Sketch-level T&R Study for Hood River Bridge
Hood River, Oregon

February 19, 2019

Stantec

Agenda

T&R 101

1. Levels of T&R Studies
2. Bond Financing
3. Parties Involved in Bond Sale

Hood River Bridge T&R Analysis

1. Scope
2. Modeling Approach
3. Data Collection
4. Spreadsheet Model
5. T&R Forecasts
6. Questions

1. What are the different levels of T&R studies?

Sketch Level Study

- Levels of Study
  - Sketch
  - Level I
  - Level II
  - Level III – “Investment Grade”
- Often referred to as “back-of-the-envelope” analysis
- Performed at a very high level
- Generally utilizes already available data
- Used only as a guidance to assess need for more detailed studies
- Followed by policy-specific analysis sensitive to
  - Toll-rates
  - Shares of electronic payment and cash/video customers
  - Costs associated with AET

Level 1 Study

- Slightly more detailed analysis than sketch-level analysis
- Helps assess project-viability early on
- Generally performed for newly proposed toll facilities
- Involves site reconnaissance and some additional data-gathering
- Final output: a short report or technical memorandum summarizing the findings

Level 2 Study – Can be Used for Financing

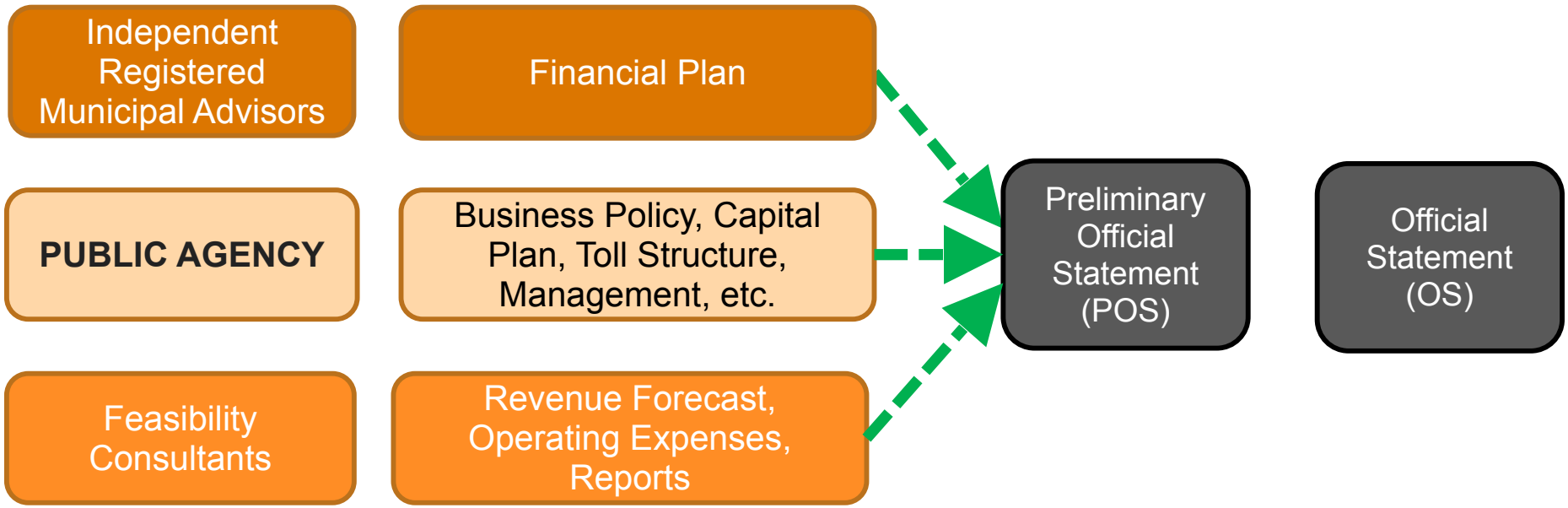
- Usually conducted when a Level 1 study deems a toll-project viable
- Involves more extensive site-visits, data-collection efforts, and use of a travel model
- Supported by a team of sub-consultants and/or local sub-contractors
- Final output: a detailed report on the assumptions and findings of the study, including sensitivity analyses to build a range of traffic and revenue forecasts reflecting the impact of changes in tolling assumptions
- In some situations, Level 2 reports can be taken to financing

Level 3 – Often Called Investment Grade Study

- Most comprehensive traffic and revenue study
- Typically involves large amounts of data collection, development of a forecasting model and extensive analysis of economic factors not considered in other levels of study
- Often confused with “Investment Grade Rating”
- Investment grade study does not guarantee investment grade rating of bonds
- T&R forecast is only one of the several factors considered by a rating agency
- Personally prefer comprehensive study because it defines level of effort

2. What are the pieces that go into a bond sale?

Pieces of a Municipal Bond Sale



Purpose of Bond Sales:

- Typically used to raise capital for highway and bridge projects
- May be used to refinance old debt to lower cost of borrowing
- May be used for other purposes using revenues from toll authority
  - Mass transit in NYC; Off Turnpike projects in Ohio, etc.

Pieces of a Municipal Bond Sale

- Project Goals – Capital Plan
- Toll Policy and Business Rules
- Toll Traffic and Gross Revenues
- Fee Revenues
- Operating Expenses
- Finance Plan
- Management
- Legislative / Legal Authority

For the rating agencies, it is all about correctly accounting for the RISK.

Ratings

- Multi – asset
- Legacy
- Well Managed

- Greenfield
- Concession
- High Risk

S&P		Moody's		Fitch		rating description
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term	
AAA	A-1+	Aaa	P-1	AAA	F1+	Prime
AA+		Aa1		AA+		High grade
AA		Aa2		AA		
AA-		Aa3		AA-		
A+	A-1	A1		A+	F1	Upper medium grade
A		A2		A		
A-	A-2	A3	P-2	A-	F2	
BBB+		Baa1		BBB+		Lower medium grade
BBB	A-3	Baa2	P-3	BBB	F3	
BBB-		Baa3		BBB-		
BB+	B	Ba1	Not prime	BB+	B	Non-investment grade speculative
BB		Ba2		BB		
BB-		Ba3		BB-		
B+		B1		B+		Highly speculative
B		B2		B		
B-		B3		B-		
CCC+	C	Caa1		CCC	C	Substantial risks
CCC		Caa2				Extremely speculative
CCC-		Caa3				Default imminent with little prospect for recovery
CC		Ca				
C						
D	/	C		DDD	/	In default
		/		DD		
		/		D		

Ratings – S&P's

Mid-Bay Bridge Authority	Mid-Bay Bridge	FL	BBB (second lien)	Stable
New Hampshire	New Hampshire Turnpike	NH	A+	Stable
New Jersey Turnpike Authority	New Jersey Turnpike	NJ	A+	Stable
New York State Bridge Authority	New York State Bridge Authority	NY	AA-	Stable
New York State Thruway Authority	New York State Thruway	NY	A	Stable
New York State Thruway Authority	New York State Thruway	NY	A- (second lien)	Stable
Niagara Falls Bridge Commission	Niagara Falls Bridges	NY	A+	Stable
North Carolina Turnpike Authority	Triangle Expressway	NC	BBB-	Stable
North Texas Tollway Authority	North Texas Tollway	TX	A	Stable
North Texas Tollway Authority	North Texas Tollway	TX	A- (second lien)	Stable
North East Texas Regional Mobility Authority	North East Texas Regional Mobility Authority	TX	BBB	Stable
North East Texas Regional Mobility Authority	North East Texas Regional Mobility Authority	TX	BBB- (second lien)	Stable
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike	OH	AA-	Stable
Ohio Turnpike and Infrastructure Commission	Ohio Turnpike	OH	A+ (second lien)	Stable
Oklahoma Turnpike Authority	Oklahoma Turnpike	OK	AA-	Stable
Orange County Transportation Authority	Orange County Transportation Authority (SR-91)	CA	AA-	Stable
Osceola County	Osceola County	FL	BBB-	Stable
Pennsylvania Turnpike Commission	Pennsylvania Turnpike	PA	A	Stable
Pennsylvania Turnpike Commission	Pennsylvania Turnpike	PA	A- (second lien)	Stable
Rhode Island Turnpike and Bridge Authority	Rhode Island Turnpike and Bridge Authority	RI	A-	Stable
Richmond Metropolitan Authority	Richmond Metropolitan Authority	VA	A+	Stable
Riverside County Transportation Commission	Riverside County Transportation Commission (SR-91)	CA	BBB-	Stable

February 8, 2017

standardandpoors.com/ratingsdirect

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Simple Toll Revenue Financing

Capital Cost Considerations (Why Borrowing)	• Cost of Bridge • Cost of Toll Collection • Cost of Back Office
Revenue Considerations	• Toll Rates • Fees and Fines • Concession & Other Revenues
Operating Cost Considerations	• Cost of Maintaining Roadway • Cost of Maintaining Toll Equipment • Cost to Collect Tolls

Simple Toll Revenue Financing

Capital Cost

- Construction of New Roadway
- Structures and Support Buildings
- Equipment
- Computers, Collection Equipment and Software
- In some cases transponders

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Simple Toll Revenue Financing

Revenue

- Total Revenues
  - Cash Coins
  - Transponder
  - Video Toll
- Other Revenues
  - Concessions
  - Fees / Fines
  - Interest on Deposit
  - Other revenue-generating activities

Remember to set your tag to the 2 or 3+ position to show your carpool status and travel free.

