FINAL REPORT

NEW RIVER CROSSING

Assessment of Alternatives Enabling Commuter Rail to Cross the New River on the FEC Corridor

August 17, 2023

CITY OF FORT LAUDERDALE FLORIDA | BROWARD COUNTY FLORIDA

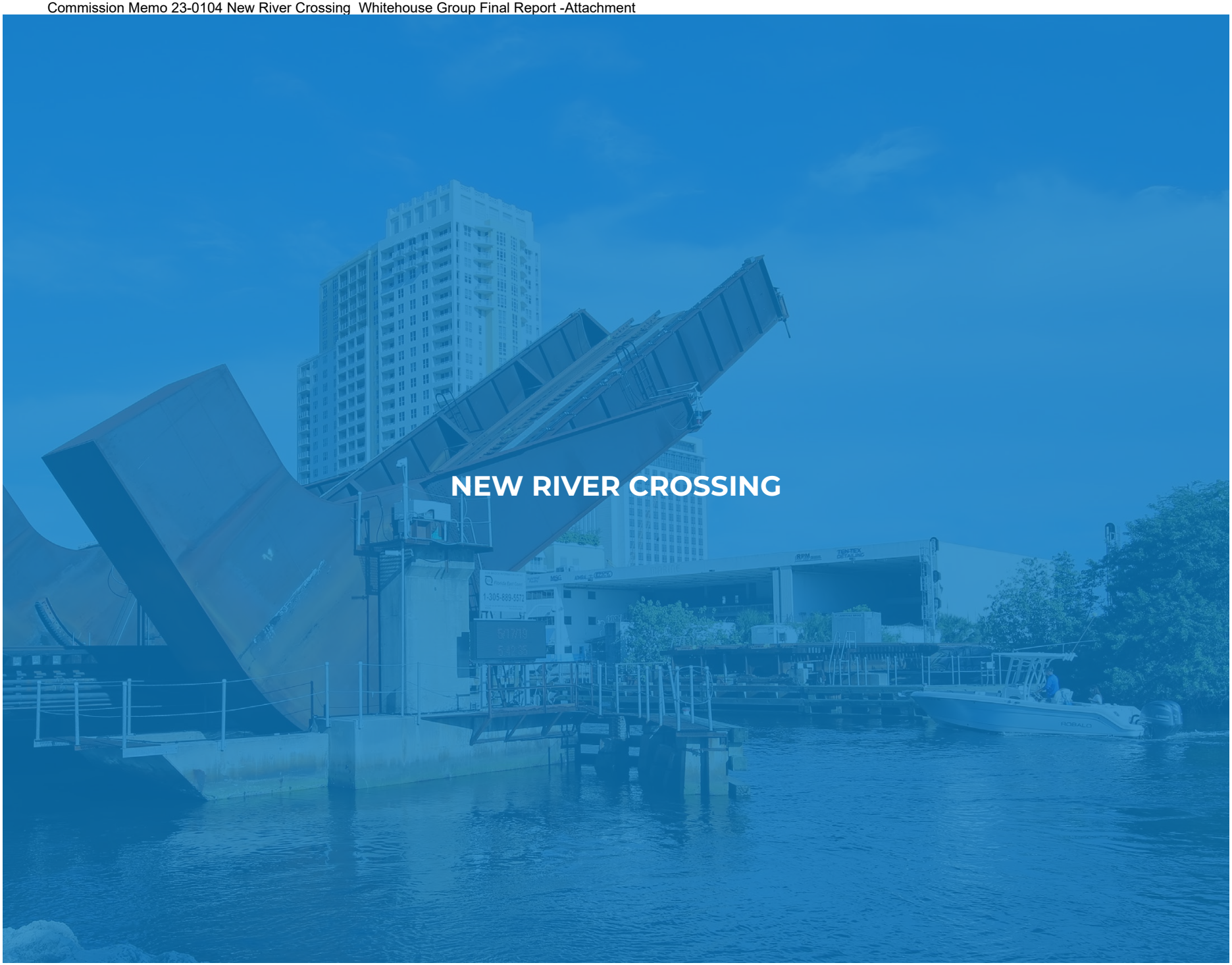
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TABLE OF CONTENTS

CONTEXT Page 1
Commuter rail requires a new crossing of the New River; options have been studied since 2020.

SCOPE Page 2
This study assesses existing information on the four alternatives so that the City and County commissions can make informed decisions on next steps.

ALTERNATIVES Page 3
FDOT developed four technically feasible options for crossing the New River.

PERSPECTIVES Page 4
Current freight and passenger rail operators reported serious concerns about construction and long-term disruptions to their businesses.

CAPITAL COSTS Page 5
Capital (construction) costs for each alternative generally align with the initial FDOT estimates, with inflation increasing the price each year.

OPERATING COST Page 6
Moveable bridges cost more to operate than fixed bridges; tunnels are more costly to maintain and operate.

