# Memorandum

MIAMI-DADE COUNTY

**Date:** February 28, 2013

**To:** Honorable Juan C. Zapata
Commissioner – District 11

**From:** Carlos A. Gimenez
Mayor

**Subject:** Key Biscayne Bridge

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As a follow-up to my memorandum dated February 14, 2013, attached is the requested report prepared by TransSystems, to address the eight (8) separate issues enumerated in your Memo dated February 7, 2013. TransSystems is the consultant hired by the County to inspect both the West Bridge and the Bear Cut Bridge (Bridges) as a result of the findings detailed in the Florida Department of Transportation's (FDOT) 2012 biennial inspection report for the West Bridge. Their inspections were instrumental in discovering previously unidentified damage to the Bear Cut Bridge, leading to FDOT's drop in sufficiency rating for this bridge from 67 in 2010 to 21 in 2012, setting in motion the ongoing process approved by the Board to select a design-build firm to expeditiously repair the Bridges.

The scope of work used for this expedited procurement process followed a careful and thorough analysis by the Public Works and Waste Management Department (PWWM), in consultation with TransSystems and FDOT. Initial consideration was given to temporary repairs to the Bridges while a traditional design/bid/build procurement was undertaken for the construction of entirely new bridges along the current alignment. Subsequently, Eugene Stearns, a resident of the Village of Key Biscayne, advocated for the construction of an entirely new Bear Cut bridge extended by approximately 1,600 feet in order to facilitate uninterrupted traffic crossing at the adjacent intersections. This option was also reviewed and analyzed. The selected scope of work is based on a review of the Bridges structural elements by visual inspection and engineering calculations, review of available FDOT inspection reports, and the re-inspection of the underwater piles by divers hired by FDOT. It presents an appropriate balance between the need to expedite repairs to the Bridges, funding mechanisms currently approved by the Board, and an acceptable extension to the life expectancy of the repaired Bridges.

In support of the information detailed in the requested consultant report please note that the determination to leave the substructure in place was made as a function of concerns for ensuring public safety, and to expeditiously rehabilitate the Bridges within feasible funding alternatives. For the purposes of this memorandum, superstructure elements are those situated above and including the steel beams (e.g., concrete deck, railings), and the substructure are those elements situated below the steel beams (e.g., concrete columns, concrete piles). The substructure review was based on 2008, 2010 and 2012 FDOT Bridge inspection Reports, as well as a follow up underwater inspection by FDOT divers conducted on January 24, 2013, which confirmed the findings of the 2012 report. Summarized below is further clarification to the consultant's report, in particular as they relate to the condition and life expectancy of the existing substructure.

**Bear Cut Bridge**

For the 1944 segment of the bridge there are 40 piers with two (2) columns each and five (5) piles under each of the columns for a total of 400 piles and 80 columns. The number of piles and columns that can be inspected and are described in the FDOT Reports is 443. The balance is under the ground line or sand and therefore cannot be inspected.

The FDOT Inspection Report's summary of findings are listed below. Please note that there is no differentiation between columns (above the footing), and the piles under the water line in the summary.

Summary Legend (both Bridges)
Condition 1 – there is little to no deterioration in the columns/piles.
Condition 2 – minor cracks, spalls, and scaling may be present in the columns/piles.
Condition 3 – some delaminations, moderate cracks, and spalls may be present in the columns/piles.
Condition 4 – severe cracks, spalls, and delaminations in the columns/piles. Condition warrants structural review.

| Inspection Date | Number of piles/columns Condition 1 | Number of piles/columns Condition 2 | Number of piles/columns Condition 3 | Number of piles/columns Condition 4 |
|---|---|---|---|---|
| 2008 | 174 | 7 | 262* | 0 |
| 2009 (Interim) | 174 | 7 | 262* | 0 |
| 2010 | 174 | 7 | 262* | 0 |
| 2012 | 399 | 17 | 28* | 0 |

*Please note that according to FDOT the reason for the sharp drop in condition 3 piles/columns is due to FDOT's consultant that prepared the 2008, 2009 and 2010 reports decision to leave all of the piles that had received jackets and were not able to be inspected visually as condition 3. A new FDOT consultant that performed the 2012 inspection decided that the piles improved with jackets had been rehabilitated and thus the condition was changed to condition 1 in full concurrence with FDOT.

