Intermediate Health Impact Assessment: Tice Community Connectivity and Redevelopment Plan HIA

Tice Health Impact Assessment Team

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Acronyms

BoCC – Lee County Board of County Commissioners
CIP – Capital Improvement Program
LGC – Local Government Commission
PACE EH – Protocol for Assessing Community Excellence in Environmental Health
SFWMD – South Florida Water Management District
TCCRP – Tice Community Connectivity and Redevelopment Plan
THCPP – Tice Historic Community Planning Panel
WALC – Walkable and Livable Communities Institute

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Executive Summary

This Health Impact Assessment (HIA) is designed to inform the Lee County BoCC regarding transportation and connectivity plans developed by the Tice Historic Community Planning Panel (THCPP). The purpose of a HIA is to assess the effects of a policy decision or plan on the health of residents. The HIA centers on walkability, neighborhood connectivity, multi-modal transportation including public transit and walking and bicycling, and traffic considerations. These are all issues that have relevant health implications. The health issues/topics addressed include physical activity and safety, air quality, public transit ridership, emergency response time, criminal activity, and social capital/civic engagement.

The entire Tice community will be affected by any decisions made regarding connectivity and transportation in their neighborhood. However, the poorest members and members of the Hispanic community will be disproportionately affected. The population of Tice is over 62% Hispanic. Poverty is most prevalent in the areas of Tice south of Palm Beach Boulevard where the majority of Hispanic residents live. Residents that live in poverty are less likely to own private motor vehicles and rely more heavily on public transport, bicycling and walking as their primary means of transportation. They are also more likely to rely on resources accessible by foot, bicycle or transit for food and other essential life services. As a result, they are more vulnerable to dangers inherent in the design of their neighborhood. Neighborhood residents are disproportionately affected by the features inherent to local transport, such as the design and placement of roadways, traffic calming devices, pedestrian crossings, and alternative transportation amenities. The focus on local transport helped to define the stakeholders in this decision. These include Tice residents, the THCPP, BikeWalkLee, Lee Department of Transportation, Lee Tran, and the organized Tice neighborhood associations.

This HIA compares the existing conditions, current road plans, and the Tice Community Connectivity and Redevelopment Plan based on the likely health effects. The recommendations of the HIA identify actions regarding Tice connectivity and redevelopment focus on policy decisions that can be implemented to minimize, mitigate or avoid adverse health effects and to optimize beneficial health effects. The conclusion of this HIA is that the Tice Community Connectivity and Redevelopment Plans are generally more beneficial when compared to the current conditions and existing road plans in terms of the health and safety of residents and visitors to the Tice Community, and are generally supported by the findings of this HIA.

Introduction & Background

The Florida Department of Health in Lee County (DOH-Lee), Florida Gulf Coast University (FGCU), and the National Association of County and City Health Officials (NACCHO) are conducting a Health Impact Assessment (HIA) of connectivity and redevelopment plans in the community of Tice in Lee County, Florida. The purpose of a HIA is to assess the effects of a policy decision or plan on the health of residents.[1] The Tice Community Connectivity and Redevelopment Plan HIA is a community-driven HIA wherein the community has created alternative proposals to current county plans for their own growth and redevelopment. Some portions of the county-based plans conflict with the community's vision for growth and redevelopment. This issue has been identified as one of the community's top priority issues through the Centers for Disease Control and NACCHO's Protocol for Assessing Community Excellence in Environmental Health (PACE EH) activities also being conducting in Tice.[2] This HIA will inform the Community Connectivity and Redevelopment Plan for the Tice Historic Community Planning Panel (THCPP), the Lee County Board of County Commissioners (BoCC), and other stakeholders.

The policy change is based on a community planning effort in the Tice community. In 2011, the Tice Historic Community Planning Panel (THCPP) began a community-based visioning and planning process under the administrative and funding guidelines established by Lee County. As part of this effort, the community developed a connectivity plan that, among other things, connects the community through a series of street gap improvements, bicycle facilities, and sidewalks. The final Tice Community Connectivity and Redevelopment Plan is anticipated to be submitted to the Lee County Board of County Commissioners for approval in the summer of 2015. It will include this HIA Report with the goal of informing policymakers on the health impacts of greater connectivity and Capital Improvement Project (CIP) plans.

The HIA Process

The HIA process helps evaluate the potential health effects of a plan, project or policy before it is implemented. It can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. The HIA brings potential public health impacts and considerations to the decision-making process for plans, projects and policies that fall outside the traditional arena of public health (Center for Disease Control, 2015).

There are six major steps in the HIA process (see Appendix VI):

Screening: Identify a plan, project or policy for which an HIA would be useful. Will the HIA provide some added value?

[1] HIAs are not designed to assess or estimate the costs associated with health improvements as a cost-benefit analysis may use.

[2] PACE-EH is a Centers for Disease Control initiative that describes a protocol for a community-driven process of identifying and implementing improvements for environmental health priorities.

Scoping: Identify the objectives of the HIA. How will the HIA be conducted?
Assessment: What are the baseline conditions and what are the positive or negative health implications of implementing the plan, project or policy?
Recommendations: Promote choices that will maximize positive health outcomes and minimize negative health outcomes.[3]
Reporting: Communicate the results, conclusions and recommendations to key stakeholders and decision-makers.
Monitoring and Evaluation: Monitor indicators to evaluate the process and determine the effect of the HIA.

Screening

Overview of the Screening Process
The screening process of a health impact assessment is based on the identification of a plan, project or policy for which an HIA would be useful. The screening process describes a proposed policy, plan, or project including a timeline for decisions and political and policy contexts. Following an initial description, the screening process states why a particular proposal was selected and provides the recommendations on whether the HIA is warranted.

In this HIA, the first step is to develop a screening checklist and process. A preliminary screening checklist was completed that included the value of and need for the HIA, the feasibility of conducting an HIA, and the receptiveness of the decision-making process (Appendix IV). Additionally, a preliminary stakeholder / partner list was created. Key stakeholders were informed of the Florida Department of Health in Lee County's (DOH-Lee) intention to conduct the intermediate HIA within the community.

The intermediate scale for this HIA was chosen to ensure that it would be completed within the required timeframe. The team assessed the work that has been completed and would be required and felt that an intermediate assessment would be most appropriate. The targeted completion dates for the HIA work and final assessment also coincide with anticipated planning decision milestones.

Significant efforts have been made by the DOH-Lee and FGCU to engage the community prior to embarking upon this HIA. The University has been a presence in the community for several years. Dr. Margaret Banyan, Associate Professor FGCU, is leading the effort to engage the community for this HIA. She also serves on the Tice Historic Community Planning Panel (THCPP) and conducted a rapid HIA on a street in the Tice community in 2013. She, the THCPP, Lee County Office of Sustainability, and others received a technical assistance grant to partner with the Local Government Commission (LGC) and Walkable and Livable Communities Institute

[3] All stakeholders were provided a draft copy of the HIA with a request for feedback on the report. Comments that were received are presented in Appendix X with the HIA Team's response.

(WALC) to conduct a walkability mini-charrette. The goal was to aid in the development and implementation of plans to implement a sustainable communities strategy for the Tice area (Local Government Commission and Walkable and Liveable Communities Institute, 2014).

Further, FGCU partnered with the Tice community to conduct a stakeholder assessment, a historic inventory, and is supporting the Protocol for Assessing Community Excellence in Environmental Health (PACE EH) data collection effort. In early 2015, FGCU, BikeWalkLee, and Goodwill Industries of SW Florida received a highly competitive grant from the Robert Rauschenberg Foundation to conduct biking and walking audits in the Tice area as a community engagement tool. The DOH-Lee began its third PACE EH project in Tice in early 2014. As part of this project, a community profile as well as a preliminary community needs assessment has already been completed. In addition to the community engagement and assessment work, an extensive literature search for similar health impact analyses has been completed.

Community Description

Tice is composed, in part, of a census designated place, Tice CDP. This is a good starting point for characterizing the community but it doesn't tell the complete story. The Tice community is larger than this. It is made up of a several neighborhoods that are inter-connected physically, socially, and economically. It includes Tice CDP as well as portions of Census Tracts (CT) 4.01 and 5.04. By consensus of local civic groups, the greater Tice community is defined as bounded by I-75 to the east, Martin Luther King Jr. Drive to the south, Prospect Avenue to the west, and the Caloosahatchee River to the north, with a total area of approximately 4.8 square miles (3,087 acres). The population of Tice CDP was 4,470 in 2010. Extrapolating from the CDP census data, the population of the greater Tice area is approximately 10,000. For the purpose of this HIA, we assume that the demographics of the residential portions of the greater Tice area mirror those of the CDP. Figure 2 below outlines the study area for this HIA.

Tice is a mixed-use, urban community composed of residential, commercial, and light Industrial areas. The residential areas vary quite substantially by race, income, age of housing stock and housing type. One of the major features of the community is Palm Beach Boulevard. Palm Beach Boulevard (SR 80) is a 4 to 6-lane divided highway that physically divides the neighborhoods into northern and southern portions. Lower income neighborhoods are to the south and more middle class neighborhoods lie to the north in closer proximity to the riverfront. Residents perceive the area closer to the waterfront as safe, while areas along Palm Beach Boulevard and to the south are perceived

Figure 1: Tice Community Snapshot

as high crime areas (VanasseDaylor Planning & Design Group).

Palm Beach Boulevard is designed to move cars quickly through the area. It has a 45 MPH speed limit and broadens to 6 lanes in the eastern portion of Tice. Without adequate street-scaping and appropriate traffic calming devices, this encourages motorists to speed. Inadequate pedestrian facilities and the lack of safety devices create conditions that foster one of the highest pedestrian/bicycle accident rates in Lee County. The entire corridor functions primarily to channel motorists speedily into and out of the Tice community (VanasseDaylor Planning & Design Group).

Demographic data for Tice CDP are summarized in Tables 21 – 29 of Appendix III. Tice CDP has a population of 4,470 residents with a population density of 4,064 per square mile. Tice is a relatively young community. The median age is 28.8 with 29% of the total population being under 18 years of age. 56.6% of the population is male and 43.4% female. 62.2% of the population is Hispanic or Latino. The percentage of households that fall below the national poverty threshold is 45.9% (United State Census Bureau, 2015).

Figure 2: Greater Tice Community Boundary Map

Perhaps resulting from the Palm Beach Boulevard thoroughfare, the Tice community has declined since its heyday throughout the 1920s-1960s. Businesses have left the community in large numbers in recent years. A major anchor grocery retailer, Publix, vacated the Morse Shores Plaza, and the Billy Creek Commerce Center business park occupancy has dropped from 85% to 35% since 2007 (Banyan & Suguri, 2014). The lack of commerce influences the rate of unemployment in the community which is estimated at 10.1% (Tice Employment Information, 2015).

Still, the commercial area along the Palm Beach Boulevard corridor provides significant potential for redevelopment. This corridor provides a connection between I-75 and the historic downtown district of Fort Myers. The riverfront area provides a venue for leisure and recreational opportunities.

Though the Tice area has experienced significant disinvestment, the civic community has remained active. The neighborhoods have created several civic organizations that are dedicated to improvement of the area. Yet, the members of the organizations are not representative of the general population and they continue to strive to overcome the engagement challenges associated with socioeconomic, racial, and language barriers.

The residential areas are a diverse mixture of single-family suburban neighborhoods and multi-family apartment complexes interspersed with both urban and suburban commercial sections. Undeveloped areas, vacant lots and green spaces create additional opportunities for redevelopment. There are also mixtures of transportation options including bicycle and pedestrian ways, public bus transit, private motor vehicles, and the potential for rail transit (VanasseDaylor Planning & Design Group). The Tice community has a grid network with good residential density. Residents already travel by transit, bike or on foot at a higher rate than almost anywhere else in the county, and LeeTran estimates the Palm Beach Boulevard and Ortiz Avenue corridors will have the highest ridership of any area by 2021. That said, this community also faces the highest incidence of bicycle and pedestrian deaths in Lee County (Local Government Commission and Walkable and Liveable Communities Institute, 2014).

The Tice community has a high level of poverty and, therefore, many of the residents do not own private vehicles. As a result, a relatively high percentage of the population uses public transit, walking and/or bicycling as their primary means of transportation.

While the community characteristics described above will present a significant challenge to this project, the HIA team has been able to build on past engagement efforts. For example, as described above, the community attracted a national technical assistance grant to conduct a "Mini-Charrette" that engaged Spanish-speaking school children and parents in a walkability audit (Local Government Commission and Walkable and Liveable Communities Institute, 2014). In addition, further community engagement efforts are planned in 2015-2016 through resident-centered bicycle audits hosted by Goodwill Industries of SW Florida, BikeWalkLee, and FGCU. Additionally, the community has developed a bicycle/pedestrian plan that proposes portions of the connectivity and redevelopment plan under consideration in this HIA. Finally, several of the

provisions and policies that have been previously adopted in Lee County (e.g. a Complete Streets Resolution, Lee Metropolitan Planning Organization Long Range Transportation Plan, etc.) support conducting an impact analysis prior to plan implementation.

Scoping

Overview of the Scoping Process

The scoping process of a health impact assessment identifies the overall objectives of the HIA. It includes elements such as summarizing the health determinants, identifying vulnerable populations, describing the research questions, data sources, and data gaps, as well as describing all the alternatives to the proposed action being assessed.

Using the Ortiz rapid HIA as a starting point, a scoping checklist was completed to reflect the scope and objectives of the intermediate HIA. The scope of the HIA included a focus on neighborhood travel and connectivity, and a comprehensive analysis of health impacts of decision alternatives. The geographical boundaries were defined and a stakeholder engagement process and evaluation measures were created (see Figure 2 above).

Affected Populations and Vulnerable Populations

The entire Tice community will be affected by the decisions made regarding connectivity and transportation in their neighborhoods, but the poorest and the Hispanic members of the community will be affected disproportionately. Poverty is most prevalent in the areas of Tice south of Palm Beach Boulevard. The population of Tice is over 62% Hispanic and the preponderance of the Hispanic population resides south of Palm Beach Boulevard.

Health Determinants

The HIA focuses on the following determinants of health:

- Public Transit Ridership
- Physical Safety
- Physical Activity and Safety
- Air Quality
- Social Capital and Engagement
- Emergency Response Times
- Criminal Activity

Connectivity has an impact on many aspects of a community; it can influence residents' health outcomes and overall sense of well-being. Integral to connectivity is the element of design. Good street design that features wide sidewalks, bike lanes, and pedestrian safety features (roundabouts or crosswalks) are also important to health outcomes. Neighborhood connectivity is related to pedestrian and bicyclist injuries and fatalities, rates of bicycling and walking, and interaction between neighbors.

There are several potential health impacts that the stakeholders considered important to consider as part of the widening project. Some of these impacts may be positive, while others may be negative.

Methodology and Data

Original Data

Researchers of the health impact assessment collected several forms of original data: bicycle pedestrian audit counts, and bus stop and crosswalk inventories.

The bicycle pedestrian counts (bike-ped audits) were conducted along major intersections of high bicycle and pedestrian volume within the Tice community. The intersections analyzed include Ortiz Avenue and Luckett Road, Ortiz Avenue and Ballard Road, And Palm Beach Boulevard and Tice Street. The bike-ped audits were conducted during peak travel times, such as weekends on which the large local farmer's market was in operation, and early morning near an elementary school. The benefit of conducting these bike-ped audits was the factor of anonymity. Researchers remained unseen during the audits and thus, resident behavior was unaltered based on the perception that individuals were being watched and analyzed. It should be noted that further, more comprehensive audits should be conducted over time to gather physical activity trend data.

Researchers also conducted surveys of public transit (LeeTran) bus stops on the routes which run through the Tice community. A survey tool was created by researchers to collect an inventory of bus stop features, and bus stops were rated based on their inventories.

Secondary Data

The table below reflects the health determinants, their respective research questions, and the secondary data sources utilized to obtain baseline data for the Tice Community. The last column of the table is the researchers' prediction of whether or not the health determinant will have an assumed health impact. Whether the health impacts are beneficial or adverse is to follow in the assessment portion of this HIA.

Table 1: Research Questions and Data Sources of Health Determinants

Health Determinant	Research Question(s)	Data Sources	Assumed Health Impact?
Public Transit Ridership	Given that public transit ridership is associated with better health outcomes, such as physical activity, will neighborhood connectivity increase rates of ridership in public transit options?	LeeTran Average Daily Ridership Stop Location; Bus stop inventory surveys	Yes

Physical Safety	Does neighborhood connectivity increase the physical safety of bicyclists, pedestrians, and all Tice community members?	Lee County Department of Transportation Crash Data; Lee County 2014 Traffic Count Report and Lee County Traffic Count Database System (TCDS)	Yes
Physical Activity	Will neighborhood connectivity increase rates of bicycling and walking among Tice Community members? Will walkability of the Tice Community increase physical activity?	2014 PRC Community Health Needs Assessment and Primary Data (Bicycle & Pedestrian Audits)	Yes
Air Quality	Will neighborhood connectivity improve air quality in the Tice Community?	Data Gaps; Lee County 2014 Traffic Count Report and Lee County Traffic Count Database System (TCDS)	Yes
Social Capital	Will neighborhood connectivity increase social capital?	Data Gap; Census tract and local available data on voting	Yes
Criminal Activity	Will neighborhood connectivity decrease the presence of criminal activity?	Annual Florida Department of Law Enforcement Reports	Yes
Emergency Response Times	Will neighborhood connectivity reduce emergency response times?	2007-2014 EMT Response Time Report – Tice Fire Department	Yes

The pathways diagram in Appendix II is an illustration of the potential relationships between health determinants and health outcomes that are relevant to this HIA.

Gaps in the Data

The baseline assessments were conducted for the Tice Community when relevant data were available and include the entire area of the Tice Community and its population as a whole. Limitations, gaps in data, and uncertainties are explicitly noted. The analysis of potential health impacts is based on relationships established in the research and current conditions.

It is important to acknowledge data gaps in order to increase transparency and aid the interpretation of the findings. Notable gaps in available data for this current HIA include:

- Tract-level local health data (morbidity/mortality) linked to the built environment
- Air quality neighborhood data
- Social capital data; neighborhood specific

- And data on physical activity by neighborhood (available primarily at the County level)

Future analysis on the connection between built environment and health outcomes at neighborhood level would strengthen this HIA project, and expanding the capacity to do so is an important future consideration.

Development of the Policy Alternatives

Alternative One: Existing Design

The existing design of the street and road network in the study area can be characterized as most connected streets with some gaps. This alternative can be described as the 'do nothing' or existing conditions alternative. The community has two major roadways that influence multi-modal transport throughout the area.

Palm Beach Boulevard. Palm Beach Blvd (State Road 80) is well known as Lee County's most dangerous roadway for pedestrians. In the most urban area of State Road 80, from downtown Fort Myers out to just east of Interstate 75, many lives have been lost over the years since it was widened. It previously featured an unrestricted left-turn lane (a road design that's often dubbed a "suicide lane"). After 2007, the middle lane was replaced with medians and pedestrian refuge areas with limited crosswalks spaced widely apart. Palm Beach Blvd is designated as an intra-state highway linking Florida's east and west coasts. This has meant that speed limits at 45 MPH are too high for its actual functionality in an urban area where businesses and housing areas are located (Lee County Metropolitan Planning Organization, 2011).

Ortiz Avenue. Ortiz Avenue is the only major north/south route through Tice from Palm Beach Boulevard to Martin Luther King Jr. Boulevard. It is a two-lane, undivided street with no turn lanes or bike lanes. It features a very small sidewalk on the east side of the street in close proximity to the roadway. The southern section (from MLK north to Ballard) is primarily industrial or light industrial. The northern section (from Ballard north to Palm Beach Blvd.) is primarily residential with neighborhood businesses and churches. The northern section is a considerably lower volume street, with roughly 4,000 fewer average daily trips than the southern section. Currently, the speed limit on Ortiz Avenue is 35 MPH.

Neighborhood Streets. Most of the neighborhood streets in the study area are 30 MPH. Due to historic development patterns, the streets are narrow with limited right of way available to build sidewalks or bike lanes. These streets are relatively low volume.

Alternative Two: Lee County Plan

The Ortiz Avenue widening proposal by county transportation planners has been a major subject of controversy within the Tice Community. The county's current plan (adopted September 17, 2014) is to widen Ortiz from Martin Luther King Jr. Boulevard (SR 82) to SR 80

(Palm Beach Boulevard), including on-road bike lanes and sidewalks on both sides, and increasing the speed limit to 45 MPH.[4] [5] [6]

One important aspect of the redevelopment plans involves Ortiz Avenue, which currently is a 2-lane, 35 mph road that traverses the middle of the Tice community from MLK Drive (SR 82) in the south to Palm Beach Blvd. (SR 80) in the north. Lee County has developed a plan to expand this section of Ortiz to a 4-lane, 45 mph divided highway from. This section would feature several right-hand only turns from neighboring side streets and additional left-hand turn lanes. If enacted, this plan would effectively divide the residential community down the middle, and the potential impacts on community health have not been taken into consideration.

Major Elements of the Lee County Plan:

- Focused on Ortiz Avenue Only
- Increased speed to 45 mph
- Adds bike lanes and sidewalks
- Widen lanes from 2 to 6 (including turn lanes

The Tice community is in opposition to this plan and has developed an alternative design for Ortiz Avenue as part of their more comprehensive community connectivity and redevelopment plan. The Ortiz expansion was the decision targeted by a rapid HIA conducted in 2013. That HIA was limited in scope and focused solely on the health impacts of the potential road widening. This intermediate HIA is more broadly-focused and includes the effects of overall community connectivity, and assesses the impact of redevelopment of the community as a whole. Additionally, the Tice Community Connectivity and Redevelopment HIA includes the collection of previously unavailable primary data for Tice.

[4] The current county design includes a statement that reads "Redesign anticipated to address community plan emphasis on walkability." (LCDOT 2014)

[5] The decision making and funding process that preceded the county's plans on Ortiz Avenue go as far back as adoption of the MPO's 2010 Long Range Transportation Plan (adopted in 1988) and has since been incorporated into the Lee County Capital Improvement Program. As the purpose of this HIA is to focus on health implications, this study does not provide a detailed account of the process of decision making.

[6] Several changes to the Lee County plan have been recommended and are in the process of approval. These are reflective of Alternative Three. However, for the purpose of clarity, this HIA only uses those approved and funded plans. These improvements include the following. The draft CIP under consideration by the BOCC in the budgeting process, contains two segments of Tice Street, a sidewalk on the south side of Tice Street (from Lynneda Avenue to Ortiz Avenue), and Tice Street (from Ortiz Avenue to Lexington Avenue). Lee County has also submitted Safe Routes To Schools grant applications for nine more streets segments, as identified in coordination with the Tice Historic Community Planning Panel. There are two segments funded by FDOT and under design on Richmond Avenue from Lexington Avenue to State Road 80 and Queens Drive from the Orange River Elementary School entrance to Richmond Avenue. Seven more segments are under review including filling gaps on Tice Street and Lynneda Avenue (along Tice Elementary School frontage), Waverly Avenue (north of Tice Street), Mississippi Avenue (north of Tice Street), and Alameda Avenue (from Palm Beach Boulevard to Shaw Boulevard). This also includes two segments of New York Drive (from Glenwood Avenue to Palm Beach Boulevard, and Beach Boulevard to Walter Street).

Alternative Three: Connectivity Plan

The Tice Community Connectivity and Redevelopment Health Impact Assessment (HIA) is a community-driven HIA wherein the community has created alternative plans for redevelopment and growth. The community-driven plans are proposed as an alternative to Lee County's current development and growth plans for the area.

