

Port of Miami Tunnel

A public-private partnership project by



PROJECT OVERVIEW PORT OF MIAMI TUNNEL

10/23/12

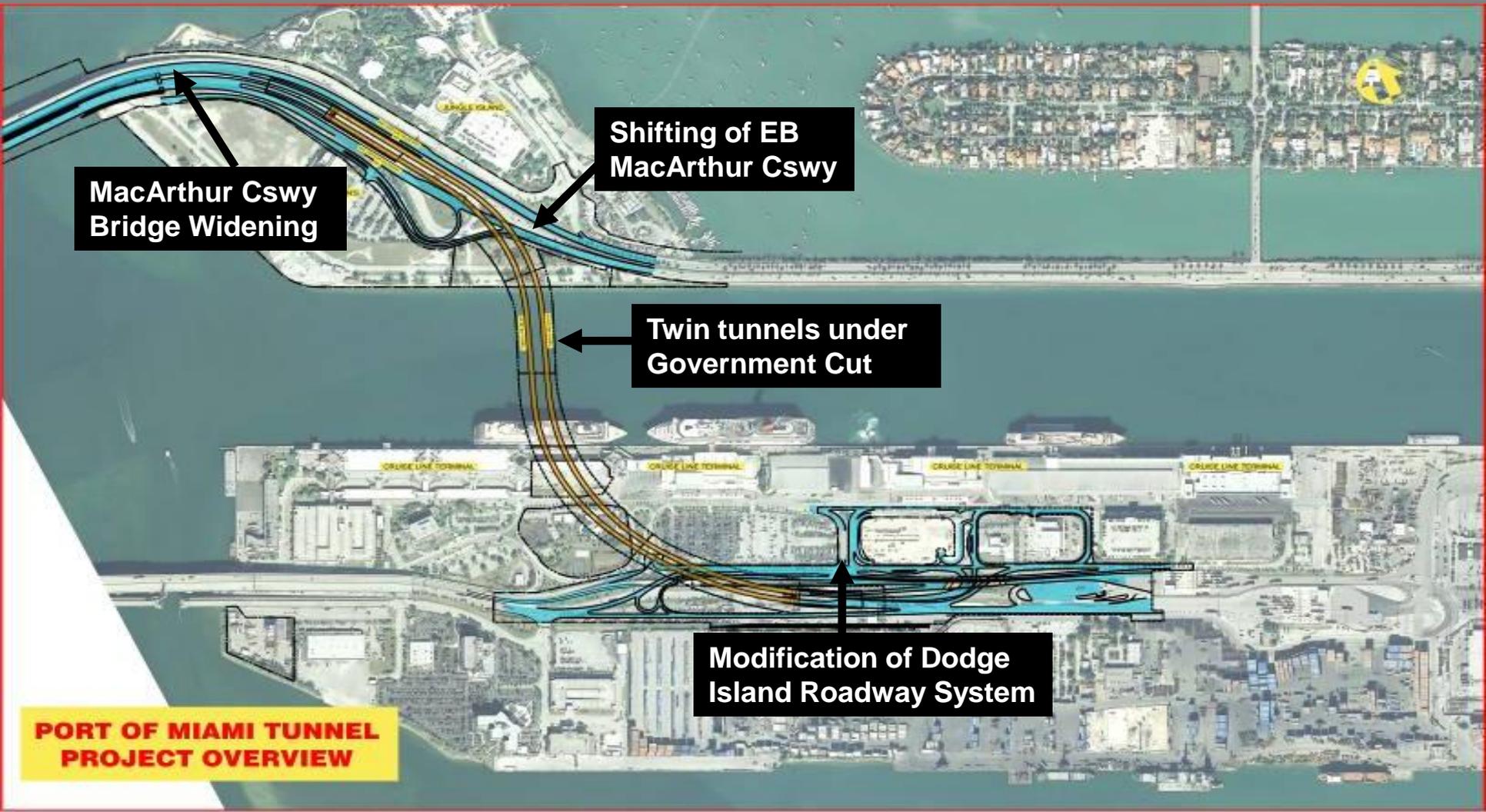
www.portofmiamitunnel.com

PROJECT BENEFITS



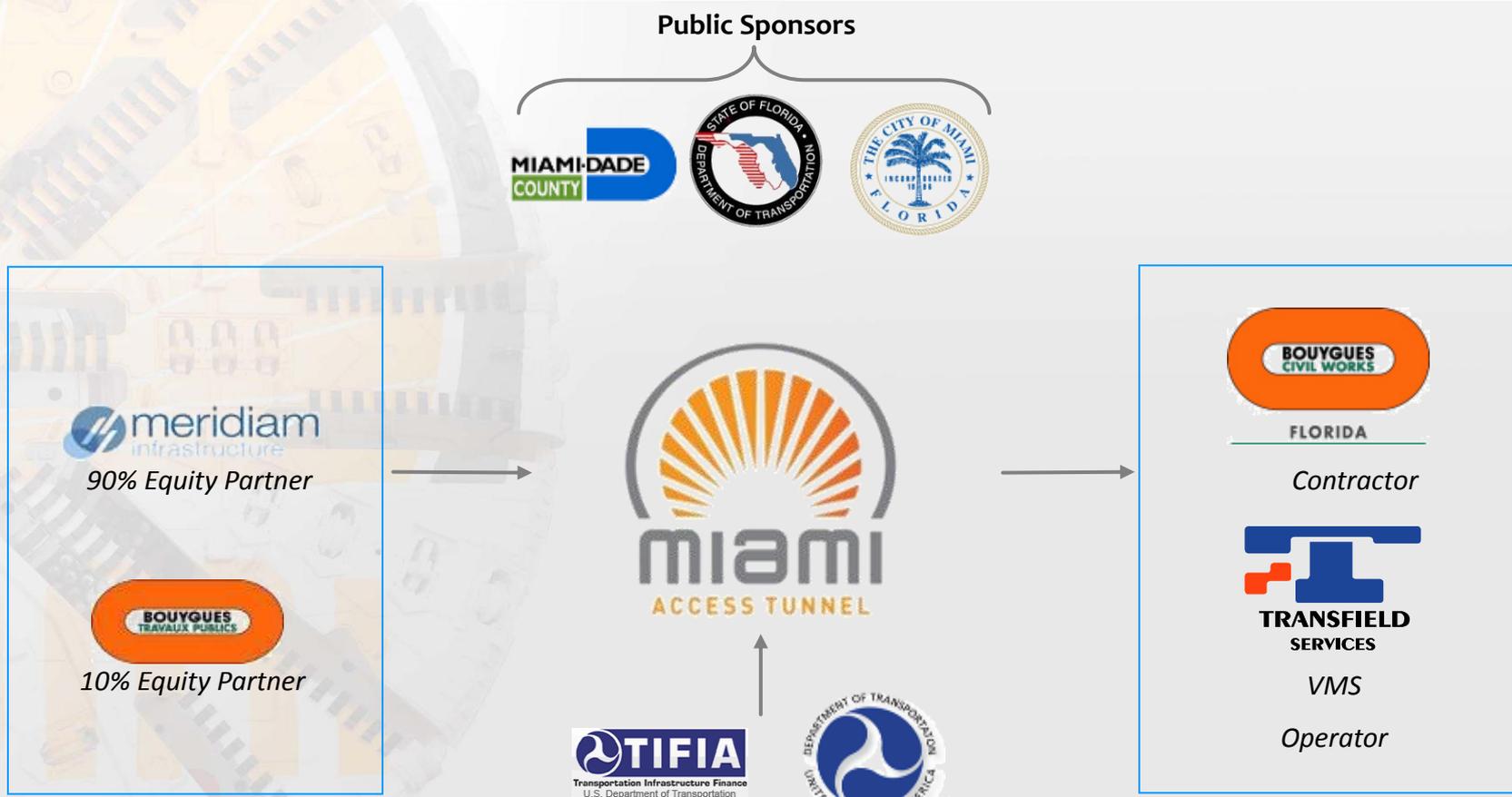
- Provide a direct connection between the Seaport, Airport and the Interstate Highway System
- Maintain PortMiami as the county's second leading economic generator
- Relieve congested downtown Miami streets of Port passenger and cargo traffic, improving safety as trucks also traverse areas of pedestrian activity
- Facilitate ongoing and future development plans in and around downtown Miami

SCOPE OF WORK



PORT OF MIAMI TUNNEL PROJECT OVERVIEW

PROJECT PARTNERS



PUBLIC FUNDING PARTNERS

- FDOT contributing 50% of capital cost
- Miami-Dade County contribution \$402.5M
(including right-of-way costs)
- City of Miami contribution \$50M
(including right-of-way costs)
- FDOT fully funding Tunnel Operations & Maintenance from statewide maintenance funds

OVERVIEW OF PAYMENT MECHANISM DURING CONSTRUCTION

Construction Cost \$607M

- \$100M during Construction consisting of 4 defined milestone payments:
 - 1st Milestone - \$20m – Tunnel Design Complete (Paid)*
 - 2nd Milestone - \$40m – TBM at work in 1st Bore (Paid)*
 - 3rd Milestone - \$25m – TBM at work in 2nd Bore*
 - 4th Milestone - \$15m – Substantial Completion of MacArthur Causeway*
- \$350M at Final Acceptance of Construction

