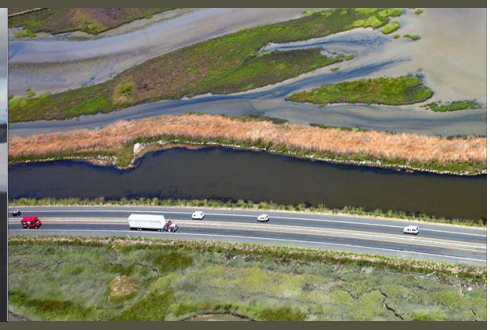
State Route 37 Corridor Financial Opportunities Analysis

Final Report

Project Finance Advisory Ltd.
November 2017



PFAL Project Finance Advisory Ltd.

Background

The Transportation Authorities of Marin, Napa Valley, Solano and Sonoma Counties entered in to a Memorandum of Understanding ("MOU") in 2015 to address concerns along State Route 37 ("SR 37") that include but are not limited to sea level rise, storm surges and flooding, congestion, mobility and safety. The purpose of the SR 37 Corridor MOU is to provide a platform to address these transportation challenges along the corridor and to develop an expedited funding, financing and project implementation strategy for the improvement of SR 37.

The MOU established three committees comprised of representatives from each of the four Transportation Authorities. The committees are:

- SR 37 Project Leadership Team ("PLT"), which includes technical staff responsible for advising the Executive Steering Committee;
- SR 37 Executive Steering Committee ("ESC"), which includes the four agencies' executive directors responsible for setting agendas for the Policy Committee; and
- SR 37 Policy Committee, which includes policy makers from each of the four participating counties and provides oversight to the SR 37 corridor implementation strategy development process.

The four transportation agencies engaged Project Finance Advisory Ltd. ("PFAL") to perform a feasibility assessment of SR 37 in June 2016. PFAL's role is to act as a financial advisor to the PLT, ESC and Policy Committee as the committee investigates financial opportunities to improve the corridor. Funding SR 37 corridor improvements is challenging given significant limitations to traditional transportation funding at the State and Federal level. Therefore, full privatization, public-private partnerships ("P3") and public-public partnership tolling options for the SR 37 corridor were considered as potential project delivery options.

Scope of Work

The SR 37 Corridor Financial Opportunities Analysis included a scope of work with six deliverables for the PLT, ESC and SR 37 Policy Committee. These include the following:

1) Background review of existing public reports and materials related to the project improvements,
2) Six case studies to introduce key concepts that apply to the analysis and highlight lessons learned from similar facilities in the U.S.,
3) Decision-making finance toolbox that provides a roadmap for the decision process and an indicative timeline,
4) A planning level toll revenue forecast to determine, at a very high level, the project's revenue potential. This is to assess the affordability envelope using toll revenue as the sole source of project funding to deliver alternative project improvements for purposes of making a go/no go decision on additional investigation,
5) Review of policy recommendations, and
6) A final report.

PFAL also, at the request of the PLT, reviewed the unsolicited proposal that was received from United Bridge Partners and provided input on the considerations required to diligence the proposal.

This memorandum represents the final report ("Report") summarizing the decision-making finance toolbox, the planning level toll revenue forecast and affordability analysis that were completed as part of PFAL's scope of work. This report acts as a resource for the SR 37 Policy Committee and the four Transportation Authorities.

Approach

PFAL's work was organized in three sections. (1) A project framework was established early on, defining the segments and configurations that would be analyzed. (2) A second section focused on the Traffic & Revenue ("T&R") analysis, to provide a basic sense of the overall revenue generation potential of the project under different assumptions. (3) Finally, an affordability analysis was developed, using the design and construction cost information from the 2016 UC Davis study and the results from the T&R analysis.

To address the scope of work required for this Report, PFAL's approach involved:

- Performing background research,
- Developing case studies for similar projects in the U.S.,
- Developing a project decision making toolbox,
- Performing a high-level toll revenue study based on available information,
- Performing affordability analysis and
- Providing review and input on policy recommendations.

This work was completed over a sixteen-month period from June 2016 to October 2017. At each step of our work, we presented interim analysis and findings regularly to solicit feedback and direction on the key assumptions and outputs of the analysis from the PLT and ESC. These interim meetings included staff and executives from the four Transportation Authorities and representatives from Caltrans and the Metropolitan Transportation Commission.

On March 02 and May 04, 2017, the results of PFAL's work were presented to the SR 37 Policy Committee for policy makers' comment and approval. During the months of June through August 2017, PFAL presented the study findings to each of the four Transportation Authority Boards. Public comment was invited during all of these presentations.

Project Framework & History:

The SR 37 corridor is 20.8 miles in length. The 2016 UC Davis study divided it into three segments: Segment A lies between SR 101 and SR 121; Segment B is between SR 121 and Mare Island; and segment C lies between Mare Island and Interstate 80. Segment lengths are as follows: A= 7.1 miles, B= 9.3 miles, C= 4.4 miles, shown in the diagram below. The current highway has two lanes in each direction for Segments A and C, and one lane in each direction in Segment B. The proposed improvements would add a new lane in each direction in Segment B.

The stretch of road east of Sears Point was once part of historic El Camino Real. As a result of the State Highways Acts of the early 20th century, the Black Point Cut-off was built over it and opened to traffic in 1917. This highway followed the current alignment east of Sears Point, before diverting northeast along present-day Route 121. Prior to 1909, when the road was taken under State control, the section between Sears Point and Vallejo that was built over an ancient Native American trail was known as the Sears Point Toll Road, a toll road managed by the Golden Gate Ferry company. When it was purchased by the State in 1938, tolls were removed; it then became signed as State Route 48 until 1964 when it was redefined as State Route 37.

We understand from the PLT that Federal funds were not used to originally build the highway, but we have not been able to independently verify this information. Since Federal funding was not used to fund the initial project, there is no new Federal legislation required to toll existing lane capacity.

Traffic & Revenue ("T&R") Analysis:

The objective of the T&R analysis was to determine, at a high level, under different scenarios, the amount of toll revenue that could be expected to be generated from the project if the facility was tolled. It is important to note in industry terms this T&R analysis represents a "Level One" assessment. This reflects a preliminary sketch-level T&R analysis for project sizing and initial feasibility purposes only. This work was subcontracted to traffic experts with over 70 years of combined industry experience.

The T&R analysis adopted two fundamental tolling concepts; the first concept includes a toll charge on a per mile basis (i.e., a "toll road" concept) and, the second, a toll charge per crossing (i.e., a "toll bridge" concept). The analysis included a number of other variables, such as;

- the number of tolled lanes (i.e., tolled four lanes, two lanes and one reversible lane), and
- the toll rates (i.e. $5, $7 and $10 for local vehicle users either one-way (i.e. west bound) or two-way. Truck traffic was tolled proportionally higher e.g. $20.

The T&R analysis focused on vehicle categories that were significant with respect to toll revenue, i.e., not exempt vehicles. The analysis assumed a weighted average toll rate based on the traffic mix that included a range of related vehicle types i.e. vehicles and various truck axle sizes. The toll rates were based on benchmarked toll rates on comparable Bay Area and California tolled facilities (e.g. Bay Area toll bridges and southern California toll roads). The toll revenue projections were developed for the period from 2022 to 2098.

The primary input to the PFAL T&R analysis was the approved Solano-Napa Activity-Based ("SNAB") Travel Demand Model based on AM Peak hour and PM Peak hour model run outputs

for years 2015 and 2040. Note, the traffic growth rate for 2040 was determined by the travel demand model and, conservatively, weekend demand was not modeled. The travel demand model is currently in a preliminary phase, and it is being developed by Cambridge Systematics, Inc. Cambridge Systematics provided preliminary outputs to PFAL for purposes of informing our analysis. A second input to the T&R analysis was the 2015 Caltrans-observed and -approved ground counts with car, truck and visitor shares.

We assumed tolls would be collected electronically and local Fastrak users would receive a discount to make the purchase of tags more advantageous and attractive and other vehicles such as trucks would be charged at a higher rate.

We assessed the impact of diversion to free alternative routes if the highway is tolled under various toll rates and tolling scenarios. We created a diversion model that used generalized costs of travel which includes toll amounts and vehicle operation costs for use of the tolled facility and alternative non-tolled routes to estimate shares of tolled traffic. The model results were examined using professional judgement and compared to similarly tolled facilities elsewhere for reasonableness. The initial analysis resulted in a traffic diversion range with;

- tolling in Segment B only in both directions at $5 = 35% and $7 = 42% diversion respectively, and
- tolling in all segments in both directions at $5 = 12%, $7 = 18% diversion respectively.

It is important to note that the impact of this diversion on the existing roadway networks has not been modelled in the SNAB Travel Demand Model. This analysis should be considered when the scope of the project has been decided to understand the project access/egress requirements and travel demand impacts on the region.

The reversible managed lane scenarios were not modeled using the SNAB Travel Demand model. The traffic demand for the managed lane scenarios were assessed based on recent observed hourly traffic distribution information on the corridor from Caltrans and assumptions from industry experience and professional judgment. The estimates of percent of vehicles using the managed lanes at peak hours was limited to the amount that would bring traffic volumes on the free general purpose lanes down to a level that would permit acceptable speeds and travel times, otherwise, users would not have an incentive to use the tolled managed lanes. The result is that minimal toll revenue is generated.

It should be noted that one-way tolling scenario produces impacts on the traffic network flow that lead to an imbalance in the overall traffic network. This is because some users will only opt to use those parts of the network that are untolled, thus creating a diversion to free alternative routes in one direction only. This will create an imbalance in the regional network traffic flow due to the diversion at peak periods, which is highly inefficient and likely to be damaging to regional traffic flows. This may require remedial measures that will, by definition, be utilized only once a day.

The table below summarizes a sample of the scenarios and toll revenue potential.

Scenario	Toll Rate (1)	Toll Option	Sum Total Toll Revenues (2)
Four lanes tolled	$5 ⇆	Toll Road (3 locations)	$12.5 b
		Toll Bridge (1 location)	$9.3 b
	$7 →	Toll Road	$9.4 b

Two lanes tolled one direction		(3 locations)	
		Toll Bridge (1 location)	$7.5 b
One reversible lane tolled	$5 ⇆	Toll Bridge (1 location) AM – westbound PM - eastbound	$0.3 b

Source: PFAL

(1) Toll rates shown in 2016 dollars

(2) Total toll revenue generated over 50 years of tolling. Toll rates and traffic demand escalated over this period (i.e. real forecast). Toll rates are escalated by 2.0% (2015-2050), 1.5% (2051-2070) and 1.0% (2071 onwards). Traffic demand are escalated by 0.13-2.7% depending on the toll rate, tolling policy per segment (2015-2040) from the SNAB Travel Demand model and the escalation rate is halved every 10 years from 2041 onwards.

Affordability & Project Delivery Analysis:

For this analysis, the concept of affordability means an assessment to determine if expected toll revenue is sufficient to fund alternative technical engineering solutions for the project improvements. This affordability consideration includes the operations, maintenance, lifecycle (or major maintenance) maintenance costs, equity return (if applicable) and interest on debt and other financing related costs over a 50 year period. Note, toll revenues are the only source of funding assumed for this analysis.

The technical solutions considered are;

- Levee/Embankment ($1 billion construction cost in 2022 dollars, $1.3 billion in 2030),
- Slab Bridge Causeway ($3 billion construction cost in 2022 dollars, $3.8 billion in 2030) and
- Box Girder Causeway ($3.4 billion construction cost in 2022 dollars, $4.3 billion in 2030).

These costs were sourced from the 2016 UC Davis Study. Each technical solution involves replacing the entire 20.8 mile highway by elevating it and adding a new lane in each direction in Segment B. These solutions primarily aim to mitigate the impact of sea level rise, storm surges, flooding, congestion and improve mobility and safety along the route.

In addition, the affordability analysis assessed three different project delivery options, all of which involve tolling. Each delivery option transfers risk to the private sector in a different way. The three delivery options were selected because they have recent US market precedents and exhibit material difference in the risk transfer, which helps to show the relative benefits of each option. It is important to note the concept of toll-rate control setting mechanism is separate from these delivery options: toll-rate control setting is a matter of public policy rather than risk transfer to the private sector. The three delivery options assessed were;

- Design-Build-Finance-Operate-Maintain ("DBFOM") Public-Private Partnership (P3) with Availability Payments: Under this concept, the public sector transfers the majority of the project delivery (e.g. cost overruns), financing and asset management risks (e.g. operations and maintenance ("O&M")) to the private sector but retains toll revenue risk (i.e. toll revenues are lower or higher than expected). The public sector commits to paying the private sector performance-based availability payments, subject to achieving certain performance and contractual conditions through the term of the concession. Note: existing

state law prohibits a P3 agreement from being entered into after January 1, 2017. New legislation is required to utilize the P3 model.

- Toll Revenue Risk DBFOM P3: Under this concept, the public sector transfers the majority of the project delivery, financing and asset management risks to the private sector, including toll revenue risk. If toll revenue does not materialize, the private sector will suffer the full loss or limited loss, under certain conditions. If the revenues exceed expectations, it is possible for the public sector to share in the gains. The private sector is repaid through the toll revenues generated from the facility through the term of the concession.

- Toll Revenue Design-Bid-Build ("DBB"): Generally the public sector retains the majority of the project delivery, financing and asset management risks including revenue risk. Typically, the public sector finances the project, secured against project revenues and/or other public funding sources. The private sector is paid on a "pay-go" basis through the construction period. In the analysis, the DBB option includes 20% and 10% cost overrun adjustments for the construction and O&M costs, respectively. These adjustments are necessary to reflect the risk of these cost overruns under the DBB project delivery model when compared to the P3 delivery model. Note, for Caltrans projects with an initial construction cost budget of $300 million or more, documented cost overruns are in the 60% range. Therefore, our initial assumptions are conservative.

- Traditional Publicly Funded With No Tolls: separately the PLT and ESC estimated the traditional public funding option without tolling the facility, the timeline under ideal traditional funding circumstances would initiate construction in 2088 for a $1 billion construction cost project.

Conclusions:

Our analysis defines the financial affordability thresholds that establish a project "feasibility envelope", which is a region that the project feasibility exists. Note, PFAL did not perform a review of the cost estimates provided in the 2016 UC Davis Study. There is potential that a deliverable project exists at lower costs than indicated in the UC Davis Study. Note in all cases toll rates and traffic demand were escalated over the forecast period (i.e. real forecast). A summary of the conclusions of the tolling and affordability analysis are as follows;

Tolling conclusions:

- Tolling the highway is required to fund a replacement project within a reasonable timeframe. There are scenarios that generate sufficient toll revenue to fund a major replacement project which is further described below.

- Toll revenue expected over a 50-year period ranges from $300 million to $12.5 billion, depending on the tolling strategy (i.e. toll road vs. toll bridge), toll rates and number of lanes tolled.

- Tolling at least two lanes in one direction is necessary to fund a viable project.

- Tolling only one reversible lane (i.e., leaving at least one lane free in each direction) is insufficient to fund the lowest-cost $1.0 billion solution from the 2016 UC Davis Study. It is important to understand that empirical evidence shows the behavior of drivers is that if there is a toll free lane they will likely only choose to use the tolled lane when there is traffic congestion and delay, and the free lane is at capacity. Therefore, toll revenue generated is significantly lower if an adjacent "free" lane exists.

- Potential for "additional cash" beyond initial investment scope, which could be used for other project improvements in the corridor. With additional revenues beyond the initial 50

year to 2098, approximate capital expenditures for other project improvements range from $300 million to $2.1 billion with toll revenue generated in these outer years.

- Further analysis will be required to assess the impact of increased traffic diversion to “free” alternatives, if a tolled is imposed on the SR 37 facility.

Affordability conclusions:

- The minimum toll rate of $6 one-way or $3 each-way is required to fund the $1.0 billion solution for improving Segments A, B & C using the toll road concept.
- The minimum toll rate of $4 one-way or $2 each-way is required to fund the $500 million solution for improving Segment B only using the toll bridge concept.
- An availability payment P3 structure provides the most efficient outcome. The two other delivery models analyzed have less favorable results.
- Tolling $7 each-way can fund a $2.6 billion project with the toll road concept under an availability payment P3, which includes O&M, full lifecycle and financing costs over the concession term. Similarly, $5 one-way can fund $800 million and $7 one-way can fund $1.3 billion.
- Tolling only Segment B $7 each-way can fund a $1.9 billion project with the toll bridge concept under an availability payment P3, which includes O&M, full life-cycle and financing costs over the concession term. Similarly, $5 one-way can fund $700 million and $7 one-way can fund $1.2 billion.

Next Steps:

- What funding and financing strategies should be pursued? The selected strategy will determine what project size is affordable using a combination of tolling and financing options. This analysis can be developed with a corridor specific financial plan.
- What risks and responsibilities can the public sector transfer to the private sector? How will the public sector fund the risks and responsibilities it chooses to retain? Through a risk workshop and market engagement process, identify the preferred acceptance and transfer of project risks and the associated costs. Note, the desire for risk transfer needs to be balanced with a potential to have a higher or lower investment return. The trade-off analysis will determine which delivery method is most appropriate in this situation considering cost, availability of funding, level of control and revenue sharing potential.
- Assess the impact of diversion to free alternative routes if the highway is tolled under various toll rates and tolling scenarios. This analysis should be considered in combination with a more detailed Level Two analysis when the scope of the project has been more accurately defined to understand the project access/egress and travel demand impacts.

Attachments:

- Index of background documentation review;
- Six case studies and summary presentation of results and lessons learned;
- March 02, 2017 SR 37 Policy Committee PFAL presentation, Affordability Analysis, Decision Roadmap Process & Indicative Timeline;
- May 04, 2017 SR 37 Policy Committee PFAL presentation, Affordability Analysis & Roadmap Process Summary & Next Steps;

About the PFAL Team

PFAL is a financial and commercial advisor specializing in alternative infrastructure project delivery strategies. The main focus of our practice is providing advice and assistance to public agencies to help them structure and deliver traditional and public-private partnerships for infrastructure projects. We are headquartered in San Francisco and also have offices in London. PFAL's core competencies as a firm are our ability to (1) provide project-structuring advice that incorporates our first-hand understanding of private developer and financial market risk appetites, (2) integrate the technical and engineering realities of our projects into our commercial advice, and (3) provide expert-level financial modelling services to accurately reflect project financial conditions and risks. PFAL is a registered Municipal Advisor with the MSRB and SEC, PFAL has both a purpose and a duty to advise in keeping with the best interests of our clients. The PFAL team includes Traffic & Revenue sub-consultant experts that have over 70 years' experience in the US tolling industry. The PFAL team also includes Altus Group as a sub-consultant, a multi-disciplinary advisory firm and a leading authority on the technical and engineering aspects of infrastructure delivery, including procurement, construction, operations, technical risk assessment, cost and schedule planning, control and management in the private and public sectors in North America.

Disclaimer

PFAL and its sub-consultants have performed a preliminary financial feasibility assessment of the SR 37 project. This independent assessment was performed using documents and information provided by the Transportation Authorities of Marin, Napa, Solano and Sonoma Counties and other partners and developed using currently accepted professional practices and procedures. PFAL, at the Transportation Authorities direction, has relied upon the accuracy and completeness of the documents and information provided by the Transportation Authorities. The accuracy and completeness of the documents and information provided by the Transportation Authorities and other publicly available material reviewed by PFAL in connection with this Report were not independently verified by PFAL, and PFAL does not assume responsibility for verifying such material. Estimates should not be construed as statements of fact. There may be differences between the projected and actual results because events and circumstances do not occur as expected. The information and conclusions presented in this Report should be considered as a whole. Selecting portions of any individual conclusion without considering the analysis set forth in the Report as a whole may promote a misleading or incomplete view of the findings and methodologies used to obtain these findings.

State Route Corridor 37 Financial Opportunities Analysis
Data References
Version: 1 Dated: 08/12/2016

N	Not directly relevant
I	Important
H	Highly important

Doc. No.	Reference Title	Document Dated	Criticality	Page & table reference	Information	Relevance	Document Link
1	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Executive Summary.	2/29/2016	H	Page 11	Study assumptions	Project definition/scope	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Front_Matter_Executive_Summary.pdf
2	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Executive Summary.	2/29/2016	H	Page 14, Table 1	Construction cost estimates for each engineered concept by reach (segment)	Construction cost estimates	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Front_Matter_Executive_Summary.pdf
3	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 1 Inundation Modeling.	10/2/2015	N	N/A	N/A	N/A	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%201_Inundation_Modeling.pdf
4	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 2 Sea Level Rise Vulnerability and Risk Assessment.	4/30/2015	I	Page 9, Table 1	SR 37 Asset Characteristics, Typical Elevations, and Shoreline Protection Features	Project definition/scope	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%202_Risk_Assessment.pdf
5	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 2 Sea Level Rise Vulnerability and Risk Assessment.	4/30/2015	I	Page 19, Table 6	Ratings of Level of Use Based on Traffic Counts	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%202_Risk_Assessment.pdf
6	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 2 Sea Level Rise Vulnerability and Risk Assessment.	4/30/2015	H	Page 20, Table 8	Operations & Maintenance Costs for SR 37 from 2012-2014	Operations & Maintenance Costs	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%202_Risk_Assessment.pdf
7	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 3 Designs and Cost Estimates for Possible Resilient Structures.	11/30/2015 (DRAFT)	H	Page 4, Table 1	Construction cost estimates for each engineered concept by reach (segment)	Construction cost estimates	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%203_Adaptive_Design_Costs.pdf
8	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 3 Designs and Cost Estimates for Possible Resilient Structures.	11/30/2015 (DRAFT)	H	Page 14 - 17	Adaptive structures basis/assumptions and methodology for design and construction cost estimates	Construction cost estimates	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%203_Adaptive_Design_Costs.pdf
9	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 4 Technical Memo: Community and Environmental Benefits of SR 37 Scenarios.	2/15/2016	I	Page 16, Table 2	Projected changes in traffic between 2010 and 2035 on SR 37 segments with and without increased capacity (4 lanes vs. 2 lanes) on SR 37	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%204_Benefits_Impacts.pdf
10	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 4 Technical Memo: Community and Environmental Benefits of SR 37 Scenarios.	2/15/2016	I	Page 17, Table 3	Traffic volumes for North Bay regional routes in 2035 with and without SR 37 (due to failure or abandonment) and change in volume (%).	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%204_Benefits_Impacts.pdf
11	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis: Final Report. Task 5 Stakeholder Involvement to Improve Sustainability.	2/26/2016	I	Full report	Stakeholder engagement process	Policy	http://hwy37.ucdavis.edu/files/upload/resource/Phase_II_SR_37_Stewardship_FinalReport_Task%205_Stakeholder_Process.pdf
12	Potential Inundation Maps - Various Scenarios	Various	N	N/A	N/A	N/A	http://hwy37.ucdavis.edu/resource/phase-ii-potential-inundation-maps-various-scenarios
13	Corridor Plan State Route 37	9/22/2010 (DRAFT)	I	Page 6, II	Concept Summary	Project definition/scope	http://hwy37.ucdavis.edu/files/upload/resource/External%20Review%20Draft%20Corridor%20Pan%20SR-37_9-22-2010.pdf
14	Corridor Plan State Route 37	9/22/2010 (DRAFT)	I	Page 10	Demographics, 2010-2035	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/External%20Review%20Draft%20Corridor%20Pan%20SR-37_9-22-2010.pdf
15	Corridor Plan State Route 37	9/22/2010 (DRAFT)	I	Page 15 -19	Trip and traffic information	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/External%20Review%20Draft%20Corridor%20Pan%20SR-37_9-22-2010.pdf
16	Corridor Plan State Route 37	9/22/2010 (DRAFT)	I	Page 21 - 23	Project characteristics	Project definition/scope	http://hwy37.ucdavis.edu/files/upload/resource/External%20Review%20Draft%20Corridor%20Pan%20SR-37_9-22-2010.pdf
17	Corridor Plan State Route 37	9/22/2010 (DRAFT)	H	Page 30 - 33, Appendix A	Pertinent Federal, State, and Regional Transportation Plans, Programs, and Directives	Funding	http://hwy37.ucdavis.edu/files/upload/resource/External%20Review%20Draft%20Corridor%20Pan%20SR-37_9-22-2010.pdf

Doc. No.	Reference Title	Document Dated	Criticality	Page & table reference	Information	Relevance	Document Link
18	Corridor Plan State Route 37	9/22/2010 (DRAFT)	H	Page 36 - 37, Appendix C	State Route 37 Freeway Agreements, between Caltrans and local agencies	Scope constraints	http://hwy37.ucdavis.edu/files/upload/resource/External%20Review%20Draft%20Corridor%20Pan%20SR-37_9-22-2010.pdf
19	Coupling of Sea Level Rise, Tidal Amplification, and Inundation	May, 2014	N	N/A	N/A	N/A	http://hwy37.ucdavis.edu/files/upload/resource/holleman2014-jpo-sfbay_slr.pdf
20	State Highway Corridor Planning California Case Study	DRAFT	I	Page 30, Table 2	Peak volume/capacity ratio per segment 2010-2035	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
21	State Highway Corridor Planning California Case Study	DRAFT	I	Page 38	Five possible futures for the corridor	Policy	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
22	State Highway Corridor Planning California Case Study	DRAFT	I	Page 46	Travel behavior	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
23	State Highway Corridor Planning California Case Study	DRAFT	I	Page 59	Agencies and corresponding permits that are likely to be required for actions along the highway 37 corridor	Policy/environmental	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
24	State Highway Corridor Planning California Case Study	5/17/2012	I	Page 30, Table 2	Peak volume/capacity ratio per segment 2010-2035	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
25	State Highway Corridor Planning California Case Study	5/17/2012	I	Page 38	Five possible futures for the corridor	Policy	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
26	State Highway Corridor Planning California Case Study	5/17/2012	I	Page 46	Travel behavior	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
27	State Highway Corridor Planning California Case Study	5/17/2012	I	Page 59	Agencies and corresponding permits that are likely to be required for actions along the highway 37 corridor	Policy/environmental	http://hwy37.ucdavis.edu/files/upload/resource/California_Stewardship_Study__Corridor_Plan_FinalReport1_0.pdf
28	Novato Creek Bayland Vision	November, 2015	N	N/A	N/A	N/A	http://hwy37.ucdavis.edu/files/upload/resource/NovatoCkBaylandsVision_FC2pt0_SFEI_2015.pdf
29	State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis	2/28/2015	N	Report 1: Sea Level Rise Assessment	N/A	N/A	http://hwy37.ucdavis.edu/files/upload/resource/CTSPR_37_Task%201_Memo.pdf
30	Preliminary Study of the Effect of Sea Level Rise on the Resources of the Hayward Shoreline	March, 2010	N	N/A	N/A	N/A	http://hwy37.ucdavis.edu/files/upload/resource/HASPA%20Report%20v15B.pdf
31	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 5	Project Goals (defined by Caltrans)	Policy	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
32	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 7, Table 1	SR 37 Corridor concept and strategies to achieve concept	Scope alternatives	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
33	Transportation Concept Report, State Route 37, District 4	1/1/2015	I	Page 10, Table 3	Population growth forecasts by County	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
34	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 13, Table 4	System characteristics	Project definition/scope	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
35	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 15, Table 6	Truck volumes (2012)	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
36	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 15, Table 7	Motor vehicle traffic data (2012)	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
37	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 17, Table 8	Traffic volumes 2013 - 2040	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
38	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Page 24	Key corridor issues (defined by Caltrans)	Policy	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf
39	Highway 37 Origin and Destination Analysis	September, 2014	H	Page 1 -19	Daily and Peak Period Airsage traffic data results	Traffic demand	https://drive.google.com/drive/folders/0B2DiXZWI6HagZzZLWE9rMGt6VnM
40	Trip tables 2010-2040		H	Excel spreadsheet	Trip tables	Traffic demand	N/A
41	SR 37 Select Link Analysis Summary	August, 2014	H	Pages 1-5, PDF Format	Highway to Highway traffic volume and percentages for years 2010 and 2030	Traffic demand	https://drive.google.com/drive/folders/0B2DiXZWI6HagZzZLWE9rMGt6VnM
42	Transportation Concept Report, State Route 37, District 4	1/1/2015	H	Pages 16-17, Table 8	Traffic volume by road segments A, B and C. Year 2013 and 2040 Total traffic (AADT), AM Peak and PM Peak per direction for three segment A, B and C	Traffic demand	http://hwy37.ucdavis.edu/files/upload/resource/TCR%2037-FINAL-SIGNED.pdf

FINANCE OVERVIEW & CASE STUDY FINDINGS

PFAL

September 1 2016

AGENDA

1. Project Finance Primer
2. P3 Overview
3. U.S. P3 Market
4. Case Studies

1 PROJECT FINANCE PRIMER

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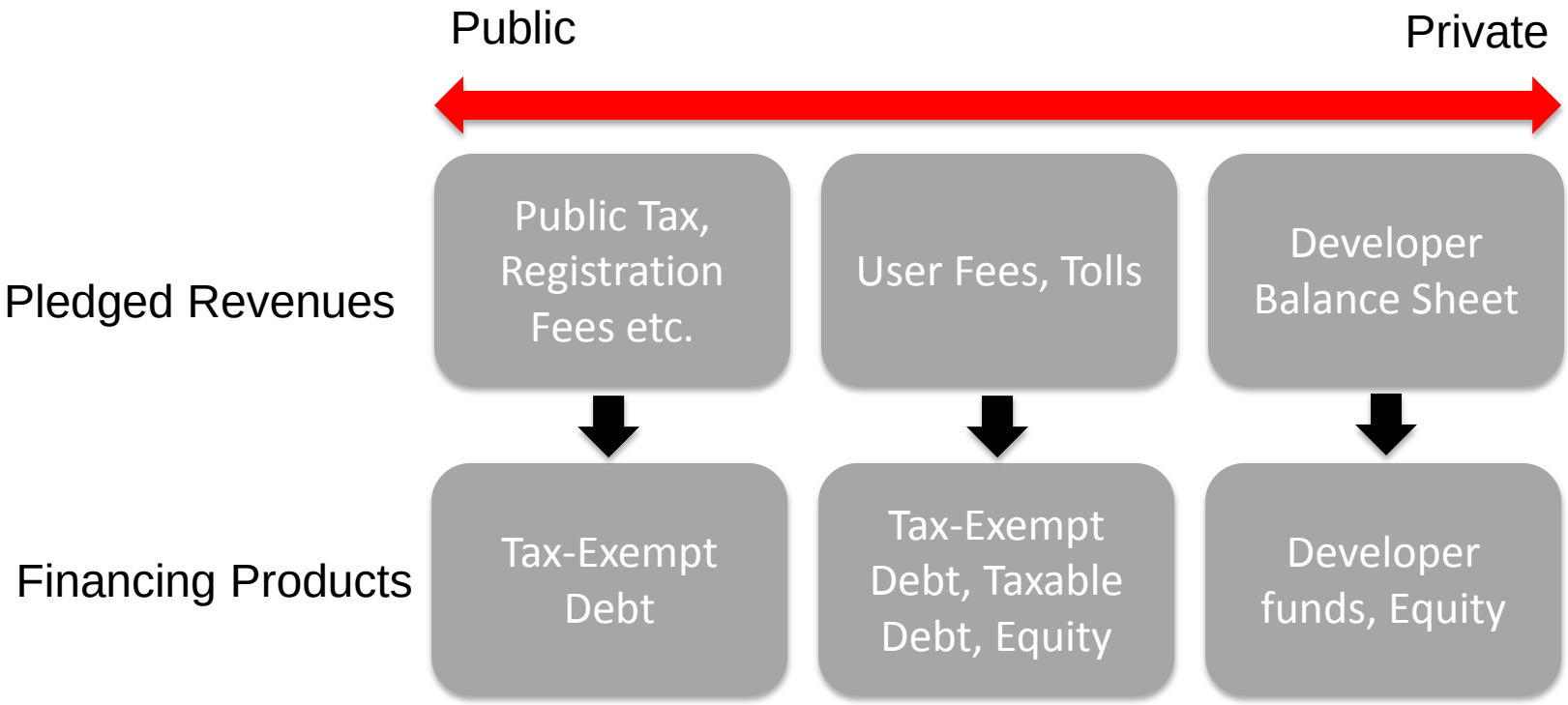
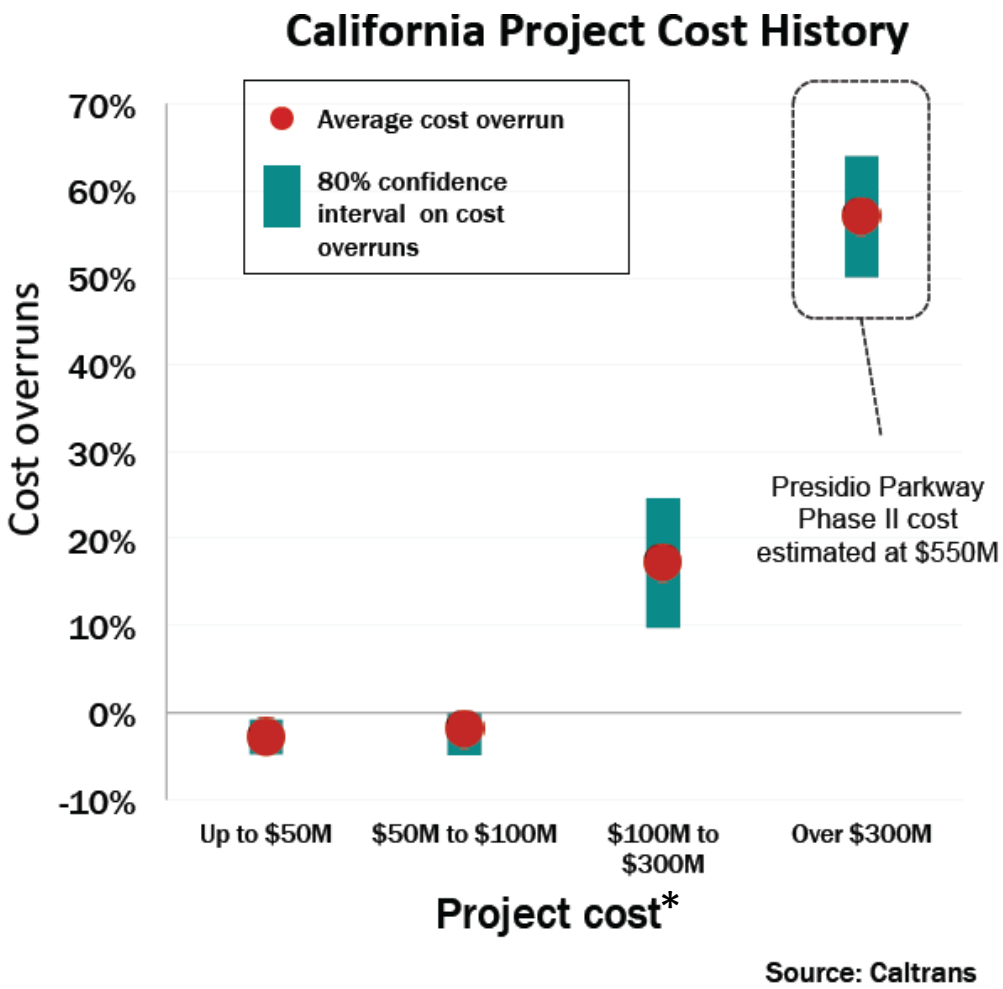
FINANCE STRATEGIES



PROJECT DELIVERY

- Historically, worst overruns on projects over $300M
- Figure illustrates Historical average cost overruns by project size (red)
- Range of likely cost overruns on future projects traditionally procured (blue)

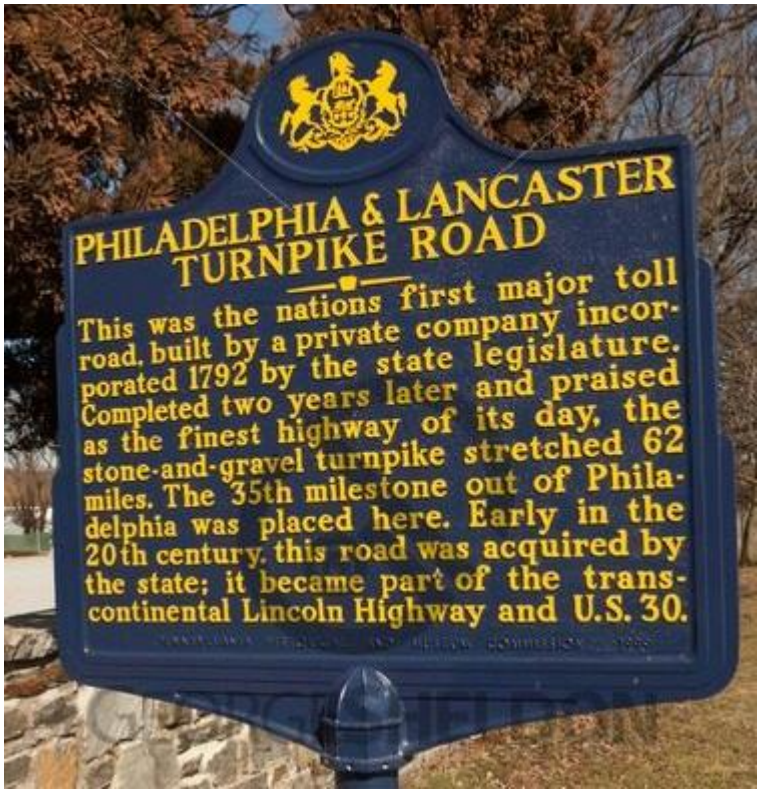


* Engineers Estimate

2 PUBLIC-PRIVATE-PARTNERSHIP MODELS

PFAL

FIRST P3'S IN THE U.S.



