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The students wish to express their sincere appreciation to the City of Tampa and Hillsborough MPO for the opportunity to help guide the future design of Morgan Street in downtown Tampa.

Disclaimer

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the City of Tampa, Hillsborough Metropolitan Planning Organization, the Florida Department of Transportation or the U.S. Department of Transportation.
This report includes urban complete streets design concepts for Morgan Street in downtown Tampa that were prepared by University of South Florida, College of Engineering graduate students. The project was made possible by a grant from the Hillsborough Metropolitan Planning Organization (MPO). The design concepts are presented for consideration by the Hillsborough MPO, the City of Tampa and interested stakeholders. Students were engaged in the project through their course work for the USF course, Sustainable Transportation, in the Spring 2017 Semester. They were asked to evaluate the existing conditions of the route and identify conceptual design alternatives to enhance livability and provide safe operations for bicycles, pedestrians and transit users.

Students were divided into three teams to ensure full participation, and asked to develop purpose and need statements, existing conditions assessments, goals and objectives, and conceptual design concepts for 2020, as well as 2040 concepts that addressed changes in land use and technology. The student concepts were presented to a project review panel on two occasions – once midway through the project and again for the final project proposals. Panel comments were considered and incorporated into the final student work.

Together the concepts offer a variety of ideas for Morgan Street for consideration by the City of Tampa and Hillsborough MPO. The concepts were developed based on available right of way, engineering and design standards, traffic and safety analysis and land use considerations. Each student team obtained design guidance from the National Association of City Transportation Officials (NACTO) and American Association of State Highway and Transportation Officials (AASHTO), and also consulted City of Tampa design standards.
**Morgan Street Overview**

Morgan Street is located in downtown Tampa. The study corridor for the project is approximately 1 mile long and extends from Tyler Street to Channelside Drive.

**Vision for Downtown Tampa**

Center City Tampa will be a community of livable places, connected people, and collaborative progress that embraces and celebrates its river and waterfront.

- A Reimagined and Refocused River and Waterfront
- Strong and Livable Center City Neighborhoods
- A Vital Mix of Uses and a Strong Pedestrian Environment in the Core
- Livable Community Linkages Between Neighborhoods and Downtown
- An Urban Pattern That Supports Transit

- InVision Tampa: The Tampa Center City Plan

**Table 1 Morgan Street Inventory**

<table>
<thead>
<tr>
<th>Category</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Volume</td>
<td>Less than 5,000 AADT in 2015</td>
</tr>
<tr>
<td>Posted Speed Limit</td>
<td>30 MPH</td>
</tr>
<tr>
<td>Level of Service</td>
<td>LOS A free flow operations</td>
</tr>
<tr>
<td>Number of Lanes</td>
<td>4 lane undivided, on-street parking north of Whiting Street</td>
</tr>
<tr>
<td>Typical Sidewalk Width</td>
<td>12-14 Feet</td>
</tr>
<tr>
<td>Roadway Pavement Surface Width</td>
<td>55-60 Feet</td>
</tr>
<tr>
<td>Right of Way</td>
<td>61-79 Feet</td>
</tr>
<tr>
<td>Bike Lane</td>
<td>None on Morgan, bike lanes pass through Jackson St. and Cass St. intersections</td>
</tr>
<tr>
<td>Transit Route</td>
<td>MetroRapid circulates and In-Towner stops at Whiting St. and Kennedy Blvd.</td>
</tr>
<tr>
<td>Truck Route</td>
<td>Yes, south of Kennedy Blvd.</td>
</tr>
<tr>
<td>Intersection Type</td>
<td>Eleven four-way signalized intersections</td>
</tr>
<tr>
<td>Crashes</td>
<td>298 total crashes between 2005 - 2016; 9 pedestrian/bicycle crashes</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>Shared by pedestrians and bicyclists</td>
</tr>
</tbody>
</table>
GOALS AND OBJECTIVES

Goal 1: Enhance safety for all modes of travel
1. Reduce collisions at intersections
2. Eliminate traffic fatalities and serious injuries (Vision Zero)
3. Implement traffic calming techniques to induce slower speeds and increase driver awareness

Goal 2: Improve accessibility and mobility for all modes
1. Improve pedestrian and bicycle facilities
2. Provide a connected network that meets the needs of all users
3. Promote modes of transportation other than the automobile
4. Increase usage of the bike share service

