



HEALTHY MOBILITY FOR COMPLETE STREETS

Executive Summary

DECEMBER 2022



Introduction

The Hillsborough County TPO intends to improve public health outcomes while supporting community development, bicycle and pedestrian safety, and sustainability. The TPO would like to understand how implementation of Complete Streets treatments identified in its Long Range Transportation Plan (LRTP) may impact public health conditions and potentially reduce risk levels. VHB was hired by the TPO to perform this statistical assessment using the Healthy Mobility Model.

For complete documentation, please see the **Health Risk Assessment** technical memorandum and the **Complete Streets Scenario Planning** technical memorandum.

Health Risk Assessment

Within the United States, health outcomes are largely dependent on socioeconomic and environmental factors with health care only shaping 20 percent of a community's overall health. The built environment, such as access to jobs, cultural institutions, healthcare, housing and active transportation; community design conducive to walking; and environmental pollutants can support healthy behaviors or create obstacles that contribute to health inequities, leading to populations with a disproportionate burden of chronic disease.

Six chronic diseases are included in the geographic comparison as well as the Hillsborough County health risk assessment, discussed below. These chronic diseases are:



1. **High Blood Pressure**- also known as hypertension, high blood pressure is a risk factor for heart disease. Environmental factors that have been found to influence blood pressure include lead exposure and air pollution. Environmental factors can also influence related behavioral factors such as diet, stress, and lack of physical activity.



2. **Asthma**- An inflammatory condition of the lungs and one of the most common long-term diseases in children. Environmental factors that influence asthma include air pollution exposure, and exposure to allergens and pests. Other related factors include weight.



3. **Coronary Heart Disease**- A type of heart disease where the arteries of the heart cannot deliver enough oxygen rich blood to the heart and is often caused by high cholesterol. Air pollution, physical inactivity, stress, and unhealthy diet can all increase risk for coronary heart disease.



4. **Diabetes**- A chronic health condition that influences how the body produces or uses insulin and therefore how the body's cells have access to energy. Risk factors for diabetes include being overweight, physical inactivity, stress, and exposure to pollution.



5. **High Cholesterol**- When total blood cholesterol for adults who have been screened in the past 5 years is greater than 200 mg/dL. This is a risk factor for heart disease and stroke. Physical activity and healthy weight and eating can help prevent high cholesterol. It has also been found that fine particulate matter can contribute to high cholesterol levels.



6. **Obesity**- A chronic disease defined as an excessive amount of body fat, that puts people at risk for other diseases including those listed above as well as others. Environments lacking health food options, that do not promote physical activity, and that contribute to high stress have been found to influence obesity.

Other population health outcomes and behaviors that are closely linked to environmental conditions were also included in the geographic comparison:



7. Physical Inactivity- Defined by the CDC as adults reporting no physical activity in their leisure time. This may not cover physical activity undertaken commuting or in daily life but may capture much of the population that is not getting the CDC recommended amount of exercise. Physical inactivity increases risk for heart disease, diabetes, colon cancer, high blood pressure, obesity, osteoporosis, muscle and joint disorders, and symptoms of anxiety and depression.



8. Poor Physical Health- Defined by the CDC as adults who spend more than 14 days a month with poor physical health, including physical illness and injury. This self-reported measure may overlap with Chronic Disease, but also capture other aspects of health.



9. Mental Health- Defined by the CDC as adults who spend more than 14 days a month with poor mental health, which includes emotional, psychological and social wellbeing.

Population Health Outcomes Geographic Comparison

VHB conducted an assessment to understand how Hillsborough County population health outcomes compare on average to that of the State and Nation. The results of this assessment are included in **Table 1**. The county population has higher rates of asthma, diabetes and obesity than Florida overall. However, the county population has lower rates of high blood pressure, coronary heart disease, and high cholesterol than Florida overall. The county also has slightly higher prevalence of physical inactivity, poor physical and mental health days than Florida overall.