1792, Philadelphia – Lancaster Turnpike, PA

WHAT IS A P3?

Public-Private-Partnership (P3)

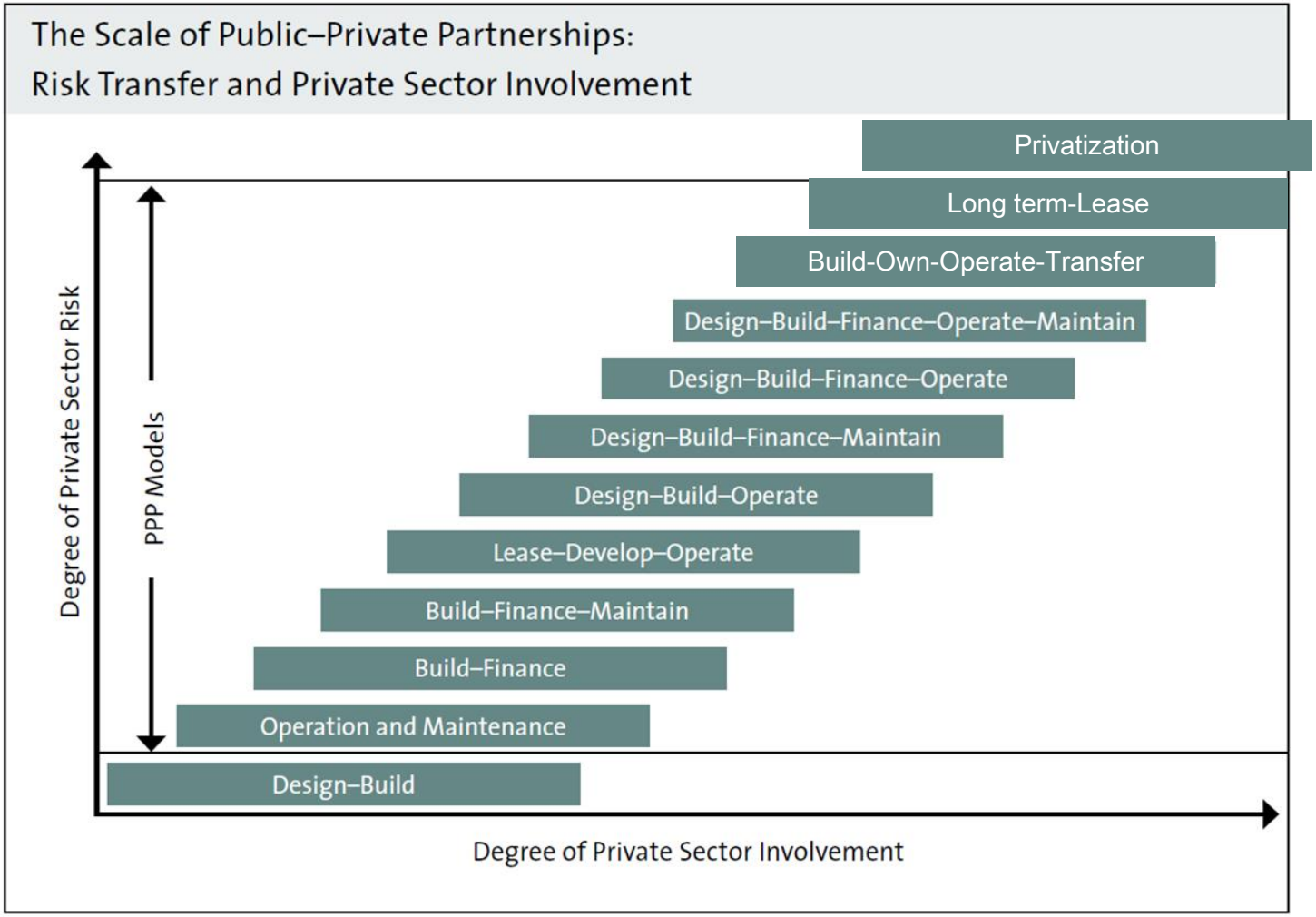
- P3s are long term contractual agreements between a public agency and a private entity that allow for greater private participation in the **delivery, financing and asset management** of projects

- More than Design-Bid-Build

P3'S ARE NOT …

- A funding mechanism, but a **PROJECT DELIVERY** technique
- Privatization of public infrastructure
- Privately owned or controlled toll roads
- Endless source of funds
- A suitable delivery method for all projects (typically >$100m with a healthy business case)

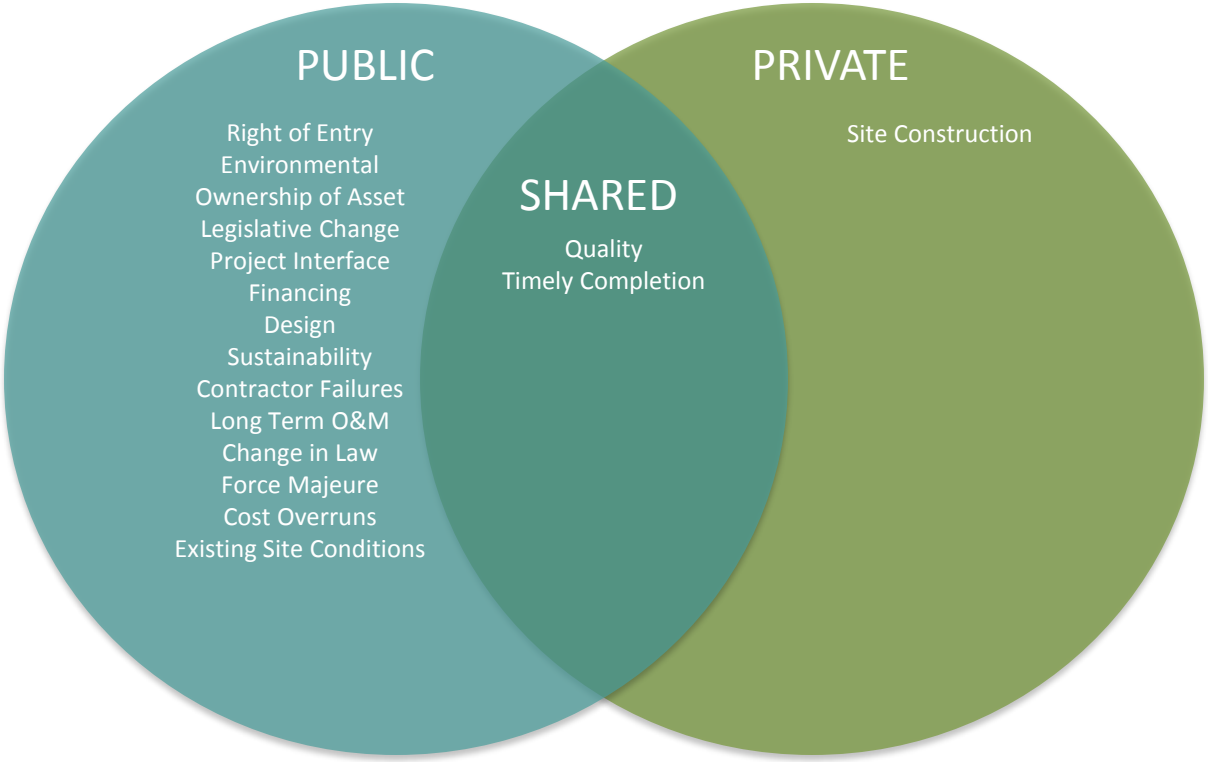
RANGE OF P3 MODELS



The Canadian Council for Public–Private Partnerships

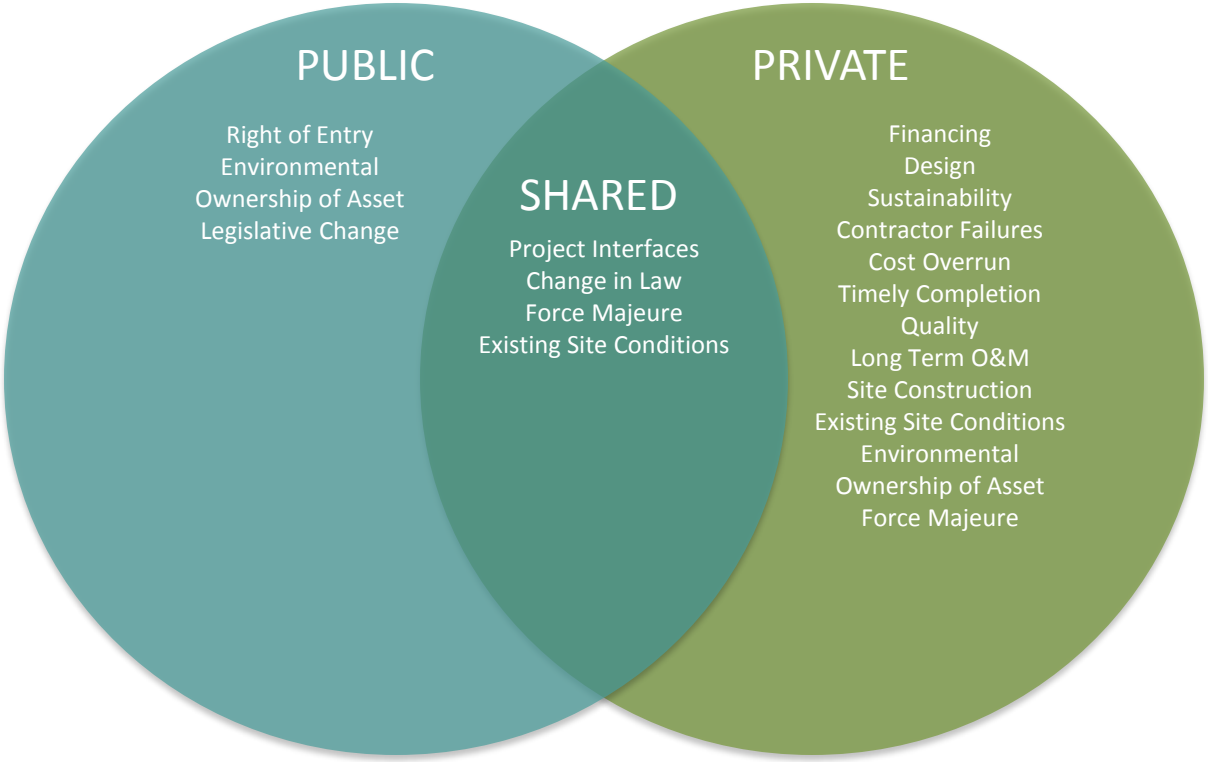
RISK TRANSFER

Design-Bid-Build Risk Allocation



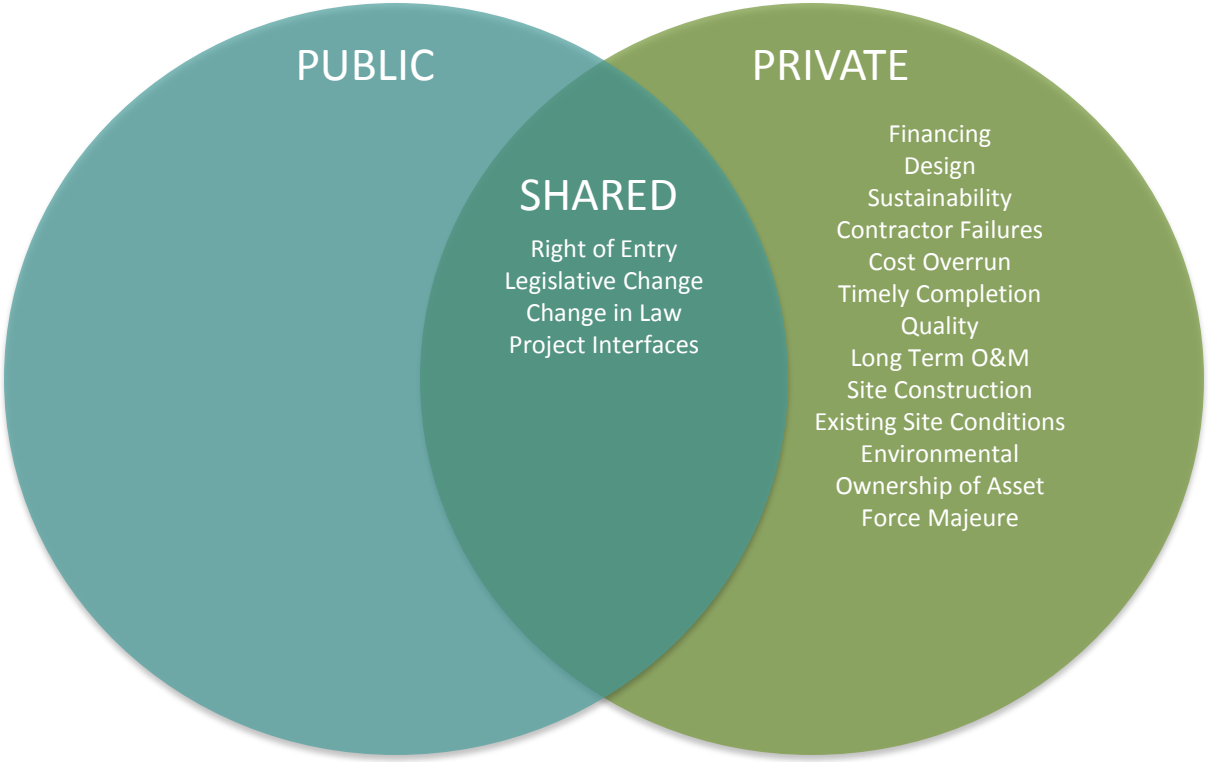
RISK TRANSFER

DBFOM P3 Risk Allocation



RISK TRANSFER

Full Privatization Risk Allocation



WHY USE P3?

Schedule Acceleration & Certainty

- Complete construction as soon as possible and as planned, to meet urgent community need

Cost Certainty

- Minimize potential for cost overruns during construction and operation & maintenance

Incentivize Quality and Sustainability

- Performance-based optimization to result in a high-quality, innovative, well-maintained facility that is well suited to public needs

Innovative Design

- Maximize potential for innovative designs that are context sensitive

Long-term Functionality

- Adaptable to technology advancement over time

Optimal Risk Transfer

- Reduce construction cost, schedule, financing and delivery risk for the public

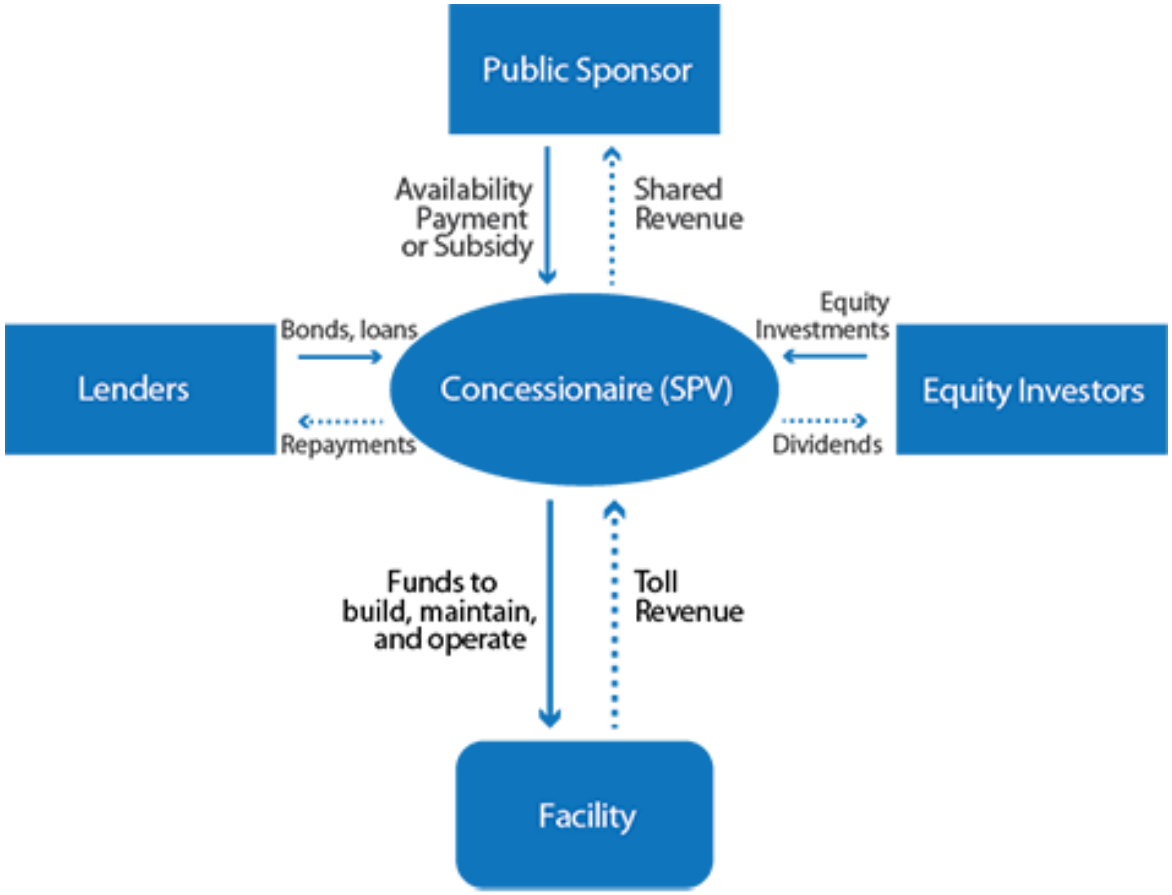
Maximized VFM

- Deliver optimal quality facilities and performance for the best price

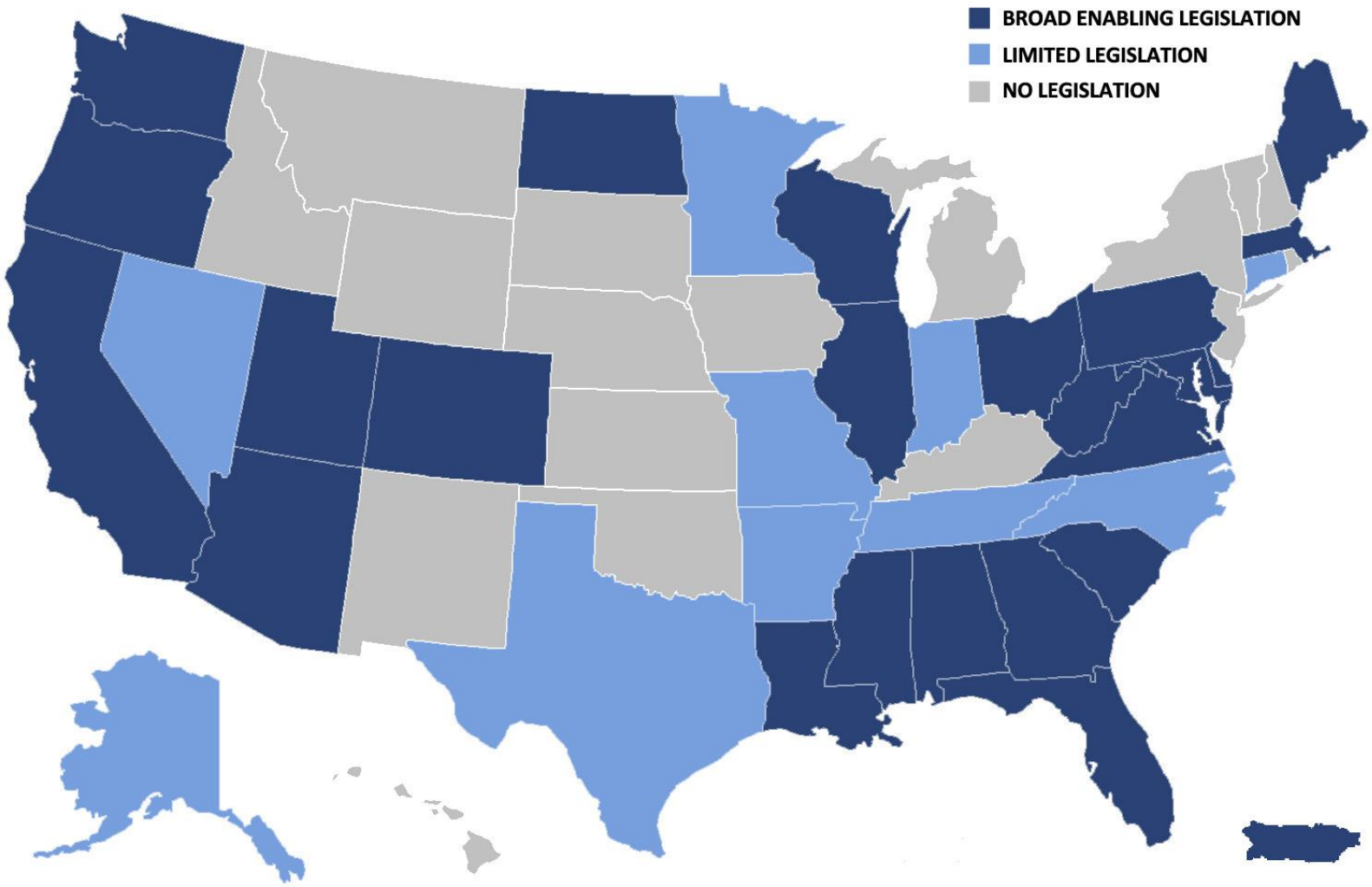
Optimized Use of Public Funds

- Leverage and optimize use of available funding to help deliver more projects with current resources

TYPICAL P3 STRUCTURE



U.S. P3 LEGISLATIVE MAP



PROCUREMENT PROCESS

Policy:

- Enabling legislation
- Established procurement policy and approval process

Solicited or unsolicited proposals:

- Either way, a competitive process typically results in best value
- Publicize unsolicited proposals to invite competing bids

Selection options:

- Lowest Net Present Value (NPV) availability payment
- Best overall value
- Lowest public subsidy
- Largest upfront payment to project sponsor

Best value over the long term, NOT the lowest construction price

3 U.S. P3 MARKET OVERVIEW

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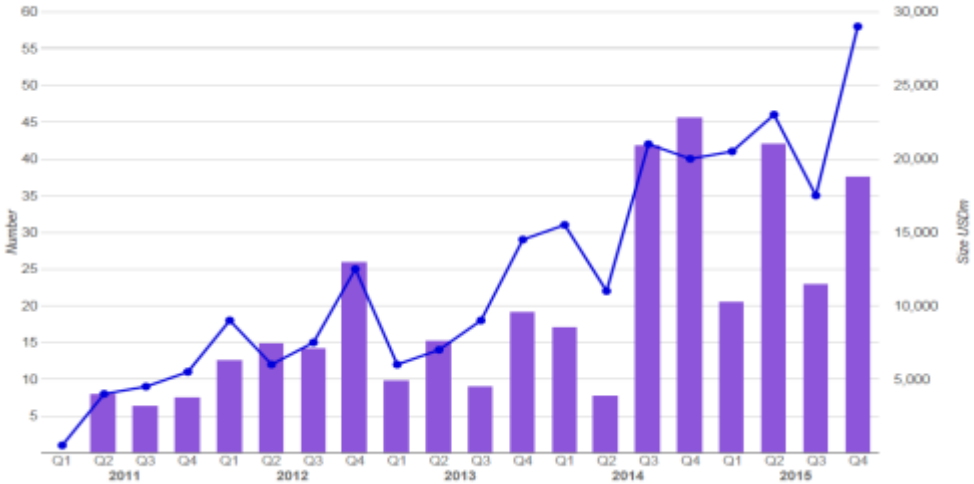
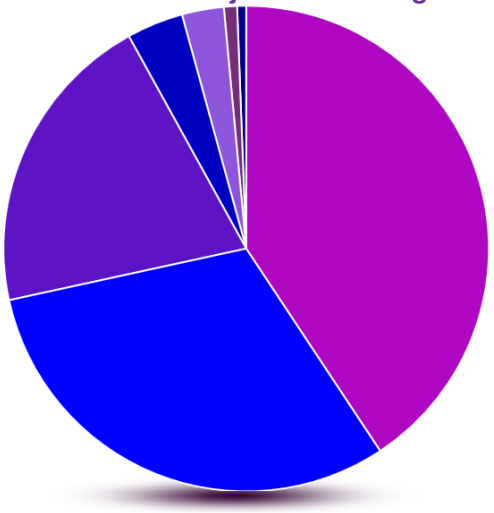
U.S. MARKET ACTIVITY

Deals Reaching Financial Close by Quarter from 2011 Q1 to 2015 Q4



Sectors with Projects Reaching Financial Close from Jan. 2011 to Jan. 2016



Power	41%	$78b
Renewables	31%	$60b
Transport	21%	$39b
Environment	4%	$7b
Telecommunications	3%	$5b
Other	0.5%	$1.5b
Social Infrastructure	0.5%	$1.5b

Source: InfraDeals 2016

2015 HIGHLIGHTS

USD 900m
Pennsylvania Bridges

Financial close: 18 March 2015

Transaction launch to financial close: 464 days

Project: Comprises the replacement of 558 geographically dispersed, structurally deficient bridges across the Commonwealth.

Delivery model: DBFOM

Duration: 28 years

Winning consortium: Plenary (80%); Walsh (20%); Granite; HDR Inc; and Infrastructure Corporation of America (ICA)

Total equity commitment: USD 62.7m

PABs: USD 721m

USD 554m
Portsmouth Bypass

Financial close: 9 April 2015

Transaction launch to financial close: 665 days

Project: Comprises of a four-lane, limited access highway - 16 miles of new freeway around the City of Portsmouth, designated as State Route 823.

Delivery model: DBFOM

Duration: 40 years

Financing: TIFIA USD 209m; PABs USD 227.36m; and Milestone payments USD 41m

Winning consortium: Grupo ACS (40%); InfraRed Infrastructure III (40%); Star America (20%); Dragados; Star America Fund; Jurgensen; and The Beaver Excavating Co.

Total equity commitment: USD 49.25m

USD 655m
I-77

Financial close: 20 May 2015

Transaction launch to financial close: 1,065 days

Project: Development of 25 miles of High Occupancy Toll lanes over three sections of the I-77.

Procuring organisation: North Carolina Department of Transportation

Winning consortium: Cintra Infraestructuras (90%); and Aberdeen Infrastructure Partners II (10%)

Total equity commitment: USD 250m

Financing: USD 189m TIFIA loan; USD 91m Government Contribution; and USD 100m in PABs

USD 40m
Michigan Freeway Lighting

Financial close: 24 August 2015

Transaction launch to financial close: 531 days

Project: Replacing approximately 13,000 freeway lights using high-pressure sodium or metal halide fixtures with energy-efficient LED lights.

Delivery model: DBFOM

Procuring organisation: Michigan Department of Transportation (MDOT)

Winning consortium: Aldridge Electric, Star America

Total equity commitment: USD 5m

Financing: Private placement priced on Aug 17 and was acquired by Allianz

USD 275m
Kentucky Broadband

Financial close: 3 Sept 2015

Transaction launch to financial close: 239 days

Project: The project brings high-speed internet connectivity to every corner of the Commonwealth and will consist o 3,000 miles of fiber.

Procuring organisation: State of Kentucky

Winning consortium: First Solutions (10%), Ledcor (15%) Macquarie NG-KIH Holdings (75%)

Total equity commitment: USD 21m

Financing: Capital market financing consisting of 1 public and 2 private placement bonds, with an average coupon of 4.65%

Source: InfraDeals 2016

2016 HIGHLIGHTS

Highway, Bridges & Tunnels

Transaction Name	State	Sub-Sector	Capex $(m)
Chicago Skyway Sale	Illinois	Bridges and Tunnels	$2,836
Corridor H	West Virginia	Highways	$209
Detroit River Tunnel Replacement	Michigan	Bridges and Tunnels	$400
I-285/SR 400 Improvements P3	Georgia	Highways	$1,056
I-395 Corridor P3	Florida	Highways	$620
I-70 East	Colorado	Highways	$1,170
SH 288	Texas	Highways	$820
State Street Redevelopment	Indiana	Highways	$80
Transform 66	Virginia	Highways	$2,100
			$9,291

Source: InfraDeals 2016

4 CASE STUDIES

PFAL

1. **<u>South Bay Expressway, CA</u>**
2. **<u>U.S. 36 Managed Lanes, CO</u>**

Next meeting:

3. Presidio Parkway, CA
4. I-4 Ultimate P3, FL
5. South Norfolk Jordan Bridge, VA
6. President George Bush Turnpike Western Extension, TX

PROJECT FEATURES

	COMPETITIVE PROCUREMENT PROCESS	TOLL REVENUE	AVAILABILITY PAYMENT	CONNECTOR ROAD	PRIVATIZATION	PUBLIC FINANCING	PRIVATE FINANCING	COMPLEX CONSTRUCTION	MANAGED LANES	CALIFORNIA PROJECT	TIFIA LOAN	>$1 BILLION
SOUTH BAY EXPRESSWAY, SAN DIEGO	✓	✓					✓	✓		✓	✓	
U.S. 36 MANAGED LANES, COLORADO	✓	✓				✓	✓	✓	✓		✓	
PRESIDIO PARKWAY, SAN FRANCISCO	✓		✓			✓	✓	✓		✓	✓	
I-4 ULTIMATE P3, FLORIDA	✓	✓	✓			✓	✓	✓	✓		✓	✓
SOUTH NORFOLK JORDAN BRIDGE, VIRGINIA		✓			✓		✓	✓				
PRESIDENT GEORGE BUSH TURNPIKE WESTERN EXTENSION, TEXAS	✓	✓		✓		✓	✓					✓

- ✓ Toll Revenue
- ✓ Private Financing
- ✓ Complex Construction
- ✓ California Project
- ✓ TIFIA Loan
- ✓ Environmental Sensitivity

South Bay Expressway \\\ San Diego, CA

DESCRIPTION OF THE PROJECT

The SBX Project was the first P3 in California, developed pursuant to California's AB 680 legislation passed in 1989. This is the first toll road in San Diego County and the first road P3 in California and a number of notable "lessons learned" were achieved during project construction and start-up in operations. The project was restructured via bankruptcy when the combination of protracted litigation between the borrower and contractor and the economic downturn made the project's costs and revenue streams unsustainable.

Interesting features of the delivery/financing

- Under a franchise agreement, the private developer raised capital for the Project and constructed the road in exchange for a 35-year toll concession. Caltrans owns the highway, but leases the road back to the franchisee. Currently, the San Diego Association of Governments (SANDAG) has the franchise, under an amended agreement executed when the toll road was sold to SANDAG in December 2011. Control will revert back to Caltrans in 2042.