Goal 3: Increase economic vitality, environmental quality and livability of the corridor
1. Promote a mix of uses in close proximity, including active uses on the ground floor
2. Reduce or eliminate surface parking lots through redevelopment
3. Provide green space, parklets and support outdoor exhibitions to encourage social interaction and activity on the street
4. Apply green infrastructure and energy harvesting treatments to improve environmental quality

MODAL PRIORITY

The City of Tampa has categorized Morgan Street as a Type A Special Pedestrian Street. With this in mind, the student teams sought to prioritize the pedestrian and bicyclist according to the above hierarchy of travel modes.
TRAFFIC ANALYSIS

Average Annual Daily Traffic (AADT) volumes vary along the corridor, depending upon proximity to major roadways. The AADT of 5300 reflects the segment from E. Tyler north to I-275. The Cass/Tyler Street corridor is an opportunity to provide a connection through downtown and into Ybor City. The AADT of 4600 at E Brorein St is due to connection with the Selmon expressway.

These findings and analysis performed by consultants for the City of Tampa indicate that Morgan street currently operates well below its available capacity. Future redevelopment plans for the downtown area, including the Channelside District, will benefit greatly from reallocation of right-of-way on Morgan Street to support additional pedestrian and bicycle activity at the street level.

Morgan Street, 2015 Annual Average Daily Traffic

Source: www.planhillsborough.org/traffic-counts/

Morgan Street Hourly Traffic Volumes

Source: City of Tampa, Downtown Multimodal Project Development Study, 2014, Appendix A-4
**SAFETY**

Between 2005 and 2016, 298 crashes occurred on Morgan Street. Of these, 9 involved pedestrians and bicyclists. Intersection crashes make up 63% of total crashes. About 49% of crashes were due to lane changes and aggressive driving, and involve angle, sideswipe and rear-end collisions. Most pedestrian crashes occurred at traffic signals while motor vehicles were turning left. Key safety issues on Morgan Street include:

- Long crossing distances at intersections increase pedestrian and bicycle exposure to traffic
- Low pedestrian visibility at intersections
- Many vehicles do not yield to pedestrians
- Red light running and tail-gating are common
- Geometric design of intersections facilitates fast vehicle movements
- Morgan Street lacks comfortable accommodations for bicyclists
- Lane widths encourage speeding

**Figure: Pedestrian and bicycle crashes from 2005-2016**

Source: Hillsborough MPO crash data

- 3 crashes
- 1 crash

**Cause of Crashes on Morgan Street**

- Negligence: 9%
- Ran Red Light: 9%
- Parked Car: 11%
- Turning Left: 14%
- Turning Right: 8%
- Other: 49%
GROUP 1

GROUP 1: Prudvhi Kadiyala, Team Leader, Sudha Kamma, and Arpita Hridaynath Meher

Group 1 proposed a two-lane street, with 10 ft drive lanes in each direction, turn lanes at the intersections, a protected intersection for bicyclists; and a 5 ft bike lane in each direction. On the Kennedy to Jackson St segment, on-street parking is provided on one side of the corridor for ease of access to businesses. Median space is available for landscaping or as a pedestrian refuge. On-street parking is removed near intersections to increase visibility for both vehicle users and pedestrians as a safety measure.

On the segment between Jackson St. and Kennedy Blvd., the left turn lane is removed as Kennedy is a one-way street. This allows for on-street parking on both sides of Morgan St. The drive lane is diverted to accommodate on-street parking and also serves as a traffic calming measure.
Madison to Kennedy – Southbound

- 15.5’ Sidewalk
- 5’ Bike lane
- 7’ Parking lane
- 10’ Drive lane
- 10’ Drive lane
- 7’ Parking lane
- 5’ Bike lane
- 15.5’ Sidewalk

Approx. 78’ Right-of-way (Varies)
Protected Intersection

Each of the student teams found value in the protected bicycle intersection design, which facilitates the flow of pedestrians and bicyclists through a four-way intersection. An extra curb is provided at each corner to connect the bicycle lanes on intersecting streets. This curb has the same radius as the existing curb and diverts right-turning vehicles around the bicycle path for improved safety of turning bicyclists. For pedestrian crossings, the stop line has been shifted behind a zebra crossing, thereby improving the line of sight of vehicles, bicyclists and pedestrians using the corridor. This design needs no more space than a traditional intersection and is safer and more convenient for bicyclists.

