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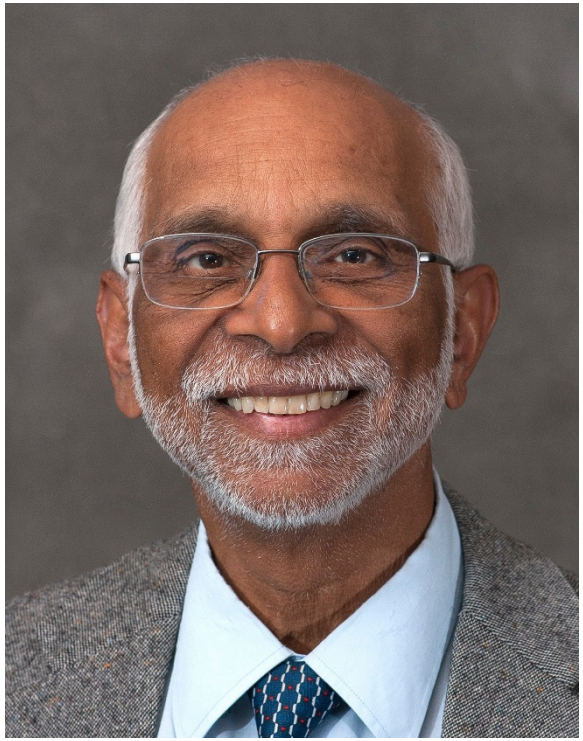
Public-Private Partnership Financial Viability Assessment using P3-VALUE 2.1

P3-VALUE Webinar on February 22, 2018

Pre-Requisite

- Pre-requisite: Webinar on FINANCIAL VIABILITY ASSESSMENT, March 21, 2016
- *Pre-requisite webinar presentations, recordings and transcripts are available on FHWA's web site at*: https://www.fhwa.dot.gov/ipd/p3/p3_training/webinars.aspx)

Instructors



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Webinar Outline

Part 1 Recap of P3 Evaluation and Financial Viability Assessment

Part 2 Introduction to P3-VALUE 2.1 Enhancements

Part 3 Illustrative Example Application for Financial Viability Assessment

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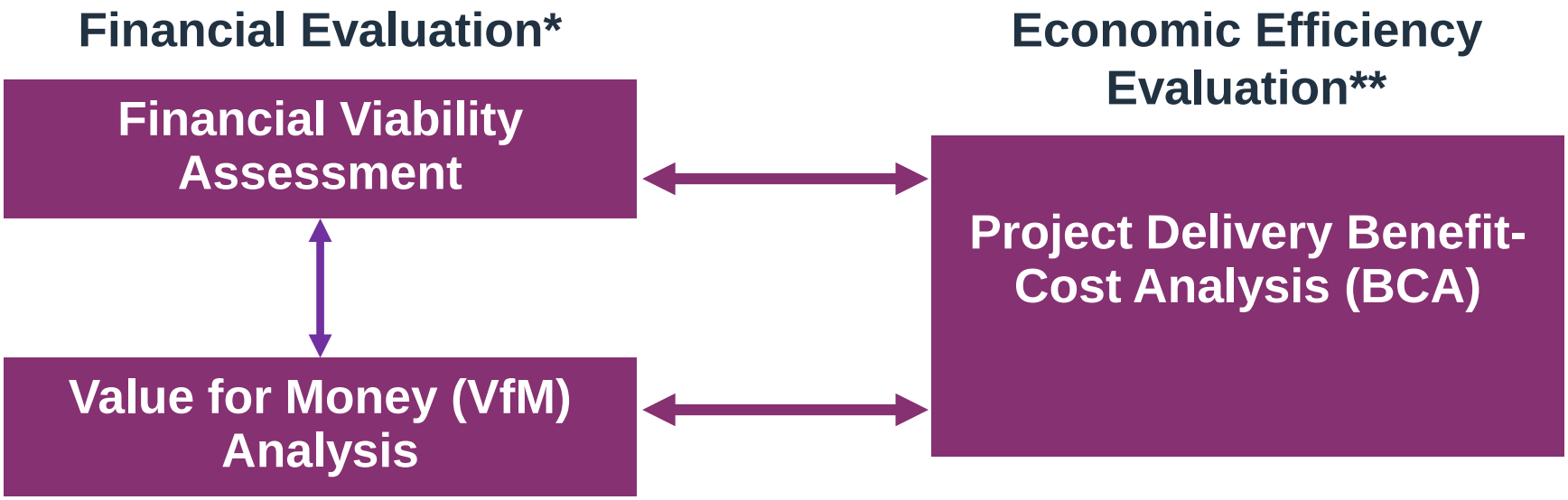
Part 1: Recap of P3 Evaluation and Financial Viability Assessment