FUNDING Page 7
State, federal, and local options are available to help fund a selected alternative; each has strings attached.

NEPA Page 8
Pursuing federal funding means complying with National Environmental Policy Act (NEPA) requirements, which can take several years.

SUMMARY Page 10
Complexity adds time and costs; there is much work to do to fully analyze and address the many complexities and set the stage for a successful project.

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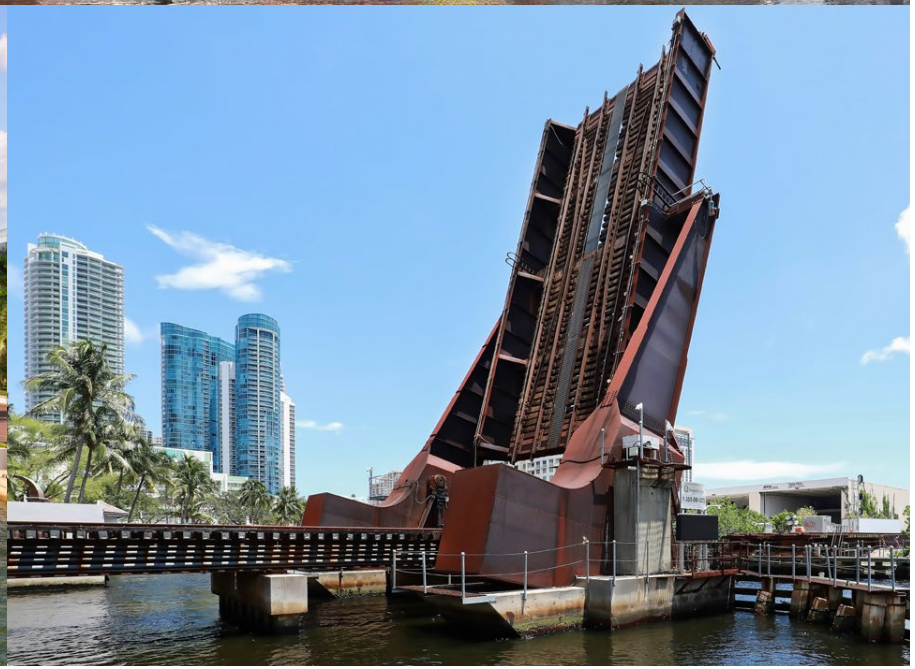


CONTEXT

Commuter rail requires a new crossing of the New River; options have been studied since 2020.

Need for a New Crossing

The Premium Mobility Plan (PREMO) proposes adding commuter rail service on a 27-mile route through Broward County along the already congested Florida East Coast Railway (FEC) freight rail corridor.

The segment south of Fort Lauderdale (BCR-South) advanced into Project Development in December 2022, making it eligible to compete for federal funding.

The potential extension of commuter rail along the corridor is more complex due to the need to cross the New River in downtown Fort Lauderdale. The existing FEC bridge creates a bottleneck for rail and marine traffic with the addition of some 60 daily commuter trains. A new crossing is needed to carry passenger trains across the New River.

Milestones

1890s–1968 — Passenger rail service operates on the FEC corridor.

January 2014 — FDOT begins Tri-Rail Coastal Link PD&E study.

January 2020 — FDOT prepares New River Crossing Feasibility Technical Memorandum identifying four alternatives (three types of bridges and a tunnel).

January 2021 — Broward County and Florida Department of Transportation (FDOT) execute a Memorandum of Understanding (MOU) to study commuter rail on FEC within Broward County.

January 2021 — FDOT initiates Broward Commuter Rail PD&E study.

December 2022 — BCR-South approved for Project Development within the federal Small Starts Program

February 2022 — City of Fort Lauderdale and Broward County approve a joint study to assess the four alternatives (this study).

SCOPE

This study assesses existing information on the four alternatives so that the City and County commissions can make informed decisions on next steps.

City & County Collaboration

The City of Fort Lauderdale and Broward County are working together to examine four alternatives developed by FDOT for the proposed passenger rail crossing of the New River within the FEC corridor—three bridge alternatives and one tunnel option.

The intent is to understand the pros and cons of each alternative so that the commissions can hold meaningful discussions and ultimately agree upon a course of action.

Interlocal Agreement

Toward that end, the City and County commissions approved an interlocal agreement (ILA) to study the four alternatives. The City of Fort Lauderdale Commission approved the ILA on February 17, 2023, and the Broward County Commission approved it on March 2, 2023.

Scope of Work

Per the ILA, upon approval by its Board, the Broward Metropolitan Planning Organization (MPO) selected a consultant team from its general planning contracts to work directly under the project managers selected by and representing the City of Fort Lauderdale and Broward County. The scope of work encompassed seven tasks centered on providing the commissions with comprehensive information to support a decision-making process on the next steps, if any, of project development.