**West Bridge**
For the 1944 segment of the bridge there are 12 piers with two (2) columns each and five (5) piles under each of the columns for a total of 120 piles and 24 columns. The number of piles and columns that can be inspected and are described in the FDOT Reports is 119. The balance is under the ground line or sand and therefore cannot be inspected.

| Inspection Date | Number of piles/columns Condition 1 | Number of piles/columns Condition 2 | Number of piles/columns Condition 3 | Number of piles/columns Condition 4 |
|---|---|---|---|---|
| 2007 | 118 | 0 | 1 | 0 |
| 2010 | 118 | 0 | 1 | 0 |
| 2012 | 110 | 6 | 3 | 0 |

Both the superstructure and substructure on the portion of the Bridges built in the mid 1980's are to remain in place. A separate project has been advertised and bids have been received by PWWM in order to provide structural jackets to the piles installed in this newer bridge portion. The caps and superstructure are in good condition.

The scope of work for the repairs to the Bridges is based on FDOT's 2012 reports, and are further confirmed by their January 24, 2013 underwater inspections. In an abundance of caution this project includes the repair of the 31 piles in condition state 3, even though they are not considered a serious situation that requires immediate action. Additionally, the columns and caps above the water will be addressed as needed.

Furthermore, as part of the design/build rehabilitation project, the Bear Cut Bridge will be widened to provide additional pedestrian and bicycle facilities. This widening will be accomplished by placing four (4) new piles at the location of each existing pier (total of 160 new piles). These new piles will be designed to carry a portion of the overall lateral load placed on the bridge. This addresses concerns over the existing bridge piles not being designed to the current standards, and possibly being susceptible to lateral loads due to storm surges during a major hurricane.

Finally, you will note that the consultant's report includes an estimate for the replacement of the Bridges along their current alignment at an approximate cost of $59,033,186.38. As referenced in their report, this estimate is based strictly on demolition and new construction costs. Their report did not consider the following elements, which if included at industry standard rates would increase their estimate to approximately $99.5 million, or within 4.3 percent of the County's cost estimate.

1. Engineering studies, surveys, geotechnical investigations, environmental permitting, PD&E Reports, and engineering design
2. Cost of roadway approaches including embankment, retaining walls, intersection improvements, lighting, and maintenance of traffic
3. Construction Inspection Services (CIS)
4. Contingency allowance
5. Allowance amounts for Off-duty police
6. Public Involvement Program, (PIP) mandated by County Ordinance for projects of this magnitude
7. Project insurance and bonding costs
8. Temporary repairs

In light of the condition of the Bridges, the current course of action provides a balanced approach to expeditiously address non-temporary repairs to the Bridges, and bring about improvements which will ensure the safety of its users and minimize the impact to the public and extend the life expectancy of the Bridges up to 40 years.

I hope that the information included above and in the attached report sufficiently addresses your concerns.

Attachment

c: Honorable Chairwoman Rebeca Sosa and Members, Board of County Commissioners
Honorable Harvey Ruvin, Clerk of the Board
Robert A. Cuevas, Jr., County Attorney
Abigail Price-Williams, First County Attorney
Alina T. Hudak, Deputy Mayor
Kathleen Woods-Richardson, Director, Department of Public Works and Waste Management
Hugo Benitez, Assistant County Attorney
Christopher Agrippa, Division Chief, Clerk of the Board