P3-VALUE 2.1 Webinar

Types of Evaluation

- Project Evaluation:
  - Is the project worthwhile for society?
    - **Benefit-Cost Analysis (BCA)**
- Project Delivery Evaluation:
  - Is the project financially viable under conventional or P3 delivery?
    - **Financial Viability Analysis**
  - Would P3 procurement add value relative to conventional procurement, and which P3 option would add most value?
    - **Value for Money (VfM) and/or project delivery BCA**

Project Delivery Evaluation



* Cash flow analysis

** Net economic benefits excludes transfers and financing cash flows

Financial vs. Economic Evaluation

- **Financial Evaluation**
  - Considers financial elements only, i.e., “cash flows”
  - Perspective is that of the procuring agency

- **Economic Efficiency Evaluation**
  - Considers full range of costs and benefits to society
  - Perspective is that of society as a whole

Timing of Evaluation

1. Planning

- *Project* benefit-cost analysis
- High level screening for financial viability and VfM

2. Project Development

- Quantitative assessment of financial viability and VfM of *project delivery* method

3. Procurement

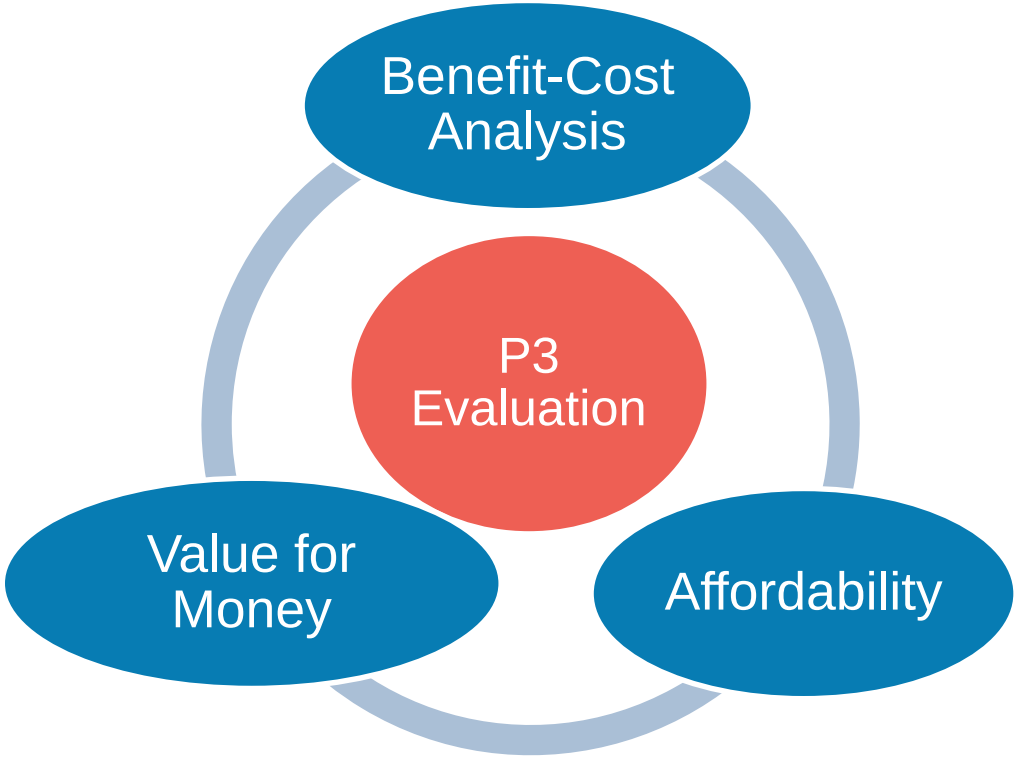
- Refine financial and VfM analyses as cost and revenue estimates are refined and bids are received

High-Level P3 Screening

- P3-SCREEN qualitative assessment:
  - Project characteristics
  - Legal framework
  - Institutional capacity
  - Market interest
- P3-VALUE 2.1 quantitative analysis:
  - Use simplified input sheet
  - For very early stage of project development