Tasks 1 through 6 each culminated in a technical memorandum (click corresponding task number to view), providing in-depth information for the technical staff of the City and County. **Task 7 compiled and summarized the findings into this final report and the companion presentation (click Task 7 to view)**, geared toward high-level decision-makers (the City and County commissioners).

TASK 1	**Conduct Project Overview to Examine Existing Studies and Information**
TASK 2	**Engage Rail Operators (Brightline and FEC)**
TASK 3	**Estimate Capital Costs and Construction Impacts for the Four Alternatives**
TASK 4	**Analyze Operations and Maintenance Costs for the Four Alternatives**
TASK 5	**Identify Grant Opportunities for the Four Alternatives and Probabilities of Success**
TASK 6	**Assess Required Environmental Reviews and Potential Schedules**
TASK 7	**Summarize Findings in Final Report and Presentations to Commissions**

Per the scope, the consultant team compiled and assessed information, but did not analyze or recommend alternatives.

Technical Materials Reviewed for this Assessment

Technical Memorandum: New River Crossing Feasibility, FDOT, The Corradino Group, HDR (January 2020)

Subsurface Exploration Report No. J 21116.001, City of Fort Lauderdale, Quest Engineering (August 2021)

Memorandum – Summary of Initial Draft Capital Cost and Operations & Maintenance (O&M) Costs, FDOT, (November 2021)

New River Crossing Workshop (Presentation November 2021)

Initial Draft Opinion of Probable Construction Cost Estimate v1.0, New River Tunnel Alternative, FDOT, HDR (December 2021)

Broward Commuter Rail Alternatives Public Workshop (January 2022)

General Findings of the New River Rail Crossing, The Lochner/LBA Partnership (March 2023)

L4 Summary for NCR Alternatives (March 2023)

Technical Memorandum: New River Crossing Alternatives, FDOT, HDR (March 2023)

New River Crossing Eight Alternatives Draft Memo, Corradino Group, HDR (March 2023)

ALTERNATIVES

FDOT developed four technically feasible options for crossing the New River.

ALTERNATIVE 1
LOW-LEVEL
BASCULE BRIDGE

- New two-track single-leaf bascule bridge (drawbridge) immediately west of the existing FEC bridge.
- Steel superstructure, concrete substructure.
- **25 feet** of vertical clearance over river (accommodates **90%** of marine traffic).
- **1.1 mile** project with approaches.
- 500 feet of retaining walls along the approaches.
- 5,457 feet (1 mile) of total track improvement.
- Existing freight tracks and freight bridge would be moved east within the FEC ROW to reduce total impacts.*

ALTERNATIVE 2
MID-LEVEL
BASCULE BRIDGE

- New two-track single-leaf bascule bridge (drawbridge) immediately west of the existing FEC bridge.
- Steel superstructure, concrete substructure.
- **56.6 feet** of vertical clearance over river (accommodates **99%** of marine traffic).
- **2.5 mile** project with approaches.
- 1,000 feet of elevated platform to serve Brightline and BCR.
- 500 to 800 feet of retaining walls along the approaches.
- 14,744 feet (2.8 miles) of total track improvement.
- Existing freight tracks and freight bridge would be moved east within the FEC ROW to reduce total impacts.*

ALTERNATIVE 3
HIGH-LEVEL
FIXED-SPAN BRIDGE

- New two-track concrete bridge with no moving parts immediately west of the existing FEC bridge.
- **80 feet** of vertical clearance over river (accommodates **100%** of marine traffic).
- **2.5 mile** project with approaches.
- 1,000 feet of elevated platform to serve Brightline and BCR.
- 500 to 800 feet of retaining walls along the approaches.
- 14,744 feet (2.8 miles) of total track improvement.
- Existing freight tracks and freight bridge would be moved east within the FEC ROW to reduce total impacts.*

ALTERNATIVE 4
TUNNEL

- Twin-bore tunnel, from south of Sunrise Boulevard to south of SW 15th Street.
- Precast concrete segments.
- About 66 feet below the mean high-water level of New River.
- **3.5 mile** project with approaches, each tube approximately 30 feet in diameter.
- New underground station to serve Brightline and BCR.

**FEC opposes relocation of existing freight tracks and bridge due to disruption of rail operations. See "Perspectives," page 8.*

