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May 26, 2022

David Stark
Manager, Priority Projects
North Carolina Department of Transportation
Email: dstark@ncdot.gov

RE: Cintra and Ferrovial Construction Response to Request for Information for the Cape Fear Memorial Bridge Replacement

Dear Mr. Stark,

We are pleased to deliver our response to the Request for Information (RFI) issued by the North Carolina Department of Transportation (NCDOT) on April 25, 2022 for the Cape Fear Memorial Bridge replacement. We hope that our attached response will assist NCDOT in further developing the Project and the procurement process. We cherish our ongoing partnership with NCDOT and the North Carolina's communities and look forward to continuing to strive to improve the mobility across the State.

Cintra and Ferrovial Construction are each independent subsidiaries of the same parent company, Ferrovial S.A., which is one of the world's leading companies dedicated to infrastructure investment, development, design, construction, operations, and maintenance. Cintra has access to the resources of Ferrovial S.A., including approximately $5.8 billion in cash and cash equivalents as of December 2021, evidencing our financial strength.

Cintra is widely acknowledged to be one of the most successful developers of transportation infrastructure in North America, having closed over $21 billion worth of public private partnership projects since 2005. Cintra currently owns a major equity position in 21 roadway concessions representing over $21 billion of direct private investment worldwide. These project developer concession companies operate more than 900 miles of roadway globally, with nearly 2,000 lane-miles in North American and over 1,033 lane-miles of revenue risk P3 Projects in the U.S.

Ferrovial Construction is one of the world's largest construction firms specializing in complex civil and transportation infrastructure with more than 90 years of experience. In the last 12 years, Ferrovial Construction has been awarded 11 major design-build contracts in the U.S. totaling more than $10.6 billion in construction value. Ferrovial Construction also has ample resources, including a $6.8 billion bonding capacity. With a focus on excellence, Ferrovial Construction and its projects have received numerous awards for safety, environmental stewardship, public relations, Disadvantaged Business Enterprise (DBE) participation and design and construction.

Together, Cintra's and Ferrovial Construction's project subsidiaries have delivered numerous roadway projects throughout the world through public-private partnership models. Because of our vertical integration capable of managing the entire lifecycle of roadway assets (including financing, design, construction, operations and lifecycle maintenance), we have been able to coordinate with our project subsidiaries and local partners in the delivery of projects for the benefit of the travelling public with value-generating innovations that increase project feasibility and reduce the need for public funds while providing those benefits faster than traditional delivery methods. For example, on our I-66 Express project in northern Virginia, by enhancing the value-creating potential of managed lanes, Cintra and Ferrovial Construction were able to propose a solution that included a $571 million concession fee paid to the

Virginia Department of Transportation (VDOT)—representing a value of over $1 billion when compared to VDOT's estimates for public funds needed with a traditional delivery model.

The information contained in our response is based on and limited by our preliminary review of the RFI and Feasibility Study made available by the Wilmington Urban Area Metropolitan Planning Organization and our experience. As more details about the purpose, need and requirements of the project are developed, the conclusions of our preliminary review could change.

If you need any additional information, please do not hesitate to contact us. We would be pleased to meet with NCDOT and its representatives to answer any questions regarding our responses, as well as to provide any additional feedback, information or materials that may assist NCDOT in its decision-making.

Best Regards,

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RESPONSE TO REQUEST FOR INFORMATION

The Cape Fear Memorial Bridge replacement project presents an opportunity for the North Carolina Department of Transportation (NCDOT) and the Wilmington region to provide a safer and more reliable travel option that enhances mobility in the area. However, as noted in the RFI, the Project is neither included in the STIP, nor has any specific funding allotment. While many of the Project's details will need to be defined, we believe that it could be possible to deliver the project through a revenue-risk public-private partnership (P3). No procurement or contractual model would be without its unique obstacles, but **we believe a revenue-risk P3 has the potential to accelerate delivery of this project with performance-driven innovations and less reliance on public funds, by establishing an optimal set of incentives and risk-allocation that maximize value creation and project feasibility**.