Detailed P3 Evaluation

- Technical Studies
  - Traffic and revenue
  - Cost estimates
  - Risk assessment
  - Financial viability
  - VfM and BCA
- Market outreach
  - Market analysis
  - Market outreach



Financial Model

Sources of Funds

- Equity & debt
- Pubic agency contributions
- Toll revenues

Uses of Funds

- Capital expenses
- Operating expenses

P3-VALUE 2.1

- Sizing of debt and equity
- Required additional public funding or concession fee
- Impact of alternative revenue, financing and cost scenarios

Key Metrics for Public Agency

- Concession fee – for “revenue positive” projects
- Required public contribution – for “revenue negative” projects
- Concession terms:
  - Length of concession term
  - Toll rates

Key Metrics for Financiers

- Debt service coverage ratio (DSCR)
- Gearing or leverage (debt/equity ratio)
- Equity IRR = Equity Internal Rate of Return

For More Information

FHWA's ***Financial Structuring and Assessment for Public-Private Partnerships: A Primer*** at:

https://www.fhwa.dot.gov/ipd/pdfs/p3/p3_primer_financial_assessment_1213.pdf

FHWA's ***Guidebook on Financing of Highway Public-Private Partnership Projects*** at:

https://www.fhwa.dot.gov/ipd/pdfs/p3/p3-toolkit_p3_project_financing_guidebook_122816.pdf

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Part 2: Introduction to P3-VALUE 2.1 Enhancements

P3-VALUE 2.1 Webinar

What is P3-VALUE 2.1?

