
Achieving Value and Quality in Alternative Delivery Projects

Eglinton Crosstown Light Rail
Ottawa Confederation Line

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METROLINX

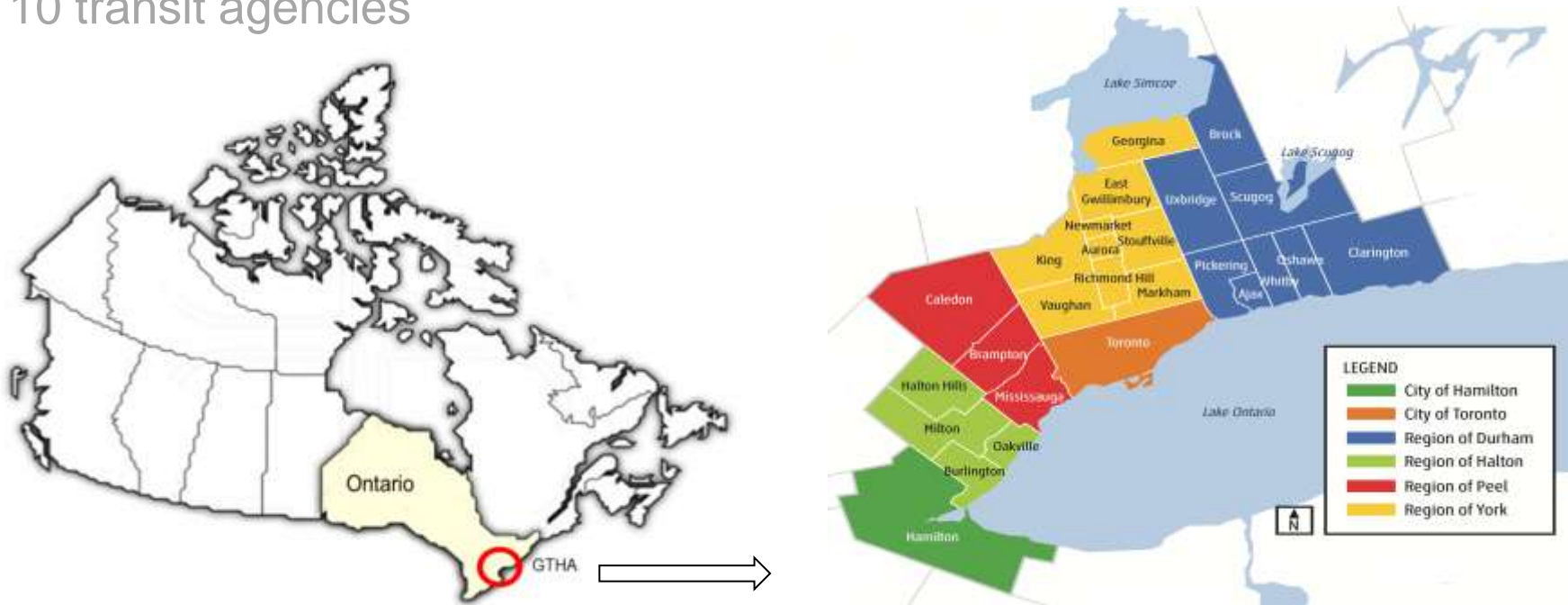
An agency of the Government of Ontario

Agenda

- Metrolinx Overview
- Light Rail Transit Projects in Toronto
- Eglinton Crosstown LRT Project
- Ottawa Confederation Line
- Delivering Value and Quality (Crosstown, Confederation Line)
 - Pre-market
 - In-market
 - Design
 - Construction
 - Maintenance

Greater Toronto & Hamilton Area (GTHA)

- Largest urban centre in Canada
- Population of 6 million people (est. to increase to 9 million by 2031)
- Generates 20% of Canada's GDP with \$323 billion
- Region is governed by 4 levels of government, 30 municipalities, and 10 transit agencies



Who is Metrolinx?



Shareholder: Ministry of Transportation
(Provincial Government Ministry)

Governance: Overseen by a 15-member board of directors that provides strategic direction and oversight for Metrolinx's activities and operations. Appointments are made by the Government of Ontario.

Mission: Champion, develop and implement an integrated transportation system for our region that enhances prosperity, sustainability and quality of life.

Mandate: Develop the first regional plan for transit and transportation.

Metrolinx Regional Transportation Plan

A 25-year integrated transportation plan for the GTHA.



- Triple length of rapid transit
- Put 81% of population within 2km of rapid transit
- Reduce commute times to an average of 77 mins
- Decrease GHG emissions from transportation by 29%

Rapid Transit Program: Part of the 25-year Plan

	<u>Budget</u>	<u>Schedule</u>
1. Eglinton Crosstown LRT	\$ 5.3B	2010-2020
2. Finch West Light Rail Transit (LRT)	\$ 1.0B	2015-2020
3. Sheppard East Light Rail Transit (LRT)	\$ 1.0B*	2017-2021
4. York Viva Bus Rapid Transit (BRT)	<u>\$ 1.4B</u>	2014-2019
Total (2010\$)	\$8.7B	

*Up to \$333 million from federal government – balance from the Province

Toronto Light Rail Transit Projects



Eglinton Crosstown Light Rail Transit (LRT)

- The Crosstown is a light rail transit line that will run across Eglinton Avenue between Mount Dennis (Weston Road) and Kennedy Station.
 - 19-kilometre corridor, with a 10-kilometre underground portion, including 25 stations and stops with links to 54 bus routes, three subway stations and various GO Transit lines
- \$5.3 billion (2010\$) investment, the largest single transit expansion in the history of Toronto
- Projected ridership: 5,400 passengers per hour in the peak direction by 2031
- The project is currently under construction and, subject to the results of the current private partner procurement, will be complete by late 2020.
- With travel times up to 60 percent faster than the existing bus service, the LRT will provide fast, reliable and convenient transit service to passengers across Toronto.