Buildability Concepts

Buildability of any structure is driven by access, work restrictions, and commonality of items used. With a new alignment offset to the south, accessibility would be relatively easy. The east approach would require minor right of way acquisition with an ability to support adequate laydown yards and staging areas. The majority of the west approach is an identified wetland where work would be required to be performed from a temporary trestle. Laydown and staging areas on the west approach are limited to industrial waterfront properties. Each approach is well supported by industrial level infrastructure making supply, trucking, and material delivery routes reliable and efficient.

With an offset alignment, most work can be performed without significant impacts to the traveling public, with minor impacts due to tie in work. Without traffic restrictions, construction could be completed during daylight hours reducing the need for night shifts and lane closures. The only perceived work restrictions will be due to the need to maintain maritime traffic in the main channel. Passage under the Cape Fear Memorial Bridge is the only way for marine traffic access areas north of the bridge and would require coordination with the Coast Guard, Harbor Master, and marine traffic. The critical nature of the channel will reduce the number of channel closures allowed making scheduling allowed closures important.

Commonality of items used will be driven by the type of bridge that is selected. A fixed structure with a 65' vertical clearance would be a very common structure where most local contractors have experience in performing the work. With a larger vertical clearance of 135' complexity of construction increases as larger cranes are necessary and setting of a larger main span would require a complex lift or complicated staging work. Shifting to a moveable structure would add even more complexity. Millwrights specialized in large gearing would be required for installation, balancing and alignment of machinery. A moveable span will have to be fabricated off site and floated into place contending with a tidal change of 4-5-feet.

Navigation in the Cape Fear River is currently limited by the existing structure to a vertical clearance of 135 ft, a horizontal clearance of 349.7 ft, with a projected channel depth of 32'. Inland of the Cape Fear Bridge where the Cape Fear River and Northeast Cape Fear River split, the Cape Fear river is limited in navigation by the US-74 bridge to a vertical clearance of 54-ft and horizontal clearance of 119.8 ft making the Northeast Cape Fear River the primary channel. The most inland turning basin is just north of the Northeast Cape Fear River split. This would be the limiting factor for longer vessels in their ability to maneuver and turn around. A projected channel depth of 32' extends inland beyond the Isabel Holmes Bridge.

North of the Cape Fear Memorial Bridge, the eastern side of the river has a developed waterfront for recreational use with a series of wharfs, piers, and marinas. The western side is primarily undeveloped with identified wetlands along the water's edge to the river split. North of the split there are waterfront properties with deep water access that are zoned industrial. Navigation restrictions caused by construction of a new structure will shape the way property inland of the Cape Fear Memorial bridge will be used and developed in the future.

Alternative Financing and Operations and Maintenance Models

The replacement of the Cape Fear Memorial Bridge also presents an opportunity for NCDOT to look at alternative financing and long-term operations and maintenance solutions. The consideration of alternative financing and operations and maintenance models go hand-in-hand as the term for financing should roughly align with the operations and maintenance term. Generally, alternative models would enable NCDOT to leverage the capabilities, experience and resources of the private sector and enable the optimization of capital and operating costs over the life of the replacement bridge compared to traditional design-bid-build procurement. By deploying an efficient risk allocation with the private sector, NCDOT can be more certain in the long-term costs of the replacement bridge as it would have assurances from a private partner regarding the quality of not only the initial construction, but also of the ongoing operations and maintenance costs as well as customer service driven by a robust set of KPI's.

Alternative Financing Models

Alternative financing models are underpinned by the future cashflows a private or government enterprise could expect. Generally, these cashflows are meant to repay equity and debt for the capital cost of the bridge and ongoing operations and maintenance. These future cashflows fall into two broad categories based on the type of risk that the private partner or government enterprise would take. These are availability payments and toll revenues.