PERSPECTIVES

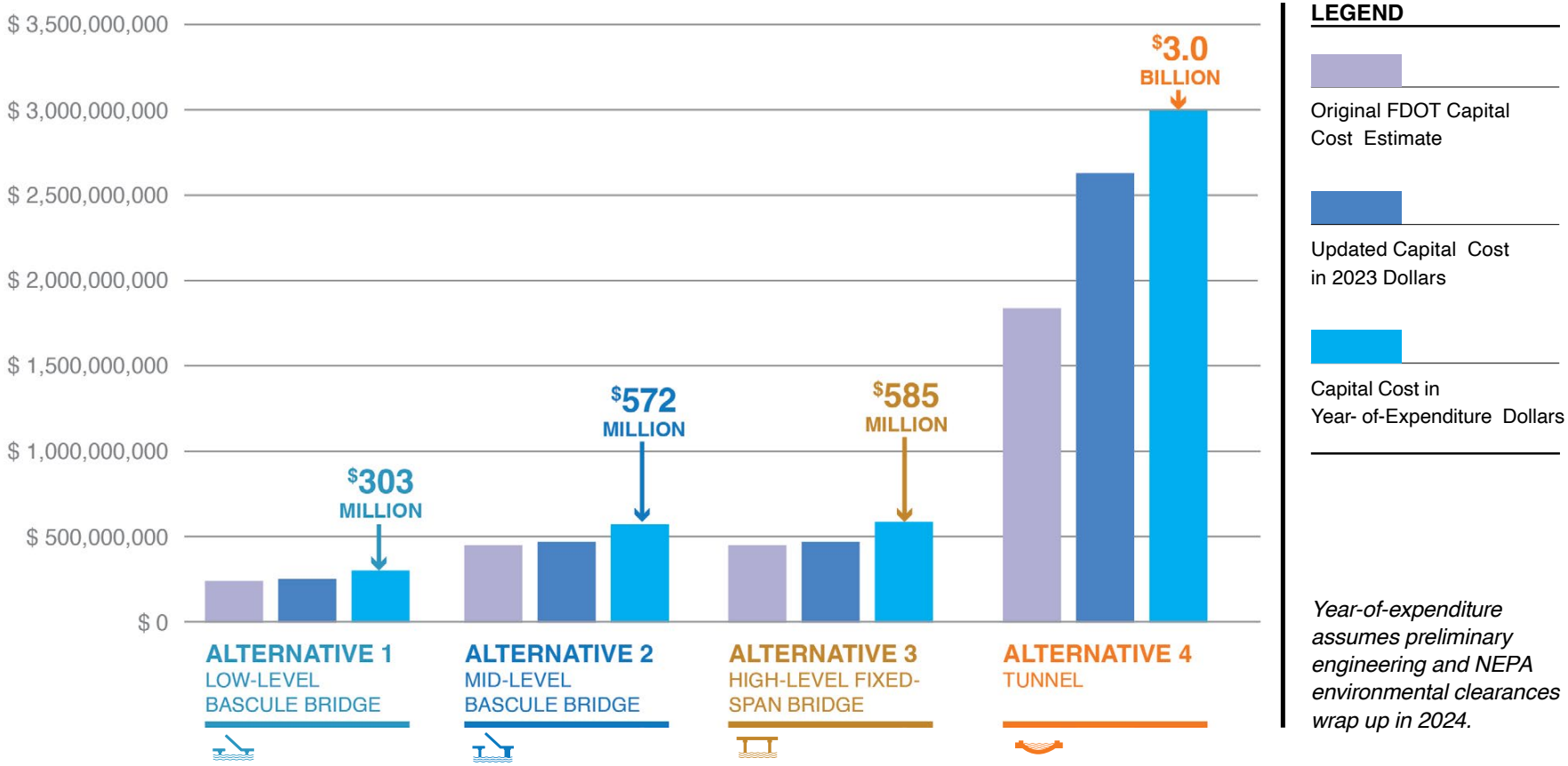
Current freight and passenger rail operators reported serious concerns about construction and long-term disruptions to their businesses.

The project team interviewed representatives of Brightline and FEC in the spring of 2023 to glean their insights on the four alternatives. Discussions covered operational impacts, preferred options, and ideas for minimizing impacts—including any other alternatives that would be more acceptable.

	PASSENGER RAIL PERSPECTIVE (BRIGHTLINE) 32-36 TRAINS PER DAY	**FREIGHT RAIL PERSPECTIVE (FEC)** 13-16 TRAINS PER DAY
ALTERNATIVE 1 LOW LEVEL BASCULE BRIDGE	• Not ideal – Presents operational issues and hinders marine traffic.	• No – FEC will not allow freight tracks and existing bridge to be shifted due to track outages.
ALTERNATIVE 2 MID LEVEL BASCULE BRIDGE	• Preferred alternative due to: - Accommodation of marine traffic - Least disruption to Brightline and FEC - Financial feasibility of construction and maintenance • Still have significant concerns about impact to station and ridership during and after construction.	• No – FEC will not allow freight tracks and existing bridge to be shifted due to track outages.
ALTERNATIVE 3 HIGH LEVEL FIXED SPAN BRIDGE	• Significant concerns about impact to station and ridership during and after construction.	• No – FEC will not allow freight tracks and existing bridge to be shifted due to track outages.
ALTERNATIVE 4 TUNNEL	• Not evaluated – Not financially feasible. • A cut-and-cover tunnel is not desirable for the passenger station because the station could be closed during the lengthy construction.	• Not advisable – Would conflict with an “astronomical” number of underground utilities in the FEC ROW.
OTHER ALTERNATIVES	• None discussed	• New tracks and bridges for passenger rail use could be constructed on either side of the freight line, instead of shifting the freight line east. • Or, FEC would allow construction of a new freight bridge, provided track outages are limited to 12 hours.
OTHER POINTS OF NOTE	• Consider potential long-term ridership losses from all construction alternatives (passengers shift travel habits during closures and not everyone returns).	• Existing freight bridge is subject to Coast Guard regulations limiting closures to navigation. • The alternatives are suitable for passenger rail only due to steep grades—freight trains can handle 1% grade max.