Major Elements of the Community Alternative:

- Street Connectivity – Entire Tice Neighborhood
- Spread traffic throughout the neighborhood
- Maintains speed of 45 MPH on Palm Beach Blvd., 35 mph on Ortiz Ave., & lowers to 25 MPH on neighborhood streets
- Would constrain lanes to no more than 3 (including turn lanes)
- Adds additional bike lanes & sharrows
- Widens sidewalks
- Adds roundabouts
- Adds bus cut outs

The Tice Historic Community Planning Panel (THCPP) has been working on a "Tice Historic Community Plan" since 2011. This group is made up of individuals and businesses from all parts of Tice with a shared goal of reinvigorating the community. The panel's vision is to embrace its assets that include "historic homes, its central location, its uniqueness, and its multi-modal lifestyle". The THCPP considers Tice to have the "bones" of a great neighborhood: unique houses, a good street network, and close-in destinations that promote walkability. The THCPP also considers transportation to be a key driver of change.

THCPP investigated other options to develop transportation capacity throughout the neighborhood. The THCPP maintains that there are likely less expensive options for "right-sizing" Ortiz Avenue and distributing traffic throughout the area. On October 8th, 2012, the panel unanimously voted to support a walkable, two-lane option with a turn lane/median island and a speed limit of no greater than 35 MPH on Ortiz Avenue, north of Ballard Road consistent with the community's illustrations and vision. As a result of the panel's vote, the community proposed changes to the Ortiz Avenue road design north of Ballard, with the hope that the Lee County BoCC and LDOT will adopt these alternative plans. The Tice Community Connectivity and Redevelopment Plan is presented in Appendix I.

Alternative Comparison

The table below reflects a three-part comparison which analyzes the baseline existing conditions, the proposed infrastructure changes of the original Lee County Department of Transportation Road Widening Plan, and the proposed infrastructure changes of the Tice Community Connectivity and Redevelopment Plan. Understanding the comparison allows researchers to determine estimates for potential health improvements or disadvantages for the policy decision.

Table 2: Alternative Comparison

			Existing Design	Lee County Plan	Connectivity Plan[7]
Elements of the Plan	**# of Lanes on Ortiz**		2 [8]	4-7 (4 travel lanes plus left and right turn lanes)	3 (2 travel lanes plus turn)
	Speed Limit (mph)		30 (neighborhood) 35 (Ortiz) 45 (Palm Beach Blvd)	45 (Ortiz) 45 (Palm Beach Blvd)	25 (neighborhood streets); 35 (Ortiz Ave.) 45 (Palm Beach Blvd)
	Intersection Improvements	Roundabouts	None	None	Yes[9]
		Pedestrian Islands	No	No (medians only)	Yes, additional pedestrian islands
		Left Turn Lanes	No existing	21 feet (Ortiz),	Center Turn Lane (Ortiz)
	Bikes Lanes		n/a	4 feet	6 feet
	Sidewalks		4 feet	6 feet	10 feet
	Crosswalks and Pedestrian Signals		Minimal existing	Yes[10]	Yes[11]
	Bus Stop Improvements		Poor quality, no improvements	No Improvements recommended	Bus Pull Outs[12]

[7] See Community Connectivity Plan in Appendix I

[8] Additional turn lanes are at Ortiz /Palm Beach Boulevard, Tice Street, Luckett Road, Ballard Road, and Dr. Martin Luther King Jr. Boulevard

[9] Tice Street and Ortiz Avenue; Palm Beach Boulevard and Ortiz Avenue; Palm Beach Boulevard/ Tice / New York.

[10] Ortiz and MLK Blvd., Ortiz Avenue and Ballard Road, Ortiz Avenue and Luckett Road, Ortiz Avenue and Tice Street, Ortiz Avenue and Palm Beach Boulevard

[11] Tice Street/New York/Palm Beach Boulevard, in front of Morse Shores Shopping Center (at LeeTran bus stop location between Queens and E. Kingston Drive, Tice Street and Ortiz Avenue, Ortiz Avenue and Luckett Road, and Ortiz Avenue and Ballard Road, Ortiz Avenue and Garcia Avenue, Ortiz Avenue and Majorca Palms, Ortiz Avenue and Zana Drive, Ortiz Avenue and Glenwood Avenue

[12] From Palm Beach Boulevard to Ballard Road on Ortiz

Assessment

Overview of the Assessment Process

The assessment process within a health impact assessment describes the baseline health status of affected populations within each health determinant. Furthermore, it analyzes and characterizes beneficial and adverse health effects of the proposal and each alternative. The assessment portion of this HIA includes a literature review, baseline assessment, and identification of potential health impacts.

The following section is organized by health determinant and discusses current conditions, and potential impacts related to each research question.

Physical Safety

Research Question: Does neighborhood connectivity increase the physical safety of bicyclists, pedestrians, and all Tice community members?

The physical environment has a strong influence on the likelihood of injuries.[13] Specifically, road design matters for the number and severity of conflicts. Fatalities and injuries are related to road design factors such as design speed, intersection arrangements (roundabouts / pedestrian signals), lane widths and number of lanes, cross walks, bike lanes, and sidewalks. For example, wider roads increase crashes; whereas traffic calming and lower speed limits greatly reduce their occurrence (Morency et.al., 2012).

From an equity standpoint, there are significant neighborhood social inequalities in road crashes, injuries, and deaths. Two California studies on neighborhood exposure to motor vehicles showed greater likelihood of higher traffic volumes in the poorest census block groups (Morency et.al., 2012). This group also examined the extent to which differential road geometry explains social inequalities in pedestrian, cyclist, and motor vehicle occupant injuries across wealthy and poor urban areas. They found that there were significantly more injured pedestrians, cyclists, and motor vehicle occupants at intersections in the poorest areas. A substantial portion of the excess rate of road traffic injuries in the poorest urban areas can be explained by the roadway environment (Morency et.al., 2012).

[13] The traffic volume on roadways has an influence on the physical safety of residents. As moving vehicles are the primary cause of road crashes, the burden of road traffic injuries on population health is related to exposure to the risk of crashes. Therefore, risk exposure is related to traffic volume on streets and intersections; the greater the traffic volume the greater the risk. As a result, the number of injured pedestrians and cyclists is directly related to the number of people exposed. However, traffic volume is not considered in this HIA, as there is not a substantial community-wide difference in volume across the three alternatives. This might not be the case if this project were to assess an individual road. The connectivity plan proposes to move traffic in a different way, not reduce its volume.

Physical Safety - Speed

Background Literature

The relationship between automobile speed and physical health is well known. Increases in speed affect the seriousness of an injury and the numbers of people who suffer a fatality (Ewing & Dumbaugh, 2009). A policy alternative for raising speeds in a given area can increase the crash risk and fatality risk associated with driving at particular speeds. The Institute of Transportation Engineers (ITE)'s design guidelines researched the effects of speed limit increases on the crash and fatality risks associated with vehicles. The table below shows the synopsis of the guidelines on speed from the ITE (National Association of City Transportation Officials, 2015). [14]

Table 3: ITE Traditional Neighborhood Development Street Design Guidelines

Speed (MPH)[15]	Stopping Distance (FT)	Crash Risk (%)	Fatality Risk (%)*
10-15	25	5	2
20-25	40	15	5
30-35	75	55	45
40 +	118	90	85

There is also a difference between design speed and actual speed. Drivers respond to the design of the roadway, rather than the posted speed (Ewing & Dumbaugh, 2009). Other transportation planners recommend that roadways be designed for target speed, rather than a posted speed limit (Knoxville Transportation Planning Organization). This is due in part to the relationship between stopping distance and speed, where stopping distance is significantly longer at increased speeds. It is also due to the reduced focal point at higher speeds. The following graphics help to illustrate the point. In addition, Table 3 and Figure 3 [16] illustrate the increased stopping distances needed as speed goes up.

[14] While the posted speed limit does not dictate driver behavior (design speed is more effective for that purpose), this analysis did not conduct speed studies to determine actual speeds on streets in the Tice area. A comprehensive HIA may be more suited to assess actual speed.

[15] Source: Traditional Neighborhood Development: Street Design Guidelines (1999). ITE Transportation Planning Council Committee. *Fatality Risks reflects individuals involved in the crash.

[16] Source: Knoxville TPO, Designing Complete Streets. Knoxville Regional Transportation Planning Organization, http://www.knoxtrans.org/plans/complete_streets/Octpres_pt2.pdf

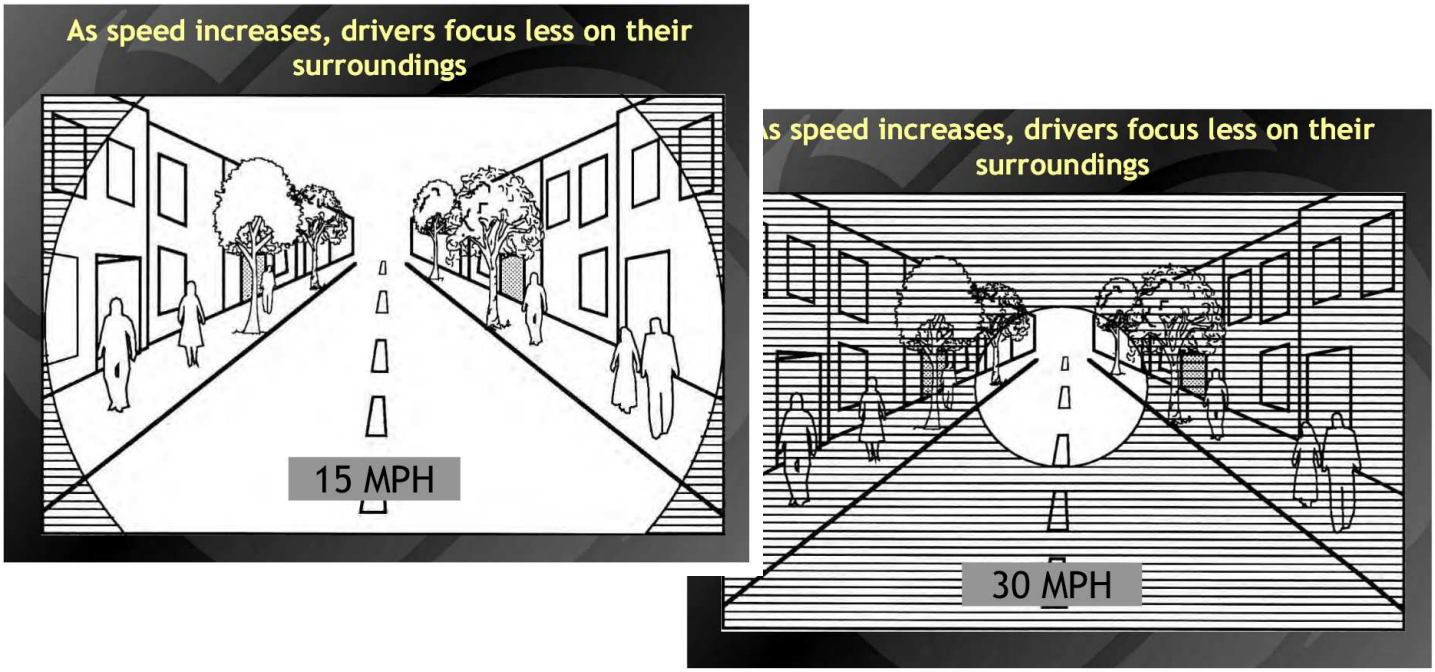

Figure 3: The effect of speed on focal point

Baseline Data

The major roadways within the study are currently posted at different speeds (see Table 4 below). Where the neighborhood streets are currently at lower limit, Palm Beach Boulevard is posted at a much higher speed. Based on the literature, it is not then surprising that Palm Beach Boulevard has a much higher fatality rate than the other streets in the study area. However, MLK Blvd in this area also has a much higher speed limit, but many fewer pedestrian and bicycle deaths. This difference is due to the dangerous mix of high pedestrian activity coupled with high speeds. Where MLK has a higher posted speed limit, it is less residential and has many fewer bicycles and pedestrians traveling in the area.

Table 4 below estimates the fatality risk based on the ITE estimates by street in the study area. As the table shows, simply based on speed, there is a much higher risk of a fatality on MLK and Palm Beach Boulevard. In other words, we can expect that an individual who is struck by a vehicle on MLK or Palm Beach Boulevard has a 40% higher risk of dying than they might on Ortiz Avenue or other neighborhood streets.

Table 4: Speed and Fatality Risk

Street	Current Speed	Fatality Risk
MLK Blvd	55	85%
Palm Beach Blvd	45	85%
Ortiz Avenue	35	45%
Neighborhood Streets	30	45%

Assessment of Alternatives

Alt 1: Existing Design. Alternative one describes the current conditions associated with speed. Given no policy changes on the horizon for these streets, there will not be any change with respect to speed and fatality rates. However, as the volume of travelers increase, there will be an expected natural increase in the number of fatalities and injuries.

Alt 2: Lee County Plan. The Lee County Plan, on the other hand, would potentially increase the risk of pedestrians and bicyclists on Ortiz Avenue. LDOT's written comments[17] suggest that they would be willing to consider lowering the speed limit on the street from 45 to 35 MPH. However, as noted above, the design speed is the overriding factor in driver behavior, not the posted speed limit. The Lee County plan would increase the risk of pedestrians and bicyclists on Ortiz Avenue by 40% over current conditions. Given this policy alternative and the natural increase in traffic volume, both the rate and the numbers of fatalities and injuries would increase.

Table 5: Lee County Plan Speed and Fatality Risk

Street	Current Speed	Proposed Speed	Current Fatality Risk	Proposed Fatality Risk
MLK Blvd	55	55	85%	85%
Palm Beach Blvd	45	45	85%	85%
Ortiz Avenue	35	45	45%	85%
Neighborhood Streets	30	25	45%	45%

Alt 3: Connectivity Plan. The connectivity plan proposes to reduce the design speed of Ortiz Avenue to 35 MPH and neighborhood streets to 25 MPH. While this would maintain the current risk to pedestrians and bicyclists on Ortiz Avenue, it would reduce the fatality risk on all other neighborhood streets from 45% down to 5%. Further, given that the connectivity plan would distribute traffic among the neighborhood streets; this study does not expect increases in traffic volume. As a result, there would likely not be an increase in the number of fatalities on Ortiz. There would also be a reduction in risk associated with slower speeds on the neighborhood streets. Given the vulnerable population in the study area, this would be a significant health benefit.

[17] See Appendix X for comments received from stakeholders and the HIA Team response.

Table 6: Connectivity Plan Speed and Fatality Risk

Street	Current Speed	Proposed Speed	Current Fatality Risk	Proposed Fatality Risk
MLK Blvd	55	55	85%	85%
Palm Beach Blvd	45	45	85%	85%
Ortiz Avenue	35	35	45%	45%
Neighborhood Streets	30	25	45%	5%

Physical Safety - Roundabouts

Background Literature

Roundabouts are a form of traffic calming, which offer promise, if properly applied, to reduce speeding and some forms of aggressive driving. Pedestrians especially benefit from traffic calming. Traffic calming employs physical changes to the roadway, signage or operation changes, and can be thought of as a "silent policeman" enforcing speed limits where no law enforcement is present (FHA 2014). Urban street design involves balancing safety, operations, community standards, and other requirements (Fitzpatrick et.al. 2000).

Traffic calming devices have the goal of reducing vehicle speeds, improving safety, and enhancing quality of life. They alter motorist behavior on a street or street network in the interest of street safety, livability, and other public purposes. A roundabout's incoming traffic yields to the circulating traffic.

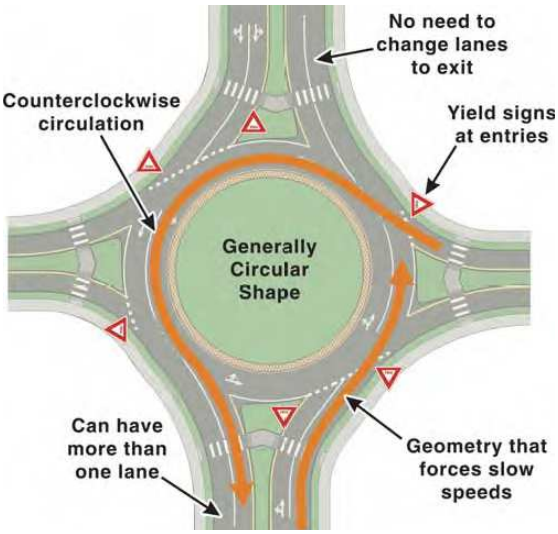

Figure 4: Dynamics of a Roundabout

Compared to other types of intersections, roundabouts have demonstrated improved safety and other benefits including 35% reduction in all crashes, a 76% reduction in injuries, and more than 90% reduction in fatalities (FHA 2008). Slower speeds introduced by roundabouts are also generally safer for bicyclists and pedestrians. From a safety perspective, where safety is measured in terms of crashes, there are no substantial safety problems for non-motorists crossing or traversing roundabouts (NCHRP 2007).

Roundabouts require traffic to circulate counterclockwise around a center island to allocate right-of-way between competing movements.

Roundabouts are good for:

- Locations with a history of accidents;

- Intersections where queues need to be minimized
- Intersections with irregular approach geometry
- Providing inexpensive-to-operate traffic control as an alternative to a traffic signal
- Handling a high proportion of U-turns
- Locations with abundant right-of-way

Table 7: A Comprehensive Look at Roundabouts

Advantages	Disadvantages	Effectiveness	Similar Measures	Cost Estimate(s)
• Roundabouts can moderate traffic speeds on an arterial • They are generally aesthetically pleasing if well landscaped • They enhance safety compared to traffic signals • They can minimize queuing at the approaches to the intersection • They are less expensive to operate than traffic signals	• They may be difficult for large vehicles (such as fire trucks) to circumnavigate • They must be designed so that the circulating lane does not encroach on the crosswalks • They may require the elimination of some on-street parking • Landscaping must be maintained, either by the residents or by the municipality	Average 29% reduction in accidents, with a reduction from 9.3 to 5.9 accidents per year[18]	By constructing a small island in a neighborhood intersection and leaving the existing curbs, you have a Traffic Circle	Varies by materials used and the amount of area covered

There are various designs for roundabouts that offer benefits. These appear in the figures below. As the figures illustrate, the design and maintenance of a roundabout matters as to its functionality and safety. The illustration from Summerlin Nevada does not offer the kind of safety features similar to the other treatments. The Tice Connectivity Plan recommends roundabouts designed with safety features for pedestrians and bicycles as a priority.

[18] From a sample of 11 sites; source: Roundabouts: An Informational Guide

Beaverton, Oregon

Some roundabouts include a fully landscaped center island and splitter islands to better accommodate to pedestrian safety, as seen in this Beaverton example.

Figure 5: Beaverton, Oregon Roundabout

Tallahassee, Florida

Bicycle treatment can happen in either of two ways. They can be encouraged to "take the lane" and travel on the circulating lane with motor vehicles, or they can be guided onto the sidewalks.

Figure 6: Tallahassee, Florida Roundabout

West Palm Beach, Florida

The setback of the crosswalk should allow at least one car to be able to pass the crosswalk and wait safely before entering the circulating lane once an adequate gap occurs.

Figure 7: West Palm Beach Roundabout

Summerlin, Nevada

Some roundabouts have a wide, multilane approach, but with the markings faded in this Summerlin example, these lanes are somewhat ambiguous.

Figure 8: Summerlin, Nevada Roundabout

Baseline Data

There are no current roundabouts within the Tice Community study area. As a result, this study is unable to provide data on the effect of roundabouts in the Tice area.

Assessment

Alt 1: Existing Design. Similar to above, because alternative one represents the current design, this study would expect no greater or less improvements to physical safety.

Alt 2: Lee County Plan. As above, the Lee County Plan does not incorporate roundabouts into their design. As a result, this study would expect no greater or less impacts to physical safety.

Alt. 3: Connectivity Plan. The Tice Community Connectivity and Redevelopment Plan incorporates the inclusion of roundabouts as traffic calming and traffic movement features in several locations along Palm Beach Boulevard and Ortiz Avenue. As a result, alternative three would be expected to increase physical safety by reducing collisions and introducing slower speeds at intersections. This would reduce both injuries and fatalities (according to national statistics, such as those noted above).

Physical Safety - Number of Lanes and Lane Width

Background Literature

As with other street design features, the number of lanes and width of lanes affect driver speeding behavior and ultimately, street safety.

*Number of lanes. S*treets that are designed with fewer lanes provide for better crossing conditions. This is because multi-lane streets require the pedestrian to cross long distances and negotiate multiple lanes of traffic. The relationship between the number of lanes and safety is well documented. In those areas where a "road diet" was implemented (conversion of 4 lanes to two lanes with a turn, often with bicycle lanes), researchers have found that fewer lanes reduce speeds as well as reduce the number of crashes that occur (Noyce, Talada, & Gates, 2006). This is all while the traffic volume has increased (Federal Highway Administration, 2010). In addition, NACTO's Urban Street Design Guide shows that increased number of lanes cause pedestrians to feel more exposed and less safe entering the intersection (National Association of City Transportation Officials, 2015). Those streets more closely resembling a road diet (two travel lanes and a center turn) are relatively simple to cross and often offer an additional pedestrian or bicycle respite location when they are properly designed. The research on pedestrian crossing recommends reducing the street crossing distance for pedestrians through curb extensions or road diets (Federal Highway Administration, 2003).

Lane Width. Lane width also influences speeding and ultimately physical safety. Several researchers have noted that narrow lanes tend to reduce crash frequencies (Ewing & Dumbaugh, 2009; Potts, Harwood & Richard, 2007). Ewing and Dumbaugh (2009) conclude that narrow lanes are one of several "less forgiving" designs that enhance roadway safety because

drivers must slow down to more appropriate operating speeds. Research recommends street-narrowing through "skinny street(s)" (Federal Highway Administration, 2003).

Baseline Data

As described above, there are two roads that have most significance in the Tice study area for physical safety: Palm Beach Boulevard and Ortiz Avenue.

Vehicle crash data for the Tice area serves as one of the measures of health. These were obtained from Lee DOT for the time period from January 2008 through January 2015 (85 months). Over the 2008-15 time period there were a total of 1,483 crashes reported by law enforcement. This included 16 fatalities and 276 injuries to bicyclists and pedestrians. This works out to an average of nearly 2.3 deaths/year and nearly 39 injuries per year on Tice roads due to vehicular traffic.

Palm Beach Boulevard. Approximately 57.9% of the crashes, 81.3% of the fatalities, and 54.7% of the injuries were associated with motor vehicle traffic on Palm Beach Boulevard.

Ortiz Avenue. In contrast, only 15.8% of the vehicle crashes and no fatalities in Tice were associated with traffic on Ortiz Avenue (County Road 865).

Assessment of Alternatives

Alt. 1: Existing Design. If nothing changes, we can expect an average of over 1.8 fatalities per year and over 21.3 injuries per year to occur in association with traffic conditions on Palm Beach Boulevard.

Alt. 2: Lee County Plan. Any plan to increase the number of lanes and the lane widths will lead to increased accidents and injuries. Given that the Lee County plan would increase both the lane widths and the number of lanes on Ortiz Avenue, there would be negative impacts that would likely increase automobile, pedestrian and bicycle fatalities and injuries.

Alt. 3: Connectivity Plan. Although the Connectivity Plan proposes a center turn lane (on Ortiz Avenue), this would offer the opportunity to reduce pedestrian and bicycle deaths and injuries due to a limited crossing width and pedestrian or bicycle respite opportunities. This benefit, of course, would only apply to Ortiz Avenue.