# Memorandum

MIAMI-DADE COUNTY

**Date:** February 14, 2013

**To:** Honorable Juan C. Zapata
Commissioner – District 11

**From:** Carlos A. Gimenez
Mayor

**Subject:** Key Biscayne Bridge

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Thank you for your memorandum dated February 7, 2013. I immediately instructed staff from Public Works and Waste Management to work with our consultant to provide the Board of County Commissioners a comprehensive response to each of the points in your memorandum. As I am sure you can appreciate, the topics requested to be detailed in the certified report require a certain degree of analysis and due diligence, as they relate to the engineering of a major County bridge spanning over a significant stretch of water. To that end, please be assured that I understand the urgency of this matter, and will provide you with the report by no later than February 28, 2013.

c: Honorable Chairwoman Rebeca Sosa and Members, Board of County Commissioners
Honorable Harvey Ruvin, Clerk of the Board
Robert A. Cuevas, Jr., County Attorney
Abigail Price-Williams, First County Attorney
Alina T. Hudak, Deputy Mayor
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February 22, 2013

Mr. Marcos R. Redondo, P.E.
Section Head, Bridge Engineering
Highway Division
Miami-Dade Public Works and Waste Management Department
111 NW 1st Street, Suite 1510
Miami, FL 33128

**RE: Response to Memorandum from Commissioner Zapata**

Dear Mr. Redondo,

In response to your request to TranSystems via email on February 7, 2013, we offer the following discussion regarding the eight points that Commissioner Zapata requested be addressed. All time and money estimates are approximate given the many unknowns and the compressed time available for this analysis.

***Feasibility and cost of temporarily repairing the bridges along with the resulting life expectancy of the bridge:***

Although it is possible to perform repairs to the Bear Cut and West bridges, the effort to make the numerous repairs to the areas of section loss on the beams is very significant. The selected contractor must first strip off the grease coating and remove all the rust scale that is present to completely define the scope of the repairs. It is likely that the orange coating beneath the grease contains lead, as most coatings from the era the bridge was constructed, or even 30 years ago, contained lead. If lead paint is present, special containment will be required for the steel to be cleaned, which will put the cost for coatings removal at a premium. Once the scope of repairs is fully defined and materials received on site, the work can begin in earnest.

At the bearing areas, it may be required to jack the bridge in order to restore load path continuity, as there are many locations where the webs at the beam ends are in poor condition. Jacking the beams is likely to be complicated by the fact that the beam webs exhibit the worst conditions near the bearings. To perform jacking, the beam webs or diaphragms may require stiffening, replacement, and/or repair at the locations where the jacks are to be installed. An entire line of beams at a pier will need to be jacked simultaneously, while traffic is on the bridge. This work is possible, but very difficult to do, and may cause some additional deterioration to the deck.

In addition to the possible need to jack some spans to make repairs, it is very likely that voids will exist between the flat surfaces of the new steel and the uneven surfaces of the existing steel, creating locations where moisture can accumulate and corrosion will advance, even with the most careful cleaning, sealing and painting processes followed. In order for the new repair steel to carry both dead (self-weight and concrete deck, etc.) and live load (vehicles), the weight needs to be removed from the beams during the installation of new steel. Span jacking is very costly. Repair work also includes concrete repairs to the substructure elements, of which there is a high probability that the extent of repairs will exceed what has been anticipated due to the contractor performing a much more detailed examination of the concrete elements to determine locations to repair.

The existing deck slab is in fair to poor condition with large areas of spalls and delaminations on the deck underside. Jacking the bridge could cause additional spalling on the deck underside. Good quality repair results to large scale deficiencies on the deck underside are hard to obtain, because it is so difficult to place repair concrete in an overhead position that bonds well. This type of repair to the deck underside cannot be counted on to last as long as the steel repairs. If the deck underside is not repaired, it may be that the deck could become the limiting factor for the remaining life of the bridge.

Well-designed and constructed steel repairs commonly last for 15-20 years before further repairs will be needed at those locations. However, such repair activities usually only address the locations noted to be in the worst condition; all locations with deterioration are typically not addressed. Those locations that are not critical enough to warrant repairs at this time will worsen and eventually become critical locations. Once corrosion has started on steel elements, that location will worsen in an increasingly fast manner. Those locations could become critical enough to cause severe load restrictions to the bridges, of the type that the County is currently dealing with, in as little as five years. In addition to the conditions discussed above, we recommend cleaning and painting the entire steel structure in order to halt the continued deterioration for the period it would take to plan and design the structure replacement.

