EXECUTIVE SUMMARY

During the 2012 Florida legislative session, Legislators established a pilot program in Florida Statute 316.091, to study the feasibility of allowing bicyclists to travel on limited access bridges. The law required that the Florida Department of Transportation (FDOT) establish a two year pilot program, in three separate urban areas, allowing bicycle access on highway approaches and bridge segments of limited access highways crossing bodies of water. Prior to this legislation, bicycles were prohibited from operating on limited access roadways or bridge sections.

In selecting the pilot projects, FDOT was required to consider the population within five miles of the highway approach and bridge segment, lack of bicycle access by other means, cost, safety and operational impacts. Three corridors were selected for the pilot project:

- Pineda Causeway (SR 404), Brevard County/Cape Canaveral National Seashore,
- William Lehman Causeway (SR 856), Aventura/Sunny Isles Beach, Dade County, and
- Julia Tuttle Causeway (I-195), Miami Beach/Miami, Dade County

The selection was based on unique characteristics of these limited access corridors, making them good candidates for added bicycle facilities. The selected pilot corridors featured existing bicycle activity prior to bicycles being permitted on each facility. The corridor selection was supported by local cycling interest groups and the respective metropolitan planning organizations.

The three pilot corridors were modified in 2012-2013 to add bicycle lane pavement markings and signs showing bicycle travel was permitted. Each of the corridors was opened to bicycle travel by March 2013. Counts of bicycle activity were conducted before, during, and after the corridors were upgraded for bicycle use. The behavior of cyclists and drivers was studied as they traveled along the causeways and over the bridges. Crash data was also collected for the two year pilot project.

Cycling activity varied on the pilot projects over the study period. The William Lehman Causeway was the most heavily used of the three pilot projects, with 1,057 bicyclists per week in January 2015, a 74% increase from December of 2012. The Julia Tuttle Causeway had 233 bicyclists per week in January 2015, a 120% increase from December 2012. The data from the Pineda Causeway showed relatively consistent use, although it should be noted that the first round of data collection was completed soon after the facility was opened for bicyclist use.

During the course of the pilot project, data shows that bicycle usage tended to be higher on the weekends. Speed data from an independent study demonstrated that drivers reduced their speed by 2.2 MPH when overtaking a bicyclist on the causeway section of
the bridges. Crashes involving bicycles did not significantly increase on the pilot corridors, although overall crashes (those involving all vehicle types and crash types) increased on the Julia Tuttle Causeway.

The corridors analyzed in this pilot project were selected based on their specific operational and design characteristics, and other limited access corridors may not experience similar operational and safety results. In general, high speed limited access facilities and adjoining corridors with higher truck volumes and narrow shoulders may not operate in the same way as the pilot projects. Caution should be taken before considering similar bicycle facilities on other limited access corridors. Engineering judgement should be actively applied when evaluating corridors for bicycle safety and operations before specific routes are considered for similar implementation. Such an evaluation should be based on a thorough review of relevant data. Therefore, the duration of the pilot project should be extended to allow for additional data collection and evaluation to determine the longer term impacts of bicycle facilities on the pilot corridors.

Given the relatively short duration of the pilot project, it is recommended that the pilot project be extended for a period of two years to monitor operations and crash data on the three project corridors. During the extension, FDOT staff should continue to gather input from local law enforcement agencies and coordinate with the bicyclist community on safe and proper use of bicycle lanes. FDOT should perform bicycle counts on an annual basis to monitor changes in bicycle use on the pilot corridors. At the end of the two year extension, crash data should be analyzed to evaluate any trends related to additional bicycle traffic and to ensure that the pilot corridors operate safely. The pilot corridors should be further evaluated after the two year extension project to determine if bicycles should be allowed on other limited access causeways meeting specific criteria. The cost of an extension of this pilot project is estimated at $100,000, which would include additional traffic counts, crash analysis, and operational reviews.
BACKGROUND