Physical Safety - Bike Lanes and Sidewalks

Background Literature

Planning and designing roads to make them safer for all users and more inviting to pedestrians, bicyclists, and transit users can increase overall capacity and efficiency without a negative impact on automobile travel. Improving intersections for pedestrian safety, such as reducing lanes and by increasing bike lane width can reduce vehicular speeds while maintaining an overall narrow roadway.

Sidewalks. Sidewalks separated from the roadway provide considerable safety benefits to users. As far back as 1987, the Federal Highway Administration found that sidewalks reduce roadway crashes as well as pedestrian-pedestrian conflicts. Most significantly, they found that, "roadways without sidewalks are more than twice as likely to have pedestrian crashes as sites with sidewalks on both sides of the street" (Federal Highway Administration, 1987).

Bike Facilities. The design of bike lanes for safe travel varies depending on the context. On slower streets, on-road bike lanes are appropriate. Generally, the recommendation is for bike lanes to be designed at 6 feet. In higher speed urban areas, bike lanes may be buffered (a designated space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane) or handled through a separated cycle track (exclusive bike facility is a separated path with the on-street infrastructure of a conventional bike lane) (National Association of City Transportation Officials, 2015).

An additional treatment is the sharrow, which is an on-street marking intended to communicate to drivers and motorists that bicycles are expected on the road. The intent is to get drivers to share the road. Sharrows have been shown to increase the operating space for bicyclists and reduce sidewalk riding (Federal Highway Administration, 2010).

Physical safety in the form of crash reduction is closely associated with bike infrastructure. Considerable research, such as an extensive 2012 cross-comparison study of streets shows that, bike-specific facilities are a significant tool for injury prevention (Teschke, et al., 2012). Figure 9 below illustrates the relationship between safety and facilities.

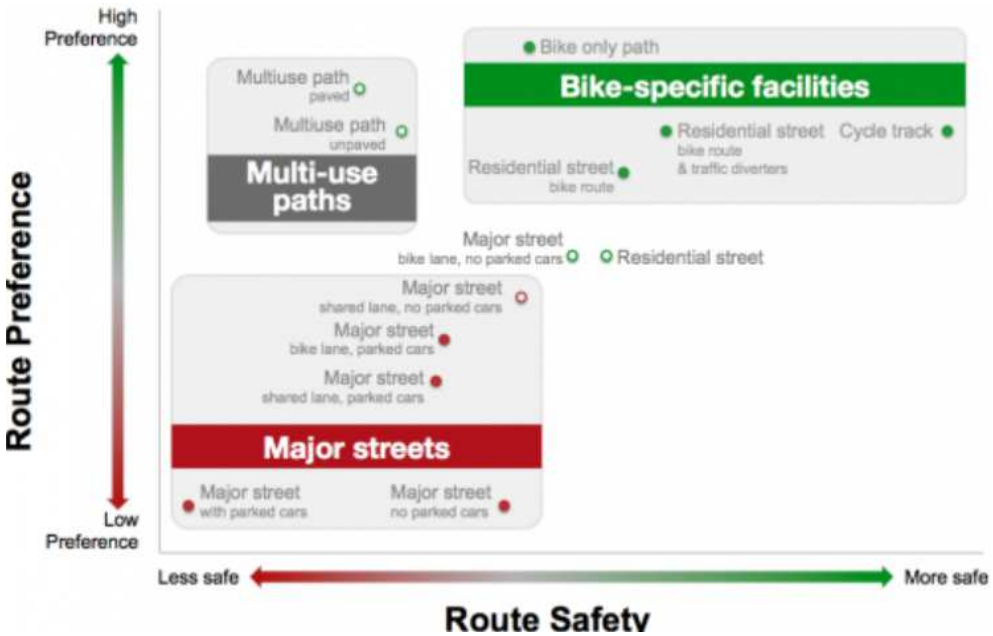

Figure 9: Bicycle Facility Design & Safety

Baseline Data

As described above, both Palm Beach Boulevard and Ortiz Avenue have sidewalks in varying size and state of repair. Sidewalks on Palm Beach Boulevard in the study area are generally 5-6 feet wide, while the sidewalks on Ortiz are directly adjacent to the roadway and narrow (4 feet). Neither Palm Beach Boulevard nor Ortiz Avenue have bike lanes.

Assessment of Alternatives

Alt. 1: Existing Design. Based on the crash data presented in the lane number and width section, if there are no design changes, the number and rate of expected crashes, injuries, and fatalities will remain the same.

Alt. 2: Lee County Plan. The Lee County Plan highlights the addition of bike lanes and sidewalks. The Lee County Plan would improve walking conditions by adding a sidewalk on Ortiz Avenue, but provides for a limited width. In addition, the Lee County Plan is proposed to add bike lanes at 4 feet. However, given the 45 MPH speed of Ortiz Avenue, on-street bike lanes are insufficient to improve bicycle safety.

Alt. 3: Connectivity Plan. The Connectivity Plan proposes slower speeds on Ortiz Avenue (which allow for safer bicycle transport), as well as considerably wider sidewalks at 10 feet. The plan also calls for "sharrows" on neighborhood streets. These additions to the pedestrian and bicycling infrastructure will tend to increase physical safety.

Physical Safety - Crosswalks

Background Literature

Because crosswalks will primarily benefit pedestrians, this HIA has focused on the pedestrian implications for physical safety. The literature on crosswalks has found the crosswalks alone are insufficient to reduce pedestrian risk. On two-lane roads they do not increase pedestrian safety and on multi-lane roads increase pedestrian risk (FHWA, 2003). However, coupled with other improvements, crossing treatments do have a significant positive impact on safety. The research recommends a variety of improvements, including raised medians, undivided roads to two through-lanes with left turn lane), installing raised crossings (raised crosswalk, raised intersection, speed humps), and/or grade-separated crossings (FHWA, 2003).

Baseline Data

HIA researchers have conducted a pedestrian crosswalk audit on all identifiable crossings in the Tice community. This includes an analysis of the number of crosswalks and the current design of each crossing. The results are presented in Appendix IX.

The design of pedestrian crossing at street intersections varied widely in terms of signage, signals, lighting, and imprinting. The distances between crosswalks on streets with multiple crossings were also measured. Those streets include Ballard Road, Glenwood Avenue, Marsh Avenue, Ortiz Avenue, Palm Beach Boulevard, and Tice Street. The distances between

crosswalks on those streets are also presented in Appendix IX. A summary of the minimum, maximum, and average distances is presented below.

Street	Minimum Distance	Maximum Distance	Average Distance
Ballard Road	665 feet	4,635 feet	2,650 feet
Glenwood Avenue	2,625 feet	2,625 feet	2,625 feet
Marsh Avenue	1,315 feet	3,915 feet	2,230 feet
Ortiz Avenue	1,650 feet	6,530 feet	4,502 feet
Palm Beach Boulevard (marked crossings)	2,220 feet	3,415 feet	2,848 feet
Palm Beach boulevard (all crossings)	355 feet	1,010 feet	657 feet

There were forty total pedestrian crosswalks identified on the streets in Tice. Thirty-one of the crossings were identified by signs and/or marking. An additional nine designed mid-block crossings were identified on Palm Beach Boulevard as determined by pedestrian cutouts in the raised median. None of the mid-block crossings had any markings, signs, imprinting, or any indication to motorists of their existence other than the cutouts themselves.

Assessment of Alternatives

Alt. 1: Existing Design. There is no known or anticipated change in the number of crosswalks or design of crossings proposed. As such, the number of fatalities and injuries that are due to crossings are not likely to change.

Alt. 2: Lee County Plan. The Lee County plan provides some limited respite opportunities in their design plans for Ortiz Avenue. This will provide some enhanced safety treatments. However, those improvements will be offset by the additional proposed speed, and increased number and width of lanes. As a result, the Lee County plan will have mixed effects on physical safety.

Alt. 3: Connectivity Plan. The Connectivity Plan recommends the addition of crosswalks on Ortiz Avenue at intervals of every 300 feet or at intersections. In addition, other raised or imprinted pedestrian crossings are recommended for Palm Beach Boulevard. Coupled with reductions in speed as compared to the Lee County Plan and proven safety improvements for pedestrian crossings on Palm Beach Boulevard, the Connectivity Plan would show significant advantages for pedestrian safety.

Physical Safety - Justification of Health Impacts

The table below represents the elements of the plan which correlate with physical safety. Each alternative is compared to the baseline, or existing conditions, and indicates the increased risk or safety as related to each of the plan elements.

Table 8: Positive or Negative Physical Safety Health Effects over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan

Crosswalks	• No measurable improvements	• No measurable improvements	• Palm Beach Boulevard: Increased safety • Ortiz Avenue: Increased safety
Roundabouts	• No measurable improvements	• No measurable improvements	• Palm Beach Boulevard: Increased safety • Ortiz Avenue: Increased safety
Lane Number and Width	• No measurable improvements	• Palm Beach: No measurable improvements • Ortiz: Increased risk	• Palm Beach: No measurable improvements • Ortiz: No measureable improvements
Bike Lanes	• No measurable improvements	• Palm Beach: No measurable improvements • Ortiz: Mixed improvements	• Palm Beach: No measurable improvements • Ortiz: Increased safety
Sidewalks		• Palm Beach: No measurable improvements • Ortiz: Increased safety	• Palm Beach: No measurable improvements • Ortiz: Increased safety
Bus Stop Characteristics			
Speed Limit	• No measurable improvements	• Palm Beach: No measurable improvements • Ortiz: 40% increased fatality risk • Neighborhood: No measurable improvements	• Palm Beach: Speed reduction - little or no measurable improvements • Ortiz: No improvements • Neighborhood: Increased safety - 40% reduction in fatality risk
Grid Network/Street Connections			

Public Transit Ridership

Research Question: Given that public transit ridership is associated with better health outcomes, such as physical activity, will neighborhood connectivity increase rates of ridership in public transit options?

Neighborhood design and the way land is developed and used may affect transport choice (Sallis, Frank, Saelens, & Kraft, 2004). Healthy living is highly dependent on contextual factors such as education, income, poverty, and the availability of safe transportation options. Public transit provides an affordable means of travel for those that are limited by income, or who may be unable to obtain a driver's license. The availability of public transit points of access can affect subsequent health determinants such as physical activity levels, traffic congestion levels, and social cohesion and capital levels within a community. Specifically, people who live or work in communities with high quality public transportation tend to drive significantly less and rely more on alternative modes of transportation. This helps to reduce traffic crashes and pollution emissions, increase physical fitness and mental health, and provides access to medical care and healthy food (Litman, 2010). When examining the relationship between transit ridership and neighborhood connectivity, findings from the literature review suggests that increased access to public transit could provide more opportunities for physical activity because most transit trips begin and/or end with walking. Research suggests that the built environment influences physical activity, including recreational walking, and walking to and from public transit (Besser & Dannenberd, 2005). Besser and Dannenberd (2005) also notes that Americans who walk to and from public transit obtain less than or equal to thirty minutes of physical activity a day. Furthermore, people of lower socioeconomic status obtain the greatest amount of physical activity by walking to and from transit, due to residence in areas with better transit access, or a reliance on transit due to the lack of personal vehicle ownership (Besser & Dannenberd, 2005).

Public transit ridership and its relationship with elements of the alternatives are discussed in the analysis below.

Public Transit Ridership - Bus Stop Characteristics

Background Literature

The design of passenger waiting areas plays a significant role in a person's decision of whether and how often to use public transit (Rogue Valley Transportation District, 2011). Safety, comfort, accessibility, general attractiveness and security are all primary considerations that can affect ridership. Ridership hinges on such features as adequate lighting at the stop or nearby, whether the facility is ADA accessible, connecting sidewalks, the location of a waiting area at a safe distance from the flow of traffic, the proximity of a stop to a pedestrian crossing, whether the waiting facilities provide a bench or protection from the elements, and whether there are trash receptacles and bicycle racks available (Rogue Valley Transportation District, 2011).

Baseline Data

There are three bus routes that service the Tice area; Route 100, Route 15, and Route 20 (see maps in Appendix VII). Route 100 runs from the Rosa Parks Center in downtown Fort Myers to Riverdale Shopping Center in Buckingham with eastbound and westbound stops along both sides of Palm Beach Boulevard through Tice. Route 15 runs from the Rosa Parks Center to the intersection of Palm Beach Boulevard and Ortiz Avenue. In the greater Tice area Route 15 travels eastbound along Ballard Road to northbound along Nuna Avenue, eastbound on Tice Street to northbound along Carolina Avenue, eastbound on Palm Beach Boulevard to southbound on Ortiz Avenue, and then westbound along Ballard Road. A third bus route, Route 20, runs along the western edge of the tice community north and south along Marsh Avenue from Palm Beach Boulevard to Michigan Avenue.

Public transportation ridership data was collected from the Lee County Transit Department based on their average daily usage of bus stops within the Tice neighborhood along the three routes. Total daily averages for exits and entries onto public transit are found in Table 9 below.

Table 9: Average Daily Transit Ridership in Tice Neighborhood

	Number of Stops on Route	Total Average Daily Bus Entries	Total Average Daily Bus Exits
Route 15	41	100	94
Route 20	22	75	146
Route 100*	45	374	412
***High traffic stops on Route 100 saw entries as high as 58, 30, 29, and 23 on average and exists as high as 51, 34, 27, and 24 on average.**			

A survey of the current conditions of all the bus stop locations and facilities in Tice was conducted, including location, frequency, current conditions, how conducive they are to encourage public transit and what are the health implications. The conditions vary widely. They range from areas with shelters and benches in good condition located a safe distance away from the street, to bus stop areas with no bench, shelter or sidewalk, and located dangerously close to the flow of traffic. Not only do these things affect ridership but they also have health and safety implications. The variations in bus stop conditions are presented below.

Very Poor	 **Figure 10: Ortiz Avenue & Zana Drive Bus Stop**
Poor	 **Figure 11: Ortiz Avenue & Luckett Road Bus Stop**
Adequate	 **Figure 12: Palm Beach Blvd & Buena Vista Blvd Bus Stop**
Good	 **Figure 13: Palm Beach Blvd & Fairfax/Bellair Rd. Bus Stop**

The quality of each of bus stop facility in Tice was rated on a scale of 1-7 based on seven criteria[19]:

- Bench = 1, No Bench = 0
- Shelter = 1, No Shelter = 0
- Adequate Lighting Present or Nearby = 1, No Adequate Lighting = 0
- Sidewalk = 1, No Sidewalk = 0
- Safe Distance from Roadway (i.e., 5 ft.) = 1, No Safe Distance from Roadway = 0
- Pad = 1, No Pad = 0
- Waste Receptacle = 1, No Waste Receptacle = 0

Rating whether or not the bus stop facility had a bench, shelter, sidewalk, pad, or a waste receptacle was a clear-cut rating decision. Whether there was adequate lighting present or nearby involved some degree of value judgment. If a street light was located directly adjacent to the stop, then that was obviously deemed adequate. Or if there was no street light in the vicinity, then the rating decision was equally easy. But if there was a light in the vicinity nearby then a value judgment was necessary to rate whether the lighting would be adequate enough to provide a feeling of safety to some degree. Whether the stop location was located a safe distance from the roadway or not also involved some degree of value judgment. In general we used a minimum of 5 feet as a rating standard. However, we also took into account the surrounding environmental conditions (e.g., ditches and drainage areas, slopes, lane width, speed of traffic, terrain, etc.). Basically, the question is do we believe a passenger would feel comfortably safe from the flow of traffic waiting for a bus at that location?

Bus stop survey results are presented in Appendix VII. The distance given after each bus stop location is the approximate linear distance from the previous stop.

There was a considerable difference in the quality of bus stop facilities between the routes. Route 100 scored much more favorably than Route 15. Route 100 bus stops scored an average rating of 4.00, while Route 15 bus stops only scored an average rating of 1.21. This finding highlights an inequity in terms of the demographic distribution of the Tice community. Route 100 services Palm Beach Boulevard which functions as a north/south dividing line between the more affluent and less affluent areas of Tice. Route 15 services the southern areas of Tice. The populace in this area is less affluent. Residents here are less likely to own a private motor vehicle, and more likely to rely on public transportation. The preponderance of the Hispanic population of Tice also resides in this area.

Route 20 bus stops, which coincide with Route 100 bus stops northbound and southbound on Marsh Avenue, had an average rating of 3.00.

[19] Note: We also looked for the presence of bicycle racks, however none of the bus stop facilities in Tice had one so we did not score for this, even though several people waiting at bus stops during our survey had bikes.)

Assessment of Alternatives

Alternative One: The status quo is difficult to measure in its impact on transit ridership. Because there is no trend data currently available for ridership within the Tice community, it can be hypothesized that alternative one will have no measureable improvements on transit ridership and its related health effects in terms of bus stop characteristics.

Alternative Two: The Lee County plan does not propose any improvements to bus stops. Therefore, the second alternative will have no measureable improvements on transit ridership and its related health effects.

Alternative Three: The third alternative proposes to install bus cut-outs for Lee Transit buses from Palm Beach Boulevard to Ballard Road with signage and proper covered/lighted/handicapped accessible bus stops. The plan also recommends to improve the safety of the school bus stops. Alternative three will likely increase transit ridership due to enhanced transit access and safety.

Public Transit Ridership - Crosswalks

Background Literature

Individuals who walk or bicycle to transit are among the most vulnerable populations in terms of physical safety. For transit to be successful, people need more than buses and bus stops, they also need safe routes to bus stops (Besser & Dannenberg, 2005). Background literature regarding crosswalks and physical safety can be found in the previous physical safety assessment.

Baseline Data

This project collected individual data, counting bicycle and pedestrian activities. Researchers noticed the placement, usage, and condition of public transportation stops. Several important factors were noted, including;

- Public transportation passengers often crossed the street at places where stops were located, and in areas where there were no pedestrian-accessible elements, such as crosswalks, making access to transportation stops more difficult and dangerous.
- The stops provided for public transportation were often located on the shoulders of roads where there were insufficient standing areas, and many had no shade, most noticeably those stops along Ortiz Avenue.

These characteristics of the Tice community population translate to unsafe and unhealthy behaviors and conditions for the transit users.

Assessment of Alternatives

Alternative One: As the status quo, alternative one will have no measureable improvements on transit ridership.

Alternative Two: With minimally implemented crosswalks and unimproved bus stops, alternative two will have no measureable improvements on transit ridership.

Alternative Three: With strategically placed crosswalks with enhanced safety measures, alternative three will likely increase transit ridership.

Justification of Health Impacts

Table 10: Positive or Negative Public Transit Health Effects over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks	• No measureable improvements	• No measureable improvements	• Increase Transit Ridership
Roundabouts			
Lane Number and Width			
Bike Lanes			
Sidewalks			
Bus Stop Characteristics	• No measureable improvements	• No measureable improvements	• Increase Transit Ridership
Speed Limit			
Grid Network/Street Connections			

Criminal Activity

Research Question: Will neighborhood connectivity decrease the presence of criminal activity?

Background Literature

The amount of criminal activity in a community can be a determinant of health. Stafford, Chandola and Marmot found an association between the fear of crime and mental health and physical functioning. One behavioral response to fear of crime is avoidance. Those who are worried about crime may restrict how much they leave the home and the places they visit, reducing opportunities to form social ties and participate in social activities (Stafford, Chandola, & Marmot, 2007). Fear of crime may also lead to restrictions in physical and outdoor activities, including walking and cycling, and to increased car use. The associated decrease in physical activity leads to a lifestyle that increases the risk of cardiovascular disease, poor mental health, and poor physical and cognitive functioning. Sundquist et.al. found that high rates of violent crime significantly increase the risk of coronary heart disease (Sundquist, et al., 2006). Stafford, Chandola and Marmot also suggest that perceived or actual threat of crime increases the vulnerability to pathogens, produces wear and tear on the nervous and immune systems, and increases the likelihood of heavy drinking (Stafford, Chandola, & Marmot, 2007).

The built environment and street connectivity also contributes to the presence of crime in a given neighborhood. Physical environment features can influence the chances of a crime occurring by affecting potential offenders' perceptions about a possible crime site and influence their evaluations of the circumstances surrounding a potential crime site. High neighbor connectivity can act as a deterrent to criminal activity, as it allows for more interaction between neighbors, and allows for familiarity between neighborhoods. How a neighborhood relates to and interacts with an adjacent neighborhood and the rest of the community is important to deterring crime. Therefore, "conventional" gated communities or sprawled communities, has a disadvantage in this aspect (Crowe & Zahm, 1994). Furthermore, designs which increase speeds and accommodate to congestion are more likely to have higher presences of criminal activity as well (Crowe & Zahm, 1994).

Finally, the literature on crime prevention through environmental design holds that eyes on the street – or more activity in a given area has a significant impact on crime prevention. As a result, vehicle speed, uninviting streets for people and bicycles, and less overall activity is linked to increases in crime (Hood, 2005). Therefore, if physical activity increases, crime decreases, and the health benefits of physical activity and physical safety prevail.

Baseline Data

We have obtained data on Tice area crime for the years 2006 through 2014 from Annual Florida Department of Law Enforcement Reports. This data is summarized in Table 33 in Appendix VIII. Overall, the total number of crimes reported per year in Tice has generally declined over the years from a high of 845 in 2007 to a low of 427 in 2014. The most prevalent types of crimes

reported include simple and aggravated assault, residential burglary, robbery, and various types of theft.

Researchers plotted the most prevalent crimes on line graphs to assess trends. These graphs are present in Appendix VIII. With the exceptions of bicycle theft, theft from a motor vehicle, and residential burglary, the trends for the most prevalent crimes reported in Tice have been generally declining. Some of this decline in the incidence in crime may be explained by improved law enforcement or the economic downturn. The economic downturn also caused a reduced inmate population due to out-migration.

The trend for residential burglary remained relatively steady over the time period examined, except for two sharp peaks in 2007 and 2011. But, if we look only at data from 2011-2014, the trend in residential burglary has also sharply declined. The trend for business burglary has also declined over the years, but the number of businesses in Tice has also declined, so there is less opportunity for this type of crime. The same might be said for retail theft. The trend declined sharply between 2006 and 2011, but it has leveled off since then. Again, this may be due to a decrease in the number of retail shops in the area.

The trend for bicycle theft is generally increasing. This may be explained by an increase in the use and popularity of bicycles as a means of transportation and recreation, thereby increasing the opportunity for bicycle theft.

There appears to be considerable variation in the incidence of theft from a motor vehicle. The graph appears to show a general decline; the line of best fit would be generally decreasing, but the data from 2009 seems to show the trend to be relatively steady.

Violent Crime. Violent crime has been identified as one of the top issues of concern in a PACE EH survey conducted in the Tice community. Violent crime is defined as a combination of murder, rape, robbery and aggravated assault. A graph of the incidence of violent crime in Tice is plotted out and presented in Appendix VIII. This graph shows that the number of violent crimes reported in Tice has sharply declined from 230 in 2006 to 98 in 2009, and it has leveled off between 82 and 93 over the last 4 years. That sounds good, and it obviously represents improvement, but how the incidence of violent crime in Tice compares to the rest of Lee County is revealing.

The violent crime rate for Lee County, from CDC's Community Health Status Indicators for the years 2010 through 2012, was 359.2 per 100,000 people. If you calculate the violent crime rate in Tice for the same period of time, that rate is 946.7 per 100,000 people, which is over 2.5 times greater than the rate for all of Lee County. If we accept the premise that violent crimes are among the most fearful types of crimes that can affect a community, then the Tice community is much more likely to suffer adverse health effects related to the fear of crime than Lee County as a whole.