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Simple Toll Revenue Financing

Operating Costs

- Roadway O&M
  - Plowing
  - Painting / maintenance
  - Repairs
- Back Office
  - Call-center
  - Mailings
  - Credit card fees
- Staff
  - Administrative
  - Police
  - Utilities
  - Benefits
  - Insurance

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Simple Toll Revenue Financing

Debt Service

Payments towards funds that were obtained through a bond sale
Combination of interest and principal

- Interest
  - Agreed to rate that money is borrowed at
- Principal
  - Payments against the actual money borrowed
- Tax Status
  - Tax-free and taxable bonds
- Senior and junior Bonds

Debt Service Coverage

Similar to Mortgage

- Operating Costs - Must have money to maintain the facility
- Net Revenue - Must have money in excess of debt service payments after maintaining the facility
- Coverage – Monies remaining after paying for maintenance
- Debt Service Coverage Ratio – Net Revenue divided by Debt Service

Simple Calculation

Total Revenue	
Tolls, Fees, Fines	$5,000,000
Less operating costs	
Bridge, collection, back-office	$3,800,000
Equals	
Net revenue	$1,200,000
Debt Service	$1,000,000
Net Revenue divided by Debt Service	
Coverage ratio	1.2

Coverage Calculator

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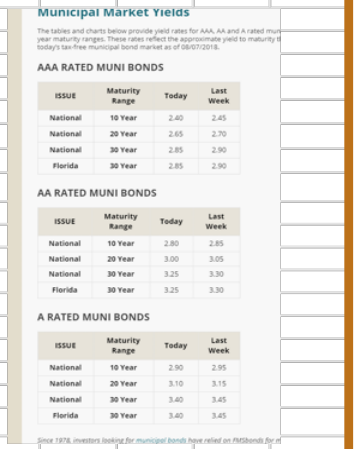
Financing Estimating Tool

Note: This is only an informational tool. It is not intended to offer financial advice or to be a recommendation of any kind. Stantec is not acting as an Independent Registered Municipal Advisor.

CAPITAL COSTS		
Roadway/Bridge		$ 25,000,000
Toll Collection		$ 2,500,000
Back Office		$ 1,000,000
TOTAL CAPITAL		$ 28,500,000
Capital Contribution		$ (1,500,000)
NET CAPITAL FUNDING REQUIRED		$ 27,000,000
FINANCING		
Interest Rate (annual %)	3.45%	
Term (yrs)	30	
Annual Debt Service		$ (1,458,844)
Reserve Requirement (yrs)	1	
Capitalize Interest (yrs)	3	
Cost of Issuance	2%	
Actual Amount Financed		$ 33,375,376
ANNUAL DEBT SERVICE		$ (1,803,314)
TRANSACTONS		
Total Transactions		5,475,000
Percentage Transponder	80%	$ 4,380,000
Percentage Image	20%	$ 1,095,000
PLEDGED REVENUES		
Avg. Toll	$1.00	$ 5,475,000
Surcharges/Fees	$0.50	$ 547,500
Fines		$ -
Other Pledged Revenues		$ -
TOTAL REVENUE		$ 6,022,500
OPERATING COSTS		
Roadway/Bridge		$ 1,000,000
Admnistrative		$ 500,000
Toll Collection	$0.10	$ 438,000
	$0.15	$ 164,250
Back Office	$0.05	$ 219,000
	$1.00	$ 1,095,000
Credit Card	2.50%	$ 150,563
TOTAL OPERATING COSTS		$ 3,566,813
DEBT SERVICE COVERAGE		
TOTAL REVENUE		$ 6,022,500
TOTAL OERATING COSTS		$ 3,566,813
NET REVENUE		$ 2,455,688
DEBT SERVICE		$ 1,803,314
COVERAGE RATIO		1.36

Normally 1.5 - 2.0

New Greenfield 1.75 - 2.25



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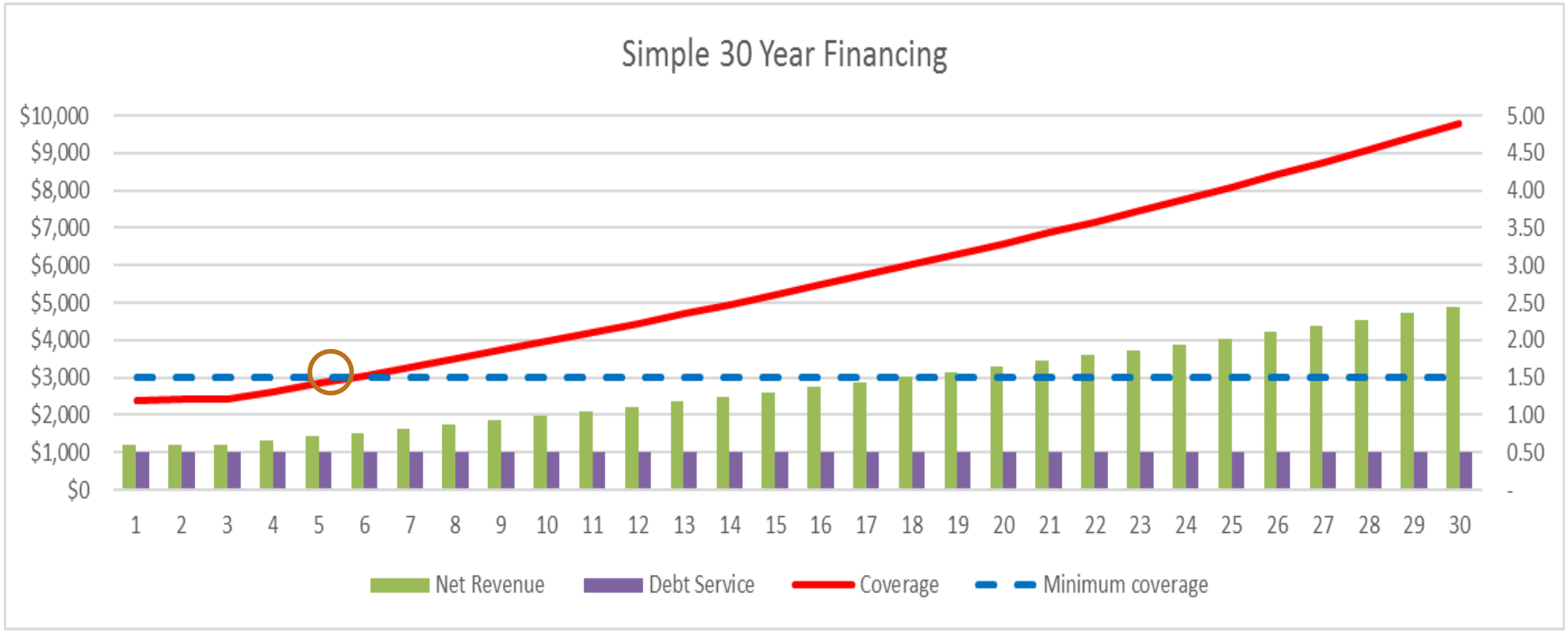
Coverage Analysis - 30 years

Trust Agreement Requires 1.5 Debt Service Coverage Ratio



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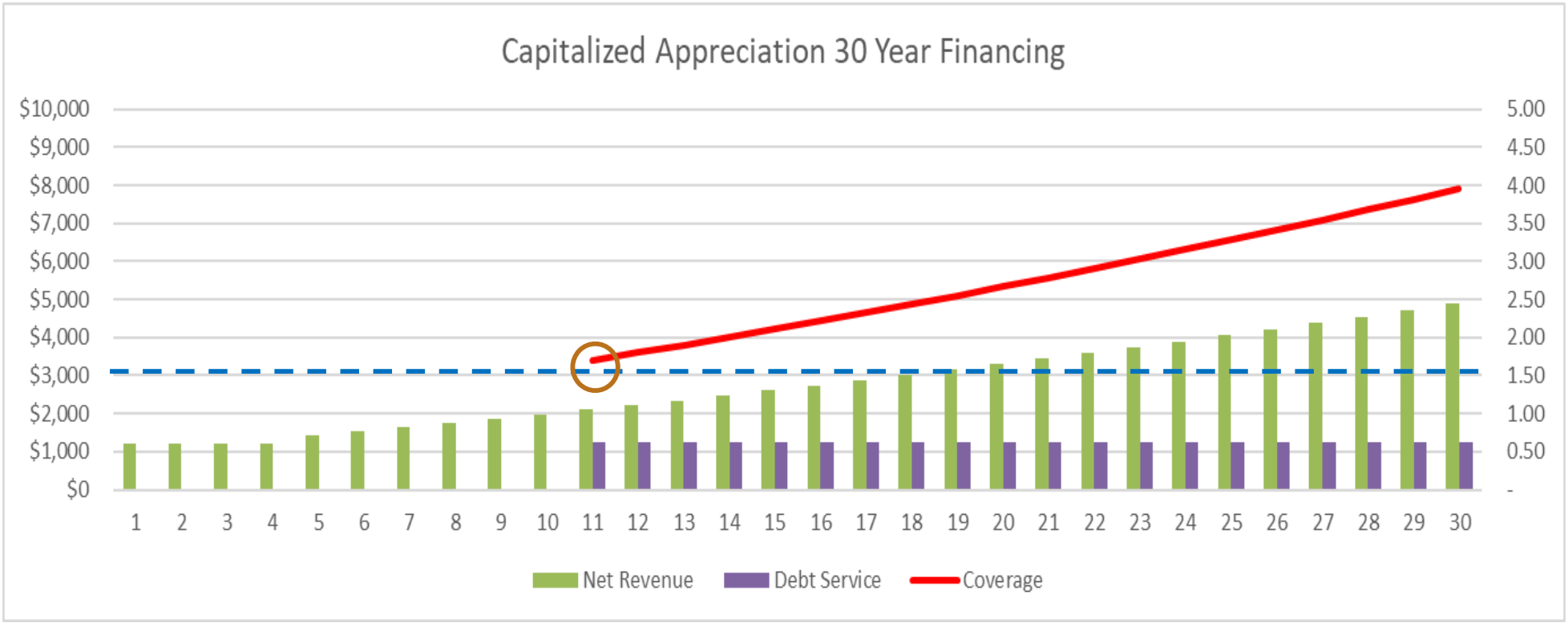