The 2012 Florida Legislature modified Florida Statute 316.091 to establish a pilot program allowing bicycles on limited access highways. With the exception of this pilot project, Florida law prohibits bicycles and human-powered vehicles on limited access highways, including bridges. The 2012 statute directed FDOT to identify three limited access highway approaches and bridge segments over water bodies by October 2012 and open them to bicycle traffic by March 2013. The two year pilot program would be followed by a report to the Governor and Legislature by September 2015. This report will serve to satisfy that requirement, as it includes an evaluation of bicycle crash data on the designated segments of the pilot program, usage by operators of bicycles and other human-powered vehicles, enforcement issues, operational impacts, and the cost of the pilot program. The full text of Florida Statute 316.091 can be found in Appendix A.

Pilot Project Corridors

The Florida Department of Transportation selected limited access corridors in three separate urban areas which met the criteria of the statute. Those corridors were required to cross a water body where no other crossing is available within approximately two miles of the entrance to the limited access facility. As part of the pilot corridor selection process, FDOT also considered the following attributes:

- urban area population within 5 miles of the bridge segment
- suitability of alternate routes
- connectivity with other bicycle facilities and regional destinations
- volume and speed of motorized vehicular traffic
- truck traffic volumes
- negotiation of ramps and merge areas
- sight distance
- safety and potential operational impacts
- cost to retrofit highway
- lighting

Ten corridors were evaluated, and three were chosen for the pilot project based on the characteristics listed above. The selected corridors were Pineda Causeway (SR 404) across the Indian and Banana Rivers in Brevard County, William Lehman Causeway (SR 856) across the Intracoastal Waterway in Dade County, and the Julia Tuttle Causeway (I-195) across Biscayne Bay in Dade County. The pilot projects were supported by the bicycle community in Brevard County and the Bicycle/Pedestrian Advisory Committee of the Miami-Dade MPO. A location map showing each of the selected corridors is included in Figure 1. Figures 2-4 depict the limits of the pilot projects. A list of the ten corridors considered for this pilot project along with the selection criteria can be found in Appendix B.
Figure 1. Location Map – Selected Corridor Projects
Each of the pilot causeways opened for bicycle travel by March 2013 after being retrofitted with the following upgrades:

- bicycle lane markings were added to the paved shoulders,
- signs were installed to clarify that the corridors were open to bicycle travel,
- merge areas across ramps were identified, some with green colored pavement to increase driver awareness of cyclist paths,
- railing height was increased on the bridge segments, and
- drainage grates were modified.

A summary of features for each selected facility is listed in the following table.

<table>
<thead>
<tr>
<th></th>
<th>Pineda Causeway</th>
<th>William Lehman Causeway</th>
<th>Julia Tuttle Causeway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Access Route</td>
<td>SR 404</td>
<td>SR 856</td>
<td>SR 112 (I-195)</td>
</tr>
<tr>
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<td>Melbourne, Brevard County</td>
<td>Aventura, Dade County</td>
<td>Miami Beach/Miami, Dade County</td>
</tr>
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<td>Waterbody Crossed by Facility</td>
<td>Indian River and Banana River</td>
<td>Intracoastal Waterway</td>
<td>Biscayne Bay / Intracoastal Waterway</td>
</tr>
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<td>Interchange 1 - Western Limit of Pilot Project</td>
<td>US 1</td>
<td>West Country Club Drive</td>
<td>NE 36th / NE 37th</td>
</tr>
<tr>
<td>Interchange 2 - Eastern Limit of Pilot Project</td>
<td>SR A1A</td>
<td>SR A1A (Collins Ave)</td>
<td>Alton Road</td>
</tr>
<tr>
<td>Alternate Crossing Route</td>
<td>SR 518</td>
<td>SR 858</td>
<td>Venetian Causeway</td>
</tr>
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<td>Distance to Alternate Crossing</td>
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<td>&gt; 2.0 miles</td>
<td>1.5 – 2.8 miles</td>
</tr>
<tr>
<td>Approx. Route Length (one way)</td>
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<td>1.1 mile</td>
<td>2.4 miles</td>
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<td>Average Annual Daily Traffic (vpd)</td>
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<td>109,000</td>
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<td>Shoulder Width</td>
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<td>10 feet</td>
</tr>
<tr>
<td>Percent Truck Traffic</td>
<td>4</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Total Number of Lanes (both directions of travel)</td>
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<td>Regional Trails Access</td>
<td>Access to Canaveral National Seashore</td>
<td>Don Soffer Trail</td>
<td>Alternate route for East Coast Greenway</td>
</tr>
</tbody>
</table>