Assessment of Alternatives

Utilizing the background literature and the baseline assessment of data, the table below represents the elements of the alternatives which correlate with criminal activity. The positive or negative health effects are also shown in relation to each element.

Alt. 1 Existing Design: The status quo has seen relatively stable criminal activity rates. Elements that promote physical activity, interaction, and deterrents to criminal activity are not being impacted in alternative one and as a result, will have no measureable improvements on criminal activity.

Alt. 2 Lee County Plan: The Lee County Plan, along with lane additions and widening, also incorporates a series of bike lanes and sidewalks along Ortiz Avenue. Bike lanes and sidewalks act as infrastructure which encourage active living, and therefore have the potential to decrease criminal activity. However, the increased speed limit proposed by alternative two has a negative impact on alleviating criminal activity, as shown in evidence offered by the background literature.

Alt. 3 Connectivity Plan: The addition of a bike lane and sidewalk grid network will provide a means for residents to pursue active lifestyles and increase neighbor interaction, which will ultimately reduce the presence of criminal activity. Furthermore, the reduction of speed can likely reduce the perception of an unsafe neighborhood and may act as a deterrent to criminal activity as well. A street design which promotes connectivity allows for more neighborhood interaction and awareness. Therefore, the connectivity element proposed by alternative three will also likely decrease criminal activity.

Table 11: Positive or Negative Criminal Activity Health Effects over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks			
Roundabouts			
Lane Number and Width			
Bike Lanes	• No measureable improvements	• Decrease Criminal Activity	• Decrease Criminal Activity
Sidewalks	• No measureable improvements	• Decrease Criminal Activity	• Decrease Criminal Activity
Bus Stop Characteristics			
Speed Limit	• No measureable improvements	• Increase Criminal Activity	• Decrease Criminal Activity
Grid Network/Street Connections	• No measureable improvements	• No measureable improvements	• Decrease Criminal Activity

Physical Activity

Research Questions: Will neighborhood connectivity increase rates of bicycling and walking among Tice Community members? Will walkability of the Tice Community increase physical activity?

Measures of the built environment that are correlated with physical activity include the presence of bicycle and pedestrian infrastructure, proximity to destinations, and greater street network density (Ferdinand, Sen, S., & Menachemi, 2012). Research suggests that measures of land use, recreational facilities, and walking and bicycling infrastructure have positive associations with physical activity (Carlson, Guide, Schmid, Moore, & Barradas, 2011). In a community where attractive destinations are in close proximity to each other and to residential areas, it makes active travel more appealing. When transportation systems are designed for multiple modes of travel, walking, biking and using public transportation become an efficient and desirable means of getting around. These more active methods of transport have the obvious result of improving health by increasing levels of physical activity, which reduces the risk of heart disease, high blood pressure, diabetes, obesity, and some cancers (International City/County Management Association, 2005). Furthermore, physical activity has long contributed to discussion regarding public health, especially as it surrounds issues such as obesity and heart disease. According to the Center for Disease Control and Prevention an average person can see positive health impacts by getting at least 30 minutes of moderate physical activity a day (Physical Activity, 2015).

Benefits of Physical Activity

According to the American Heart Association, there are several tremendous health benefits associated with physical activity. This includes:

- Reduces the risk of heart disease by improving blood circulation
- Decreases the risk of obesity
- Improves blood cholesterol
- Helps to manage high blood pressure
- Helps to manage stress
- Releases tension
- Increases muscle strength
- Counters anxiety and depression and increases enthusiasm and optimism.

Source: American Heart Association, 2015

These relationships are highlighted in the following analysis regarding physical activity.

Physical Activity - Bike Lanes and Sidewalks

Background Literature

The built environment affects physical activity on several levels. Evidence from transportation and urban planning studies suggests that persons living in neighborhoods with greater population densities, land-use mix, street connectivity, and walking and biking infrastructure tend to walk and cycle more frequently. Furthermore, public health research indicates positive associations between physical activity and self-reported accessibility to recreational facilities,

the presence of sidewalks, safety from crime and traffic, and aesthetics (Brennan-Ramirez, et al., 2006). A considerable number of studies have shown that increasing the presence of sidewalks and bike lanes encourage people to walk and bike more to their destinations, including trips to school, work, grocery stores, among others as part of their daily physical activities (Powell, Martin, & Chowdhury, 2003). Further research also mentions in a New Orleans study of bike lane installations, there was a 4.3% increase in physical activity after bike lanes were installed (Gustat, Rice, Parker, Becker, & Farley, 2012).

Baseline Data

The existing physical activity conditions for the Tice Community include data from researcher-conducted bicycle and pedestrian audits of several predominant intersections within the Tice community. Data on physical activity is also available from the Lee Memorial Health System at the County level, though separated into smaller market area levels. Although not as specific, the data aids in the formulation of fundamental physical activity data and can provide a base of foundation.

Bicycle and Pedestrian Count Data. Table 12 below reflects the counts of bicyclists and pedestrians in the Tice community.

Table 12: Bicycle and Pedestrian Counts at Predominant Intersections

		Bicyclists	Pedestrians
Intersection	Ballard Road and Ortiz Avenue	30	82
	Luckett Road and Ortiz Avenue	17	7
	Palm Beach Boulevard and New York Drive	15	22

During the bicycle and pedestrian audits, it was noted by researchers that individuals did not utilize the existing infrastructure due to the poor quality and inadequacy of the sidewalks. Bicyclists and pedestrians often crossed the street before intersections and designated crosswalks (if they even existed) and walked via manmade “cow paths” through open fields or empty parking lots. Subsequent to the high volume of bicyclists and pedestrians was a relatively high volume of vehicular traffic as well, which increases the concern of personal safety for the bicyclists and pedestrians who do not have safe and adequate infrastructure to utilize.

Community Health Needs Assessment Data. The Lee Memorial Health System conducted a 2014 PRC Community Health Needs Assessment report which utilized primary research data in the form of a Community Health Survey, as well as secondary research data, including vital statistics and other existing health-related data to contribute to a Countywide Health Assessment. The report differentiates between several market areas of the County, which increases only slightly

the validity of the measurements for the Tice community in this health impact assessment. For the market area in which the Tice community fell (Market Area 2), the report asserts several findings:

- A total of 22.3% of Market Area 2 responded reported no leisure-time physical activity and the lack of physical activity is higher among women, lower-income residents, and Hispanic adults.
- In Market Area 2, 45.7% of adults meet physical activity requirements as distinguished by the U.S. Department of Health and Human Services (i.e. 2 hours and 30 minutes of moderate-intensity physical activity a week).

Furthermore, along with these statistics, the report indicated that County-wide, there were several environmental influences that were positively associated with physical activity, including the presence of sidewalks, having a destination or walking to a particular place, access to public transportation, low traffic density, and access to neighborhood or school play areas or parks .

Assessment of Alternatives

Alt. 1 Existing Design: With no additional bike lanes or sidewalks being implemented or improved, the status quo will likely have no measureable improvements on physical activity and its health implications.

Alt. 2 Lee County Plan: Along with a system of road widening, the Lee County Plan implements a minor system of bike lanes and sidewalks. The implementation of bike lanes and sidewalks in the Lee County plan can encourage an increase in physical activity.

Alt. 3 Connectivity Plan: The community alternative plan recommends to implement an extensive system of bike lanes and sidewalks. Along with the safety enhancements of these features, including a wider sidewalk proposal (10 feet), physical activity will increase.

Physical Activity - Speed

Background Literature

Based on the literature review, there are several negative impacts that are related to wider roads and higher speeds. Ewing and Dumbaugh show that wider and faster roads are related to greater fear of engaging in physical activity. In addition, an increased speed limit has also been shown to have a negative impact on physical activity (Dumbaugh & Li, 2011; Perdue et al., 2012). The negative impacts of increased speed can be somewhat mitigated by the incorporation of bike lanes and sidewalks. According to Emerine et. al (2005), the addition of bike lanes and sidewalks encourages physical activity but the positive impacts may be muted because bike lanes on higher speed roadways do not necessarily encourage physical activity (International City/County Management Association, 2005).

Baseline Data

The data regarding speed within the Tice Community is referenced above in the Physical Safety assessment section.

Assessment of Alternatives

Alt. 1 Existing Design: With no changes in regard to speed, the status quo will likely not lend to a differentiation in physical activity than what currently exists.

Alt. 2 Lee County Plan: Speed limits on neighborhood streets can act as a deterrent to physical activity. The Lee County plan recommends an increase in speed limit on Ortiz Avenue, which is an epicenter for physical activity. The second alternative, in relation to speed, will likely decrease physical activity.

Alt. 3 Connectivity Plan: The third alternative recommends reducing the speed limit on Ortiz Avenue to 35mph. It also recommends reducing the neighborhood streets speed limit to 25mph. The reduction of speed can enhance the perception of safety and will increase physical activity within the Tice community. Regarding a prior discussion on public transit, the improvement of transit bus stops will also encourage residents to utilize public transit, lending to the accomplishment of a physical activity requirement (see Public Transit Ridership assessment).

Physical Activity - Justification of Health Impacts

The table below represents the elements of the plan which correlate with physical activity. The positive or negative health effects are also shown in relation to each element and are compared to the baseline.

Table 13: Positive or Negative Physical Activity Health Effects over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks			
Roundabouts			
Lane Number and Width			
Bike Lanes	• No measureable improvements	• Increase Physical Activity	• Significantly increase Physical Activity
Sidewalks	• No measureable improvements	• Increase Physical Activity	• Significantly increase Physical Activity
Bus Stop Characteristics	• No measureable improvements	• No measureable improvements	• Increase Physical Activity
Speed Limit	• No measureable improvements	• Significantly decrease Physical Activity	• Significantly increase Physical Activity
Grid Network/Street Connections			

Emergency Response Times

Research Question: Will neighborhood connectivity reduce emergency response times?

Poor connectivity characteristics within a neighborhood can result in longer trip distances, increased traffic congestion, and trip time variability (Trowbridge, Gurka, & O'Connor, 2007). This can also apply to the response times of emergency response services (EMS). In relation to connectivity, wider streets have shown to be associated with more traffic injuries and fatalities, demanding higher levels-of-service for EMS. Furthermore, reduced connectivity has increased local fiscal burdens and each fire station is able to serve fewer and fewer households. This is due, in part, to majority of emergency calls responded to by fire departments are not related to fire, but rather to calls for medical or traffic injuries (The Congress for New Urbanism, 2009).

These relationships are highlighted in the following analysis regarding emergency response times.

EMS Response - Grid Network/Street Connections

Background Literature

Ideally, fire trucks and EMS responders should get to locations in their area within five minutes. They need to move down streets efficiently. Since highly interconnected street networks offer multiple routes to most places, emergency personnel have a better opportunity to find the most direct and unimpeded route possible (The Congress for New Urbanism, 2009). Connectivity can decrease the amount of time spent by emergency responders to get to the site of an emergency, and can ultimately reduce the initial number of emergencies, lessening the demand on EMS providers. Congested streets and limited connections and access points can significantly increase response times. Wide, high-speed streets – particularly those in residential neighborhoods or near schools and shopping areas – also increase the risk of accidents with other vehicles and pedestrians (Burden & Zykofsky, 2000). Traditional, connected street networks, even when narrower than 20 feet can reduce response times by offering multiple and shorter paths to a given location.

Baseline Data

The current conditions of roads in the Tice community indicate that there are areas of street disconnect.

Assessment of Alternatives

Alt. 1 Existing Design: Currently, the streets within the Tice community are not fully connected, meaning that emergency responders have limited access to certain areas of the neighborhood. However, depending on the location of a particular emergency, the lack of connectivity may increase emergency response times.

Alt. 2 Lee County Plan: The second alternative proposes no connectivity options beyond the widening of Ortiz Avenue. Therefore, the connectivity in alternative two mimics the connectivity of streets in alternative one. In relation to EMS response time as a result of

connectivity, alternative two may increase emergency response times, depending on the location of a particular emergency.

Alt. 3 Connectivity Plan: The third alternative proposes to connect streets in the following areas:

- Chattanooga Drive to Flamingo Circle, which would join Alabama Grove and Russell Park neighborhoods.
- Kingston Drive to Alameda Avenue, which would join Russell Park and Morse Shores neighborhoods.
- Lexington Avenue to Division Drive, which would increase north-south connectivity throughout the Tice community.
- Miramar Road to Tice Street, which would increase north-south connectivity throughout the Tice community.
- Extend Alta Vista Lane to Miramar Road, which would increase north-south connectivity throughout the Tice community.

The proposed connections offer EMS responders different paths to a given area, which in turn likely reduces their response times if they can avoid certain areas which may take longer than others by utilizing an alternate route.

EMS Response - Roundabouts

Background Literature

Traffic calming measures, especially when poorly implemented, such as increasing the number and frequency of stops signs and implementing speed humps, have the potential to increase response times and can be hard on the equipment used by responders (Burden & Zykofsky, 2000). On the other hand, traffic calming devices such as pedestrian refuge islands and roundabouts improve safety at crosswalks, slow vehicle traffic, yet are still able to efficiently handle large traffic volumes at formerly signalized intersections (Burden & Zykofsky, 2000). Although the implementation of roundabouts may result in a 2-10 second delay in left-hand turns, U-turns are more easily made, and straight paths or right-hand turns may reduce response time (Burden & Zykofsky, 2000).

Baseline Data

Currently, no baseline data exists for the Tice Community regarding the effectiveness or current status of roundabouts.

Assessment of Alternatives

Alt. 1 Existing Design: Currently, there are no roundabouts within the Tice community, and if the status quo were to remain as the given alternative, there would be no measureable improvements on emergency response times.

Alt. 2 Lee County Plan: No roundabouts or traffic calming measures are proposed in the Lee County plan. As far as effects on emergency response times, there will be none.

Alt. 3 Connectivity Plan: The community alternative connectivity plan proposes to add roundabouts on Palm Beach Boulevard and Ortiz Avenue, on Palm Beach Boulevard and New York Street, and Ortiz Avenue and Luckett Road. The addition of roundabouts will likely have a positive effect on emergency response times. Although left hand turns may be delayed, it is offset by the potential gain of time through U-turns, right hand turns, and straight routes.

EMS Response - Lane Number/Width and Bike Lanes

Background Literature

The literature on street design notes that intersection additions, such as medians which divide roads, are debilitating to emergency responders, which prevent emergency vehicles from crossing into oncoming traffic lanes to get through signalized intersections (Burden & Zykofsky, 2000). Bike lanes will likely decrease emergency response time, as it allows for other motorists to pull off the roadway and allow emergency responders to pass through. Bike lanes and decreased number of lanes, along with neighborhood connectivity reduces the need for excess pavement width to allow emergency vehicles to pass by vehicles that are already deployed at a scene. Those later arrivals can come down the street from the other direction, or go to the rear of the scene via an alternate route. While lane width may aid in some cases of emergency response, higher traffic volume on high-speed wide roads will ultimately cause delays in emergency response times (The Congress for New Urbanism, 2009).

Baseline Data

The table below shows the average emergency response times by the Tice Fire Department. It represents all emergency responses throughout the Tice neighborhood. As illustrated in the table below, over the seven years analyzed, response times remained relatively stable and meet national recommendations of five minutes or less.

Table 14: Average Emergency Response Times - Tice Fire Department

2007	2008	2009	2010	2011	2012	2013	2014	Average
4:07	4:02	3:57	3:53	4:17	4:12	4:04	4:01	4:04

Assessment of Alternatives

Alt. 1: Existing Conditions. Currently, the baseline assessment of emergency response times is below the five minute recommendation (see above). However, because no improvements to street lanes or bike lanes would be undertaken in the status quo, there will likely be no measureable improvements on emergency response times.

Alt. 2: Lee County Plan. The Lee County plan recommends to widen Ortiz Avenue to a six-lane street to accommodate and ease traffic congestion, which in theory may decrease emergency response times. However, the added bike lanes are recommended to be only four feet in width, which may not be adequate to allow passenger vehicles to move safely out of the route of emergency response vehicles. Furthermore, the Lee County plan also adds in a constant

median on Ortiz Avenue, barring the ability of some neighborhood side streets to turn left. As a result, emergency response times will likely be increased.

Alt. 3: Connectivity Plan. There are many elements of the Connectivity Plan which would likely decrease the injuries and fatalities of pedestrians and cyclists, including the installation of a network of safe bike lanes and sidewalks. In addition, alternative three would also decrease the rate of traffic accidents, making streets safer overall, and in less need of emergency response. Furthermore, the addition of the bike lane, and the slower speeds associated with the plan, would allow traffic to move safely out of the way during an emergency response call. Related to lane width, and bike lanes of the alternative, emergency response times will likely decrease.

EMS Response - Justification of Health Impacts

The elements proposed by alternative two and three may have beneficial or adverse effects on emergency response times of the Tice Fire Department, especially as it concerns traffic calming measures and street connectivity. The table below represents the elements of the plan which correlate with emergency response. The positive or negative health effects are also shown in relation to each element.

Table 15: Positive or Negative Emergency Response Health Effects over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks			
Roundabouts	• No measureable improvements	• No measureable improvements	• Decrease Emergency Response Times
Lane Number and Width	• No measureable improvements	• Increase Emergency Response Times	• Decrease Emergency Response Times
Bike Lanes	• No measureable improvements	• Decrease Emergency Response Times	• Decrease Emergency Response Times
Sidewalks			
Bus Stop Characteristics			
Speed Limit	• No measureable improvements	• Increase Emergency Response Times	• Decrease Emergency Response Times
Grid Network/Street Connections	• No measureable improvements	• Increase Emergency Response Times	• Decrease Emergency Response Times

Air Quality

Research Question: Will neighborhood connectivity reduce the rate of traffic congestion in the Tice Community?

Background Literature

Several health outcomes associated with air quality are also important for these plans. The effects of both indoor and outdoor air pollutants on health are of great public interest. One main source of outdoor air pollution is road traffic, which produces "a mixture of volatile hydrocarbons, airborne particles, nitrogen oxides, and carbon monoxide" (Wjst, et al., 1993).

Transportation is a major contributor to air pollution. Automobile emissions include nitrogen oxide, sulfur dioxide, and ozone (Banyan & Suguri, 2014; Lin, Munsie, Hwang, Fitzgerald, & Cayo, 2002). Increases in road development have implications for respiratory and cardiovascular diseases, and cancers (Gorman, Douglas, Conway, Noble, & Hanlon, 2002). Among the affected populations are those that spend a significant amount of time within close proximity to a busy road (Lin, Munsie, Hwang, Fitzgerald, & Cayo, 2002; Venn, Lewis, Cooper, Hubbard, & Britton, 2001).

For the study area, the strength of impacts to air quality and health may be somewhat mitigated by the flat topography and sea breeze winds that tend to more quickly disperse pollutants.

Still, poorly planned streets can lead to an increased amount of traffic volume in a given area. As a result, the increased traffic volume can then lead to health disadvantages such as respiratory illnesses and decreased safety for pedestrians and bicyclists.

Baseline Data

Traffic volume in the Tice Community has been relatively stable since 2007. However, due to poorly developed roads, sidewalks, and bike paths, the level of traffic volume within the community poses a high risk for pedestrians and bicyclists.

The Lee County Department of Transportation operates permanent count stations wherein traffic characteristics at permanent count stations are detailed with monthly, daily, and hourly factors where available. Average Annual Daily Traffic at permanent count stations were developed by Lee County by dividing total volume by number of days data were collected. Table 16 below shows the average daily traffic counts within the Tice community between 2007 and 2014.

Table 16: Average Annual Daily Traffic Counts for Tice Neighborhood[20]

Year:	2007	2008	2009	2010	2011	2012	2013	2014	AVG
Count:	15,991	17,100	14,075	16,100	19,302	13,050	15,075	14,500	15,649

Assessment of Alternatives

Alt. 1: Existing Design. As the expected volume of traffic will increase over time, the impacts to health as a result of air quality will gradually increase. Still, this HIA is not able to address the numbers of individuals affected or the strengths of these impacts due to a lack of data.

Alt. 2: Lee County Plan. Because the Lee County Plan proposes to increase the number of travel lanes to Ortiz and incorporates relatively minor changes in the multi-modal facilities, traffic volume will increase. Along with the increases to volume, air quality risks to health will rise. However, as above, this HIA has a data gap and cannot measure the exact effects of risk relative to air quality.

Alt. 3: Connectivity Plan. The Connectivity Plan proposes to increase the amount and quality of the biking and walking infrastructure. This includes improvements along the major and neighborhood streets relative to crosswalks, roundabouts, reduced lanes, reduced lane width, bike lanes, bus stops, speed limit reductions, and increased street connectivity. As a result, this HIA assumes a decrease in air quality risk due to lowered traffic volumes. Still, as above the data to support this claim is a gap in the research.

Air Quality - Justification of Health Impacts

The table below represents the elements of the plan which correlate with air quality. The positive or negative health effects are also shown in relation to each element. These are represented as improvements over the baseline only.

Table 17: Positive or Negative Impacts to Air Quality Over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks			
Roundabouts	• No measurable improvements	• No measurable improvements	• Improve air quality
Lane Number and Width	• No measurable improvements	• Increased risk	• Improve air quality
Bike Lanes	• No measurable improvements	• No measurable improvements	• Improve air quality
Sidewalks	• No measurable improvements	• No measurable improvements	• Improve air quality

[20] Source: Lee County 2014 Traffic Count Report and Lee County Traffic Count Database System (TCDS)

Bus Stop Characteristics	• No measurable improvements	• No measurable improvements	• Improve air quality
Speed Limit			
Grid Network/Street Connections			

Social Capital/Civic Engagement

Research Question: Will neighborhood connectivity increase social capital?

Neighborhood environments consist of not only physical characteristics, but also social characteristics, such as interactions between neighbors and social contribution (Mehta, 2007). Social networks affect health through a variety of mechanisms, including the provision of social support; social influence; social engagement; person-to-person contacts; and access to resources, such as money, jobs, and health care (Smith & Christakis, 2008). The built environment affects social capital and characteristics in several ways.

These relationships are highlighted in the following analysis regarding social capital.

Background Literature

There are many definitions of social capital but most involve some aspects of interactions that inspire trust, reciprocity, and networks. The collective value of social, political, and/or economic networks, and the reciprocities that arise from them, have value beyond individual gain (Leyden, 2003; Dannenberg, et al., 2003). Walkable, mixed-use neighborhood designs encourage the development of social capital, as residents in these communities are more likely to know their neighbors, participate politically, trust others, and become socially engaged (Leyden 2003).

Lund (2002) found that the frequency of walking within neighborhoods was associated with more unplanned interactions with neighbors, which can lead to enhanced interaction and relationship formulation. Elements of the built environment that are conducive to walking and which encourage the use of public transportation can also increase likelihood of unplanned encounters (Lund, 2002). Furthermore, individuals who perceived their neighborhood to be safe have been shown to increase their outdoor presence and have a greater likelihood of social interaction (Lund, 2002). The presence and level of traffic volume, congestion, and higher traffic speeds have been shown to negatively affect perceptions of area friendliness and safety. Therefore, pedestrian-friendly environments that encourage regular walking are important from a physical and a mental health perspective (Lund, 2002).