Total Milestone Payments = \$450M

TUNNEL BORING MACHINE (TBM) ASSEMBLY



- Manufactured in Germany, approximate cost \$45M
- Arrived **June 23, 2011** and came in several pieces (**75 regular cargo, 20 containers and 19 heavy haul pieces**).
- It took **4 months** for re-assembly including testing and commissioning.
- Shield consists of **6 pieces**
- Trailing gear is comprised of **6 gantries**



Tunnel Boring Machine (TBM)



- TBM cutter head with an outside diameter of **42.3 feet** (as high as a 4 story building)
- **361 foot** long trailing support gear made up of 6 gantries
- Total length of the TBM is **428.5 feet** long (more than a football field).

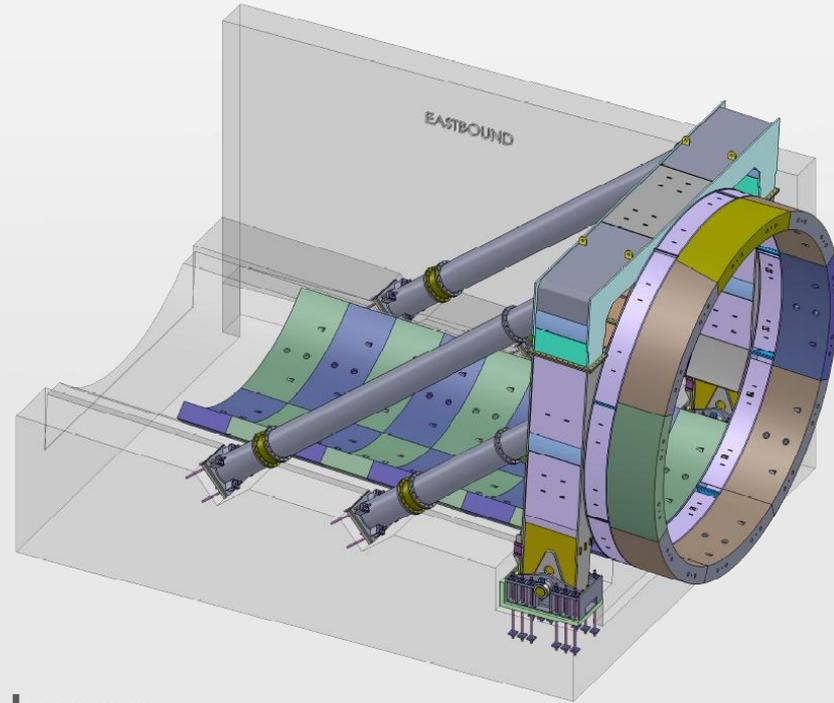
TUNNEL BORING MACHINE (TBM)

HOW DOES IT WORK?

- The cutter head rotates and bores out the underground area.
- The trailing gear contains the electrical, mechanical and guidance systems and additional support equipment.
- Excavated material is carried back on a conveyor belt and deposited outside the tunnel entrance.
- Once the TBM moves forward it installs a precast concrete liner in place that becomes the finished wall of the tunnel.
- Once the liner is in place, grout is pumped into the space between the liner and the excavated area to seal the tunnel in place.

FEEDING THE TBM

- 12,000 Segments
- 8 Segments per Ring
- Each segment weighs 12.2 Metric Tons
- Ring installation time 60-75 minutes
- 12-16 persons in TBM & 12-14 on Surface
- TBM operates 24 hrs/day, 7 days a week
 - 20 hrs/day production (alternating between mining and ring building)
 - 4 hrs/day maintenance