Table 1. Summary of Pilot Causeway Features
Detailed Project Information

Pineda Causeway

Improvements along the Pineda Causeway between US 1 and SR A1A included roadway restriping, addition of a bullet rail to the existing concrete barrier wall, drainage inlet grate replacement, and modified signs at each end of the corridor allowing cyclists. The existing 8 foot shoulder was striped as a dedicated bicycle lane in each direction, separated from the vehicular travel lane by 6 inch white audible pavement markings. Green pavement was installed in the bicycle lanes across ramp merge areas at US 1, CR 3, and South Patrick Drive. Older grated inlet tops were replaced with those that have smaller openings and designed for bicycle travel. Neither the vehicular lane width nor the posted speed limit was changed to accommodate the new bicycle lanes. Plan sheets for the Pineda Causeway improvements are included in Appendix C.

Figure 2. Location Map – Pineda Causeway (SR 404)

The Space Coast Transportation Planning Organization staff and FDOT staff worked with local bicycle clubs and residents to launch the Bicycle Access on Limited Access Highway program on the Pineda Causeway. A local newspaper, Florida Today, completed an in depth interview with staff and filmed a live bicycle trip across the Pineda Causeway to increase public awareness of the pilot program.¹

Bicycles on Limited Access Facilities Pilot Project
FINAL REPORT - August 2015

William Lehman Causeway

Bicycle lanes were dedicated in the existing 10 foot paved outside shoulder on the William Lehman Causeway between West Country Club Drive and SR A1A. A portion of the William Lehman Causeway features ground-in rumble strips in the shoulder, between the travel lane and bicycle lane. Green pavement markings were added in the vicinity of on and off-ramps and frontage road connections. The markings are designed to alert drivers to the possible crossing of the travel lane or ramp by cyclists, guide cyclists to cross at locations with better sight distance, and encourage appropriate yielding. Shared lane markings were installed on the system of frontage roads that run parallel to the Causeway, between West Country Club Drive and East Country Club Drive. During the course of the pilot project, the frontage roads were resurfaced and bicycle lanes were added in place of the shared lane markings. Bicycle crossing signs and markings were installed across the frontage road near its merge location with William Lehman Causeway. Bicycle loop detectors were also installed on the westbound frontage road approach to the signalized intersection at Country Club Drive. Plan sheets for the William Lehman Causeway improvements are included in Appendix C.

Figure 3. Location Map – William Lehman Causeway (SR 856)
Julia Tuttle Causeway

Bicycle lanes were dedicated in the existing 10 foot paved outside shoulder on the Julia Tuttle Causeway between its merge with NE 36th Street and Alton Road. Shared lane markings and “Bikes May Use Full Lane” signs were installed in the eastbound through lane of NE 36th Street, between US 1 and the west end of the bridge. A portion of the causeway features ground-in rumble strips in the shoulder, between the outside travel lane and the bicycle lane. Green pavement markings were installed in the bicycle lane across the ramp merge areas on the Alton Road onramp at Mount Sinai Hospital. Drainage grates were replaced with those that have smaller openings, to lower the risk to bicycle tires. Plan sheets for the Julia Tuttle Causeway improvements are included in Appendix C.