High levels of social capital have been linked to many positive health consequences. People with high social capital are less likely to experience colds, heart attacks, strokes, cancer, depression, and premature death of all sorts (Putnam, 2000). Social isolation is a major cause of illness and, once ill, socially isolated individuals are two to five times more likely to die than those with strong social networks. High levels of social capital result in improved mental health, better self-esteem, better self-image, greater self-worth, a reduced incidence of violent crime, and increased physical activity (Center for Quality Growth and Regional Development).

Baseline Data

There are a variety of ways to measure social capital, very few of which are available at the neighborhood level. For example, some studies have been conducted assessing newspaper

readership, neighborhood or community meeting attendance, or interaction with neighbors. These data collection efforts require expensive surveys or interviews. Voting turnout data, however, is easily accessible and does offer some (albeit rough) estimate of political engagement.

The Russell Park Community Center in Tice voting turnout can be assessed to determine baseline voting turnout data. For the 2014 general election, there were 2,045 registered voters and a turnout of 39.22% (Lee County Supervisor of Elections. See: http://www.leeelections.com/141104gen.htm). This turnout rate is quite low when compared to the overall Lee County average of 52.31% (Lee County Supervisor of Elections).

Social Capital - Justification of Health Impacts

Alt. 1 Existing Design: The existing design of the Tice community is not conducive to encouraging social interaction or capital. Due to the safety issues associated with active transport, there is likely minimal interaction taking place. Therefore, the status quo will likely not have a substantial effect on social capital within the neighborhood.

Alt. 2 Lee County Plan: The Lee County plan encompasses some elements of additional bike lanes and sidewalks which may initially encourage active transport and enhance the ability of neighbors to interact with one another. However, there are no improvements to public transit access needs, nor are there improvements to street connectivity, which will then have no measureable improvements in those regards to social interaction. The increased speed limit can act as a deterrent to physical activity or outdoor interaction with neighbors. This element will likely decrease social capital.

Alt. 3 Connectivity Plan: The community alternative plan will increase social capital due to a variety of elements. The bike lane and sidewalk network would encourage lifestyles of active living and active transport which would enhance the likelihood of unplanned encounters with neighbors. Furthermore, the improvement of public transit stops, and increasing the safety of the route to access public transit will also increase the likelihood of chance encounters. The reduction of the speed limit will enhance perceptions of safety within the neighborhood and will encourage more outdoor activity. Lastly, the connectivity of streets has the ability to connect neighborhoods with one another, and allow for more efficient interaction.

The table below represents the elements of the plan which correlate with social capital. Related, the positive or negative health effects are also shown in relation to each element.

Table 18: Positive or Negative Social Capital Health Effects over Baseline

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks			
Roundabouts			
Lane Number and Width			
Bike Lanes	• No measureable improvements	• Increase Social Capital	• Increase Social Capital
Sidewalks			
Bus Stop Characteristics	• No measureable improvements	• No measureable improvements	• Increase Social Capital
Speed Limit	• No measureable improvements	• Decrease Social Capital	• Increase Social Capital
Grid Network/Street Connections	• No measureable improvements	• No measureable improvements	• Increase Social Capital

Conclusions

Below is a broad analysis of the positive and negative health impacts which have been summarized in the sections above and cumulated into a comprehensive analysis. The three alternatives and their positive or adverse health effects are displayed below in the table for each of the plan elements.

Table 19: Positive or Negative Health Effects of Alternative Elements over Baseline – A Comprehensive Look

	Alternative One: Existing Design	Alternative Two: Lee County Plan	Alternative Three: Connectivity Plan
Crosswalks	• No measureable improvements on Transit Ridership • No measureable improvements on Physical Safety	• No measureable improvements on Transit Ridership • No measureable improvements on Physical Safety	• Increase Transit Ridership • No measureable improvements on Physical Safety on Ortiz Avenue • Increase physical safety on Palm Beach Boulevard
Roundabouts	• No measureable improvements on Emergency Response Times • No measureable improvements on Physical Safety • No measureable improvements on Air Quality	• No measureable improvements on Emergency Response Times • No measureable improvements on Physical Safety • No measureable improvements on Air Quality	• Decrease Emergency Response Times • Improve Physical Safety • Improve Air Quality
Lane Number and Width	• No measureable improvements on Emergency Response Times • No measureable improvements on Physical Safety • No measureable improvements on Air Quality	• Increase Emergency Response Times • No measureable improvements on Physical Safety on Palm Beach Boulevard • Increase physical safety risk on Ortiz Avenue • Increased Risk on Air Quality	• Decrease Emergency Response Times • No measureable improvements on Physical Safety • Improve Air Quality

Bike Lanes	• No measureable improvements on Criminal Activity • No measureable improvements on Physical Activity • No measureable improvements on Emergency Response Times • No measureable improvements on social capital • No measureable improvements on Physical Safety • No measureable improvements on Air Quality	• Decrease Criminal Activity • Increase Physical Activity • Decrease Emergency Response Times • Increase social capital • No measureable improvements on Physical Safety on Palm Beach Boulevard • Mixed improvements on physical safety on Ortiz Avenue • No measureable improvements on Air Quality	• Decrease Criminal Activity • Increase Physical Activity • Decrease Emergency Response Times • Increase social capital • No measureable improvements on Physical Safety on Palm Beach Boulevard • Improve physical safety on Ortiz Avenue • Improve Air Quality
Sidewalks	• No measureable improvements on Criminal Activity • No measureable improvements on Physical Activity • No measureable improvements on Air Quality	• Decrease Criminal Activity • Increase Physical Activity • No measureable improvements on Air Quality	• Decrease Criminal Activity • Increase Physical Activity • No measureable improvements on Physical Safety on Palm Beach Boulevard • Improve physical safety on Ortiz Avenue • Improve Air Quality
Bus Stop Characteristics	• No measureable improvements on Transit Ridership • No measureable improvements on Physical Activity • No measureable improvements on social capital • No measureable improvements on Air Quality	• No measureable improvements on Transit Ridership • No measureable improvements on Physical Activity • No measureable improvements on social capital • No measureable improvements on Air Quality	• Increase Transit Ridership • Increase Physical Activity • Increase social capital • Improve Air Quality

Speed Limit	• No measureable improvements on Criminal Activity • No measureable improvements on Physical Activity • No measureable improvements on Emergency Response Times • No measureable improvements on social capital • No measureable improvements on Physical Safety	• Increase Criminal Activity • Decrease Physical Activity • Increase Emergency Response Times • Decrease social capital • No measureable improvements on Physical Safety on Palm Beach Boulevard • 40% increased risk on physical safety on Ortiz Avenue • No measureable improvements on Physical Safety on neighborhood streets	• Decrease Criminal Activity • Increase Physical Activity • Decrease Emergency Response Times • Increase social capital • Little to no measureable improvements on Physical Safety on Palm Beach Boulevard • 40% increased Physical Safety on neighborhood streets • No measureable improvements on Physical Safety on Ortiz Avenue
Grid Network/Street Connections	• No measureable improvements on Criminal Activity • No measureable improvements on Emergency Response Times • No measureable improvements on social capital	• No measureable improvements on Criminal Activity • Increase Emergency Response Times • No measureable improvements on social capital	• Decrease Criminal Activity • Decrease Emergency Response Times • Increase social capital

Challenges to the Tice Community Plan

One of the primary challenges to the community's plan is Lee DOT's objection to the portion concerning Ortiz Avenue. This objection relates to the time involved in transportation planning and the funding expended.

Lee County started the four-lane design and permitting process for Ortiz Avenue in 2003 and, to date, has already completed the design to the 90% stage. As part of the planning process, the county held two public meetings (2002 and 2006) with relatively little opposition to their four-laning project. Based on the conditions at the time, the acquisition process began. However, the drastic reduction in impact fees as a result of the economic downturn significantly delayed the project. In 2011, the Tice Historic Community Planning Panel became aware of the project and became much more active in the planning process to incentivize infill and redevelopment and to take advantage of the significant multi-modal attributes of the community.

At its core, the challenges to the Tice Connectivity Plan are inherently about the role of citizens in the planning process and their ability to influence plans that span over long periods of time. When transportation planning is a long-term process (sometimes 20 years or more) quick adjustments are not feasible. Still, there is a long-standing value in the Unites States that planning processes should incorporate new or innovative ideas, new economic conditions, and new realities. This is especially true in under privileged or impoverished communities.

Recommendations

The recommendations of the HIA identify actions regarding Tice connectivity and redevelopment that can be taken to minimize, mitigate or avoid adverse health effects and to optimize beneficial ones. The proposals presented in the Tice Community Connectivity and Redevelopment Plan generally represent improvements to current conditions and redevelopment plans in terms of the health and safety of residents and visitors to the Tice Community. However, additional features that would improve safety that are not addressed in the Connectivity Plan should also be considered. Those recommendations that go beyond the THCPP Connectivity Plan are noted with an asterisk (*) in the table. For example, this HIA recommends reducing the speed limit on Palm Beach Boulevard to 35 MPH, which would reduce the fatality risk by 40%. Recommendations based upon the results of the HIA are presented in the following table.

Table 20: HIA Recommendations

Plan Element	Recommendation
Number of Lanes	• 2 lane Ortiz Avenue with center turn lane and pedestrian islands between Ballard Road and Palm Beach Boulevard
Speed Limits (mph)	• Maximum 35 mph on Ortiz Avenue between Ballard Road and Palm Beach Boulevard * • Maximum 35 mph on Palm Beach Boulevard between Marsh Avenue and Lexington Avenue * • Maximum 25 mph on all roads in residential areas
Roundabouts	• Install roundabouts at the intersections of: o Tice Street and Ortiz Avenue o Palm Beach Boulevard and Ortiz Avenue o Palm Beach Boulevard and Tice St,/New York Dr.
Bus Stops	• Install bus cut outs at all Lee Transit and school bus stops along Ortiz Avenue between Ballard Road and Palm Beach Boulevard • Provide safe, illuminated, handicap accessible waiting areas at a minimum of 5 feet from the flow of traffic at all Lee Tran and school bus stop locations
Neighborhood Connectivity	• Extend Lexington Avenue south to Division Drive • Extend Miramar Road south to Tice Street • Extend Alta Vista Lane south to Miramar Road • Construct a joiner road from Chattanooga Drive to Flamingo Circle north of Schandler Hall Community Park • Construct a joiner road from Kingston Drive to Alameda Avenue north of the 7-Eleven

Sidewalks	• Install 10 foot sidewalks on both sides of Ortiz avenue from Martin Luther King Jr. Boulevard to Palm Beach Boulevard * • Install 10 foot sidewalks on both sides of Lexington Avenue from Tice Street to Palm Beach Boulevard* • Incorporate sidewalks on the following roads: o Browning Avenue o Maine Avenue o Coral Drive o Schneider Drive o Lake Caloosa Drive o Morse Plaza o Shaw Boulevard o Alameda Avenue o Queens Drive o Richmond Avenue o Kingston Drive o Balboa Avenue o Bellair Road o Fairfax Road o Flamingo Circle o Tice Street o New York Drive o Baltimore Avenue o Allan Avenue o Prospect Avenue o Palm Place
Pedestrian Crossings	• Imprint, stain and provide signage at all pedestrian crosswalks along Palm Beach Boulevard, Ortiz Avenue, Ballard Road, Nuna Avenue, and Tice Street • Install pedestrian crosswalks at all bus stop locations along Ortiz Avenue from Ballard Road to Palm Beach Boulevard • Install pedestrian crosswalks at every bus stop along Ballard Road, Nuna Avenue, Tice Street • Install pedestrian crosswalks at the intersections of Ortiz Avenue and: o Tice Street o Garcia Avenue o Majorca Palms Drive o Zana Drive o Glenwood Avenue o Luckett Road o Ballard Road
Bike Lanes	• Based on literature of bikes lanes and recommendations from national associations, researchers will recommend to the Tice community that six foot bike lanes be proposed.* • Install marked bikes lanes along both sides of Ortiz Avenue from Martin Luther King Jr. Boulevard to Palm Beach Boulevard • Install marked bike lanes along both sides of Lexington Avenue from Tice Street to Palm Beach Boulevard

Intersections	• Redesign the intersection of Palm Beach Boulevard and Lexington Avenue/Orange Rive Boulevard to provide for both east and west bound traffic going north into Morse Shores Plaza and south onto Lexington Avenue • Provide additional turn lanes on the west side of Lexington Avenue at: o Richmond Avenue o Tice Street o North Trail RV facility

Future Research

The potential benefits of a continued comprehensive health impact assessment of the Tice community could be tremendous in aiding the recommendations listed above. Future considerations include residents' access to health care options, as well as economic impacts of a neighborhood connectivity plan for the Tice community. Future research could lead to enhanced projections and estimations of change as a result of the plans. Furthermore, original data collection could be enhanced through the utilization of neighborhood surveys and specific health data, which would aid in the closing of noted data gaps.

Reporting

Results, conclusions and recommendations from the HIA will be reported to the BoCC and to all interested parties and stakeholders. This will include public presentations to area civic organizations. Monthly progress reports are routinely being presented at meetings of the Morse Shores Civic Association, the Tice Association, the Russell Park Association, and the Tice Historic Community Planning Panel. The written HIA report and all supporting materials will also be available to the public and any interested parties on the DOH-Lee website at http://lee.floridahealth.gov/programs-and-services/environmental-health/index.html.

Monitoring and Evaluation

Monitoring and evaluation will be two-fold – Impact evaluation and outcome evaluation. Impact evaluation will track whether the HIA influenced the decision-making process. Outcome evaluation will determine whether implementation of the proposals changed health indicators.

Monitoring and Evaluation Indicators:

- Crime Rates
- Emergency Response Rates
- Civic Participation
- BikePed Audits
- Crash, Injury and Mortality Rates
- Traffic Volumes

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Appendix I: Tice Community Connectivity and Redevelopment Plan

Ortiz Avenue

- Two-lane with continuous center turn lane and appropriately placed pedestrian islands from Ballard Road to Palm Beach Boulevard. Pedestrian cross walks in 300 feet intervals, or at every intersection, on Ortiz Avenue and Tice Street, Garcia Avenue, Majorca Palms, Zana Drive, Glenwood Avenue, Luckett Road, Ballard Road consistent with most current design recommendations that enhance safety[21].
- No greater than 35 mph speed limit on Ortiz Avenue from Palm Beach Boulevard to Ballard Road.
- Install bus cut-outs for Lee Transit buses from Palm Beach Boulevard to Ballard Road with signage and proper covered/lighted/handicapped accessible bus stops. At current bus stop locations.
- Install ten (10) foot sidewalks on both sides of Ortiz Avenue from Palm Beach Boulevard to Dr. Martin Luther King Jr. Boulevard. A multi-use path current exists South of Dr. Martin Luther King Jr. Boulevard on Ortiz Avenue.
- Install 6 foot bike lanes on both sides of Ortiz Avenue from Palm Beach Boulevard to Dr. Martin Luther King Jr. Boulevard.
- Install a roundabout at Tice Street and Ortiz Avenue intersection
- Redesign Ortiz Avenue / Luckett Road intersection to allow truck traffic to more conveniently turn (e.g., relocate light poles/utility boxes, etc.)
- Install pedestrian crossing signals at Luckett Road and Ballard Road.
- Install pedestrian signage along Ortiz Avenue (e.g., pedestrian crossings, bus stops, etc.) consistent with County and State regulations.
- School bus stops that allow sufficient sidewalk area for school children to safely wait for the school bus (not standing in ditches along the roadway)[22]
- Low impact drainage system and linear park feature along Ortiz Avenue from SR 80 (Palm Beach Blvd.) to Ballard Road using Lee County right of way.

Lexington Avenue

- Extend south to Division Drive. Include bike lanes and sidewalks on both sides and provide additional turning lanes at Richmond, Tice, and North Trail RV facility on west side of Lexington Avenue.

[21] Midblock crosswalks not permitted if distance between intersections is less than 660 feet.
[22] Lee County School District does not provide a plan or any planning requirements for bus stops.

Palm Beach Boulevard

- Redesign intersection of Lexington Avenue and Orange River Boulevard to provide for both east and west bound traffic going north into Morse Shores Plaza and south to Lexington Avenue.
- Install a modern roundabout at Palm Beach Boulevard and Ortiz Avenue.
- Install a modern roundabout at Palm Beach Boulevard/ Tice / New York intersection.

Sidewalk Infrastructure

- Incorporate sidewalks on the following roads:
    - Browning Drive, Maine Ave., Coral Dr., Schneider Dr., and Lake Caloosa Dr.
    - Morse Plaza: from Palm Beach Blvd. to Coral Dr.
    - Shaw Blvd.: from Alameda Ave. to Maine Ave.
    - Alameda Ave.: North of Palm Beach Blvd.
    - Queens Dr. and Richmond Ave.: from Palm Beach Blvd. to Carol Dr.
    - Kingston Dr.: North of Palm Beach Blvd. to Palmacea Rd.
    - Balboa Ave.: from Palm Beach Blvd. to Garcia Ave.
    - Bellair Rd.: North of Palm Beach Blvd.
    - Fairfax Rd.; North of Garcia Ave.
    - Flamingo Circle: North of Palm Beach Blvd. to Bellair Rd.
    - Tice St.: West of I75 to New York Dr.
    - New York Dr.: Glenwood Ave. to Seminole St.
    - Baltimore Ave.: North of Palm Beach Blvd.
    - Allan Ave.
    - Prospect Ave.: North of Palm Beach Blvd. to Woodside Ave.
    - Palm Pl.: From Prospect Ave. to Allan Ave.

Alta Vista Lane

- Connect Alta Vista Lane south to Miramar Road

Miramar

- Connect Miramar Road south to Tice Street.

Neighborhood Roads

- Reduce speed limits on all Tice streets except Ortiz Avenue and Palm Beach Blvd. to 25 mph or less.

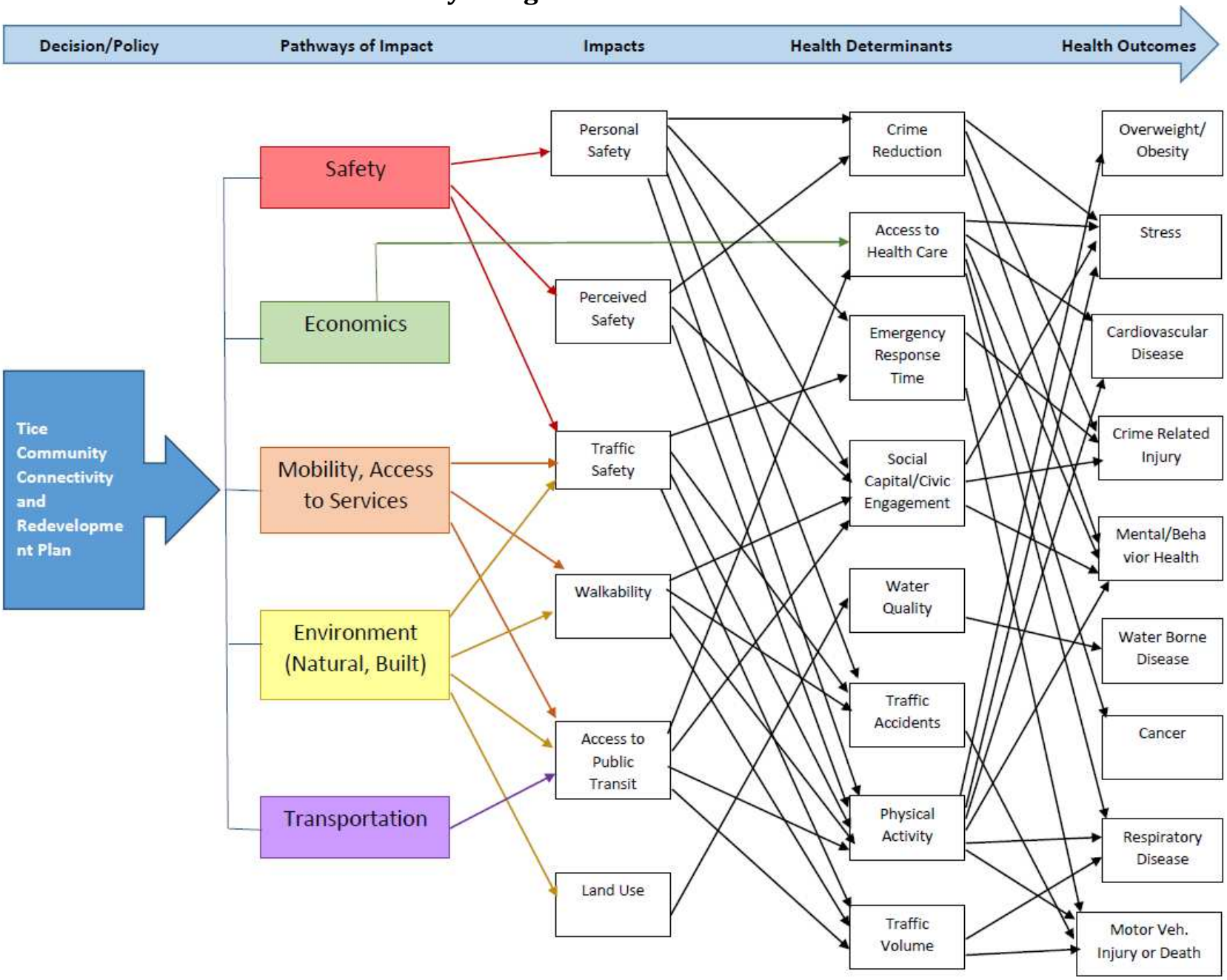
Neighborhood Connections

- Joiner road from Chattanooga Drive to Flamingo Circle, joining Alabama Grove and Russell Park neighborhoods. Joiner road from Kingston Drive to Alameda Avenue (behind 7-Eleven) connecting Russell Park to Morse Shores neighborhoods.

Pedestrian Crosswalks

- Imprint and stain the pedestrian crossings (simulated cobblestone) at Tice Street/New York/Palm Beach Boulevard, in front of Morse Shores Shopping Center (at LeeTran bus stop location between Queens and E. Kingston Drive, Tice Street and Ortiz Avenue, Ortiz Avenue and Luckett Road, and Ortiz Avenue and Ballard Road.