- An analytical tool
- Educational
- Quantitative screening

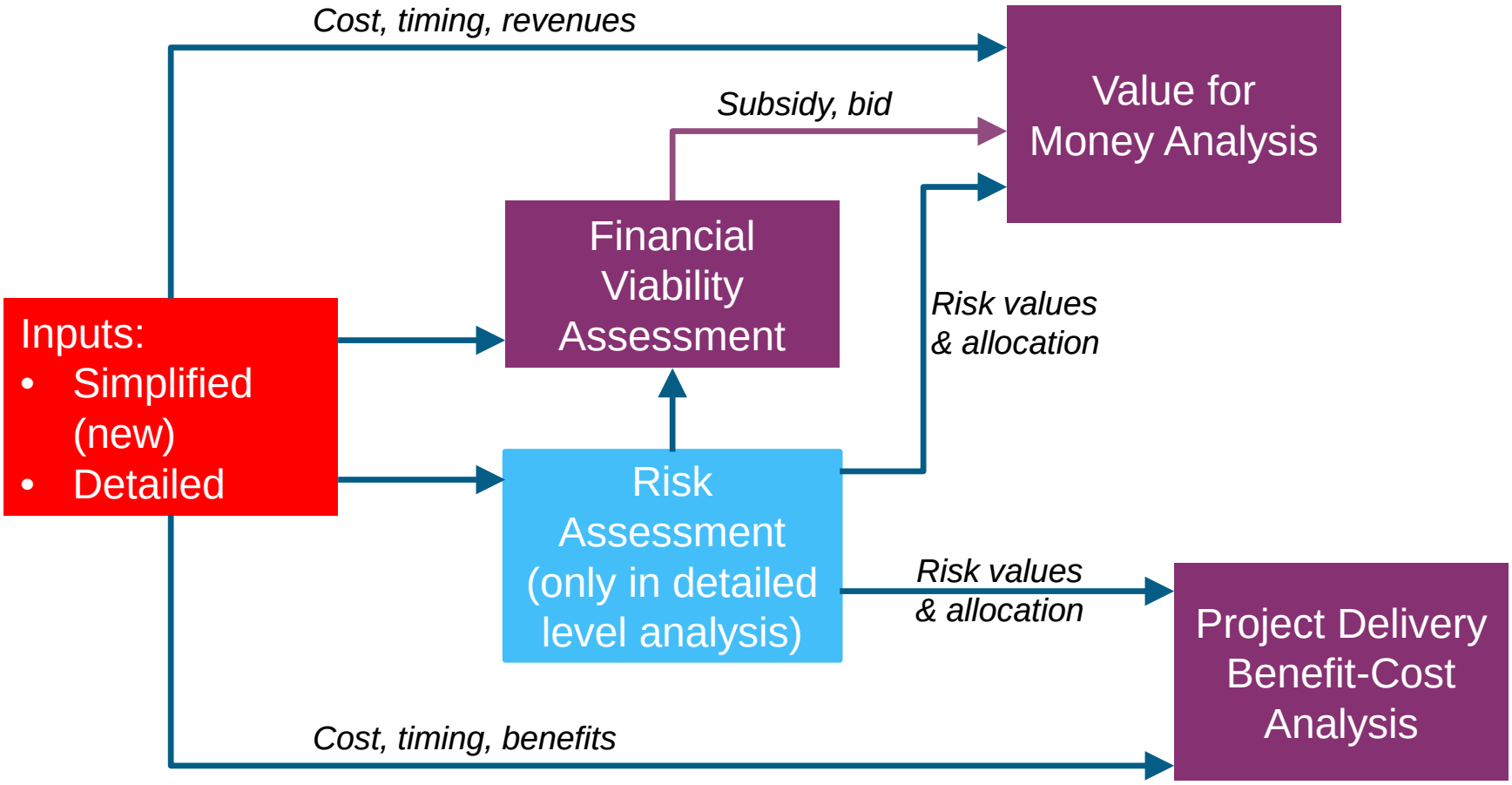
Tool and References

P3-VALUE 2.1 Excel Spreadsheet

User Guide, Quick Start Guide, FAQs

Primers & Guidebooks

P3-VALUE 2.1 Tool Structure



P3-VALUE 2.1 Enhancements

- Single simplified input sheet
  - Reviewed in today's webinar
- Transparent output for value for money analysis
  - Reviewed in webinar on March 22
- Benefits from ridesharing (carpools and transit) included in benefit-cost analysis
  - Reviewed in webinar on April 26

- Please stand by while we open the P3-VALUE 2.1 tool to show the enhanced features

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Part 3: Illustrative Example of Financial Viability Assessment

P3-VALUE 2.1 Webinar

Study Background

A study was done previously by a state DOT to estimate financial viability of conventional and P3 delivery for a highway project. The various inputs required for the analysis are included in the P3-VALUE 2.1 spreadsheet model.

Project Information

- 20 miles highway expansion, from 3 lanes to 5 lanes in each direction
  - 3 General Purpose Lanes (GPL); 2 new Managed Lanes (ML)
- Costs under PSC (including contingencies for risks):
  - Pre-construction $25M
  - Construction: $400M
  - Routine O&M: $4M per year
  - Major maintenance: $10M every 8 years
- Timing:
  - Preconstruction start: 2018 (2 years duration)
  - Construction duration: 4 years for PSC, 3 years for P3
  - Concession term: 46 years
  - Delay in start under PSC 5 years

DELIVERY, TIMING, COST & FINANCING INPUTS

Project Delivery Inputs	PSC	P3
Facility tolled?	TRUE	
P3 delivery model		Toll concession

Project Timing Inputs	PSC	P3
Pre-construction start year	2018	2018
Pre-construction duration (in years)	2 years	2 years
Construction duration (in years)	4 years	3 years
Operations duration (in years)	40 years	41 years
Delayed PSC pre-construction start year	2023	

Capital Cost Inputs (Risk Adjusted)*	PSC	P3*	
Public procurement cost (in million $)	$5.0M	$10.0M	0%
Private procurement cost (in million $)	$5.0M	$10.0M	100%
Pre-construction cost (in million $)	$25.0M	$22.5M	100%
Construction cost (in million $)	$400.0M	$367.5M	100%

DELIVERY, TIMING, COST & FINANCING INPUTS (CONTD.)

Operational Cost Inputs (Risk Adjusted)*	PSC	P3*	
Annual routine O&M cost (in million $/year)	$4.0M	$3.6M	100%
Major maintenance cost (in million $)	$10.0M	$9.0M	100%
Major maintenance frequency (in years)	8 years	8 years	
No Build annual O&M cost (in million $/year)	$10.0M		

Key Financial Levers

- **Public funding contribution (if any)**
- **Revenue:** Toll rates
- **Debt terms:**
  - Debt Service Coverage Ration (DSCR)
  - Debt maturity
  - Interest rate
- **Equity requirements (for P3):**
  - Gearing (debt/equity ratio)
  - Rate of return (Equity IRR)
- **Other:**
  - Tax Rates (for P3)
  - Indexation