TRAFFIC VOLUMES AND BICYCLE USAGE

Bicycle traffic volumes were collected before and after the corridors were opened to bicycle traffic. Each of the selected corridors reported bicycle usage before or at the beginning of the pilot project implementation. The count data was collected to compare changes in bicycle use on each corridor. Each count data collection period occurred over a seven day period to gauge bicycle use on the pilot corridors. In the interest of consistency, subsequent bicycle counts were collected at the approximate same time of the year on each corridor. As weather patterns, local events, and other circumstances
can affect bicycle use, each data set should be considered a snapshot rather than an average representative of bicycle use on that corridor.

**Pineda Causeway Bicycle Use**

Bicyclist traffic volume data was collected twice on the Pineda Causeway, the week of April 8-14, 2013 and again March 23-29, 2015. These dates were selected to compare bicyclist usage at the opening of the bicycle lanes with their usage at the end of the two year pilot period.

Because the Pineda Causeway pilot corridor features an interchange with CR 3 within the limits, the counts were collected at several locations to capture bicyclists on the mainline and those using the ramps to enter and exit the causeway. These locations include the ramps to and from both US 1 and CR 3.

Figure 5 illustrates the comparison of bicycle usage on this corridor during the two count periods. For the purpose of comparison, the data used in Figure 5 includes the two way traffic on the causeway, just east of US 1. While the data may suggest a slight decrease in bicyclist use on the causeway on some days of the week, it is important to note that both rounds of data collection were performed after the upgrades were installed and bicycle use was permitted on the causeway. Additional count data can be found in Appendix D.
William Lehman Causeway Bicycle Use

Bicyclist traffic volume data was collected on the William Lehman Causeway on three occasions, once before and twice during the pilot project. Each count was completed at the east end of the facility. The first set of bicyclist traffic volume data was collected from December 9-15, 2012 (Sunday through Saturday). A second round of counts was completed from December 11-17, 2013 (Wednesday through Tuesday), and the final counts were completed January 10-16, 2015 (Saturday through Friday).

The data found significant differences in bicyclist usage between weekday and weekend counts, with more cyclists using the corridor on the weekends. A comparison of the counts revealed a 74 percent increase in total weekly bicycle trips from December 2012 to January 2015. Figure 6 illustrates the comparison of bicycle usage on this corridor during the three count periods. Additional count data, including bicyclist use by time of day, can be found in Appendix D.
Julia Tuttle Causeway Bicycle Use

Similar to the William Lehman Causeway, bicycle count data was collected during three separate periods: December 9-20, 2012 (Sunday through Thursday), January 21-27, 2014 (Tuesday through Monday), and January 10-16, 2015 (Saturday through Friday). The 2012 counts were slightly longer due to an inadvertent disturbance of the count collection equipment during the count period. Seven days of 2012 count data was used. The Julia Tuttle Causeway pilot corridor is significantly longer than the William Lehman Causeway project, and not all bicyclists were determined to travel the entire length of the Causeway. Therefore, volume data were collected on both the east and west ends of the Causeway. Interestingly, the data indicated that volumes significantly differed from one end of the Causeway to the other. A significant percentage of bicyclists traveled on only a portion of the causeway, and the majority of these users originated from the west end.

Overall, a comparison of the count periods revealed a 120 percent increase in total weekly bicyclist trips between December 2012 and January 2015. Figure 7 illustrates the comparison of bicycle usage on this corridor during the three count periods. The complete count data with analysis by day of week and time of day can be found in Appendix D.
CRASH ANALYSIS

A review of available crash data was completed using the Signal Four Analytics system. Available crash reports were downloaded and reviewed during the two year period of March 1, 2013 to February 28, 2015. This evaluation period was selected to evaluate crashes that occurred during the two year period after the bicycle improvements were implemented. Collision Summaries and Diagrams for the pilot projects are included in Appendix E.

Crashes on Pineda Causeway

According to the available information, no crashes involving bicyclists occurred on the study segment of Pineda Causeway during the analysis period. A total of 95 crashes (of all types) occurred during the analysis period. The number and nature of total crashes that occurred in the two years ending February 28, 2015 were similar to those that occurred in the two years prior (103). None of the reported crashes involved bicyclists.