The table below summarizes our opinion of the probable cost to perform steel repairs and concrete substructure repairs, based on Florida Department of Transportation (FDOT) pay items for similar work and using typical unit prices for FDOT projects in District 6, without consideration for accelerated scheduling or the need for immediate completion.

| OPINION OF PROBABLE COST - BRIDGE REPAIRS AT BEAR CUT AND WEST BRIDGES | | | | | |
|---|---|---|---|---|---|
| ITEM NO. | PAY ITEM | UNIT | QUANTITY | UNIT PRICE | COST |
| Bridge No. 874544 (Bear Cut Bridge) | | | | | |
| 401-70-2 | Restore Spalled Areas | CF | 7,888 | $ 400.00 | $ 3,155,229.28 |
| 415-1-5 | Reinforcing Steel - Substructure | LB | 45 | $ 1.00 | $ 45.31 |
| 460-1-1 | Structural Steel - Rehab, Carbon | LB | 134,278 | $ 7.72 | $ 1,036,086.40 |
| 460-1-13 | Structural Steel Rehab - Bolts, Nuts, Washers & Plates | LB | 13,428 | $ 6.54 | $ 87,817.59 |
| 561-1 | Coating Existing Structural Steel | TN | 896 | $ 1,500.00 | $ 1,344,205.97 |
| Bridge No. 874541 (West Bridge) | | | | | |
| 401-70-2 | Restore Spalled Areas | CF | 1,705 | $ 400.00 | $ 681,807.60 |
| 415-1-5 | Reinforcing Steel - Substructure | LB | 1,445 | $ 1.00 | $ 1,445.00 |
| 460-1-1 | Structural Steel - Rehab, Carbon | LB | 36,620 | $ 7.72 | $ 282,557.04 |
| 460-1-13 | Structural Steel Rehab - Bolts, Nuts, Washers & Plates | LB | 3,662 | $ 6.54 | $ 23,949.24 |
| 561-1 | Coating Existing Structural Steel | TN | 312 | $ 1,500.00 | $ 467,803.85 |
| | **SUBTOTAL (BOTH BRIDGES)** | | | | $ 7,080,947.27 |
| 101-1 | Mobilization | | | | $ 100,000.00 |
| | Superstructure Jacking | | | | $ 650,000.00 |
| | **TOTAL** | | | | **$ 7,830,947.27** |

In an emergency situation, where the work needs to get done under a very compressed schedule and labor, materials and equipment will incur premium costs related to overtime, rush delivery, or other factors, the cost to complete the work is likely to be higher. The amount of these premium costs is difficult to quantify, as each contractor has a unique situation and the extent of premium costs will vary widely because of such

factors as other workload, availability of required equipment to do the work, etc. Additionally, the requirements of the emergency work vary greatly, for example, will the contractor be allowed or required to work 24 hours/day? What levels of existing traffic will be allowed or required to be maintained? Premium costs could add up to 50% to the project, resulting in a total repair cost greater than $10,000,000. Spending upwards of $10,000,000 to make needed repairs, even though less costly than replacing the superstructures or replacing the bridges completely, does not appear to be prudent.

We cannot offer an opinion as to the life expectancy of the entire bridge if repairs are made to the superstructure, because of the many variables discussed above and because these types of repairs are highly dependent on the quality of the field work. In addition, the substructure for the original portions of both bridges have unknown foundations, which means that documentation of the existing pile depths through design plans, as-built plans or pile driving records is unavailable. The existing underwater inspection reports provided by FDOT indicate that there are few problems with the foundations. Because we do not know the details of the foundations and the depth of the piles, the life expectancy of the foundations, and by extension the bridge as a whole, cannot be predicted at this time.