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Actual Bonds from Recent Bond Sale

From actual bond

- Series of bonds
- All designed to meet the needs of the capital projects
- Toll policy
- The market place for the bonds
- And the Debt Service Coverage Ratio

New York State Thruway Authority
General Revenue Junior Indebtedness Obligations
Series 2016A

MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, YIELDS AND CUSIP NUMBERS

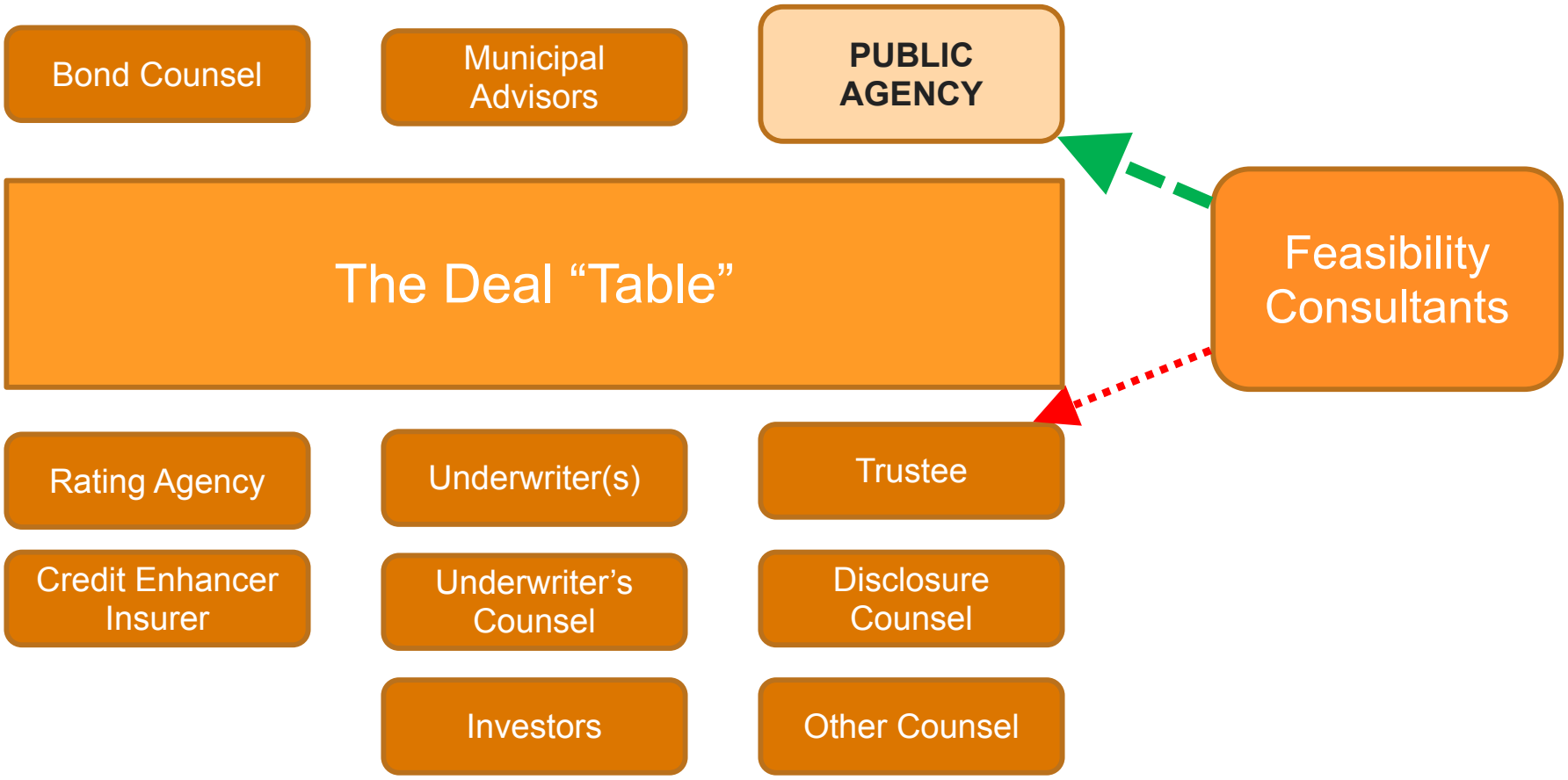
$190,665,000 Serial Bonds

Due January 1	Principal Amount	Interest Rate	Yield	CUSIP Number† (Base # 650010)
2021	$ 250,000	3.00%	1.13%	AE1
2022	250,000	4.00	1.30	AF8
2023	250,000	4.00	1.46	AG6
2024	250,000	4.00	1.62	AH4
2025	2,000,000	5.00	1.76	AJ0
2026	4,000,000	5.00	1.89	AK7
2027	6,000,000	5.00	2.05*	AL5
2028	8,000,000	5.00	2.17*	AM3
2029	10,000,000	5.00	2.31*	AN1
2030	12,000,000	5.00	2.39*	AP6
2031	14,000,000	5.00	2.45*	AQ4
2032	16,000,000	5.00	2.51*	AR2
2033	17,330,000	5.00	2.57*	AS0
2034	18,195,000	5.00	2.63*	AT8
2035	19,105,000	5.00	2.69*	AU5
2036	20,060,000	5.00	2.75*	AV3
2037	21,065,000	4.00	3.02*	AW1
2038	21,910,000	4.00	3.06*	AX9

$71,830,000	5.00%	Term Bond due January 1, 2041	Yield 2.91%*	CUSIP Number†	650010AY7
$145,745,000	5.00%	Term Bond due January 1, 2046	Yield 2.97%*	CUSIP Number†	650010AZ4
$134,960,000	5.00%	Term Bond due January 1, 2051	Yield 3.06%*	CUSIP Number†	650010BB6
$50,000,000	4.00%	Term Bond due January 1, 2051	Yield 3.37%*	CUSIP Number†	650010BA8
$156,800,000	5.25%	Term Bond due January 1, 2056	Yield 3.07%*	CUSIP Number†	650010BD2
$100,000,000	4.00%	Term Bond due January 1, 2056	Yield 3.49%*	CUSIP Number†	650010BC4

3. Who are the parties involved in a municipal bond sale?

Among the Parties to A Municipal Bond Sale



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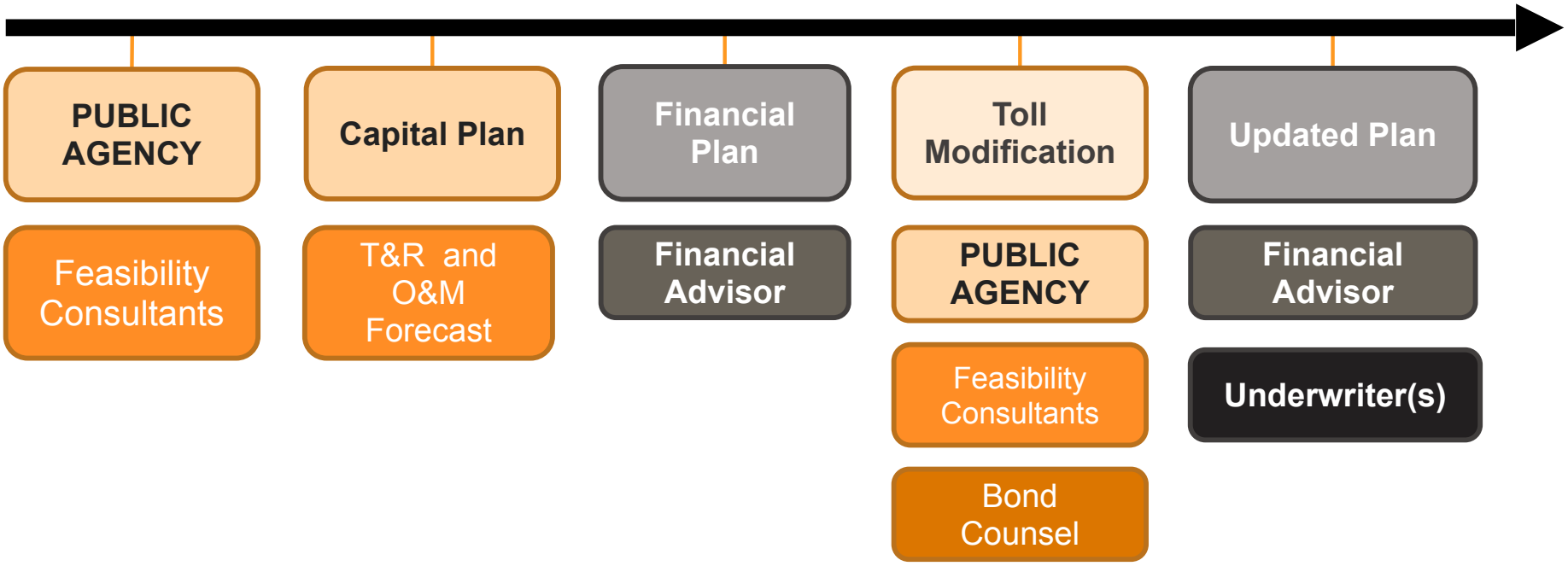
Among the Parties To A Bond Sale