Appendix II: Health Determinant Pathways Diagram



Appendix III: Demographic Tables

Table 21: Tice CDP Population by Age and Gender

	Total Population		Male Population		Female Population	
	Number	Percent	Number	Percent	Number	**Percent**
Total	4,470	100.0	2.529	56.6	1,941	**43.4**
Under 5 years	465	10.4	252	5.6	213	**4.8**
5 to 9 years	380	8.5	195	4.4	185	**4.1**
10 to 14 years	288	6.4	157	3.5	131	**2.9**
15 to 19 years	311	7.0	171	3.8	140	**3.1**
20 to 24 years	436	9.8	274	6.1	162	**3.6**
25 to 29 years	439	9.8	278	6.2	161	**3.6**
30 to 34 years	366	8.2	224	5.0	141	**3.2**
35 to 39 years	293	6.6	160	3.6	133	**3.0**
40 to 44 years	250	5.6	143	3.2	107	**2.4**
45 to 49 years	275	6.2	145	3.2	130	**2.9**
50 to 54 years	245	5.5	142	3.2	103	**2.3**
55 to 59 years	214	4.8	120	2.7	94	**2.1**
60 to 64 years	152	3.4	90	2.0	62	**1.4**
65 to 69 years	120	2.7	64	1.4	56	**1.3**
70 to 74 years	93	2.1	50	1.1	43	**1.0**
75 to 79 years	57	1.3	25	0.6	32	**0.7**
80 to 84 years	50	1.1	27	0.6	23	**0.5**
85 years and over	37	0.8	12	0.3	25	**0.6**
Median age (years)	28.8		28.6		29.4	
16 years and over	3,290	73.6	1,902	42.6	1,388	**31.1**
18 years and over	3,172	71.0	1,833	41.0	1,339	**30.0**
21 years and over	2,944	65.9	1,710	38.3	1,234	**27.6**
62 years and over	446	10.0	229	5.1	217	**4.9**
65 years and over	**357**	**8.0**	**178**	**4.0**	**179**	**4.0**

Source: U. S. Census Bureau, 2010 Census

Table 22: Tice CDP Racial/Ethnic Background

Race	Number	Percent
Total population	4,470	**100.0**
One Race	4,319	**96.6**
White	2,291	**51.3**
Black or African American	383	**8.6**
American Indian and Alaskan Native	59	**1.3**
Asian	41	**0.9**
Asian Indian	6	**0.1**
Chinese	3	**0.1**
Filipino	1	**0.0**
Japanese	0	**0.0**
Korean	6	**0.1**
Vietnamese	9	**0.2**
Other Asian[a]	16	**0.4**
Native Hawaiian and other Pacific Islander	9	**0.2**
Native Hawaiian	0	**0.0**
Guamanian or Chamorro	9	**0.2**
Samoan	0	**0.0**
Other Pacific Islander[b]	0	**0.0**
Some other race	1,536	**34.4**
Two or more races	151	**3.4**
White, American Indian and Alaska Native[c]	7	**0.2**
White, Asian[c]	5	**0.1**
White, Black or African American[c]	17	**0.4**
White, Some Other Race[c]	77	**1.7**
Race alone or in combination with one or more other races[d]		
White	2,406	**53.8**
Black or African American	425	**9.5**
American Indian and Alaskan Native	81	**1.8**
Asian	61	**1.4**
Native Hawaiian and Other Pacific Islander	13	**0.3**
Some Other Race	1,648	**36.9**
Hispanic or Latino	Number	**Percent**
Total Population	4,470	**100.0**
Hispanic or Latino (of any race)	2,782	**62.2**
Mexican	1,249	**27.9**
Puerto Rican	334	**7.5**
Cuban	21	**0.5**
Other Hispanic or Latino[e]	1,178	**26.4**
Not Hispanic or Latino	**1,688**	**37.8**

Source: U. S. Census Bureau, 2010 Census

(a) Other Asian alone, or two or more Asian categories
(b) Other Pacific Islander alone, or two or more Native Hawaiian and other Pacific Islander categories
(c) One of the four most commonly reported multiple-race combinations nationwide in Census 2000
(d) In combination with one or more of the other races listed. The six numbers may add to more than the total population, and the six percentages may add to more than 100 percent because individuals may report more than one race

(e) This category is composed of people whose origins are from the Dominican Republic, Spain, and Spanish-speaking Central or South American countries. It also includes general origin responses such as “Latino”, or “Hispanic”

Table 23: Tice CDP Hispanic or Latino and Race

	Number	Percent
Total Population	4,470	**100.0**
Hispanic or Latino	2,782	**62.2**
White alone	1,034	**23.1**
Black or African American alone	52	**1.2**
American Indian and Alaskan Native alone	40	**0.9**
Asian alone	2	**0.0**
Native Hawaiian and Other Pacific Islander alone	9	**0.2**
Some Other Race alone	1,532	**34.3**
Two or More Races	113	**2.5**
Not Hispanic or Latino	1,688	**37.8**
White alone	1,257	**28.1**
Black or African American alone	331	**7.4**
American Indian and Alaskan Native alone	19	**0.4**
Asian alone	39	**0.9**
Native Hawaiian and Other Pacific Islander alone	0	**0.0**
Some Other Race alone	4	**0.1**
Two or More Races	**38**	**0.9**

Source: U. S. Census Bureau, 2010 Census

Table 24: Tice CDP Household Characteristics

Relationship	Number	Percent
Total Population	4,470	**100.0**
In households	4,455	**99.7**
Householder	1,358	**30.4**
Spouse[a]	521	**11.7**
Child	1,294	**28.9**
Own child under 18 years	993	**22.2**
Other relatives	630	**14.1**
Under 18 years	229	**5.1**
65 years and over	28	**0.6**
Nonrelatives	652	**14.6**
Under 18 years	72	**1.6**
65 years and over	18	**0.4**
Unmarried partner	131	**2.9**
In group quarters	15	**0.3**
Institutionalized population	0	**0.0**
Male	0	**0.0**
Female	0	**0.0**
Noninstitutionalized population	15	**0.3**
Male	6	**0.1**
Female	**9**	**0.2**

Source: U. S. Census Bureau, 2010 Census

(a) “Spouse” represents spouse of the householder. It does not reflect all spouses in a household. Responses of “same-sex spouse” were edited during processing to “unmarried partner.”

Table 25: Tice CDP Households by Type

	Number	Percent
Total Households	1,358	**100.0**
Family households (families)[b]	878	**64.7**
With own children under 18	456	**33.6**
Husband-wife family	521	**38.4**
With own children under 18	271	**20.0**
Male householder, no wife present	154	**11.3**
With own children under 18	68	**5.0**
Female householder, no husband present	203	**14.9**
With own children under 18	117	**8.6**
Nonfamily households[b]	480	**35.3**
Householder living alone	316	**23.3**
Male	187	**13.8**
65 years and over	53	**3.9**
Female	129	**9.5**
65 years and over	54	**4.0**
Households with individuals under 18 years	558	**41.1**
Households with individuals 65 years and over	278	**20.5**
Average household size	3.28	
Average family size[b]	**3.78**	

Source: U. S. Census Bureau, 2010 Census

Table 26: Tice CDP Housing Occupancy

	Number	Percent
Total Housing Units	1,700	**100.00**
Occupied housing units	1,358	**79.9**
Vacant housing units	342	**20.1**
For rent	130	**7.6**
Rented, not occupied	2	**0.1**
For sale only	55	**3.2**
Sold, not occupied	11	**0.6**
For seasonal, recreational, or occasional use	34	**2.0**
All other vacants	110	**6.5**
Homeowner vacancy rate (percent)[c]		**7.3**
Rental vacancy rate (percent)[a]		**16.1**

Source: U. S. Census Bureau, 2010 Census

Table 27: Tice CDP Housing Tenure

	Number	Percent
Occupied units	1,358	**100.0**
Owner-occupied units	683	**50.3**
Population in owner-occupied housing units	1,903	
Average household size of owner-occupied units	279	
Renter-occupied units	675	**49.7**
Population in renter-occupied housing units	2,552	
Average household size of renter-occupied units	3.78	

Source: U. S. Census Bureau, 2010 Census

(a) "Spouse" represents spouse of the householder. It does not reflect all spouses in a household. Responses of "same-sex spouse" were edited during processing to "unmarried partner."

(b) "Family households" consist of a householder and one or more other people related to the householder by birth, marriage, or adoption. They do not include same-sex married couples even if the marriage was performed in a state issuing marriage certificates for same-sex couples. Same-sex couple households are included in the family households category if there is at least one additional person related to the householder by birth or adoption. Same-sex couple households with no relatives of the householder present are tabulated in nonfamily households. "Nonfamily households" consist of people living alone and households which do not have any members related to the householder.

(c) The homeowner vacancy rate is the proportion of the homeowner inventory that is vacant "for sale." It is computed by dividing the total number of vacant units "for sale only" by the sum of owner-occupied units, vacant units "for sale only", and vacant units that have been sold but not yet occupied, and then multiplying by 100.

(d) The rental vacancy is the proportion of the rental inventory that is vacant "for rent." It is computed by dividing the total number of vacant units "for rent" by the sum of the renter-occupied units, vacant units that are "for rent", and vacant units that have been rented but not yet occupied, and then multiplying by 100.

Table 28: Tice CDP Percentage of Families and People Whose Income in the Past 12 Months is Below the Poverty Level

Relationship	Percent
All families	21.9 (+/-10.0)
With related children under 18 years	32.7 (+/-14.6)
With related children under 5 years only	44.6 (+/-36.4)
Married couple families	9.8 (+/-8.6)
With related children under 18 years	16.9 (+/-15.7)
With related children under 5 years only	31.4 (+/-43.7)
Families with female householder, no husband present	56.3 (+/-23.7)
With related children under 18 years	73.1 (+/-25.2)
With related children under 5 years only	100.0 (+/-67.8)
All people	31.3 (+/-8.1)
Under 18 years	37.2 (+/-17.6)
Related children under 18 years	37.2 (+/-17.6)
Related children under 5 years	48.5 (+/-30.0)
Related children 5 to 17 years	31.8 (+/-19.5)
18 years and over	29.7 (+/-7.1)
18 to 64 years	30.0 (+/-6.7)
65 years and over	27.3 (+/-19.0)
People in families	28.8 (+/-12.3)
Unrelated individuals 15 years and over	36.1 (+/-8.9)

Source: U.S. Census Bureau, 2007-2011 American Community Survey

Table 29: Community Comparisons

	Tice	FM	LA	CC	BS	SC	LC	FL	US
White persons (%)[a]	51.3	54.6	67.5	88.2	88.8	98.0	87.6	78.5	**78.1**
Black persons (%)[a]	8.6	32.3	19.3	4.3	0.8	0.6	8.8	16.5	**13.1**
American Indian or Native Alaskan persons (%)[a]	1.3	0.6	0.4	0.3	0.5	0.1	0.5	0.5	**1.2**
Asian persons (%)[a]	0.9	1.6	1.2	1.5	1.0	0.4	1.5	2.6	**5.0**
Native Hawaiian and Other Pacific Islander (%)[a]	0.2	0.1	0.1	0.1	0.1	<0.05	0.1	0.1	**0.2**
Two or More Races (%)	3.4	2.8	3.3	2.3	1.4	0.6	1.4	1.8	**2.3**
Hispanic or Latino (%)[b]	62.2	20.0	34.3	19.5	22.5	2.3	18.6	22.9	**16.7**
White, non-Hispanic (%)	28.1	44.6	44.2	73.5	75.1	96.1	70.7	57.5	**63.4**
Persons under 5 yrs (%)	10.4	7.3	8.7	5.4	4.4	1.3	5.2	5.6	**6.5**
Persons under 18 yrs (%)	29.0	22.7	30.1	22.4	13.8	7.9	19.4	21.0	**23.7**
Persons 65 yrs & Over (%)	8.0	14.4	10.3	17.0	33.8	50.1	24.1	17.6	**13.3**
Foreign Borne Persons (%)	38.7	17.1	23.6	14.7	21.3	6.7	15.2	19.2	**12.8**
Population Density/sq.mi.	4,064	1,559	938	1,460	1,138	401	789	351	**87**
High School Graduate (%)	56.1	79.0	80.5	89.6	85.6	99.1	87.0	85.5	**85.4**
Bachelor's Degree (%)	3.7	21.3	14.5	20.6	28.5	59.4	24.6	26.0	**28.2**
Unemployment Rate (%)[c]	10.1[d]	15.3	15.1	12.6	9.7	5.4	11.9	10.3	**8.7**
Persons Living Below Poverty Level (%)	**31.3**	**25.2**	**18.2**	**11.9**	**14.9**	**5.5**	**13.5**	**14.7**	**14.3**

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so are also included in applicable race categories
(c) 2007-2011 American Family Survey 5-Year Estimate
(d) www.areavibes.com/tice-fl/employment/ 2010

FM=Fort Myers; LA=Lehigh Acres; CC=Cape Coral; BS=Bonita Springs; SC=Sanibel City; LC=Lee County; FL=Florida; US=United States

Appendix IV: Screening Checklist

Answers Favoring Doing a HIA	To Your Knowledge	Answers Favoring Not Doing a HIA
Health Impacts		
Yes	Does the project affect health directly?	
Yes	Does the project affect health indirectly?	
Yes	Are there any potentially serious negative health impacts that you currently know of?	
Yes	Is further investigation necessary because more information is required on the potential health impacts?	
Yes	Are the potential health impacts well known and is it straightforward to suggest effective ways in which beneficial effects are maximized and harmful effects minimized?	
No	Are the potential health impacts identified judged to be minor?	
Community		
Yes	Is the population affected by the project at large?	
Yes	Are there any socially excluded, vulnerable, disadvantaged groups likely to be affected?	
Yes	Are there any community concerns about any potential health impacts?	
Project		
Yes	Is the size of the project large?	
Yes	Is the cost of the project high?	
Yes	Is the nature and extent of the disruption to the affected population likely to be major?	

Organization		
Yes	Is the project a high priority/important for the organization/partnership	
Yes	Is there potential to change the proposal?	
Favoring HIA = 14	Total	Against = 0
	Type of HIA: Favoring Intermediate HIA	
Yes	Is there only limited time in which to conduct the HIA?	
Yes	Is there only limited opportunity to influence the decision?	
Yes	Is the time frame for the decision-making process set by external factors beyond your control?	
Yes	Are there only very limited resources available to conduct the HIA?	
	Assessors	
Yes	Do personnel in the organization or partnership have the necessary skills and expertise to conduct the HIA?	
Yes	Do personnel in the organization or partnership have the time to conduct the HIA?	

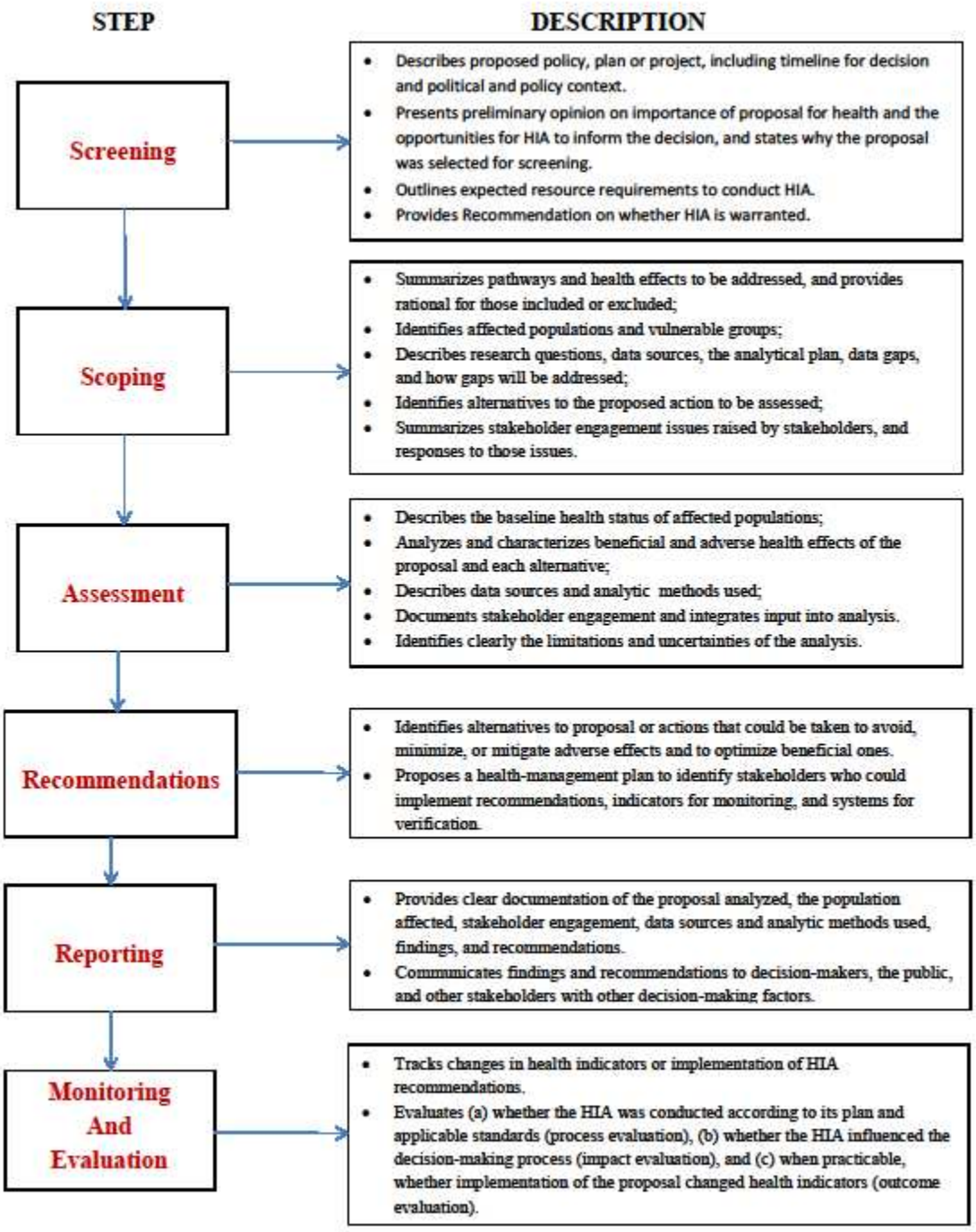
Source: Harris et. al., 2007

Appendix V: Scoping Checklist

Scoping Checklist		
Question	Response to Question	Impact Description
Is the magnitude of the proposed construction project significant?	Yes	
Are there significant potential health impacts of the project?	Yes	
What is the level of political interest in this project?	High	
What is the level of public interest?	High	
How urgent is the completion of the HIA to influence decisions?	High Urgency	
What funds are available for the HIA?	Yes	Funds were provided by the Florida Gulf Coast University Office of Research and Sponsored Programs internal grant program to support a graduate student to conduct this research
What data associated with the proposal is available and accessible? What is the health evidence base associated with the proposal?	Primary Data Secondary data Scientific evidence	

Source: Harris et. al., 2007

Appendix VI: Steps of a Health Impact Assessment



Appendix VII: Bus Ratings and Maps

Table 30: Route 100 Bus Stop Rating

ROUTE 100 LOCATION	BENCH	SHELTER	LIGHTING	SIDEWALK	5 FEET	PAD	RECEPTICAL	RATING
Palm Beach Boulevard, Eastbound								
1. Fairview Avenue	1	0	1	1	1	0	0	4
2. Prospect Avenue – 787 ft.	0	0	1	1	1	0	0	3
3. Tice Street – 980 ft.	1	0	1	1	1	0	0	4
4. Tyrone Avenue – 1004 ft.	0	0	1	1	0	0	0	2
5. Carolina Avenue & Figuera Avenue – 970 ft.	0	0	1	1	0	0	0	2
6. Family Dollar Store (4712 Palm Beach) – 975 ft.	1	1	0	1	1	1	1	6
7. Fairfax Road – 450 ft.	1	0	0	1	0	0	0	2
8. Buena Vista Boulevard – 792 ft.	1	0	0	1	0	0	0	2
9. Alta Vista Avenue – 920 ft.	1	1	1	1	1	1	1	7
10. Speedway Gas Station (East of Richmond) – 1725 ft.	1	1	0	1	1	1	1	6
11. Lexington Avenue – 870 ft.	1	0	1	1	0	0	0	3
Palm Beach Boulevard, Westbound								
1. Morse Plaza Road	1	0	0	1	0	1	1	4
2. Morse Plaza/East of Richmond Avenue – 950 ft.	1	1	0	1	1	1	1	6
3. Kingston Drive – 1650 ft.	1	1	1	1	1	1	0	6
4. Buena Vista Boulevard – 875 ft.	1	0	1	1	1	0	0	4
5. Fairfax Road/Bellair Road – 618 ft.	1	1	0	1	1	1	0	5
6. Flamingo Circle (East of Ortiz Avenue) – 580 ft.	0	0	0	1	1	1	0	3

7. 150 ft. west of Royal Palm Park Road – 910 ft.	1	1	0	1	1	1	1	6
8. Post Office – 838 ft.	0	0	0	1	1	0	0	2
9. New York Drive – 1492 ft.	0	0	0	1	0	0	0	1
10. 218 ft. west of Prospect Avenue – 834 ft.	1	1	1	1	0	1	1	6
11. Fairview Avenue – 550 ft.	0	0	1	1	1	0	1	4

Table 31: Route 15 Bus Stop Rating

ROUTE 15 LOCATION	BENCH	SHELTER	LIGHTING	SIDEWALK	5 FEET	PAD	RECEPTICAL	RATING
Ballard Road, Eastbound								
1. 4348 Ballard Road – 1000 ft. east of Marsh Avenue	0	0	1	0	0	0	0	1
2. Kingsman Circle North – 1730 ft.	0	0	0	0	0	0	0	0
Nuna Avenue, Northbound								
1. 50 ft. North of Ballard Road – 665 ft.	0	0	1	0	0	0	0	1
2. Skipton Circle North – 900 ft.	0	0	0	0	0	0	0	0
3. Indian Grove – 550 ft.	0	0	1	0	0	0	0	1
4. Jesus Abrero Church – 1200 ft.	0	0	1	0	0	0	0	1
5. Goodman's MHP – 1350 ft.	0	0	0	0	0	0	0	0
6. Orange Grove MHP – 700 ft.	0	0	0	0	0	0	0	0
7. Glenwood Avenue – 500 ft.	0	0	1	0	0	0	0	1
8. Pelham Street – 650 ft.	0	0	1	0	0	0	0	1
9. Tice Street 625 ft.	0	0	0	0	1	0	0	1
Tice Street, Eastbound								
1. Mississippi Avenue – 425 ft.	0	0	1	0	1	0	0	2
2. Carolina Avenue – 350 ft.	0	0	1	0	0	0	0	1
Carolina Avenue, Northbound								
1. 75 ft. South of Palm Beach Boulevard – 1075 ft.	0	0	0	0	0	0	0	0
Palm Beach Boulevard, Eastbound								
1. Carolina/Figuera (share w/Route 100) – 300 ft.	0	0	1	1	0	0	0	2

Ortiz Avenue, Southbound								
1. 200 ft. South of Palm Beach Boulevard – 875 ft.	0	0	1	1	1	1	0	4
2. 280 ft. South of Tice Street – 1800 ft.	0	0	1	0	0	0	0	1
3. Dean Street – 1500 ft.	0	0	1	0	0	0	0	1
4. Zana Drive – 450 ft.	0	0	1	0	0	0	0	1
5. Billy's Creek Drive (North) – 575 ft.	0	0	0	0	0	0	0	0
6. Nottingham Drive – 1900 ft.	0	0	0	0	0	0	0	0
7. 150 ft. South of Luckett Road – 750 ft.	0	0	1	0	0	0	0	1
8. 250 ft. North of Ballard Road – 625 ft.	1	0	1	0	1	0	0	3
Ballard Road, Westbound								
1. 250 ft. West of Luckett Road – 500 ft.	0	0	1	1	1	0	0	3
2. Poinsettia Park/Iglesia Christiana Church – 1050 ft.	1	0	0	1	1	0	0	3
3. 50 ft. West of Kingsman Circle North – 1300 ft.	0	0	0	1	1	0	0	2
4. Utana Avenue – 700 ft.	0	0	0	1	0	0	0	1
5. 4348 Ballard Road – 950 ft.	0	0	1	1	0	0	0	2
6. Marsh Avenue – 1000 ft.	0	0	0	1	0	0	0	1