Delivering the Eglinton Crosstown

Delivery model:

- Two components of the tunnel each completed by separate contractor under a traditional design-bid-build model
- Vehicles procured directly from supplier
- AFP contract for balance of system infrastructure with a design, build, finance, maintain agreement for 30 years
- Operator will be municipal transit commission under contract
- Approximately 257 properties, including temporary easements and permanent takings, required for the project

Current Contracts

- West Tunnels Contractor
 - Crosstown Transit Constructors (CTC) JV of Obayashi/Kenny/Kenaidan/Technicore
 - \$283M (December 6, 2012 to December 16, 2016)
- East Tunnels Contractor
 - Aecon-Dragados Joint Venture (ADJV)
 - \$177M (October 29, 2013 to November 6, 2016)
- Tunneling from the west began in spring 2013 with just over three kilometers completed; tunneling from the east to begin as early as spring 2015
- The tunnel boring machines create twin tunnels of 6.5m in diameter, at a rate of 10m per day, operating 16-20m below ground
- Once the tunnel is complete, stations, tracks and other system elements will be constructed in the new tunnels by the AFP contractor
- The AFP contract is currently in procurement with technical submissions due in December 2014

Stakeholders – Eglinton Crosstown

- **Government of Ontario**
 - principal funder: \$5.3 billion (\$2010)
- **Infrastructure Ontario**
 - management of the procurement process and support during implementation
- **City of Toronto**
 - Master Agreement: framework for working together
- **Toronto Transit Commission (TTC)**
 - prospective operator and owner of intersecting subway
 - fully engaged in the project planning and AFP process
- Participation in an AFP relationship is a new experience for some stakeholders

Qualified bidders bring local knowledge and global experience

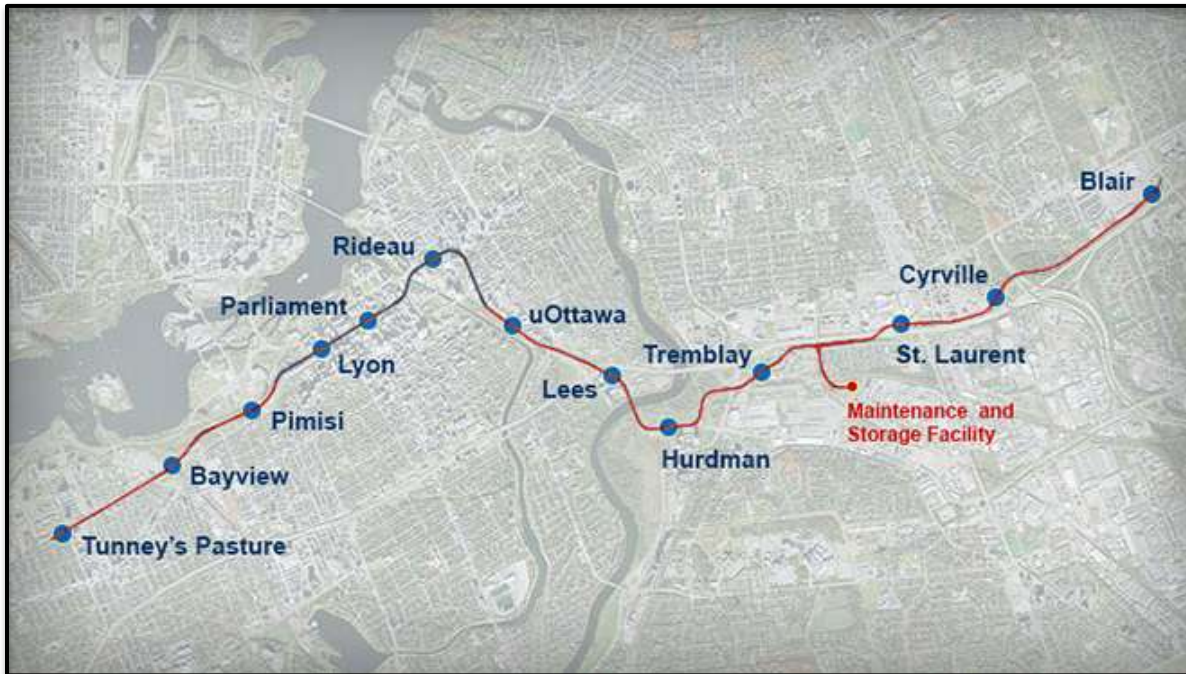
Crosslinx Transit Solutions

EllisDon
Aecon
SNC • LAVALIN
ACS
INFRASTRUCTURE CANADA INC.
DRAGADOS CANADA

Crosstown Transit Partners

FENGATE //
CAPITAL MANAGEMENT
STRABAG
VEOLIA
TRANSPORTATION
BECHTEL
KEN AidAN
O BAYASHI
OHL
Concesiones

Ottawa Confederation Line



- \$2.1 B
- 12.5 km
 - 2.5 km tunnel
- 13 stations
 - 3 underground
- Within existing Transitway
- Maintenance facility
- Highway 417
 - Spring 2013 to Fall 2015
- Awarded Feb 2013
 - Complete spring 2018

Eglinton Crosstown is Very Complex

Major linear transit in mature urban environment tends to be very complex:

- Construction in a dense urban corridor
- Three major interchange stations
- Multiple stakeholders with varying roles
- Approvals
- Utilities
- Contamination
- Large number of properties
- Injurious affection
- Overall public impact
- Coordination with other infrastructure and development projects
- City building

Confederation Line is Very Complex too...

