Way Trail connection.

FIGURE 37 SR 50/SR 436 STATION AREA ILLUSTRATIVE LONG-TERM SCENARIO

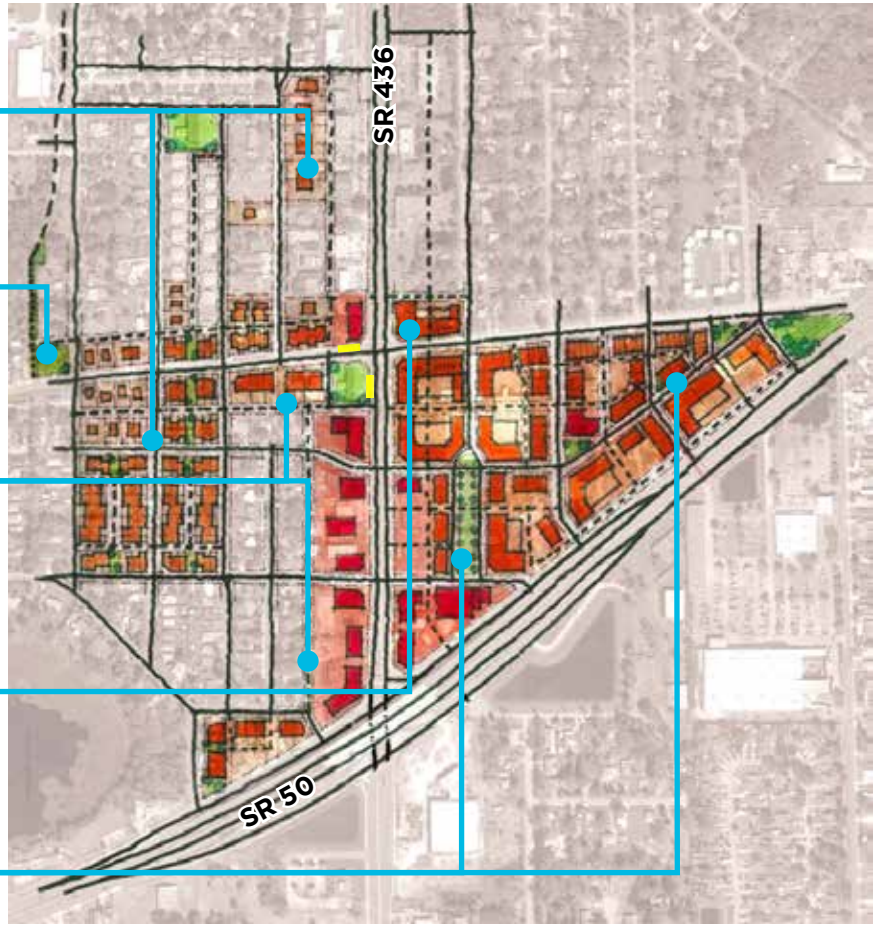
INFILL HOUSING (SINGLE FAMILY HOMES, DUPLEXES, TOWNHOMES, LIVE/WORK) IN A BLOCK AND ALLEY STRUCTURE

CONNECT TO CADY WAY TRAIL

CREATION OF ALLEYS TO DEFINE NEIGHBORHOOD EDGE AND SEPARATE DIFFERING LAND-USES

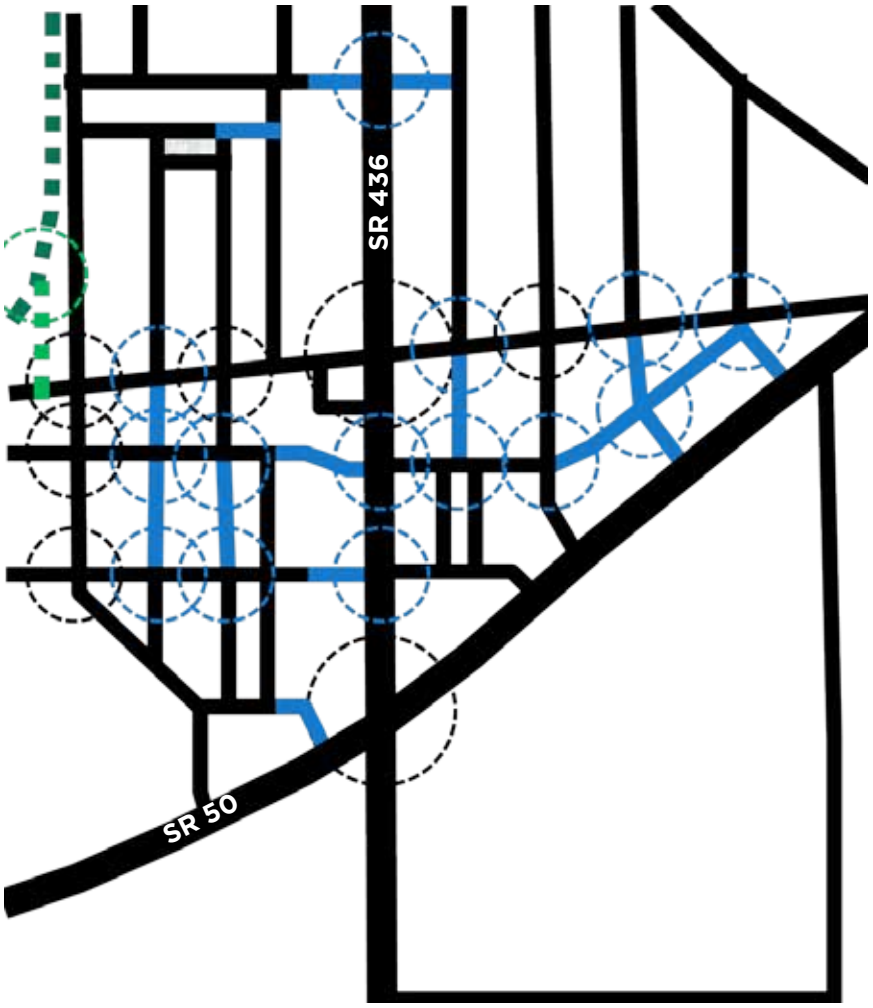
INFILL DEVELOPMENT WITH A MIX OF USES AND MIX OF HEIGHTS/DENSITIES WITH OPEN SPACE; TALLER, DENSER BUILDINGS CLOSER TO THE TRANSIT STATION, STEPPING DOWN IN DENSITY AND INTENSITY TOWARDS THE NEIGHBORHOOD.