Table 32: Route 20 Bus Stop Rating

ROUTE 20 LOCATION	BENCH	SHELTER	LIGHTING	SIDEWALK	5 FEET	PAD	RECEPTICAL	RATING
Marsh Avenue, Eastbound (Northbound)								
12. Eugenia Avenue	0	0	0	1	0	0	0	1
13. Ballard Road – 665 ft.	0	0	0	1	1	0	1	3
14. New York Avenue – 1350 ft.	1	0	1	1	1	0	0	4
15. Brookside Village Apartments – 1100 ft.	1	0	0	0	1	0	0	2
16. Madison Avenue – 555 ft.	0	0	1	1	1	0	0	3
17. Woodside Avenue – 960 ft.	1	0	1	1	1	1	0	5
18. Greenwood Avenue – 675 ft.	0	0	0	1	0	0	0	1
19. Glenwood Avenue – 645 ft,	1	0	1	1	1	1	0	5
20. Palm Beach Boulevard – 375 ft.	1	1	1	1	1	1	1	7
Marsh Avenue, Westbound (Southbound)								
12. Glenwood Avenue – 375 ft.	1	1	0	1	1	1	1	6
13. Greenwood Avenue – 610 ft.	1	0	0	0	0	0	0	1
14. Woodside Avenue – 700 ft.	1	1	0	1	1	1	1	6
15. Madison Avenue – 870 ft.	1	0	0	0	0	0	0	1
16. Brookside Village Apartments – 560 ft.	1	0	0	0	0	0	0	1
17. New York Avenue – 1180 ft.	1	0	0	1	1	0	0	3
18. Ballard Road – 1210 ft.	1	0	1	0	1	0	0	3
19. Eugenia Avenue – 665 ft.	1	0	0	0	1	0	0	2
20. Michigan Avenue – 655 ft.	0	0	0	0	0	0	0	0

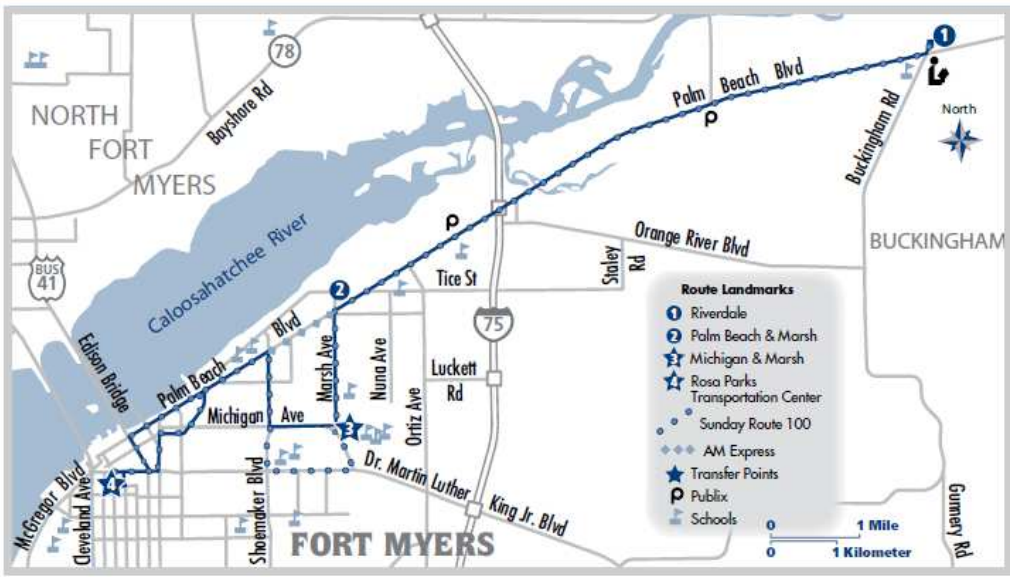


Figure 14: Bus Route 100 Map

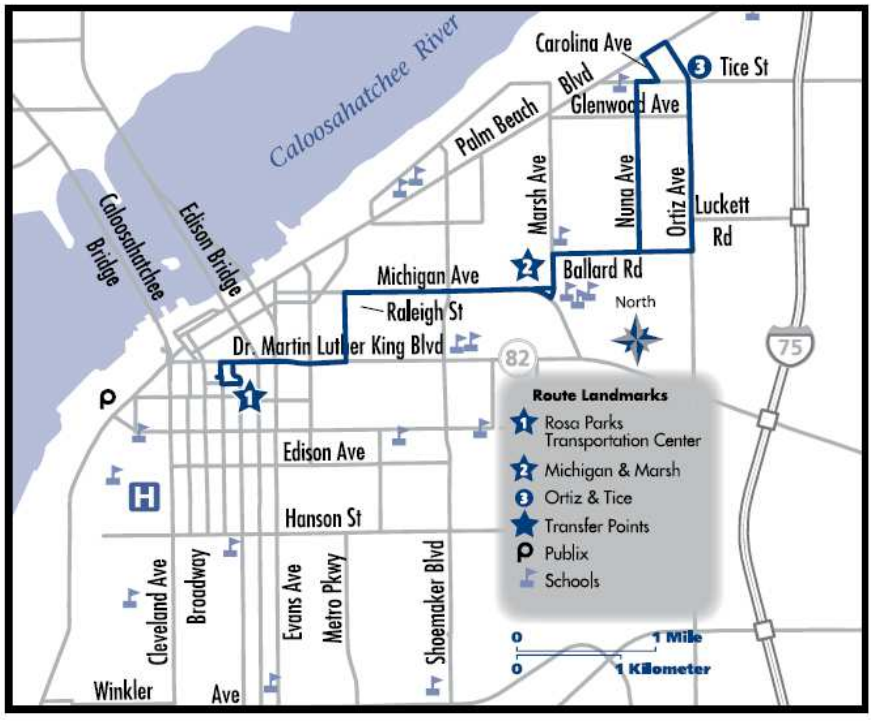


Figure 15: Bus Route 15 Map

Figure 16: Bus Route 20 Map

Appendix VIII: Criminal Activity Tables and Charts

Table 33: Tice Crime Statistics by Year

	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Homicide/Manslaughter	4	6	3	1	0	1	1	0	3	**19**
Forcible Sex Offenses	13	17	12	3	9	7	12	7	6	**86**
Robbery	111	78	47	54	50	46	36	41	34	**497**
Aggravated Assault	102	83	53	40	52	37	33	45	39	**484**
Motor Vehicle Theft	75	89	49	47	30	16	36	31	20	**393**
Burglary, Residence	88	129	91	95	94	133	97	81	69	**877**
Burglary, Business	35	30	35	13	14	22	13	16	14	**192**
Pocket Picking	0	2	0	1	0	0	0	0	0	**3**
Purse Snatching	4	1	1	1	2	0	2	2	0	**13**
Theft, Retail	76	67	42	29	33	9	11	14	12	**293**
Theft from Motor Vehicle	65	52	56	37	45	33	33	46	45	**412**
Theft of Motor Vehicle Parts	23	43	27	21	19	21	23	28	26	**231**
Theft of Bicycle	14	13	7	4	5	9	16	21	18	**107**
Theft from Building	28	37	39	24	16	17	26	28	17	**232**
Theft, from Coin Machine	0	0	0	0	2	0	0	0	0	**2**
Theft, Other	40	79	77	56	66	64	48	62	32	**524**
Simple Assault/Stalking	131	116	101	91	106	116	73	89	87	**910**
Intimidation	1	0	0	0	0	0	0	1	0	**2**
Arson	2	3	8	3	4	2	1	3	5	**31**
Total	**812**	**845**	**648**	**520**	**547**	**533**	**461**	**515**	**427**	**5308**