A review of crashes on nearby facilities that also cross the Banana River or Indian River was completed for comparison. During the two year pilot project, the following bridges/causeways in Brevard County were reviewed for bicycle related crashes:

- Nasa Parkway (CR 405) – 0 bicycle crashes
- Hubert Humphrey Memorial Bridge / Cocoa Beach Causeway (SR 520) – 0 bicycle crashes
- Eau Gallie Causeway (SR 518) – 0 bicycle crashes
- Melbourne Causeway (US 192) – 0 bicycle crashes

Crashes on William Lehman Causeway

Crashes were reviewed for the entire length of the William Lehman causeway, including the frontage roads. Although bicyclists are only permitted between West Country Club Drive and SR A1A, the entire corridor from US 1 to SR A1A was reviewed for comparison. Three crashes involving bicyclists occurred during the analysis period.

Two of the reported bicycle crashes occurred at the intersection of US 1 and the western end of the Causeway. The location of these crashes is adjacent to, but not within, the limits of the pilot project. Both reported bicycle crashes at this intersection involved a westbound right turning driver who failed to yield to a southbound cyclist in the crosswalk on US 1. Both crash reports indicated that the at-fault driver fled the scene but later returned. The third bicycle crash occurred when two bicyclists were traveling westbound on the frontage road north of the causeway, and one bicyclist was hit by a passenger car as he passed the other bicycle in the outside travel lane. All of the reported crashes on this corridor listed Failure to Yield Right of Way as the contributing cause of the crash.

A total of 82 crashes occurred on William Lehman Causeway during the two year pilot project, which was very similar in to the number of crashes that occurred in previous two
year period ending March 2013 (84 vs 82). None of the crashes during the two year period prior to the pilot project involved bicyclists.

**Crashes on Julia Tuttle Causeway**

During the pilot project analysis period, three bicyclist crashes were reported on the portion of the Julia Tuttle Causeway included in this pilot project.

One bicycle crash occurred in the eastbound lanes of the Causeway just east of US 1. A bicyclist changed lanes from the outside shoulder to the inside lane, and was hit by a vehicle in the inside lane. The other two bicycle crashes occurred on the westbound off ramp of the Causeway, between the limited access lanes and US 1. One crash with a bicycle occurred when a bicycle turned left from the right lane on westbound NE 38th Street, at its intersection with US 1. Another bicycle crash occurred when a westbound bicyclist was reported to run into the side of a vehicle.

A fatality involving a bicyclist occurred on the Julia Tuttle Causeway on April 20, 2015. A driver was reported to have swerved to avoid another vehicle and struck a bicyclist riding on the causeway. The impact launched the bicyclist over the railing and into the water below. While this crash occurred outside the analysis period, it is worth noting in this report.

A total of 330 crashes were reported on the study segment of the Julia Tuttle Causeway during the two year analysis period. The total number of crashes on Julia Tuttle Causeway was 30 percent higher during the pilot project than the 254 crashes that occurred in the previous two year period. However, the number of bicycle crashes was steady during the pilot project, as three bicycle crashes occurred during the two year period before the pilot project was implemented.

A review of crashes on nearby facilities that also cross the Intracoastal Waterway in Miami-Dade County was completed for comparison. During the two year pilot project, the following bridges/causeways in Miami Beach experienced bicycle related crashes:

- MacArthur Causeway (SR A1A) – 4 bicycle crashes
- Venetian Causeway (local toll facility) – 6 bicycle crashes
- Normandy Drive/NE 79th Street (SR 934) – 5 bicycle crashes
- Broad Causeway (CR 922) – 4 bicycle crashes
- SR 826/NE 163rd Street – 1 bicycle crash

<table>
<thead>
<tr>
<th></th>
<th>Bicycle Crashes 2 Years Prior to Pilot Project</th>
<th>Bicycle Crashes 2 Years During Pilot Project</th>
</tr>
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<tbody>
<tr>
<td>Pineda</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>William Lehman</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Julia Tuttle</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 2. Summary of Bicycle Crashes Before and During Pilot Project
Table 2 shows a summary of bicycle crashes that occurred on each of the causeways during the two years prior and during the pilot project. Collision Diagrams and Crash Summaries for the two year pilot period can be found in Appendix E.