- Federal role through NCC in planning approval
- Replacing heavily relied upon operating Transitway
- Utilities
- Replacing previous program cancelled after financial close
- Contamination
- Need to complete major highway widening
- Large number of properties
- Injurious affection including super sensitive receivers like National Arts Centre
- Coordination with other infrastructure and development projects
- Major tunnel construction in national capital before 150th anniversary of Confederation Celebration
- Tightly limited capital budget due to capped tri-party funding agreement

What Does Complex Look Like?

Typical streetscape (Eglinton Avenue)



What Does Complex Look Like?

Launch Shaft One (Black Creek and Eglinton)



What Does Complex Look Like?

Tunnelling in Toronto



What Does Complex Look Like?

Secant piles



What Does Complex Look Like?

Close to peoples' homes



What Does Complex Look Like?

Headwall construction



What Does Complex Look Like?

Tunnelling in Ottawa



What Does Complex Look Like?

417 Highway work in Ottawa
Rapid bridge replacement



Achieving Value and Quality - DBFM

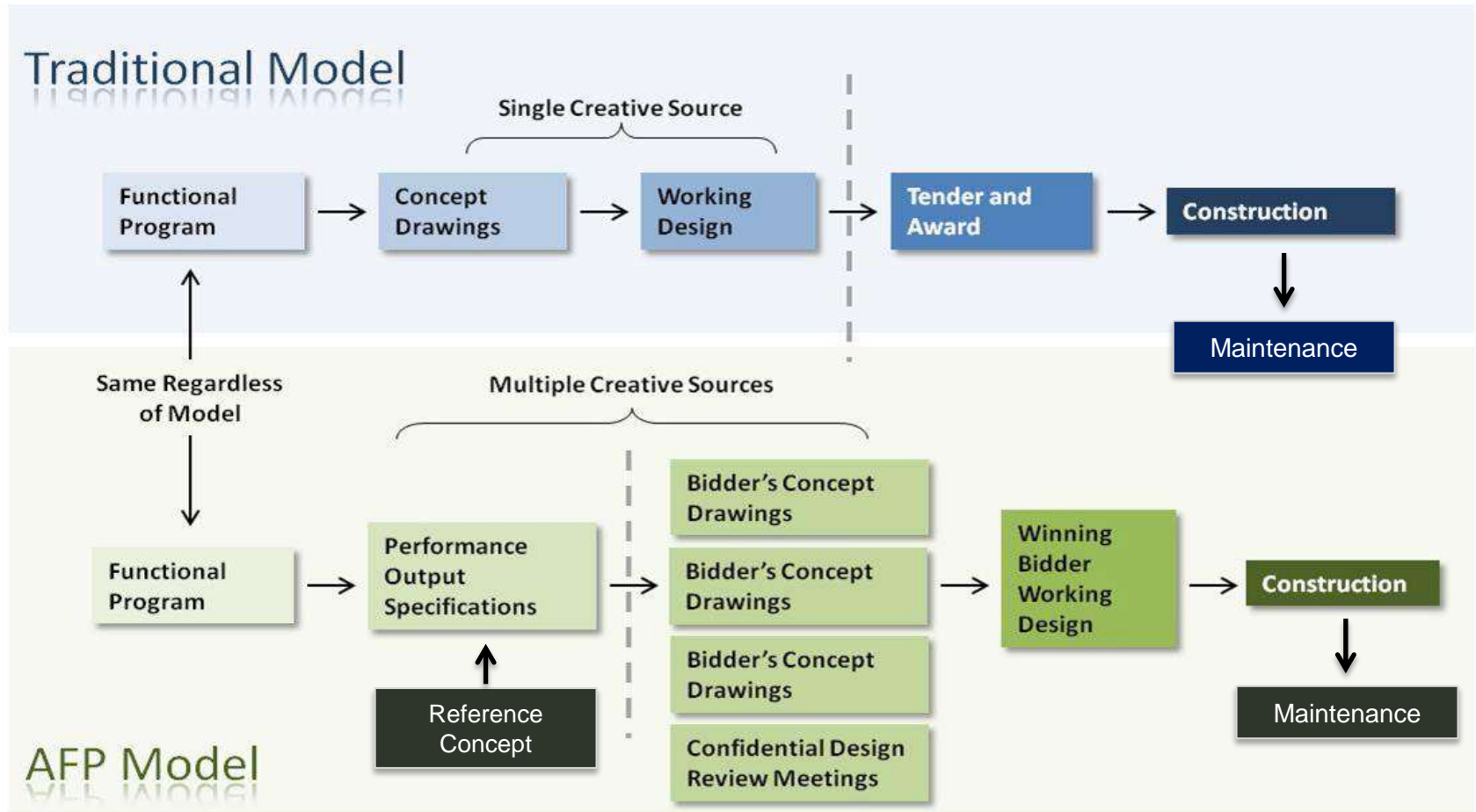
- **Appropriate risks transferred to private sector to ensure “on time, on budget” delivery, quality and value**
 - Fully integrated private sector teams are best able to create clear accountability with highly complex design and construction projects
 - Access to highly skilled professional management and private sector discipline that would be very difficult to replicate with public delivery
 - Transfer of overall integration, design, coordination, construction execution, cost escalation, schedule delays, operations, maintenance, life cycle, financial risks
- **Managing costs**
 - Optimize costs by combining capital, maintenance and life cycle costs
 - Integration of design, construction and maintenance/lifecycle