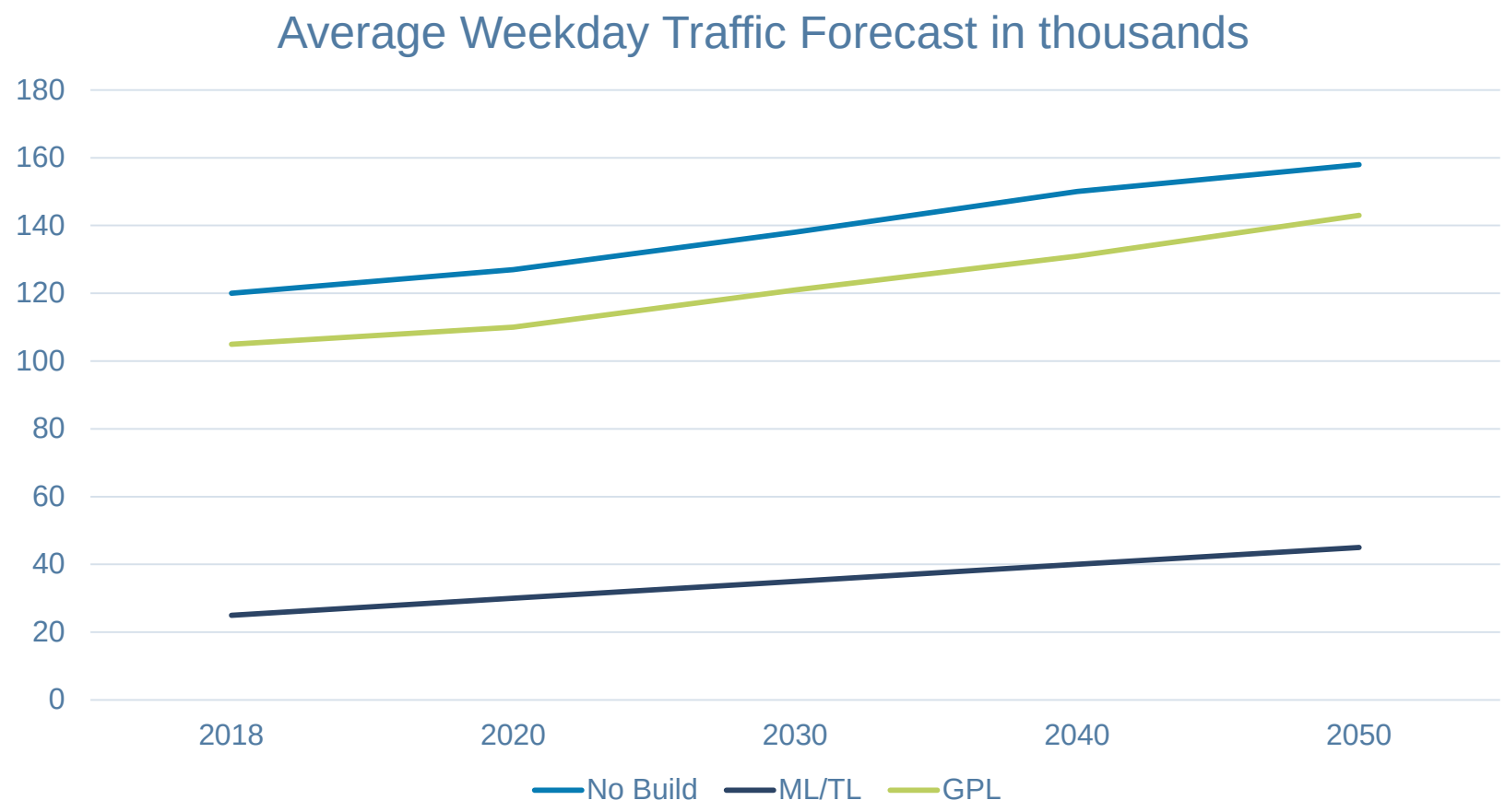
Financing Inputs for Toll Concession

Financing Inputs	PSC	P3
Subsidy/milestone payment (in million $)	$100.0M	$100.0M
Cost of equity (in percent)		**12.00%**
Gearing (in percent)		**75.00%**
Debt maturity (from start construction, in years)	35 years	30 years
Debt interest rate (in percent)	4.00%	6.00%
Equity bridge loan interest rate (in percent)		6.00%
Minimum required DSCR (multiple of debt service)	1.30x	**1.30x**
Interest rate on reserves (in percent)	2.00%	2.00%
Debt issuance/arrangement fee (in percent)	1.00%	1.00%