TUNNEL BORING MACHINE (TBM) BREAK-IN



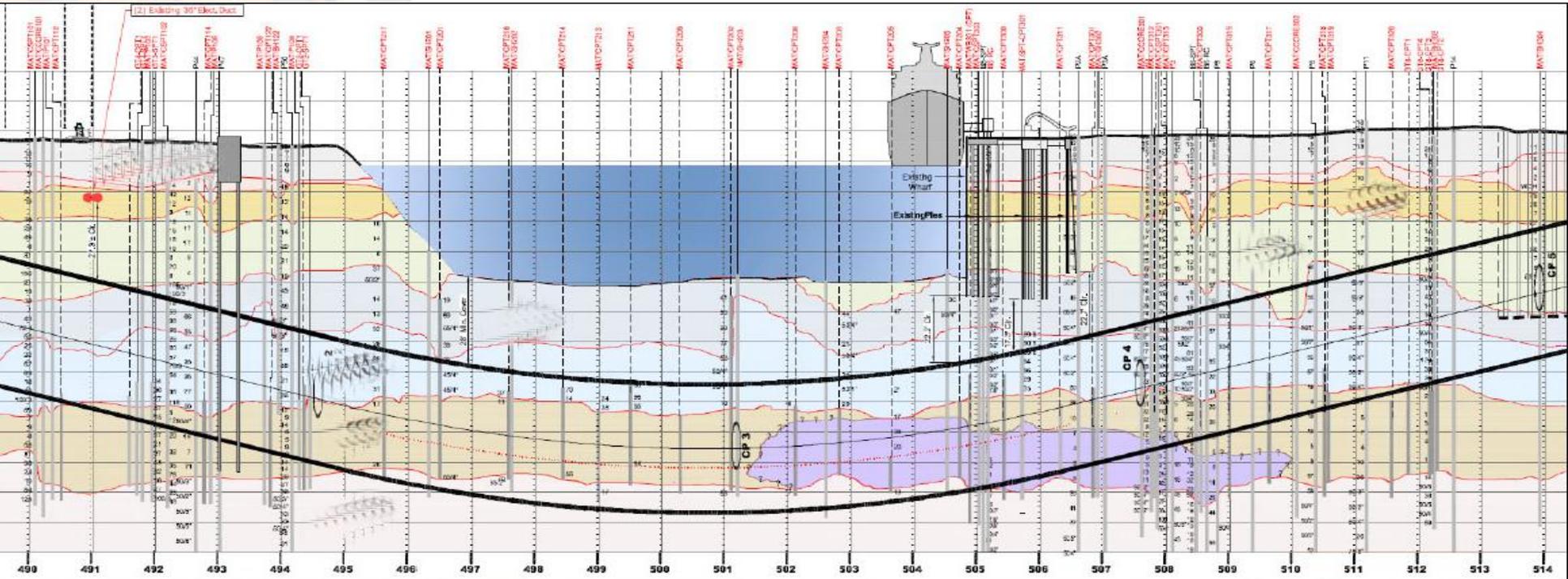
The Tunnel Boring Machine (TBM) began cutting into the ground on November 11, 2011 and the first permanent ring was installed on November 18th, 2011.

SEGMENT PRODUCTION

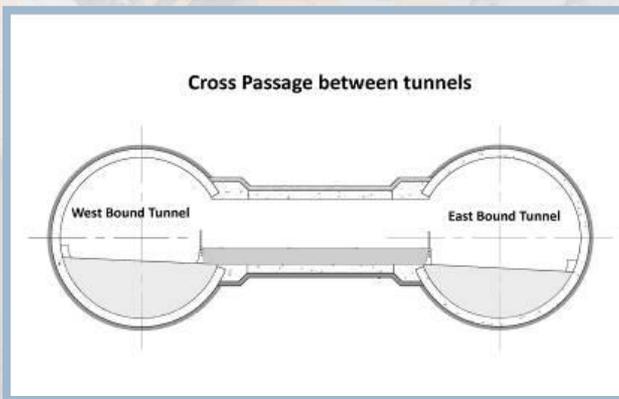


- Dedicated facility built for the project at Cemex Plant in Sweetwater (Miami-Dade County)
- Over 8,800 of the 12,000 concrete segments required produced to date
- Segments are:
 - 2 ft thick
 - 5 ft 7 in Wide
 - 14 ft 6 in Long
 - 13 Tons