BREAK UP BIG BLOCKS INTO SMALLER FOOTPRINTS SURROUNDED BY PARK SPACE



Commercial
Residential
Institutional
Recreational
BRT Station

FIGURE 38 SR 50/SR 436 STATION AREA
POTENTIAL LONG-TERM STREET NETWORK



Existing Signalized Intersection

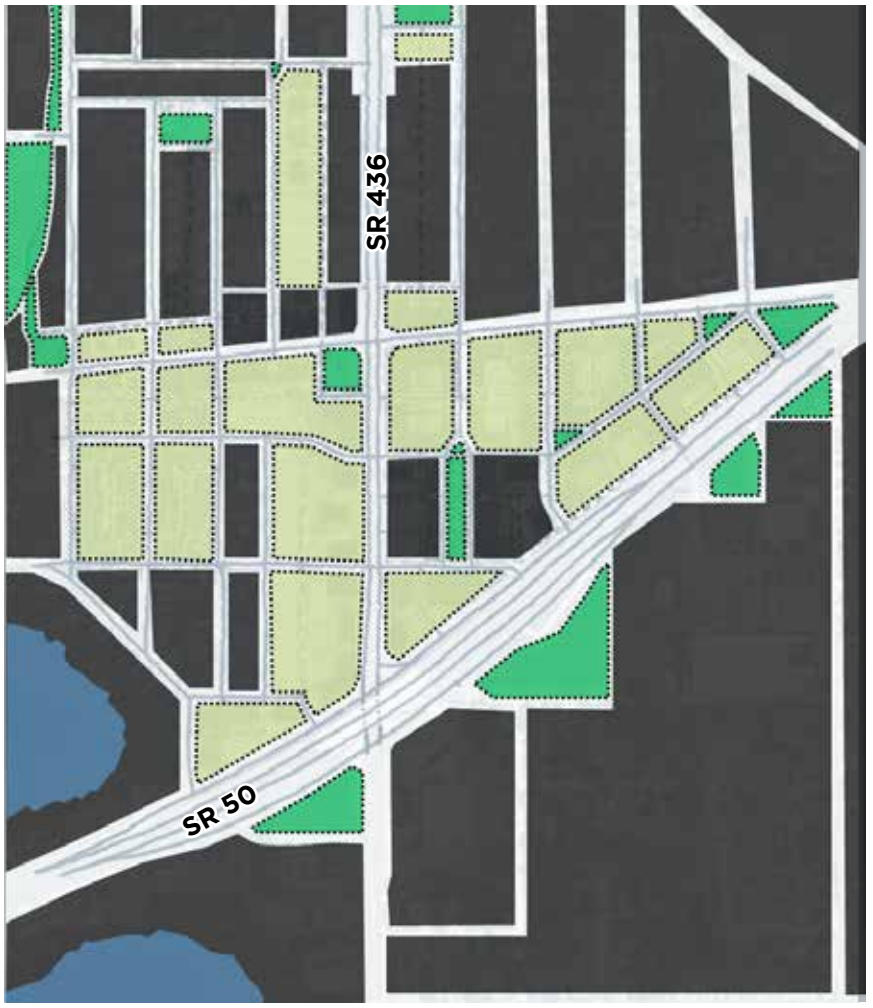
Existing Four-Way Unsignalized Intersection

Cady Way Trail Extension

New Roadway

New Four-Way Unsignalized Intersection

FIGURE 39 SR 50/SR 436 STATION AREA
POTENTIAL LONG-TERM BLOCK STRUCTURE



New Block
Created by New Network

New Open Space
Created by New Network

NOTE: The scenarios presented on pages 82 & 83 are meant to illustrate a possible and hypothetical development scenario and provide tools to help understand how transit and transit-supportive development can influence the health of the community around the stations. These are not meant to indicate any approved or proposed plans.

The short and long-term illustrative scenarios were evaluated to gauge how each scenario can influence the outcomes of the various health indicators. Table 27 provides a summary of measures related to each health indicator when comparing the short and long-term scenarios to the current conditions. The short and long-term scenarios resulted in significant increases in housing density, street connectivity, and trail space; a significant decrease in average block size, and a modest traffic volume growth compared to the population and tax base added to the community.

