

# Memorandum



**Date:** April 11, 2014

**To:** Honorable Chairwoman Rebeca Sosa and Members  
Board of County Commissioners

**From:** Carlos A. Gimenez  
Mayor 

**Subject:** Venetian Causeway Bridges

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On March 15, 2014, a Miami-Dade Transit (MDT) bus traveling eastbound along the westernmost part of the West Venetian Bascule Bridge (Bridge) of the Venetian Causeway (Causeway) was temporarily delayed due to its contact with a localized bridge deck failure. This was caused primarily due to the age and current condition of this segment of the Bridge. Public Works and Waste Management (PWWM) personnel arrived at the location to conduct necessary emergency repairs and maintenance staff were able to re-open the Causeway to vehicular traffic in the early hours of the following day.

Working with the Florida Department of Transportation (FDOT), PWWM has obtained the services of an FDOT consultant to conduct immediate inspections of the Bridge in order to determine the full extent of the required repairs. These efforts commenced on March 18, 2014 and will be followed by PWWM accessing a consultant contract to negotiate a scope and cost for the full inspection of the remaining 11 bridges on the Causeway, and to prepare the documents necessary to perform any needed repairs. As these inspections and remedial actions progress, I will update the Board accordingly.

In light of the issues along the westernmost 730 feet of the West Venetian Bascule Bridge, and the follow-up inspections performed by PWWM in conjunction with an FDOT bridge inspection consultant, a plan of action was implemented beginning in the evening hours of Wednesday, April 9, 2014.

## Plan of Action

An additional thirteen (13) steel plates (three (3) were installed on March 15, 2014) were placed on April 9, 2014 along the deck of the bridge to cover additional deteriorated areas identified during inspections. The plates were placed from beam to beam where possible in order to distribute loads across the deck and beams. This action will protect against further incidents until permanent repairs have been implemented.

These actions were communicated to the area homeowner's associations as well as through a news release available to the public. Furthermore, PWWM staff will attend a meeting on April 22, 2014 with the area's residents to explain the plan of action, and advise of what impacts can be expected during construction activities.

Additionally, signage has been installed to denote a reduction in load ratings along the bridge as a result of recently conducted load ratings by FDOT. Specifically, load ratings are to be reduced from 15 tons to 11 tons on all bridges except the West Venetian Bascule Bridge which will be posted at 5 tons until such time as intermediate repairs are implemented. In conjunction with the above, "Slippery when Wet" signage will be installed for cyclists on account of the steel plates. All signage will be installed by April 12, 2014. In support of the installed weight restriction signage, PWWM will coordinate enforcement with FDOT.

Furthermore, as a result of the lowered load ratings, MDT Route A is being suspended until further notice. This route provides bus service on the Venetian Causeway from Lincoln Road on Miami Beach to the Omni Bus / Mover Terminal (Biscayne Blvd and 15 Street). Customers have been notified of the route suspension via the MDT rider alert system and by MDT Supervisory personnel. MDT is currently analyzing the impact and evaluating alternatives.

Finally, PWWM staff has coordinated with the City of Miami Beach and the City of Miami the providing of emergency services to all of the islands along the Venetian Causeway.

### **Mid Term Action Plan**

As a temporary measure until such time as permanent repairs can be conducted, PWWM will procure services to mill the existing asphalt and place a three (3) inch lightweight concrete deck cover with steel mesh over the affected segment of the bridge. This work will take approximately four (4) weeks to complete, during which time the bridge will be closed to vehicular traffic. The cost for this work is estimated at \$700,000.00, and, based on consultations with FDOT, will temporarily extend the life of the bridge for two (2) years. This work would also allow for an increase in the load rating for this segment of the bridge. PWWM is currently working with the Internal Services Department to expeditiously procure a contract for these services. All work will be coordinated with the City of Miami and Miami Beach, as well as the homeowner's associations along the Causeway.

### **Long Term Action Plan**

PWWM is moving towards securing a design/build contract to effectuate the complete replacement of the affected segment of the Bridge. The procurement of the contract is expected to take eight (8) months, with actual construction to take six (6) to nine (9) months thereafter, during which time the bridge would be closed to vehicular traffic. The estimate for this work is \$9 million, and will extend the life expectancy of this bridge by 60 years. All work will be coordinated with the City of Miami and Miami Beach, as well as the homeowner's associations along the Causeway.

### **Background**

For reference purposes, PWWM has provided the following background for all bridges along the Causeway, as well as previous efforts to improve the condition of the bridges:

The Causeway is listed in the National Register of Historic Places, and the City of Miami and Miami Beach have also designated the Causeway as a local historic landmark. The Causeway follows the original route of the Collins Bridge, a wooden structure built in 1913, and consists of a series of 12 bridges spanning the 11 man-made Venetian Islands. The 12 current bridges were built in 1927, with ten (10) bridges being fixed low-level arch bridges, and the remaining two (2), bascule bridges with concrete arch approach spans.

Due to their location, and low elevation, the bridges have and continue to be subject to the typical deterioration caused by a harsh marine environment. In my memo to the Board dated September 6, 2013, the need to replace these bridges was listed as the second priority in terms of needed improvements. The order of priority was based on factors including structural conditions, functionality, and the bridges' relative importance based on average traffic, and location.