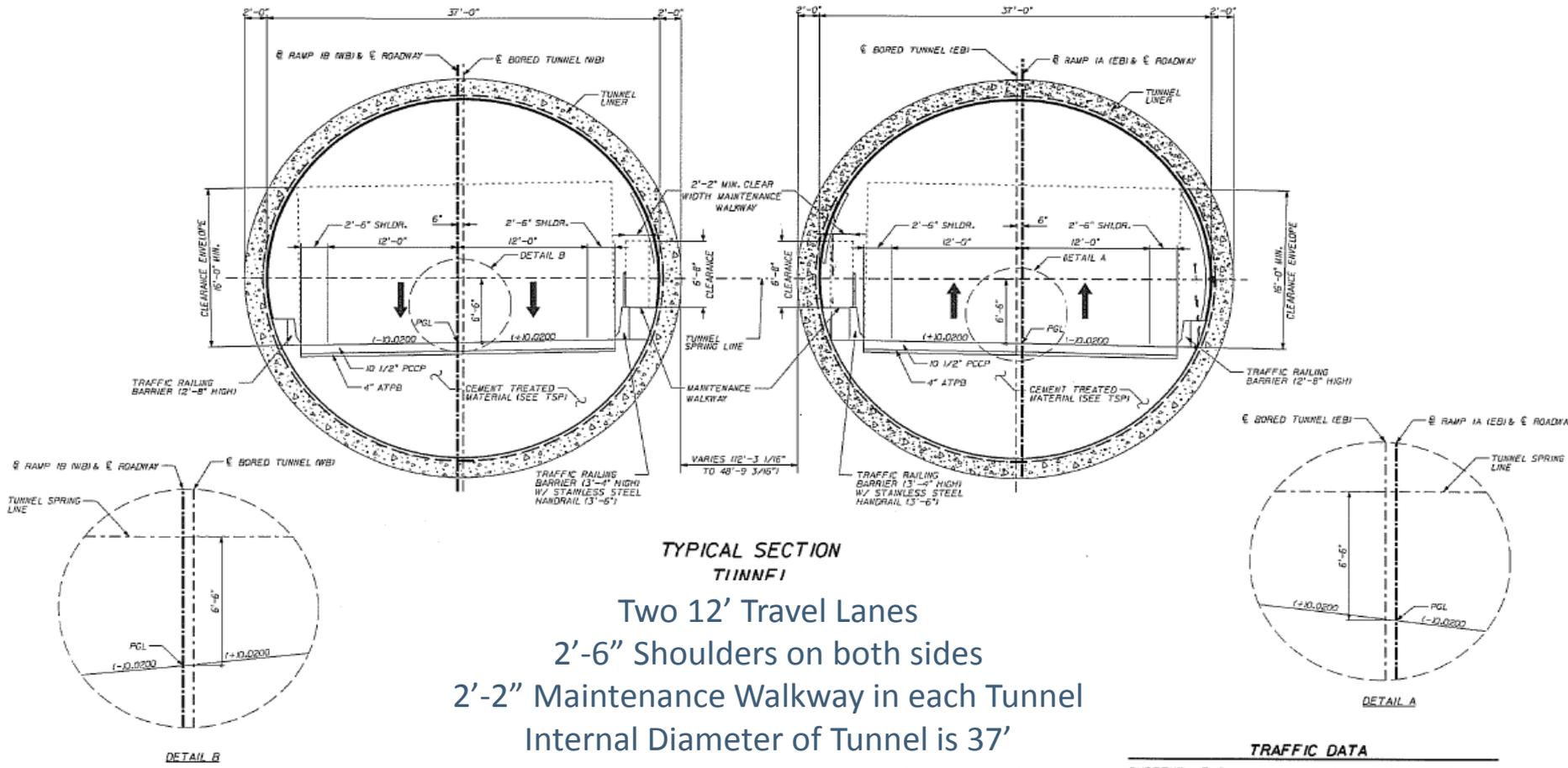
TUNNELING PROFILE SECTION & CROSS PASSAGES



- Tunnels are approximately 4200 ft. long
- +40 ft. under the bottom of Government Cut & approximately 120 ft. below the surface at deepest point
- 5% Grade
- 5 cross passages