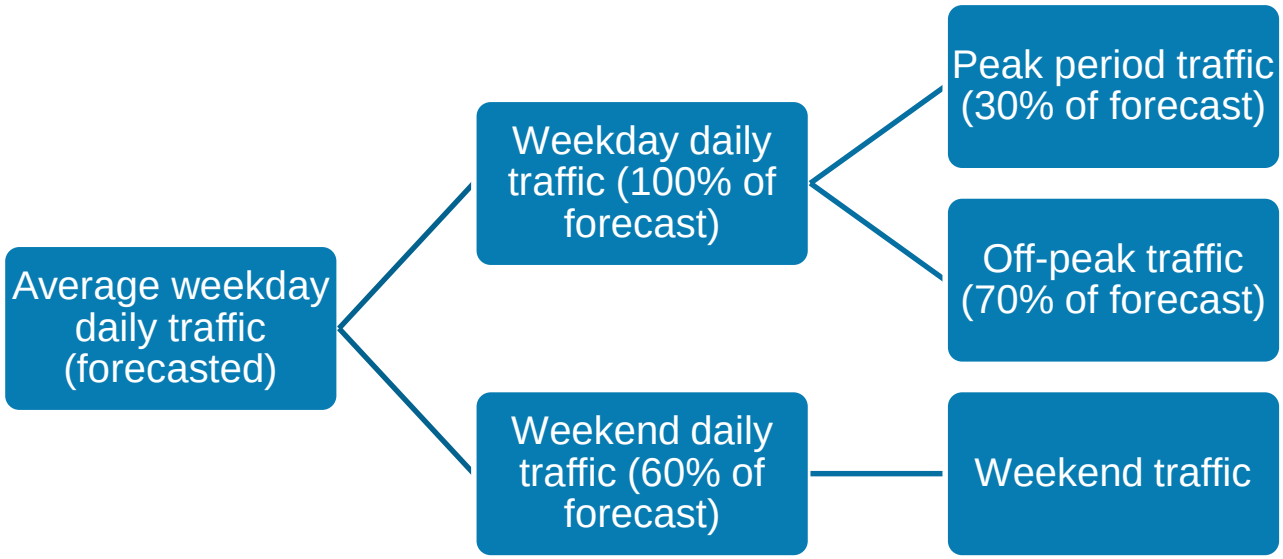
Financing Inputs for Availability Payment Concession

Financing Inputs	PSC	P3
Subsidy/milestone payment (in million $)	$100.0M	$100.0M
Cost of equity (in percent)		**10.00%**
Gearing (in percent)		**85.00%**
Debt maturity (from start construction, in years)	35 years	30 years
Debt interest rate (in percent)	4.00%	6.00%
Equity bridge loan interest rate (in percent)		6.00%
Minimum required DSCR (multiple of debt service)	1.30x	**1.20x**
Interest rate on reserves (in percent)	2.00%	2.00%
Debt issuance/arrangement fee (in percent)	1.00%	1.00%