***Caveats with respect to temporarily repairing the bridges:***

Repair and rehabilitation work on existing bridges commonly uncover hidden deterioration that results in additional cost. The extent of that additional deterioration is not known until partial demolition occurs at existing deteriorated locations. Generally, contingency quantities are used to account for the unknown conditions.

***Anticipated cost difference of performing the work under emergency conditions with severe time constraints versus under non-emergency conditions:***

Doing repair work under emergency conditions is always more expensive to perform, as premium overtime costs for labor and rush delivery surcharges for materials and equipment to perform the work would not be included if the work is done under non-emergency conditions. There are no standard guidelines for the incremental cost associated with emergency work because the cost difference cannot be determined with significant accuracy, as it is very much a function of the individual contractors, their labor force, and the extent to which they are able to fine tune their bids during the acquisition process. Additionally, the requirements of the emergency work vary greatly, as well as the owner's contractual requirements. Requirements for maintenance of existing traffic on structures also vary from project to project. In general terms, it can be reasonably estimated that work under emergency conditions may cost 30-50% more than when done under non-emergency conditions. However, the County has declared a public emergency in order to expedite the necessary bridge work, and is using a fast-paced, streamlined design-build procurement process that allows for competitive bidding by proposers, which should keep the premium costs down. At this time, there are five responsive contractors that have submitted packages to the County.

***Cost to repair the existing bridge foundations and the resulting life expectancy:***

The original portions of the bridges have unknown foundations, which means that documentation of the existing pile depths through design plans, as-built plans or pile driving records is unavailable. The existing underwater inspection reports provided by FDOT indicate that there are few problems with the foundations. Newly designed bridges have foundations much deeper than ones built decades ago. The modern design of such elements incorporates estimated effects of scouring of the channel bottom during storm events that are usually deeper than older design methods estimated. The bridges have been in place and withstood past storm events in the County, but that is no guarantee that a future storm event could not have greater scour impact. Because we do not know the details of the foundations and the depth of the piles, or what a reasonable calculated scour depth is at these specific bridge locations, the life expectancy of the foundations cannot be predicted at this time.

It should be noted that superstructure replacement will include widening of the bridge. As part of the widening, new piles will be installed that will be driven to the depth required to meet current design requirements.

***Cost to build new bridges with new foundations and expected construction duration:***

The proposed cross section for a new Bear Cut bridge is 116'-0", as described to us in meetings with County staff. The cross section of the West bridge would remain as-is. Our opinion of the probable cost to replace both bridges in their entirety is as follows:

| OPINION OF PROBABLE COST - NEW CONSTRUCTION TO REPLACE ORIGINAL PORTIONS AT BEAR CUT AND WEST BRIDGES | | | | | |
|---|---|---|---|---|---|
| | PAY ITEM | UNIT | QUANTITY | UNIT PRICE | COST |
| Bridge No. 874544 (Bear Cut Bridge) | | | | | |
| | Demolition | SF | 173,088 | $ 60.00 | $ 10,385,290.50 |
| | New Construction | SF | 242,637 | $ 145.00 | $ 35,182,394.00 |
| Bridge No. 874541 (West Bridge) | | | | | |
| | Demolition | SF | 65,685 | $ 60.00 | $ 3,941,122.50 |
| | New Construction | SF | 65,685 | $ 145.00 | $ 9,524,379.38 |
| | **TOTAL (BOTH BRIDGES)** | | | | **$ 59,033,186.38** |

The square foot unit costs are from the FDOT Structures Design Guidelines, Topic No. 625-020-018, January 2013. We have assumed the high end of the cost range for both demolition and construction, as these bridges are in an urban location and they cross over waters that are likely to require special consideration, and unit costs do not account for such factors as mobilization, removal of existing structures, lighting, walls, approach slabs, maintenance of traffic or any contract-specific compressed construction schedules or requirements that go beyond what is expected of routine bridge construction. Note that the cost tabulated above does not include the work that will be necessary to tie into the approach roadways off of the bridge and assume that the vertical and horizontal geometry is very similar to the existing bridges. Additionally, the costs for design, construction inspection and the County's 10% construction contingency are not included. If the vertical profile is raised significantly, the cost of the work away from the channel will increase substantially.