BORED TUNNEL TYPICAL SECTIONS

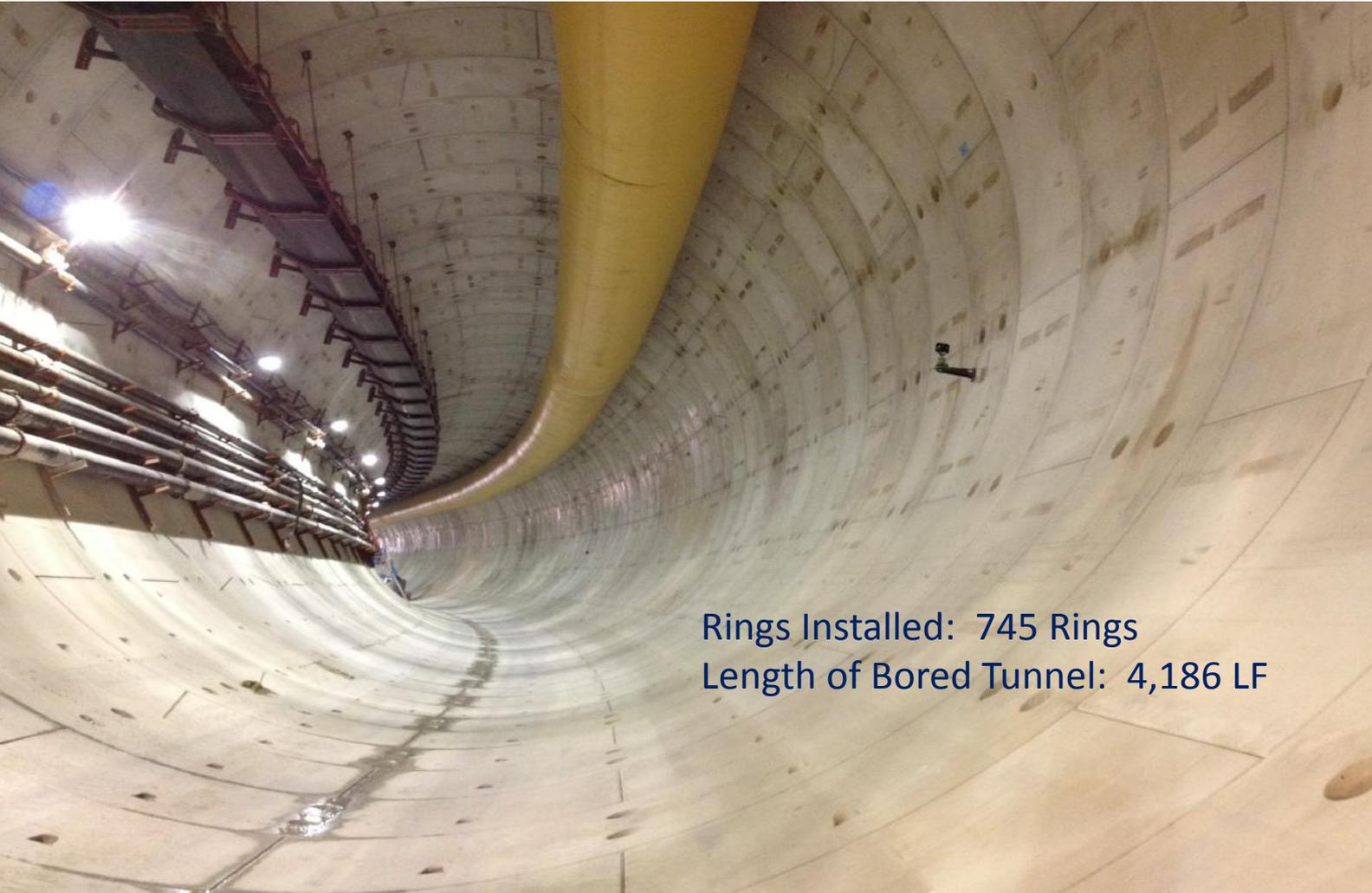


TRAFFIC DATA

CURRENT YEAR	= 2009 AADT = N/A
ESTIMATED OPENING YEAR	= 2015 AADT = 28869
ESTIMATED DESIGN YEAR	= 2035 AADT = 54094
K	= 9.20% D = 52.50% T = 29.30% (24 HOUR)
DESIGN HOUR T	= N/A
DESIGN SPEED	= 35 MPH

NOTE:
SHOULDER HAS THE SAME CROSS SLOPE AS THE ADJACENT ROADWAY.

EASTBOUND TUNNEL INTERIOR



Rings Installed: 745 Rings
Length of Bored Tunnel: 4,186 LF

TBM EASTBOUND TUNNEL BREAKOUT



- TBM Breakout
7/31/12 on
Dodge Island

WATSON ISLAND – TUNNEL PORTAL



- Eastbound MacArthur Causeway view
- Tunnel Portal Structure houses the Flood Gates which come down in the event of a storm to prevent flooding of tunnels
- Aesthetic challenge was the massive size and boxy shape of the structure

PUBLIC-PRIVATE PARTNERSHIP OVERVIEW

- Project structured as a P3 (1st availability payment procurement in the U.S.)
- Concessionaire will design, build, finance, operate and maintain (DBFOM) tunnel for 35 years
 - Design and construction - first 55 months
 - Operation and maintenance - remaining 30 years and 5 months through facility hand-back
- No tolls unlike other P3s delivered elsewhere
- Concessionaire compensated through
 - Milestone payments during construction period
 - Availability payments during operating period

MAIN OBJECTIVES FOR P3 IMPLEMENTATION

- Tunnel construction and operation atypical for FDOT
 - Need to share risks with contractors experienced in managing tunneling risks ; private sector innovation
 - Encouraging lifecycle efficiencies requires long-term contract
- Short-term local funding , long-term work program funds
- Concern for cost overruns
 - FDOT Need long-term guaranteed cost structure
 - Limited Industry interest expressed for fixed-price arrangements
- Considered DB, DBOM and DBFOM project delivery