Financial Close	23 May 2003
Opened to Traffic	Nov 2007
Delivery Method	DBFOM, 35 years

Capital Value	$635 million
Financing	Private – Toll Revenue
Project Type	New Build Highway

SBX: LESSONS LEARNED

Primary Lessons

1. Define project goals and objectives
2. Balanced and commercially reasonable risk allocation maximizes benefits of competitive process
3. High risk projects have higher equity return requirements
4. Allow flexibility for a range of project funding and financing sources
5. Effective stakeholder engagement throughout procurement and development processes
6. Advance environmental approvals to avoid surprise costs and delays
7. Adopt legislation that offers flexibility for alternative procurement approaches

- ✓ Toll Revenue
- ✓ Public Financing
- ✓ Private Financing
- ✓ Complex Construction
- ✓ Managed Lanes
- ✓ TIFIA Loan

U.S. 36 Managed Lanes: Phase 1 & 2 \\\ Denver Metro Area, CO

DESCRIPTION OF THE PROJECT

The US 36 Express Lanes Project is a multi-modal project led by the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD) to reconstruct US 36 from Federal Boulevard to Table Mesa Drive in Boulder.

The Project built an express lane in each direction on US 36, in addition to the two free general-purpose lanes. Additionally, the project replaced several bridges, built a commuter bikeway, added BRT improvements, and installed Intelligent Transportation Systems (ITS) for tolling, transit and traveler information, and incident management. The project opened to the public winter 2016.

Interesting features of the delivery/financing

- Phase 1 was delivered under a design-build contract while Phase 2 was delivered as a DBFOM.
- Phase 1 was transferred to the Phase 2 concessionaire after toll revenue had been established.

Fiscal Year Approved	2011
Opened to Traffic	Mar 2016
Delivery Method	Phase 1: Design-Build Phase 2: DBFOM, 50 years

Capital Value	$497 million
Financing	Public / Private – Toll Revenue
Project Type	Managed Lane

US-36: LESSONS LEARNED

Primary Lessons

1. Ensure a dedicated project champion to drive process
2. Educate key decision makers early in the process
3. Adopt an independent and/or shared oversight function during planning and implementation
4. Document effective cooperation and funding agreements with multi-agency involvement
5. Engage all necessary stakeholders effectively and early in the process
6. Equitable revenue sharing mechanism that benefits the local agencies, critical for project support and approval
7. Enabling legislation and defined approval process

SAMPLE OF COMMON THEMES

Theme	SBX	US-36
Project Delivery Performance	• 12 year delay	• On-time
Toll Rate Setting Control	• Private sector sets toll up to 18.5% cap on equity return	• Private sector sets dynamic toll to achieve specified service requirement
Revenue Control	• Shared with public sector beyond a defined limit	• Shared with public sector beyond a defined limit
Established Traffic History	• No • Greenfield	• Yes • Expansion
Competitive Procurement Process	• Partial (RFQ only)	• Yes
Environmental Approval Process Responsibility	• Private sector, initiated post award	• Public sector, substantially completed prior to procurement

KEY SUCCESS FACTORS

Well-defined goals/objectives + project positioning

Clear communication + approval process

“Bankable” + credit worthy structure

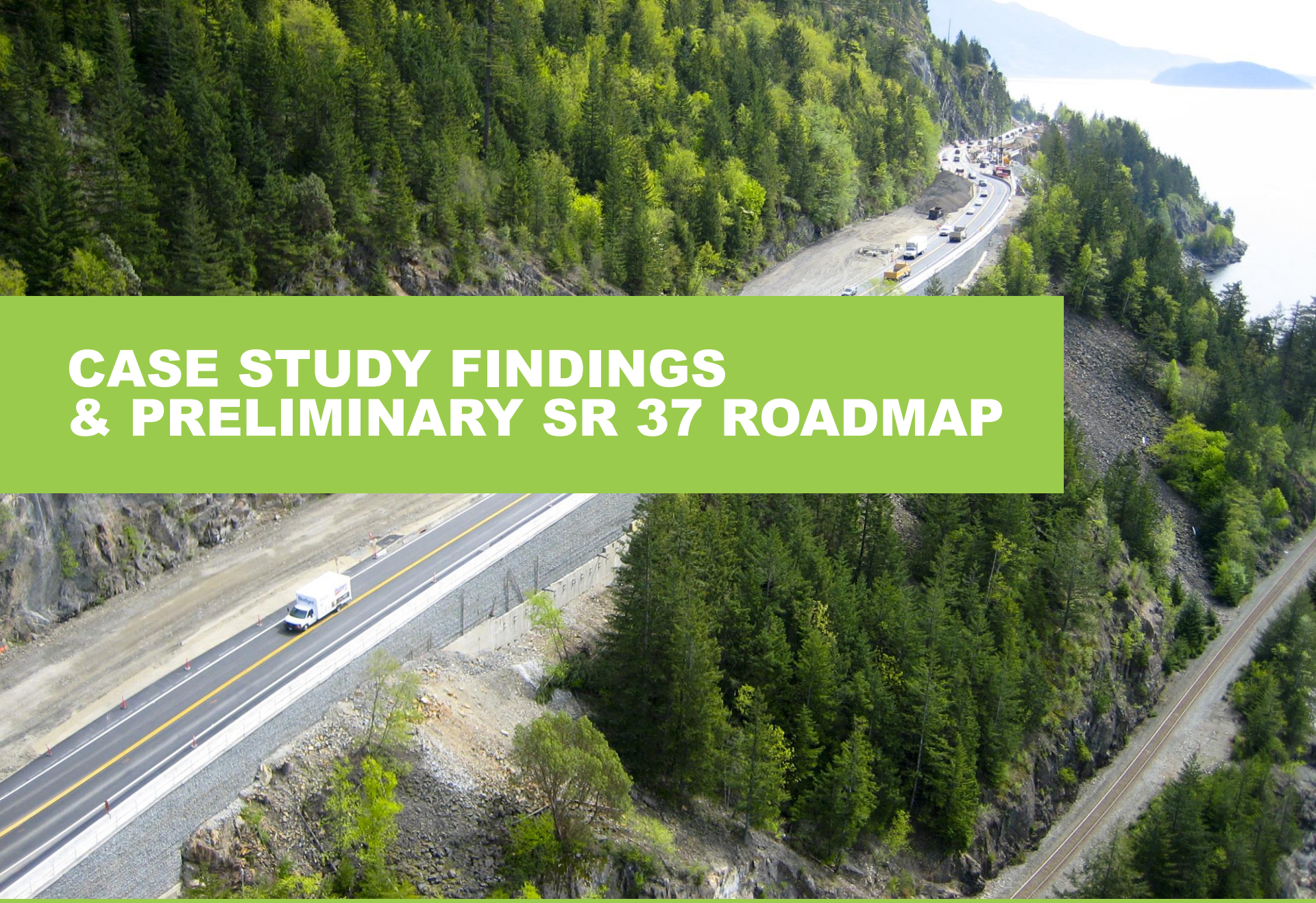
Dedicated revenue + funding/finance alternatives

Market appetite + balanced risk allocation

Competitive + transparent procurement process

Value-driven performance requirements

Market-tested asset management costs



CASE STUDY FINDINGS & PRELIMINARY SR 37 ROADMAP

PFAL

November 3, 2016

AGENDA

1. Case Studies
2. Preliminary Roadmap
3. Q&A

1 CASE STUDIES

PFAL

Today:

1. **Presidio Parkway, CA**
2. **I-4 Ultimate, FL**
3. **South Norfolk Jordan Bridge, VA**
4. **President George Bush Turnpike Western Extension, TX**

Last meeting:

5. South Bay Expressway, CA
6. U.S. 36 Managed Lanes, CO

PRESIDIO PARKWAY, CA

Rationale for alternative delivery

- Significant funding gap
- Timing and availability of funding
- Created short-term funding program capacity
- High project complexity with significant interface and delivery risk

Benefits

- Project risk transfer
- Alignment of interests between public and private
- Greater price & schedule certainty
- Initial and lifecycle cost efficiencies
- Long-term performance based asset management

PRESIDIO: LESSONS LEARNED

Relevance for SR 37:

1. Enabling legislation with the flexibility for alternative project delivery
2. Early education on benefits and limitations of alternative delivery
3. Adopting best-practice approvals management and implementation
4. Management of delivery and interface risks for complex multi-phased procurements
5. Multi-agency cooperation and commitments
6. Extensive and early stakeholder engagement process

I-4 ULTIMATE, FLORIDA

Rationale for alternative delivery

- Significant funding gap
- Traditional approach would take 27 years
- Severe congestion and expected growth

Benefits

- Value for Money analysis demonstrated a potential cost savings of 35% (or $1.38 billion) over 40 years
- Advanced project delivery by 27 years
- Successful competitive process saved $70 million from feasibility estimates
- Lower cost of financing than traditional tax-exempt debt

I-4: LESSONS LEARNED

Relevance for SR 37:

1. Accelerated project delivery
2. Toll revenue sufficient to cover annual Availability Payments
3. Aligned interests between public and private sector
4. Savings projected to be 20-30% less than engineers estimate due to innovative private sector solutions to a complex problem: actual savings were greater
5. Lower cost of finance than traditional tax-exempt debt
6. Adopted a competitive process while respecting commercial confidentiality of bidders
7. Adopted legislation that offered flexibility for alternative procurement approaches
8. Executive-level approvals for alternative delivery provided early

SOUTH NORFOLK JORDAN BRIDGE, VIRGINIA

Rationale for alternative delivery

- Existing bridge decommissioned
- Significant funding gap to replace bridge
- Desire to maintain transportation link
- Alternative crossings available

Benefits

- Maintained transportation link
- Allowed heavier vehicles to use crossing
- Reduced reliance and minimized congestion on alternative crossings
- Limited/no public funding required
- Provided pathway to project delivery

SNJB: LESSONS LEARNED

Relevance for SR 37:

1. No other affordable alternatives and limited appetite to reallocate funds, “an option of last resort”
2. Bridge was originally privately funded, decommissioned and not part of the statewide highway system
3. Toll rate setting transferred to private sector
4. Revenue-generating assets have value that needs to be assessed

PRESIDENT GEORGE BUSH TURNPIKE, TEXAS

Rationale for alternative delivery

- Constrained public resources
- Limit funding diversion
- Enhance public financial resources

Benefits

- Competitive process identified highest possible value of upfront payment
- Advanced project delivery
- Delivery risk and long term asset liabilities transferred
- Limited impact on public debt capacity

PGBT: LESSONS LEARNED

Relevance for SR 37:

1. Define project goals and objectives
2. Ensure key project stakeholders are aligned and committed
3. Procurement objectives and process should align and deliver project objectives
4. Maintain a competitive procurement process

KEY DATA POINTS

Theme	SBX	US-36	Presidio	I-4	S. Norfolk*	G. Bush
Project Size	• $635 million	• $497 million	• $1.1 billion	• $2.9 billion	• $142 million	• $1.2 billion
Project Delivery Performance	• 12 year delay	• On-time	• On-time	• Under construction	• 9 months after planned	• On-time
Toll Rate Setting Control	• Private sector sets toll up to 18.5% cap on equity return	• Private sector sets dynamic toll to achieve specified service requirement	• No tolls	• Public sector sets dynamic toll to achieve specific service level	• Private sector set toll rates with no defined limit	• Public sector
Revenue Control	• Shared with public sector beyond a defined limit	• Shared with public sector beyond a defined limit	• Not applicable	• Public sector	• Private sector	• Public sector
Established Traffic History	• No • Greenfield	• Yes • Expansion	• Yes • Replacement	• Yes • Expansion	• Yes • Replacement	• No • Greenfield
Competitive Procurement Process	• Partial (RFQ only)	• Yes	• Yes	• Yes	• No	• No
Environmental Approval Process Responsibility	• Private sector, initiated post award	• Public sector, substantially completed prior to procurement	• Public sector	• Public sector	• Private sector	• Public sector

*Note: some facts have been disputed by UBP

KEY FACTORS

Relevance for SR 37:

1. Project goals/objectives/definition
2. Public sector role, responsibility and control
3. Leadership and governance framework
4. Approval process
5. Long term asset value and cost
6. Dedicated funding sources
7. Procurement alternatives and assessment (e.g. Value-for-Money)
8. Market appetite and financing alternatives
9. Competitive and transparent procurement process
10. Enabling legislation
11. Stakeholder engagement and priorities

2 SR 37 PRELIMINARY ROADMAP

PFAL

SR 37 ROADMAP

1. Policy:	2. Project Needs:	3. Funding & Affordability:	4. Delivery Options:
Enabling Environment	**Well-Scoped Project**	**Financial Viability**	**Clear path: Procurement to Delivery**
Example: • Enabling legislation	**Example:** • Establish project Goals & Objectives	**Example:** • Identify funding sources	**Example:** • Value-for-money analysis

PROVEN PROCESS

1. Policy:

- Enabling legislation
- Established procurement policy and approval process (solicited and unsolicited proposals)
- Governance and oversight framework
- Stakeholder engagement

2. Project Needs:

- Establish project Goals & Objectives
- Define needs and scope
- Phasing requirements
- Environmental and other consultation constraints
- Risks and benefits assessment

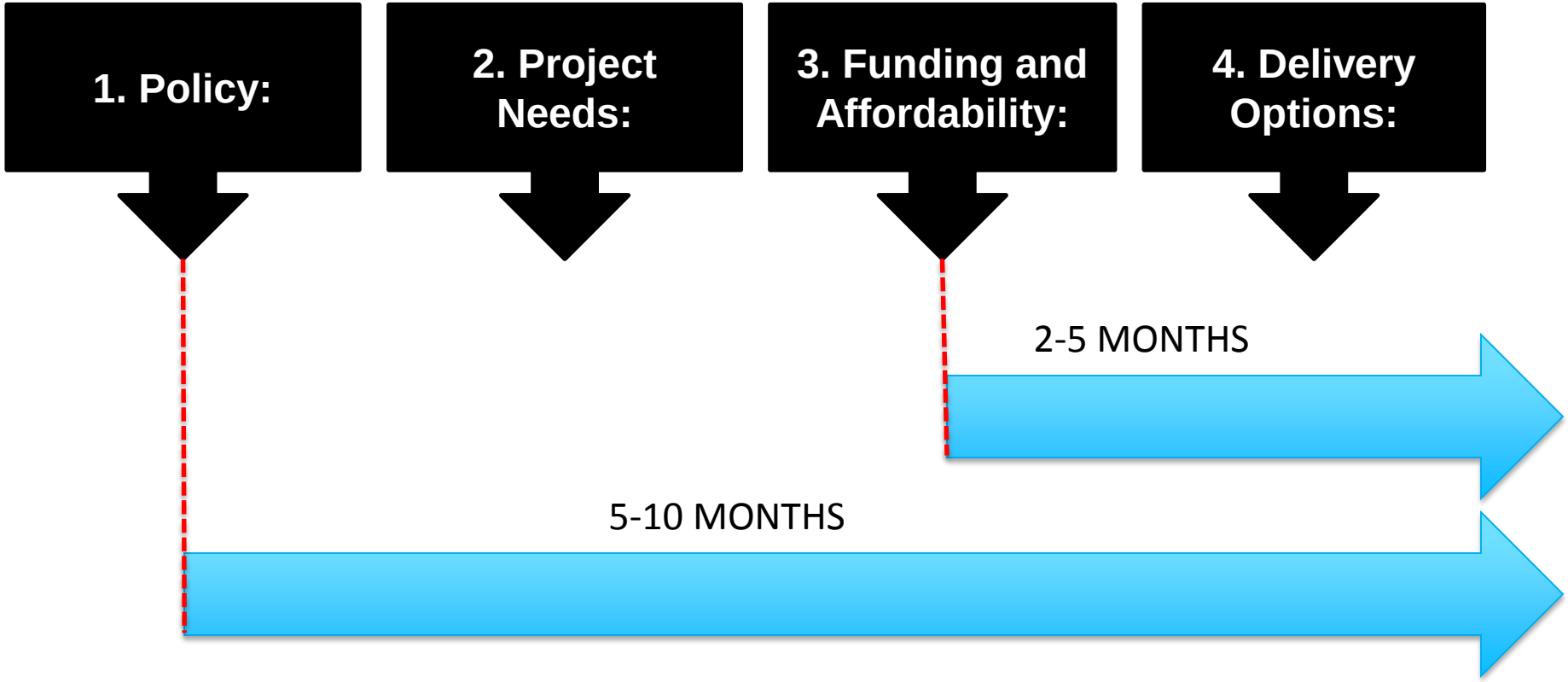
3. Funding & Affordability:

- Traffic & Revenue potential
- Identify value capture and other funding sources
- Project affordability limit and funding gap

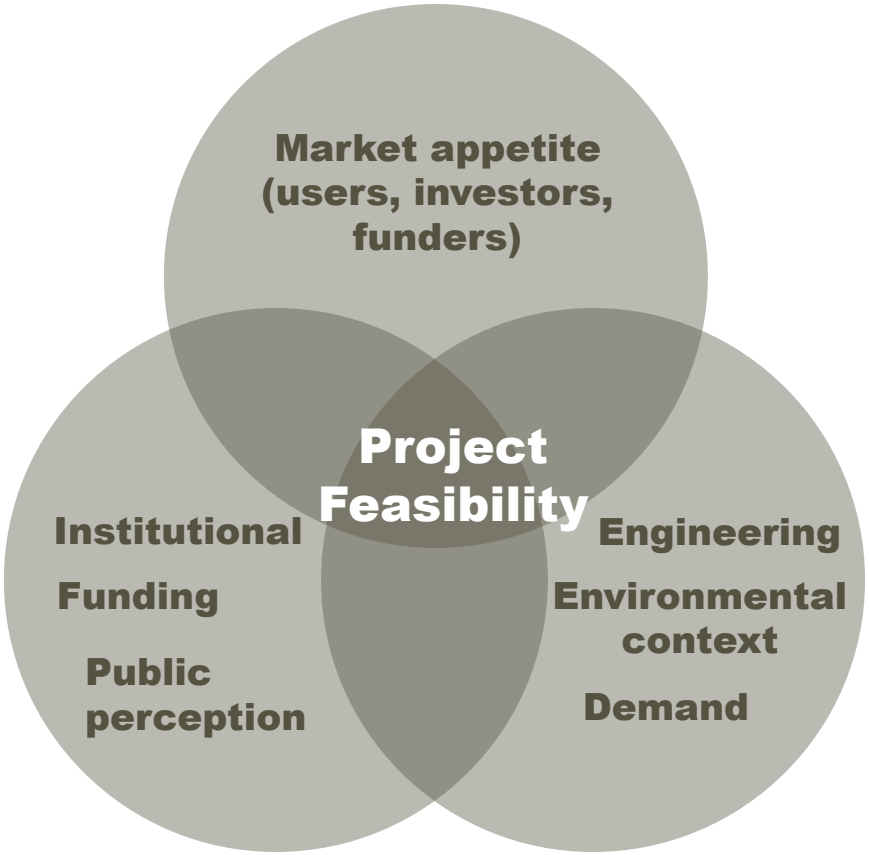
4. Delivery Options:

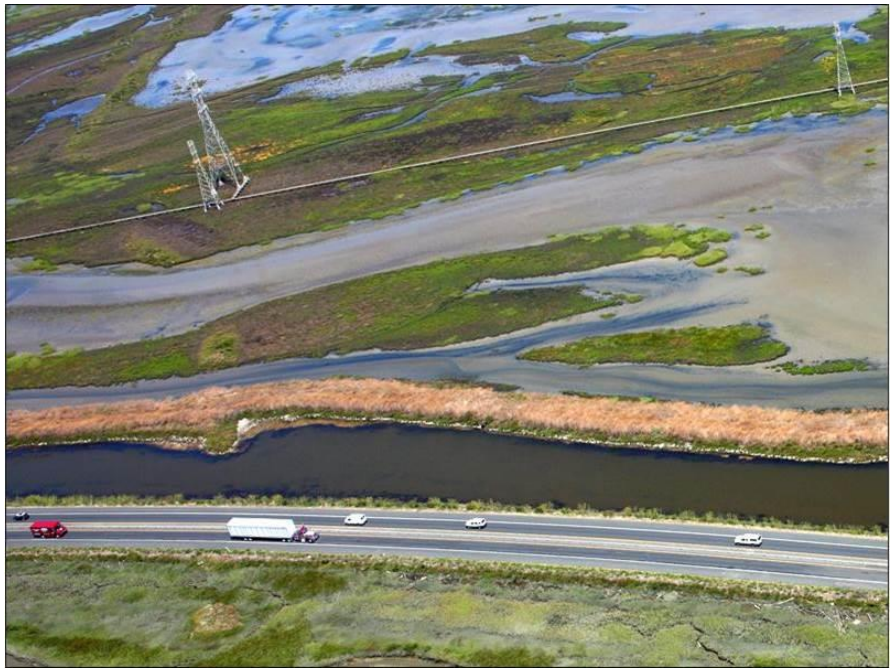
- Delivery alternatives
- Financing alternatives
- Value-for-money analysis
- Risks and benefits assessment
- Stakeholder engagement

INDICATIVE TIMELINE



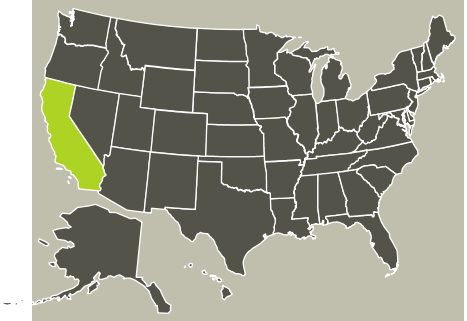
FEASIBILITY ENVELOPE





- ✓ TOLL REVENUE
- ✓ PRIVATE FINANCING
- ✓ COMPLEX CONSTRUCTION
- ✓ CALIFORNIA PROJECT
- ✓ TIFIA LOAN
- ✓ ENVIRONMENTAL SENSITIVITY

SOUTH BAY EXPRESSWAY



SAN DIEGO, CA

The South Bay Expressway ("SBX", formerly known as SR-125) project was the first public private partnership ("P3") in California, developed pursuant to California's AB 680 legislation passed in 1989. This was also the first toll road in San Diego.

BACKGROUND + PROJECT DRIVERS

SBX had been in California's transportation plans since the 1950's. In 1976, SBX was removed from the state highway system plan when funding could not be identified for the project. In 1984, the San Diego Association of Governments ("SANDAG") added SBX to the Regional Transportation Plan, but as before, funding for the entirety of the project was never identified.

The need for the project was driven by:

- Observed and expected population growth around the city of San Diego
- Observed and expected commercial traffic growth in the south east part of San Diego County, an area of expanding trade with Mexico at the Otay Mesa Port of Entry
- Observed and expected economic growth and activity in Chula Vista and Otay Mesa, which at the time were largely undeveloped

SBX was expected to achieve the following goals:

- Complete a missing link in the San Diego freeway network
- Reduce traffic congestion in the suburbs of San Diego including the city of Chula Vista, where significant population growth was expected
- Reduce travel time by 34% from Otay Mesa to San Diego and by 75% in the reverse direction
- Improve regional mobility in the South Bay; and
- Give residents and businesses access to employment centers on both sides of the US-Mexico border

FINANCIAL CLOSE
23 May 2003

OPENED TO TRAFFIC
November 2007

DELIVERY METHOD
DBFOM, 35 years

CAPITAL VALUE
$635 million

FINANCING
Private, toll revenue

TOLL RATES
Fastrak: 50 cents to $2.75
Cash/Credit: $2 to $3.50

ROUTE
10 miles in length
Connects SR 905 to SR 54

REVENUE
$32.0m in 2015

RIDERSHIP
44,200 AADT in 2016
40,378 AADT in 2015

POPULATION (2013)
3.15m San Diego County
476,896 South Region

MEDIAN INCOME (2013)
$67,753 San Diego County
Approximately $52,000 South Region

UNEMPLOYMENT (2013)
9.54% San Diego County
11.97% South Region

DELIVERY METHOD ASSESSMENT

There is no indication that other delivery alternatives aside from a toll road were seriously considered for the SBX project, or that any affordability analysis was conducted for the project. However, industry literature from the late 1980's and responses to the ideas proposed therein suggests a strong, growing interest and coalescing of public opinion around the idea of using public private partnerships to deliver badly needed infrastructure.

In 1989, a framework for delivery using private funding was established in California in the form of AB 680. The bill's aims were to introduce private capital in cash-strapped California, to introduce private sector efficiency to infrastructure delivery, and to reduce congestion while providing "reasonable profit" to the state's potential private partners. AB 680 was model legislation in that it provided a framework not only to regulate concessions before any were even in the negotiation phase, but also in that it provided testing grounds for the concession model that was being used to deliver infrastructure in Virginia and overseas in Australia and Europe.

In 1988, a half-cent sales tax was implemented in San Diego County called "TransNet" which resulted in sufficient funds being raised to fund the "GAP/Connector" road, which would be needed to link SBX with Route 54. The parties agreed to include acquisition, design and construction of the GAP/Connector in the SBX Franchise Agreement. This GAP/Connector portion was constructed with public funds and the parties agreed the public's use of the GAP/Connector would always be toll-free.

While the TransNet sales tax increased available transportation funding, the county estimated that the funded needed to build SBX under a traditional delivery model would not be available until 2020.

Benefits

Using a public private partnership, the County was able to open a new highway facility 13 years earlier than a traditional delivery model.

PROCUREMENT APPROACH

AB 680 generated great interest in a private toll road option, and in 1989 Caltrans issued an Request for Qualifications ("RFQ") to firms who were interested in designing, permitting, building, operating, and maintaining SBX as a toll road as permitted by AB 680. Under the franchise agreement, the private developer would assume responsibility for raising capital for the project and constructing the road in exchange for a 35-year toll concession. Caltrans would retain ownership of the highway, but lease the road back to the franchisee. In all, 13 firms responded to the RFQ. The competitive procurement process ended at the RFQ stage. Rather than shortlisting firms to respond to an RFP with detailed project specifications, Caltrans selected a respondent to proceed with the development of the project.

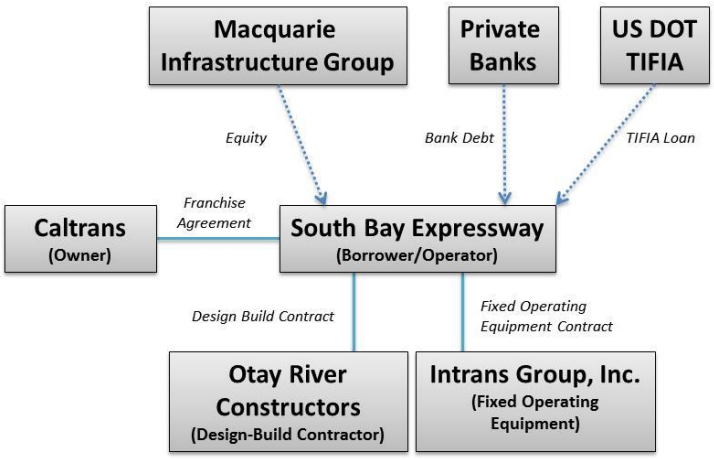
California Transportation Ventures ("CTV," now SBX LLC, was then an equal partnership among Parsons Brinckerhoff, Inc., Transroute International S.A., Fluor Daniel Corporation, and Prudential Bache Capital) was selected to develop the long-planned extension of SBX as a toll facility. In January 1991, Caltrans and CTV signed a franchise agreement for the project, which allowed CTV to finance and construct the roadway with title transferring to Caltrans upon construction completion. Caltrans also leased back the operational rights for a 35-year concession period. Toll rates would be set by the concessionaire, subject to a cap on its rate of return. The agreement also prohibited Caltrans from building any competing roads that could divert traffic away from the SBX.

Under the franchise agreement, CTV was to develop and submit final environmental documentation for the project by December 1997 with Caltrans acting as the lead agency for the environmental process. After delays due to legal challenges, unanticipated complications, shifting responsibilities, and other factors, the project finally received environmental approval in 2003, 12 years after the franchise had been awarded to CTV in principle.

Under the franchise agreement with the state, CTV's "reasonable return" on investment was capped at 18.5% over the 35-year period of the lease. At financial close in 2003, the project's capital requirement was $635 million, more than 50% higher than the projected $400 million project cost in 1990. CTV cited that $40-50 million of the project's increased costs were needed to cover environmental mitigation expenses, including research and maintenance of endangered butterfly and owl species, acquiring 1000 acres of land to be used as an open space preserve, and building and maintaining local parks, playing fields, campgrounds, etc. In addition, the franchise was responsible for approximately $5 million per year in property taxes throughout the time period of the agreement, as well as road maintenance and enforcement costs.

CTV struggled to finance the project without access to the tax-exempt markets. However, in 2003, just after the environmental permits were issued, CTV awarded a design-build contract for the project and shortly thereafter was acquired by Macquarie Infrastructure, who established SBX LP as the new concession company implementing the project.

ORGANIZATION CHART



FINANCING

- A $340m term loan and accompanying interest rate swaps with a tenor of 18.5 years was provided by Spanish bank Banco Bilbao Vizcaya Argentaria (BBVA) and Irish bank DEPFA Bank, plc. The loan was backed by toll revenue.
- A $140m TIFIA loan was provided by FHWA, one of the first 5 loans to be issued by the TIFIA program. The rate on the TIFIA loan was 4.46%. The TIFIA loan was also backed by toll revenue.
- Donated right-of-way was valued at $48m.
- Investor equity of $130m was contributed to the project for construction.

CONSTRUCTION

Following financial close, construction began in May 2003 and SBX was substantially completed in November 2007, roughly one year behind the original schedule.

The project's construction cost overruns were significant. One of the most striking features of the expressway is the Otay River Bridge. It is one of only two precast segmental bridges in the state, stretching three quarters of a mile and towering 18 stories high. Several sources cite increased costs of the Otay Mesa Bridge due to the requirement to accommodate future light rail as a major source of additional costs. However, other sources cite micromanagement by Caltrans that slowed the design approval and construction processes, added environmental mitigation costs, legal costs, and interface issues arising from the separation of the design-build and tolling operations contracts as other significant contributors to the project's overall financial welfare.

OPERATIONS

The highway opened to traffic in November 2007 in the height of the subprime mortgage crisis. Chula Vista and Otay Mesa were among the areas hardest hit in the global financial crisis, with unemployment levels in the area quoted by some sources to be as high as 18%. The severe impact of the economic downturn took a major toll on the suburban communities the expressway was built to serve, and ridership on the newly opened SBX was far below expected projections for commuter, casual, and commercial traffic.

Electronic tolling on SBX began in January 2008 following delays in activating the tolling system for the facility. Toll revenue forecasts failed to materialize. In 2008, the road's $22m in toll revenue was 30% below projections. In 2009, the road's $21m in revenue was 50% below projections.

Despite financial distress and reorganization, the road has operated continuously and remained open to traffic since that time.

In March 2010, SBX LP filed for bankruptcy. During the bankruptcy, the court reviewed over 62 claims totaling more than $1 billion that were made against the Concessionaire, nearly all of which were found to be invalid according to court filings. According to FHWA, while the primary cause of the bankruptcy filing was ongoing litigation related to claims by the contractor that built the SBX project, toll revenue collections on SBX had also fallen well short of the original projections.

SBX's reorganization plan was confirmed by the bankruptcy court in April 2011. It settled the outstanding litigation with the contractor and established a new concession company ("SBX LLC")

under the ownership of TIFIA and project's commercial lenders, who would share future toll revenues.

To avoid further lawsuits after SBX emerged from bankruptcy, a consideration was paid to the contractor as part of the bankruptcy settlement out of the project company's existing cash pool. This settlement amount was not made public.

ENR reported that the contractor was obligated to write off over $95m in unsuccessful claims following the conclusion of the bankruptcy process. Other sources reported that the equity investor and the contractor together had amassed bills for legal advice of over $80m through the duration of the construction period and the bankruptcy process. These funds were paid by the private sector.

CURRENT STATUS

SBX LLC emerged from bankruptcy in April 2011, owned by the private lenders and TIFIA lender, with a restructured and reduced debt burden. The franchise agreement remained in place and unchanged.

SANDAG purchased the SBX franchise from the new owners. The rationale for the purchase was that lowering the tolls on the road would encourage additional ridership and alleviate traffic on nearby highways. Under the terms of the $344.5 million sale, which closed in December 2011, the private lenders' restructured loans were repaid and the TIFIA loan remained in place. The TIFIA program issued a new loan under the same terms as in the reorganization plan and received a cash distribution of $15.4 million.

Soon after completing the sale of SBX, SANDAG lowered toll rates on the facility to attract more local and through traffic and relieve congestion on I-805, a parallel route. Control of SBX is scheduled to revert to Caltrans in 2042 under the terms of the original franchise agreement.

According to SANDAG, the road is performing above expectations and a rating upgrade is expected from Fitch. SANDAG has found the road is profitable and demonstrates the agency's successful investment in a road that it purchased for a price below the cost of the highway's construction.

The public sector agencies in the SBX story have, by all accounts, fared well. It is not uncommon for claims to be filed by contractors against Caltrans (and other public entities) on publicly-funded projects. Public records of Caltrans' claims liability were not found.

In 2009, the State strengthened California's public-private partnership law to reduce Caltrans' claims liability exposure, which deserves further consideration in the context of the typical risk allocations in a public private partnership and the roles that agencies like Caltrans play in facilitating (or hindering) progress on complex construction projects.

SANDAG was able to acquire a profitable and important highway link for 54% of the construction price and discussions with SANDAG officials suggest that SANDAG is pleased with the road's performance. The TIFIA lender's repayment terms have been adjusted from the 2003 loan agreement with the intent of allowing USDOT to recover all of the principal and capitalized interest that were originally contemplated back when the loan closed.

ROLES + RESPONSIBILITIES

RISK	OBLIGATIONS ASSUMED BY CALTRANS	OBLIGATIONS ASSUMED BY CONCESSIONAIRE
Design and Construction	Oversight	Yes
Financing		Secure financing
Traffic and Revenue	10 year franchise extension to be entertained if 18.5% equity IRR cannot be achieved	Full revenue risk assumed by Concessionaire
Toll Rate Setting		At Concessionaire's discretion subject to an 18.5% cap on equity return
O&M and Major Maintenance		Yes, services contracted to Caltrans
Insurance		Yes
Change in Law (discriminatory)	Yes	
Environmental Permitting & Licensing		Yes
ROW Acquisition	Reasonable Assistance	Yes
Hand-back	Oversight	Yes
Police and Emergency Services		Yes
Environmental		Yes
Termination for Convenience	Not applicable	
Protection from Competitive Transportation Facilities	Yes	
Federal Requirements	Reasonable assistance	Yes
Force Majeure	Shared	Shared

APPLICABILITY TO HWY 37

At the time of its passage AB 680 was considered groundbreaking legislation to enable private involvement in developing public-use highway infrastructure. However, the bill placed nearly all project risks on the private sector and precluded the use of public funding for the project. Sources cite these restrictions as terminal for two of the projects originally planned under the act and for causing the severe delays observed in SBX's construction.