Table 1 Prevalence of Health Conditions by Geography

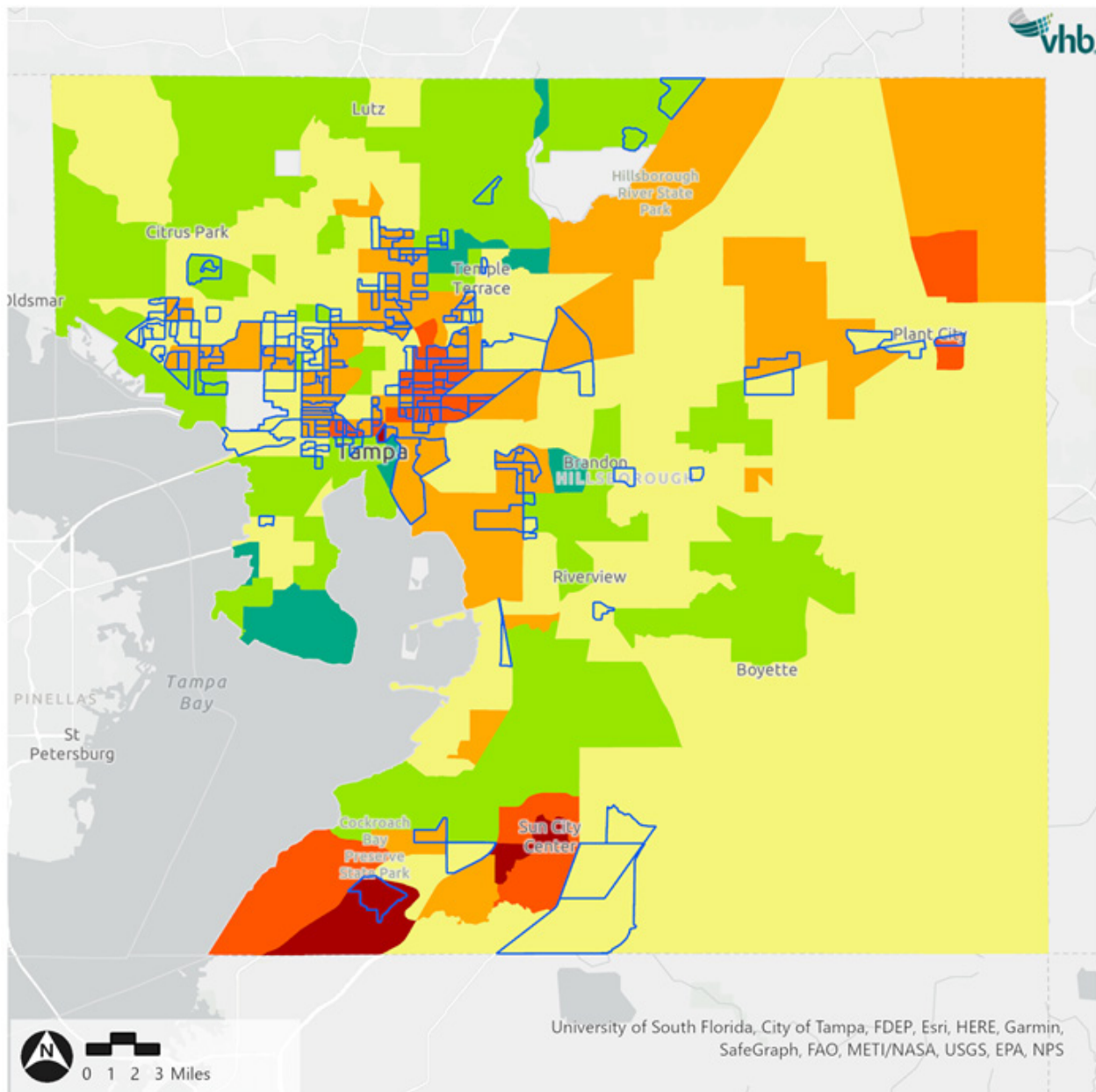
| Chronic Disease | Crude Prevalence (% of Overall Population) | | |
|------------------------|--|---------|----------|
| | Hillsborough ¹ | Florida | National |
| High Blood Pressure | 30.9 | 33.5 | 32.6 |
| Asthma | 8.1 | 7.3 | 8.9 |
| Coronary Heart Disease | 5.7 | 7.6 | 6.2 |
| Diabetes | 11.8 | 11.8 | 11 |
| High Cholesterol | 30.4 | 33.4 | 33.6 |
| Obesity | 30.4 | 28.4 | 31.3 |
| Physical Inactivity | 27 | 26.5 | 26 |
| Poor Physical Health | 13.5 | 10.3 | 12.5 |
| Poor Mental Health | 14.7 | 12.3 | 13.6 |

¹ Green highlighted cells show where the county population has better health outcomes than that of the state, while yellow highlighted cells show where the population has worse outcomes.

Sources: CDC, Division of Population Health. PLACES Data [online]. 2021. URL: <https://www.cdc.gov/PLACES/>; CDC, Division of Population Health. BRFSS Prevalence & Trends Data [online]. [BRFSS Prevalence & Trends Data: Home | DPH | CDC](#).

A county-specific assessment was also conducted for Hillsborough County to understand the geographic distribution of census tracts that are overburdened by chronic disease. This health risk assessment is intended to establish a baseline understanding of health conditions in the county, including Environmental Justice (EJ) Areas (as defined in the Plan Hillsborough Nondiscrimination and Equity Plan), which are block groups in the top 10th percentile of low-income households or racial/ethnic minority populations. A map of combined risk is shown in **Figure 1**.