ADAPTING THE AVAILABILITY PAYMENT FRAMEWORK

- Custom-designed P3 Agreement for Unique Project
 - Single-purpose facility with no tolls
 - Technically challenging project
 - Geotechnical risk
 - Hurricanes in Miami essentially uninsurable
 - First of kind in US and Florida legal system
- First Availability Payment to navigate through the FHWA major projects / federal financing process
- Optimized risk allocation with fixed 35-year overlays

SUMMARY RISK ALLOCATIONS

Risk Category	Risk Allocation		
	FDOT	Concessionaire	Shared
Political	X		
Financial		X	
Traffic & Revenue	X		
Right-of-Way	X		
Permits/Government Approvals			X
Utilities			X
Procurement	X		
Construction		X	
Operations & Maintenance		X	
Hand-Back		X	
Force Majeure			X
Change in Law	X		
Contamination			X
Geotechnical			X

MAJOR CONSTRUCTION PERIOD RISKS

- Design – performance specifications (outcome rather than input based)
- Permitting led by MAT with FDOT support
- Differing site conditions (Geology, Existing bridge foundations)
 - Changed conditions measured against Geotechnical Baseline Report, compliance with “Subsurface Methods Plan” submitted as part of proposal
 - Contingency fund with \$10M “deductible”, \$150M “FDOT tranche” and \$20M “concessionaire tranche”
- Other key risks also rely on baseline reports:
 - Hazardous materials management / remediation
 - Utilities and underground piles
- Force Majeure strictly defined, with named windstorm and terrorism being self-insured by FDOT

COST ESCALATION AND COMPLETION DELAY

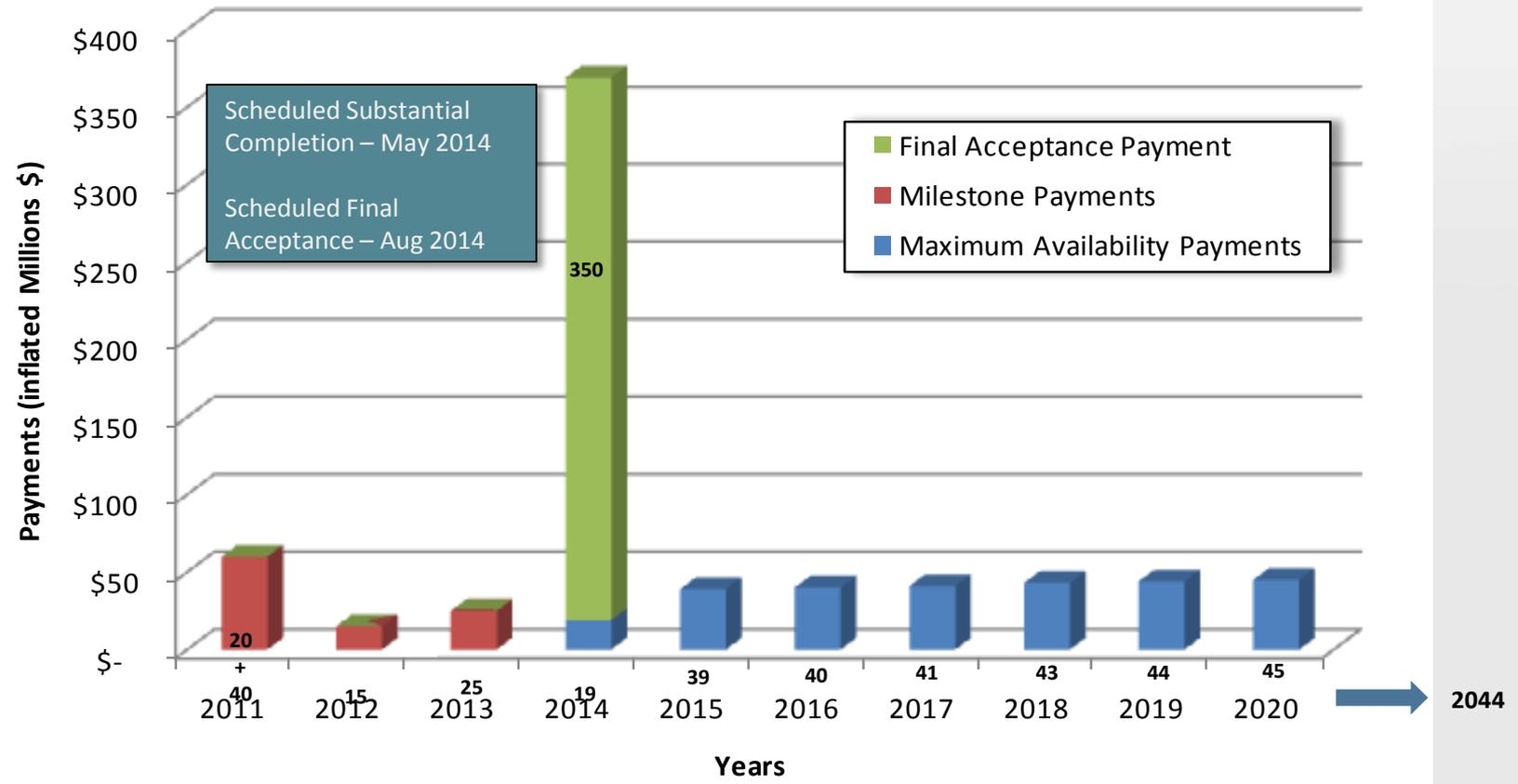
- Cost escalation is fully Concessionaire's risk (unless due to relief event such as a change order)
- Concessionaire set schedule as part of Proposal
 - Long stop date is 18 months beyond baseline completion date
 - FDOT owns the float
 - Owner-caused critical path delays result in time extension
- Concessionaire-caused delays can also result in "missed" Availability Payments