One criticism that has been leveled at the SBX project parties is that the government did not play a sufficient role in defining the project or in assisting bidders in understanding the needs of the government or the project rationale. This resulted in a wide range of proposed alternatives from the large number of pre-qualified bidders. While not specifically referenced in any of the reviewed sources, we suspect that there was difficulty in evaluating and comparing the bids which were responding to different interpretations of the project definition. In current P3 transactions, one on one meetings with bidders are frequently using during a procurement to enable bidders to ask questions and for government to provide clarifications.

The environmental clearance process was arduous, expensive, and exhausting to the project parties. A key takeaway from the experience on SBX is that the public sector is best qualified to manage the risks of the CEQA process. Some sources that were reviewed alluded to an environmental clearance process that was stymied and slowed by a public that was strongly opposed to tolls and suspicious of private participation in public infrastructure delivery. In our experience, most credible potential private sector partners will avoid investing in P3 initiatives that have not already achieved environmental clearance, primarily because it is viewed as a high-risk effort that requires message management and leadership from government.

The same can be said for obtaining other public agency permits for the project, and for securing land for right-of-way. Public sector sponsors of these projects can better manage the risks of dealing with other public permitting agencies or acquiring property by using its powers of eminent domain. Having public sector partners involved in or being fully responsible for these functions will reduce project risks for private sector partners and thereby enhance the attractiveness of the P3 project to the private sector, which in turn will improve competitive tension among bidders.

Public opinion is generally against new toll facilities, and one of the important lessons from the SBX experience is that public message management is critical to the success of a project. Support among local agencies for an improvement in service and travel alternatives is a case that needs to be made to the public and to decision-makers in a way that is strategic and credible.

WHAT LEGISLATION NEEDS TO BE ENACTED TO PERMIT A SIMILAR EFFORT FOR HWY 37?

P3 enabling legislation should be more flexible in defining the roles and responsibilities of public and private sector partners. For a project of the size and complexity that is anticipated for Hwy 37, particularly in an area where users may not be accustomed to paying tolls, a real toll risk option may discourage competitive tension. Some public backstop for debt repayment, whether that is in the form of some type of payment guarantee, a minimum revenue payment or a full availability payment, there are several proven alternatives that warrant maintaining payment mechanism flexibility in new legislation for Hwy 37.

Other state P3 statutes permit the use of both public and private sector funding and allow the partners to assume different roles and responsibilities for the project commensurate with the risks and potential for return from the project proceeds. Many of the financial hurdles that existed when SBX was financed have been removed. Private Activity Bonds are now a commonplace tax-exempt option used in many P3 transactions. New legislation should contemplate the use of tax-exempt financing to achieve the lowest possible cost of capital.

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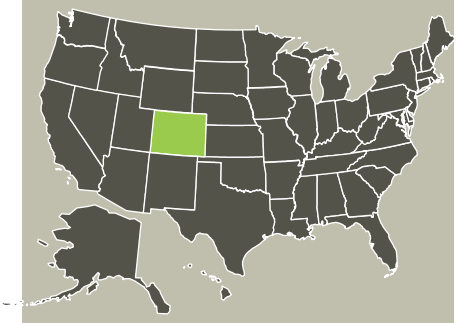
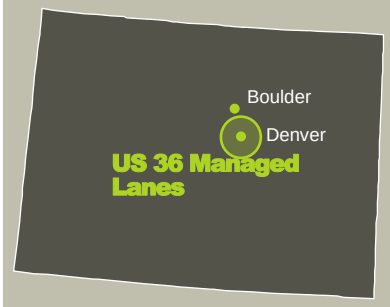
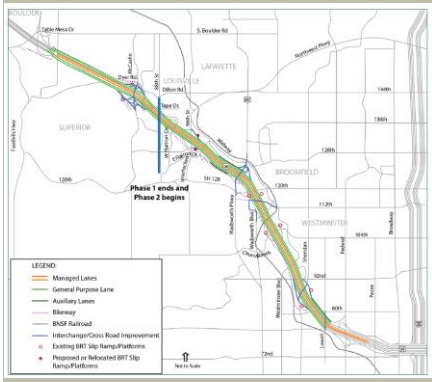
- ✓ TOLL REVENUE
- ✓ PUBLIC FINANCING
- ✓ PRIVATE FINANCING
- ✓ COMPLEX CONSTRUCTION
- ✓ MANAGED LANES
- ✓ TIFIA LOAN

US 36 MANAGED LANES







DENVER, CO

The High Performance Transportation Enterprise ("HPTE") was created in 2009 as a government-owned business and a division within the Colorado Department of Transportation ("CDOT"). It is responsible for seeking out opportunities for public-private partnerships ("P3s") through any available means of financing that allows for efficient completion of road and bridge projects. Under HPTE's US 36 P3 project agreement, the private sector designed, constructed, financed and is operating and maintaining managed toll lanes on US 36 in exchange for toll revenues.

BACKGROUND + PROJECT DRIVERS

Over half of CDOT's $1.5 billion annual budget is dedicated to maintenance of the state's existing highway system. There are limited resources to improve congestion and mobility: CDOT is projecting an annual shortfall of approximately $600 million per year to maintain and expand its existing transportation system.

CDOT's ability to keep pace with growth was constrained by state and federal gas taxes that have not increased in the last twenty years. Additionally, due to inflation and increases in fuel efficiency, CDOT is observing a decrease in fuel tax revenue.

In the meantime, CDOT needs are not stationary. As a result, CDOT has initiated several programs to try to do more with the available resources. Senate Bill 09-108, also known as the Funding Advancements for Surface Transportation and Economic Recovery Act of 2009 ("FASTER"), was passed by Colorado lawmakers in 2009. It authorized state officials to look for innovative ways to finance and construct major highway projects since traditional sources of highway funding, including federal and state fuel taxes, are insufficient.

The High Performance Transportation Enterprise ("HPTE") was created as a result of the FASTER Act. HPTE is a government-owned business and a division of CDOT. The purpose of HPTE is to pursue P3s and other innovative means, such as operating concessions, variable tolling, availability-based contracts, and design-build contracting, to complete surface transportation projects in Colorado.

CDOT/HPTE's first P3 project under this legislation was the US 36 Express Lanes Project (US 36). US 36 is a new 5.1 mile four-lane divided multi-modal highway project that built an Express Lane in each direction on US 36, in addition to the two free general-purpose lanes. The Express Lanes accommodate High Occupancy

FISCAL YEAR APPROVED
September 04, 2014

OPENED TO TRAFFIC
March 2016

DELIVERY METHOD
Phase I: Design Build
Phase II: DBFOM, 50 years

CAPITAL VALUE
$497 million

FINANCING
Public / Private -Toll Revenue

TOLL RATES
Morning peak $8.75 ($16.33 w/o pass)

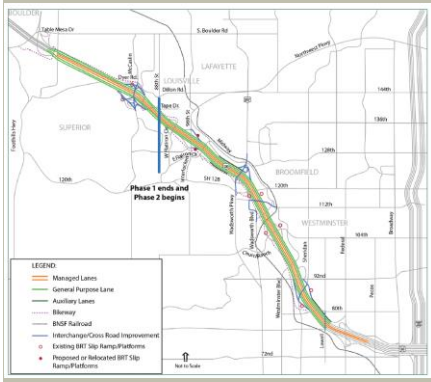
ROUTE
Multi-modal project on US36 from Federal Boulevard to Table Mesa Drive in Boulder

RIDERSHIP
100,000 trips per day

POPULATION (2013)
650,000 Denver
5.2m Colorado

MEDIAN INCOME (2013)
$62,760 Denver

UNEMPLOYMENT (2015)
4.2% Denver/Colorado



Vehicles ("HOV") and Bus Rapid Transit ("BRT"). In addition, the project replaced several bridges, built a commuter bikeway, added BRT improvements, and installed Intelligent Transportation Systems ("ITS") for tolling, transit and traveler information, and incident management.

As a congested and rapidly growing corridor carrying between 80,000 and 100,000 vehicle trips per day and operating at nearly 90 percent capacity, the US 36 experienced three to four hours of severe bi-directional congestion daily. The need for the project was driven by the desire to:

- Improve the condition of the highway
- Replace bridges that were in poor condition
- Provide congestion relief
- Expand mode of travel options
- Increase efficiency of transit service Delivery Method Assessment

For US 36, the goals of the project included:

- Maximize scope and improvements within the project budget;
- Minimize operating and life cycle maintenance costs and provide a long term, high quality product;
- Deliver the project ahead of schedule;
- Minimize inconvenience to the public and maximize safety of workers and traveling public;
- Maximize engagement of local workers, businesses, and communities in the development, construction and sustainability of improvements.

The project was split in to two phases. Phase I was procured separately under a design-build arrangement. Phase I was a 10-mile Managed Lanes project, which opened in July 2015. The new 5.1 mile Phase II Managed Lanes opened in March 2016.

Under the US 36 P3 performance-based arrangement, the concessionaire is responsible for operations and maintenance ("O&M") and toll collection for Phase I, Phase II and the existing 7.7 mile I-25 reversible managed lanes project. Note; the performance-based contract means that financial deductions are made for poor performance e.g. failure to meet the operations and maintenance standards such as snow plowing and travel time delays to transit.

Phase I: Design-Bid-Build:

Phase I of the project was delivered using a design-build approach. The project was funded and financed with a mixture of Federal, State and Regional Transportation District ("RTD") funds, including a federal Transportation Infrastructure Finance and Innovation Act ("TIFIA") loan, the repayment of which was supported by tolls. Additionally, a federal Transportation Investment Generating Economic Recovery ("TIGER") grant, as well as direct contributions from the City and County of Broomfield and the City of Westminster. RTD's substantial commitment to Phase I of the project came with an understanding that

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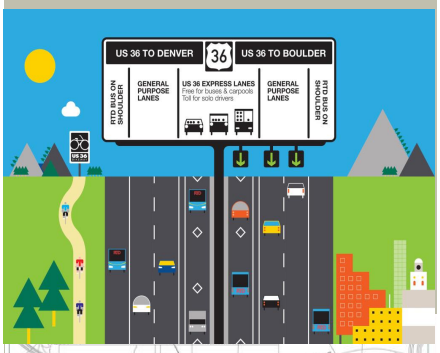

partial completion of the corridor improvements did not fill the overall need, and commencement of Phase II should begin before completion of Phase I. CDOT and the local partners shared that view.

Phase II: Design Build Finance Operate Maintain P3:

The decision to enter into a P3 for Phase II was justified by a Project Value Analysis ("PVA") or Value-for-Money Analysis. A PVA is a risk-adjusted analysis that shows, in Net Present Value terms, the benefits and costs of delivering a project using a traditional "public model" compared to a P3 concession model. HPTE analyzed the value that Colorado and its taxpayers would derive from having a private concessionaire build, operate and maintain the US 36 project, along with the I-25 express lanes, under a long-term agreement instead of using a traditional design-bid-build delivery. The analysis considered the level of public subsidy required, including the net revenue expected over the 50-year operating term of the concession agreement. The qualitative factors used for the P3 assessment were:

- Deliver project with lowest upfront public subsidy
- Transfer risk to concessionaire
- Relieve CDOT of Phase I O&M obligations
- Construct Phase II Managed Lanes Reconstruction of General Purpose Lanes in an effective and economical way
- Facilitate RTD's Bus Rapid Transit programs
- Optimize asset condition over long term
- Minimize inconvenience to public and maximize safety of workers and the traveling public.

With the goal of reducing the upfront public subsidy, the P3 model was the preferred alternative. Given HPTE and CDOT's limited financial resources, they were concerned about the potential financial exposure if revenues were lower than expected over fifty years, or other related costs were higher than forecasted. Therefore, the transaction structure that HPTE reached was to transfer the majority of the major project risks, including financing and maintenance risks, while retaining for the state the right to share in excess revenues generated by the highway if toll income exceeds forecasted targets over the life of the agreement. Over the useful life of the asset, the P3 approach was considered the best value alternative for taxpayers.

The final version of the PVA was completed in March 2014, once Plenary Roads Denver ("Plenary") had been selected and negotiations were nearing completion.

PROCUREMENT BENEFITS

Transfer project risk to private partner:
Colorado weighed risks versus the rewards in selecting the P3 model. The preferred alternative was to transfer project risks i.e. financing, operation and maintenance, and lifecycle replacement risks, while retaining the right to share excess revenues generated by the highway if toll income exceeds pre-determined

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targets over the life of the agreement. This approach limited the state's exposure if toll revenues were lower than expected, or if maintenance costs were higher than anticipated, yet the revenue-sharing provision allows for upside gain if toll traffic and income were more robust than predicted. There was no contractual guarantee for a minimum level of revenue for Plenary. The system uses a dynamic tolling with toll rates set by the concessionaire based on a schedule that is incorporated in to the concession agreement. Any changes to the dynamic tolling algorithm must be approved by HPTE.

Revenue sharing mechanism:
Excess toll revenue to which the state is entitled will be dedicated to ongoing transportation improvements in the corridor. HPTE signed an agreement with cities and counties in the US 36 corridor that allows them to participate in deliberations over how the state would spend excess toll revenue, should it materialize, to boost mobility and transit options in the corridor. This was an important mechanism of sharing control and gaining local support for the project.

"Freed up" public funds for other uses:
HPTE contributed a subsidy to the project to help meet the project's affordability requirement. The upfront public subsidy was minimized and was used to pay only a portion of the total cost of the project. All other project costs will be paid with toll revenue over the 50-year concession period. This freed up cash available from public funding sources to be applied to other projects in the near term.

Project delivered sooner:
Using the P3 model, the concessionaire provides equity and debt to cover upfront project costs rather than waiting until funds become available over time from traditional public sources. As a result, the project delivery was accelerated by 20 years.

PROCUREMENT APPROACH

The 24-month procurement process included several steps which involved CDOT, HPTE and local governments. The outline of the procurement process was as follows:

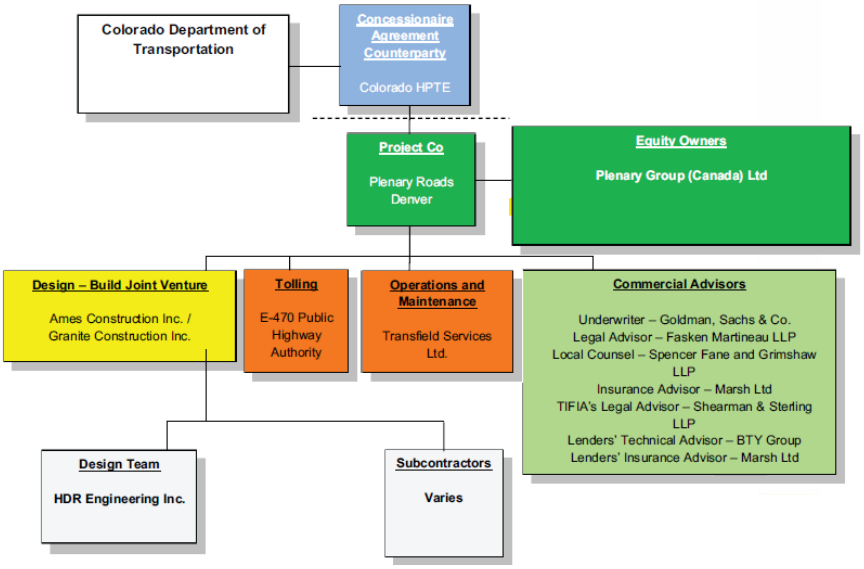
- Request for Qualifications ("RFQ") released February 2012;
- Four teams responded by April 2012. Three were short-listed;
- Final Request for Proposals ("RFP") released August 2012;
- Submissions were evaluated on the technical proposal, financial capacity, experience and qualifications of team;
- Plenary selected April 2013;
- Commercial Close July 2013;
- Financial Close February 2014.

The Plenary team included; Ames Construction, Granite Construction, HDR (as designer/engineer) and Transfield Services O&M. Toll collection is performed by the E-470 Authority, an existing public agency in the Denver region that manages other highway tolling projects i.e. I-25 and E-470 highways.

During the procurement process, bidders needed to include Phase I's existing TIFIA loan in their financial plans. However, they lacked complete information on how to legally achieve the transfer of the loan to a new borrower. This caused a delay to the procurement schedule and increased costs by about $5m due to interest rate increases between the proposal due date and financial close. The financial close deadline was scheduled for October 2013, but it was extended four times to accommodate the loan negotiations between HPTE, Plenary and the TIFIA lender. In addition, the federal government shut-down occurred during the loan negotiation period, which also contributed to the delay. Financial close occurred in February 2014, almost 1 year after proposals were delivered and 5 months after the date scheduled in the RFP.

Following commercial close and prior to the planned financial close date, Colorado legislators requested 60-days to review the executed P3 agreement, citing the need for improved transparency on the terms of the agreement. This review process delayed financial close. A subsequent bill aimed at improving transparency was introduced in June 2014. The bill was subsequently rejected by the Governor due to concerns that the provisions would constrain interaction with the private sector and stifle the viability of future P3s. "We firmly believe that government should always strive to be transparent and accountable," he stated in a letter to the Senate. "These constraints on business terms would create a chilling component on future transactions, making investors unlikely or unwilling to bid on Colorado projects due to the increased risks this process would generate." This is an important lesson. Any enabling legislation should include all the necessary steps for good governance to be laid out and agreed in advance while protecting commercially confidential bid details. Certainty for public and particularly private sector parties reduces risk and increases the value for money proposition.

ORGANIZATION CHART



FINANCING

Plenary will receive toll revenue collected on Phases I & II and the I-25 Express Lanes over a 50-year period which will be used to repay project debt, O&M costs, and a return on equity.

The project was financed with;

- $20.36m of series 2014 tax-exempt private activity bonds ("PABs");
- $60m TIFIA loan;
- $55m (Phase I, TIFIA loan);
- $20.6m junior subordinate loan from Northleaf Capital;
- Equity committed by Plenary of $20.8m.

The PABs, which pay a fixed coupon of 5.75%, priced at 98.241 to yield 5.875%. The PABs have a 30-year maturity. The new TIFIA loan carries an interest rate of 3.68%. Fitch Ratings assigned a BBB- rating to the TIFIA loan and senior PABs.

CONSTRUCTION

CDOT acquired all the necessary right-of-way for the project. Overall the construction was delivered on time, but initially there was a delay in closing the Phase I TIFIA Loan refinancing. This could have been avoided with earlier engagement with the TIFIA loan program.

In order to keep the project on time and on budget during the delay to financial close, HPTE negotiated a concession agreement amendment to permit Plenary to undertake utility work and certain other tasks to avoid a delay in completing Phase II of the

construction. The amendment obligated HPTE to pay for approximately $8.8m in utility work and $750,000 for early works prior to the project's financial close. It is important to note that these tasks were part of the project budget and did not increase the project's overall costs. However, if HPTE had been unable to reach financial close, HPTE would have been responsible for paying for these tasks.

TOLLING & OPERATIONS

As part of the P3 agreement, Plenary assumed toll collection and O&M responsibilities of US 36 Phase I, Phase II and for the existing I-25 Express Lanes. The existing general-purpose lanes remained free for all commuters. When executing the P3 agreement, Plenary agreed a schedule of maximum toll rates and certain minimum toll rates that could be charged under a dynamic pricing model, while maintaining certain safety and performance standards such as average vehicle speeds and journey times.

Establishing a maximum rate allows the public sector to maintain a certain level of control and approval rights over future toll rate increases beyond the defined rates. Conversely, the private sector investment and lending community can gain comfort that with the fact that approved toll rates are defined at financial close within these limits.

The toll rates on the North I-25 Express Lanes range in price depending on the time of day to ensure a reliable travel time for people in the Express Lanes. For example, on the southbound North I-25 Express Lanes during peak travel times, 7:15-8:15 a.m., the toll rate for drivers with an ExpressToll account and pass was $2.25, and the License Plate Toll ("LPT") was $5.56. On northbound I-25, between US 36 and 120th Avenue, toll rates from 4:30-6 p.m. was $3 for drivers

with an ExpressToll account and pass, and $6.75 for an LPT.

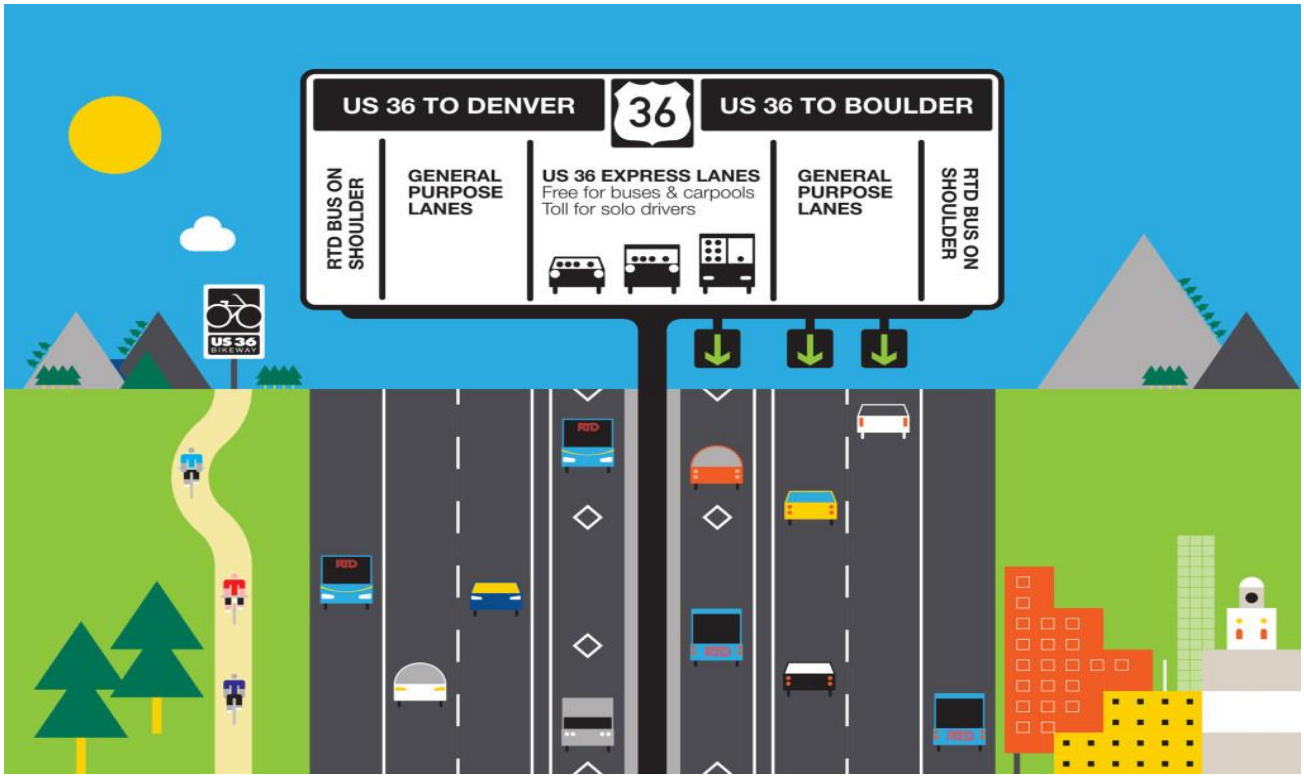
With the opening of Phase II, the overall project was complete. The toll rates approved by the HPTE Board vary at different times of day to manage congestion and ensure a reliable travel time in the Express Lanes. From Table Mesa to downtown Denver, the morning high peak (7:15 a.m.- 8:15 a.m.) is $8.75 with an ExpressToll pass. Without a pass, a surcharge is applied, and the cost increases to $16.33. At afternoon hours (3:30 p.m.- 4:30 p.m.), the ExpressToll rate decreases to $3.45 with an ExpressToll pass and to $8.70 without a pass. The toll rates for the same trip with an ExpressToll pass drop to $1.75 on Saturdays and Sundays and to $7.00 without a pass.

CURRENT STATUS

The project opened to traffic in March 2016 and is operating successfully.

Building off the success of the US 36 P3 and the $1.6b Denver FasTracks light rail P3 which closed in 2010, Governor John Hickenlooper and Denver Mayor Michael Hancock are backing the P3 model to deliver major infrastructure plans in the state and Denver region, with the governor stating Colorado is continuing to explore P3 opportunities.

CDOT and HPTE received the backing of the governor and mayor with the $1.2b I-70 East P3 project which is in procurement at the RFP stage. Other P3s are under preparation at the municipal level, including Denver International Airport terminal building, the National Western Center complex and a Denver Performing Arts Center, including a dozen other projects, with funding ring-fenced for the P3 model. As a result, Denver and Colorado are considered by the private markets to be attractive and competitive markets for P3 investment opportunities.



FUNDING SOURCES

US 36 Phase I	million
Regional Transportation District	$124.0
Colorado Department of Transportation and the Colorado Bridge Enterprise	$77.7
Future US 36 Phase I Toll Revenues advanced through a Federal Transportation Infrastructure Finance and Innovation Act (TIFIA) loan	$54.0
Denver Regional Council of Governments	$46.6
HPTE (I-25 Toll Revenues and Federal Transportation Investment Generating Economic Recovery [TIGER] Grant)	$10.0
City and County of Broomfield and City of Westminster	$5.6
TOTAL	**$317.9**

US 36 Phase II	million
Toll Revenues on I-25 and US 36 (from both Phase I and II) advanced by the concessionaire	$120.0
Regional Transportation District	$18.5
Denver Regional Council of Governments	$15.0
Colorado Department of Transportation	$15.0
Boulder County, the City of Louisville, and the Town of Superior	$11.0
TOTAL	**$179.5**

ROLES AND RESPONSIBILITIES

Risk	Obligations assumed by CDOT/HPTE	Obligations assumed by Concessionaire
Design and Construction	Oversight	Yes
Financing		Secure financing
Traffic and Revenue	Revenue shared after a minimum rate-of-return targets are met for the Concessionaire	Full revenue risk assumed by Concessionaire
Toll Rate Setting		Yes, subject to restrictions
O&M and Major Maintenance	Oversight	Yes
Snow & Ice Removal		Yes
Insurance		Yes
Change in Law (discriminatory)	Yes	
Environmental Permitting & Licensing Updates		Yes
ROW Acquisition	Yes	
Hand-back	Oversight	Yes
Police and Emergency Services	Yes	
Initial Environmental Approval	Yes	
Utility Relocation	Shared	Shared
Geotechnical Condition	Shared	Shared
Protection from Competitive Transportation Facilities		No
Federal Requirements		Yes
Force Majeure	Yes	

APPLICABILITY TO HWY 37

Legislation:
California does not have the legislative restrictions that necessitated Colorado to established HPTE, but having a dedicated function and resources (i.e. 4 full-time equivalents budgeted yearly) focused on innovative means to deliver major infrastructure projects is something that California could benefit from. It is likely that incorporating lessons learned and standardizing documentation and approval processes would make California a more attractive investment opportunity to the private sector and improve the acceptability of the P3 model to taxpayers. For example, new legislation in Colorado, SB 15-172, introduced in 2015 as a P3 oversight bill in the Colorado General Assembly, will improve the P3 process. One of the provisions of the new bill will require HPTE to hold public meetings in conjunction with local governments at the "visioning, initial RFP preparation, and draft RFP stage" of procurement. Additionally, HPTE will be required to provide the P3 agreement's terms to the General Assembly committees that have jurisdiction over transportation after entering into a P3 agreement, and post the terms to its web site. The bill also directs HPTE to evaluate the suitability of express bus service or bus rapid transit for projects that have one or more High Occupancy Vehicle lanes, High Occupancy Toll lanes, or managed lanes.

Revenue sharing mechanism:
The mechanism to share excess toll revenue and shared decision making with the state and local agencies for reinvestment into the corridor was an effective way to cultivate local support and approval from the stakeholders that would be impacted directly by the project. This also improved cooperation on the public sector side between the state, local agencies and cities/counties. A similar mechanism could be considered for the Hwy 37 project.

Public sector management:
An independent performance audit report on the project conducted in March 2015 and commissioned by the State Auditor and Legislative Audit Committee found that HPTE did not have adequate records of management processes for maintaining project-related documents or systematic processes for sharing public records and protecting confidential records under the Colorado Open Records Act. Additionally, HPTE and CDOT did not have a systematic process for monitoring operations and maintenance activities to ensure the concessionaire meets the performance standards outlined in the concession agreement once the project is operational.

The relevance for Hwy 37 is that the success of the P3 model, (i.e. effective and certainty of risk transfer which has been proven in the US and around the world), relies on adopting P3 best practice management and implementation techniques that support timely decision making and a predictable process, particularly once the project has reached financial close. Typically, the private sector comes prepared with the necessary P3 experience and wherewithal; however, with any emerging P3 program and with any project "first", there will be lessons learned and improvements to adopt, especially when public agencies initially lack a comparable level of experience. On the public side, there should be a clear understanding of the P3 approach and how it differs from traditional project delivery (i.e. design-bid-build); otherwise, the public agency will tend to attract many of the risks that it aimed to transfer to the private sector. Typically, for P3 projects, this inspection mechanism is done by an independent party (i.e. an independent engineer) hired and compensated by the project, who is objective to the terms of the agreement and impartial to both the public and private sector. If the independent engineer role is not an option, a compromise could be that the local agencies retain a certain level of oversight and control during this process to sustain a vested position during performance reviews and potential disputes or claims. Ensuring that sufficient public sector management and oversight is dedicated to the project from the very beginning, through planning, procurement, design and construction and the operating period is essential to the immediate and long term success of P3 projects. The public sector would be well-advised to ensure adequate measures are in place to retain institutional memory and project knowledge.

Established traffic data:
Having a multi-stage project meant that there was established traffic data and community acceptance on the use of Managed Lane facilities in the local region (e.g. I-25), allowed COT and HPTE to extract better value, reduce risk and offer a more competitive process for the later staged P3 project scope. CDOT/HPTE is conducting a similar approach for the other highway projects in their pipeline.

WHAT LEGISLATION NEEDS TO BE ENACTED TO PERMIT A SIMILAR EFFORT FOR HWY 37?

Similar to Colorado, California has had a number of successful P3 projects across a number of different sectors (i.e. transportation, public buildings and water) which has injected excitement into the US market, but a bankable pipeline has yet to materialize. Typically, this has been constrained by the short-term nature of enabling legislation, given the time required to prepare and execute major complex infrastructure projects. Caltrans' authority to enter into P3 agreements expires on December 31, 2016, under the current law. The enabling P3 legislation in Colorado, the Senate Bill 09-108, does not have a sunset or expiration date.

In April 2016, the California General Assembly's Transportation Committee approved legislation that will extend Caltrans authority to enter into P3 agreements. The new bill, AB 2742, would allow Caltrans' to enter into P3 agreements until 1 January 2030, which provides for a more reasonable amount of time to build a comprehensive P3 pipeline of projects.

SOURCES OF INFORMATION

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Infra-deals: https://www.infra-deals.com/deals/316476/US 36-p3.thtml; Accessed August 19, 2016

Infra Americas: http://www.infra-americas.com/legislation/ Accessed August 19, 2016

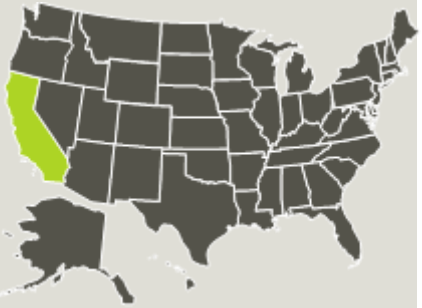
HPTE US 36 and I-25 Managed Lanes, Senior Revenue Bonds Series 2014 Offering Statement; http://emma.msrb.org/

CDOT Executed P3 Agreement https://www.codot.gov/programs/high-performance-transportation-enterprise-hpte/projects/US 36/US 36-phase-ii/p-3/US 36-public-private-partnership-executed-concession-agreement

- ✓ AVAILABILITY PAYMENT
- ✓ PUBLIC FINANCING
- ✓ PRIVATE FINANCING
- ✓ CALIFORNIA PROJECT
- ✓ TIFIA LOAN
- ✓ COMPLEX CONSTRUCTION

PRESIDIO PARKWAY

SAN FRANCISCO, CA



BACKGROUND + PROJECT DRIVERS

The Presidio Parkway is the new south access to the iconic Golden Gate Bridge, which connects San Francisco to the North Bay counties. It replaced the original access structure, known as Doyle Drive, which was built together with the bridge in 1936. Doyle Drive was originally designed as a series of viaducts to fly over what was then a military base, the Presidio of San Francisco. Built to the standards of the 1930s, with six narrow lanes, no shoulders, and no dividing barrier between the two directions of travel, the facility could not handle even minor traffic incidents without creating major backups on the bridge.

Calls for the replacement of Doyle Drive started as early as 1955, when the State Division of Highways, responding to the post-war traffic boom, proposed a project as part of a large freeway expansion plan in San Francisco; but in 1966 the freeway revolt movement put a stop to all new freeway construction plans in the city. Head-on collisions and traffic jams kept Doyle Drive periodically in the public eye, but the next major step did not occur until 1989, when Congress voted to close the Presidio military base, eventually giving rise to the initiative to make it into a major urban national park. The concept of undergrounding part of the facility, to lessen noise and pollution impacts while providing improved multi-modal access to the park, dates back to that period. In October of that year, the Loma Prieta earthquake doomed the Embarcadero freeway and brought into focus the seismic deficiencies of Doyle Drive.

In 1991, the San Francisco Board of Supervisors established the Doyle Drive Task Force. The Task Force considered design options and made recommendations that were approved in 1993. In 1994, the National Park Service released the Final General Management Plan Amendment ("GMPA") identifying the main objectives for Doyle Drive improvements, which focused on maintaining the historic value of the surrounding areas, minimizing noise and pollution impacts and enhancing Presidio access and circulation features.