To date, protected intersections for bicyclists have been implemented in at least four locations in the U.S.:

- Salt Lake City, Utah
- Chicago, Illinois
- Austin, Texas
- Davis, California
Eighty-three crashes, 25% of all crashes between 2005 - 2016, occurred at the intersection of Morgan Street and Brorein. High-speed inbound traffic from the Selmon expressway via the exit ramp is a key contributor to the crashes. From the crash data collected, 52% of crashes are due to aggressive driving and 56% are angle collisions.

To decrease the crash rate at this intersection, the group proposed increasing red time at the signal by about four seconds, and installing an advanced warning system on the off ramp warning drivers of their speed and to be prepared to stop.
Piezoelectric Charging: Energy harvesting, or energy scavenging, is a process that captures unused ambient energy that would otherwise be lost as heat, light, sound, vibration, stress or movement. Piezoelectricity is energy generated by the mechanical vibrations of moving automobiles as they transition over a piezoelectric device. Piezoelectric components are used to convert the mechanical energy into electrical energy.

Permeable Pavement
Permeable pavement (also known as pervious or porous concrete) is a type of pavement that allows rainwater to pass through into the ground below. Through this movement, pervious concrete mimics the natural process that occurs on the ground’s surface, consequently reducing runoff and returning water to underground aquifers. It also traps suspended solids and pollutants, keeping them from polluting the water stream.

Source: assemblymanmikegatto.blogspot.com

**Group 2**

**Group 2:** Ashok Sampath, Team Leader, Manvitha Rajalingola, and Mohammed Asif Sirajuddin

Group 2 proposed a two-lane street, with 10 ft drive lanes in each direction separated by a 2 ft painted median, 7 ft parking lanes on each side, and 6 ft bike lanes on each side separated from on-street parking by a 3 ft planted separator. Sidewalk width is 13 feet, depending on right-of-way. The group also proposed a protected intersection for bicyclists at the Jackson Street intersection.
Whiting Street to Twiggs Street

Design aspects:
1. Protected bike lanes on both sides
2. Curb extensions slow turning vehicles and reduce pedestrian and bicycle crossing distance
3. Curb opening for storm water runoff

Twiggs Street to Tyler Street

Design aspects:
1. TWSI for improved ADA compliance
2. Restricted parking near intersections
3. Curb opening for trucks to enter for loading/unloading

Channelside Dr to Whiting Street

Design aspects:
1. Bus stop shelter
2. Controlled right turn when exiting Selmon Expressway
3. Sidewalk with permeable brick pavers

TWSI = tactile walking surface indicator
Other student concepts for 2040 included the use of solar street lights and transit stops (see images), along with permeable brick pavers for sidewalks, tree trenches, curb openings and gutter inlets at bike lanes for stormwater management. In addition, Group 2 proposed a controlled right turn at the traffic signal when exiting Selmon Expressway at the Brorein and Morgan Street intersection. This would replace the free right-turn ramp that allows high-speed traffic to exit the Expressway directly.

This example shows additional details of a protected intersection for bicyclists.

Group 2 suggested a simple infographic like this one to help unfamiliar users understand the new treatments.

**GROUP 2 Continued**

Source: Nick Falbo, Protected Intersections for Bicyclists, vimeo.com/86721046
GROUP 3

GROUP 3: Vanessa Adame, Team Leader, Abhinav Madadi, Sagar Janakbhai Patel, and Mingyu Xue.

Group 3 proposed a road diet for Morgan Street that included alternating left turn lanes, continuous bike lanes, wider and uniform sidewalks, and a protected intersection for bicyclists at Brorein and Morgan. They also proposed the addition of parklets along the street, as well as bulb-outs to shorten pedestrian crossing distances at Jackson St and Kennedy Street intersections.

Morgan Street - Brorein Intersection
Parklets

Parklets function as mini parks and feature public seating, art installations, and plants. They are inexpensive and easy to build. People may even be willing to sponsor a parklet project.
Solar Bike Lanes

All the groups proposed solar bike lanes paved with a light-emitting material called luminophores – chemicals that “ingest” light from the sun and can glow for up to 10 hours in the dark. This type of path can glow in multiple colors and highlights the bike path at night.

College Station, Texas was the first in the U.S. to implement a bright green solar luminescent pavement that stores solar energy during day and emits light during the night. The concept originated in the Netherlands.

Credits: Monitha Vankati