Figure 1 Combined Health Risk Assessment, with Environmental Justice Areas



Source: CDC Places Data 2021, Plan Hillsborough Nondiscrimination and Equity Plan

Complete Streets Scenario Planning

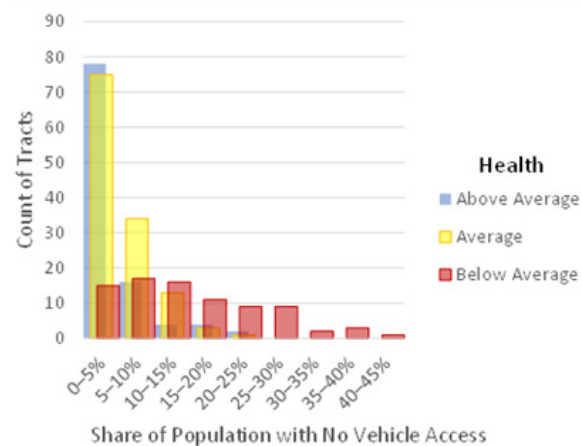
Following the Countywide health risk assessment, a scenario planning exercise was conducted to provide the County with tools to help identify and prioritize the roadways and appropriate elements for future improvements with a foundation grounded in healthy community design.

This assessment, detailed in the **Complete Streets Scenario Planning memorandum**, highlights the findings and relationships between determinants of health and health outcomes. Building on the countywide theme, the data and statistical analysis showed that an unequal distribution of wealth and resources is related to poorer health outcomes across Hillsborough County. Characteristics of urban form such as higher street intersection density and use of active means of transportation was found to be related to better health outcomes in diseases related to physical activity. However, closer proximity to the jobs in the urban center was not related to improved health outcomes, possibly due to social barriers of access. Higher traffic proximity and poor air quality were statistically associated with poor health outcomes across each chronic disease. Another key finding in this memorandum relates to the possibility that the benefits from being in dense places with higher walkability is negated by the exposures from a car-centric metro area and highways, or other elements that make it less comfortable or safe to use active facilities, such as high crash rates even when complete street characteristics are present.

Key Takeaways

- » Unequal distribution of wealth and resources is related to poorer health outcomes in Hillsborough County
- » Increased transportation cost burden is related to poorer health outcomes
- » Street intersection density is associated with better health outcomes across a number of categories, especially those related to physical activity.
- » Having greater access in close proximity to the urban center with jobs does not confer health benefits. This might speak to other social issues surrounding access to opportunity such as educational attainment. In categories such as asthma, having to drive further to reach destinations was associated with better health outcomes, and areas with a high share of car commuters were also associated with better rates of mental health than in areas with lower shares of car commuters.
- » The populations that rely on active means of transportation, may see some health benefits from this use, given that a higher share of car commuters equates with poorer health outcomes related to diseases associated with physical activity. However, the presence of active facilities such as bike lanes or greenways, did showed mixed significance. This may be because the quality or prevalence of active facilities is not such that they efficiently help people access the resources they need.
- » Higher traffic proximity and poor air quality was associated with poor health outcomes across the board. It is possible that the benefits from being in dense places with higher walkability is negated by the exposures from a car-centric metro area and highways, or other elements that make it less comfortable or safe to use active facilities, such as high crash rates. A higher rate of car crashes was found to be associated with poorer rates of physical health.

Figure 2 Distribution of Health Outcomes for No Vehicle Access Households



Health Outcomes tend to be below average as the share of population without vehicle access increases.

Prioritization Principles

When seeking to understand where complete streets project should occur, in addition to looking at high crash roadways, the TPO should prioritize:

Environmental Justice Communities

Social inequality is a major driver of health disparity in the county, therefore, mobility improvements should focus on serving the most vulnerable and those who have been, and continue to be, impacted by discrimination.



Health Burdened Communities

Communities that are overburdened by chronic disease (in the poor or below average categories) should be prioritized for improvements. The EJ community definition might not capture all of the intersectional facets of what creates an underserved community. Pairing the consideration with health risk can help capture who is not being best served by their environments.



Beyond prioritizing these areas, prioritization of treatment type should consider the following:

Improving Active Facilities Ratios

Increasing pedestrian street intersection density and active facilities in places with low presence of these facilities. The density and access of these features are linked to high cholesterol, a risk factor for coronary heart disease, as well as diabetes, physical activity, mental health, and physical health. This may include facilities such as pedestrian and bike infrastructure to serve as a means of recreation or to connect to important destinations.