That same year, the San Francisco County Transportation Authority ("the Authority") initiated the Doyle Drive Intermodal Study. Completed in 1996, and consistent with the general design concepts from the Task Force and GMPA reports, this document was crucial in confirming the replacement of Doyle Drive as

FINANCIAL CLOSE
14 June 2012

OPENED TO TRAFFIC
July 2015

DELIVERY METHOD
DBFOM, 30 years

CAPITAL VALUE
$360 million

FINANCING
Private, Availability Payment, Facility Not Tolled

ROUTE
Multi-modal access to The Presidio of San Francisco

RIDERSHIP
Approx. 120,000 trips per day

a San Francisco infrastructure investment priority. By detailing the likely devastating traffic impacts on the regional highway network, and on the regional economy, from a potential earthquake-induced Doyle Drive closure, the Authority's study kicked off the process of establishing the replacement of Doyle Drive as a major regional priority for funding, and it cemented a partnership with Caltrans, the facility's owner, but one where the Authority played the lead role in championing the project and securing federal funds for it, and managing the local and regional consensus-building process.

Subsequently, the Authority obtained a $6 million federal earmark to continue studying the project and initiate environmental evaluation. The historic assessment for the project began in 2000. At the November 2003 ballot, the Authority succeeded in reauthorizing the local sales tax for transportation, which included $100 million for the Doyle Drive replacement project, creating a tangible source of local matching funds to leverage state and federal dollars for the project. The Draft Environmental Impact Statement/Report ("DEIS/R") was released in 2005. On September 26, 2006, the Authority Board unanimously selected the Presidio Parkway as the Preferred Alternative for the replacement of Doyle Drive. The Final Environmental Impact Statement/Report ("FEIS/R") was certified on December 16, 2008, clearing the way for the detailed design and construction phases of the project. The project's cost estimate had climbed by then to over $900 million, and the funding gap was close to $200 million.

DELIVERY METHOD ASSESSMENT

In 2009, the Authority began discussions with Caltrans and the California Transportation Commission ("CTC") for consideration of the Presidio Parkway as a public private partnership ("P3"), under California's newly approved P3 legislation, SB4. Later that year, citing urgent concerns about the seismic vulnerability of the existing structure, the Caltrans Director ordered the project divided in two phases and expedited for construction. The phasing plan contemplated the construction of the southbound portion first, using the traditional design-bid-build ("DBB") delivery method, followed by a second phase, which would build the rest of the project using a P3.

The decision helped to expedite the project's initiation and deal with internal challenges raised by the design engineers' union at Caltrans, the Professional Engineers in California Government ("PECG"). However, it also had its downsides, restricting opportunities for creativity in design and construction methods in Phase II, increasing contractor interface risks and reducing the potential benefits of the P3 by reducing its overall size and tying its scope and schedule to those of Phase I. A number of components initially slated to be delivered in Phase I ended up being shifted to Phase II, creating contractual complexities and opportunities for claims by the concessionaire that eventually resulted in costs for additional scope, which would likely have been lower if they had been planned as part of Phase II from the start.

To assess the benefits of alternative delivery methods a business case study and Value-for-Money ("VFM") analysis was initiated comparing different project delivery alternatives. In comparing delivery methods, the DBB option was used as the Public Sector Comparator ("PSC"), against which the Design-Build-Finance ("DBF") and the Design-Build-Finance-Operate-Maintain ("DBFOM") alternatives were evaluated. The analysis included both quantitative and qualitative aspects. The quantitative analyses used a net present value ("NPV") approach to compare the life-cycle costs of the two P3 options (DBF and DBFOM) with the traditional DBB approach.

The analysis showed that the DBFOM delivery option offered the best value for the project. In a DBFOM, the government makes certain fixed payments as construction milestones are reached. Then, over the term of the

contract (in this case 30 years), the government makes fixed annual payments to compensate the private concessionaire for the expense of operating and maintaining the facility to the contractually agreed-upon standards, and to repay equity contributed to the project by the concessionaire and provide a return on investment. The analyses showed that the DBFOM approach would cost $147 million (23%) less than the traditional DBB approach and achieve greater VFM over the project's life-cycle. Some issues were not easily expressed in monetary terms and a qualitative assessment had to be considered for these three delivery options.

The timing of availability of funds was a compelling issue. In order to go with the traditional DBB delivery option, Caltrans and the Authority would have to ensure that all committed project funding was available up front to address all costs within a three-year construction period. Some of the funding, however, would only be available over a longer period of time, as dictated by county shares and other funding program guidelines, resulting in construction delays which would increase the cost of the project and reduce user benefits. The use of private finance in both the DBF and DBFOM options would allow Caltrans and the Authority to better match the timing of payments with anticipated revenue availability over a longer period of time. In addition, adopting a P3 approach for the project created short-term funding program capacity for Caltrans to address other projects around the state, because less funding was required up front for the Presidio Parkway. This was particularly relevant at the time, because the state was dealing with the effects of the Great Recession and the State Highway Account was nearly depleted.

The CTC approved the entry of the Presidio Parkway project into the P3 procurement track in May 2010. The

action took place over several months and it was the subject of fierce debate. CTC staff recommended against the project, arguing that the recession provided an opportunity to build the project cheaper using the traditional method. The Authority argued that final price would not be the same as the low bid, especially on a project of this complexity, and pointed to the business case study of the Caltrans track record, which demonstrated that on projects with an initial cost estimate of over $300 million, delivered traditionally through DBB, the likely cost overrun level at completion was 60% over the initial budget. The CTC eventually voted to override the staff recommendation and approve the P3, but it doing so it lowered the maximum annual availability payment level from $40 million to $35 million. The change did not deter the market from bidding on the project.

PROCUREMENT BENEFITS

Transfer project risk to private partner:
The DBFOM option offered a more extensive and appropriate transfer of risks to the private sector. This option transferred key risks related to construction (such as construction means and methods, construction quality, and long-term asset performance) to the party best able to manage them, which is a private company who has a business model dedicated to delivering these services. The concessionaire is responsible for both project delivery and long-term operations and maintenance. Caltrans and the Authority would be protected from any cost overruns or price escalation due to delays. In addition, there were material benefits to delivering the design, construction and maintenance as part of an integrated strategy under one contract, minimizing interface risk, and optimizing economies of scale and opportunities for collaboration across multidisciplinary teams.

Alignment of interests:
The DBFOM commercial structure, contracts, and financial security packages assisted in aligning the incentives of the concessionaire with those of Caltrans and the Authority. The concessionaire has a strong incentive to achieve project performance specifications for construction, operations, and maintenance because documented failure to meet performance standards will reduce the size of the annual availability payment. This reduces the return on investment for the concessionaire's investors who, in turn, will apply internal pressure to meet performance standards and avoid financial penalties.

Greater price and schedule certainty:
P3s allow government agencies to share risks with, or in some cases entirely transfer certain risks to a private sector developer who has proven experience dealing with such risks and has developed strategies to mitigate potential delays and cost increases that can result from such risks. In addition, the concessionaire must build the project first and get it ready for operation and the public agencies get to formally inspect it and accept it before they authorize a significant milestone payment. The agencies can also achieve greater price certainty from P3s because the contracts often have a maximum price, which means that the private partner must pay for any cost increases above the agreed upon price. In a DBB, which is awarded to the lowest responsive bid, change orders and time charges during construction can mean a big difference. The final cost is usually much higher than the lowest bid, especially for larger, complex projects.

Cost efficiencies:
Due to the integration and innovation that can be achieved in construction of large scale DBFOMs, significant cost savings can be realized against original

- ~1/3 of the scope
- One tunnel, one viaduct, half an interchange
- Relatively more utility relocations and demolition

Total constr. cost = $370M

Total constr. cost = $384M (est.)

- ~2/3 of the scope
- Three tunnels, three viaducts, one and a half interchanges
- Relatively less utility relocation and demolition work

construction estimates. Here is a striking comparison: the Presidio Parkway construction costs for Phase I, which represents approximately one-third of the physical scope, were $370 million. By contrast, Phase II (the P3 phase), which represents approximately two-thirds of the physical scope, cost approximately $385 million. Therefore, the P3 delivered almost twice the scope for virtually the same price based on these interim results.

The annual affordability limit set by the CTC was $35 million and the P3 agreement at financial close was $22 million, approximately 37% below the affordability limit. These payments are fixed over the concession term, but subject only to inflation or deductions due to poor performance by the private partner. These payment certainties make for easier annual budgeting and fiscal planning.

"Freed up" public funds for other uses:
In an availability payment-based DBFOM, the government pays a portion of the total cost of the project during construction and the remainder is paid over the 30-year concession term. This minimizes the need to raise public debt to complete a project. It also frees up other available cash to be used towards other projects. Therefore, using a private sector concessionaire to access capital can free up government funds to advance the construction of other infrastructure projects in the near-term and, therefore, provide the public with access to improved infrastructure sooner than would otherwise be possible with traditional delivery methods.

Performance-based asset management:
Under a P3 agreement with availability payments, the public agency gets to deduct a portion of the annual payment if the concessionaire fails to maintain the asset to the contractually agreed performance standards, as inspected according to specified procedures. This means the public sector effectively receives a 30-year performance and quality warranty and the private sector is incentivized to operate and maintain the asset appropriately over the concession term. At the end of the contract term, the government will regain operating control of the asset and the asset will have a pre-determined useful life left in it because of the routine and regular maintenance level specified in the contract.

Throughout the concession period, rehabilitation costs are the responsibility of the private sector; this also means that there are no surprises, as far as major investments needed by the public sector over that period. This simplifies budgeting and fiscal planning and ensures the continued, safe operation of the project.

Sustainability
A sustainability program for the project was built into the P3 performance and payment mechanism, to incorporate sustainability principles throughout the design, construction, operation and maintenance of the project. In 2015, the Presidio Parkway became the first Greenroads® Certified State Highway Project in California.

PROCUREMENT APPROACH

The overall P3 competitive procurement approach for Phase II was as follows:

- December 2008: Environmental assessment completed
- February 2010: Issued Request For Qualifications ("RFQ") and submitted the project proposal to the CTC
- May 2010: The CTC approved the proposal; Issued draft Request For Proposals ("RFP")
- October 2010: Three bidders shortlisted; Issued final P3 Agreement
- January 2011: Awarded contract to Golden Link Partners ("GLC"); Commercial Close
- November 2011: California State Supreme Court denies legal appeal by PECG (the last of three court decisions in the case)
- June 2012: Financial Close
- July 2015: Project completed and open for traffic

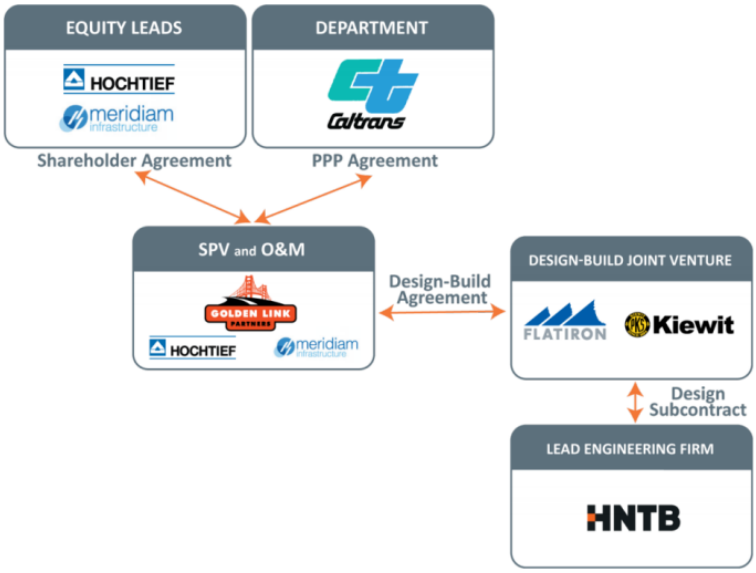
Following the RFQ, Caltrans/Authority announced three companies as being qualified for the potential P3 in April 2010. These companies qualified based on demonstrated successful experience on similar sized projects in the past. The shortlisted teams were;

- Golden Link Partners: Meridiam Infrastructure North America and Hochtief PPP Solutions North America in a 50/50 equity venture. Their construction team comprised of Kiewit and Flatiron Construction.
- Golden Gate Access Group: ACS Infrastructure Development, with a construction team of Dragados, the local employee-owned CC Myers and design firm CH2MHill.
- Royal Presidio San Francisco Partners: Globalvia Infrastructure (equity member, lead O&M), FCC Construction, Tutor Perini Corporation and the Parsons Transportation Group as lead engineer.

The proposed P3 approach was controversial. PECG, the state-employed engineers union, strongly criticized the P3 concept and argued that tolls and user fees were required by law for P3 transportation projects. They also argued that the proposed P3 project did not go through the normal procedures developed to ensure public funding accountability. State officials responded that the state law does not prohibit the government from using availability payments for P3 projects and the state can benefit from the P3 arrangement by transferring risks to GLC.

On November 2, 2010, PECG filed a lawsuit to block the P3 procurement and claimed that the process was illegal. On December 22, 2010, the Superior Court in Alameda Country granted a temporary restraining order ("TRO") to restrain Caltrans from awarding the contract to GLC while the complaint was considered. The TRO was lifted on January 3, 2011, and Caltrans and the Authority signed the P3 contract with GLC for Phase II. Financial close was reached in June 2012 and the project opened in July 2015.

ORGANIZATION CHART (PHASE II)



COSTS AND FINANCING

GLC will be repaid over the 30-year period with the annual availability payments. Note; the facility was not tolled. The project was financed with;

Bank Debt:

- A $170 million, 3.5-year bank facility, which priced at 180 bps over monthly LIBOR, funded construction until GLC received a milestone payment from Caltrans and the Authority. The bank facility came from a group of five international banks; BBVA, BMO, BTMU, Santander and Scotia Capital. The five banks all contributed equally to the loan.

- Once construction was complete, GLC was entitled to receive availability payments of $22 million per year during the 30-year concession, subject to inflation adjustment. These payments were used to cover operations and maintenance costs, fund major maintenance reserves, and pay a modest return on equity.

TIFIA Loan

- GLC received two tranches of a TIFIA loan; a short-term tranche for $90 million and a long-term tranche for $60 million. This was the first project with direct Federal-aid participation in availability payments and the first TIFIA loan to be repaid in part with a milestone payment following substantial completion.

- The short-term tranche, which helps cover construction costs, had an interest rate of 0.46%, and the long-term tranche, which expires in 2045, had an interest rate of 2.71%.

- GLC had once planned to issue up to $150 million in private activity bonds ("PABs") but decided the project was better suited for bank financing as the cost of debt for the bonds would be slightly higher.

Equity Contributions

- GLC contributed $46 million in equity, split evenly between Hochtief and Meridiam, resulting in a debt-to-equity ratio of 87.5:12.5.

CONSTRUCTION

The risks to the schedule and to the budget were significant:

- The existing highway had to remain open to traffic throughout the construction phase;

- Sixteen state and federal agencies either have jurisdiction over portions of the right-of-way or had to be consulted for other reasons;

- Several different construction contractors depended on the timely implementation of and interface with separate construction contracts for Phase I to be able to access the site and deliver their portion of the overall project on time and on budget.

Construction cost increases:

- At completion, Phase I costs were $391 million, which was a 24% increase over the budget and 61% increase over bid.

- Phase II had a 9% increase over budget, based on change orders supported by the project review board. It is important to stress that the Caltrans is currently recommending paying over $100 million in additional compensation to the concessionaire for disputes related to extra costs, but the vast majority of these costs, as documented by Caltrans' own report to the CTC, are for scope increases requested by Caltrans.

Construction schedule impacts:

- Phase I planned delivery was 20 months, against an actual 48.

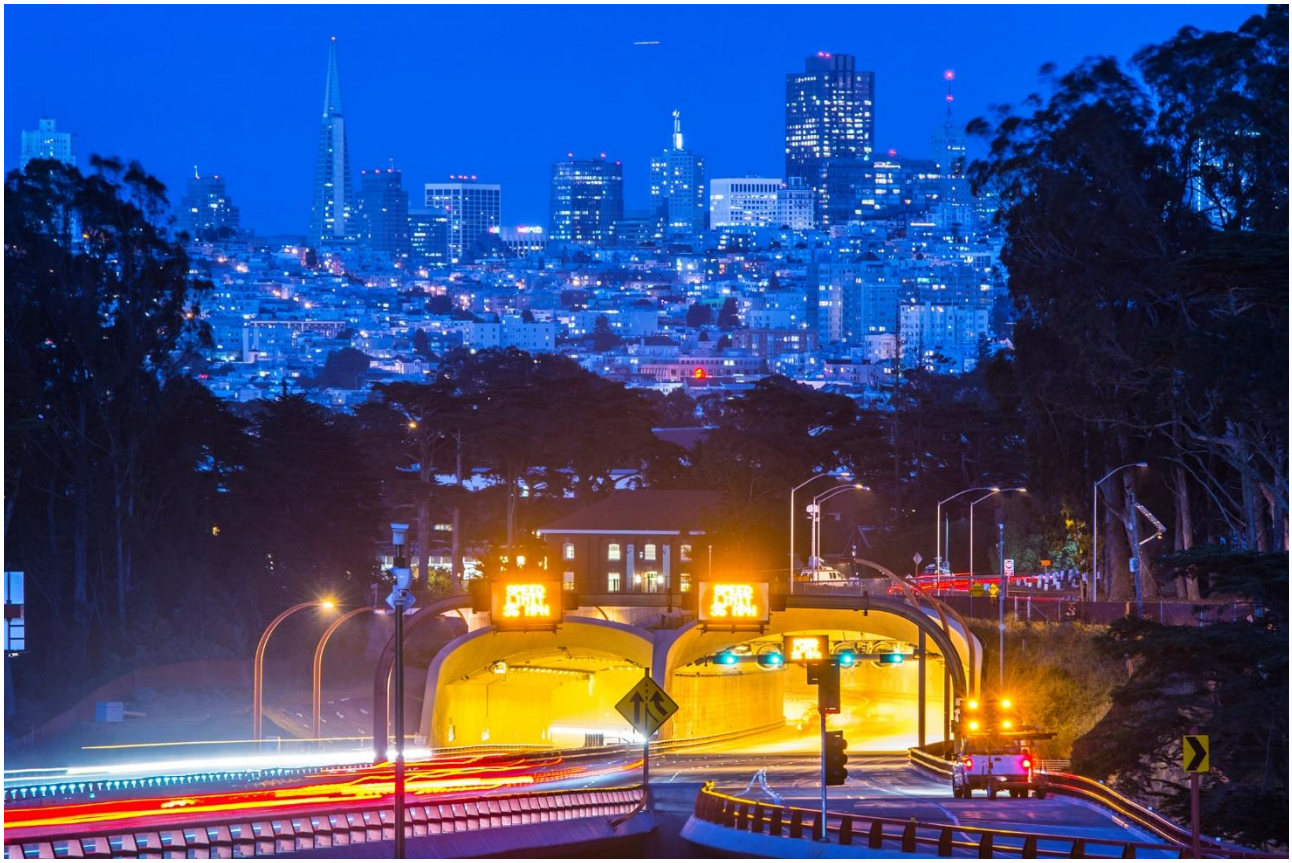
- Phase II was delivered as planned, in 51 months, and it delivered twice the scope value of Phase I

and most of the complex structures, including three of the four tunnels, the Park Presidio and Girard Street interchanges, and all of the complex life safety systems.

In April 2012, traffic was shifted onto a seismically-safe temporary bypass that carried traffic until Phase II was complete in July 2015.

OPERATIONS

The project is open to traffic. Over the long-term GLC has to ensure a safe and durable facility over the 30-year contract term. GLC is responsible for operation and maintenance of the entire project facility, including all Phase I and Phase II elements.



PROJECT CAPITAL COSTS & PUBLIC FUNDING SOURCES (JUNE 2012)

Capital Cost	Phase I	Phase II
	Design-Bid-Build	**Public-private partnership**
Environmental	$27,800,000	
Development and Design	$50,100,000	
Right of Way	$83,800,000	
Transaction, Construction Management and Oversight	$59,100,000	$37,400,000
Construction	$274,400,000	
Construction Completion Milestone Payment		$185,400,000
TIFIA Tranche A Loan Repayment		$91,000,000
TIFIA Tranche B Loan Repayment		
Reserve	$1,100,000	$46,500,000
Availability Payments		
TOTAL	**$496,300,000**	**$360,300,000**
Funding	**Phase I**	**Phase II**
Federal Grants	$70,800,000	$5,900,000
American Recovery and Reinvestment Act	$86,700,000	$46,000,000
State Highway Operations and Preservation Program	$197,100,000	$72,200,000
State Highway Account		
Transportation Congestion Relief Program	$15,000,000	
Prop K Sales Tax	$29,600,000	$36,000,000
Regional Improvement Program	$17,100,000	$67,000,000
State Local Partnership		$19,400,000
Metropolitan Transportation Commission Bridge Tolls	$80,000,000	
Metropolitan Transportation Commission STC/CMAQ		$34,000,000
Golden Gate Bridge Highway and Transportation District		$75,000,000
Transportation Authority of Marin		$4,000,000
Sonoma County Transportation Authority		$1,000,000
TOTAL	**$496,300,000**	**$360,500,000**

ROLES AND RESPONSIBILITIES

Risk	Obligations assumed by Caltrans	Obligations assumed by Concessionaire
Design and Construction	Oversight	Yes
Financing		Secure financing
Traffic and Revenue	Yes	
Toll Rate Setting	Not tolled	Not tolled
O&M and Major Maintenance	Oversight	Yes
Insurance		Yes
Change in Law (discriminatory)	Yes	
Environmental Permitting & Licensing		Yes
ROW Acquisition	Yes	
Hand-back	Oversight	Yes
Police and Emergency Services	Yes	
Traffic Management		Yes
Environmental	Yes	
Utility Relocation		Yes
Hazardous Materials	Shared	Shared
Termination for Convenience	Yes	
Protection from Competitive Transportation Facilities	NA	NA
Federal Requirements		Yes
Force Majeure	Shared	Shared

APPLICABILITY TO HWY 37

Legislation:
California has had a number of successful P3 projects across a number of different sectors (i.e. transportation, public buildings, energy and water) which has injected excitement into the US market, but a bankable pipeline has yet to materialize. Typically, this has been constrained by the short-term nature of enabling legislation, given the time required to prepare and execute complex infrastructure projects.
Under the current law, Caltrans and regional transportation agencies' authority to enter into P3 agreements expires on 31 December 2016. The legislation did not limit the number or location of the P3 projects that Caltrans or the local agencies could pursue, but the Presidio Parkway was the only project procured since the 2009 legislation was introduced. Given the pending expiration, in April 2016 the California General Assembly's Transportation Committee approved legislation that will extend Caltrans authority and regional agencies to enter into P3 agreements. The new bill, AB 2742, would allow Caltrans and regional agencies to enter into P3 agreements until 1 January 2030. If adopted, this new legislation would give sufficient authorized time for the SR 37 project to contemplate a P3 delivery.

Education:
Ambiguity with the use of new terms like P3 and a common understanding of the benefits and limitations of alternative procurement is a major challenge for the public sector and taxpayers, especially during the procurement and approval process of projects. Sufficient time and resources are necessary to educate and gain feedback early in the process. Most importantly, a project champion on the public sector side is needed to drive the process and make the project procurement a success.

Public sector management:
The success of the P3 model that has been proven in California, the U.S. and around the world relies on adopting best-practices management and implementation techniques that support timely decision making and a predictable process. Typically, the private sector comes prepared with the necessary P3 experience and wherewithal; however, with any emerging P3 program and with any project "first", there will be lessons learned and improvements to adopt, especially when public agencies initially lack the

comparable level of experience. On the public side, there should be a clear understanding of the P3 approach and how it differs from traditional project delivery (i.e. DBB). Without continued professional training, public agencies will tend to transfer back onto themselves many of the risks that they aimed to transfer to the private sector by using a P3.
This is especially important during the oversight and inspection of design and construction phases of the project. For the Presidio Parkway, Caltrans retained the inspection and documentation functions. Typically, for P3 projects this inspection mechanism is done by an independent third party (i.e., an independent engineer) who is hired and compensated by the project, and is therefore objective to the terms of the agreement and impartial to both the public and private sector. Alternatively, if the independent party role in not an option, a common compromise is that the local agencies retain a certain level of oversight and control during this process to sustain a vested position during performance reviews and any potential disputes or claims.

Multi-phased project:
The fact that the project was separated into two phases meant that there was a material interface risk. For example, additional scope requests were placed on the Phase II contractor related to Phase I. In addition, given the constrained site location, the Phase II contractor was delayed in accessing the site until Phase I could be completed. This resulted in additional time charges. The potential project interface risks should be carefully considered in the context of a multiple-phase procurement of the SR 37 project.

Multi-agency cooperation:
With sixteen federal and state agencies either having jurisdiction over portions of the right-of-way or a consultation role for other reasons, the public side of the P3 equation had to find the right balance between a timely decision-making process, requirements of each agency and effective cooperation to make the project a success. For the SR 37 project, there would need to be clear documentation of each agency's commitments to the project, spelled out in cooperative agreements or multi-party agreements, to avoid misunderstandings that can undermine the success of the project. In particular, it is crucial that transparent and unambiguous reimbursement agreements among the funding partners be put in place to address the parties' interest but also, and very importantly, to minimize the potential for fund appropriation challenges. This is particularly important for availability payment-based transactions where revenues that are subject to annual appropriations by the public sector are a primary source of repayment funds.

Environmental clearance process:
Given a similarly environmentally sensitive context for SR 37 corridor, an extensive stakeholder engagement and approval process will likely be required. This may also require significant time and resources to achieve the necessary clearances. For example, the cost of the environmental clearance for the Presidio Parkway project was $27.8 million.

WHAT LEGISLATION NEEDS TO BE ENACTED TO PERMIT A SIMILAR EFFORT FOR HWY 37?

The Presidio Parkway was California's first P3 transaction under the SBX2 4 legislation and the first transportation P3 with availability payments. This legislation expires on December 31, 2016. An extension to the enabling legislation, with similar authority, is currently proposed through AB 2742, as previously discussed.

SOURCES OF INFORMATION

FHWA http://www.fhwa.dot.gov/ipd/project_profiles/ca_presidio.aspx; Accessed August 19, 2016

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Presidio Parkway Delivery Option, Value-for-Money Report: http://www.presidioparkway.org/project_docs/files/presidio_prkwy_prjct_bsnss_case.pdf; 2010

Wiki Books https://en.wikibooks.org/wiki/Public-Private_Partnership_Policy_Casebook/Presidio

Caltrans, Presidio Parkway Project Summary Agreement http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/04/04-1637U4/P3Agt_Summary/P3_Agt_Summary.pdf

Infra-Americas http://www.infra-americas.com/legislation/; Accessed August 19, 2016

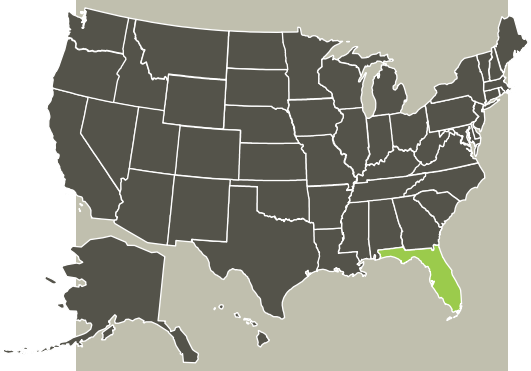
Infra Deals https://www.infra-deals.com/deals/511398/presidio-parkway-doyle-drive-concession.thtml; Accessed August 19, 2016

GLC/Caltrans P3 Agreement, http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/04/04-1637U4/P3Agt_Final_Form/App_2E_101910.pdf

SFCTA 2015 Update, California Foundation on the Environment and the Economy

- ✓ TOLLS FUND AVAILABILITY PAYMENT
- ✓ PUBLIC FUNING
- ✓ PRIVATE FINANCING
- ✓ COMPLEX CONSTRUCTION
- ✓ TIFIA LOAN
- ✓ > $1 BILLION

I-4 ULTIMATE P3



ORLANDO, FLORIDA

Construction on I-4 Ultimate began in early 2015. The project will rebuild 21 miles of I-4 from west of Kirkman Road in Orange County to east of State Road ("SR") 434 in Seminole County, add two new dynamic tolled Managed Lanes in each direction, replace more than 140 bridges, reconfigure 15 major interchanges, reconstruct the entire existing roadway and increase the posted speed to 55 mph.

The existing general purpose lanes, which range from three to four lanes in each direction, are approximately 50 years old and experience significant levels of congestion. Once the project is completed, the Florida Department of Transportation ("FDOT") will set toll rates and collect all revenue. Access and egress will be provided at five exchange areas and by direct connectors at major intersections. The project is expected to be complete in 2021.

BACKGROUND + PROJECT DRIVERS

Already a vacation hot spot to more than 4.5 million visitors annually, Florida's popularity began skyrocketing in the 1950s. The advent of air-conditioning and the expanding space industry in Cape Canaveral are credited with bringing more than 60 new industries to Central Florida by 1960, prompting the Census Bureau to declare Orlando the highest growth area in the US. In 1971, Disney World opened, and Orlando's tourism industry skyrocketed.

Popularity in tourism and increased economic activity gave rise to increased traffic. In addition to the Orlando metropolitan area's commuting population of 2.4 million people, Disney World, Epcot Center, Sea World, and Universal Studios attract millions of visitors each year. Just prior to the I-4 Ultimate procurement, a traffic study identified over 210,000 vehicle trips per day in and out of the metro Orlando/Winter Park area on a highway designed and built in 1965 to accommodate 70,000 trips per day.

Over the last 25 years, interim interchange, reconstruction and auxiliary lane widening projects have provided Band-Aid solutions to the serious capacity issues on the I-4 corridor. FDOT forecasted a loss in mobility for the area's residents, visitors, and employees resulting in a severe threat to the continued viability of the economy and the quality of life in the Orlando region if no major improvements were made to I-4.

FINANCIAL CLOSE
4 September 2014

SUBSTANTIAL COMPLETION
Estimated 2021

DELIVERY METHOD
DBFOM, 40 years

CAPITAL VALUE
$2.32 billion

FINANCING
Private, Availability Payment

TOLL RATES
Variable, Dynamic
Full Electronic Tolling

ROUTE
21 miles of I-4 from west Kirkman Road in Orange County

TOLL REVENUE FORECASTS
$28.5-32.0 million (gross) in 2021
$181.5-229.4 million (gross) in 2040

RIDERSHIP FORECASTS
41.2-44.0 million transactions in 2021
96.0-114.5 million transactions in 2040

POPULATION (2015)
2.4 million

MEDIAN INCOME (2014)
$48,270 Orlando-Kissimmee-Sanford metro area

UNEMPLOYMENT (2016)
4.3% Orlando
4.7% Florida

Due to inflation and increases in fuel efficiency (and resultant declines in gas tax receipts), FDOT is unable to keep pace with growing demands on the statewide interstate system. FDOT did not have sufficient funding available for the I-4 Ultimate project. In fact, FDOT had approximately half of the $2.3 billion needed for the project in 2014. FDOT completed analysis that showed that if the I-4 Ultimate was built as traditional funding became available; it would take 27 years to complete.

The I-4 Ultimate is a project that involves demolishing, rebuilding and improving — including adding tolled Managed Lanes on 21 miles of existing highway. The project is being designed, built, financed, operated and maintained as a public-private partnership, or P3, which means that the Concessionaire, I-4 Mobility Partners, will shoulder most of the responsibility for designing and building the roadway, as well as making sure it operates correctly and is well-maintained for 40 years.

Construction is scheduled to be completed in 2021 and the roadway will remain open during that time.

The need for the project is driven by:

- Severe congestion in the Orlando region
- Observed and expected population growth around the city of Orlando
- Observed and expected growth in tourism and commercial traffic

The I-4 Ultimate project is expected to achieve the following goals:

- Provide new commuter options on I-4
- Improve traffic flow, safety, community connections, sustainability, and use of technology
- Improve highway throughput
- Deliver improved aesthetic treatments, including a signature pedestrian bridge, accent lighting, fountain illumination, art sculptures and monuments, and other architectural treatments

DELIVERY METHOD ASSESSMENT

Limited by prohibitive additional right-of-way purchase costs and the need to navigate environmentally sensitive wetland in the vicinity of the existing highway, FDOT explored the idea of double-decking the existing interstate to create the 12 to 14 lanes that would be needed to handle projected traffic. It was determined to be a non-viable option primarily due to cost. Eventually the managed lanes concept was recognized as a way to expand capacity and give commuters a travel alternative without having to incur significant right-of-way acquisition.

FDOT has successfully delivered two complex infrastructure projects using P3s. The Port of Miami Tunnel ($914 million in 2009) was the first P3 project in the US to use availability payments as a form of compensation to the private sector developer and it was followed by the I-595 Managed Lanes ($1.8 billion also 2009), which also used availability payments. The I-4 Ultimate project, with a capital requirement of $2.3 billion, was the largest project to be considered.

In 2011/2012, a Value for Money analysis was performed by FDOT to compare the benefits of a design-build-finance-operate-maintain model (“DBFOM”) with

FINANCIAL CLOSE
4 September 2014

SUBSTANTIAL COMPLETION
Estimated 2021

DELIVERY METHOD
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2.4 million

MEDIAN INCOME (2014)
$48,270 Orlando-Kissimmee-Sanford metro area

UNEMPLOYMENT (2016)
4.3% Orlando
4.7% Florida

availability payments against a design-build ("DB") delivery model. Value for money analysis is a tool used to compare the total potential costs over the full life cycle for a project over a fixed time period (which can be anywhere from 30-75 years), adjusted for risk factors under different delivery methods. Risk factors can include elements such as cost and schedule overruns, operations and maintenance cost increases, or increased materials cost risk. This type of analysis allows for a simple apples-to-apples quantitative comparison of the net present value of potential project costs over a specified period under different delivery methods.

The Value for Money analysis performed by FDOT for I-4 Ultimate assumed a post-tax equity IRR (internal rate of return) of 12% and a nominal discount rate of 5% for both the DB and DBFOM alternatives. The analysis showed that the lowest cost delivery option over the project life was a DBFOM.

The 5% nominal discount rate applied by FDOT to its Value for Money analysis is relatively low compared to the few US projects where the analysis has been used. Discount rates are intended to reflect the time value of money. A detailed discount rate calculation will take account of a number of factors, including the public benefit of the project and the cost of capital that would be used to build the project, so they are highly dependent on current financial markets. Typical discount factors in the UK, Canada, and US range from 3.5% - 10%. Higher discount rates (which would be in the range of 9-10%) usually favor the P3 alternative, but it is important to note that several factors contribute to the overall results of the quantitative analysis, including risk assessment and risk allocation, expected equity return requirements, the magnitude of operations and maintenance costs, and public benefits. In the case of FDOT, its cost of borrowing is relatively low as a AAA-rated agency of the state of Florida. Qualitative results also need to be considered when making a decision to proceed with a P3 procurement.