TABLE 27 SR 50/SR 436 DEMONSTRATION AREA METRICS

HEALTH INDICATORS	METRIC		EXISTING	ILLUSTRATIVE SCENARIOS	
	TYPE	UNIT		SHORT-TERM	LONG-TERM
TRANSIT SUPPORTIVE LAND USES	Housing density	dwelling unit per acre	0.0	1.6	8.3
	Employees	number of employees	1,700	2,900	3,700
	Housing units	number of units	490	534	1,720
	Public streets linking north-south direction	linear feet	29,400	32,200	33,000
	Public streets linking east-west direction	linear feet	15,900	18,200	19,200
	Peak hours trip generated (traffic volume generated during peak hour)	trips	2,720	4,140	5,770
	Overall street connectivity	number of intersections	43	65	84
QUALITY OF LIFE/ SOCIAL COHESION	Publicly accessible parks and open space	acres	0	10.3	12.0
	Amount of Trails	linear feet	0	0	475
	Diversity of land use types per building	number of uses	2	2	3
	Diversity of housing types	number of housing types	2	3	3
	Average block size	acres	11	6	2
	Ability to allow land-use changes	number of blocks	20	38	56
OBESITY RATE	Average block perimeter (walkability)	linear feet	3,000	3,800	1,100
	Streets w/ ped/bike facilities	linear feet	45,000	51,200	64,100
	Streets w/ fronting uses/street trees	linear feet	0	8,600	30,500
PED/BIKE FATALITY/ INJURY RATE	Streets w/ 30 mph or less	linear feet	36,350	42,600	46,000
	Percentage of network with high potential for ped/bike incidents (no bike lanes, high speeds)	percentage	19%	17%	16%
	Percentage of network with low potential for ped/bike incidents (bike lanes, lower speeds)	percentage	81%	83%	84%

SR 50/SR 434 TARGET DEMONSTRATION AREA

The following illustrates a potential short-term and long-term development scenario for SR 50/SR 434 station area. This station area is located in east Orange County at the intersection of two high volume roads between two major activity centers – UCF and Waterford Lakes.

CURRENT CONDITIONS

As seen in Figure 41, the SR 434 area has a very limited street network with a limited amount of signalized intersections. The land uses are primarily single-use commercial with large shopping plaza parking lots and outparcels fronting SR 50. Near the SR 50/SR 434 intersection the roadway exhibits a wide cross section, having seven 12' lanes and a posted speed of 45 mph. This makes for a difficult and often uncomfortable pedestrian environment through the heart of the station area. Block sizes along this sector are, on average, five times the size of standard blocks sizes with the largest blocks in the area being more than ten times the size of a typical city block (Figure 43). The limited connections and an environment that encourages higher vehicular speeds have caused motorists and pedestrians to utilize parking aisles as "streets" to cut through the large blocks (Figure 42).

FIGURE 40 A SR 50/SR 434 STATION AREA

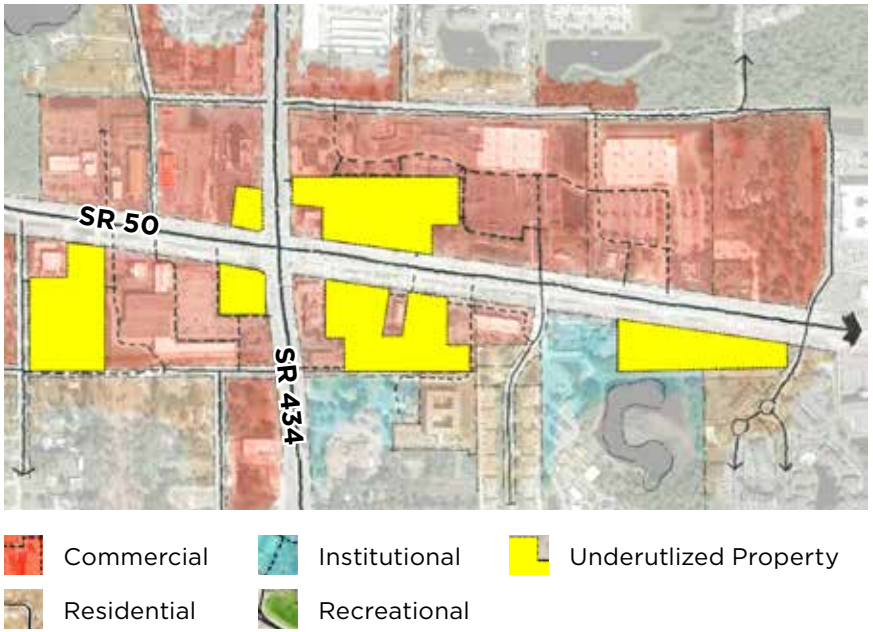
FIGURE 41 SR 50/SR 434 STATION AREA EXISTING STREET NETWORK

FIGURE 42 SR 50/SR 434 STATION AREA EXISTING BLOCK STRUCTURE

FIGURE 43 SR 50/SR 434 STATION AREA EXISTING LAND USES

An analysis of underutilized parcels determined there are several parcels that currently do not reach their maximum potential and tax capacity (Figure 44). A property is considered underutilized when its improvement value is at a threshold that may encourage the property owner to re-invest in the property (for the purposes of this study, underutilized properties are those that have improvement values that are less than 40% of the total building plus land value). These parcels have the highest likelihood for redevelopment and could serve as the catalyst for TOD to occur.