ENFORCEMENT CONSIDERATIONS

FDOT staff requested feedback from agencies with jurisdiction over each of the pilot causeways. Liaisons to the local Community Traffic Safety Team in the FDOT District Offices were instrumental in soliciting input about enforcement considerations on the pilot projects.

Florida Highway Patrol (FHP) has jurisdiction over Pineda Causeway. While the FHP representative did not note any challenges with enforcement of the bicycle lanes, they did note significant concern with debris in the bicycle lane, often residual from traffic crashes. They noted that this type of debris is more common on higher volume/high speed roadways where crews aim to clear collisions quickly to restore traffic flow and avoid secondary crashes. One local officer said debris is very common and that he has seen large objects occasionally obstructing the bicycle lane, raising his concern for the safety of cyclists. The FDOT Asset Management contractor has been made aware of the observed debris, and is monitoring and clearing as needed.

The Sunny Isles Beach Police Department covers the west portion of the William Lehman Causeway. Their representative noted that they have found it difficult to “do enforcement” on the bridge. The Aventura Police Department was also consulted, as it is responsible for enforcing traffic on the east side of the William Lehman Causeway. An Aventura Police sergeant cited pedestrian use as a concern, along with very large groups of cyclists who take up an entire lane of the causeway. While he noted that they have not issued citations on the causeway, they have issued a few to cyclists for running red lights or riding without lights elsewhere in the city.

FDOT contacted the Miami Police Department to gather input on any enforcement issues related to bicyclist activity on the Julia Tuttle Causeway. While traffic enforcement on the causeway is generally handled by FHP, a sergeant with the Miami Police Department shared concern about allowing bicyclists to ride on the causeway without a concrete barrier separating bicyclists from the high speed motorist traffic.

Full email correspondence from the enforcement agencies can be found in Appendix F.
OPERATIONAL IMPACTS

A study completed by the University of North Florida analyzed the behavioral and operational characteristics of drivers and cyclists on the pilot project corridors. The study, titled *Operational Analysis of Shared Lane Markings and Green Bike Lanes on Roadways with Speeds Greater Than 35 MPH*, included the three limited access pilot corridors as well as five other bicycle facilities around the state of Florida.\(^2\)

The study included a review of operations at green bicycle lane locations on the pilot corridors, where bicyclists crossed vehicular traffic at on and off ramps. The study found that bicyclists “consistently turned their heads to search for overtaking traffic before crossing.” Drivers on both William Lehman and Julia Tuttle Causeway were observed to search and yield as needed as they approached a crossing bicyclist. Observations related to bicycle crossing locations are listed in Table 3.

<table>
<thead>
<tr>
<th>Location</th>
<th>Road Name</th>
<th>Bicyclist reduced speed?</th>
<th>Bicyclist visibly checked for overtaking traffic before crossing?</th>
<th>Driver reduced speed?</th>
<th>Bicyclist used marked crossing location?</th>
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</thead>
<tbody>
<tr>
<td>Miami</td>
<td>Lehman West Off-Ramp</td>
<td>50.0% 50.0%</td>
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<td>25.0% 75.0%</td>
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<tr>
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<td>100.0% 0%</td>
<td>100.0% 0%</td>
<td>100.0% 0%</td>
</tr>
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</table>

Table 3. Operational Observations at Bicycle Crossing Locations

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The study also found that approaching drivers reduced their vehicle’s speed (a slight but statistically significant amount) when overtaking bicyclists on causeways. On average, drivers overtaking a bicyclist slowed down by approximately 2.2 MPH, as shown in Figure 9. This speed change is consistent with previous FDOT research on motorist–bicyclist interactions during overtaking maneuvers.  