- Availability payments would be predefined payments to the development partner based on projected costs. They are payments for making the infrastructure available to the public and often include deductions for poor performance. This would more effectively amortize the cost of the bridge over a longer term and could potentially reduce negative impacts of carrying such debt on NCDOT's own balance sheets (if allowed) but is subject to adequate regular appropriations from the legislature. Furthermore, because availability payments are predefined there is little potential for financial gain for overperformance and little incentive for a development partner to improve asset performance and could lead developers to simply seek cost savings without improved performance.
- Toll revenue is another potential source of future cashflows. In this model, the development partner would be enabled to collect and retain most of or a portion of tolls that are collected. While this would incentivize a development partner to improve performance of the asset, including efforts to optimize mobility, it is not clear at this time that traffic on the Cape Fear Memorial Bridge would be adequate to cover capital expenditures and ongoing operations and maintenance. Certainly, if tolls were only collected on the Cape Fear Memorial Bridge, the Wilmington area would see some traffic diverted north to the Isabel Holmes Bridge, further reducing the ability of toll revenues to cover debt and operating costs.

There are also future cashflow arrangements that are a hybrid of availability payments and toll revenues, such as toll revenue combined with a Debt Service Reserve Account (DRAM) from NCDOT for the initial portion of the term. If traffic levels are adequate this would still incentivize the development partner to improve overall performance and mobility but would also have a "backstop" of cashflows from NCDOT that would be viewed favorably by lenders and development partners, resulting in a more efficient financing structure. Another hybrid arrangement could be shadow tolling, where the development partner would be paid based on the number of vehicles using the bridge, but the drivers do not pay the fee themselves. This would incentivize the development partner to increase performance without having the issues of toll diversions. This could be another solution where toll revenues alone would be insufficient to cover debt and operating costs due to relatively low volumes, while also avoiding tolling enforcement by the private partner.

Alternative Operations and Maintenance Models

Alternative operations and maintenance models can be viewed on a scale from design-bid-build procurements where NCDOT retains all responsibilities for financing, operations and maintenance, to a Design-Build-Finance-Operate-Maintain (DBFOM) model where all operations and maintenance are the responsibility of a development partner. With a traditional design-bid-build or design-build procurement NCDOT would retain the risks and costs associated with the long-term operations and maintenance of the replacement bridge. While this could fit into NCDOT's normal operations, NCDOT would still be exposed to inflation of costs of materials and labor.

A design-build-finance procurement model would charge a development partner with the design and construction of the replacement bridge with a fixed price with a short maintenance period (generally 5 years or less). Because the maintenance period is short, there generally are not any major maintenance interventions in this time and the maintenance period acts more like an extended construction warranty. While this can have some benefits due to NCDOT having a period where the asset proves itself in real conditions, NCDOT would not benefit from the consideration of long-term maintenance costs nor the lifecycle optimizations that DBFOM structures offer.

A design-build-finance-maintain model is one in which a development partner would design, construct and maintain the replacement bridge for a long period. This model works well with availability payments (discussed above). NCDOT would reap the benefits of the integration of long-term maintenance costs and risks while also placing those risks with the private sector. This is an ideal solution where NCDOT would like to maintain control over operations, such as bridge lifting/opening and tolling, or where routine maintenance (mowing, graffiti removal, motorist assistance) is smaller in scale and localized (as with a bridge). While NCDOT will benefit from long-term savings in maintenance and capital costs, it does not leave much opportunity for the development partner to increase performance through operations.

In addition to the advantages of the other models discussed above, a DBFOM model would also allocate the scope and risks, including lift operations, tolling, and the full scope (or partial, depending on NCDOT's appetite) of daily routine maintenance to the development partner. Contractual terms can define acceptable operations parameters (e.g. when/how often to lift the bridge), while also creating incentives for the development partner to increase performance and ensures excellent customer service. To ensure this is efficient for is that if the routine operations are a small scope the development partner would have difficulty achieving the economies of scale that NCDOT's own local operations could achieve.

Predevelopment Agreements (PDA's) where the private developers compete for the Pre-development work without providing a firm commitment during the procurement for the entire scope (DBFOM or similar) result in destruction of value for the State as well as do not capture lifecycle optimizations or benchmarks from similar Projects. Private developers are incentivized to compete in terms that do not align with the ultimate customer needs and are inferior when seeking feasibility of a project, therefore these procurement methods are not adequate for the Project.