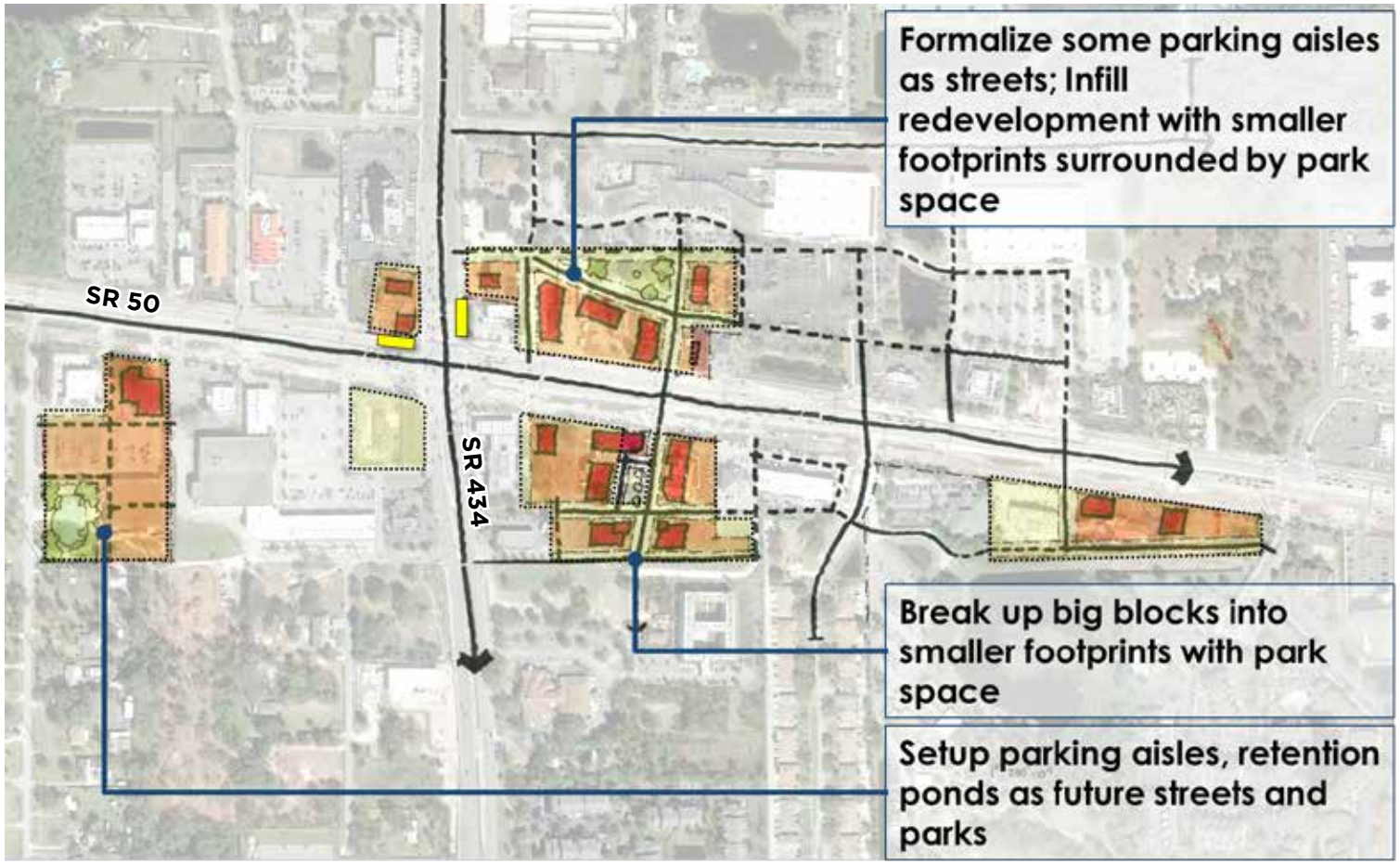
FIGURE 44 SR 50/SR 434 STATION AREA UNDERUTILIZED PARCELS



SR 50/SR 434 STATION AREA SHORT-TERM ILLUSTRATIVE SCENARIO

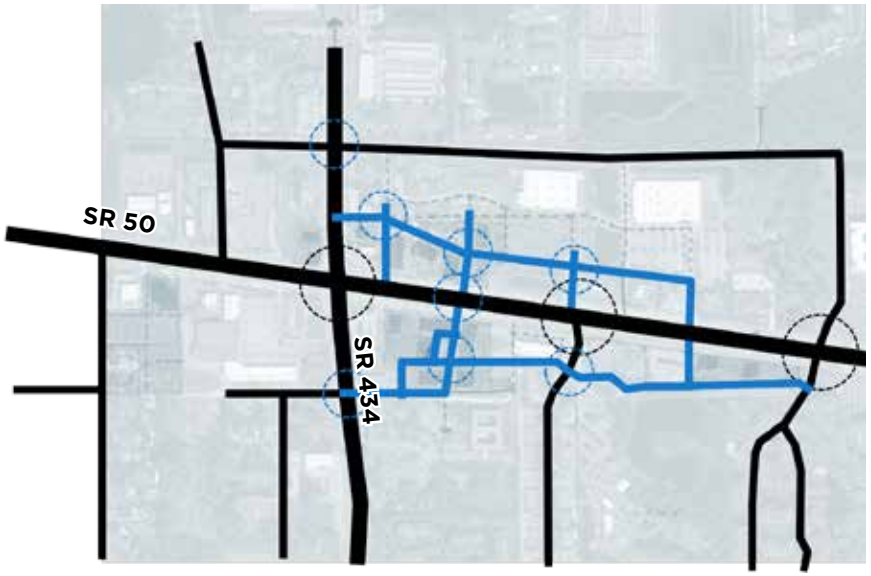
In this scenario, redevelopment could occur in the short-term as individual infill of properties and likely on the underutilized parcels. Parking aisles in the large parking lots could be formalized as streets, breaking up some of the large blocks and adding park space in the smaller footprint parcels. The new open space can be utilized to create new development blocks. This will increase connectivity, break-up the large blocks, and improve overall walkability. The redevelopment could use this opportunity to create new shared community open space areas that could encourage physical activity.

FIGURE 45 SR 50/SR 434 STATION AREA ILLUSTRATIVE SHORT-TERM SCENARIO



NOTE: The scenarios presented on pages 87 & 88 are meant to illustrate a possible and hypothetical development scenario and provide tools to help understand how transit and transit-supportive development can influence the health of the community around the stations. These are not meant to indicate any approved or proposed plans.