The construction duration is difficult to estimate, since the parameters the County would put on such an effort are unknown. In addition, the effort to design and construct the new sections of bridges will be affected by the time it would take to address any potential environmental impacts with affected agencies and obtain permits. Typical bridge replacement projects of this size take five to ten years from concept to construction, depending on the level of project development and environment (PD&E) studies, alternatives, and cultural resource impacts evaluated. As you have noted in our discussions, some PD&E studies for replacement of County bridges have taken more than five years to complete. Given the location of these two bridges and the concerns of the affected citizens, the PD&E effort could take four to five years to complete.

***Advantages of building a new bridge in accordance with today's standards:***

Modern design codes and specifications are intended to provide a 75-year design life, assuming routine maintenance is performed on the bridge over that period. Building a new bridge will significantly reduce the maintenance effort required at the bridges, as the need for concrete repairs and the need for steel repairs should not be needed for decades. The foundation elements would be designed to withstand significant scour events, as well as some vessel impact. The level to which the existing bridges' might withstand these events is unknown. In addition to the structural and maintenance perspectives, constructing a new bridge

provides the opportunity to improve the roadway geometry and improve safety for vehicles, bicyclists and pedestrians.

***Environmental permitting impacts and mitigation requirements of the different actions:***

The impacts for the various construction options - repair, superstructure replacement with widening (re-use of existing substructure), full superstructure and substructure replacement with widening - are varied. Below is a very preliminary matrix of agencies that FDOT requires be consulted during the Efficient Transportation Decision Making screening process, along with our assessment of possible impact for the various types of work. Note that the final cross section desired for a new bridge and the environmental conditions at the bridge sites (seagrasses, mangroves, hazardous materials, etc.), are unknown. A more detailed discussion is not possible at this time.

| ASSESSMENT OF LIKELY AGENCY CONCERN TO SELECTED CONSTRUCTION OPTION | | | | |
|---|---|---|---|---|
| Issue | Agency | Repair | Superstructure Replacement | Superstructure and Substructure Replacement |
| Air Quality | US Environmental Protection Agency | Low | Low | Low |
| Coastal and Marine | National Marine Fisheries Service | Low | High | High |
| Contaminated Sites and hazardous materials | US Environmental Protection Agency | Moderate | Low | Low |
| | Federal Highway Administration | Low | Low | Low |
| | FL Department of Environmental Protection | Moderate | Low | Low |
| Floodplains | US Environmental Protection Agency | Low | Moderate | Moderate |
| | Federal Highway Administration | Low | Moderate | Moderate |
| Navigation | US Coast Guard | Low | Low | Low |
| Special Designations | Federal Highway Administration | Low | Moderate | Moderate |
| | US Environmental Protection Agency | Low | Moderate | Moderate |
| | US Fish and Wildlife Service | Low | Moderate | Moderate |
| Water Quality and Quantity | US Environmental Protection Agency | Low | Moderate | High |
| | FL Department of Environmental Protection | Low | Moderate | High |
| Wetlands | US Environmental Protection Agency | Low | Moderate | High |
| | FL Department of Environmental Protection | Low | Moderate | High |
| | National Marine Fisheries Service | Low | Moderate | High |
| | US Army Corps of Engineers | Low | Moderate | High |
| | South Florida Water Management District | Low | Moderate | High |
| | US Fish and Wildlife Service | Low | Moderate | High |

| ASSESSMENT OF LIKELY AGENCY CONCERN TO SELECTED CONSTRUCTION OPTION (continued) | | | | |
|---|---|---|---|---|
| Issue | Agency | Repair | Superstructure Replacement | Superstructure and Substructure Replacement |
| Wildlife and Habitat | US Fish and Wildlife Service | Low | Moderate | High |
| | South Florida Water Management District | Low | Moderate | High |
| | FL Fish and Wildlife Conservation Commission | Low | Moderate | High |
| | Federal Highway Administration | Low | Moderate | High |