BENEFITS

I-4 Ultimate's Value for Money analysis demonstrated a cost savings of $1.375 billion (35% of project costs) over a 40-year period between a DB and a DBFOM.

By using the P3 procurement method, the project is being designed and built in less than 7 years – 20 years earlier than a traditional procurement would allow.

The results of the received bid compare favorably to the Value for Money analysis, and the results show that FDOT has saved over $70 million from their initial assessment of the value of a DBFOM.

PROCUREMENT APPROACH

FDOT completed its Value for Money analysis in 2012.

In February 2013, Florida Governor Rick Scott and the Florida Legislature gave FDOT approval to move forward with the procurement process for the I-4 Ultimate Project in Central Florida P3, valued at $2.1 billion. Under Florida law, a contractor-financed P3 project requires both the Governor's approval and a 14-day legislative consultation and notification period.

The transaction was launched to the P3 market in March 2013. Over 1,000 industry players attended the public information session held in early March 2013.

By the time the RFQ was released on March 8, 2013, funding had been lined up and initial environmental permits and 97% of the required right-of-way were in hand for the full 21-mile corridor. Updated toll revenue forecasts were prepared and the design was 60% complete.

FDOT received seven responses to their RFQ and on May 21, 2013. FDOT announced that they had shortlisted four of the respondents to move forward with the procurement and receive a formal RFP.

In October 2013, FDOT issued the RFP.

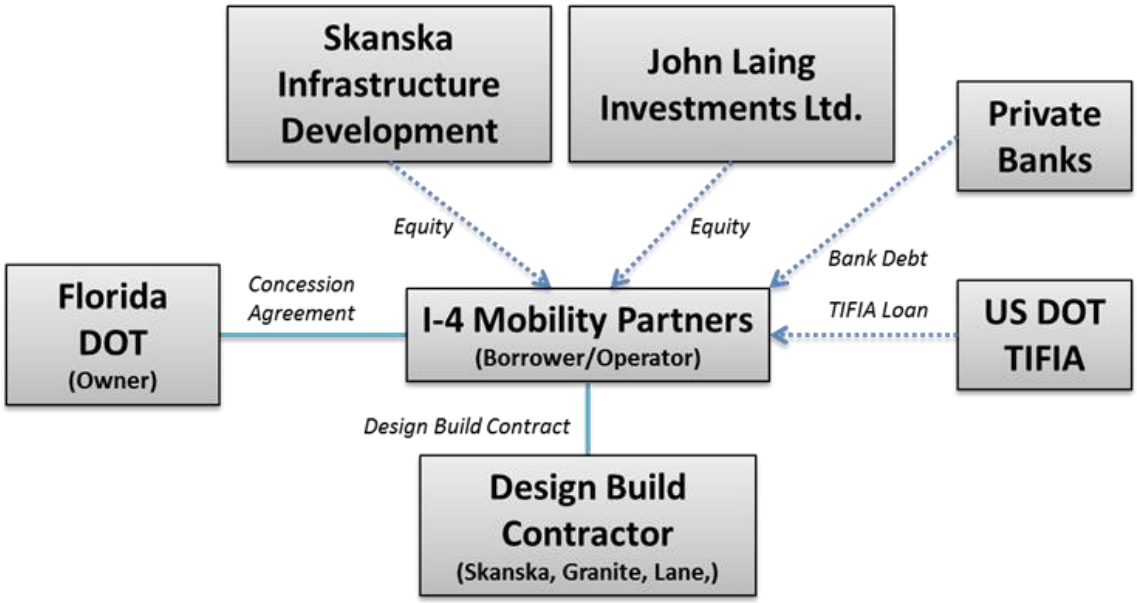
On February 12, 2014 FDOT received all four technical proposals.

On March 13, 2014 all four financial proposals were submitted.

On April 23, 2014, I-4 Mobility Partners was named as the preferred proponent and all of the unsuccessful, responsive bidders were eligible to receive a $2 million stipend.

Financial close was reached on September 5, 2014.

ORGANIZATION CHART



FINANCING

When the I-4 Mobility Partners team submitted their bid to FDOT, they had secured commitments from banks to provide financing to the project. The commitments were oversubscribed to protect against interest rate movements in the period between selection of the Best Value Proposer and Financial Close. They also had secured credit approvals and letters of support from two underwriters who were prepared to market private activity bonds ("PABs") to the tax-exempt markets if market movements resulted in PABs being a more efficient financing solution during the time period from selection to financial close.

A TIFIA term sheet had been negotiated by FDOT and made available to the bidders for a maximum TIFIA Loan amount of $950 million.

The winning bidder's sources of financing included:

- $949 million TIFIA loan (which in turn breaks down into a short-term 8-year tranche A of $127.3 million with an average cost of 2.32% and a long-term 38-year tranche B of $822.2 million with an average cost of 3.17%)
- $483 million senior bank loan with an 8-year maturity (priced at 125 bps over 1-month LIBOR for an average cost of 3.85%)
- $103 million of sponsor equity with a 12% return

The average total debt service cover ratio was 1.26x at the time of bid submission with a minimum TIFIA loan life cover ratio of 1.28x. The debt was rated Baa1 by Moody's.

At financial close, interest movements went in favor of the project, and the total weighted average cost of capital for the project was 4.45%. The project's financing mix consisted of 94% debt to 6% equity, which is high gearing for a project financing but reflective of the low-risk nature of the revenue stream and the payment structure offered by FDOT (which includes payments at specific construction milestones and annual availability payments during operations).

The sources and uses chart at the bottom of this page is taken from the proposal submitted by I-4 Mobility Partners. It was adjusted prior to financial close to take account of current interest rates and marginal adjustments in the loan quanta.

FDOT's milestone and availability payments are funded with a combination of federal, state, local, and private funding sources. Revenue from the I-4 Managed Lanes fund more than half of the project during the 40-year concession period.

Sources		Uses	
Periodic Payments	1,034,984,132	Design Build Agreement	2,323,000,000
Senior Bank Facility	488,988,484	Development Costs	27,274,297
TIFIA Loan Tranche A - Principal	126,825,942	Ongoing Overheads	77,258,026
TIFIA Loan Tranche A - Capitalized Interests	21,550,225	O&M Startup	5,947,209
TIFIA Loan Tranche B - Principal	823,174,058	Interest during Construction	261,326,233
TIFIA Loan Tranche B - Capitalized Interests	136,837,404	Arrangement & Underwriting Fees	6,612,356
Equity	105,468,201	Commitment Fees	5,053,796
Interest Income	7,507	Reserves and cash accounts	31,364,037
Total Sources	2,737,835,954	Total Uses	2,737,835,954

CONSTRUCTION

The I-4 Ultimate project includes reconstructing 15 major interchanges; constructing more than 145 bridges; adding four variable priced toll Managed Lanes in the median; and completely rebuilding the general use lanes along the entire corridor.

FDOT will make capital payments totaling $1.7 billion as specific milestones are achieved during the construction period. Of the $1.7 billion, $688 million will be paid at final acceptance of the facility.

About 99 percent of the material being pulled from the existing I-4 is being recycled and reused as road bed, according to the report. One hundred percent of the steel that is being reclaimed is melted down and turned around as new material.

FDOT and its Construction Oversight Services ("COS") team (comprised of HNTB, Elipsis Engineering & Consulting, the Corradino Group and New Millennium, among other companies) oversees the Concessionaire, ensuring they are adhering to all requirements in the contract through regular check-ins and audits of processes and procedures, as well as a review of materials and workmanship. Construction is in progress and the Concessionaire is obligated to keep at least two lanes of traffic open at all times.

The Concessionaire has established an informative website for the public to view information about the project, the P3 delivery model, and construction progress.

OPERATIONS

The project is expected to open for operations at the end of 2021. In exchange for fulfilling their obligations under the concession, I-4 Mobility Partners will receive a maximum $75 million annual payment (July 2014 dollars), subject to performance deductions and inflationary adjustment, during each year that the I-4 Managed Lanes are in operation.

Once completed, two dynamic tolled Managed Lanes in each direction on I-4 will provide more reliable travel times for Central Florida drivers and manage traffic efficiently. The Managed Lanes will be operated with variable tolls, which will be adjusted to improve traffic flow throughout the corridor. Pricing will be set by FDOT and will increase or decrease depending on the number of vehicles using the Managed Lanes. The tolls will be collected electronically, with automated signs notifying motorists of the cost, which drivers will lock in when entering the Managed Lanes.

The Managed Lanes will be separated by a concrete barrier and are designed to keep traffic moving around a steady 50 mph. Monumental pylons will be placed at each entry and exit point, adding a unique aesthetic feature to I-4. Direct-access ramps will link the I-4 Managed Lanes with State Road 408 for a smooth transition.

According to the traffic study completed in 2012, the Managed Lanes are expected to gross $27.4 million in 2021. Under its most conservative forecast, the Project is expected to be generating sufficient toll revenue after 10-15 years of operations (depending on the conservatism of the forecast) to cover the annual availability payment and toll collection expenses. Projected estimates show the Managed lanes grossing $200 million (in nominal dollars) by 2040. Therefore, over the long term FDOT is anticipating a significant return on its investments in the Project.

CURRENT STATUS

I-4 Ultimate was honored by the Infrastructure Journal and Project Finance Magazine as the 2014 "Deal of the Year" in the Transportation category.

Construction by all accounts is progressing well and there is significant support for the Project in the local press.

ROLES + RESPONSIBILITIES

RISK	OBLIGATIONS ASSUMED BY FDOT	OBLIGATIONS ASSUMED BY CONCESSIONAIRE
Design and Construction	Oversight	Yes
Financing		Secure financing
Traffic and Revenue	Yes	
Toll Rate Setting	Yes	
O&M and Major Maintenance	Oversight	Yes
Insurance		Yes
Change in Law (discriminatory)	Yes	
Permitting & Licensing		Yes
ROW Acquisition	Yes	
Hand-back	Oversight	Yes
Police and Emergency Services	Yes	
Environmental	Yes	
Termination for Convenience	Yes	
Protection from Competitive Transportation Facilities	Yes	
Federal Requirements	Reasonable Assistance	Yes
Force Majeure	Shared	Shared

APPLICABILITY TO HWY 37

FDOT is a clear winner in this Project. FDOT officials have confirmed in public statements that the I-4 Ultimate project was advanced by 20 years, and that the safety improvements and congestion relief that are provided by the project are a genuine benefit to the public. Using a P3 for a large, complex project such as I-4 Ultimate or Highway 37 can help accelerate delivery because the project's funding requirement can be deferred in to the future. In the case of I-4 Ultimate, FDOT was able to make a case that managed lanes toll revenue would be sufficient to cover their payment obligations to the private sector, reducing the impact of the availability-based project on FDOT's balance sheet.

FDOT officials have noted that the public private partnership creates an alignment of incentives between the public and private sectors, and that lenders and investors are highly motivated to achieve project completion to realize their anticipated returns. While construction oversight and approval is still required at all stages of construction by the public sector, the nature of the contracts in a concession-based P3 provides for a significant level of oversight by lenders and equity investors, who are in a first loss position if the project fails to be delivered. Typical P3 agreements provide lenders with specific rights of enforcement in the event that a contractor fails to perform its obligations. These types of provisions have successfully insulated the public sector from problems that have arisen in other P3 projects in the US.

FDOT has also noted the benefit of the innovation that the private sector has provided to the design and construction of the I-4 managed lanes, which helped to drive costs below engineers' estimates and add to an efficient delivery of the new lanes. A documented benefit of P3s is that through efficiencies in construction and reduction of interface risk, reduction in construction costs from engineers' estimates can range from 20-30%.

By utilizing an availability-based structure where funding for the payments is provided primarily through toll revenue, FDOT was able to achieve two important benefits: firstly, FDOT minimized the budgetary impact and funding needs of the project. Secondly, by assuming payment risk over the long term, FDOT effectively offered the private sector a AAA-rated payment stream. As reflected in the private financing that the concessionaire was able to secure, which was far below the tax-exempt rate of debt, the financial markets had a favorable view of this structure. Lowering the costs of financing is one of the ways that a P3 can help provide value to the public sector.

FDOT was able to leverage its reputation for successful P3 projects into its largest project yet. California can similarly take advantage of a newly-established P3 track record (on the heels of Presidio Parkway, South Bay Expressway, Long Beach Courthouse and Long Beach Civic Center), a regional acceptance of tolls, and state-wide experience in managed lanes to make a compelling case to the market that California agencies are high quality partners to have in concession-based P3s.

WHAT LEGISLATION NEEDS TO BE ENACTED TO PERMIT A SIMILAR EFFORT FOR HWY 37?

One area where many governments struggle with P3s is that the procurement process needs to be highly confidential. In the I-4 Ultimate, in response to a question about the biggest challenge, FDOT's project manager Laureen Bobo was quoted as saying: "The procurement process was very confidential. We had four teams made up of firms from around the world spending millions to pursue the contract. We couldn't share any of the cool ideas the teams had. Even the meetings were very confidential, where your name had to be on a list to get in and we had to put our cellphones down. We couldn't take anything out of the room, even if we wanted to read up on things after hours. We had about nine months like that." In a state where sunshine laws dictate that all procurement information is public, special dispensation needed to be given to ensure that the teams' bid concepts and

questions would be protected to ensure a highly competitive process.

By having the Governor and Legislature approve the project prior to launching the project in to the market FDOT resolved an issue that has caused the downfall of many P3 projects in the US: political risk. Because P3 delivery is still a novel concept, they are viewed negatively by some and they are subject to political wrangling. This is a major risk area for private developers, who invest heavily in assembling bids for full DBFOM procurements. Hints of political infighting or potential failure of the project at the last minute will suppress developer appetite and reduce competitive tension among bidders.

Using toll revenue as a source of availability payments is one of the keys to success of this Project, and should be strongly considered by California for the next phase of its P3 program. By assuming the risk of making long-term payments to the private developer, FDOT was able to leverage its AAA-rating into securing extremely competitive costs of financing from its private partner. FDOT was also able make a persuasive case to the rating agencies that the Managed Lanes revenue supported over half of the availability payment requirement, which helped to preserve FDOT's rating and debt capacity.

On the Federal level, the new Fixing America's Surface Transportation Act includes a five-year, fully paid-for surface transportation reauthorization of federal highway, transit, highway safety, motor carrier safety, hazardous materials, and passenger rail programs. The bill promotes the use of private investment using P3s for the surface transportation system. Perhaps most compelling for California are the new federal matching strategies, particularly the potential use of toll credits in lieu of local funds. This should be considered in the context of the options that are investigated for Highway 37.

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I-4 Ultimate Draft Traffic and Revenue Summary (http://i4ultimate.com/project-info/express-lanes/ Traffic and Revenue Reports)

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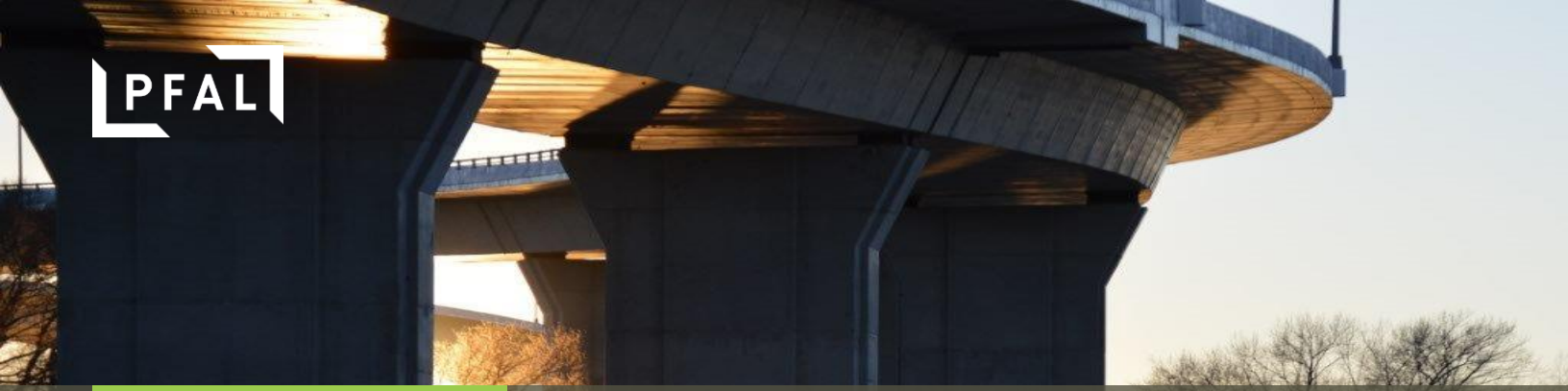


PFAL

- ✓ TOLL REVENUE
- ✓ NEW BUILD / REPLACEMENT
- ✓ PRIVATIZATION
- ✓ PRIVATE FINANCING
- ✓ UNSOLICITED BID

SOUTH NORFOLK JORDAN BRIDGE

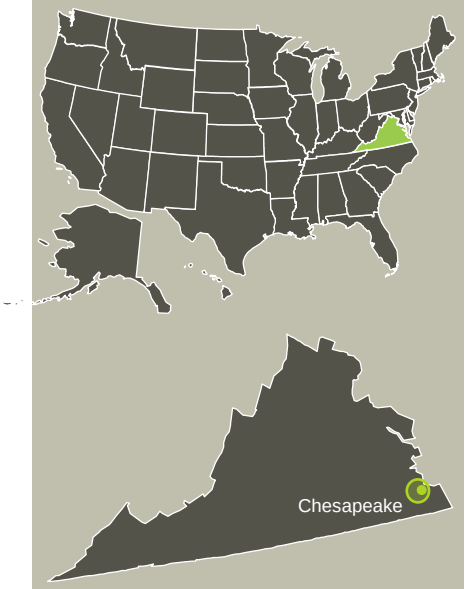


Figure 1: Elizabeth River Crossings.
Source: Pickard, A. (2008, June). Elizabeth River Crossings Study

CHESAPEAKE, VA

The South Norfolk Jordan Bridge ("SNJB") is a 5,372 ft fixed bridge that connects the City of Chesapeake to the City of Portsmouth over the Elizabeth River in Virginia. The City of Chesapeake had decommissioned the original Jordan Bridge in November 2008. An unsolicited proposal submitted by United Bridge Partners ("UBP") to replace the Jordan Bridge with a new, privately owned bridge was approved by the City of Chesapeake in January 2009[1] by executing an Acquisition and Development Agreement ("ADA") between UBP and the City of Chesapeake. As part of the ADA, UBP assumed responsibility to demolish the existing Jordan Bridge, aquired the right of way and easments associated with the bridge, and the right to toll, design, construct, finance, operate and assume ownership of a new bridge and associated tolling facilities on the SNJB. The construction of the SNJB was reported to be privately financed. Project revenue on the SNJB comes from tolls, set by the private operator with no defined limit, which are collected electronically on the bridge[2].

Note: the facts of this case study were reviewed by UBP. We have provided footnotes to describe instances where UBP disputes information in the public domain.

BACKGROUND + PROJECT DRIVERS

The Elizabeth River Corridor between Midtown Tunnel and High Rise Bridge in southern eastern Virginia near the Chesapeake Bay serves approximately 250,000 vehicle trip crossings per weekday. It is a growing corridor that primarily serves naval and industrial operations. The original Jordan Bridge, opened in 1928, was the first highway crossing of the Elizabeth River. Since the Jordan Bridge opened in 1928, four additional crossings (two tunnels and two bridges) were added to the Elizabeth River Corridor to accommodate the needs of the growing population and military in the area. Prior to construction of the SNJB, there had not been any new crossing or expanded capacity since the construction of the eastbound Downtown Tunnel in 1987.

[1] City of Chesapeake. (2009, January 27). City Council Work Session.
[2] UPB responses from September 21, 2016

FISCAL YEAR ADA APPROVED
January 2009

FISCAL YEAR NTP APPROVED
November 2010

OPENED TO TRAFFIC
October 2012

DELIVERY METHOD
Privatization

CAPITAL VALUE
$142 million

FINANCING
Private -Toll Revenue

TOLL RATES
$2.00 - 4.75 (2 axles)

ROUTE
Two-lane toll bridge, connecting the cities of Portsmouth and Chesapeake

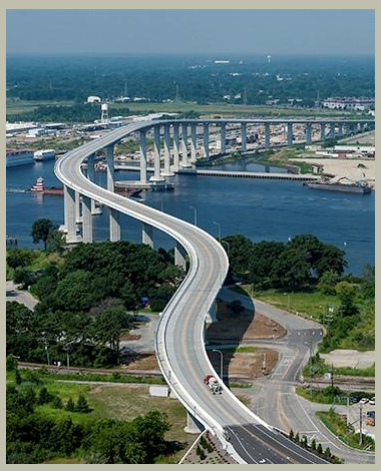
RIDERSHIP
6,300 AADT in 2015

POPULATION (2014)
230,571 – City of Chesapeake

1.7 million - Hampton Roads Metropolitan Area

MEDIAN HOUSEHOLD INCOME (2013)
$56,161 - Hampton Roads Metropolitan Area

UNEMPLOYMENT (2014)
6.1% - Hampton Roads Metropolitan Area



The original Jordan Bridge was a vertical-lift drawbridge built in 1928 by a private company to support their own industrial needs. It was operated by the South Norfolk Bridge Commission, Inc. until 1977, when ownership and operations of the Jordan Bridge and landings were transferred to the City of Chesapeake. By 2008, the Jordan Bridge was serving approximately 7,200 vehicles per weekday despite an estimated "unrestricted" demand of 18,000 per weekday[3]. Limited usage of the Jordan Bridge was primarily driven by delays due to the manual toll collection operation, delays from daily bridge lifts, delays from rail crossings and a vehicle weight limit of 3 tons owing to the age and condition of the Jordan Bridge structure.

Deferred maintenance of the asset further compounded the deteriorating integrity of the structure, resulting in the Virginia Department of Transportation downgrading the Sufficiency Rating (which is based on a 0-100 scale) of the Jordan Bridge from a 3 ("serious condition") in 2007 to a 0 ("failed condition") in 2008[4]. Due to structural concerns, the City of Chesapeake had to decide to repair, replace or decommission the Jordan Bridge. At the time, the City of Chesapeake had $17 million available to repair the bridge[5] and estimated full-replacement with a four-lane bridge was approximately $200 million[6]. Lacking sufficient funding and given the concerns over the safety of the bridge, the Chesapeake City Council voted to decommission the Jordan Bridge in October 2008.

In December 2008, UBP formally submitted an unsolicited proposal to the City of Chesapeake to replace the Jordan Bridge using private financing. By January 27, 2009, the City of Chesapeake's City Council authorized the execution of the ADA between the City and UBP[7]. The project received significant political support from both local governmental agencies and the Commonwealth of Virginia despite concerns over SNJB's height and width clearance requirements to accommodate New Panamax-sized ships[8]. In November 2010, the City of Chesapeake issued UPB a Notice-to-Proceed ("NTP")[9]. Approximately 45 months after the City of Chesapeake approved the ADA and approxiamtely 23 months after the NTP, the SNJB opened to traffic in October 2012[10].

According to UBP, the total cost to demolish the Jordan Bridge and construct the new SNJB was $142 million on completion[11]. The SNJB was constructed as a 5,372-ft long pre-cast concrete bridge. There is one 12-ft wide lane in each direction (the City originally contemplated 2 lanes in each direction[12]), two 8-ft shoulders and one pedestrian walkway. At its maximum clearance height, the SNJB is 145-ft tall. Tolls are collected using a fully electronic tolling system.

[3] Pickard, A. (2008). Elizabeth River Crossings Study (pp. 6). Hampton Roads MPO.
[4] City of Chesapeake. (2008, October 14). City Council Work Session.
[5] City of Chesapeake. (2008, October 14). City Council Work Session.
[6] Harell, W., & Saunders, M. (2012, July). Build that bridge. ICMA/PM, 12. A request to the City of Chesapeake to obtain the cost estiamte report was made in August 2016 but no report was furnished. According to UBP, the City's replacement cost estimates were approximately $300 million.
[7] City of Chesapeake. (2009, January 27). City Council Work Session.
[8] Virginia Marine Resources Commission. (2009, August 25). Commission Meeting Minutes
[9] UPB responses from September 21, 2016
[10] Rohleder, J., & Woodruff, S. (2013, Winter). South norfolk jordan bridge. ASPIRE, 29.
[11] South Norfolk Jordan Bridge Project Information Sheet
[12] Pickard, A. (2008). Elizabeth River Crossings Study (pp. v). Hampton Roads MPO.

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UNEMPLOYMENT (2014)
6.1% - Hampton Roads Metropolitan Area

The acceptance of the unsolicited proposal and need for the new SNJB was driven by:

- City Council's decision to decommission the Jordan Bridge due to structural concerns and limited use
- City of Chesapeake was not willing to seek funding, raise financing or taxes to pay for the Jordan Bridge's repair or replacement
- City of Chesapeake's view that private financing and delivery of SNJB would reduce risk to the City and expedite delivery
- New bridge would allow heavier vehicles and reduce congestion at neighboring crossings

Timeline

- 1928 – original Jordan Bridge constructed by private party
- 1977 – original Jordan Bridge ownership transferred to City of Chesapeake
- November 2008 – Jordan Bridge decommissioned
- December 2008 – Unsolicited proposal submitted to City of Chesapeake by UBP
- January 2009 – Approval of Acquisition and Development Agreement between the City and UBP
- November 2010 – NTP issued
- October 2012 – South Norfolk Jordan Bridge opened for traffic

BENEFITS & ISSUES

Benefits:

- The new SNJB increased the weight limit over the prior bridge, reducing traffic burden on adjacent bridges/tunnels
- No City imposed taxes were required to fund the project
- Responsibility for demolishing the old bridge was transferred to UBP
- Permitting, design, construction and revenue risk was transferred to UBP
- Provided additional non-tunnel route for emergency use
- City waived liablity for the asset e.g. for cost increases, lawsuits from construction claims/accidents and schedule delays.

Issues:

The chief concerns raised during the City's decision-making process and issues after construction were:

- Public loss of control on toll pricing set by UBP; however it was agreed that City and State vehicles would travel for free and there would be no tolling during a state of emergency
- City of Portsmouth filed a lawsuit over their ability to collect tax on the project. Note, they were not party to the original ADA.
- Concerns regarding the use of eminent domain on a privately financed and constructed project. No eminent domain was ultimately required and it was explicitly prohibited in the ADA.

DELIVERY METHOD ASSESSMENT

Prior to the unsolicited proposal by UPB, the City of Chesapeake was considering the following three options for the Jordan Bridge:

- Repair: Estimated to be approximately $17 million in 2007 dollars
- Replace: Estimated to be approximately $200 million in 2007 dollar. UPB has stated that estimates were $300 million.
- Decommission in place

The City, along with the Hampton Roads Metropolitan Planning Organization, developed a report in 2008 that indicated the potential traffic impact and costs of the three options for the Jordan Bridge. The 2008 report indicated the "replace" option would require a $0.60 toll in 2007 dollars and assumed volume crossing of the Jordan Bridge would increase by approximately 30% by 2030[13]. The decommission option indicated that existing ridership would primarily shift to the existing Downtown Tunnel, further straining the tunnel's capacity.

It appears the decision to select between the three options was primarily made on the basis of cost. Lacking dedicated funding or the desire to increase taxes and fees, the City of Chesapeake voted to decommission the bridge with no apparent analysis on potential delivery methods of procuring a new bridge.

Upon receiving the unsolicited proposal from UBP, the City did not appear to perform any independent alternative delivery method assessment. With the Jordan Bridge no longer operational, the decision to deliver the SNJB as a privately funded project was primarily driven by the unsafe condition of the structure, as indicated by the speed of approval of the ADA and approval by the Virginia legislature[14].

PROCUREMENT APPROACH

Unlike typical public transportation projects, the SNJB project did not go through a competitive public procurement process. The City instead chose to negotiate directly with UBP once the unsolicited proposal was submitted. The City of Chesapeake did not appear to have an unsolicited proposal policy in place, nor was the project subject to Virginia Department of Transportation's unsolicited proposal policy. As a result, the unsolicited proposal process for the SNJB did not involve an unsolicited proposal review fee, a requirement to conduct a financial feasibility

[13] Pickard, A. (2008). Elizabeth River Crossings Study (pp. 19). Hampton Roads MPO.
[14] An Act to authorize the emergency replacement of the Jordan Bridge in the City of Chesapeake; emergency, § 581 (2009).

assessment, or a mandatory public procurement for the project.

In January of 2009, an ADA was signed between the City of Chesapeake and UBP. The City of Portsmouth, the city on the west landing of the SNJB, was not party to the ADA. The ADA provided for the sale of City of Chesapeake property to UBP for $10.00 and the transfer of ownership of the Jordan Bridge to UBP. It obligated the purchaser to demolish the existing Jordan Bridge and gave the purchaser sole responsibility to set tolls on the SNJB.

Legislation was required to permit execution of the ADA. Shortly after the ADA was signed, the Virginia legislature unanimously (40-0) passed SB1550 in February 2009. The bill confirmed the City of Chesapeake's right to transfer the bridge to a private entity and enter into an ADA for a private entity to design, build, finance, operate and maintain the bridge so long as no public funds were used. It also clarified the City has no financial obligation or responsibilities for the bridge's construction and ongoing operations.

Under the ADA, UBP was responsible for obtaining necessary permits including from Virginia Marine Resources Commission and the US Coast Guard. All construction and material contracts were the responsibility of UBP and were privately negotiated.

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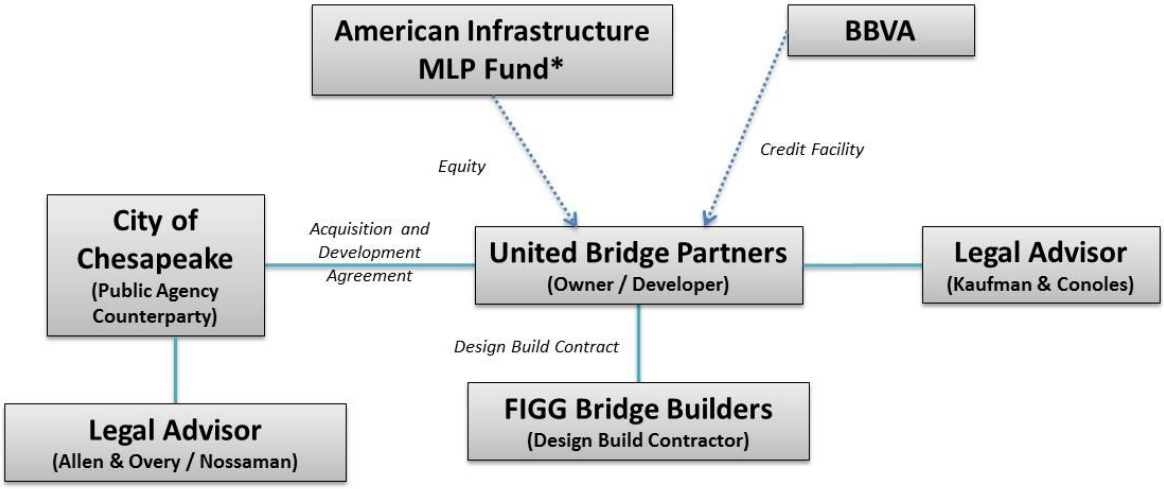
ORGANIZATION CHART



*American Infrastructure MLP Fund replaced Britton Hill Partners, LLC in October, 2009

FINANCING

Under the ADA, no City, State or Federal funds were used to finance the SNJB. The SNJB was privately financed by American Infrastructure MLP Fund, a partner to UBP. Because SNJB was privately financed, limited information is available regarding the financing of the SNJB.

According to UPB, the project was financed using a combination of equity from UBP through American Infrastructure MLP Fund and debt from BBVA. Exact details are confidential and were not made available by UBP. As reported by the global Infrastructure Journal publication, SNJB used $105 million financed with $66 million in equity and a $39 million credit facility from BBVA. The credit facility had a 12 year term and a maturity date of October 22, 2022. The accuracy of this information and a "like-for-like" comparison of the project scope is in question based on UBP's feedback, but no other additional information sources could be identified in our research.

Toll revenues are used to pay debt service for the project's private financing, operating costs and equity returns. As demonstrated in the following table comparing rates prior to decommissioning the Jordan Bridge and the SNJB tolls as of January 2016, tolls increased by a factor of four and added tolling in each direction.

Vehicle Type	2008 City of Chesapeake each way	2016 UBP each way E-ZPass[15]	2016 UBP Pay by Plate	2016 UBP Pay by Mail
Motorcycles	$0.50	$2.00	$3.50	$4.75
Two axles	$0.75	$2.00	$3.50	$4.75
Three axles	$1.00	$4.00	$5.50	$6.75
Four axles	N/A	$5.00	$6.50	$7.75
Five + axles	N/A	$6.00	$7.50	$8.75

DESIGN & CONSTRUCTION

The SNJB is a precast, post-tensioned fixed-span bridge. The span of the bridge is 5,375-ft with a 145-ft vertical and 270-ft horizontal clearance for shipping and naval vessels. Because the SNJB was designed with an 8-ft pedestrian walkway, SNJB's pavement gradient could not exceed 5 degrees, thus limiting the vertical clearance for ships to 145-ft instead of 185-ft, the height recommended by local shipping contractors and associations. SNJB has a total of two 12-ft wide lanes and two 8-ft wide shoulders for vehicle traffic.

All permits were the responsibility of UBP under the ADA. UBP initiated the US Coast Guard application in May of 2009[16] and appeared to obtain approval in December of 2009. As part of the US Coast Guard permit, UBP conducted an Environmental Assessment ("EA"). It does not appear an Environmental Impact Statement ("EIS") was required. The project also obtained a Nationwide Permit from the US Army Corps of Engineers, Water Protection Permit from the Virginia Department of Environmental Quality and approval from the Virginia Marine Resources Commission.

In November 2010, the City of Chesapeake issued the NTP to UBP. The use of pile driving dampeners and bubble curtain enabled UBP to work throughout the year by limiting disturbance to marine life. By January 2012, SNJB's foundations were completed and the construction of the SNJB's precast piers and spans were underway. The main span was constructed using precast concrete segments that were cast on-site. The main span used precast concrete segments and the balanced cantilever construction method.