Achieving Value and Quality - DBFM

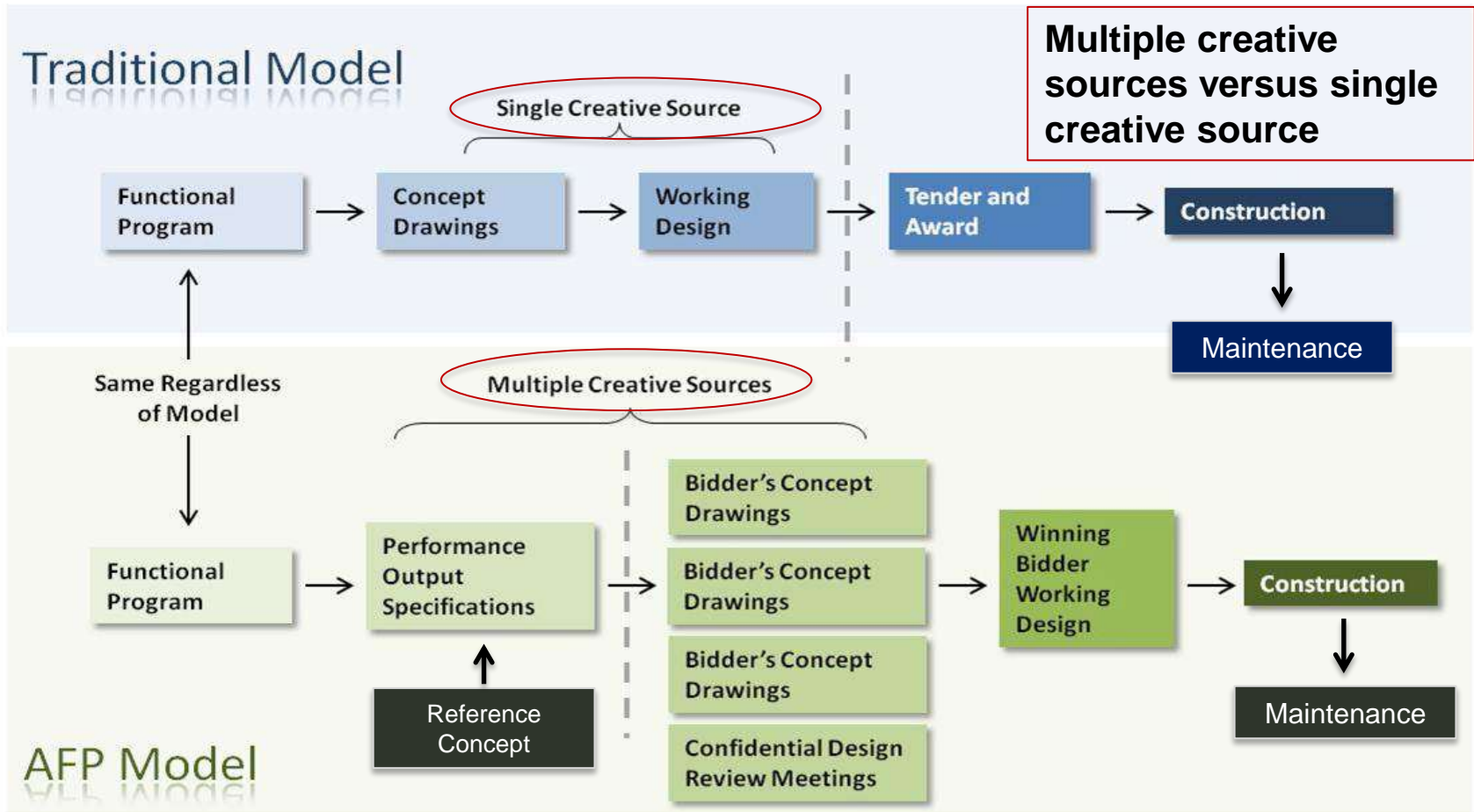
Cost is important, but achieving value is not just about cost

- Cost to the owner
 - What is the owner prepared to bear
 - Fixed price
- Alignment with the owner's core business and objectives
 - Owner's capacity to self perform
- Commercial and contractual structure
 - Ensuring compliance
- Value from risk transfer
 - Integration