Mitigation of effects vary widely depending on project location and the agencies involved. Mitigation can be generally categorized as avoidance, minimization or compensation. In general, it could involve techniques such as relocation of wildlife and habitat, wetland mitigation banking, or drainage improvements for handling increased runoff. FDOT construction activities are regulated by numerous environmental rules and regulations administered by Federal, State, local, and special district governing agencies. These agencies have established environmental programs to conserve, protect, manage, and control the air, land, water, and natural resources which will need to be adhered to as part of the project. Actual mitigation efforts needed for this project would need to be discussed with the individual agencies once more specifics of the actual work to be performed are known and the impacts of construction on the environment are identified.

***Life-cycle cost analysis over a 50 year period, comparing temporary bridge repairs with complete bridge replacement within five years; to superstructure replacement and foundation repairs now with complete replacement when the expected remaining life of the existing foundation is reached:***

The life expectancy of the bridges cannot be determined at this time, as the actual construction of the foundations is unknown. The FDOT has an on-going project to evaluate bridges with unknown foundations; the Bear Cut and West bridges are part of that study population. Depending on the results from that study, they may be able to evaluate the ability of the bridges to withstand significant storm surge.

If you have any questions, please feel free to contact me.

Steven Shaup, P.E.
Vice President

cc: Alan Klevens, P.E., TranSystems

# MEMORANDUM
# BOARD OF COUNTY COMMISSIONERS
## Commissioner Juan C. Zapata, District 11

DATE: February 7, 2013

TO: The Honorable Carlos A. Gimenez, Mayor

FROM: Commissioner Juan C. Zapata

RE: Key Biscayne Bridge Item (8L5 Adopted January 23rd BCC Meeting)

I would like to thank Deputy Mayor Alina Hudak for arranging the Sunshine meeting on Tuesday to allow me to share my concerns with the proposed plan to build a new bridge superstructure on a 69 year-old foundation that most likely does not meet today's engineering standards.

Despite the meeting, I am still concerned about spending in excess of 30 million dollars, on an emergency basis, to build a new bridge superstructure on a foundation that is at its lifespan and may not satisfy today's standards for foundations in a tidal area. Miami-Dade County experiences hurricanes with significant storm surges that could place additional challenges on this aged foundation. I would like the licensed Florida professional engineer that the county used to evaluate the bridge to certify (sign and seal) in writing the life expectancy of the existing foundation, the condition of the foundation, and whether it can withstand a significant storm surge.

I believe we should evaluate the feasibility of repairing the bridges to allow them to function for the time needed to study (limited to 1 year) and implement the best solution within a 2 year or less period.

It is important to all of us, that we receive a report within the next ten days signed and sealed by a licensed Florida professional engineer with bridge engineering experience that addresses: (1) the feasibility and cost of temporarily repairing the bridges along with the resulting life expectancy of the bridge; (2) any caveats with respect to temporarily repairing the bridges; (3) the anticipated cost difference of performing the work under emergency conditions with the severe time constraints versus under non-emergency conditions; (4) the cost to repair the existing bridge foundations and the resulting life expectancy; (5) the cost of building new bridges with new foundations and the expected construction duration; (6) the advantages of building a new bridge in accordance with today's standards; (7) the environmental permitting impacts and mitigation requirements of the different actions; and (8) a life cycle cost analysis, over a 50 year

period, comparing temporary bridge repairs with complete bridge replacement within 5 years; to superstructure replacement and foundation repairs now with complete replacement when the expected remaining life of the existing foundation is reached.

I thank you in advance for your kind assistance to this pressing matter.

CC: The Honorable Rebeca Sosa, Chairwoman of Board of County Commissioners
Members of the Board of County Commissioners
Alina Hudak, Deputy Mayor
Harvey Ruvin, Clerk of the Board of County Commissioners
Christopher Agrippa, Division Chief, Clerk of the Board
Robert A. Cuevas, Jr., County Attorney
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Kathleen Woods-Richardson, Director of Department PWWM