Project Viability

This section looks at the pros and cons of the different options for vertical and horizontal alignment presented in the Cape Fear Memorial Bridge Replacement Feasibility Study (May 2020) and also different contracting and procurement models. Until the requirements of the replacement bridge are determined (e.g. vertical clearances for port/marine traffic) it will be challenging to determine or justify one particular option over another, however, we have include some concepts for improving pedestrian access and financial viability through tolling for NCDOT's consideration.

Technical

The technical feasibility study considers four options, each with specific technical challenges:

Option 1 – Fixed Structure (65' Vertical Clearance): is simplest for construction/operation, and in terms for accessibility for road vehicles and pedestrians, however, it will present challenges for river navigation.

- Accessibility: option 1 retains the existing bridge elevation and its relative flat approach grades, benefitting both vehicle and pedestrian access.
  A possible variant to this option includes **retaining the existing bridge for** pedestrian and bicycle crossing. With a much broader cross section and separation to traffic, this can become a tourist attraction on its own.
- River Navigation: the relatively low vertical clearance will require extensive coordination with upstream stakeholders including Kinder Morgan, Marine Mechanix at N Terminal Rd., Louisiana-Pacific Corporation, Colonial Materials and Stepan Company. It is imperative that the proposed construction does not hinder economic development.

- Construction: The commonality of option 1 leads to the simplest constructability option with the use of traditional methods. Cranes would be reasonably sized with foundations and construction methods being of common traditional method that are readily available. Marine impacts would be minimal and easy to coordinate with marine traffic. Water access is supported by multiple wharfs in the area providing convenient barge, tug, and material staging.
- Operation: eliminating the movable structure and low grade helps operation.
- Environmental Approvals: option 1 retains the existing profile and visual impact.

Option 2 – Fixed Structure (135' Vertical Clearance): the increased vertical clearance will result in increased visual impacts and more vertical grades at both approaches.

- Accessibility: option 2 increases the bridge elevation by 70', resulting in considerable grades on the East approach (7-7.5%) resulting in lower speed and higher noise, as well as the inability to meet ADA requirements. However, there are several opportunities to reduce these grades including:
  - Reduced structural depth: this can be achieved with a Bow String type of structure.
  - Provision of access from S 5th Street in lieu of S 3rd Street and reconfiguring S Front Street and associated ramps to cater for the higher bridge elevation.
- River Navigation: whereas 135' vertical clearance matches the existing vertical clearance with the bridge in a lifted position, consultation during the NEPA process will ensure this meets current and future needs, maximizing economic potential in the region.
- Construction: the higher elevation would require larger, specialized barge-mounted cranes and specialized laydown yards and staging areas. Larger laydown yards with water access would be required for prepping and staging. On the east shore additional temporary trestle work would be necessary to install bridge components along the west approach to reduce wetland impacts. Main span installation could be performed using a cantilever method or using the 4–5-foot tide change and floating the structure into place.
- Operation: eliminating the movable structure helps operation.
- Environmental Approvals: increased visual and noise impacts.

Option 3 – Movable Structure (65' Vertical Clearance): option 3 addresses riverine navigation at significant expense both in CAPEX and maintenance costs. Additionally, a portion of the reliability is lost as the facility will not be operational when the movable bridge is lifted.

- Accessibility: option 3 retains the existing bridge elevation and its relative flat approach grades, benefitting both vehicle and pedestrian access.
- River Navigation: similar to Option 2, but with the need to request bridge lifting for passage. Whereas 135' vertical clearance matches the existing, consultation during the NEPA process will ensure this meets current and future needs, maximizing economic potential in the region.
- Construction: a moveable structure reduces the number of options to source key elements for the bridge, increasing material supply logistics and lead time. Many items cannot be fabricated in North Carolina and would require offsite inspection and coordination. On-water crane access would require specialized cranes as additional headroom would most likely be required. The main span component would have to be floated into place using the tide creating an extended marine impact lasting multiple day, with additional impacts to follow for mechanical alignment and testing.
- Operation: operation will have to consider the addition of the movable bridge.
- Environmental Approvals: option 3 retains the existing profile and visual impact.