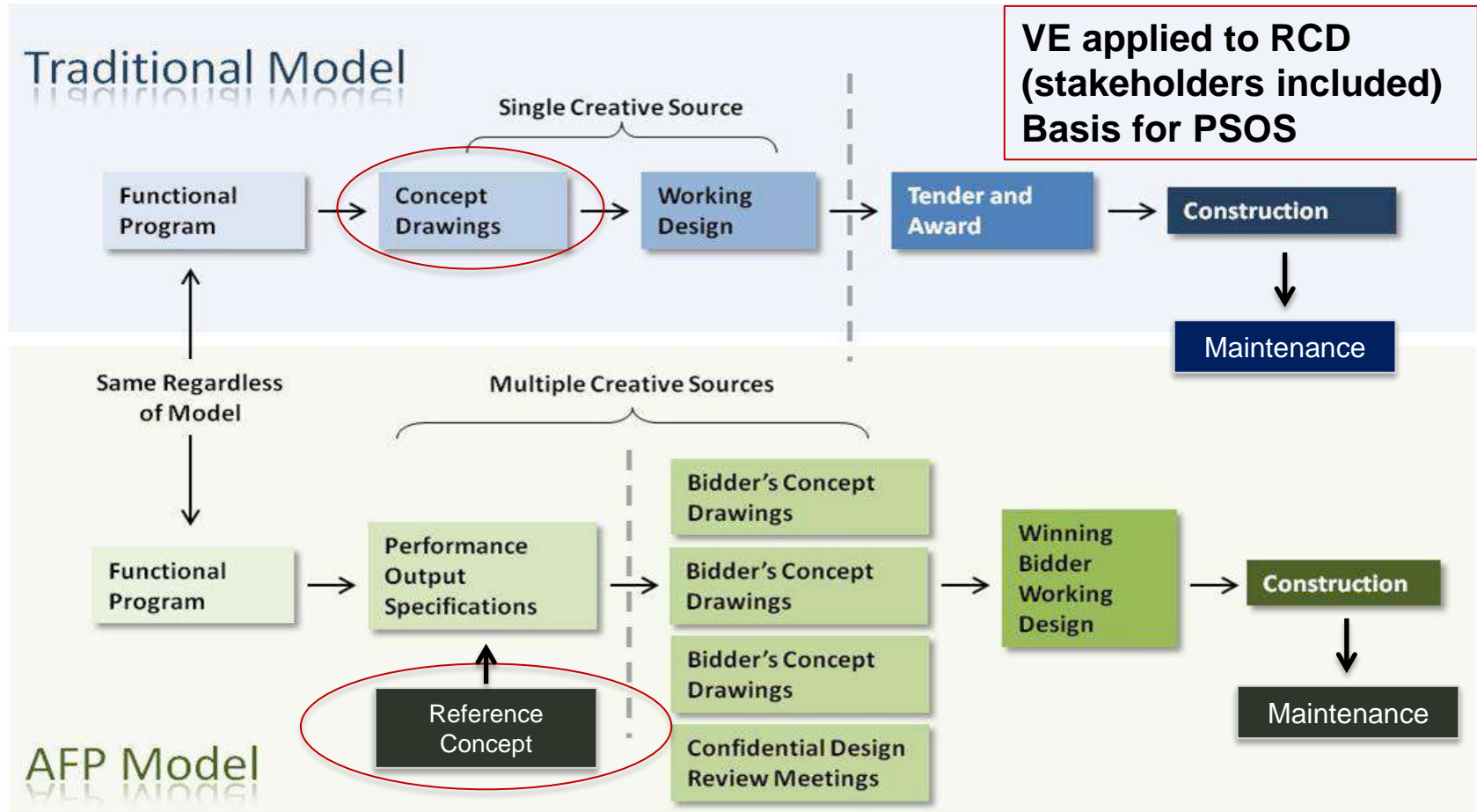
AFP – Driving Value and Quality in a DBFM