Traffic Forecast

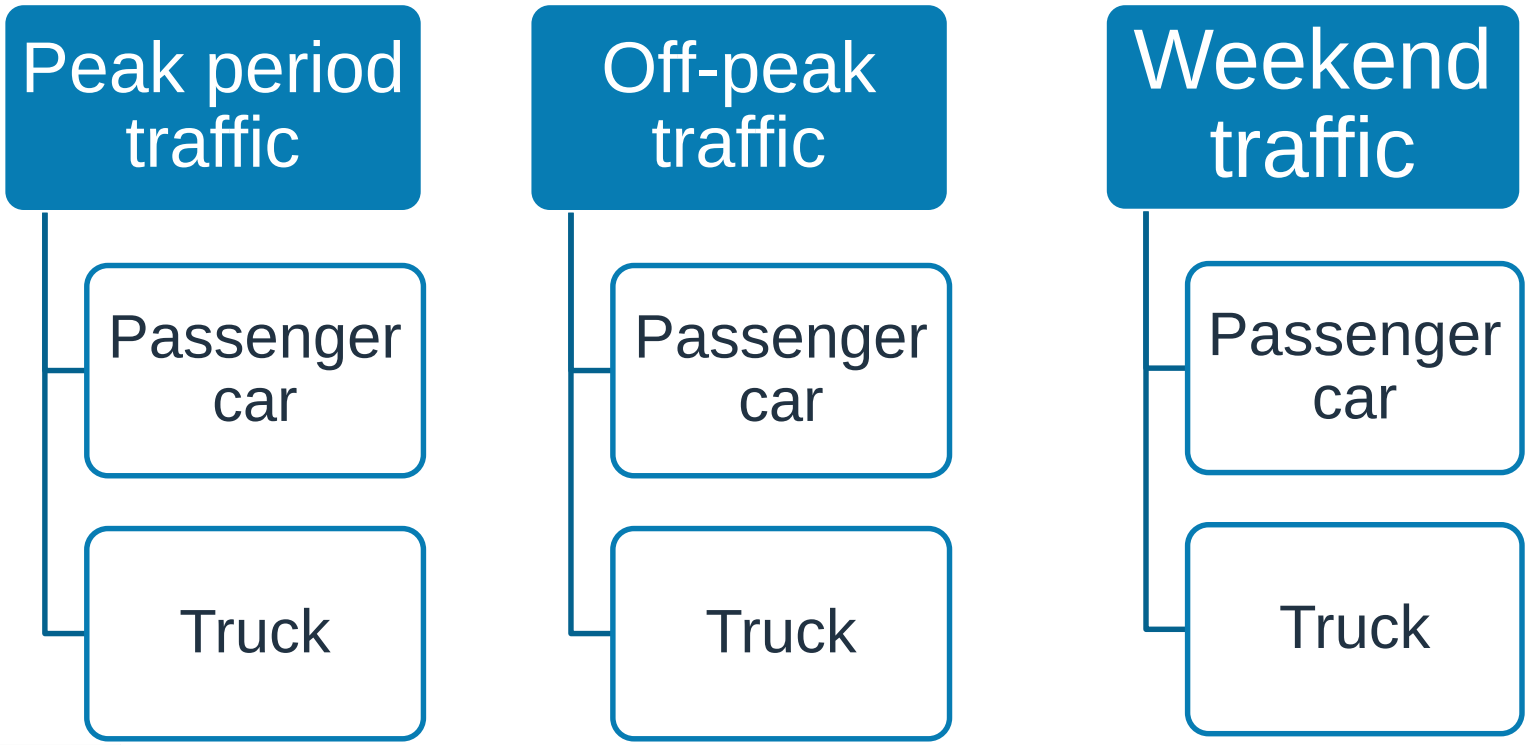


Breakdown of No Build, ML and GPL Traffic Forecasts into Time Periods



Breakdown of Build, ML and GPL Traffic Forecasts by Mode

Toll rates vary by time period and vehicle type



TRAFFIC & TOLL INPUTS

Bidirectional P50 Traffic Inputs	Year	No Build	ML/TL	GPL
Weekday daily traffic in model start year (in thousands)	2018	120k	25k	105k
Weekday daily traffic in input year 2 (in thousands)	2020	127k	30k	110k
Weekday daily traffic in input year 3 (in thousands)	2030	138k	35k	121k
Weekday daily traffic in input year 4 (in thousands)	2040	150k	40k	131k
Weekday daily traffic in input year 5 (in thousands)	2050	158k	45k	142k
Annual traffic growth after last input year (in percent)	> 2050	0.50%	1.00%	0.50%

Toll Inputs	No Build	ML/TL	GPL
Passenger car toll rate - Weekday peak (in dollars)	$0.00	$4.00	$0.00
Passenger car toll rate - Weekday off-peak (in dollars)	$0.00	$2.00	$0.00
Passenger car toll rate - Weekend (in dollars)	$0.00	$2.00	$0.00
Truck/bus axle toll rate - Weekday peak (in dollars)	$0.00	$6.00	$0.00
Truck/bus axle toll rate - Weekday off-peak (in dollars)	$0.00	$4.00	$0.00
Truck/bus axle toll rate - Weekend (in dollars)	$0.00	$4.00	$0.00

TRAFFIC & TOLL INPUTS INPUTS (CONTD.)