Option 4 – Movable Structure (65' Vertical Clearance) with RR Relocation: similar to option 3, the addition of the railroad relocation introduces additional visual impacts and railroad coordination. Early coordination as part of the NEPA process should facilitate implementation without challenging feasibility but this option would add risk and complexity.

- Accessibility: consideration should be made to vertical grades that may prevent the railroad from reaching a minimum 65' vertical clearance. As a result, available vertical clearance may be lower than 65'.
- River Navigation: if the railroad vertical clearance is lower than 65', consideration may be given to keeping the span open except when railroad traffic takes place, similar to existing upstream bridges.
- Construction: construction of a railroad bridge separate from the vehicular structure would be straight forward as long as alignments share a construction easement. With an existing connection in service it would be expected that railroad outages would not be necessary, and the railroad connection would be made after construction of the vehicle structure. Using a minimal vertical clearance adjacent to an already established construction easement, construction should be simple and straight forward.
- Operation: operation will have to consider the addition of the movable bridge.
- Environmental Approvals: option 4 retains the existing profile and visual impact.

Environmental

Finalizing the western footprint to ensure wetland impacts are minimized and avoided as much as possible will be the first thing coordinated with the USACE and USCG. This area will have a significant impact to WOTUS that will have permit implications, most likely an individual permit that will be unavoidable in this project. Therefore, early coordination with all approving agencies for impacts to discuss design, construction approaches and avoidance and minimization strategies is key to the permitting aspect for this project. Early communications with adjacent property owners will be the best approach to ensuring that obtaining the CAMA permit goes smoothly. Aside from mitigation credits and compensation, NCDOT can suggest to the USACE a constructed wetland offsite as a form of mitigation to preserve the natural ecosystem. Keeping the new bridge at the elevation of 65ft would reduce the visual and noise environmental impacts. Fortunately, the eastern side will not impact historic buildings and therefore Section 106 should be easy to obtain. If the existing bridge is to be removed, then construction methodologies would include rubblization of the pavement to the limits of the bridge deck so that it can be reused as subgrade for road segments, construction entrances, etc. This lowers overall carbon footprint by reducing transportation of excess material. Hydrodemolition can be used in the process of demolition to lower the noise and dust impacts. If approved by NCDOT, construction can source the water from the river to be used which would also lower transportation pollution.

Leaving the existing bridge along with Option 1 can help create many environmental advantages while minimizing the environmental risk. Converting the existing bridge to pedestrian and cyclist use alternatives will create more positive support from the public and completely avoid the concern of bridge demolition that can potentially affect water quality and aquatic wildlife. The existing top layer of bridge will need to be transformed, creating many opportunities through green alternatives such as Plastic Roads as a substitute for asphalt or concrete. Kinetic tiles, solar panel tiles and windmills can all be installed to generate the electricity for the lighting along the bridge and bridge replacement for vehicle use as well as any other necessary needs. This concept is similar to the Highline in New York City or Harbor Drive in Portland, OR and is a popular choice among daily stakeholders. This will also benefit the USS North Carolina Battleship Museum, in creating a more pedestrian-accessible route. By repurposing the existing bridge for pedestrian use, NCDOT can reduce the visual impacts by obscuring the new bridge since there is a high chance both old and new bridges will be at the same profile. For future projects, the existing bridge can be reused as the Railroad extension from coast to coast. This will avoid future need of railroad construction in this area. Further studies will need to be done to ensure the existing bridge can withstand the railroad loads and specification requirements.