CAPITAL COSTS

Capital (construction) costs for each alternative generally align with the initial FDOT estimates, with inflation increasing the price each year.



Year-of-expenditure assumes preliminary engineering and NEPA environmental clearances wrap up in 2024.

This study assessed previous cost estimates for completeness and reasonableness. The team also identified several cost-saving opportunities and factors likely to increase costs. Highlights follow, with details in Tech Memo 3.

Top cost-saving opportunities

- Do not relocate FEC track and bridge.
- Flank FEC bridge with single-track bascules for passenger rail to minimize ROW requirements.
- Adjust construction staging to reduce operational conflicts.
- Purchase two refurbished tunnel boring machines instead of one new one to accelerate construction schedule.

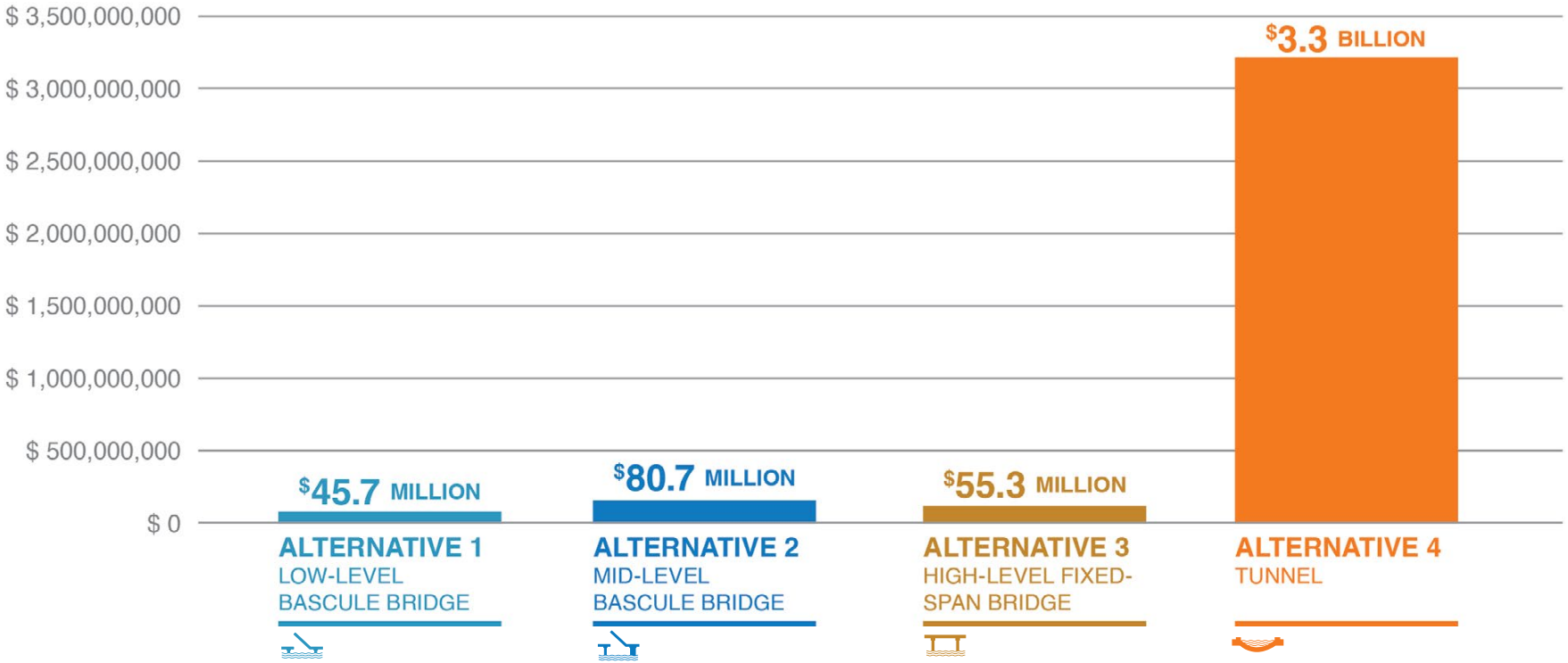
Major sources of cost escalation

- Price of structural concrete
- Price of structural steel
- 40% contingency for Tunnel

OPERATING COSTS

Moveable bridges cost more to operate than fixed bridges; tunnels are more costly to maintain and operate.