- **Public Agency**
  Borrower
- **Municipal Advisor**
  Advises agency on how to borrow
- **Bond Counsel**
  Prepares POS/OS, legal issues
- **Feasibility Consultants**
  T&R, O&M, Condition of Facilities
- **Rating Agencies**
  Assess everyone's credibility
- **Credit Enhancers**
  Insure bonds to lower interest rate
- **Underwriter**
  Buys bond from agency & sells to investors
- **Trustee**
  Protects bond holders and makes sure agency keeps promises
- **Disclosure Counsel**
  Assure that all material information is disclosed to investors
- **Investors**
  Buy bonds from Underwriter
- **Other Counsels**
  As needed cashing in on deal ☺

Municipal Bond Sale Timeline



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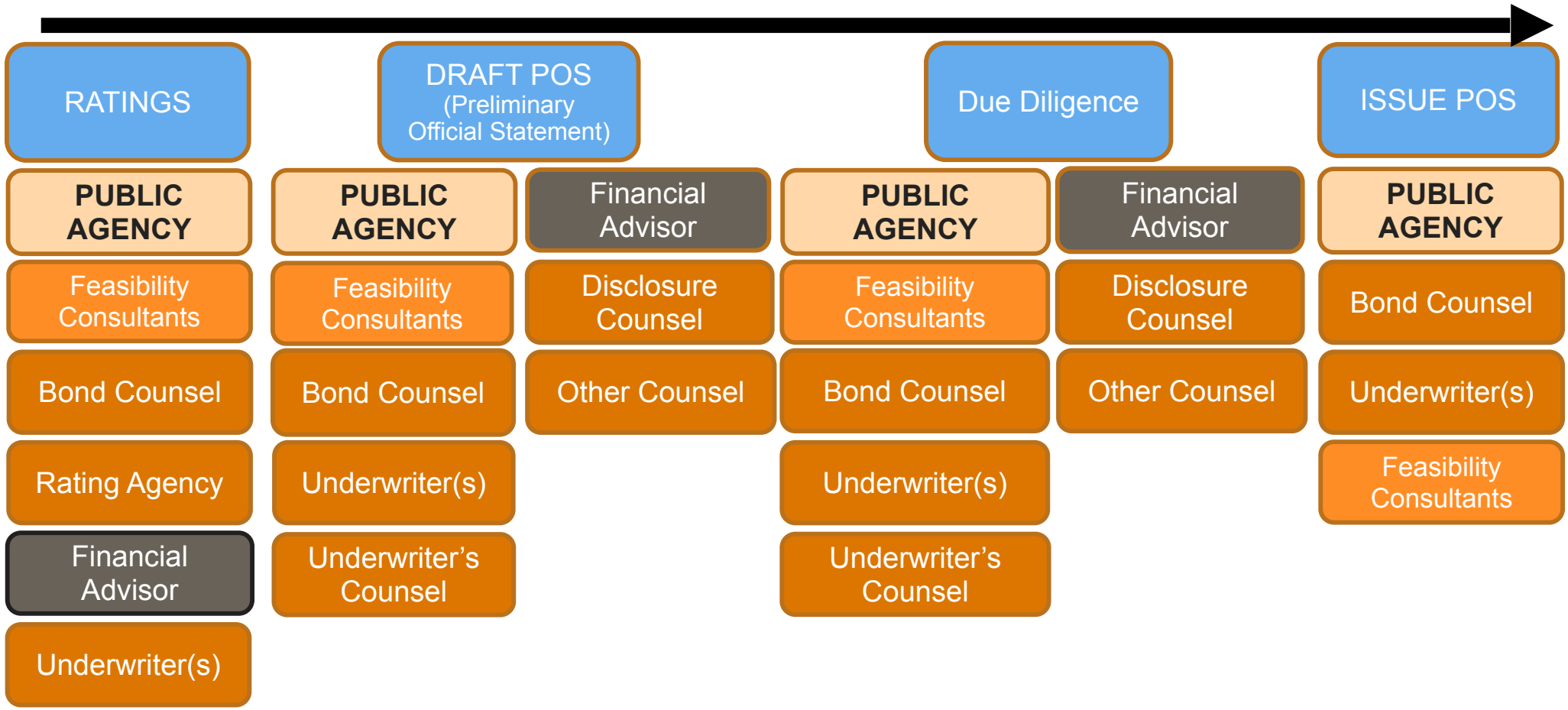
Municipal Bond Sale Timeline



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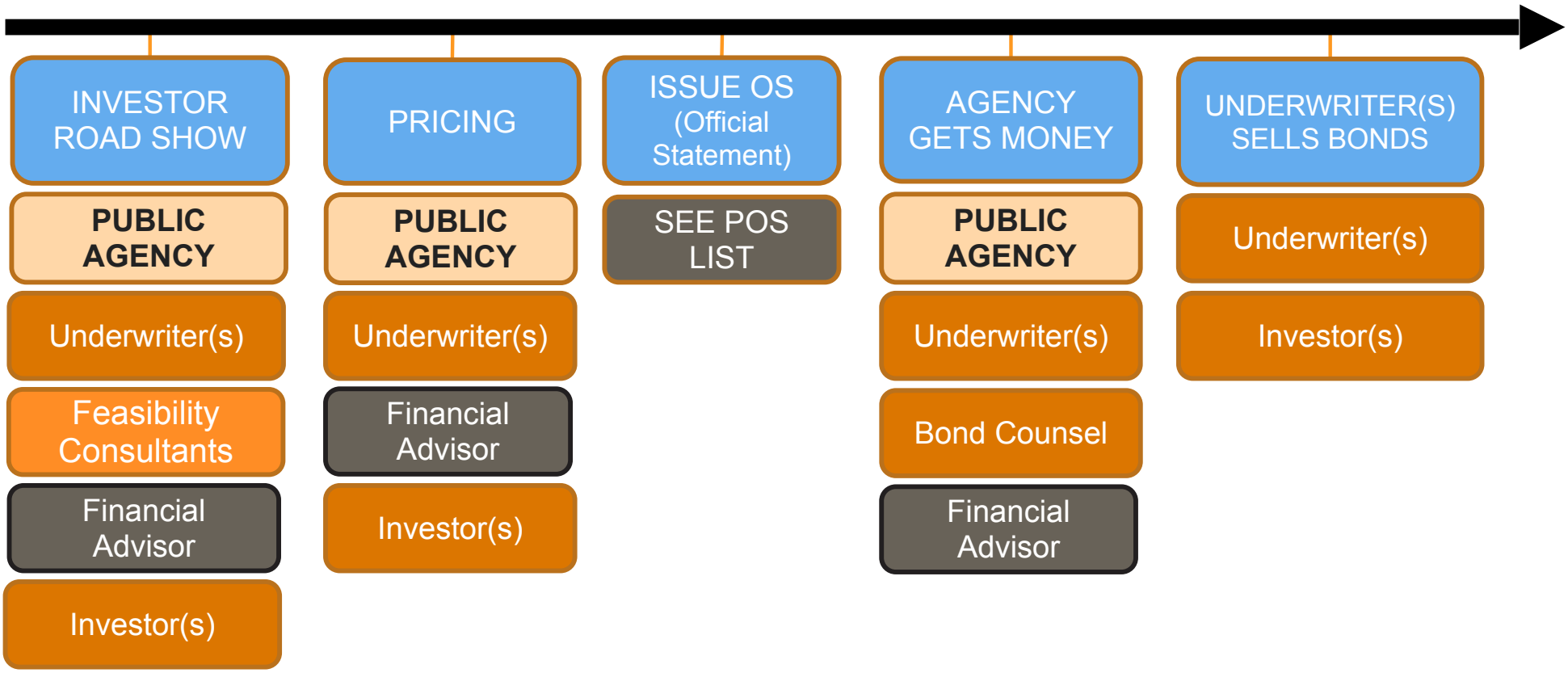
Municipal Bond Sale Timeline



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Suggested Timeline for Hood River T&R Studies