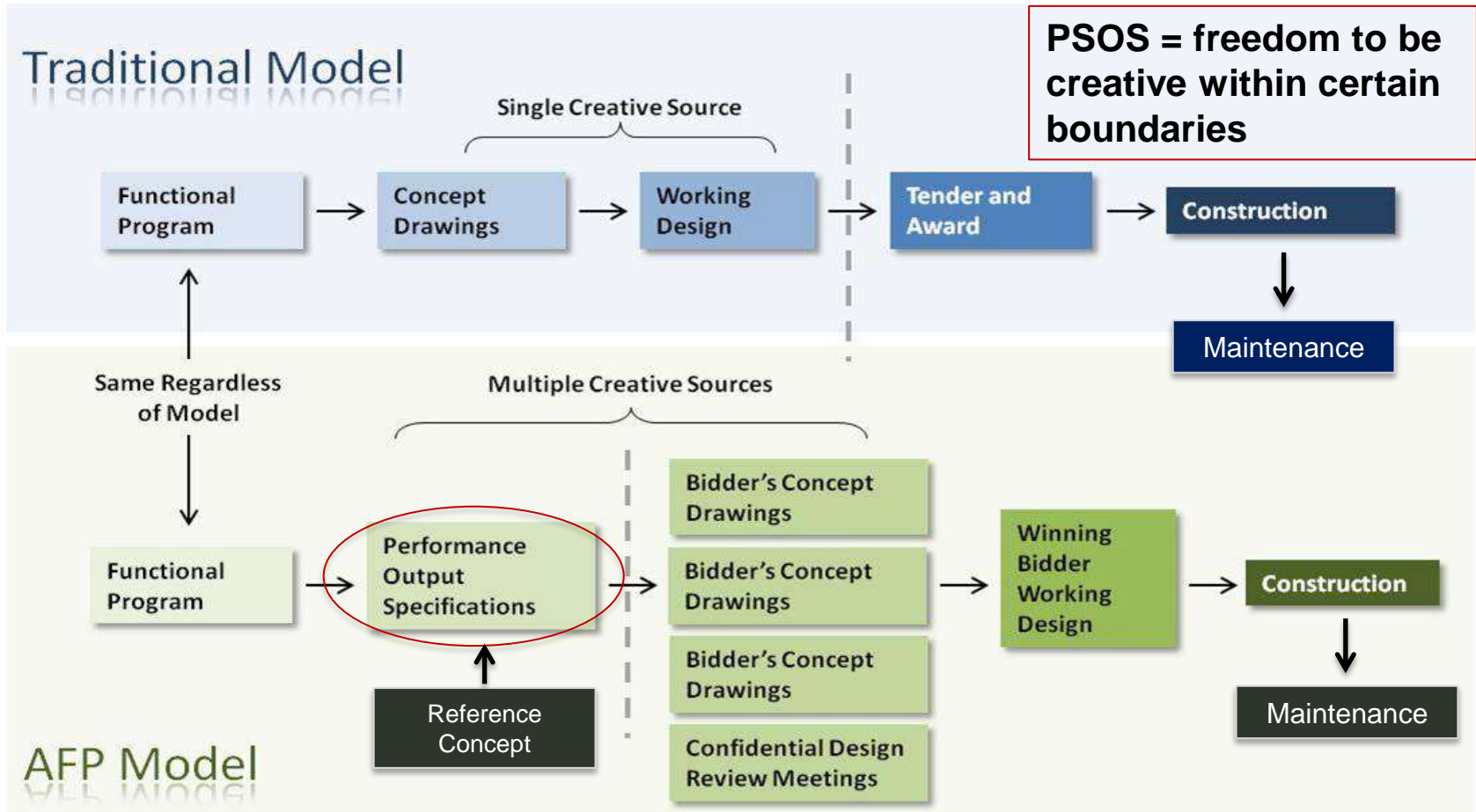
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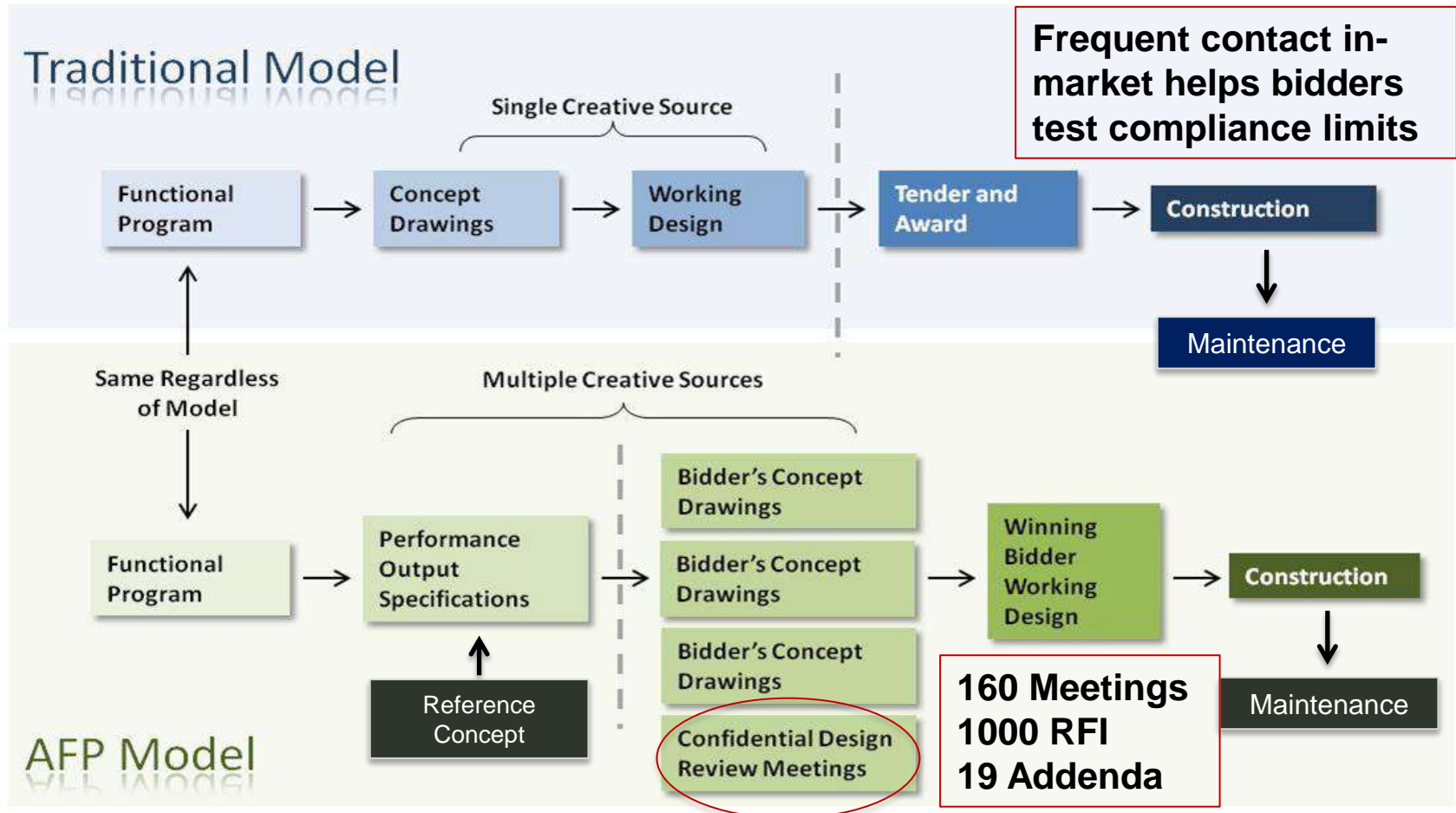
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