Estimated 50-Year Cumulative Operating and Cyclic Capital Costs



**Costs include track maintenance and are expressed in year-of-expenditure dollars, averaging a high-end and low-end estimate of expected costs.*

Average Annual Operations and Maintenance Costs

COST COMPARISON, $2023	ALTERNATIVE 1 LOW-LEVEL BASCULE BRIDGE	ALTERNATIVE 2 MID-LEVEL BASCULE BRIDGE	ALTERNATIVE 3 HIGH-LEVEL FIXED-SPAN BRIDGE	ALTERNATIVE 4 TUNNEL
AVG. ANNUAL O&M EXPENSE	$.3 MILLION	$.4 MILLION	$.3 MILLION	$4.6 MILLION
AVG. ANNUAL CYCLIC CAPITAL COST	$.2 MILLION	$.5 MILLION	$.4 MILLION	$20.6 MILLION

FUNDING

State, federal, and local options are available to help fund a selected alternative; each has strings attached.

Choice of Funding Approaches

Non-Federal — Form a partnership with FDOT and Broward County to fund the New River Crossing (NRC) at 50% each from state and local grants (eliminates costly federal requirements but reduces potential sources).

Federal FTA — Include the NRC as part of a potential extension of commuter rail for Federal Transit Administration (FTA) discretionary capital grants and pursue a 50% federal, 25% state, and 25% local funding mix.

Federal Non-FTA — Apply for a range of federal discretionary grants and cover what is not funded by the federal grants at 50% state and 50% local.

CAPITAL GRANT SOURCE	LEAD AGENCY	FUNDING LEVEL	NOTES
FDOT STATE/FEDERAL FORMULA FUNDS			
FDOT Statewide Transit/Rail Discretionary Programs	FDOT Central Office	Medium	Discuss approach—standalone or part of regional transit project
FDOT District Allocated	FDOT District 4	Medium	Likely partners with above grant options due to size of project
FEDERAL DISCRETIONARY GRANTS			
FTA Capital Investment Grants	FTA	High	Likely would need to be part of regional commuter rail
RAISE Grants	USDOT	Low	Highly competitive and limited to $25M per year
Federal/State Partnership for Intercity Passenger Rail	FRA	High	Intercity passenger rail is eligible
Consolidated Rail Infrastructure and Safety Improvements	FRA	Medium	Focused primarily on freight, but passenger rail is eligible
INFRA Grants	USDOT	Medium	Focused on highways and freight movement
Mega Grants	USDOT	Medium	For large projects of regional significance
Reconnecting Communities	USDOT	Low	To reduce or eliminate impacts of prior projects that disconnected communities
LOCAL DISCRETIONARY FUNDS			
Broward Transportation Surtax	Broward County	High	Funds to provide local match to state/federal capital grants
Value Capture Fees	Broward County	Medium	Could be Tax Increment or Tax Assessment Fees

Overall Funding Assessment by Alternative

ALTERNATIVE 1 - LOW-LEVEL BASCULE BRIDGE	Most flexibility for funding and best range of grant options.
ALTERNATIVE 2 - MID-LEVEL BASCULE BRIDGE	Challenging to secure grant funding—would likely need the FEC rail corridor to be designated a Strategic Intermodal System (SIS) facility to provide more flexibility for FDOT to support a match amount.
ALTERNATIVE 3 - HIGH-LEVEL FIXED-SPAN BRIDGE	
ALTERNATIVE 4 - TUNNEL	Very limited grant options due to high cost; bulk of funding would fall to state and local government.

NEPA

Pursuing federal funding means complying with National Environmental Policy Act (NEPA) requirements, which can take several years.

Status in FDOT's Project Development Process

Broward County and FDOT signed a memorandum of understanding (MOU) on January 28, 2021, authorizing FDOT to conduct a NEPA-compliant Project Development and Environmental (PD&E) study on the BCR corridor. FTA will be the lead agency for NEPA reviews.

FDOT is following its NEPA-compliant PD&E process to advance the potential extension and BCR-South project separately. The process has three types of activities and five basic steps:

PRE-NEPA ACTIVITIES (No set time limit)
STEP 1 Planning and Community Support
STEP 2 Transit Corridor Alternatives Review
PROJECT DEVELOPMENT AND NEPA ACTIVITIES (Two-year time limit for New Starts; sponsor-anticipated timeline for Small Starts)
STEP 3 PD&E (FTA NEPA-compliant) Study resulting on one of the following FTA determinations: • Categorical Exclusion (CE) • Environmental Assessment (EA) • Environmental Impact Statement (EIS)
POST-NEPA ACTIVITIES (NO SET TIME LIMIT)
STEP 4 FTA Capital Funding, Engineering, Design and Construction
STEP 5 Operations

BCR-South has started NEPA activities.