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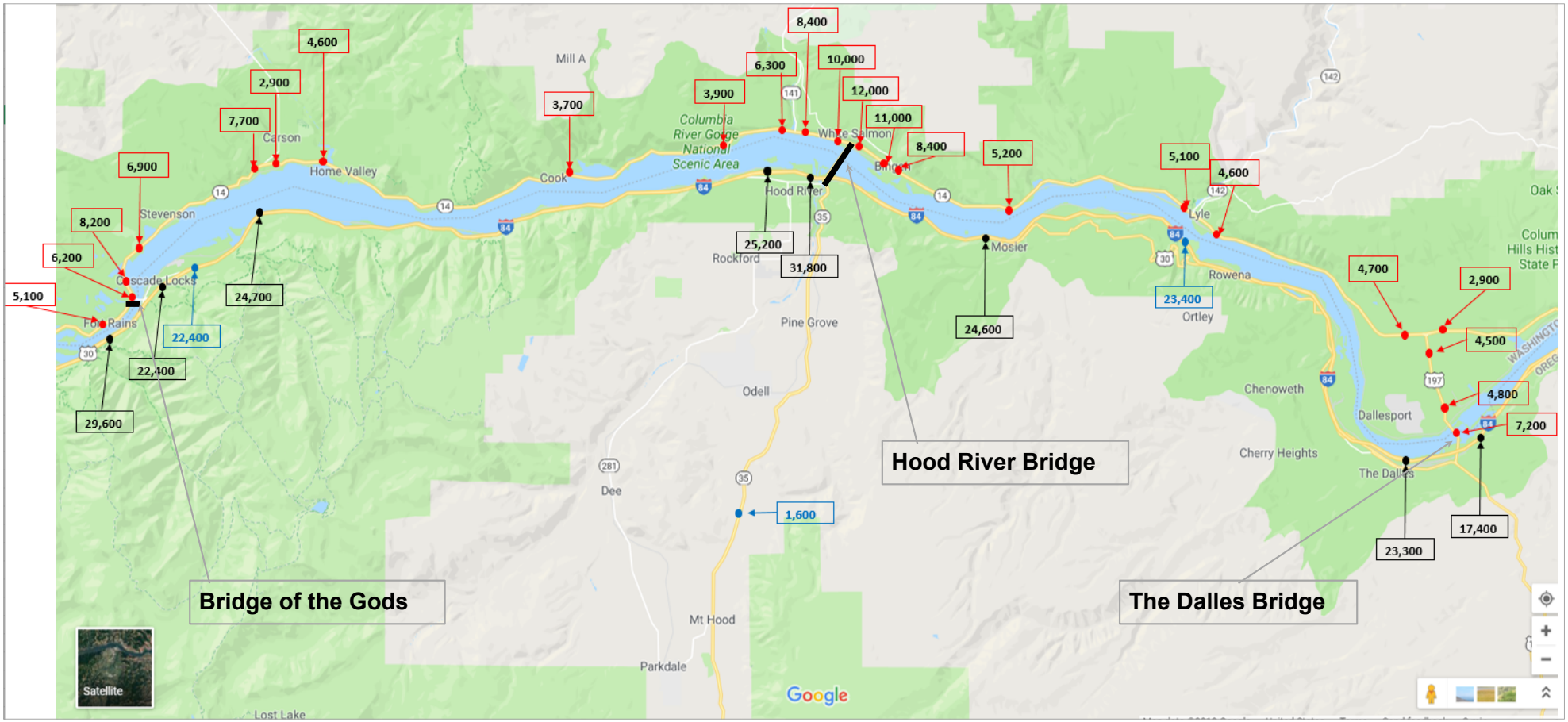
Hood River Bridge T&R Study

Scope

- Sketch-level study
- Traffic and revenue estimate for two cases:
  - Existing bridge conditions
  - New bridge conditions with AET
- Includes toll O&M cost estimate

Data Collection

- AADT data from Oregon and Washington DOTs
- Collected data along the river, between the competing bridges
- Field spot-surveys to observe truck activity at key locations



Hood River Bridge

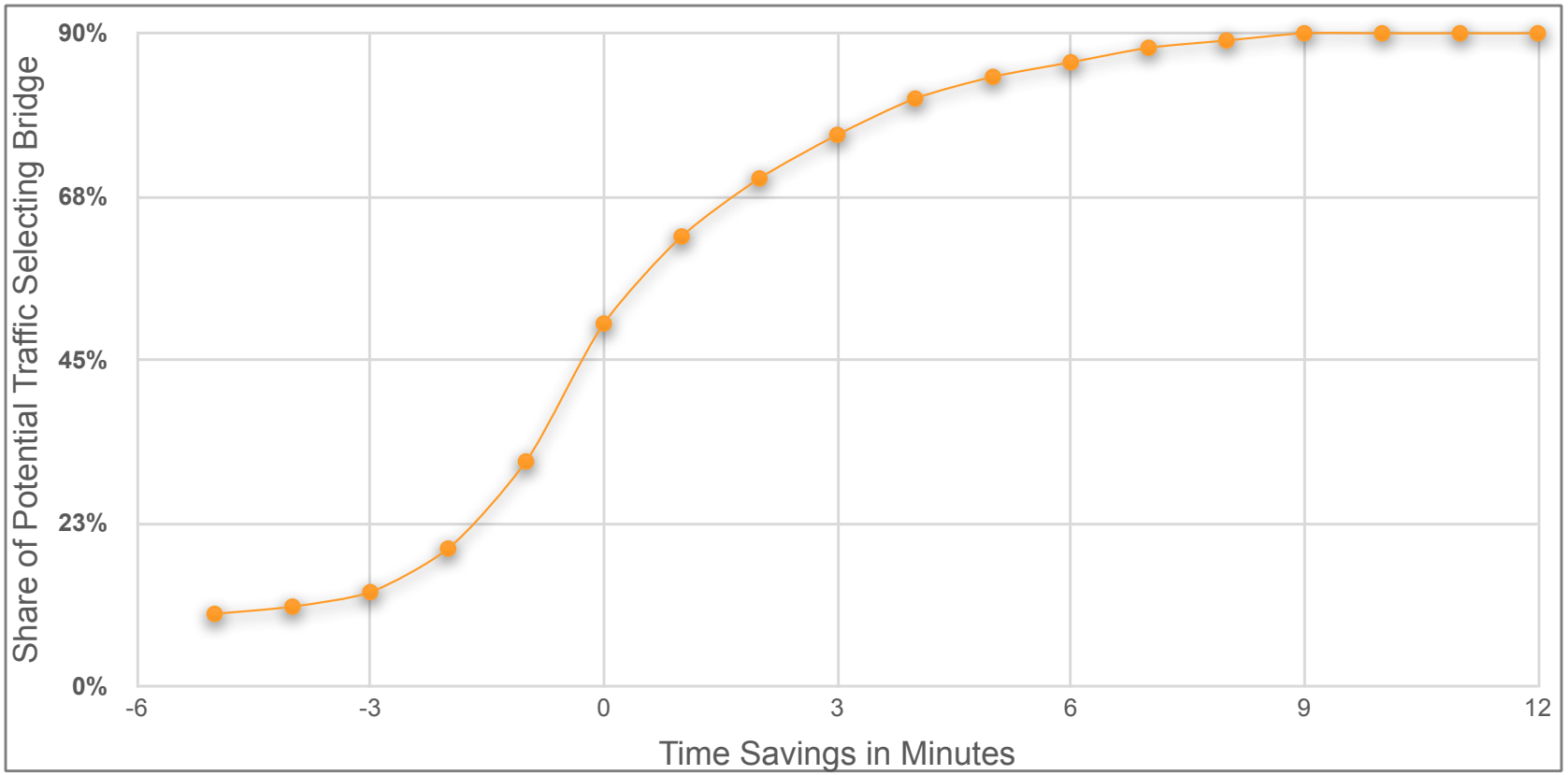
Traffic Modeling Approach

- No travel demand model
- Built a spreadsheet-based model
- Developed balanced network based on AADT counts
- Considered two competing bridges – Bridge of the Gods to the west and The Dalles Bridge to the east

Route Choice Parameters for Each Bridge

Dir	From Zone	To Zone	Bridge of the Gods			Hood River Bridge			The Dalles Bridge		
			Distance (miles)	Time (minutes)	Cost (dollars)	Distance (miles)	Time (minutes)	Cost (dollars)	Distance (miles)	Time (minutes)	Cost (dollars)
SB	1	4	1.3	3.0	$2.00	-	-	-	-	-	-
	1	5	21.5	24.0	$2.00	24.7	32.0	$2.00	-	-	-
	1	6	44.0	44.0	$2.00	47.2	52.0	$2.00	45.0	55.0	-
	2	4	23.1	30.0	$2.00	24.1	24.0	$2.00	-	-	-
	2	5	-	-	-	1.0	3.0	$2.00	-	-	-
	2	6	-	-	-	23.7	24.0	$2.00	21.9	26.0	-
	3	4	45.2	56.0	$2.00	42.7	49.0	$2.00	43.9	42.0	-
	3	5	-	-	-	22.1	28.0	$2.00	23.3	22.0	-
	3	6	-	-	-	-	-	-	1.0	2.0	-
NB	4	1	1.3	3.0	$2.00	-	-	-	-	-	-
	4	2	23.0	29.0	$2.00	24.0	25.0	$2.00	-	-	-
	4	3	46.0	56.0	$2.00	43.0	47.0	$2.00	45.0	41.0	-
	5	1	21.5	24.0	$2.00	24.7	32.0	$2.00	-	-	-
	5	2	-	-	-	1.2	4.0	$2.00			
	5	3	-	-	-	21.4	27.0	$2.00	24.2	23.0	-
	6	1	44.0	44.0	$2.00	47.3	52.0	$2.00	45.4	54.0	-
	6	2	-	-	-	24.0	24.0	$2.00	22.0	26.0	-
	6	3	-	-	-	-	-	-	1.0	2.0	-

Toll Diversion Curve



T&R Scenarios

Scenario 1
- Existing bridge structure
- No toll-rate modification
- Toll collection continues by cash and BreezeBy

Scenario 2
- New bridge opens in FY2029
- No toll-rate modification
- Toll collection continues by cash and BreezeBy

Scenario 3
- New bridge opens in FY2029
- All Electronic Tolling (AET) begins in FY2029
- Image-based toll rate equal to cash rate
- No toll-rate modifications