On July 7, 2011, the Board adopted Resolution No. R-547-11, approving a Locally Funded Agreement between the County and FDOT in order to address the need for funding a Project Development and Environment Study (PD&E) for the rehabilitation and/or replacement of the 12 existing Causeway bridges. A PD&E Study is required in order to have the project's construction eligible to receive federal funding. The PD&E takes into account viable replacement alternatives, the historic nature of the bridges, public and stakeholder concerns, environmental impacts, and potential costs.

On November 5, 2013, through Resolution No. R-906-13, the Board approved Amendment No. 1 to the Locally Funded Agreement, which increased the funding amount for the PD&E as a result of the need to fully address considerations that include the following:

- Multiple historic resources in the area need to be evaluated that will involve more extensive coordination with historic preservation groups and Florida's State Historic Preservation Officer, and the utilization of historic architecture services.
- Procurement of additional services related to new structural design guidelines, drainage provisions for bridge hydraulics, geotechnical investigations, and environmental services.
- Significantly greater public involvement costs to inform and involve the general public in the development of the project.

The PD&E is expected to be completed in four (4) to five (5) years depending on the level of effort required by the Federal Highway Administration, as the entity responsible for the review and approval of the study. Once completed, PWWM will apply for a grant to fund the complete replacement of all 12 bridges, which is currently estimated at over \$110 million. Any matching funds would be supported through Causeway toll revenues.

### **Inspection History**

As required by Federal mandate, all County bridges must be inspected every two (2) years. As part of these inspections, an FDOT consultant prepares a comprehensive report of all bridge elements including the superstructure (e.g., beams, deck, railings), substructure (e.g., columns, column caps) and underwater elements (e.g., piles). The completed reports are transmitted to PWWM for information purposes, and for further action if warranted. Remedial maintenance actions are performed by PWWM staff (e.g., joint repairs, sidewalk cracks, asphalt repairs, spall repairs). However, any major repair work is contracted to a private entity, through the County's procurement process once funding has been allocated.

In the early 1990's inspections of the Causeway bridges determined that the bridges were in need of repairs. As a result, FDOT funded and supervised repairs which were implemented from 1996 to 1999. The repairs consisted of major rehabilitation of the beams and decks for all 12 bridges, the complete replacement of the bascule portion of the East Venetian Bascule Bridge, and the replacement of approximately 70% of the West Venetian Bascule Bridge, including the bascule span itself. It is important to note that at that time FDOT's plan was to fund and fully replace the bridges, instead of only rehabilitate them. However, the replacement plan was opposed by the area's residents since the proposal was not consistent with the historic nature of the existing bridges (e.g., architectural arch beams, railings, low profile elevations).

In 2004, a load rating calculation conducted by FDOT led to the need to reduce the allowable vehicular loads on the bridges. As soon as the results were made available, the County proceeded to post signs allowing a maximum vehicular load of 15 tons on the Causeway. These restrictions were discussed at the time with representatives from the City of Miami and Miami Beach, area homeowner's associations, and remained in effect until this week.

In March 2006, FDOT conducted a load test on two (2) representative bridges on the Causeway. All legal vehicular loads in the State of Florida were simulated by using trucks loaded with concrete blocks placed at critical locations on the bridges. The resulting report, dated April 2006, demonstrated that the bridges could carry all but one (1) of Florida's legal vehicular loads. However, FDOT's report noted that the conclusions were based on the condition of the bridges at the time and that the capacity of the bridges would be compromised if remedial action was not taken in the near future. As a result, it was determined by PWWM that all load restrictions would remain in place until such time as the rehabilitation of the bridges could be implemented.

Additionally, as a pro-active step, PWWM retained the services of a consultant in 2007 to inspect, design, and prepare plans to repair the ten (10) fixed bridges, the East Venetian Bascule Bridge, and the segment of the Bridge not improved by FDOT in the 1990's. This led to a major rehabilitation project implemented between 2009 and 2011, funded by Causeway toll revenues, as well as from the federal government through the County Incentive Grant Program (CIGP), for a total amount of \$7,133,162.75. The scope of work for the project consisted of major repairs to the support beams, including removing existing concrete and adding new reinforcing and concrete. Additionally, major repairs to the diaphragms, the deck underside and the support piers were performed.

In addition to the above referenced work, PWWM concluded that due to the age of the bridges, as well as their proximity to the corrosive marine environment, recurring major repairs would be necessary. As a result, PWWM initiated the design process for the full replacement of all bridges. A Notice to Proceed was issued to a design consultant on May 26, 2009 in order to prepare the full contract documents required to secure a construction bid. However, the design process was stopped when FDOT informed PWWM that a PD&E would need to be completed prior to the design in order to remain eligible to receive Federal funding.

Lastly, as part of their regular bi-annual inspection program, FDOT's 2012 Inspection Report shows sufficiency ratings ranging from 32.6 to 61.0, depending on the bridge. PWWM continues to perform routine maintenance of the bridges, including deck repairs. These ratings are expected to decrease further as a result of FDOT's 2014 inspection report.

## **Conclusion**

Through the above noted efforts, safe access will be provided across the bridge until such time as funding is identified and services are procured for the complete replacement of the affected segment of the Bridge. I will continue to keep the Board, affected stakeholders, and the County residents informed during this process.

c: Honorable Harvey Ruvin, Clerk of the Board  
Robert A. Cuevas, Jr., County Attorney  
Alina T. Hudak, Deputy Mayor and Interim Director of Public Works and Waste Management  
Antonio Cotarelo, County Engineer, Public Works and Waste Management  
Ysela Llort, Director, Miami-Dade Transit