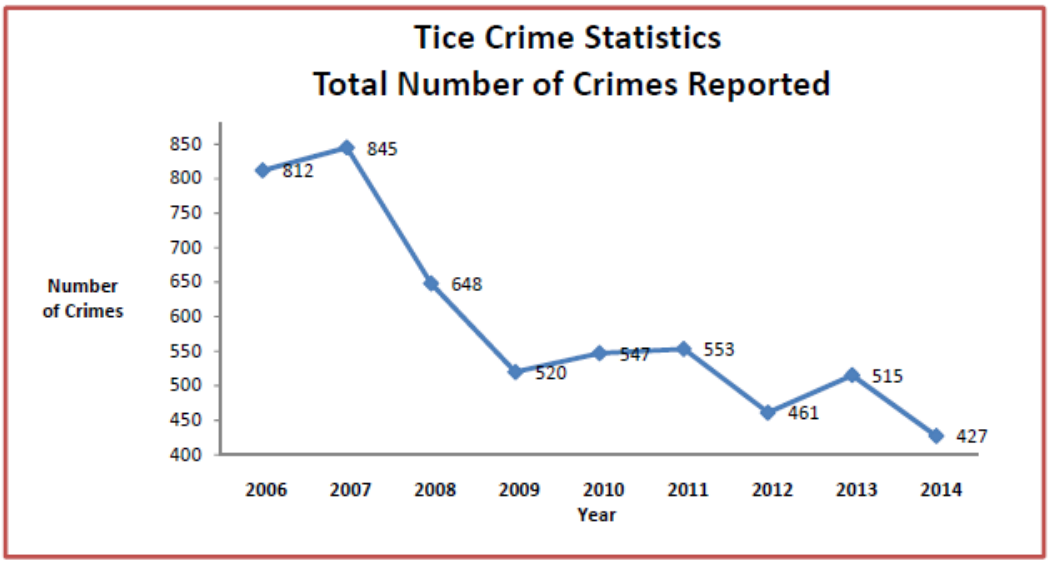


Figure 17: Total Number of Crimes Reported

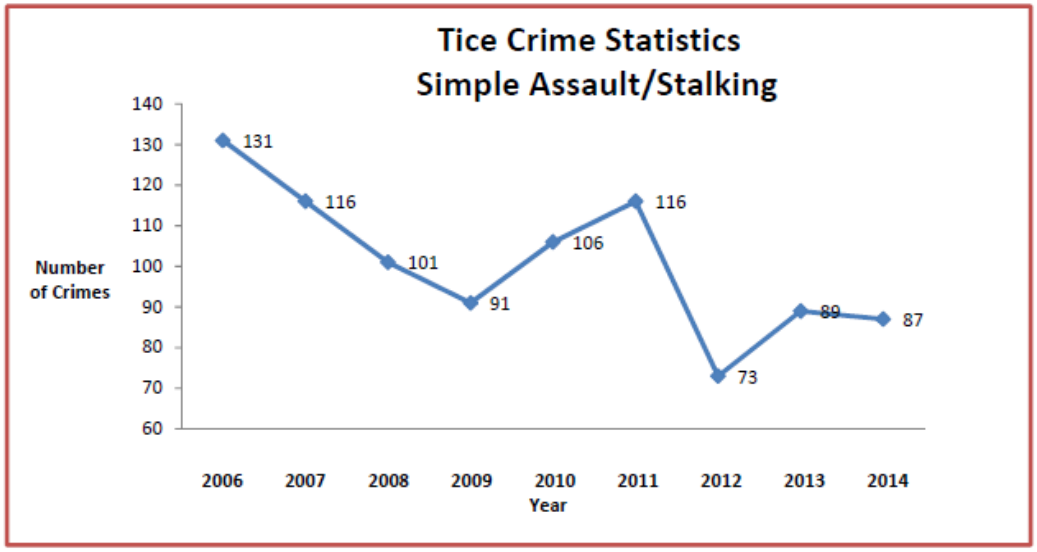


Figure 18: Simple Assault Crime Trends

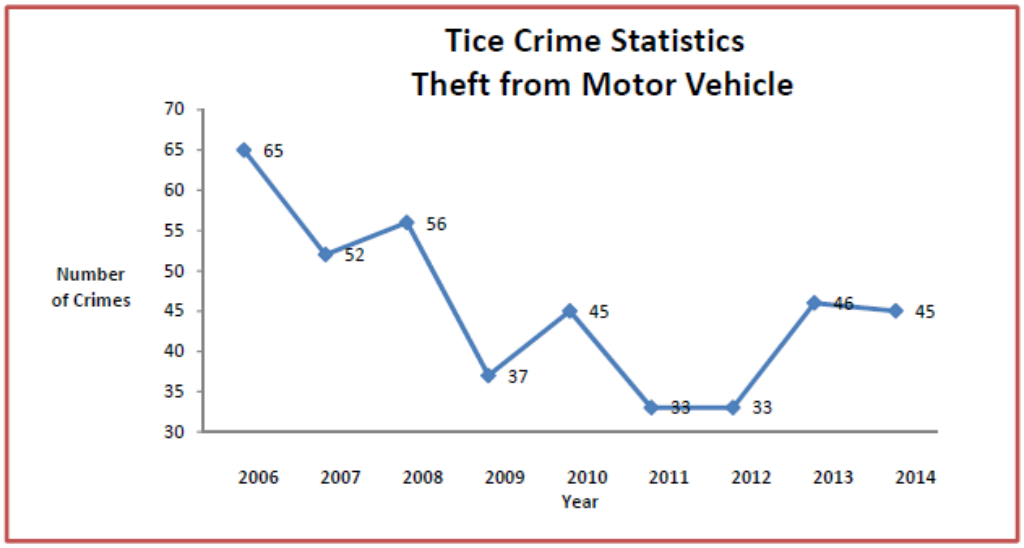


Figure 19: Theft from a Motor Vehicle Crime Trends

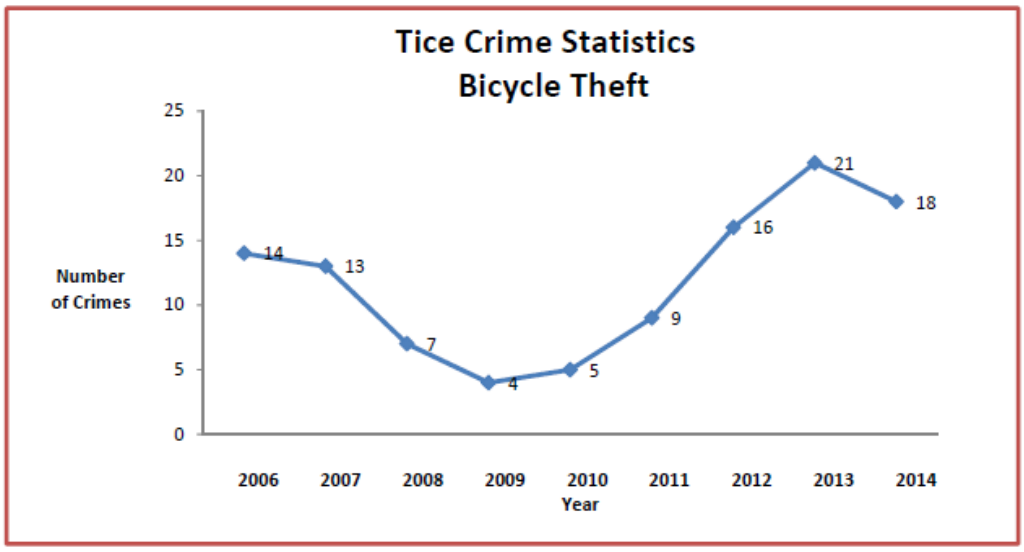


Figure 20: Bicycle Theft Crime Trends

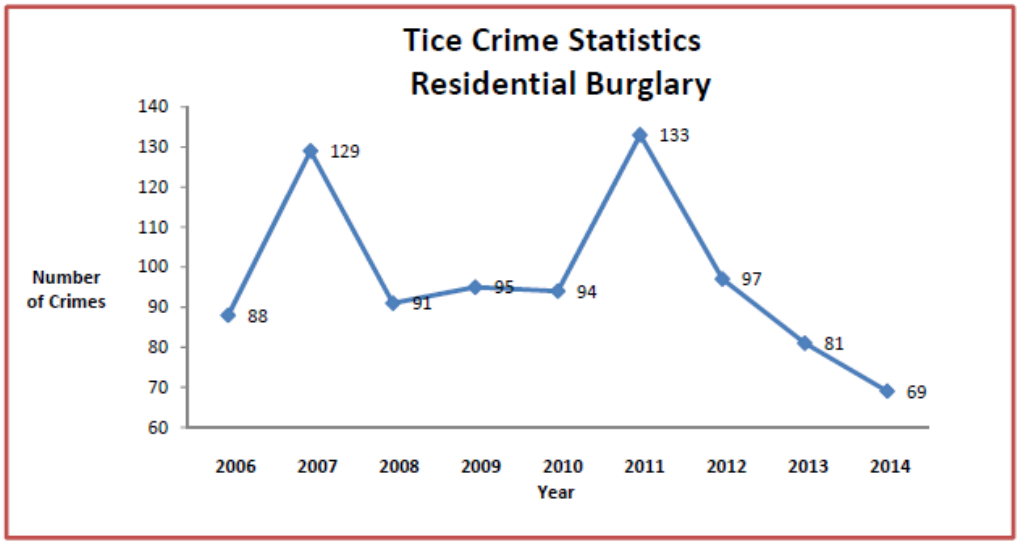


Figure 21: Residential Burglary Crime Trends

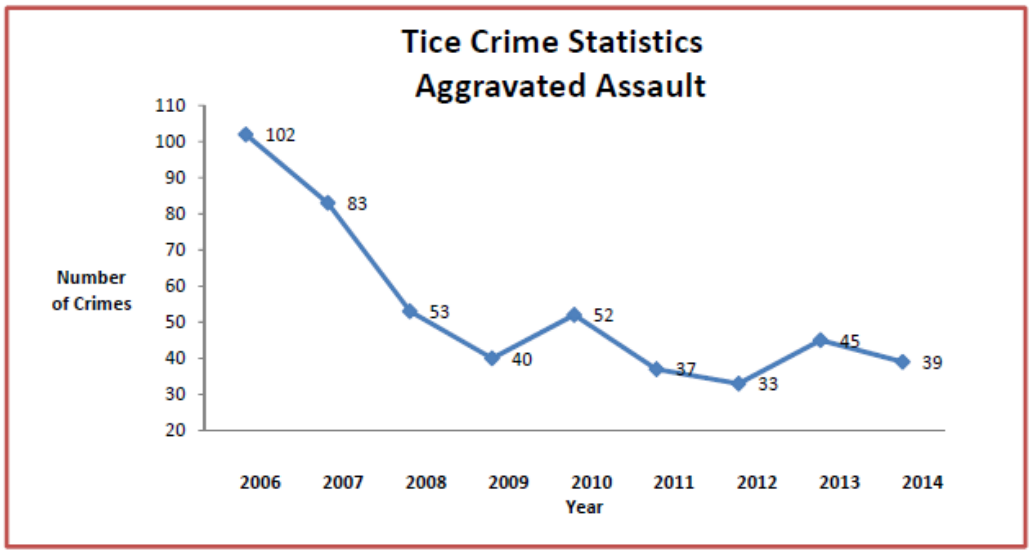


Figure 22: Aggravated Assault Crime Trends

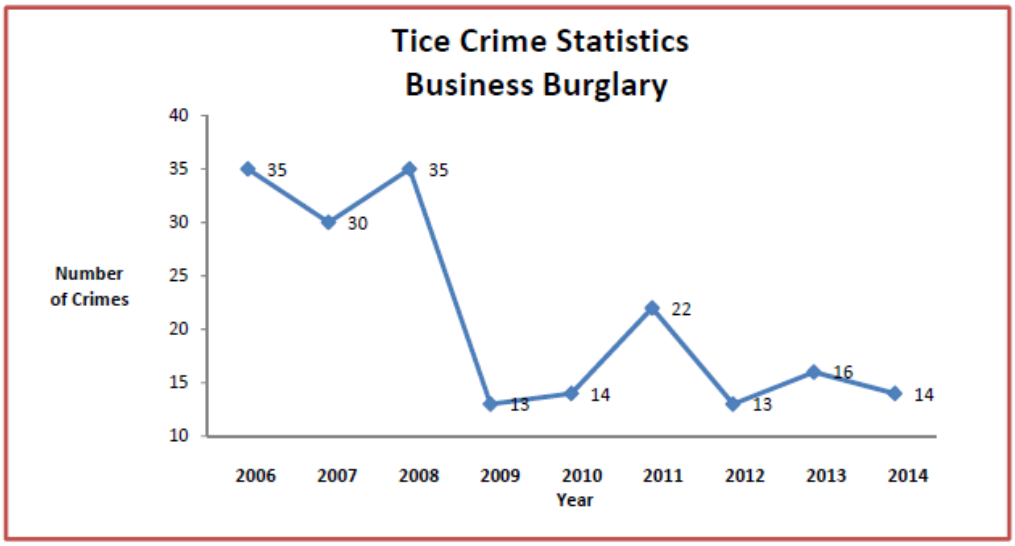


Figure 23: Business Burglary Crime Trends

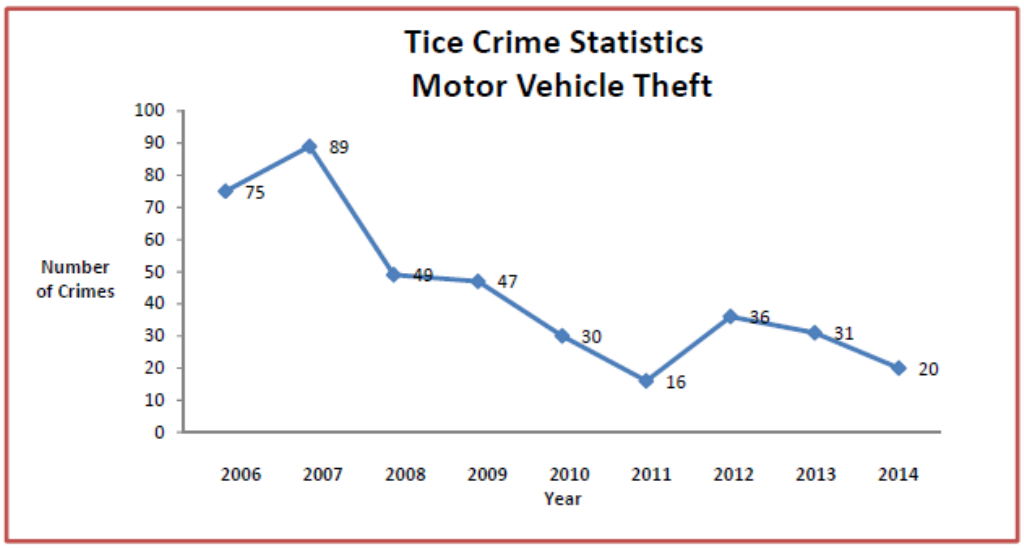


Figure 24: Motor Vehicle Theft Crime Trends

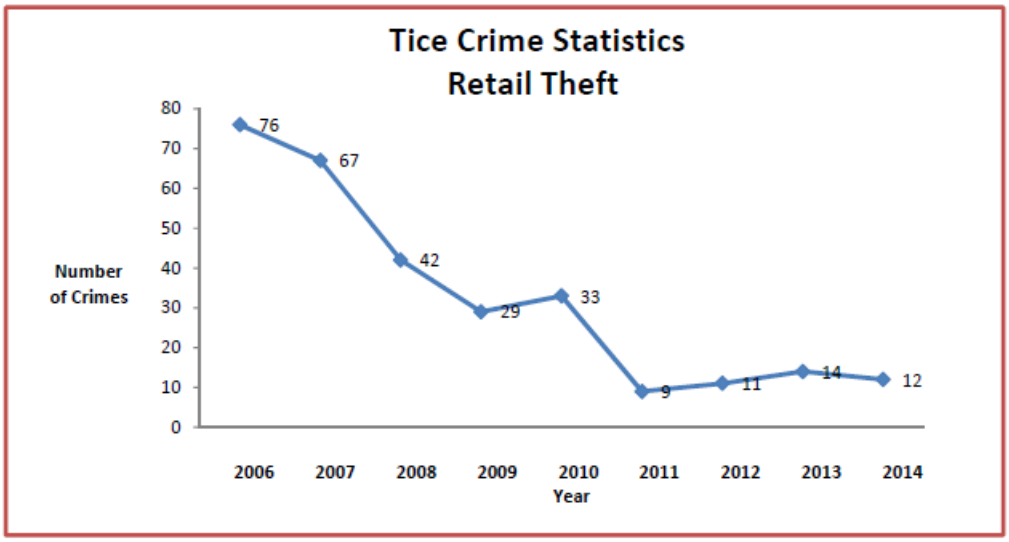


Figure 25: Retail Theft Crime Trends

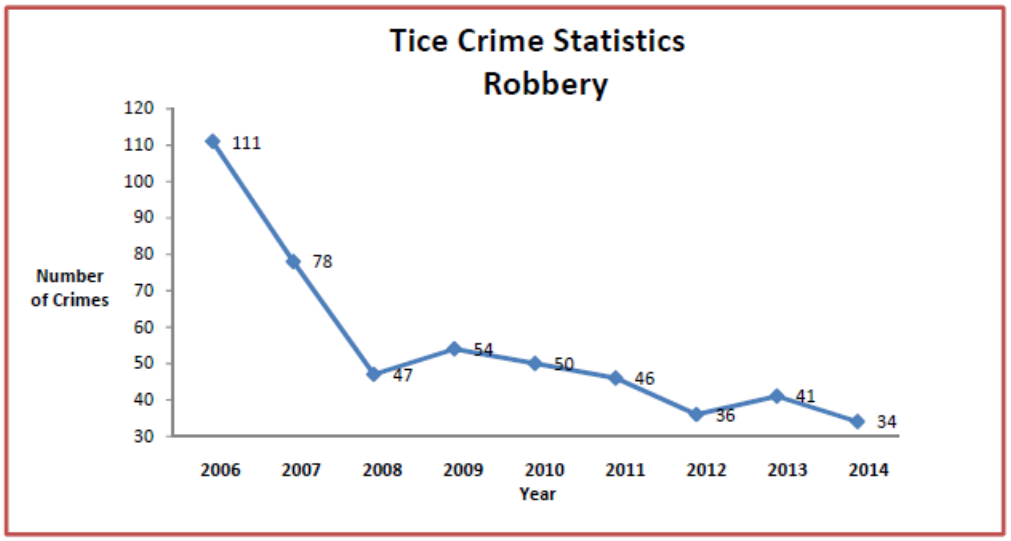


Figure 26: Robbery Crime Trends

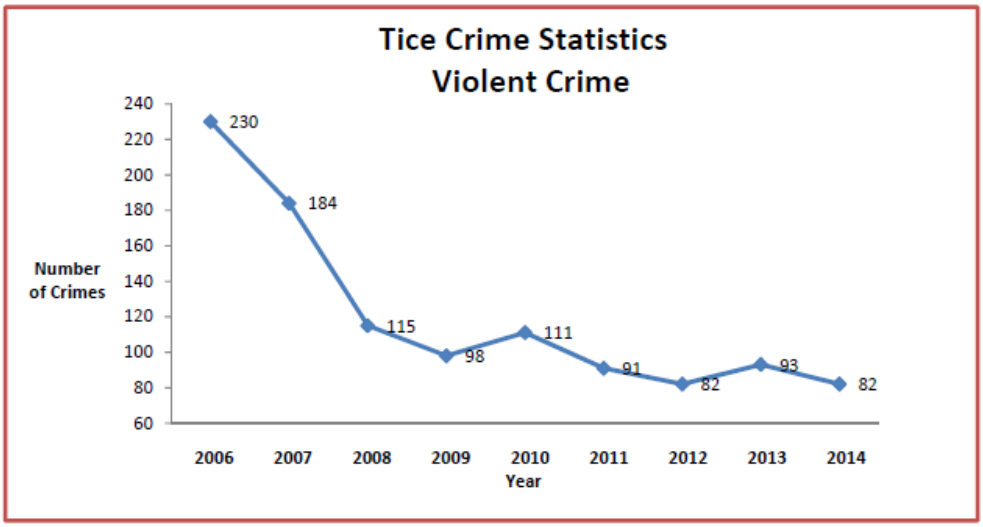


Figure 27: Violent Crime Trends

Appendix IX: Pedestrian Crosswalk Audit

Table 34: Pedestrian Crosswalk Audit

Location	Description
Ballard Rd & Clotilde Ave	• 1 zebra striped crossing on west • 1 streetlight on NE corner • 2 pedestrian crossing signs • 665 ft. west to Marsh Avenue crossing • 4,635 ft. east to Ortiz Avenue crossing
Glenwood Ave & Tice Community Pool	• 1 zebra striped and lined crossing • 2 pedestrian crossing signs • 2,625 ft. west to Marsh Avenue crossing
Lexington Ave & North Trail RV Center	• 2 lined crossings on east side of Lexington at 2 entrances to the RV Center
Marsh Ave & Glenwood Ave	• 1 lined crossing on the east • 1 streetlight on the SE corner
Marsh Ave & Armeda Ave	• 1 lined crossing on east (badly faded) • 1 streetlight on the NE corner
Marsh Ave & Greenwood Ave	• 1 lined crossing on east • 1 streetlight on the NE corner
Marsh Ave & Scott Ave	• 1 lined crossing on east • 1 streetlight on the NE corner
Marsh Ave & Woodside Ave	• 3 lined crossings on north, south & east • 1 streetlight on the SE corner • 1,460 ft. north to Palm Beach Boulevard crossing • 3,915 ft. south to Ballard Road crossing
Marsh Ave & Desoto Ave	• 1 lined crossing on the east
Marsh Ave & Madison Ave	• 1 zebra striped & lined crossing on the south • 1 streetlight on the SE corner
Marsh Ave & Arlington Ave	• 1 lined crossing on the east • 1 streetlight on the SE corner
Marsh Ave & New York Ave	• 1 zebra striped and lined crossing on the north • 1 lined crossing on the west • 1 streetlight on the SE corner
Marsh Ave & Pricilla Ln	• 1 zebra striped and lined crossing on the west • 1 lined crossing on the east (middle entrance to James Stevens International Academy) • 1 streetlight on the SE corner
Marsh Ave & James Stevens Academy	• 1 lined crossing at south exit from James Stevens International Academy
Marsh Ave & Ballard Rd	• 2 lined crossings on the north and east • 2 streetlights on NE and NW corners • 3,915 ft. north to Woodside Avenue crossing • 1,315 ft. south to Michigan Avenue crossing

Marsh Ave & Michigan Ave	• 4 zebra striped crossing on north, south, east & west • 4 Pedestrian crossing signs • 1 streetlight on NE corner • 1,315 ft. north to Ballard Road crossing
Nuna Ave & Palma de Nova Ln	• 1 zebra striped crossing on the east
Ortiz Ave & Tice St	• 4 lined crossings on 4-way intersection north, south, east & west • 3 streetlights on NE, SE & SW corners • 2 pedestrian crossing signs on Ortiz Ave for crossing on the north & south sides of Tice St • 1.650 ft. north to Palm Beach Boulevard crossing • 6,530 ft. south to Ballard Road crossing
Ortiz Ave & Luckett Rd	• 1 lined crossing on the east • 2 streetlights on the NE & SE corners
Ortiz Ave & Ballard Rd	• 2 lined crossings on north & east • 2 streetlights on NE & NW corners • 6,530 ft. north to Tice Street crossing • 5,325 ft. south to Dr. Martin Luther King Jr. Boulevard crossing
Ortiz Ave & Middle of Farmer's Market	• 1 yellow lined crossing in front of entrance gate on east side of Ortiz
Ortiz Ave & Dr Martin Luther King Jr Blvd	• 4 lined crossings on north, south, east & west • 2 streetlights on NE & NW corners • 5,325 ft. north to Ballard Road crossing
Palm Beach Blvd & Marsh Ave	• 4 zebra striped crossings on north, south, east & west • 4 Pedestrian crossing signs • 595 ft. west to pedestrian cutout in median near Pine Street • 655 ft. east to pedestrian cutout in median near Fairview Ave
Palm Beach Blvd & Fairview Ave	• No marking • Pedestrian cutout in the median • 655 ft. west to Marsh Avenue crossing • 900 ft. east to pedestrian cutout in median near Prospect Ave.
Palm Beach Blvd & Prospect Ave	• No marking • Pedestrian cutout in the median • 900 ft. west to pedestrian cutout in median near Fairview Ave. • 665 ft. east to New York Drive/Tice Street crossing
Palm Beach Blvd & New York Dr/Tice St	• 3 zebra striped crossings on north, south, & west • 1 streetlight on NW corner • Pedestrian crossing signs in all directions • 665 ft. west to pedestrian cutout in median near Tice Street • 890 ft. east to pedestrian cutout in median near Waverly Ave.
Palm Beach Blvd & Wilma Ave/Waverly Ave	• No marking • Pedestrian cutout in the median • 890 ft. west to New York Drive/Tice Street crossing • 1,010 ft. east to pedestrian cutout in median near Carolina Ave

Palm Beach Blvd & Carolina Ave	• No marking • Pedestrian cutout in the median • 1,010 ft. west to pedestrian cutout in median near Wilma Ave. • 625 ft. east to pedestrian cutout in median near Royal Palm Park Road/Figuera Avenue
Palm Beach Blvd & Royal Palm Park Rd/Figuera Ave	• No marking • Pedestrian cutout in the median • 625 ft. west to pedestrian cutout in median near Carolina Ave. • 385 ft. east to Ortiz Avenue crossing
Palm Beach Blvd & Ortiz Ave	• 3 lined crossings on 3-way intersection south, east & west • 1 streetlight on the north approximately 100 feet west of the west crossing • 385 ft. west to pedestrian cutout in median near Figuera Ave. • 675 ft. east to pedestrian cutout in median near Fairfax Drive
Palm Beach Blvd and Parking Lot south across from Flamingo Circle	• 1 lined crossing on the parking lot
Palm Beach Blvd & Fairfax Dr	• No marking • Pedestrian cutout in the median • 675 ft. west to Ortiz Avenue crossing • 655 ft. east to unmarked crossing at Buena Vista Blvd (middle)
Palm Beach Blvd & Buena Vista Blvd	• There is a sign for a pedestrian crossing but no markings • Unable to discern the intended crossing location • 655 ft. west to pedestrian cutout in median at Fairfax Drive • 355 ft. east to pedestrian cutout in median near Fairfax Drive • (Measurements from the middle of Buena Vista Blvd)
Palm Beach Blvd & Balboa Ave	• No marking • Pedestrian cutout in the median • 355 ft. west to the middle of Buena Vista Boulevard • 755 ft. east to pedestrian cutout in median near Kingston Dr.
Palm Beach Blvd & Kingston Dr/Alta Vista Ave	• No marking • Pedestrian cutout in the median • 755 ft. west to pedestrian cutout in median near Balboa Ave. • 410 east to pedestrian cutout in median near Alameda Avenue
Palm Beach Blvd & Alameda Ave	• No marking • Pedestrian cutout in the median • 410 ft. west to pedestrian cutout in median near Kingston Dr. • 565 ft. east to Underwood Drive crossing
Palm Beach Blvd & Underwood Dr	• 3 zebra striped crossings on east, south, and north into Morse Plaza shopping center • 565 ft. west to pedestrian cutout in median near Alameda Ave.
Tice St & New York Dr	• 2 zebra striped crossings on east across Tice St and south across New York Dr • 1 street light on SE corner • 935 ft. east to Waverly Avenue/Lynneda Avenue crossing

Tice St & Waverly Ave/Lynneda Ave (at Tice Elementary School)	• 4 lined crossings on north, south, east & west • 1 street light on SW corner • 935 ft. west to New York Drive crossing • 2,270 ft. east to Ortiz Avenue crossing
Tice St & Carolina Ave	• 1 lined crossing on north
Tice St & Figuera Ave	• 1 lined crossing on north

Appendix X: Comments Received and HIA Team Response

Table 35: Comments Received and HIA Team Response

Lee County DOT Comments	HIA Team Response
Ortiz Avenue four-laning is not mentioned in the summary.	4-Laning is noted in the Executive Summary. See, "This HIA compares the existing conditions, current road plans, and the Tice Community Connectivity and Redevelopment Plan based on the likely health effects."
The report appears biased toward or to advocate a policy decision to proceed with an alternate set of unfunded and higher cost improvements.	Report is designed to assess health effects, not cost of improvements, comment not incorporated.
Page 13, last paragraph, first sentence "the widening" is not introduced at this point	Purpose of scoping section is not on Ortiz Avenue, comment not incorporated.
Page 16, second paragraph Alternative One as described appears to represent and would be more accurately characterized as "existing conditions" or a "do-nothing" alternative.	The HIA team agrees. Additional language added to reflect comment.
Page 16, last paragraph through Page 17, second paragraph. Alternative Two would be more accurately described as a "Lee County" rather than a "LDOT" plan.	The HIA team agrees and has renamed the LDOT Plan to Lee County plan.

Page 16, last paragraph through Page 17, second paragraph. The determination of the number of lanes on a roadway is first made during the Lee County Metropolitan Planning Organization (MPO) Long Range Transportation Plan (LRTP). The MPO consists of elected officials from the county and municipalities. Planning to four-lane Ortiz Avenue dates back to the 1970's in the Lee County Transportation Study (excerpt is attached). Four-laning is depicted on the November 1988 MPO 2010 Financially Feasible Plan (excerpt is attached) and other adopted documents such as the 1989 Lee County Official Trafficways Map. The MPO is in the process of evaluating the LRTP for the year 2040, and is required to adopt an update by December 2015. A community representative has submitted a request to evaluate the two-lane divided alternative for Ortiz Avenue. Capital Improvement Projects (CIP) only move forward when approved by the Lee County Board of County Commissioners (BOCC). Approval occurs incrementally at inclusion in the CIP, award of the design contract, right-of-way acquisition purchases, and construction contract award. To date, the BOCC has approved the Ortiz Avenue design contract and most right-of-way acquisitions. Design plans posted on the LCDOT website were initiated approximately ten years ago and are approximately six years old. During the time of design, the BOCC adopted the Lee Plan amendment adding the Trails and Greenways Master Plan in August 2007. The BOCC adopted Resolution 09-11-13 for Complete Streets in November 2009. Funding for four-lane construction of Ortiz Avenue is not included in the first five years of the current approved or staff draft CIP. There are anticipated funds for construction in years 6-10 of the CIP (See Major Road Project Summary spreadsheet).	Additional language used in footnote only to indicate that the HIA recognizes that previous planning effort but does not intend summarize the entire decision making and funding process, as that process is ancillary to the health impacts of the policy.

http://www.leegov.com/dot/engineeringservices/projectsplans The current plans utilized a 45 mph design speed. LCDOT discussions with the Tice Historic Community Planning Panel (THCPP) involved redesign of the segment north of Luckett Road using a lower (35 mph) design speed and addressing safety, and bicycle and pedestrian concerns with the Ortiz Avenue project. The BOCC will consider and take action on any remaining right-of-way acquisition, any contract revisions for design plans, and any construction contract for the Ortiz Avenue CIP project. There has been no direction or funding identified to move forward with a redesign effort.	
On September 17, 2014, Paul Moreno represented the THCPP and presented a map of prioritized (as 1a, 1b, and 2) bicycle and pedestrian facilities to the Lee County Bicycle Pedestrian Advisory Committee (BPAC). The map was generally reflective of the HIA Alternate 3, except the Lexington Avenue sidewalks were not included in the THCPP map. Based on the THCPP request, BPAC added the priority 1a, 1b and priority 2 projects identified by the THCPP to the BPAC list of projects for consideration in making recommendations for additions to the CIP. BPAC included a number of Tice streets in their recommendation (Agenda Item #4). http://www.leegov.com/dot/Documents/2014%20Minutes%20Archive/BPAC%20Minutes%209-17-2014.pdf	

As a result, the draft CIP under consideration by the BOCC in the budgeting process, contains two segments of Tice Street, a sidewalk on the south side of Tice Street (from Lynneda Avenue to Ortiz Avenue), and Tice Street (from Ortiz Avenue to Lexington Avenue). Lee County has also submitted Safe Routes To Schools grant applications for nine more streets segments, as identified in coordination with the Tice Historic Community Planning Panel representatives. There are two segments funded by FDOT and under design on Richmond Avenue from Lexington Avenue to State Road 80 and Queens Drive from the Orange River Elementary School entrance to Richmond Avenue. Seven more segments are under review including filling gaps on Tice Street and Lynneda Avenue (along Tice Elementary School frontage), Waverly Avenue (north of Tice Street), Mississippi Avenue (north of Tice Street), and Alameda Avenue (from Palm Beach Boulevard to Shaw Boulevard). This also includes two segments of New York Drive (from Glenwood Avenue to Palm Beach Boulevard, and Palm Beach Boulevard to Walter Street).	The HIA Team recognizes that there are improvements to conditions that are in progress. Additional footnote added reflecting the changes. No changes to analysis due to the status of change as in progress.
Page 18, first full paragraph, first two sentences The reference to “cheaper options” in THCPP discussion “to develop transportation capacity” may be a premature statement subject to further study in evaluation of the MPO LRTP (noted above in the comment on page 16-17). The total cost of the street extensions and other suggested modifications in Alternative Three is yet to be determined. Based on historical costs and long range planning estimates, collectively the total cost of Alternate three is likely to be much higher than Alternate Two. Based on planning level cost estimates prepared for BPAC, the total estimate for the Alternative Three places sidewalk improvement costs in the four to five million dollar range.	The HIA Team agrees in part. The document has been amended to reflect that the THCPP assumes that these are less expensive options. Even though cost is not the purpose of this HIA, the panel has maintained that the cost savings to the county but may be even more beneficial than that associated with right-sizing Ortiz. This is especially true as the THCPP has suggested that the excess right of way along Ortiz Avenue be used to create a system of low impact water drainage treatment systems. This assumes that these low impact drainage systems would allow Lee County to meet their TMDL credits and not be required to purchase additional property for that purpose. Water runoff affects Billys Creek and the Caloosahatchee River.

Page 18, Third sentence The suggested change in design north of Ballard Road would leave the segment of Ortiz Avenue from Ballard Road to Luckett Road as two lanes with no north-south alternative. This segment of Ortiz Avenue (south of Luckett Road) has much higher projected traffic volumes than Ortiz Avenue north of Luckett Road in MPO alternative testing to date. Both segments are subject to further MPO LRTP evaluation and testing.	While this may be accurate, it does not change the community's suggested alternative. This section describes the community's alternative. Comment not incorporated.
Page 19, Table 2 – There is an inconsistency in identifying the number of lanes. In the "existing design" column condition, #lanes is indicated as "2" while Alternate Two and Three both show turn lanes. There are existing left and right turn lanes at the intersections of Ortiz Avenue with Palm Beach Boulevard (T-intersection, northbound left and right turn) Tice Street (southbound and northbound left and right turn lanes), Luckett Road (northbound and southbound left turn lanes), Ballard Road (northbound southbound left and right) and Dr. Martin Luther King Jr. Boulevard (two southbound through lanes and two northbound through lanes, with right and left turn lanes at the intersection.	Comment incorporated as a footnote.
Page 22, Table 4. The "current speed" column indicates the posted speed limit. The fatality risk increases like those referenced in ITE in Table 3 on page 21 (there is more recent data than the 1999 study) is based on actual vehicle speed, and not the posted speed limit. Before and after studies consistently show that a change in the posted speed limit alone, has minimal effect on actual speed due to driver behavior. Most local streets in Tice have a posted speed limit of 30 MPH and some have a posted speed limit of 25 MPH. Speed study data indicates insignificant differences in measured operator speeds between those segments posted at 25 MPH and those posted at 30 MPH. Increased enforcement of lowered speed limits has a temporary effect. Reducing	The narrative following table 3 discusses posted, design, and actual speeds. An additional footnote was added to reflect the effectiveness of posted speed on driver behavior. However, as this was an intermediate HIA, it was not designed to collect data on actual speeds on neighborhood streets.

operating speeds requires a physical change in the design of the roadway. The appropriate treatment and cost of the street treatments for traffic calming have yet to be determined.	
Page 28, paragraphs 3, 4, 5, 6 and 7. This is an inaccurate and improper method of crash data evaluation and projection. Crash rates are measured in terms of crashes per million miles traveled, or where travel data is not available, crashes per capita.	Comment not incorporated. The HIA Team believes this reporting approach is more readable for a lay / policy audience.
Page 30. Some proposed mid-block crosswalks will require signalization. This cost has yet to be determined.	Comment not incorporated. This is an important concept and part of the process, however, it is outside of the scope of this HIA as funding is not determined, nor the focus of this HIA.
Pg 33-38. LCDOT staff coordinates bus stop improvements with Lee Tran and defers on identification, prioritization and funding of facility improvements. More recently, LCDOT has included design and construction of additional transit/improved stops in our roadway plans but only with input from LeeTran. ADA design criteria has changed significantly since these plans were shelved. LeeTran determines routes/stop locations and LCDOT includes the transit stop pad in the plans. Enhancements such as shelters, etc. are typically funded by Lee Tran. Inclusion of/funding for bus pullouts hasn't been completely vetted. LCDOT could design (and construct) bus stop improvements as part of a road improvement project with a marginal increase in cost to the overall project if no additional right-of-way required.	Comment not incorporated. This is an important concept and part of the process, however, it is outside of the scope of this HIA.

BikeWalkLee Comments	**HIA Team Response**
BikeWalkLee has been an active stakeholder in this project from its beginning and appreciates the opportunity to review the draft Tice HIA report. The HIA team has done an excellent job with this project and the draft report is thorough, well organized, and a clearly written comprehensive review and assessment of the transportation and connectivity plans and	The HIA Team appreciates support from all of the community organizations interested in the health implications of community and street design.

alternatives for the Tice community. Being able to assess the health implications of various policy options for policymakers, is a critical new decision-making tool. We hope that the County Commissioners will seriously consider the findings of this report before they take action on the Tice Community Connectivity and Redevelopment Plan later this summer.	
The HIA recommends reducing the speed limit on Palm Beach Blvd. to 35 mph. While lower speeds would make the area safer for pedestrians and cyclists, simply changing the speed limit on the sign may not actually reduce the actual speeds that drivers are going. Are you recommending that changes be made in street designs (narrower lanes, bike lanes, medians, changes in intersection design, etc.) or some other physical change on the road or surrounding land use that would actually slow the traffic? It would be helpful to clarify that point in the report.	The HIA incorporated an additional footnote that describes the difference between actual, design, and posted speeds. The HIA discusses the safety features of narrower lanes, cross walks, and other traffic calming designs. These are embedded throughout the report.
The matrix with the specific list of all the locations for each of the plan elements is excellent. It's not clear from the introduction whether this is essentially the list from the Tice Community Plan or solely the HIA recommendations. While the introductory note mentions the speed limit issue as one not included in the Tice Community's Plan, are there others? It would be helpful to footnote or mark in some way which of these recommendations were added by the HIA team.	Asterisk included where recommendations go beyond the THCPP plan.
Are any of these recommended items been included in any transportation or school or other type of plan? have any of them been programmed or funded? Would be helpful for policymakers to know whether these are all "new" projects. Although it may not be part of the HIA scope, do cost estimates exist for this list? Again, this list invites policymakers to ask the "cost" question.	Comment partially incorporated to reflect that some changes have been programmed or are in the process of prioritization. The cost of improvements are not addressed in this HIA, as funding is outside of its scope. Funding decisions will depend on state and county funding. The HIA Team anticipates that funding is a longer term process.

Please express our appreciation to the HIA team for their outstanding work. We look forward to seeing the final report and to its presentation to the County Commissioners.	Thank you for the comment. A public workshop is being planned and a request will be made to the BoCC to present the findings.