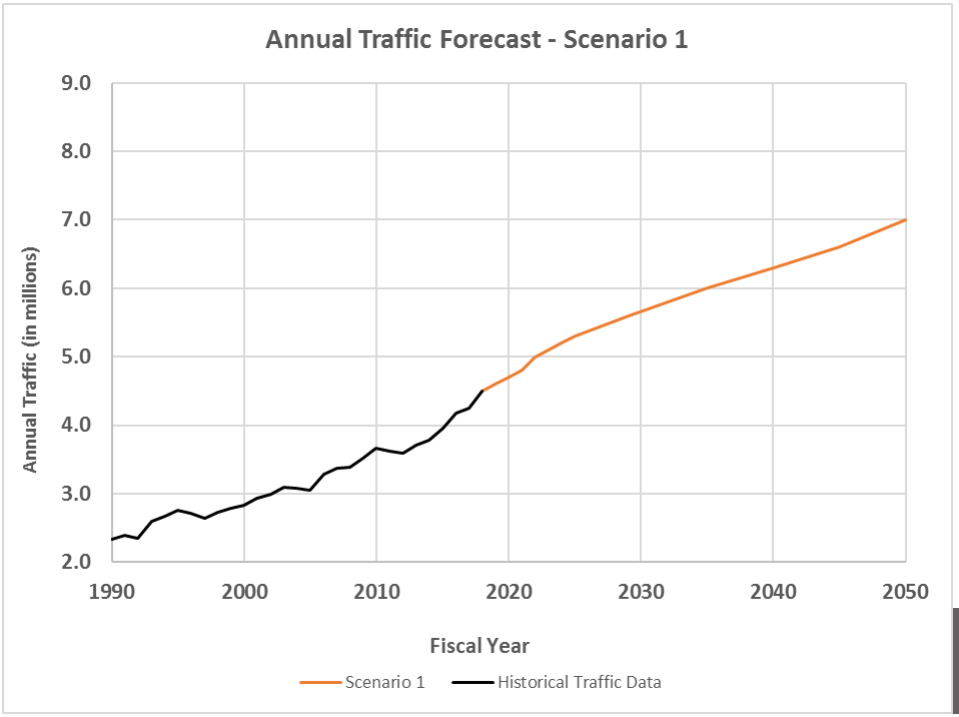
Scenario 4
- New bridge opens in FY2029
- All Electronic Tolling (AET) begins in FY2029
- Image-based toll rate equal to cash rate
- 100% toll-increase is applied upon new bridge opening

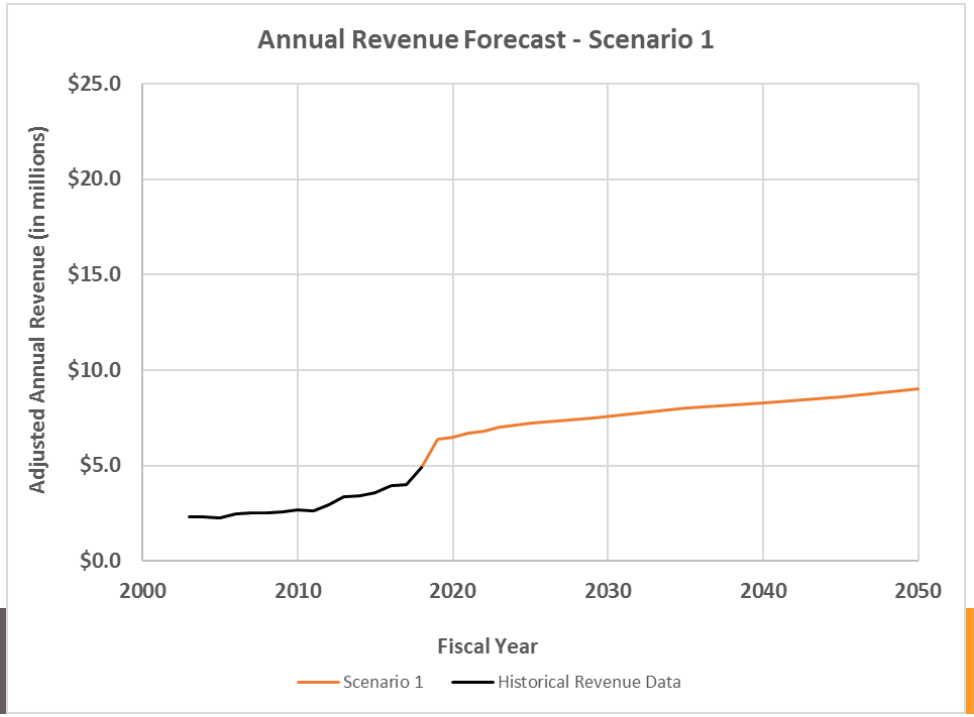
Scenario 5
- New bridge opens in FY2029
- All Electronic Tolling (AET) begins in FY2029
- Image-based toll rate equal to cash rate
- 100% toll-increase is applied upon new bridge opening
- 2% inflation per year beginning FY2030

Assumptions:
1. Auto-truck share remains unchanged over the forecast period.
2. Share of BreezeBy customers grows gradually
3. Annual traffic growth for first few years is based on historical trend; growth slows down over the forecast period

Scenario 1 – No-build Scenario

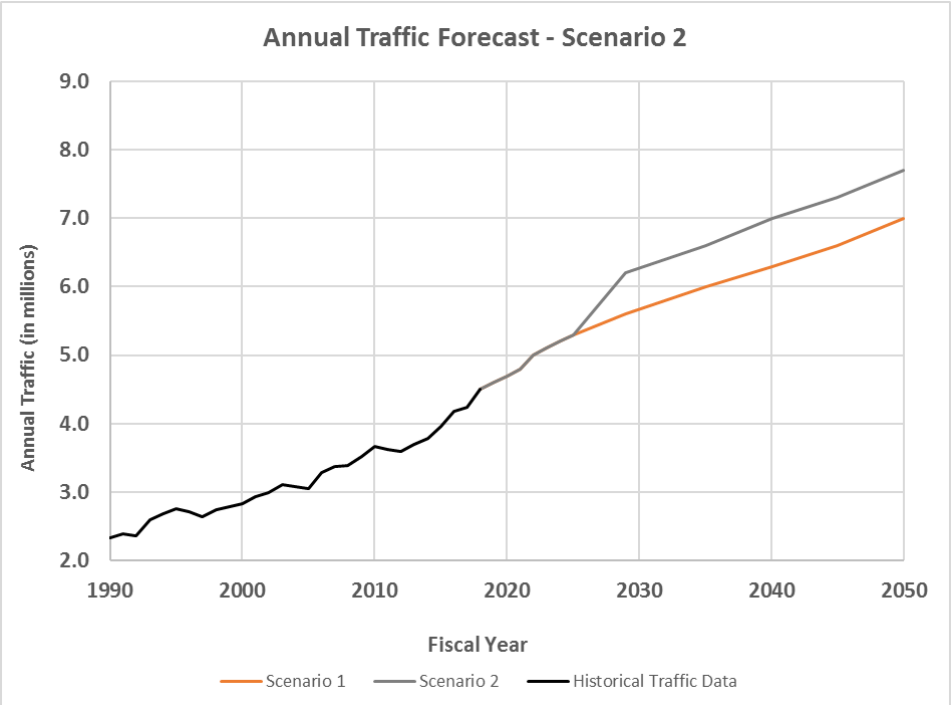
Traffic and Revenue Forecast - No-Build						
Fiscal Year	Average Toll	YoY Growth	Annual Traffic (in millions)	Annual Revenue (in millions)	Net Change in O&M (in millions)	Adjusted Annual Revenue (in millions)
2018	$1.09		4.5	$4.9	$ -	$4.9
2019	$1.39	2.50%	4.6	$6.4	$ -	$6.4
2020	$1.38	2.50%	4.7	$6.5	$ -	$6.5
2021	$1.38	2.50%	4.8	$6.7	$ -	$6.7
2022	$1.37	2.50%	5.0	$6.8	$ -	$6.8
2023	$1.37	2.25%	5.1	$7.0	$ -	$7.0
2024	$1.37	2.00%	5.2	$7.1	$ -	$7.1
2025	$1.36	1.75%	5.3	$7.2	$ -	$7.2
2029	$1.34	1.25%	5.6	$7.5	$ -	$7.5
2035	$1.32	1.00%	6.0	$8.0	$ -	$8.0
2040	$1.31	1.00%	6.3	$8.3	$ -	$8.3
2045	$1.30	1.00%	6.6	$8.6	$ -	$8.6
2050	$1.28	1.00%	7.0	$9.0	$ -	$9.0