Engineering

Each of the four options under consideration present unique challenges to permitting, financing, design, construction and operations. What follows outlines engineering solutions to these challenges and offer insight as to our choice of the option best suited for the project:

Pedestrian/Bike Accessibility: pedestrian use is beneficial in multiple ways as it will not only help increase the area's vitality but also will likely increase local support for the project. It is desirable to keep the vertical gradient low to enhance the user experience and maximize these benefits. To this end, we recommend gradients be kept as low as possible. Vertical gradients can be kept low through a combination of methods including:

- Reduced structural depth: there are several alternatives to reduce structural depth below deck, while enhancing bridge aesthetics. These include bowstring and extradosed bridges

- Provision of access from S 5th Street in lieu of S 3rd Street and reconfiguring S Front Street and associated ramps to cater for a higher bridge elevation.
- Separate approaches for pedestrian/bicycles.

Visual Impact: reconstructing the bridge at a higher elevation will increase its visual impact. This, however, can be improved through the provision of a signature bridge at a low premium relative to a conventional bridge. Typologies include bowstring and extradosed but both solutions are costly and technically complex.

Noise Impact: a higher vertical grade will result in increased noise levels. These can be minimized through the use of noise barriers attached to the structure. Transparent noise walls can be proposed to enhance aesthetics.

Environmental Impacts and Permitting: early coordination with USACE and USCG should be considered in the project schedule to help ensure a smooth approval process for necessary permits and avoid any delays. This will also strengthen communications to encourage agreement on final design and construction approach to avoid or minimize impacts.

River Navigation: NCDOT has provided options to facilitate navigability including increased vertical clearance and movable bridges. Several options for the latter are available however, they all involve considerable additional capital and operating costs. We consider these solutions will be detrimental to project feasibility as they will increase the potential toll and decrease appeal.

Bridge Typology: To maximize the vertical clearance over the navigation channel, two main possibilities are proposed at this stage: a bowstring arch or an extradosed bridge. A cable stayed bridge could also be considered in lieu of an extradosed bridge if additional reduction in structural depth is required.

- The bowstring arch, as the compression thrust is balanced by tension in the deck, can be built in a nearby location, such as on the banks of the river, and floated and lifted to its final position. From a technical perspective, this typology could be used both in fixed and movable options.
- The extradosed/cable-stayed option can be erected using the cantilever method. In this case, this typology is only compatible with a fixed span.

Other possibilities, such as a concrete balanced cantilever bridge, are feasible from the constructability point of view, but the bigger structural depth required under the deck might encroach into the required vertical clearance for navigation.

Maintenance of Traffic: construction of options 1, 3 and 4 can be implemented with limited effects to existing traffic due to the offset alignment and limited elevation differential, however, option 2 requires additional engineering to ensure service continuity:

- Proposed S 5th Street ramps can be constructed while keeping S 3rd street ramps operational.
- S Front Street can be reconfigured with ramps at a higher elevation while keeping the street and railroads operational.

Right of way: coordination with Colonial Oil Industries.

Stakeholder Coordination: extensive coordination with the project stakeholders as part of the early planning activities and every subsequent stage will be key to ensure their requirements are understood and implemented as much as possible. Key stakeholders include the City of Wilmington, USACE, USCG, MFC, WRC, NCDEQ, FEMA, area businesses and resident associations. Each should be engaged early and regularly including public information sessions.

Connecting Facilities: extensive coordination with the city of Wilmington with respect to the proposed S Front Street widening to coordinate timing, maximize compatibility, and limit throw-away work.

Legal

Traditional: Traditional delivery of a replacement bridge with give more control over the final design, operations and maintenance of the facility to the North Carolina Department of Transportation but would come at the cost of increased risks to the Department. In a traditional design-bid-build procurement, the Department would have any risk in the insufficiency of any designs and would be required to cover the cost of any change orders during construction. The Department would also be responsible for ongoing operations and maintenance of the replacement bridge, which may not have been fully considered to optimize lifecycle costs during design.

A design-build approach would alleviate some of these risks, placing them with the private sector, but a design-build procurement would still not fully optimize the lifecycle costs as it would generally exclude value engineering considerations from the operations and maintenance of the bridge.