A potential extension of commuter rail, which includes the New River Crossing, will benefit from pre-NEPA activities designed to identify environmental issues, project alternatives, adverse impacts, and mitigation strategies.

If pre-NEPA activities are completed for the potential extension of commuter rail along the corridor, FTA would then decide which NEPA Class of Action is appropriate.

NEPA Classes of Action

Categorical Exclusion (CE):
Granted to projects with no significant social or environmental impacts constructed within the existing right-of-way. No further detailed environmental review is required.

Environmental Assessment (EA):
Required for projects with unknown social or environmental impacts. Results in either a Finding of No Significant Impact (FONSI) or, in the case of significant expected social and environmental impacts, in the requirement for an EIS.

Environmental Impact Statement (EIS):
A detailed study describing project impacts, the alternatives evaluated, and all reasonable adverse environmental impact mitigation strategies.

Given the number of significant issues along the potential extension, FTA could require an EIS, the most complex and time-consuming NEPA action (previous EIS completed in 2009).

NEPA Schedule Implications

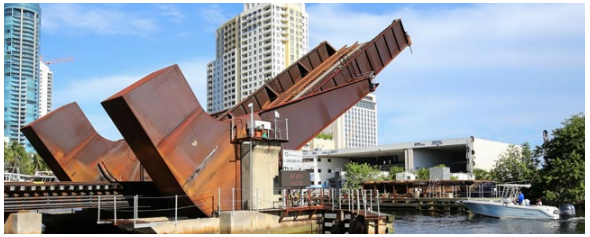
Given the NEPA requirements, the process of securing funding, and the complexity of design and construction, expect the following timeframes for project completion, at a minimum.

ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
LOW LEVEL BASCULE BRIDGE	MID LEVEL BASCULE BRIDGE	HIGH LEVEL FIXED SPAN BRIDGE	TUNNEL
7.5 YEARS	**8.5 YEARS**	**10.5 YEARS**	**10.5 YEARS**

Next Steps — Positioning for Success

To minimize unanticipated delays to the project schedule, FDOT and Broward County could complete the following steps.

1. **Identify alternatives that resolve as many significant adverse impacts as possible** before requesting FTA's formal approval for BCR-North and the New River Crossing to enter the NEPA process.
2. **Complete as many pre-NEPA activities as possible** before requesting FTA's approval to advance to the PD phase and undertake NEPA activities.
3. **Develop a general funding plan** for capital construction, operations, and maintenance, early in the project development process. However, only after a project satisfies the PD and NEPA process can the sponsor apply for FTA and Congressional approval for discretionary funding to advance into final design and construction.