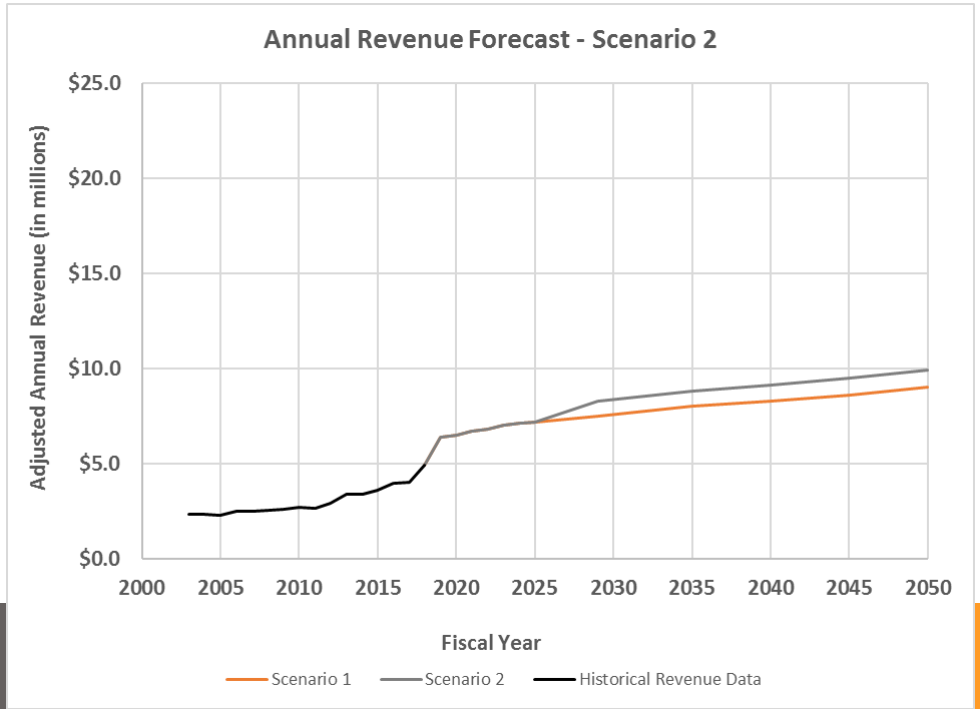




Scenario 2 – New Bridge Opens in FY2029

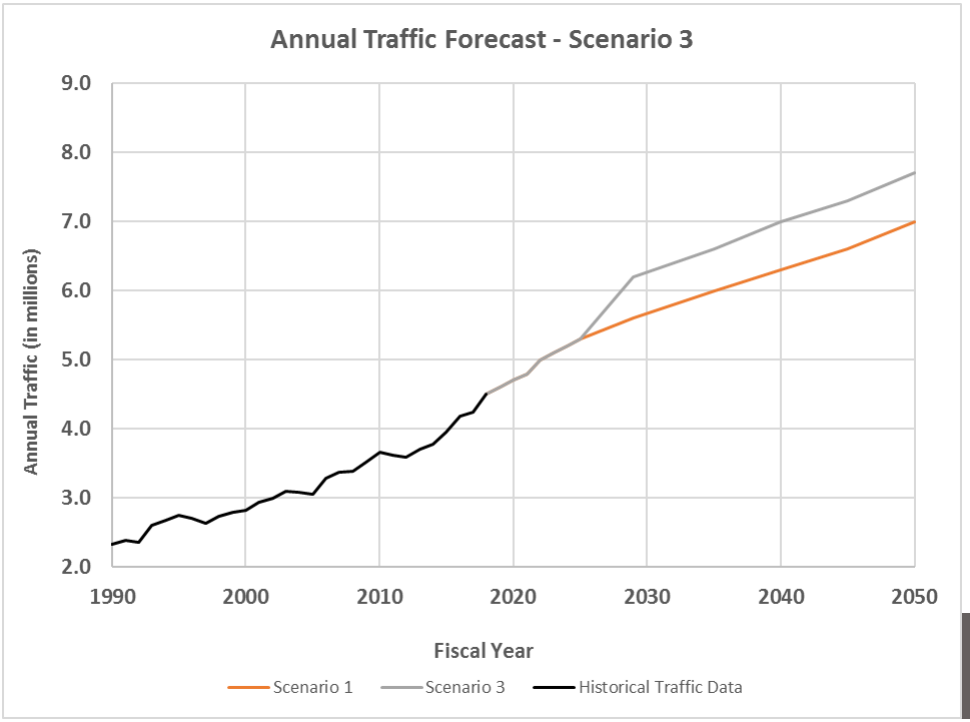
Traffic and Revenue Forecast - New Bridge Open without AET						
Fiscal Year	Average Toll	YoY Growth	Annual Traffic (in millions)	Annual Revenue (in millions)	Net Change in O&M (in millions)	Adjusted Annual Revenue (in millions)
2018	$1.09		4.5	$4.9	$ -	$4.9
2019	$1.39	2.50%	4.6	$6.4	$ -	$6.4
2020	$1.38	2.50%	4.7	$6.5	$ -	$6.5
2021	$1.38	2.50%	4.8	$6.7	$ -	$6.7
2022	$1.37	2.50%	5.0	$6.8	$ -	$6.8
2023	$1.37	2.25%	5.1	$7.0	$ -	$7.0
2024	$1.37	2.00%	5.2	$7.1	$ -	$7.1
2025	$1.36	1.75%	5.3	$7.2	$ -	$7.2
2029	$1.34	1.25%	6.2	$8.3	$ -	$8.3
2035	$1.32	1.00%	6.6	$8.8	$ -	$8.8
2040	$1.31	1.00%	7.0	$9.1	$ -	$9.1
2045	$1.30	1.00%	7.3	$9.5	$ -	$9.5
2050	$1.28	1.00%	7.7	$9.9	$ -	$9.9

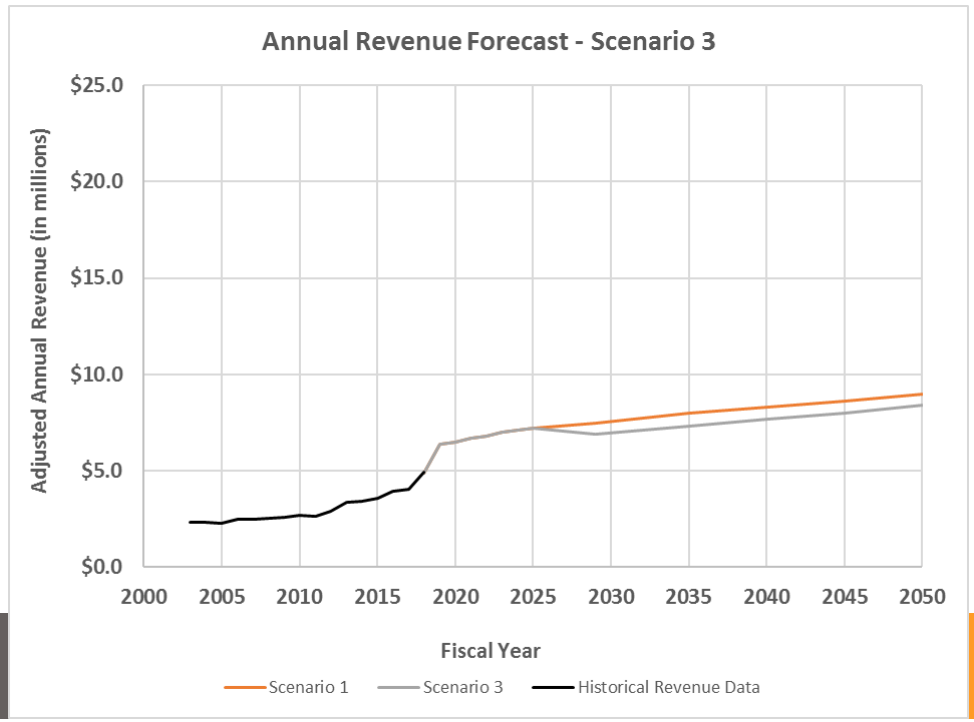




Scenario 3 – New Bridge Opens in FY2029 with AET

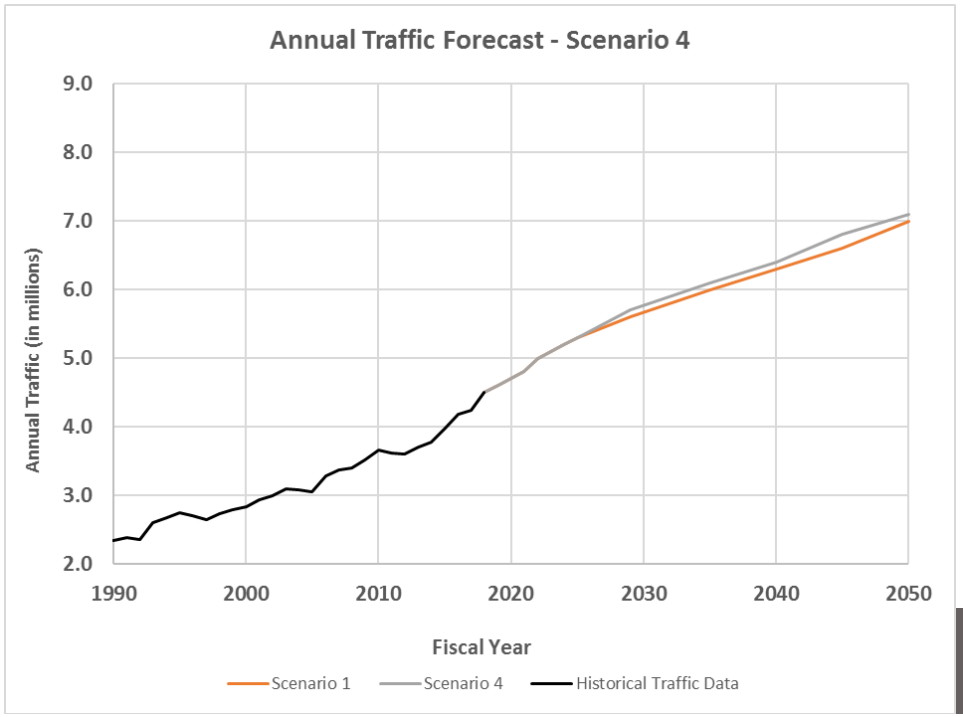
Traffic and Revenue Forecast - New Bridge Opening with AET						
Fiscal Year	Average Toll	YoY Growth	Annual Traffic (in millions)	Annual Revenue (in millions)	Net Change in O&M (in millions)	Adjusted Annual Revenue (in millions)
2018	$1.09	6.10%	4.5	$4.9		$4.9
2019	$1.39	2.50%	4.6	$6.4	$0.0	$6.4
2020	$1.38	2.50%	4.7	$6.5	$0.0	$6.5
2021	$1.38	2.50%	4.8	$6.7	$0.0	$6.7
2022	$1.37	2.50%	5.0	$6.8	$0.0	$6.8
2023	$1.37	2.25%	5.1	$7.0	$0.0	$7.0
2024	$1.37	2.00%	5.2	$7.1	$0.0	$7.1
2025	$1.36	1.75%	5.3	$7.2	$0.0	$7.2
2029	$1.17	1.25%	6.2	$7.2	-$0.3	$6.9
2035	$1.16	1.00%	6.6	$7.7	-$0.4	$7.3
2040	$1.16	1.00%	7.0	$8.1	-$0.4	$7.7
2045	$1.16	1.00%	7.3	$8.5	-$0.5	$8.0
2050	$1.16	1.00%	7.7	$8.9	-$0.5	$8.4