Conventional Toll: Procuring the project as a conventional toll project would include many of the same legal risks as the traditional procurement methods but could facilitate the project being delivered sooner as it would not have to compete with other projects in the STIP planning process. However, it should be noted that that the Isabel Holmes bridge is less than two miles away and tolling on the Cape Fear Memorial Bridge could see significant traffic diversion to that bridge to the north. This is discussed more in the section on financial viability, below.

Alternative: Alternative delivery options include Public-Private Partnership options including DBFM and DBFOM. These options significantly shift the risk allocation for the overall project to the private sector and guarantee the

performance of the bridge in both financial and technical operations. In P3 contracts more control, as well as the associated risks, are transferred to the private sector to manage for a set period of time, usually 30-50 years. Because the entire lifecycle of the bridge would be the responsibility of the development entity during that term, lifecycle considerations, including maintenance and operation of the bridge, are considered from the outset of designing the bridge. This results in a bridge that is more financially viable, provides a better experience for motorists, and reduces the strain on NCDOT's limited resources. The developer of DBFM and DBFOM P3s could be remunerated through an availability payment, a fixed or defined regular payments from NCDOT, or by taking revenue risk if the project ultimately includes the implementation of tolls sufficient to cover the capital costs of construction and ongoing operations and maintenance. We believe that a traffic risk structure generates the strongest incentives to expedite delivery, provide excellent customer service and deploy lifecycle optimizations that maximize value for money and affordability.

Financial

Traditional: Traditional delivery of a replacement bridge would follow a pay as you go regime. Capital costs of construction would be covered by NCDOT during the construction period, and ongoing operations and maintenance costs would be paid as incurred. This could reduce financing costs but does not realize any inflationary gains over the life of the bridge and requires the project to compete against other priorities in the STIP, potentially delaying implementation for years or decades while undergoing maintenance interventions that erode value for money.

Conventional Toll: A conventional toll project could potentially reduce the fiscal strain of replacing the bridge, however, if toll revenues are not projected to cover the costs of construction, NCDOT would likely be required to make pledges of its revenue from the legislature to cover potential shortfalls. NCDOT would also be required to adequately maintain the bridge to avoid excess traffic diversion which could further diminish the advantages of using tolling. Furthermore, the Isabell Holmes bridge is less than two miles away from the Cape Fear Memorial Bridge. This proximity would have a significant impact on driver behavior and diversion of traffic to the toll-free alternative, limiting the ability of NCDOT to use tolling to fully cover the costs of the Cape Fear Memorial Bridge replacement.

While it is noted that NCDOT does not support or intend to toll alternate routes to fund the replacement of the Cape Fear Memorial Bridge, bundling a replacement of both the Cape Fear Memorial Bridge and the Isabel Holmes Bridge into one procurement and tolling both could be an option to avoid the traffic diversion problem and threats to Project feasibility should the replacement bridge be tolled. NCDOT would have to carefully consider this approach and whether I-140 is considered a toll-free alternative for crossing the Cape Fear River in accordance with NCDOT's Toll Project Development Policy.

Alternative: Alternative procurement models can ensure the financial viability of the replacement bridge through tailored remuneration to the development partner. Discussed more fully above, the revenue of a development partner could be based on availability payments, toll revenue, or a hybrid model. The main advantage of using alternative procurement models in the financing of a project is that the payments or value captured is spread over a longer term more aligned with the useful life of the replacement bridge, while potentially allowing NCDOT or the state of North Carolina not to carry the additional debt on their balance sheets. Due to transaction costs, this advantage has a more pronounced effect when the replacement costs of the bridge are higher, but transaction costs in an alternative procurement wouldn't necessarily be higher than if financing was backed with a conventional tolling model and an experienced partner is chosen to structure and develop the P3.

In both conventional tolling models and alternative financing models where project cashflows are supported by tolling, consideration should be made for keeping the railroad component included in replacement option 4 optional and/or contingent on a financial plan separate from that of the roadway tolling. We believe such an approach will decouple the funding responsibility from the roadway users and reduce political risk.