In the ADA, UBP agreed to advance "best efforts" to complete the SNJB by July 4, 2010, but no later than January 2012. UPB indicated to the City that work would be completed two years from start of construction, though no mention of construction time limit was included in the ADA. UBP's presentation to the Chesapeake City Council on June 23, 2009 stated the SNJB would be open to traffic 18 months after construction start. The SNJB opened in October of 2012, nine months later than the planned, and approximately 23 months after the NTP was issued to UBP. No documentation was disclosed to determine if penalties were incurred by UBP for the delay in the planned opening. The exact reasons for the delay in operational commencement are not clear. One influencing factor may have been a reported accident involving one of the pre-cast concrete spans, but UBP disputes this information[17].

[15] Traveling the SNJB. (2016, January 1). Retrieved September 9, 2016, from http://www.snjb.net/traveling-the-snjb/travel-fees-accounts

[16] FIGG Bridge Developers (2009, June 23). South Norfolk Jordan Bridge a private proposal. Presentation presented at Chesapeake City Council

[17] Forster, D. (2013, April 27). Railroad company sues over Jordan Bridge accident.

UBP's unsolicited proposal indicated the SNJB project would cost approximately $100 million[18, 19]. Total construction costs, including the demolition of the existing Jordan Bridge was reported by UBP to be $142 million. Note; none of these additional costs were the responsibility of the City of Chesapeake.

TOLLING & OPERATIONS

All operations and maintenance of the SNJB and the tolling facilities are the responsibility of UBP under the ADA. No termination or handback date was noted in the ADA, indicating UBP ownership and operation of the SNJB is perpetual. Inspections and compliance with State standards are also the responsibility of UBP.

Tolls on the SNJB are collected using a fully electronic tolling system. UBP is responsible for collecting tolls, but utilizes E-ZPass. The E-ZPass tolling tags used for the SNJB are compatible with the neighboring toll systems operated by the State.

CURRENT STATUS

SNJB is currently operational. Ridership has averaged around 6,400 daily riders since 2012. UBP disputes these numbers but did not provide additional information.

Year	Annual Average Daily Traffic Volume
2015	6,300[20]
2014	6,200[21]
2013	6,400[22]
2012	6,600[23]

A lawsuit was filed by the City of Portsmouth against SNJB over a property tax dispute. The lawsuit was settled in August of 2016. According to UBP, the settlement created a revenue sharing mechanisum between UBP and the cities of Portsmouth and Chesapeake. According to the Virginian-Pilot, the settlement resulted in a $1 million payment from the State to the City of Portsmouth for back taxes and obligated SNJB to pay the City of Portsmouth annual payments of approximately $130,000[24].

[18] Saewitz, M. (2008, December 24). Proposal: Tolls to pay for new $100M Jordan Bridge.
[19] City of Chesapeake. 2011 Annual Report
[20] Average daily traffic volumes with vehicle classification data on interstate, arterial and primary routes (Rep.). (2015).
[21] Average daily traffic volumes with vehicle classification data on interstate, arterial and primary routes (Rep.). (2014).
[22] Average daily traffic volumes with vehicle classification data on interstate, arterial and primary routes (Rep.). (2013).
[23] Average daily traffic volumes with vehicle classification data on interstate, arterial and primary routes (Rep.). (2012).
[24] Somers, J. (2016, July 29). Portsmouth and South Norfolk Jordan Bridge reach settlement over taxes, document says.

ROLES + RESPONSIBILITIES

RISK	OBLIGATIONS ASSUMED BY CITY OF CHESAPEAKE	OBLIGATIONS ASSUMED BY PRIVATE DEVELOPER
Design and Construction		Yes
Financing		Yes
Traffic and Revenue		Yes
Toll Rate Setting		Yes
O&M and Major Maintenance		Yes
Insurance		Yes
Change in Law (discriminatory)		Yes
Environmental Permitting & Licensing		Yes
ROW Acquisition		Yes
Hand-back	N/A	N/A
Police and Emergency Services	Yes	
Environmental		Yes
Termination for Convenience	N/A	N/A
Protection from Competitive Transportation Facilities		Yes
Federal Requirements		Yes
Force Majeure		Yes

APPLICABILITY TO HWY 37

The six main lessons applicable to Hwy 37 are: approval process of an unsolicited proposal, the bridge was originally built with private funds, availability of alternate routes, toll setting policy, potential for political challenge and direct versus indirect public use of funds.

It is important to note the review and approval of the unsolicited proposal for the SNJB was done under "emergency" conditions. The Jordan Bridge was decommissioned over structural concerns and a lack of dedicated funding or financing to repair or replace the entire existing facility. The unsolicited proposal may have been seen as an option of last resort by the City of Chesapeake and the State. These conditions do not currently apply to Hwy 37 and should be taken into consideration.

The Jordan Bridge was originally built and funded by a private party, the ownership was transferred to the City in 1977, therefore, the political support for transferring the ownership of the facility back to private partners was likely politically more acceptable given no public funds were used to originally build the project and it was not part of the statewide highway system. Unlike Hwy 37 which was built with public funds and is part of the statewide system, the transfer of ownership may have different political challenges and consequences compared to the Jordan Bridge.

The Elizabeth River Corridor has five different crossings within approximately 5 miles, including SNJB. The existence of alternative routes in the vicinity of the privately owned bridge is a relevant fact that likely entered in to the City of Chesapeake's decision to accept the UBP proposal. Because constituents have several travel options in the immediate vicinity of the Jordan Bridge, there were likely fewer stakeholder engagement and political issues to consider for the government.

Toll setting is seen as a potentially contentious issue, both for the SNJB and Hwy 37. The loss of public control of the tolls on the SNJB could have serious implications. As would be expected from more than a 4x increase in tolls, we understand users have filed complaints to the City of Chesapeake. As a result, an economic benefit report was meant to be conducted in December of 2014. No additional information on this report was found.

Despite SNJB's strong political support through the development of the project, public records indicate that the City of Portsmouth sued SNJB over their ability to collect property tax after construction was completed. It should be noted, property tax has been an obligation of other road projects in California that were developed via public private partnerships. It is difficult at this stage to determine what type of political challenges Hwy 37 may face, but it important to understand a private company will most likely not receive tax relief from the state and county authorities without prior engagement and agreement.

Though no public funds were used to finance the SNJB, there are questions around the use of indirect public resources such as the cost to review and negotiate the ADA, toll increases, and loss of future toll revenue once the cost to replace and operate the facility is paid off. The City of Portsmouth's settlement also included the State to provide $1 million in back taxes related to the SNJB. For clarity, no breach of the ADA occurred, but total costs to the government should be scrutinized and considered when evaluating a full privatization for Hwy 37.

Based on information reviewed, the City did not conduct a valuation of future toll revenue and did not consider alternatives to privatizing the SNJB. In a separate transaction, a privately developed toll road in Virginia, the Pocahontas Parkway, was leased to a private developer for 99 years in 2006 for $604 million. The $604 million was used to pay an upfront consideration to the Virginia Department of Transportation for the lease and to complete the legal retirement of the existing debt on the highway. The Virginia Department of Transportation and the Pocahontas Parkway operator have a revenue-sharing mechanism in the project lease agreement once a certain equity return threshold is met. The implication of this example is that all revenue-generating assets have value and cost obligations that should be calculated and considered to avoid potentially sacrificing long term benefits of an asset to a private developer.

WHAT LEGISLATION NEEDS TO BE ENACTED TO PERMIT A SIMILAR EFFORT FOR HWY 37?

The City of Chesapeake's main legislative requirement was obtaining State approval for the sale of the Jordan Bridge to a private entity. The State unanimously passed SB1550 in February 2009 which allowed the City to proceed with the ADA. The Jordan Bridge was owned and operated by the City of Chesapeake which did not requirement them to follow the legislation applicable to the Virginia Department of Transportation.

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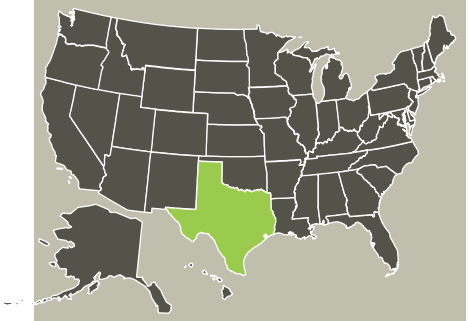
- ✓ TOLL REVENUE
- ✓ CONNECTOR BETWEEN MAJOR HIGHWAYS
- ✓ PUBLIC FINANCING
- ✓ COMPLEX CONSTRUCTION
- ✓ > $1 BILLION

PRESIDENT GEORGE BUSH TURNPIKE WESTERN EXTENSION



BACKGROUND + PROJECT DRIVERS

As one of the fastest growing states, both economically and demographically, infrastructure in Texas has come under increasing pressure in recent decades. In 2001, for example, planners in Texas discussed the need to build over 4,000 miles of new highways badged "the Trans-Texas Corridor" ("TTC") to sustain the robust economic and demographic growth otherwise enjoyed by the State. However, the planners at the time had failed to identify ways in which projects of such significant scale could be readily funded and financed. It was in this context that the Comprehensive Development Agreement ("CDA") program evolved.

Driven by the Texas Department of Transportation ("TxDOT"), the CDA program was intended to address many of the issues in Texas, which were common to Departments of Transportation across the US, namely: a divergence of investment requirements from the (financial) resources to meet these needs. More specifically, the CDA program was TxDOT's attempt to ensure the delivery of many billions of dollars of highways used private capital to avoid over-extending the State's constrained financial resources. Furthermore, by requiring significant upfront payments and revenue sharing from the private-sector developers who would deliver and operate these new highways, the CDA program was also intended to be a means of expanding/supplementing TxDOT's financial resources. The President George Bush Turnpike Western Extension ("PGBT WE") was a constituent of this CDA program and along with a number of other projects, notably SH 121 (latterly renamed the Chisholm Park Trailway, "CTP"), formed the initial batch of pathfinder projects.

The Project under review here entailed a new 11.5 mile link between State Highway (SH) 183, I-30 and 1-20. Known initially as SH 161, later called the PGBT WE, it now forms part of a western orbital around Dallas, lying to the south of Dallas Fort Worth International Airport and connecting the cities of Irving and Grand Prairie. The project was intended to serve as a major link within the wider Dallas-Fort Worth regional transportation network, reducing commuter and freight congestion along adjacent corridors such as the parallel SH 360.

COMMERCIAL CLOSE
April 2008

FINANCIAL CLOSE
March 2011

OPENED TO TRAFFIC
October 2012

DELIVERY METHOD
Public Sector/"Traditional"

CAPITAL VALUE
$546 million (Phase 4 only)

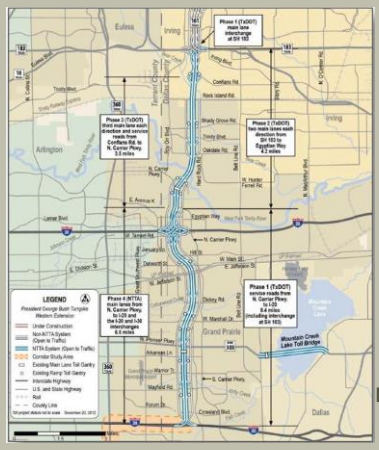
FINANCING
Public Bonds, TIFIA Loan, State Contributions

RIDERSHIP
200,310 per day (2015)

POPULATION (2013)
6.4 million (2010 Dallas, Fort Worth, Arlington)

MEDIAN INCOME (2013)
$59,124 (2010 Dallas, Fort Worth, Arlington)

UNEMPLOYMENT (2013)
8.1% (2010 Dallas, Fort Worth, Arlington)



PROCUREMENT APPROACH AND DELIVERY METHOD ASSESSMENT

Open for Business

In 2005, TxDOT officially declared Texas was "open for business" for public private partnerships ("P3s"), and under its CDAs program invited the private sector to participate in the development of a number of highway projects.

TxDOT moved forward with this initiative by soliciting qualifications from private developers for a number of projects in 2006, including the SH 161 Project. Ten separate consortia presented their qualifications for the SH 161 Project in September 2006 with four shortlisted by November of the same year. Shortly thereafter, however, extenuating political circumstances altered the course of the procurement in a fundamental way with the result that the Project, subsequently renamed the PGBT WE, was delivered almost entirely at public-sector risk with a modest, narrowly defined, element delegated to the private sector.

Asset Monetization

The CDA program was, in many respects, an evolution from the "asset monetization" approach but did not yet adopt, in other essential areas, the full concept of a P3. Typically, in the asset monetization approach, private-sector developers bid to acquire existing, brownfield, assets with well-established patterns of usage.

Frequently cited examples of this approach are the Chicago Skyway monetization from early 2005 and the Indiana Toll Road ("ITR") project from 2006. In this approach, the assets were leased to private-sector developers for 99 and 75 years, respectively. The private developers were then required to operate the highways and were afforded the rights to collect tolls under a given tariff regime which allowed for limited upward adjustments over time according to certain contractual prescriptions. Certain upgrades and operational standards were also required to be achieved.

However, the principal concern of the public sector authorities was to extract the highest possible value from the private developers by way of an upfront payment and a share of toll revenues during the lease. In part facilitated by the fact the leases were very long dated and, in part the result of very favorable terms available in the capital markets at the time, efforts to monetize these assets yielded very substantial upfront payments ($1.4 billion and $3.8 billion respectively) and constituted a welcome boon to the public purse.

Greenfield Evolution

The CDA program was very much designed with this notion in mind: public assets could be leased to private developers and the proceeds of these transactions could supplement public-sector revenue and, in a virtuous circle, be applied to further develop public infrastructure. Additionally, there was limited (or no) impact on the credit standing/debt capacity of the public sector as the financing obligations had recourse solely to the project by itself (as is typical in many projects, the financing raised by the private-sector developers was a direct obligation of their special project company). The evolutionary step taken by the CDA program, however, was to apply this concept to greenfield assets. That is, projects would entail not just the payment of an upfront consideration and share of toll revenues, but also include the design and construction of a new highway as well. In this sense, the CDA program

envisioned a much more radical transfer of risks to the private sector than in the initial set of asset monetization projects, namely:

(i) design and construction risks;

(ii) revenue risks where a track record of user demand had yet to be established empirically

Virtuous Circle

In theory, therefore, the CDA program could not only facilitate the delivery of an extensive program of works across the State with limited or no impact on the State Highway Fund, it could also provide additional financial resources for the further development of Texas transportation infrastructure where tolls were perhaps not suitable or permissible.

By 2006, Texas already had P3 enabling legislation in place, which allowed TxDOT to move forward with its centrally-driven CDA program in earnest. However, shortly after announcing the shortlist for the SH 161 Project, moves were afoot in the Texas legislature to place a moratorium on the privatization of state toll roads. By March 2007, trade press reported[1] that at least two thirds of legislators (sufficient to override a governor's veto) in both houses were in favor of the moratorium. By April, legislators had begun to discuss additional language in the moratorium, which vastly expanded the participation and role of regional tolling agencies in the development of new toll road capacity. These discussions culminated in Senate Bill 792, which was signed into law in June 2007.

Moratorium and Regional Authorities

SB 792 imposed a two-year moratorium on CDA projects but exempted practically all those projects that were under active procurement including the SH 161. Crucially, SB 792 incorporated the provisions that were discussed in April which expanded and enshrined the powers of local transportation authorities to develop toll projects by ensuring that local authorities had the first option to build new toll roads. Now regional authorities, such as the North Texas Toll Authority ("NTTA"), had an intervening right of first refusal to develop projects in their areas of jurisdiction. Arguably, SB 792 was a clear message from the regions (through their legislators) to the center that the CDA program was only deliverable with the consent of the relevant regional authorities.

The consequences of SB 792 for private-sector developers were undoubtedly adverse. One of the shortlisted bidders on the SH 161 noted, "With our partners we have invested a significant amount of time and money to be successfully shortlisted on two major projects in Dallas that are now, regrettably, surrounded by an uncertain process"[2]. Other projects under the CDA banner were at an even more advanced stage than the SH 161 and considerable resources had been invested. Private-sector developers on the SH 121 project, for example, had, at great cost, already submitted binding bids and the Texas Transportation Commission had mandated the winning bidder. The SH 130 was in the process of meeting its conditions precedent to financial close. Another bidder noted that the moratorium, "greatly hampered and certainly cast doubt into the Texan P3 market, and combined with giving away the SH 121 and SH 161 to the NTTA, has forced us to re-evaluate ambitions to build a lasting partnership with Texas. Texas caused us plenty of heartburn and heartbreak"[3]. Private-sector developers now talked about needing "political risk insurance," a product typically only required in emerging markets, when doing business in Texas. Sentiments about future opportunities in Texas were negative as developers looked elsewhere for more reliable opportunities, "We [are] seeing sponsors withdrawing or moving their focus away from Texas"[4]. In effect, SB 792 would bring to a halt the CDA program and, for the present case, end the SH 161 procurement with private-sector bidders.

Procurement After SB 792

In order to move forward with the SH 161 Project, the relevant regional authority, the NTTA had to submit a bid to TxDOT that comprised a design and construction solution along with an upfront payment to TxDOT. SB 792 required that the upfront payment had to be "negotiated" between TxDOT and NTTA (and not that it had to be superior to any private sector bid). This negotiation proved to be problematic and the process was suspended in August 2007 when a value could not be agreed.

[1] (Allison 2007)

[2] (Allison 2007)

[3] (Hilderbrandt, Is Texas Skating on Thin Ice? 2008)

[4] (Allison 2007)

It is fair to say that the value of the upfront payment that was initially proposed, $548 million, was met with some derision by the private sector. One private-sector developer, for example, stated that his company would have been prepared to offer $1.2-1.9 billion and that the NTTA's proposal undervalued the road by three to four times[5]. Of course, it is not possible to determine the validity of this statement as binding bids were not submitted by the time SB 792 was enacted and, it is worthy of note, that the value of the upfront payment suggested above was made by a private-sector developer that did not make the shortlist of qualified teams for the SH 161 Project. Nevertheless, as a result of the vacillation of the procurement objectives and without any objective framework to assess and compare the NTTA's proposal the criticisms of the private-sector developers cannot be dismissed out of hand. In short, it is impossible to know whether TxDOT, in fact, got a "good deal". Indeed, the process precipitated changes at the Federal level, with the Federal Highway Administration ("FHWA") noting that, "TxDOT may have benefitted from conducting a competition"[6] in the case of SH 161. The FHWA would subsequently initiate a rule change which required public toll authorities to offer fair market value in order to lease roads from states that are built with Federal assistance. Arguably, the rule change was intended to prevent states from giving regional toll authorities the first right of refusal to operate and develop toll roads and, thereby, circumvent market mechanisms when determining value.

Executed Transaction

The disruptions caused by the credit crunch and other financial market dislocations no doubt contributed to delays from late 2007 but it is notable that financial close did not occur until four years later, in 2011. By the time the Project reached financial close, several aspects of the transaction were conspicuously weaker from the TxDOT perspective including:

- The final upfront consideration reduced by 15%, or $79 million, to $469 million;
- The Project would not be operated under a term-limited concession/lease of 52 years and revert to TxDOT ownership upon maturity but, rather, would be effectively owned by the NTTA in perpetuity; and
- The vast majority of the cost risks including the repayment risks of the project debt were shifted from NTTA and the Project to TxDOT under the executed financial structure.

Procurement Outcomes In Review

Clearly, therefore, the key weakness of the CDA program was political and it is apparent, initially at least, TxDOT had not adequately addressed the concerns of relevant regional toll authorities before it launched the procurement of the SH 161 Project. In assessing the procurement process as it developed from the moratorium and SB 792, we would also note that:

- A lack of a competitive process to challenge NTTA's proposal means the upfront consideration would never be robust to a counterfactual critique ("our bid would have been higher if we had been given a fair opportunity");
- From the perspective of TxDOT, the final Project terms were noticeably weaker and did not necessarily meet the broader objectives of the CDA program as initially envisioned;
- The transaction took an inordinate amount of time between NTTA's appointment of "preferred bidder" to financial close (four years); and
- The benefits of risk transfer never appeared to be an integral component of discussions. In essence, the vast majority of risks were retained by the public sector and, more specifically, mostly by TxDOT.

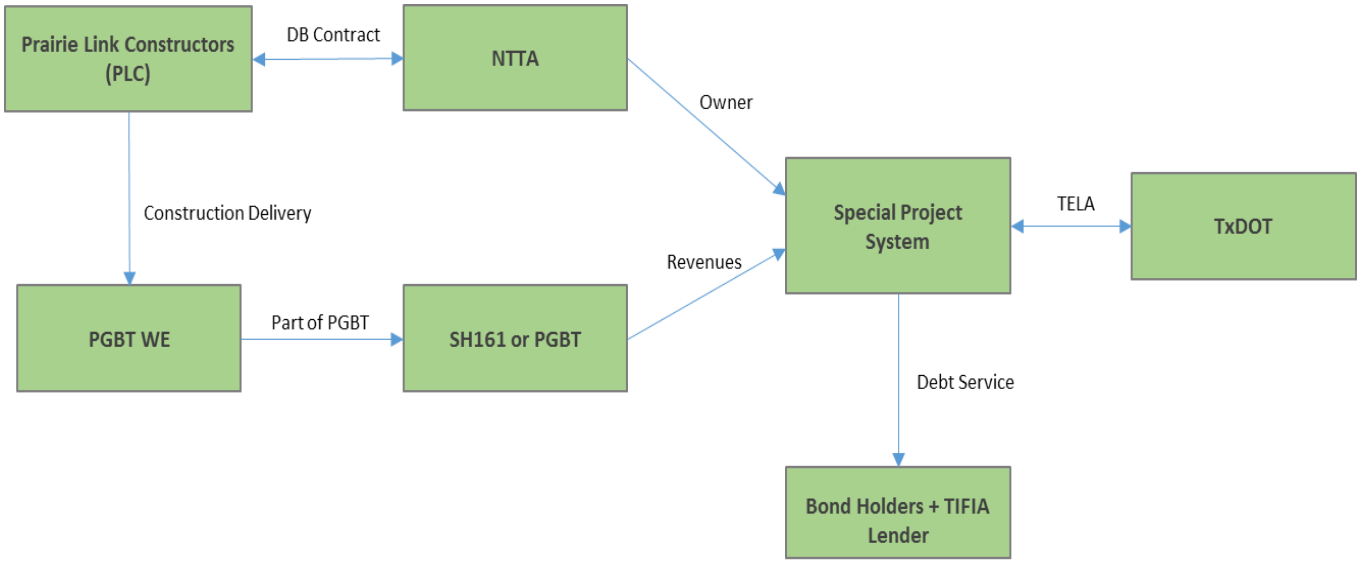
Indeed, in later generations of P3 projects, a value-for-money ("VFM") analysis has been used as a tool, along with other feasibility measures, to determine, on objective grounds, whether it makes sense to move forward with a P3 and, more specifically, what risks should be transferred to the private developer and what should be retained by the public sector. We note that the greenfield SH 130 project was one of the few CDA projects that successfully navigated procurement, financial close (in 2006) and construction delivery. Once the construction was completed, the traffic and revenue numbers, however, were substantially below forecasts and, by March 2016, the project company had filed for bankruptcy protection. A VFM analysis can be very compelling when rationalizing a particular

[5] (Hilderbrandt, Is Texas Skating on Thin Ice? 2008)
[6] (Hilderbrandt, FHWA Rule Could Ensure Fair Market Valuation of Toll Road Concessions 2008)

procurement approach and it is arguable that a more robust discussion of risk transfer during the planning and procurement of this project may have led to less value-destructive outcomes.

Ironically, in November 2015, the NTTA launched a solicitation for a P3 advisor.

ORGANIZATION CHART



FINANCING AND FUNDING SOURCES

A summary of the Project's sources and uses of funds is shown in the table below:

Table 1 - Project Sources and Uses

Sources		Uses	
Bond and Note Proceeds*	1,091,238,450	Upfront Payment to TxDOT+	469,074,676
Revenue**	7,219,191	Design and Construction Costs (PGBT WE)	546,598,381
TxDOT Contribution***	12,000,000	Capitalized Interest on Bonds and Notes	86,711,324
NTTA Contribution	72,471,089	Deposit to Rate Stabilization Fund	65,376,911
		Deposit to Major Maintenance Fund	4,002,391
		Cost of Issuance	12,645,301
Total	**1,184,408,984**	**Total**	**1,184,408,984**

* Comprises tax-exempt bonds and taxable notes. Taxable notes were repaid by way of a $418.4 million TIFIA Loan and a $9.1 million TIFIA TIGER Grant.
** Revenues generated on the partially opened highway before the entire corridor was completed
*** Partial Reimbursement for a railroad bridge
+ For delivering Phase 1-3 of the WE. This includes accumulated interest on the upfront payment of $11 million.

The enactment of SB 792 and the NTTA's role as project developer shaped the financing structure to a great extent. Some private-sector developers had questioned NTTA's ability to finance the SH 161 and the SH 121 projects simultaneously, "[The NTTA] has mortgaged every room in the house. They don't have the leverage left to borrow the money they need for the long list of projects they have promised"[7]. In order to understand how the NTTA addressed these pertinent debt capacity issues, the following features of the financing structure are salient:

- The NTTA established a Special Projects System ("SPS") – The SPS was a separate system to the NTTA System and comprised the PGBT and the SH 121 (subsequently renamed Chisholm Trail Parkway ("CTP")[8]) assets. Debt raised to finance both the PGBT WE and the CPT projects would be recourse only to the combined revenues of the SPS (and not the wider NTTA system). In effect, this limited recourse of debt providers (and preserved the credit rating of the NTTA System bonds) while ensuring some diversity of income and risk for bondholders and the Transportation Infrastructure Finance and Innovation Act ("TIFIA") lender;
- NTTA's Equity Investment – $400 million of subordinated NTTA debt was issued in 2010 as the NTTA's "equity" contribution to the SPS projects. $72.5 million of this was allocated to fund the required sources of PGBT WE project;
- The Toll Equity Loan Agreement ("TELA") with TxDOT – to make the bonds of the SPS more marketable, the NTTA was able to extract certain guarantees from TxDOT covering project expenditures including debt service for the bonds and TIFIA loan as well as certain operating, maintenance and capital expenditures. TxDOT's obligations to pay these sums is subject to the necessary appropriations and limited to a defined annual amount. Further any TELA payment made by TxDOT from the State Highway Fund would be subordinate to the fund's other debt obligations (including $6 billion of first tier bonds and $500 million of subordinated commercial paper). However, the credit profile of the SPS bonds is reflective not of the underlying project risks (construction risks, operational risks, toll revenue risks) but, rather, of the high quality of the State Highway Fund in Texas. As a result, the SPS bonds have carried a AA- rating from Fitch[9] and a AA+ rating from Standard & Poors[10] since inception. This latter feature of the finance structure is of important consequence. In essence, this means that TxDOT and not the NTTA (nor the Project) absorbs the vast majority of project risks[11].

Shortly after inviting private-sector developers to qualify for bidding on the SH 161 Project, TxDOT and the FHWA signed an Early Development Agreement ("EDA"). This formalized how TxDOT would approach the Federal government to access credit assistance under TIFIA. This was a watershed moment in respect of how transportation infrastructure projects with private-sector developers could access TIFIA loans. Until this point, each private-sector developer bidding in the procurement of transportation projects had to wait until their consortium was selected before they could secure the favorable terms and low costs of the financing available under the TIFIA program. Effectively, this meant that private-sector developers had to run the risk of applying for a TIFIA loan and then not receiving this financing before financial close. The EDA process, therefore, established a template which reduced the financing uncertainty of these types of projects considerably. Ultimately, this approach to securing TIFIA credit assistance was not utilized once SB 792 was enacted but the NTTA was, nevertheless, able to avail the SPS of a long-term TIFIA loan. The TIFIA Loan itself was not funded until August 2013 when it was drawn to retire the Bond Anticipation Notes (BANs) which funded the Project at financial close.

[7] (Hilderbrandt, NTTA Seeks Funding for SH 161 2008)

[8] The CTP is a 27.6 mile extension of SH 121 from I-30 to Farm-to-Market Road 1187 in Tarrant County, and extending further south to US 67 in Johnson County

[9] (Fitch Ratings 2011, 2013)

[10] (Standard & Poors Ratings Services 2011)

[11] (Citi, Barclays Capital, Estrada Hinojosa & Company Inc, Loop Capital Markets, Morgan Keegan, Morgan Stanley, Ramirez & Co, Inc 2011)

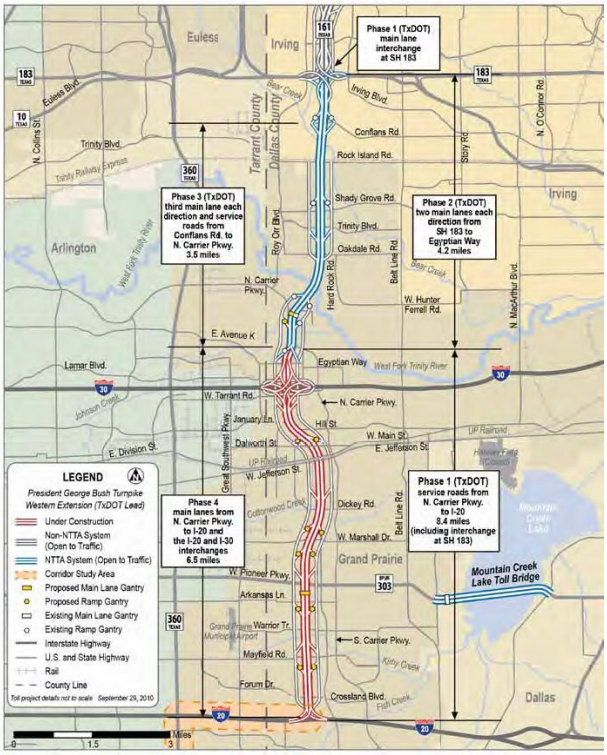
CONSTRUCTION

The construction on the SH 161 or, as it became known, the President George Bush Turnpike, began in 1998 and was completed in seven segments between December 1998 and October 2012. Segment VI, the Western Extension, was actually the last segment to be built and includes the project highway currently under review. The PGBT WE runs between the SH 183 in Irving to the I-30 in Grand Prairie and was itself delivered in four phases:

- Phases 1 to 3 – covering portions of the Western Extension between from the SH 183 to the I-30 (11.5 miles). These phases of the project were principally constructed by TxDOT and opened to traffic between August 2009 and April 2010; and

- Phase 4 – covering part of the Western Extension between North Carrier Parkway and I-20 (6.5 miles). This phase included the delivery of two toll lanes in each direction and interchanges with the I-30 and the I-20. Phase 4 also included delivery of a railroad bridge and the installation of toll gantries for Phases 2 and 3. The NTTA was responsible for the delivery of the Phase 4 scope of work and contracted with Prairie Link Constructors (a consortium comprising Balfour Beatty and Fluor) to execute the construction obligations under a design build ("DB") contract. Phase 4 opened in October 2012 with the railroad bridge completed later in 2012 and the interchange with I-30 fully opened in early 2013.

Figure 2 – PGBT Corridor and Project Phases



Although a separate project, much of Phase 4 was completed in parallel to the construction of the CTP and, as noted above, together these highways sit outside NTTA's core system, forming part of the NTTA's Special Projects System.

Progress of the Phase 4 construction works was monitored by an independent engineering firm, HNTB. HNTB's reports showed steady, on-time, progress and reasonable performance against the cost budget throughout the construction period[12]. At the publication of the last full report on PGBT WE dated August 2012, HNTB estimated the construction would be delivered on time and to the budget at $546.6 million.

OPERATIONS AND CURRENT STATUS

Operations for the PGBT WE are undertaken in-house by the NTTA. Objective measures of operational and financial performance of the PGBT WE are more difficult to ascertain because:

- there is no independent engineer's report available for the post-construction period;

- in available management discussions the performance of the PGBT WE is largely wrapped up with that of CPT with performance metrics described at the SPS level ; and

- the period of performance under the present assessment falls within the "ramp up" period for both the PGBT WE and CPT projects. Characteristically, the ramp-up period begins with the opening of the highwayto traffic as its starting pointing and continues through the earliest years of operations until users have familiarized themselves with the new highway and its layout and the highway reaches its steady state of usage. The ramp-up can be challenging to forecast with a high degree of accuracy and the methodologies for applying ramp-up factors to traffic and revenue models can be quite

[12] (HNTB 2011-2012)

crude. So it is not unsurprising to find revenue estimates, in particular, considerably above or below the forecasted projections during this time. This can also be impacted by the adoption and increasing penetration over time of more efficient methods oftoll payment (e.g. electronic tags). Indeed, the performance data of NTTA's SPS do show that there has been considerable variance in respect to forecasted revenue performance.

Table 2 - NTTA's Special Project System - Toll Revenues[13]

Year	Actual ($)	Estimate ($)	Variance ($)	Variance (%)	Actual Growth (%)
2011	6,466,245	8,281,900	(1,815,655)	(21.90)	N/A
2012	10,488,973	6,861,500	3,627,473	52.90	62.20
2013	24,429,140	24,566,814	(137,674)	(0.60)	32.90
2014*	38,179,423	34,529,300	3,650,123	10.60	56.30
2015	69,698,415	46,897,500	22,800,915	48.60	82.60

*NTTA change traffic and revenue forecast consultant

However, we do know that there has been no default under the debt instruments and, likewise, there has not yet been any need to utilize funds under the TELA arrangements. This suggests that on a net basis, the revenue and costs performance has remained within acceptable parameters for the SPS projects overall

APPLICABILITY TO HWY 37

The PGBT WE Project is a salutary lesson in ensuring that key stakeholders are aligned with or do not impede the objectives of the procuring authority. While the construction and operations of the project appear to have been delivered satisfactorily in this example, the procurement outcomes have varied from the initial prime objectives of investing private capital to develop public infrastructure and in doing so bolstering the financial resources of the State itself. To the contrary, when analyzed from a risk perspective, it is arguable that the financial structure absorbed the resources of the State.

WHAT LEGISLATION NEEDS TO BE ENACTED TO PERMIT A SIMILAR EFFORT FOR HWY 37?

Beyond basic tolling authorization and P3 enabling legislation, the legislation impacting this project is generally not applicable to the Hwy 37.