FIGURE 46 SR 50/SR 434 STATION AREA
SHORT-TERM POTENTIAL STREET NETWORK



Existing Signalized Intersection

Existing Four-Way Unsignalized Intersection

New Roadway

New Four-Way Unsignalized Intersection

FIGURE 47 SR 50/SR 434 STATION AREA
SHORT-TERM POTENTIAL BLOCK STRUCTURE

New Block
Created by New Network

New Open Space
Created by New Network

SR 50/SR 434 STATION AREA ILLUSTRATIVE LONG-TERM SCENARIO

In the long-term, as redevelopment continues, the area may see additional streets connections and new intersections. More drive aisles could be formalized as streets, creating a more walkable urban pattern. Residential uses could be scaled back as development comes closer to residential neighborhoods. The creation of open space, storm water retention, and park space could add to the potential for physical activity and an improved quality of life. The new development may incorporate shared green spaces of various sizes and consist of a mix of uses, heights and densities. This mix of uses could create much shorter trips,and more trips internally to the site, potentially reducing vehicle trips on SR 50.

FIGURE 48 SR 50/SR 434 STATION AREA ILLUSTRATIVE LONG-TERM SCENARIO

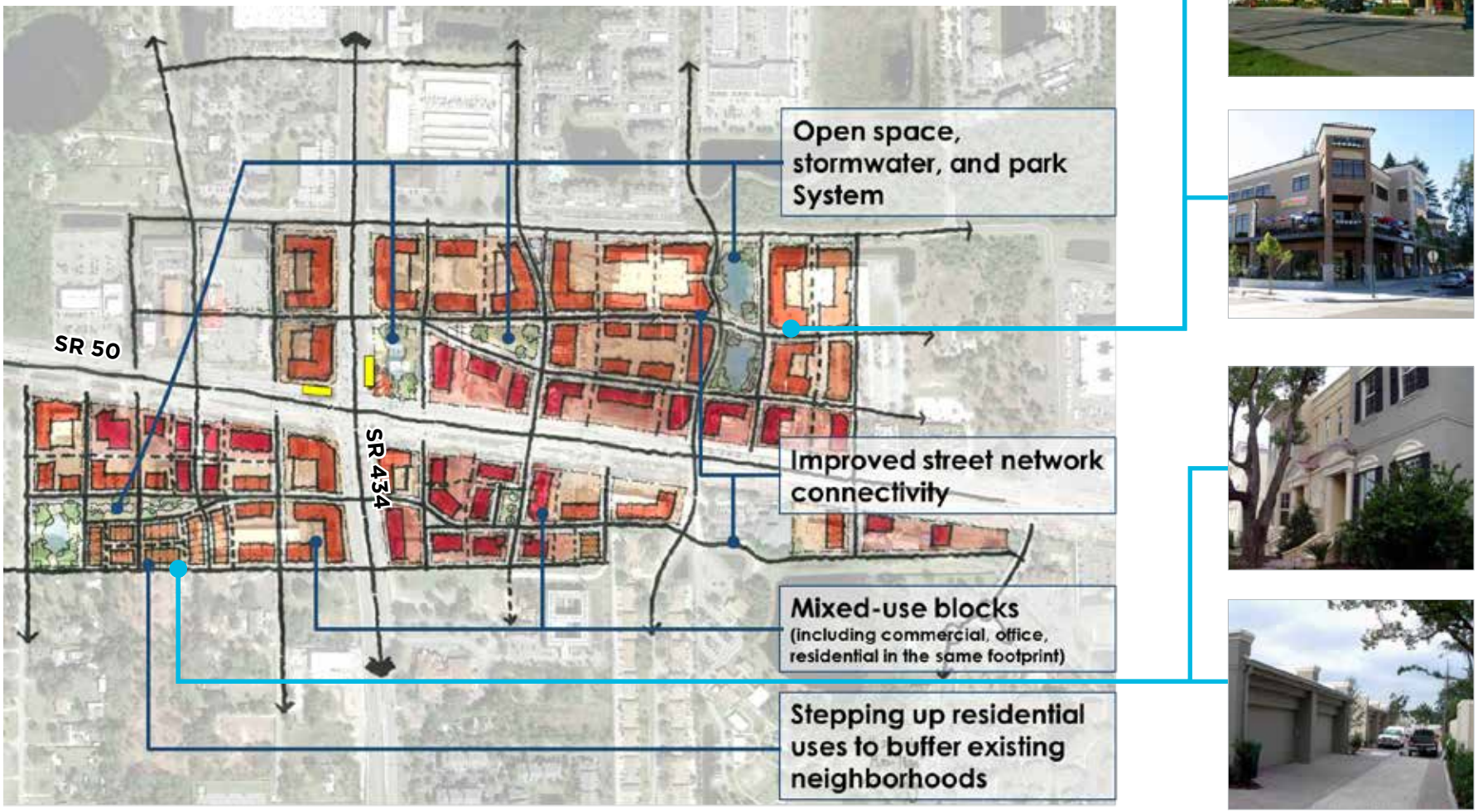


FIGURE 49 SR 50/SR 434 STATION AREA POTENTIAL LONG-TERM STREET NETWORK

New Roadway

Existing Signalized Intersection

Existing Four-Way
Unsignalized Intersection

New Four-Way
Unsignalized Intersection

FIGURE 50 SR 50/SR 434 STATION AREA LONG-TERM BLOCK STRUCTURE

New Block
Created by New Network

New Open Space
Created by New Network

NOTE: The scenarios presented on pages 89 & 90 are meant to illustrate a possible and hypothetical development scenario and provide tools to help understand how transit and transit-supportive development can influence the health of the community around the stations. These are not meant to indicate any approved or proposed plans.

The short and long-term illustrative scenarios were evaluated to gauge how each scenario can influence the outcomes of the various health indicators. Table 28 provides a summary of measures related to each health indicator when comparing the short and long-term scenarios to the current conditions. Similar to the other demonstration areas, the short and long-term scenarios resulted in significant increases in housing density, street connectivity, mix of land uses and green space; a significant decrease in average block size, and a modest traffic volume growth compared to the population and tax base added to the community. The creation of slower speed roads results in a lower potential for severe bike and pedestrian incidents.