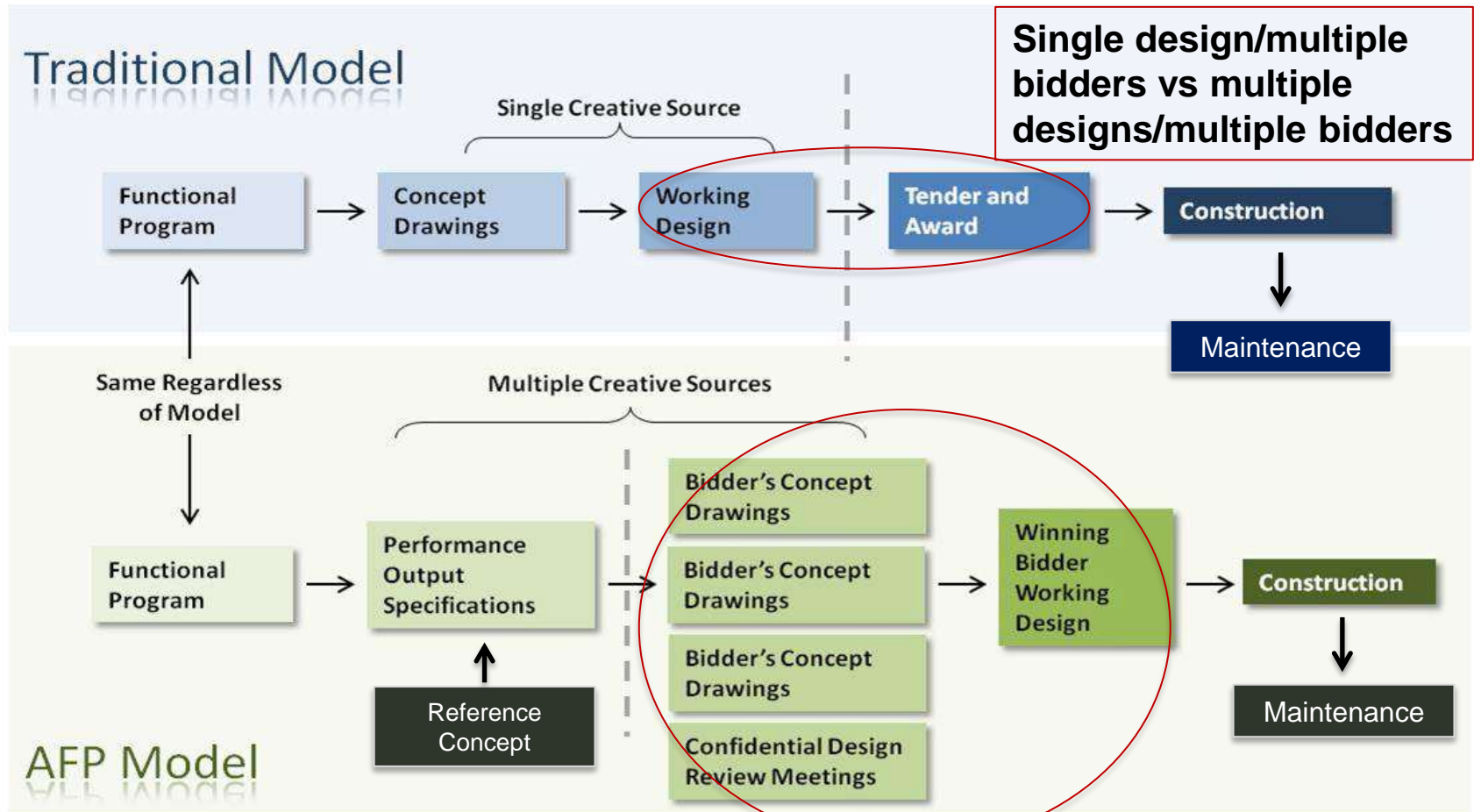
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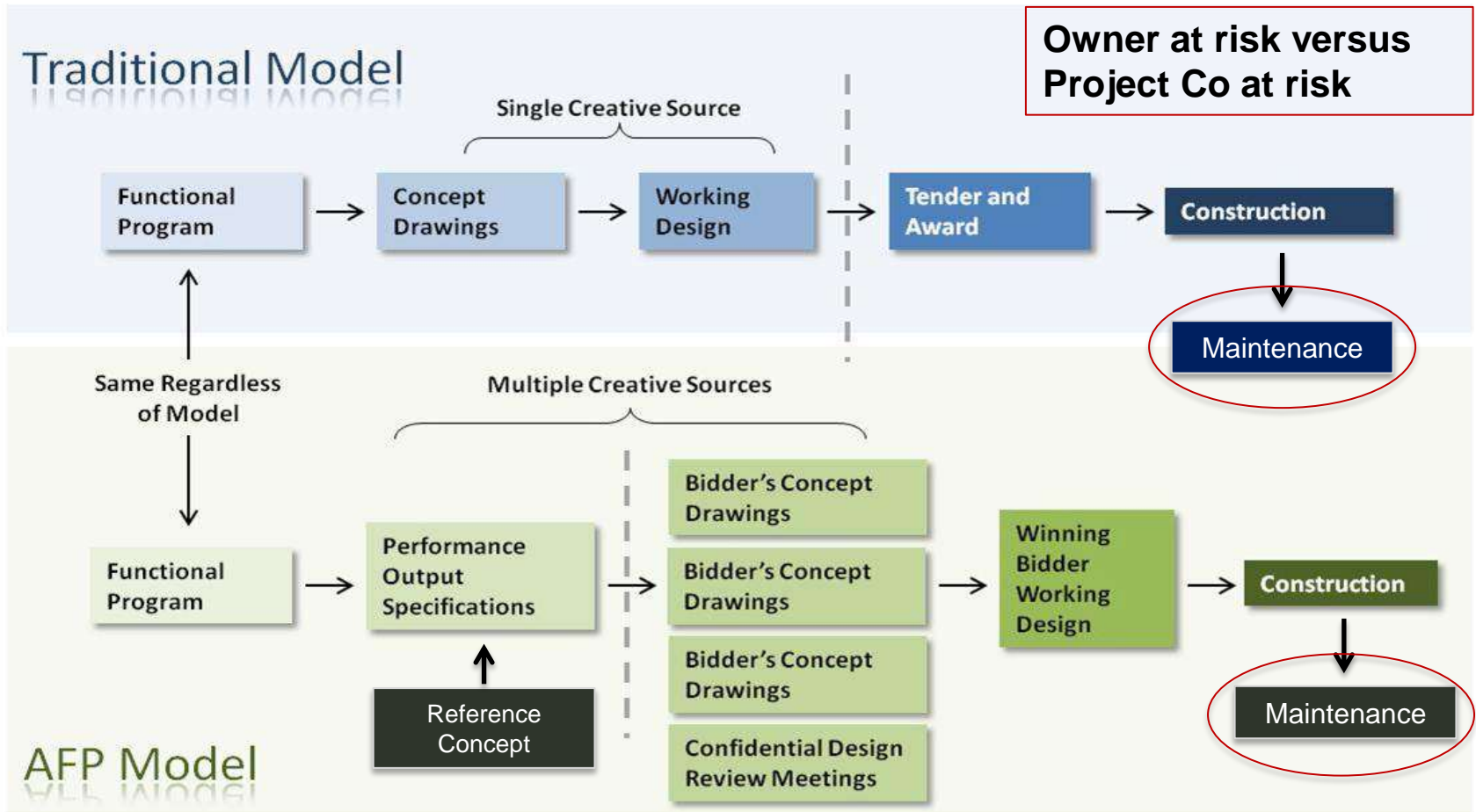
AFP – Driving Value and Quality in a DBFM