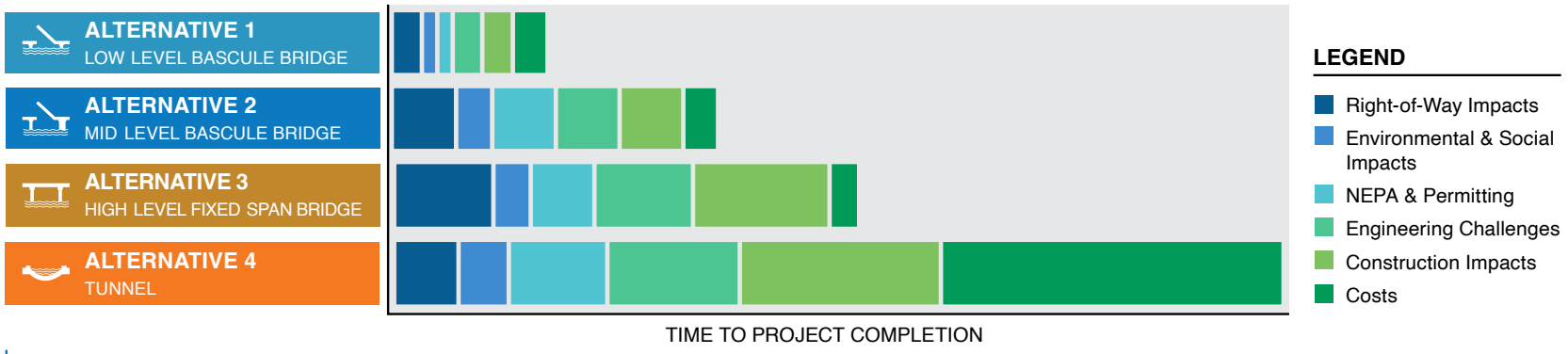


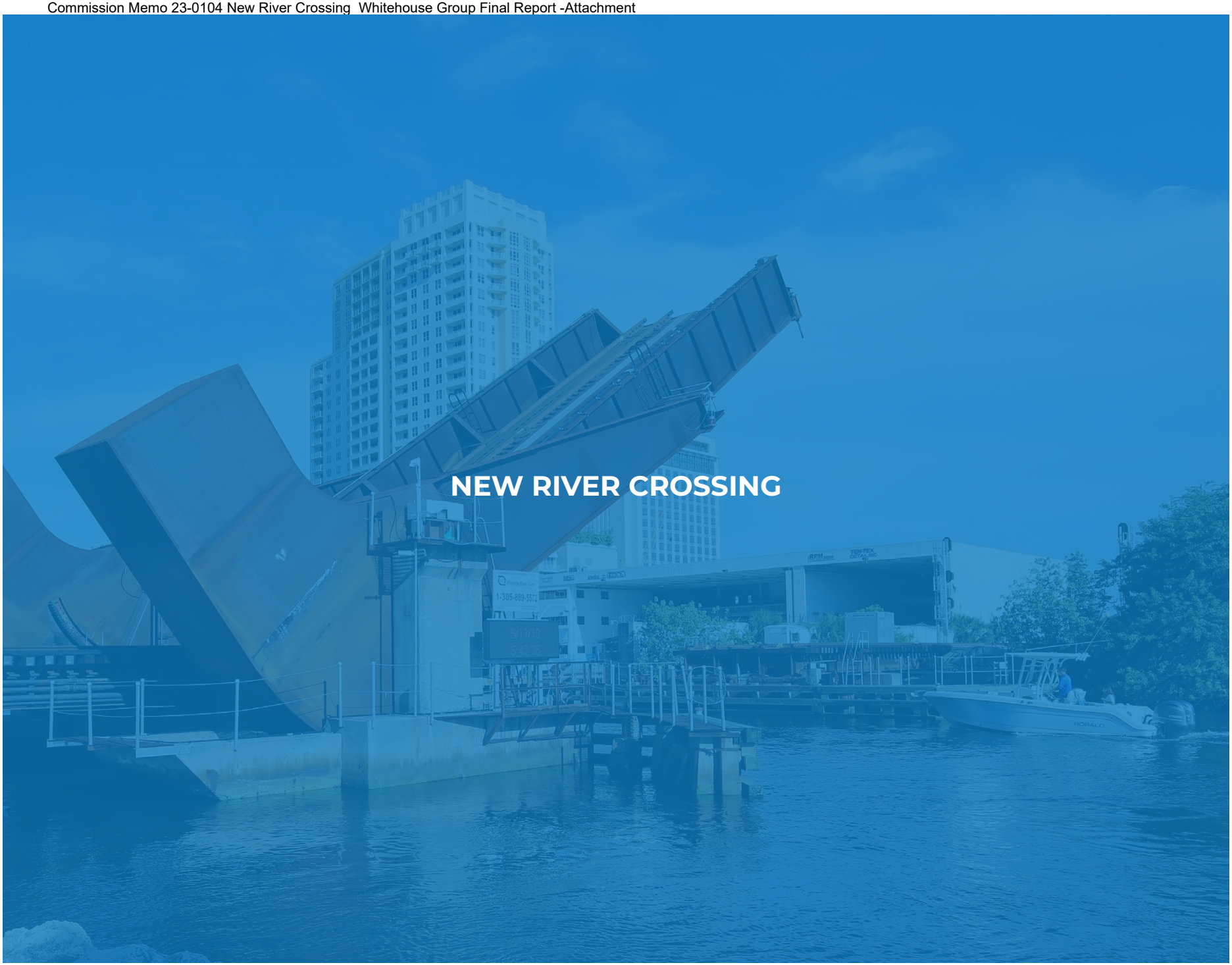
SUMMARY

Complexity adds time and costs; there is much work to do to fully analyze and address the many complexities and set the stage for a successful project.

	ALTERNATIVE 1 LOW-LEVEL BASCULE BRIDGE	ALTERNATIVE 2 MID-LEVEL BASCULE BRIDGE	ALTERNATIVE 3 HIGH-LEVEL FIXED-SPAN BRIDGE	ALTERNATIVE 4 TUNNEL
Capital Cost	**$303 million**	**$572 million**	**$585 million**	**$3.0 billion**
50-year Operations & Maintenance Cost	**$45.7 million**	**$80.7 million**	**$55.3 million**	**$3.3 billion**
Funding Options	Most flexibility for funding and best range of grant options.	Challenging to secure grant funding—would likely need the FEC rail corridor to be designated a Strategic Intermodal System (SIS) facility to provide more flexibility for FDOT to support a match amount.		Very limited grant options due to high cost; bulk of funding would fall to state and local government
Brightline Perspective		Preferred alternative; concerns about long-term ridership impacts for all alternatives		Not evaluated; not considered financially feasible
FEC Perspective	Would not oppose passenger rail bridges on either side of FEC bridge instead of moving FEC bridge to eliminate disruptions to freight operations.			Utility relocation would be prohibitively complex
Project Delivery Timeframe	**7.5 years**	**8.5 years**	**10.5 years**	**10.5 years**

Complexity Extends Project Schedules – A Conceptual Illustration

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