TABLE 28 SR 50/SR 434 DEMONSTRATION AREA METRICS

HEALTH INDICATORS	METRIC		EXISTING	ILLUSTRATIVE SCENARIOS	
	TYPE	UNIT		SHORT-TERM	LONG-TERM
TRANSIT SUPPORTIVE LAND USES	Housing density	dwelling unit per acre	0.13	0.08	9.20
	Employees	number of employees	5,600	5,300	5,200
	Housing units	number of units	20	11	1,100
	Public streets linking north-south direction	linear feet	8,200	10,300	20,900
	Public streets linking east-west direction	linear feet	8,100	12,500	22,600
	Peak hours trip generated (traffic volume generated during peak hour)	trips	6,850	6,440	6,530
	Overall street connectivity	number of intersections	19	39	76
QUALITY OF LIFE/ SOCIAL COHESION	Publicly accessible parks and open space	acres	0	2.1	5.6
	Amount of Trails	linear feet	0	0	0
	Diversity of land use types per building	number of uses	1	1	3
	Diversity of housing types	number of housing types	2	2	3
	Average block size	acres	22	10	2
	Ability to allow land-use changes	number of blocks	7	25	38
OBESITY RATE	Average block perimeter (walkability)	linear feet	3,900	3,500	1,000
	Streets w/ ped/bike facilities	linear feet	2,900	22,800	41,400
	Streets w/ fronting uses/street trees	linear feet	0	6,700	31,300
PED/BIKE FATALITY/ INJURY RATE	Streets w/ 30 mph or less	linear feet	9,310	22,800	34,500
	Percentage of network with high potential for ped/bike incidents (no bike lanes, high speeds)	percentage	43%	23%	17%
	Percentage of network with low potential for ped/ bike incidents (bike lanes, lower speeds)	percentage	81%	83%	84%

RECOMMENDATIONS

RECOMMENDATIONS

The SR 50 BRT could catalyze significant land use changes that can help address the access, health and safety challenges of the corridor. However, two primary actions must begin taking place before additional recommendations from the HIA can be implemented. These primary recommendations and associated literature findings that support them are summarized below.

PRIMARY RECOMMENDATION # 1

FOR ORANGE COUNTY AND PARTNERING AGENCIES TO FUND CAPITAL AND OPERATING EXPENSES OF THE SR 50 BUS RAPID TRANSIT

Overview	***Related Literature Findings that Support Recommendation***
Public transit is a critical component to the Region's transportation system and is essential to the economic and quality of life of our citizens. Investment in the SR 50 BRT could provide access to job markets and educational facilities, increase transportation options for residents, and improve mobility of people, goods, and services along SR 50. In addition, the Orlando area needs to invest in transit in order to remain competitive with other metropolitan areas. Our Region's peer metropolitan areas have all significantly invested in premium public transit. Denver's 2015 budget proposal includes $1.26 billion dollars for transportation and affordable housing. Salt Lake City has spent $2.5 billion in recent years to expand their light rail and downtown circulator. By transporting people to work, school, local attractions, and healthcare facilities, public transit can reach into nearly every area of life, from public health to tourism. Studies show that public transit has encouraged growth and development, providing economic benefits to individuals and municipalities alike.	*Every $10 million in capital or operating investment in public transportation yields $30 million in increased business sales. (APTA, 1999)* *For every dollar invested in public transportation, four dollars are generated in economic returns. (APTA, 2015).* *Public transportation saved Utah travelers 1.3 million hours in travel time and $73 million in fuel and time costs. (APTA, 2007)* *The Cleveland HealthLine BRT has catalyzed $4.3 billion in development, while the tax base in the Boston Silver Line corridor has grown by 250 percent (compared to 150 percent citywide during the same period). (SGA, 2011)* *Expanding public transportation in communities with high unemployment produces up to 2.5 times more jobs compared to investing public transit in low unemployment communities. (SGA, 2011)*

PRIMARY RECOMMENDATION # 2

FOR FDOT, PARTNERING AGENCIES, AND GOVERNING BODIES TO ADOPT AND IMPLEMENT COMPLETE STREETS POLICIES ALONG THE SR 50 STUDY CORRIDOR

Overview	***Related Literature Findings that Support Recommendation***
Implementing a successful premium transit service requires investing in safe, quality pedestrian and bicycling access. Complete Streets policies focus on the safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Projects that enable the safe access for all users also encourage more multimodal travel and increased local business activity. Throughout the US, trips by foot, bicycle, and transit have increased after the completion of Complete Streets projects. Locally, the Edgewater Drive corridor has seen 77 net new businesses open and 560 new jobs created since 2008 when the corridor was rebuilt as a Complete Street. Since its completion, the value of property adjacent to Edgewater Drive has risen 80 percent, and the value of property within half a mile of the road has risen 70 percent. With a corridor that has seen more than 500 pedestrian and bicycle crashes in the last five years, implementing Complete Streets policies will also make the corridor a safer place to walk or bike. A Complete Streets approach fills in the critical first- and last-mile connections to transit stops and improves the overall connectivity of the street network. As every transit user is a pedestrian or a cyclist, without safe and convenient walking and bicycling infrastructure, the SR 50 BRT will have a smaller catchment area and capture fewer potential riders.	*60 percent of people walk to transit stops. Yet even if these stops are close by, walking to them can often be inconvenient or even dangerous. (APTA, 2007)* *Between 2009 and 2014, the Study Corridor had 509 bicycle and pedestrian crashes with 40 fatalities. (MetroPlan Analysis, 2015).* *Out of 37 Complete Street Projects, approximately 56 percent experienced a reduction in injuries. (SGA, 2015)* *Policies that increase the numbers of people walking and bicycling appear to be an effective route to improving the safety of people walking and bicycling. (Injury Prevention, 2003)*

Based on the SR 50 BRT HIA findings, the SR 50 BRT HIA Steering Committee developed a set of recommended actions to advance positive health outcomes as part of the SR 50 BRT project. The agencies listed as the lead or partnering entities to the recommendations are those that could potentially implement or support the recommendations. Some of the recommendations may already be incorporated into current local government and agency ongoing efforts. In these cases, the recommendations may be regarded as further support for such initiatives. To achieve the optimum benefits of the SR 50 BRT and take advantage of potential ongoing opportunities, recommendations should be advanced as soon as possible and should not be contingent upon the completion of the SR 50 BRT project.