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AFP – Driving Value and Quality in a DBFM



Pulling the Pieces Together for Crosstown

- Integration risk transferred to AFP
 - Tunnels (DBB)
 - Vehicles (separate procurement)
 - Stations, systems, Maintenance Facility
 - Local transit authority operator
- Fully integrated private sector teams are best able to create clear accountability within highly complex design and construction projects
- Responsibility for overall integration, design, coordination, construction execution, cost escalation, schedule delays, maintenance, life cycle, financial risks

Principle for Success: Focus on Outcomes

- **Integrate as many elements into the AFP as possible**
 - In Ottawa, this meant not only tunnels and vehicles but also widening of the Hwy 417
 - For Eglinton, size and program wide imperatives saw tunnel work undertaken as early works and vehicles
- **Flexibility and openness to challenging assumptions**
 - In Ottawa, the alignment identified in the EA had to be abandoned enabling a shallower tunnel in City owned right of way
 - For Eglinton, fine tuning of risk transfer to assess best value proposition has required ongoing calibration
- **Silo-busting**
 - It can be easy to lose sight of the integrated whole and allow transfer of costs from the DBFM contractor to the public without ongoing vigilance
 - Optional Lands (or OLRT's Innovation Zone for the tunnel) is an example of an innovation that allows flexibility while protecting best value for taxpayer as a whole

Driving Quality over Time

- Affordability cap + 30 year maintenance term + design excellence + competitive tension
 - Drives decision-making around integration of design, construction and maintenance/lifecycle
- Affordability cap
 - Affordability cap + competitive tension encourage optimization of costs
- Design Excellence criteria ensure the Eglinton Crosstown will be built to a high standard of architecture, station finishes and overall quality
 - Drives initial design quality, then helps prevent sub-optimal decisions in respect of trading capital for operating

Driving Value Over Time

Energy Matters

- Provision to make sure that owner's energy costs are reflected in analysis of best price and lowest overall lifecycle cost
- Metrolinx pays >> AFP partner needs incentive to limit these costs
- Energy Matters rules:
 - push proponents to provide energy efficiency
 - reduce overall consumption
 - limit peak demand that drives power infrastructure costs
- Painshare and gainshare provision puts AFP partner at risk for achieving promised energy efficiency with incentive to improve from day one and throughout the 30 year concession period
- Some additional specified “green” enhancements:
 - LEED Silver certified maintenance and storage facility
 - green roofs mandated over 50% of building roof space

Driving Quality During Construction

Mobility Matters

- Mobility Matters deals with the owner's desire to minimize disruption to the city streets during construction
- Provides a financial incentive to select construction methods that minimize traffic changes and disruption
- Requires AFP partner to rent sections of road allowance from the public in their evaluated price
- Painshare and Gainshare requires accurate promises of lane closures at bid time and creates incentive to improve in the field

Driving Quality During Construction

Door Access Matters

- Owner must pay for compensation to businesses along the route for disruption caused by the build process
- Door Access Matters is an adjustment to the bid price to account for loss of sidewalks, delivery bays, parking lot entrances and access doors for businesses
- Closure of any private access is subject to a predictable rental fee that is then added to evaluation of price
 - Limits the total number of closures allowed in an absolute cap
- Failure to stay within the number of closures is subject to additional payments and exposure to liability to compensate affected party directly

Ensuring Quality During Construction

- **Enhanced Enforcement** tools have been built into contracts to further strengthen quality mechanisms
 - Encourages a “get it right the first time” culture
 - Provides flexible and fair set of penalties that can be applied in the event that quality problems occur during construction that are not being addressed by the contractor
 - Many assets out live concession period and so quality must be ensured in fundamental construction
 - Uses established reporting process; kicks in when AFP partner’s own QA process has failed
- **Private Capital at risk** = lender and lender technical advisor oversight
- Accountability for 30 year maintenance means they care about what they build

Ensuring Quality During Maintenance

- **Enforcement** tools have been built into contracts to ensure compliance with system availability and quality requirements during the maintenance term
- **Private Capital at risk** during the maintenance term = lender and lender technical advisor oversight on build quality and maintenance
- **Private Capital at risk** also means there is “skin in the game” that can be held back – debt and equity at risk as well as availability payments
- **Handover requirements** ensure the system is maintained to a certain standard at the end of the maintenance term

Conclusion

Food for thought:

- Value Engineering is an inherent component of AFP that is driven by accountability and risk transfer
- Staying focused on the “what” you want to achieve rather than the “how” of the delivery is key
- Apply Principles for Success: Sensible Integration, Openness to Challenge and Silo-busting
- Every project of this type is complex and has unique aspects
- Procurement teams need to think for themselves and resist slavish adherence to templates and precedent

Thank You



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