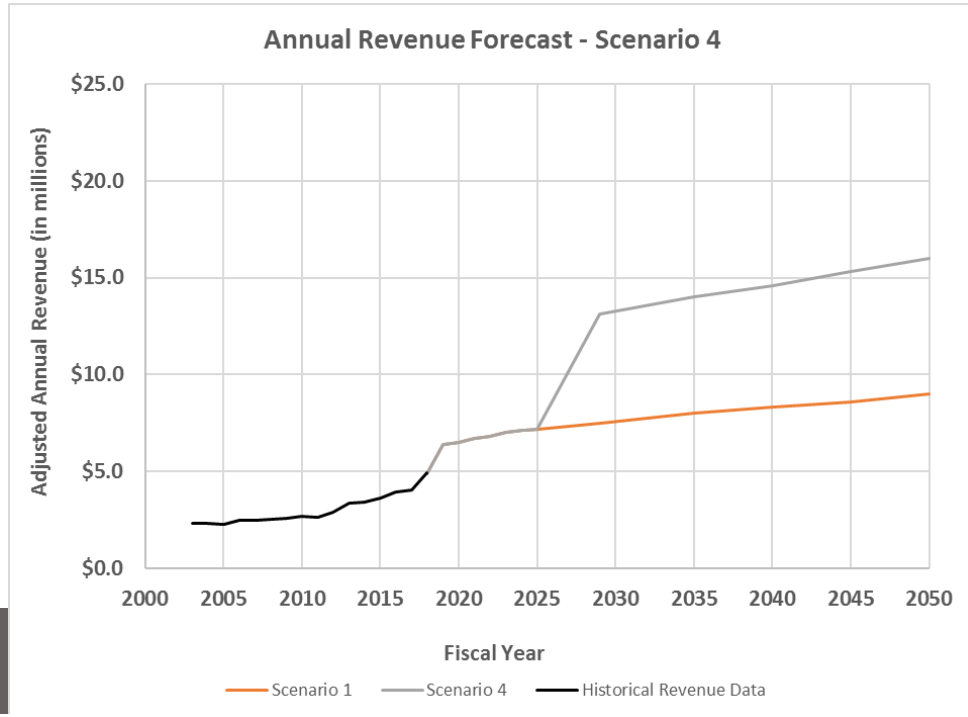




Scenario 4 – New Bridge Opens in FY2029 with AET & Toll Hike

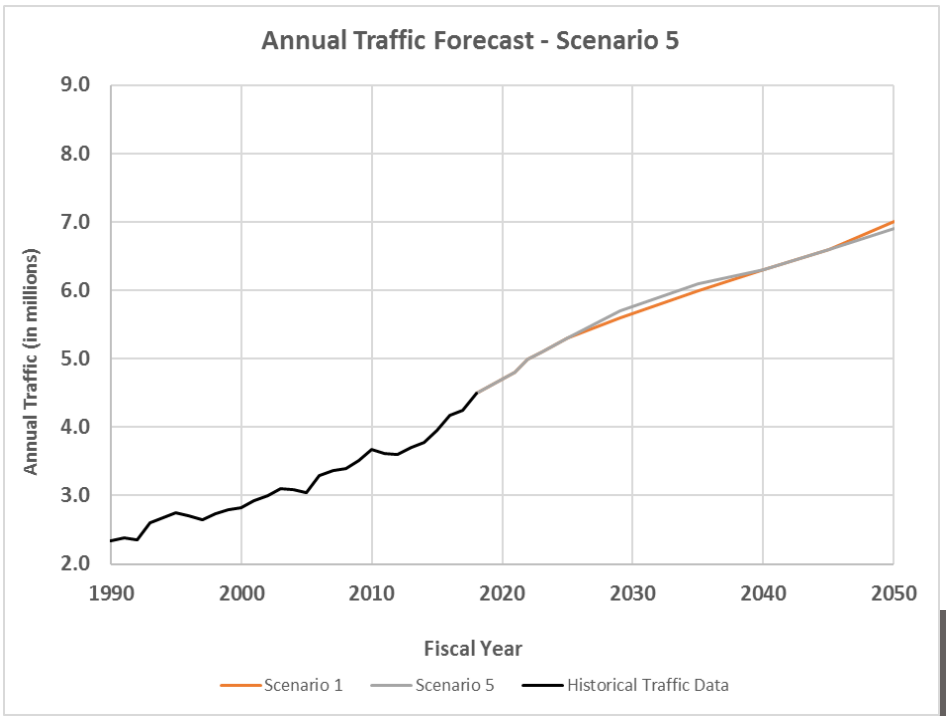
Traffic and Revenue Forecast - New Bridge Opening with AET & Toll Hike						
Fiscal Year	Average Toll	YoY Growth	Annual Traffic (in millions)	Annual Revenue (in millions)	Net Change in O&M (in millions)	Adjusted Annual Revenue (in millions)
2018	$1.09	6.10%	4.5	$4.9		$4.9
2019	$1.39	2.50%	4.6	$6.4	$0.0	$6.4
2020	$1.38	2.50%	4.7	$6.5	$0.0	$6.5
2021	$1.38	2.50%	4.8	$6.7	$0.0	$6.7
2022	$1.37	2.50%	5.0	$6.8	$0.0	$6.8
2023	$1.37	2.25%	5.1	$7.0	$0.0	$7.0
2024	$1.37	2.00%	5.2	$7.1	$0.0	$7.1
2025	$1.36	1.75%	5.3	$7.2	$0.0	$7.2
2029	$2.33	1.25%	5.7	$13.4	-$0.3	$13.1
2035	$2.33	1.00%	6.1	$14.3	-$0.3	$14.0
2040	$2.32	1.00%	6.4	$15.0	-$0.4	$14.6
2045	$2.32	1.00%	6.8	$15.7	-$0.4	$15.3
2050	$2.32	1.00%	7.1	$16.5	-$0.5	$16.0

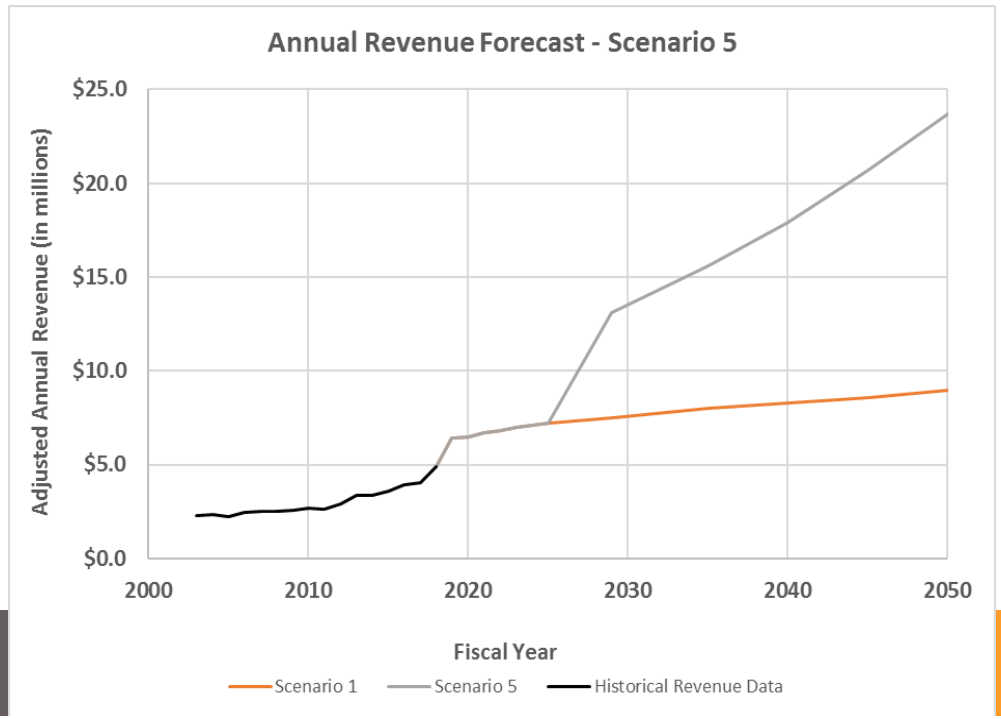




Scenario 5 – New Bridge Opens in FY2029-AET, Toll Hike & Inflation

Traffic and Revenue Forecast - New Bridge Opening with AET, Toll Hike, Inflation						
Fiscal Year	Average Toll	YoY Growth	Annual Traffic (in millions)	Annual Revenue (in millions)	Net Change in O&M (in millions)	Adjusted Annual Revenue (in millions)
2018	$1.09	6.10%	4.5	$4.9		$4.9
2019	$1.39	2.50%	4.6	$6.4	$0.0	$6.4
2020	$1.38	2.50%	4.7	$6.5	$0.0	$6.5
2021	$1.38	2.50%	4.8	$6.7	$0.0	$6.7
2022	$1.37	2.50%	5.0	$6.8	$0.0	$6.8
2023	$1.37	2.25%	5.1	$7.0	$0.0	$7.0
2024	$1.37	2.00%	5.2	$7.1	$0.0	$7.1
2025	$1.36	1.75%	5.3	$7.2	$0.0	$7.2
2029	$2.33	1.25%	5.7	$13.4	-$0.3	$13.1
2035	$2.62	1.00%	6.1	$15.9	-$0.3	$15.6
2040	$2.89	1.00%	6.3	$18.3	-$0.4	$17.9
2045	$3.18	1.00%	6.6	$21.1	-$0.4	$20.7
2050	$3.51	1.00%	6.9	$24.2	-$0.5	$23.7





Questions?