In addition, each community within the Study Corridor is unique and has different needs and various policy and regulatory tools to address the concerns and recommendations. MetroPlan Orlando encourages local agencies and governing bodies to reach out to local communities and utilize existing organizational and policy mechanisms when implementing these recommendations.

ACCESS TO GOODS AND SERVICES		
POTENTIAL LEAD AGENCY	OTHER PARTNERING ENTITIES	RECOMMENDATIONS
LYNX City of Orlando Orange County Seminole County	Local Government's Parks and Recreation Departments	Promote transit connections to recreational opportunities by posting park and recreation maps in LYNX facilities, vehicles, and website; and posting LYNX bus route maps at Corridor recreational facilities, maps, and websites.
City of Orlando Orange County Seminole County	Department of Health Local Government's Community/ Economic Development Departments Community Development Fund Institutions	Promote the development of community hubs (civic, health, and recreational services) and program community and health-oriented events (farmer's market, health fairs, food trucks, etc.) within TOD areas.
LYNX Department of Health Winter Park Health Foundation	Social Service Providers Hospitals	Strategically market and educate existing and potential BRT users on BRT system and supporting feeder bus system with emphasis on health care facilities, social services, healthy food locations, etc.
Department of Health Winter Park Health Foundation	LYNX Social Service Providers Hospitals	Encourage service organizations to inform and link their constituents on available transit services.
LYNX	Social Service Providers Hospitals	Locate stations near health care offices and specialty clinics, especially those that serve children and elderly.
LYNX	Chambers of Commerce City of Orlando Orange County Seminole County Major Employers	Make transit-related materials (maps, bus passes, etc.) available throughout Corridor businesses (e.g. grocery stores, institutions, etc.)

INCREASE NON-AUTO TRAVEL		
POTENTIAL LEAD AGENCY	OTHER PARTNERING ENTITIES	RECOMMENDATION
MetroPlan LYNX Department of Health	Major Employers	Develop targeted marketing campaigns on health benefits of using transit for different user groups (existing riders and future choice riders) and promote physical fitness programs that link to transit use (e.g. incentives for employees to use transit, etc.).
FDOT City of Orlando Orange County Seminole County	Local Property Owners	Improve bicycle and pedestrian infrastructure around station areas to connect to major destinations/origins (schools, hospitals, parks, community centers, etc.), including sidewalks, crosswalks, pedestrian paths, and bicycle paths.
City of Orlando Orange County Seminole County	Local Property Owners Civic Users	Evaluate and improve connectivity from individual sites to public right-of-way that link major destinations/origins (schools, hospitals, parks, community centers, etc.)
MetroPlan LYNX FDOT	City of Orlando Orange County Seminole County	Develop a framework of premium transit service to connect with SR 50 BRT (SR 436, Phase II of SR 50 LPA).
City of Orlando Orange County Seminole County	Local Government's Planning and Zoning Departments	Consider regulatory changes that better support walkability, including regulations on pedestrian access and connections, block sizes, etc.
City of Orlando Orange County Seminole County	FDOT Local Government Public Works Departments	Improve bicycle and pedestrian streetscape amenities (e.g. benches, bicycle parking/lockers, shelters, etc.)
MetroPlan FDOT	Best Foot Forward Winter Park Health Found	Strengthen partnerships with bicycle and pedestrian safety organizations to increase bicycle and pedestrian safety education campaigns along the Corridor, especially in the high crash areas.
FDOT City of Orlando Orange County Seminole County	LYNX Local Government Public Works Departments	Improve wayfinding to transit routes and stations to and from major Corridor destinations, major thoroughfares, and shared-use paths.
MetroPlan ReThink	LYNX Juice Bikes Major Employers	Co-locate BRT and bike share stations at BRT stations and promote education on bike share and car share in relation to transit use.
MetroPlan LYNX FDOT	City of Orlando Orange County Seminole County	Maintain quality levels of service for transit (i.e. acceptable frequency, reliability, effective transit schedule communication, etc.)

ACCESS TO JOBS AND EDUCATION		
POTENTIAL LEAD AGENCY	OTHER PARTNERING ENTITIES	RECOMMENDATIONS
MetroPlan	Small Business Development Center (SBDC) Unemployment Centers Chambers of Commerce Career Source Central Florida LYNX	Develop marketing campaign to promote BRT and transit use to job training resources along the Corridor.
MetroPlan LYNX	UCF Valencia Barry University Full Sail Seminole State College	Collaborate with educational institutions along the corridor to understand and address any opportunities for SR 50 BRT to support staff and student needs, including off-peak hour activities or evening classes. Encourage Florida State Legislature to allow "colleges" (Valencia College, Seminole State College) to provide transit subsidies for students.
FDOT	FDOT (ReThink) LYNX	Include BRT service as part of ReThink campaigns and programs.
LYNX	Large Employers	Implement transit services that match users' needs, including special consideration for weekend and evening workers and those with varying shift schedules.
MetroPlan LYNX ReThink	Career Source Central Florida Central Florida Transportation Task Force Major Employers	Market and educate users, with emphasis on major employers and educational institutions, on BRT system and supporting feeder bus system.
LYNX	City of Orlando Orange County Seminole County	Locate stations near employment centers/concentrations.