OPERATING PERIOD RISKS

- Risk of O&M performance and cost of O&M and renewals essentially belongs to Concessionaire, except cases such as:
 - Force Majeure
 - Rectification costs
 - Business interruption – inability to earn availability payment
 - FDOT self-insured risks
 - Shared risk via compensation formula and termination provisions
 - Change in law, mandatory technical upgrades and other relief events
- Contract includes “Hand-back” requirements to ensure Tunnel is returned to FDOT in first-class condition

PAYMENTS TO CONCESSIONAIRE

MAT Concessionaire Payment Structure



OVERVIEW OF AVAILABILITY PAYMENT MECHANISM

- Maximum Availability Payment (“MAP”) is adjusted for inflation – starts at \$32.5 million/year in 2010 dollars
- Essentially FDOT is paying pro rata for each hour of unobstructed tunnel lane service that meets its performance criteria
- From Tunnel completion to fixed October 2044 concession end date
 - built-in incentive for schedule adherence
- Includes both Capital & Operating Expenses
- Performance-based – not prescriptive (outcome vs. input-based), with clear performance-driven targets to facilitate administration

CALCULATING THE AMOUNT EARNED

- Availability Payments are calculated every quarter by itemizing all service hours for each tube to factor in potential payment reductions:

Hourly Availability Payment for each tube

$$= 50\% * \text{Inflated MAP} * (1 - \text{Hourly Unavailability Factor}) * \text{Time Weighting Factor}$$

(prorated hourly)

~ \$1,850 per hour per tube
at the most (in 2010 dollars)

0.0 - Tube fully operational

0.4 - Occurrence of a 1-lane
closure or a non-critical fault

1.0 - Occurrence of a 2-lane
closure or a critical fault

0.10

Factor Value based on:

- Prime vs. non- prime season
- Peak vs. standard day
- Time of the day

3.00

- Bank of “free closure hours” for planned routine/capital maintenance
- Incentives for timely incident response (cure periods)

FEDERAL PROJECT FUNDING

- Concessionaire Financial Plan includes a TIFIA loan of \$381 Million which includes accrued interest.
- FDOT coordinated with FHWA to have all contract documents reviewed and submitted a Project Management Plan for approval.
- FDOT obtained National Highway System Funds in the amount of \$192.5 Million to fund a portion of the Milestones and Final Acceptance payment.

PROJECT AWARDS

- 2007 “PPP Project of the Year” by the American Road and Transportation Builders Association.
- 2009 Project Finance International’s Americas P3 Deal of the Year.
- 2009 Euromoney’s Project Finance Magazine’s North American P3 Deal of the Year and Global Deal of the Year.
- 2009 Bond Buyer’s Non-Traditional Financing of the Year (North America).
- 2011 South Florida Chamber of Commerce – Public Outreach Award

PROJECT SCHEDULE

July 31, 2012 – Completion of eastbound tunnel

Spring 2013 – Completion of westbound tunnel

Spring 2014 – Completion of Dodge Island roadway improvements

May 14, 2014 – Substantial Completion - Port of Miami Tunnel opens to traffic, O&M Period begins

August 14, 2014 – Final Completion

*As of 10/23/12 - Construction Days to Date:
1105 of 1765 (55 months) = 63% of Design-Build*

THANK YOU!



Port of Miami
Tunnel

A public-private partnership project by    

www.portofmiamitunnel.com



Questions?

For additional project information,
please visit our website at:

www.portofmiamitunnel.com

Project Videos & Gallery

www.portofmiamitunnel.com