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The study reported that bicyclists were also observed to slow down when passing a motorist at a crossing location, with the exception of the eastbound off ramp on William Lehman Causeway. The entire University of North Florida report, including additional photos of bicycle activity taken during the research study, can be found in Appendix G.
COSTS OF THE PILOT PROGRAM

The costs of upgrades to each pilot corridor are included in the following table. Note that the improvements to the Julia Tuttle Causeway were completed in two phases. As such, the project costs are itemized by project number. One Julia Tuttle project included signing and markings while the other involved work on the shoulder and railing. The table includes costs related to the design, construction, and bicycle counts on each pilot project corridor. The figures listed are as accurate as practical, but do not include the costs of routine maintenance, enforcement, operational research, staff reviews, or costs associated with crashes. Additional detailed project cost information can be found in Appendix H.

<table>
<thead>
<tr>
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<th>Pineda Causeway</th>
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<td>Total</td>
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<td>$739,386</td>
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Table 4. Costs of the Pilot Projects

CONCLUSIONS AND RECOMMENDATIONS

This pilot project was established by Florida Statute 316.091, to allow bicycle activity on three limited access causeways in Florida. During the course of the pilot project, data shows that bicycle usage increased steadily over the pilot period for the William Lehman and Julia Tuttle Causeways, and held steady for the Pineda Causeway. Bicycle usage tended to be higher on the weekends. Speed data from an independent study demonstrated that drivers reduced their speed by approximately 2.2 MPH when overtaking bicyclists on the causeway segments of the bridges. At the merge areas, both drivers and bicyclists were found to actively search for other traffic and yield appropriately.

The frequency of bicycle crashes did not significantly increase on the pilot corridors, even with the increase in bicycle activity. Overall crashes (those involving all vehicle types and crash types) increased on the Julia Tuttle Causeway and remained the same for the other two causeways.
The corridors selected for this pilot project were chosen based on their specific operational and design characteristics, and other limited access corridors may not experience similar operational and safety results. Caution should be taken before implementing similar bicycle facilities on other limited access corridors. In general, high speed limited access facilities and adjoining corridors with higher truck volumes and narrow shoulders may not operate in the same way as the pilot projects. Engineering judgement and operational considerations should be actively considered, and corridors should be evaluated for bicycle safety before allowing bicycles on other limited access corridors. Such an evaluation should be based on a thorough review of relevant data.

FDOT Safety studies utilize at least three years of data to achieve reliable conclusions from crash and volume data. When crashes are broadly distributed across the study locations and small in relative numbers, a longer time period is needed over which to collect and analyze the data. Therefore, the duration of the pilot project should be extended to allow for additional data collection and evaluation to determine the longer term impacts of bicycle facilities on the pilot corridors.

Given the relatively short duration of the pilot project, it is recommended that the pilot project be extended for a period of two years to monitor operations and crash data on the three pilot corridors. During the extension, FDOT staff should continue to gather input from local law enforcement agencies and coordinate with the bicyclist community on safe and proper use of bicycle facilities. FDOT should perform bicycle counts on an annual basis to monitor changes in bicycle use on the pilot corridors. At the end of the two year extension, crash data should be analyzed to evaluate any trends related to additional bicycle traffic. The longer crash analysis period is consistent with the requirement for FDOT Safety Projects and Design Exceptions. The pilot corridors should be further evaluated after the two year extension project to determine if bicycles should be allowed on other limited access causeways meeting specific criteria. This report should also be updated after the two year extension of the pilot project.

The cost of a two year extension of this pilot project is estimated at $100,000, which would include additional traffic counts, crash analysis, and operational reviews. This estimate does not include the costs associated with routine maintenance, enforcement, staff reviews, or costs associated with crashes.