Traffic Characteristics, Share & Speed Inputs	No Build	ML/TL	GPL
No. of lanes per direction	3 lanes	2 lanes	3 lanes
Unidirectional peak traffic percentage (% of total traffic)	30%	30%	30%
Weekend traffic (% of weekday traffic)	60%	60%	60%
Passenger car percentage - Peak (% of total traffic)	95%	100%	95%
Passenger car percentage - Off-peak (% of total traffic)	90%	100%	90%
Passenger car percentage - Weekend (% of total traffic)	95%	100%	95%
Highway free flow speed - Passenger car (in mph)	65 mph	70 mph	70 mph
Highway free flow speed - Truck/bus (in mph)	60 mph	65 mph	65 mph

Ramp-Up & Other Inputs	
Ramp-up starting traffic (% of post-ramp up traffic)	50%
Ramp-up period duration (in years)	5 years
Toll revenue leakage (in percent)	1.00%
Segment length (in miles)	20 miles
No. of unidirectional peak hours in a day (during AM, PM or combined)	3 hours
No. of unidirectional off-peak hours in a day	15 hours

Tax Inputs

Taxation Inputs	State	Federal
Tax rate (in percent)	10.00%	25.00%
Tax considered for competitive neutrality adjustment?	TRUE	TRUE

Indexation Inputs

Indexation Inputs	
Indexation and NPV base year	2018
Indexation rate for construction, operations, tolls & subsidy (in percent)	2.00%
Indexation rate for availability payments (in percent)	0.50%
Nominal discount rate (in percent, used for VfM)	4.00%
Real discount rate (in percent, used for BCA)	2.00%

Review of Model Outputs

1. Conventional Delivery
2. Toll Concession
3. Availability payment Concession

Financial Feasibility of Conventional Delivery

Conventional Delivery - Debt service coverage ratio	Ratio	Unit
Average calculated DSCR	1.30	ratio
Minimum calculated DSCR	**1.30**	ratio
Minimum calculated vs. minimum required DSCR alert	-	alert

Conventional Delivery - Sources of funding and financing	Amount	
Debt amount	$363M	
Subsidy/milestone payment	**$103M**	
Additional required subsidy	**$38M**	
Total sources of funding and financing	***$504M***	

Financial Feasibility of Toll Concession

P3 - Debt service coverage ratio	Ratio	Unit
Average calculated DSCR	1.63	ratio
Minimum calculated DSCR	**1.63**	ratio
Minimum calculated DSCR vs. required DSCR alert	-	alert

P3 - Sources of funding and financing	Amount
Debt amount	$260M
Subsidy/milestone payment to Developer	**$102M**
Additional required subsidy to Developer	$1M
Equity contribution	$87M
Total sources of funding and financing	***$449M***

P3 - Financial outputs	Value	Unit
Pre-tax equity IRR	**12.00%**	% p.a.
Post-tax equity IRR	10.35%	% p.a.
Pre-tax P3 WACC	8.88%	% p.a.
Post-tax P3 WACC	7.99%	% p.a.
Additional required subsidy from Agency (if applicable)	**$1M**	
Concession fee to Agency (if applicable)		
Annual availability payment (if applicable)		
Interest capitalized during operations? (Yes, No)	Yes	text
No. of years interest is capitalized during operations	5	years
Maximum outstanding debt	$270M	
Maximum debt-to-equity ratio*	**75.71%**	%

Financial Feasibility of Availability Payment Concession

P3 - Debt service coverage ratio	Ratio	Unit
Average calculated DSCR	1.22	ratio
Minimum calculated DSCR	**1.22**	ratio
Minimum calculated DSCR vs. required DSCR alert	-	alert

P3 - Sources of funding and financing	Amount
Debt amount	$304M
Subsidy/milestone payment to Developer	$102M
Additional required subsidy to Developer	-
Equity contribution	$54M
Total sources of funding and financing	***$459M***

P3 - Financial outputs	Value	Unit
Pre-tax equity IRR	**10.00%**	% p.a.
Post-tax equity IRR	7.50%	% p.a.
Pre-tax P3 WACC	7.43%	% p.a.
Post-tax P3 WACC	6.66%	% p.a.
Additional required subsidy from Agency (if applicable)		
Concession fee to Agency (if applicable)		
Annual availability payment (if applicable)	**$34M**	
Interest capitalized during operations? (Yes, No)	No	text
No. of years interest is capitalized during operations	-	years
Maximum outstanding debt	$304M	
Maximum debt-to-equity ratio*	**85.00%**	%

FHWA P3 Webinars

- Prior webinar presentations, recordings and transcripts are available at: https://www.fhwa.dot.gov/ipd/p3/p3_training/webinars.aspx)
- Upcoming webinar topics:
  - **March 22**: P3 Value for Money Assessment using P3-VALUE 2.1
  - **April 26**: P3 Benefit-Cost Analysis using P3-VALUE 2.1
- Pre-registration is required for these webinars. You will need to register separately for each webinar. Please register at: https://www.eventbrite.com/e/p3-value-21-webinars-registration-42478716986

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