Reducing Traffic Proximity and Air Pollution

In more urban context classifications (C4 and C5) treatments that are geared towards reducing traffic proximity and air pollution, as these areas bear the brunt of the car centric metro area while they have lower shares of the population using cars.



Improving Safety

Urban context classifications have a higher rate of all types of crashes, bicycle and pedestrian crashes, and serious and fatal injury crashes, which were tied to poor physical health outcomes. Treatments should be geared towards crash reduction and other safety counter measures to make active facilities more appealing.



Incentivizing Non-Car Commutes

Car commuters are most prevalent in more suburban context classifications (C2 and C3). Treatments should be focused on reducing the need to commute by car, which will also improve traffic proximity for more urban context classifications. Furthermore, high transportation cost burden is tied to poorer health outcomes, and cost burden is highest in more rural areas. Bolstering public systems or carpooling options, which are often less expensive than personal vehicle ownership, in rural areas, could help improve health outcomes.

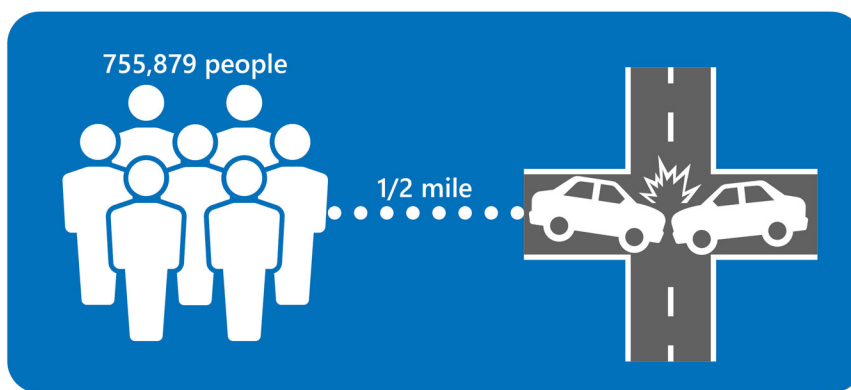


These are the overarching principles that can guide the selection of complete streets projects and treatments.

Potential Effects of Complete Streets Program on County Health Outcomes

If the TPO complete streets plan prioritizes areas that are chronic disease burdened and have higher rates of exposure to these variables, while focusing on treatments that have the most potential to reduce these exposures, over time it would likely make Hillsborough a healthier place to live. Approximately 755,879 people, or 51% of the County's population, live within a 1/2 mile buffer of the 350 miles of high crash corridors. Therefore, implementing complete street treatments on these corridors has the potential to provide safety, mobility and community health benefits to the majority of the County's residents.

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1/2 mile of the **350 miles** of high crash corridors



The overarching prioritization principles and associated complete street treatments identified in this study can help improve health outcomes by:

- Changing behavior and use of streets by both drivers and pedestrians;
- Promoting walking and using active forms of transportation, including public transportation, by providing amenities and making places safer to achieve physical activity;
- Reducing exposure to transportation-related emissions;
- Reducing vehicle-related injuries and fatalities; and
- Making streets greener and shadier, including at public transit stops.

ⁱ <https://www.vhb.com/healthy-mobility-model/>

ⁱⁱ University of Wisconsin Population Health Institute and Robert Wood Johnson Foundation, [County Health Rankings Model | County Health Rankings & Roadmaps](#)

ⁱⁱⁱ High Blood Pressure References: [How Cumulative Risks Warrant A Shift In Our Approach To Racial Health Disparities: The Case Of Lead, Stress, And Hypertension | Health Affairs; Environmental Hypertensionology The Effects of Environmental Factors on Blood Pressure in Clinical Practice and Research \(umich.edu\); Prevent High Blood Pressure | cdc.gov](#)

^{iv} Asthma References: [Asthma | CDC](#); [Understanding How Environmental Factors Affect Children's Asthma | US EPA](#)

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- v [Coronary Heart Disease - Causes and Risk Factors | NHLBI, NIH](#)
 - vi Diabetes References: [Environmental Risk Factors for Developing Type 2 Diabetes Mellitus: A Systematic Review - PMC \(nih.gov\)](#); [What is diabetes? | CDC](#)
 - vii High Cholesterol References: [Cholesterol Information | cdc.gov](#); [Study Shows Possible Link Between Air Pollution and Higher Cholesterol Levels | US EPA](#)
 - viii [Social and Environmental Factors Influencing Obesity - Endotext - NCBI Bookshelf \(nih.gov\)](#)
 - ix [Monthly Estimates of Leisure-Time Physical Inactivity -- United States, 1994 \(cdc.gov\)](#)