ENCOURAGE ECONOMIC DEVELOPMENT		
POTENTIAL LEAD AGENCY	OTHER PARTNERING ENTITIES	RECOMMENDATION
City of Orlando Orange County Seminole County East Central Florida Regional Planning Council	Sustainable Communities Regional Planning Grant Housing Consortium (ECFRPC)	Preserve existing attainable housing (housing units that are affordable by those whose income is below the median household income) and support the development of attainable and mixed-income housing around station areas
City of Orlando Orange County Seminole County	Local Government's Planning and Zoning Departments	Consider zoning and regulatory changes (i.e. allowing for mix-use patterns, cross-access easements, reduction in parking minimums, etc.) and implement strategies to incentivize developers and property owners to consider TOD patterns (i.e. streamlined permitting, planning and design guidance as part of development review)
City of Orlando Orange County Seminole County	Local Government's Planning and Zoning Departments	Encourage pedestrian and bicycling infrastructure investments within station areas through overlay districts.
LYNX City of Orlando Orange County Seminole County	Large Property Owners Major Businesses	Consider establishing shared parking agreements with property owners and business around station areas. Create incentives for shared parking; reduce the number of parking spaces required.
LYNX City of Orlando Orange & Seminole County	MetroPlan FDOT Large Property Owners	Participate in public/private partnership to develop TOD. Utilize FTA's Joint Transit Development program to encourage TOD around BRT stations.
LYNX	Main Streets Neighborhood Improvement Districts Neighborhood Services	Partner with local businesses to advertise BRT and promote TOD businesses along Corridor (e.g. advertising program to allow TOD businesses to advertise for free along the line)
City of Orlando Orange County Seminole County	Chambers of Commerce Central Florida Transportation Task Force	Consider designating economic development coordinators to help recruit, facilitate, and retain TOD-supportive businesses along the Corridor
City of Orlando Orange County Seminole County	Chambers of Commerce, Central Florida Transportation Task Force	Consider creating a special district or organization (e.g. neighborhood improvement districts, main street districts, etc.) to help engage chambers, property owners, businesses, and neighbors around transit stations to support TOD.
MetroPlan LYNX	City of Orlando Orange County Seminole County	Establish an economic development website for the SR 50 BRT where businesses and residents can learn the benefits of the BRT and the incentives available to them.

MONITORING

MONITORING

As part of MetroPlan Orlando's ongoing relationships with Orange and Seminole Counties, and the City of Orlando, the MPO could track and document the impact of the SR 50 BRT on the health indicators described in this report. MetroPlan Orlando can also work with regional and local partners to incorporate priority recommendations from this HIA into decisions related to the Region's enhanced transit system. This monitoring plan seeks to determine the following:

WHICH RECOMMENDATIONS PROVIDED IN THIS HIA HAVE BEEN ENACTED TO PROTECT AND IMPROVE HEALTH?

WHAT EVIDENCE IS THERE FOR CHANGES IN COMMUNITY HEALTH AS A RESULT OF THE BRT'S DEVELOPMENT AND OPERATION?

WHAT EVIDENCE IS THERE FOR CHANGES IN COMMUNITY HEALTH AS A RESULT OF THE HIA'S RECOMMENDED ACTIONS?

The following outlines general baseline numbers referencing data currently available. Where data is not readily available at a corridor level, the next higher level of geographic scale was used (census block, census block group, census tract, zipcode, or county-wide). Where a larger geographic scale data was used, the measure was adjusted proportionally to the corridor's size. These numbers can be updated when monitoring occurs and when more refined/granular data is available at the time of monitoring.

ACCESS TO GOODS AND SERVICES			
INDICATOR	RESPONSIBLE AGENCY	TIMING	BASELINE
Percentage of adults who have diabetes	Department of Health	Annual	10%
Percentage of adults who are obese			25%
Percentage of adults who have asthma			14%
Percentage of adults with a cardio vascular disease			7%
Percentage of adults participating in recommended level of physical activity			50%

ACCESS TO JOBS AND EDUCATION			
INDICATOR	RESPONSIBLE AGENCY	TIMING	BASELINE
Percentage of study corridor individuals with a high school degree	MetroPlan Orlando	Annual	51%
Percentage of study corridor individuals with some college education			17%
Percentage of study corridor individuals with a bachelors degree			12%
Number of net new businesses			0
Number of jobs created			0
Number of students utilizing the BRT	LYNX, Educational Institutions	2-Years	0
Average study corridor poverty percentage	MetroPlan Orlando	3-Years	22%

INCREASE NON-AUTO TRAVEL			
INDICATOR	RESPONSIBLE AGENCY	TIMING	BASELINE
Corridor transit ridership	LYNX	Annual	12,000 daily transit riders (corridor-wide)
Number of bicycle and pedestrian accidents	MetroPlan Orlando		100
Traffic congestion data			Varies
Number of pedestrians and bicyclist using the sidewalk	MetroPlan Orlando/ Orange County	2-Years	N/A
Number of users utilizing adjacent shared-use paths			N/A
Workers commuting by public transportation	MetroPlan Orlando	3-Years	0.5 %

ENCOURAGE ECONOMIC DEVELOPMENT			
INDICATOR	RESPONSIBLE AGENCY	TIMING	BASELINE
Study corridor population density	MetroPlan Orlando	2-Years	6 persons per acre
Average value of property adjacent to SR 50		5-years	$1,202,900
Average value of property within half a mile of SR 50			$384,200
Number of new businesses	MetroPlan Orlando/ Orange County	Annual	N/A

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REFERENCES

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