[13] (NTTA, Finance Department 2011-2015)

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SR 37: AFFORDABILITY ANALYSIS & DECISION ROADMAP

PFAL

March 2, 2017

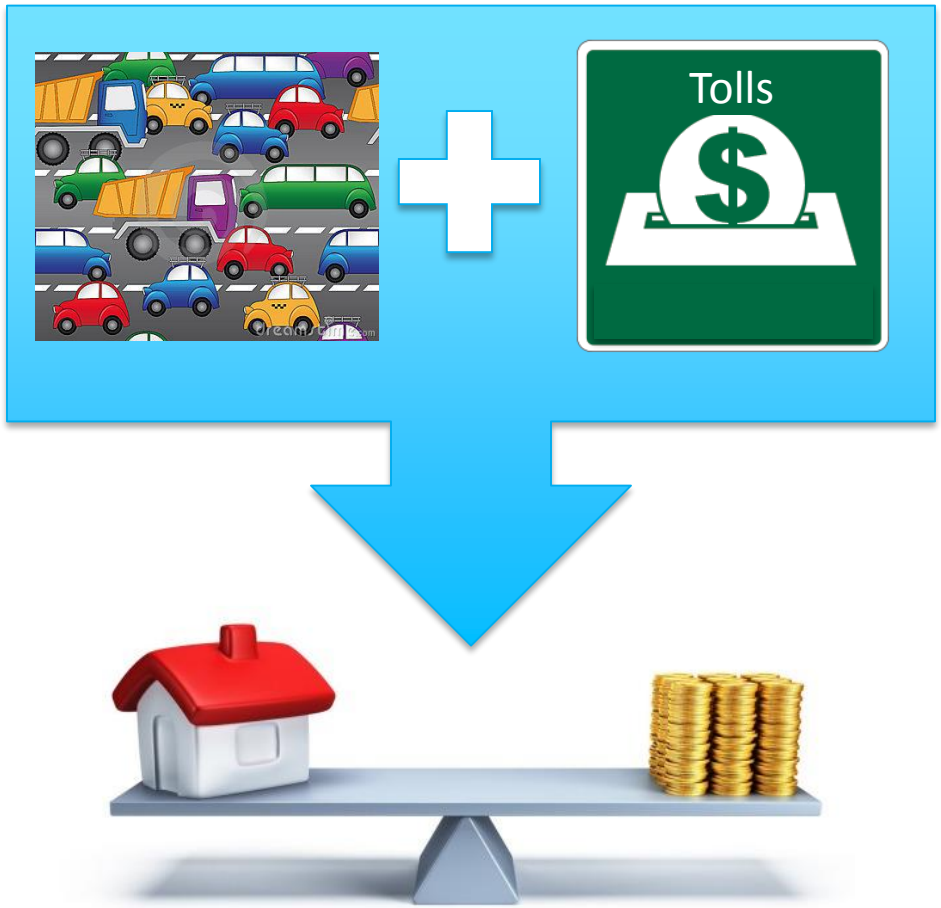
AGENDA

1. Introduction
2. Traffic & revenue analysis
3. Affordability analysis
4. Decision Roadmap
5. Q&A

1 INTRODUCTION

PFAL

PROCESS OVERVIEW



Project Affordability

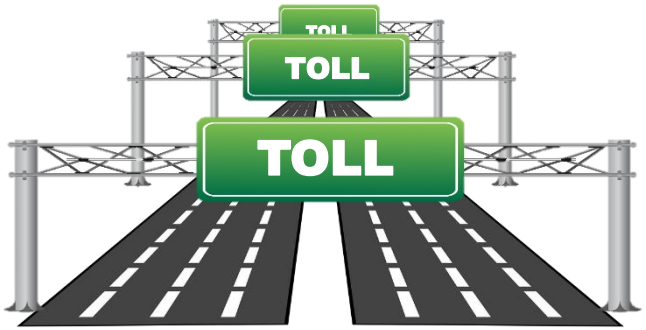
PROJECT OVERVIEW

Highway length 20.8 miles with segment lengths:

A= 7.1 miles, B= 9.3 miles, C= 4.4 miles

Source: UC Davis Study

TOLLING CONCEPTS



"Toll Road"

Three toll locations
Toll charge per mile travelled

Segment	Toll
A	$1.70
B	$2.25
C	$1.05
Total	$5.00

"Toll Bridge"

One toll location
Toll charge per "crossing"

Segment	Toll
A	-
B	$5.00
C	-
Total	$5.00

2 TRAFFIC & REVENUE

PFAL

ANALYSIS FRAMEWORK

Analysis parameters:

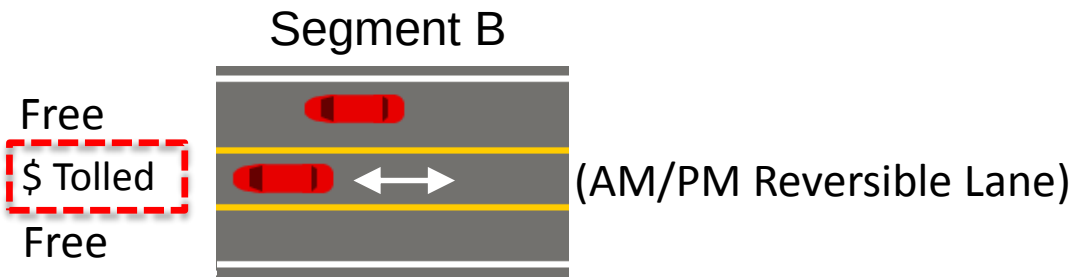
- Level One T&R assessment; preliminary sketch level analysis.
- Toll diversion assessment.
- Benchmarked to comparable California toll facilities.

PFAL team assumptions

- Tolls collected electronically with one gantry per segment (vehicle cost per mile and a flat charge at one location only).
- Discount for local Fastrak users.
- Trucks charged $20 per trip (Benchmark Bay Area: $15 - $35).

TRAFFIC CHARACTERISTICS

Users choice to pay tolls with alternative free lane

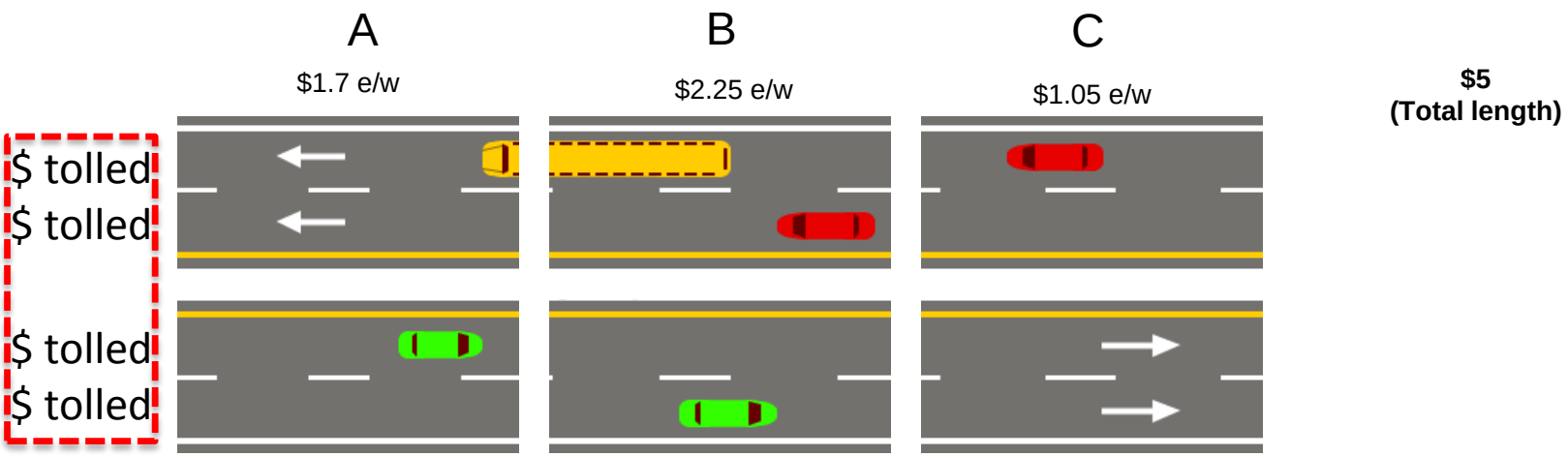


- Peak hour traffic 2,040* vehicles per hour (~15% of daily traffic)
- Capacity of single lane 1,800 vehicles per hour (LOS “C”)
- Approximately 12% of peak hour vehicles (or ~2% of daily traffic) would choose to pay a toll during peak hours.
- Outside peak hours users would choose free lane alternative given the traffic volumes are below the congested single lane capacity i.e. time savings gained would not be worth the toll charge.

* Estimated in year 2040. LOS means Level of Service.

TOLL REVENUE - $5 BOTH WAYS

Four lanes tolled, $5 each way



Vehicle colors do not represent different toll rate

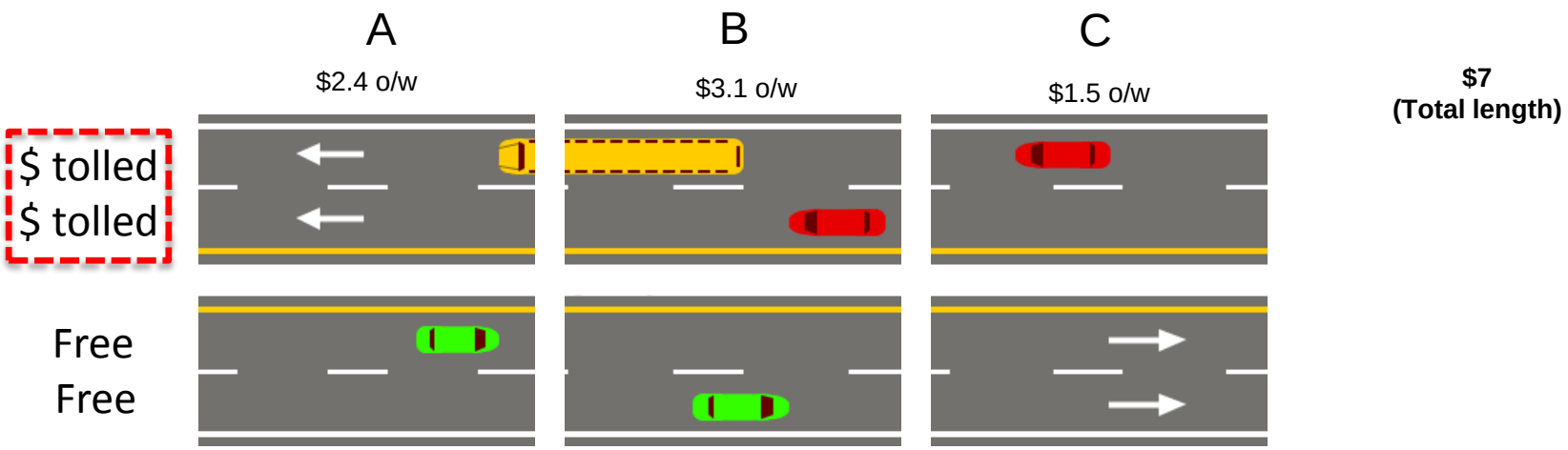
Tolling Options	A	B	C	Sum Total (over 50 years)*
Toll Road	$3.7 b	$5.3 b	$3.6 b	$12.5 b
Toll Bridge	-	$5 in Segment B only	-	$9.3 b

* Total revenue generated over 50 years of tolling. Toll rate escalated over this period.

e/w = each way; o/w = one way

TOLL REVENUE - $7 ONE WAY

Two lanes tolled, $7 one direction



Vehicle colors do not represent different toll rate

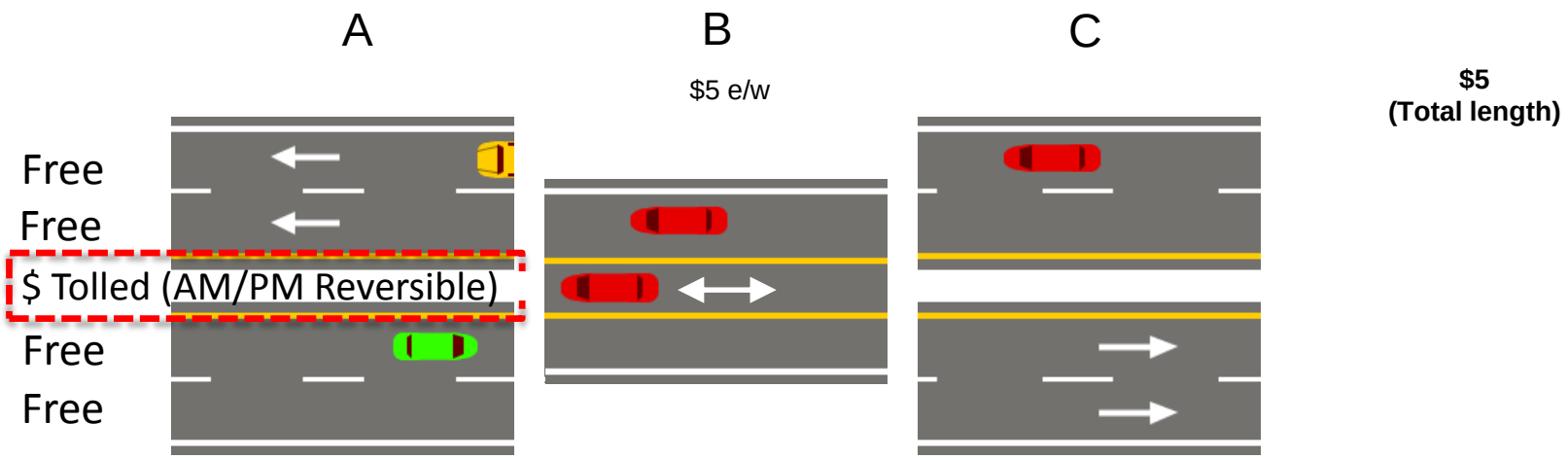
Tolling Options	A	B	C	Sum Total (over 50 years)*
Toll Road	$2.7 b	$3.9 b	$2.7 b	$9.4 b
Toll Bridge	-	$7 in Segment B only	-	$7.5 b

* Total revenue generated over 50 years of tolling. Toll rate escalated over this period.

e/w = each way; o/w = one way

TOLL REVENUE - $5 REVERSIBLE

One reversible lane tolled, $5 each way



Vehicle colors do not represent different toll rate

Tolling Options	A	B	C	Sum Total (over 50 years)*
Toll Road	N/A	N/A	N/A	N/A
Toll Bridge	$5 in Segment B only (Reversible toll: AM – westbound, PM – eastbound)			$0.3 b

* Total revenue generated over 50 years of tolling. Toll rate escalated over this period.

e/w = each way; o/w = one way

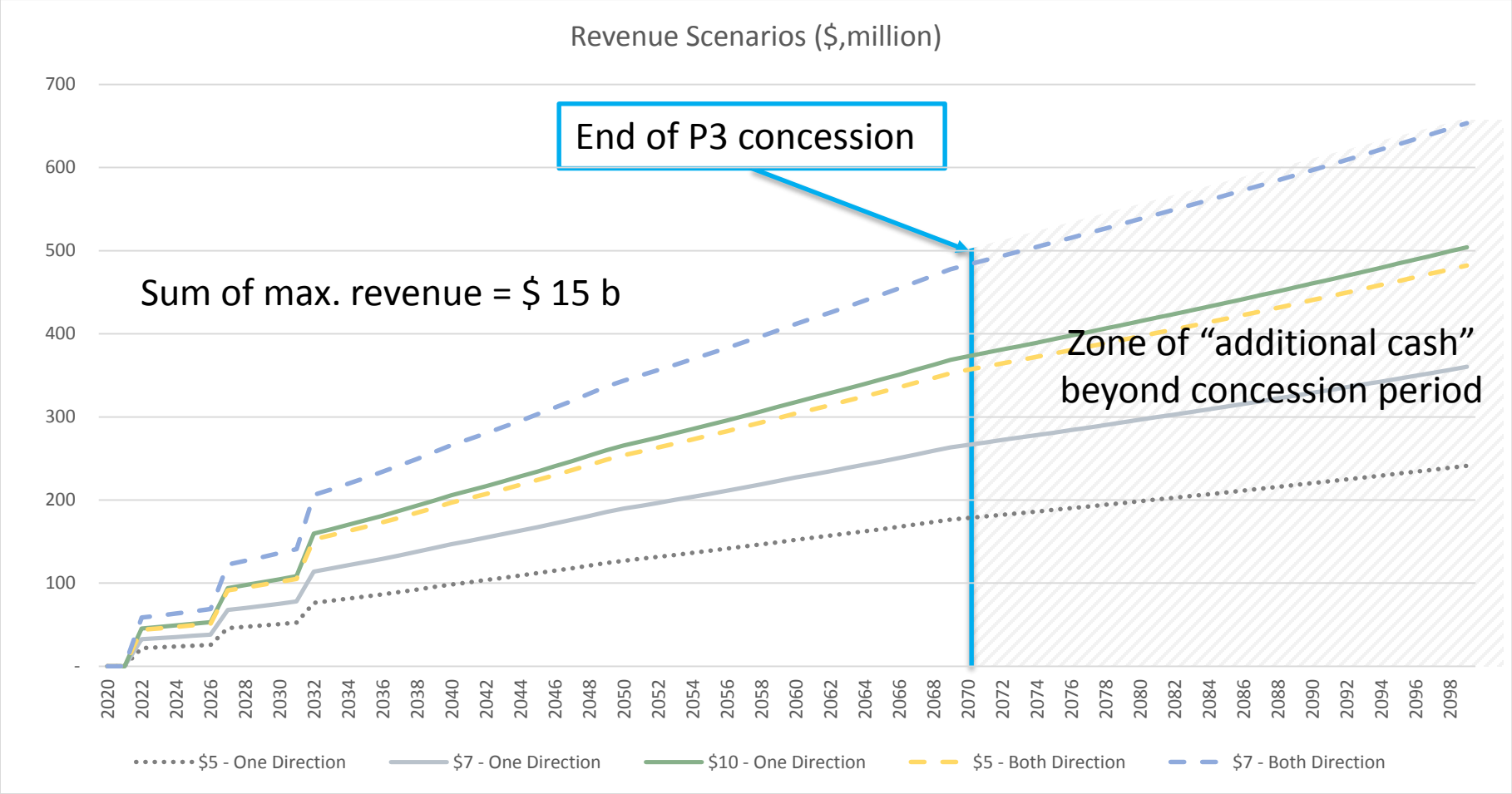
TOLL REVENUE SUMMARY

Toll revenue generation. Relative comparison for illustrative purposes.

Scenario	Toll Rate	Toll Option	Total Revenue
Four lanes tolled	$5 →	Toll Road (3 locations)	$12.5 b
		Toll Bridge (1 location)	$9.3 b
Two lanes tolled one direction	$7 →	Toll Road (3 locations)	$9.4 b
		Toll Bridge (1 location)	$7.5 b
One reversible lane tolled	$5 ⇆	Toll Bridge (1 location) AM – westbound PM - eastbound	$0.3 b

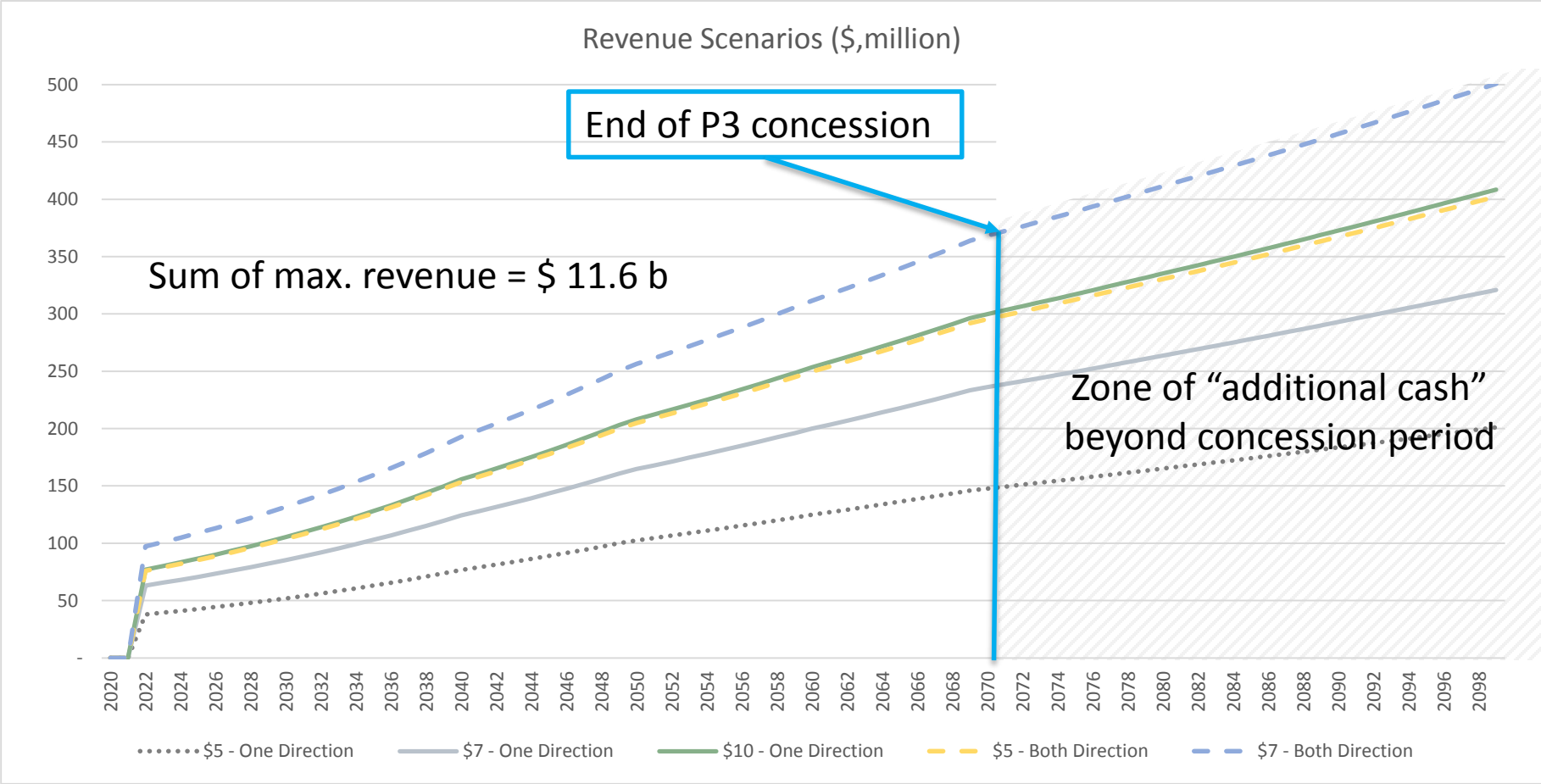
e/w = each way; o/w = one way

TRAFFIC & REVENUE – TOLLED IN EVERY SEGMENT (TOLL ROAD)



TRAFFIC & REVENUE – TOLLED IN SEGMENT B ONLY (TOLL BRIDGE)

Revenue generated is approximately 15-20% less than tolling in all Segments



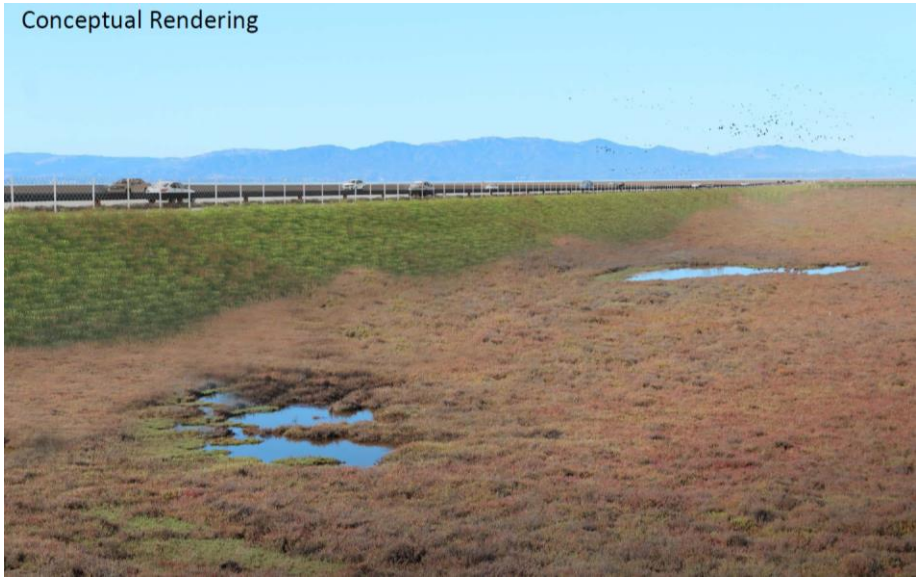
3 AFFORDABILITY ANALYSIS

PFAL

TECHNICAL ALTERNATIVES

1. Levee/Embankment

Segment	Construction Cost in 2030	Construction Cost in 2022
A	$0.5 b	$0.4 b
B	$0.7 b	$0.5 b
C	$0.1 b	$0.1 b
Total	$1.3 b	$1.0 b



Source: UC Davis Study, 2016

TECHNICAL ALTERNATIVES

2. Slab Bridge Causeway

Segment	Construction Cost in 2030	Construction Cost in 2022
A	$1.3 b	$1.0 b
B	$2.2 b	$1.7 b
C	$0.3 b	$0.3 b
Total	$3.8 b	$3.0 b

Source: UC Davis Study, 2016

TECHNICAL ALTERNATIVES

3. Box Girder Causeway

Segment	Construction Cost in 2030	Construction Cost in 2022
A	$1.4 b	$1.1 b
B	$2.5 b	$2.0 b
C	$0.4 b	$0.3 b
Total	$4.3 b	$3.4 b

Source: UC Davis Study, 2016

DELIVERY OPTIONS

1. Traditional

- **Revenue:** non-tolled facility
- **Facility Ownership:** public
- **Contract:** traditional inter-agency agreements
- **Funding:** only public funds (local/state/fed grants)
- **Delivery Method:** Design-Bid-Build (DBB)

2. Public-private partnership (P3)

- **Revenue:** tolls, sales tax
- **Facility Ownership:** public
- **Contract:** long term lease with private partner (e.g. 30 to 50 years)
- **Funding:** mix of public funds (local/state/fed grants) and private funds (equity & debt)
- **Delivery Method:** Design-Build-Finance-Operate-Maintain (DBFOM), DBFM and DBF

3. Public-Public

- **Revenue:** tolls, sales tax
- **Facility Ownership:** public
- **Contract:** Cooperative Agreement e.g. Bay Area Toll Authority (BATA)
- **Funding:** publicly financed (e.g. revenue bonds), grants
- **Delivery Method:** DBB, DB

4. Privatization

- **Revenue:** tolls
- **Facility Ownership:** private
- **Contract:** Acquisition & Development Agreement
- **Funding:** 100% privately financed (equity & debt)
- **Delivery Method:** full private responsibility for asset

Goals/Objectives: Roles & Responsibilities

Determine "Best Value" approach via Value-for-Money Assessment

Industry/Market Feedback

MODEL ASSUMPTIONS

Project Costs	Low	Medium	High
Total Construction Costs* ($b)	$1.0	$3.0	$3.4
Total Operations & Maintenance Costs ($b)	$0.40	$0.40	$0.40
Total Lifecycle Costs ($b)	$0.34	$0.57	$0.60

Dates	
Construction Period (Per Segment)	3 years
Operation Period	50 years
Total Project Period	53 years

*Source: UC Davis Study, 2016. Note: construction costs provided in 2022 dollars

MODEL ASSUMPTIONS

Analyzed three project delivery and financing alternatives.

P3 Financing – Availability Payment

Debt/Equity	85 / 15
Private Debt Pricing*	5.35%
Debt tenor	40 years
Equity return	12.0%

Case Studies:

- I-4 Ultimate, FL
- Presidio Parkway, CA

P3 Financing – Revenue Risk

Debt/Equity	75 / 25
Private Debt Pricing*	6.20%
Debt tenor	40 years
Equity return	13.5%

Case Studies:

- South Bay Express, CA
- US 36, CO
- South Norfolk, VA

Financing – Public Finance**

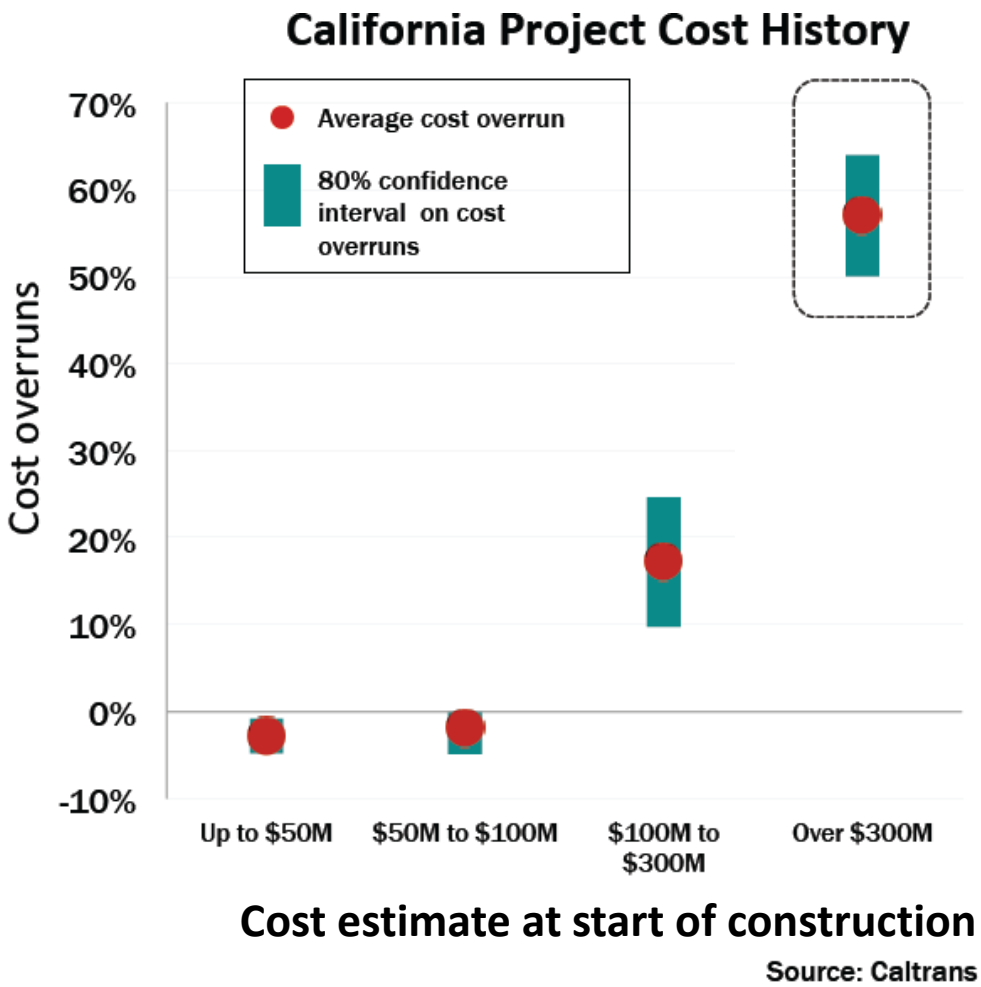
Debt/Equity	100 / 0
Public Debt Pricing*	3.90%
Debt tenor	40 years
Equity return	N/A

Case Studies:

- George Bush Turnpike, TX

**Base interest rates based on 30-year AAA MMD benchmark, Corporates Bonds benchmark, and Municipal Bonds Benchmark.*
***Design Bid Build (DBB) option includes 20% and 10% cost overrun adjustment for Construction and O&M costs, respectively*

PROJECT DELIVERY



For Caltrans projects with an initial budget of $300m or more, documented cost overruns are in the 60% range.

AFFORDABILITY ASSESSMENT – TOLLED IN EVERY SEGMENT

	Low CAPEX ($1.0 b)*					Medium CAPEX ($3.0 b)*					High CAPEX ($3.4 b)*				
	$5→	$7→	$10→	$5⇆	$7⇆	$5→	$7→	$10→	$5⇆	$7⇆	$5→	$7→	$10→	$5⇆	$7⇆
Segment A	✗	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Segment B	✗	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Segment C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓

Important Notes:

1. Check marks represent toll revenue in that segment is sufficient to fund the total cost of the segment under an availability payment P3 structure. Note; other delivery models may have less favorable results.
2. The reversible lane option revenue is insufficient across all options.
3. This affordability analysis relies on key inputs from third party sources. This third party information will need to be updated and reflected in any subsequently revised affordability analysis.
4. This affordability assessment includes O&M, full lifecycle and financing costs for years 1-50.
5. *Source: UC Davis Study, 2016. Note: construction costs for Segments A, B & C provided in 2022 dollars.

AFFORDABILITY ASSESSMENT – TOLLED IN SEGMENT B ONLY

	Low CAPEX ($0.5 b)*					Medium CAPEX ($1.7 b)*					High CAPEX ($2.0 b)*				
	$5→	$7→	$10→	$5⇆	$7⇆	$5→	$7→	$10→	$5⇆	$7⇆	$5→	$7→	$10→	$5⇆	$7⇆
Segment A	---------- Not applicable in this case, Segment B only----------														
Segment B	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Segment C	---------- Not applicable in this case, Segment B only----------														

Important Notes:

1. Check marks represent toll revenue in that segment is sufficient to fund the total cost of the segment under an availability payment P3 structure. Note; other delivery models may have less favorable results.
2. The reversible lane option revenue is insufficient across all options.
3. This affordability analysis relies on key inputs from third party sources. This third party information will need to be updated and reflected in any subsequently revised affordability analysis.
4. This affordability assessment includes O&M, full lifecycle and financing costs for years 1-50.
5. *Source: UC Davis Study, 2016. Note: construction costs for Segments A, B & C provided in 2022 dollars.

MINIMUM TOLL RATE NEEDED

Tolling Scenarios		Minimum Toll Rate Needed*	Construction Cost Affordability**
Toll Road	One Direction	$6 o/w	$1.0 b
	Both Directions	$3 e/w	$1.0 b
Toll Bridge	One Direction	$6 o/w	$1.0 b
	Both Directions	$3 e/w	$1.0 b
Toll Bridge (Segment B only)	One Direction	$4 o/w	$0.5 b
	Both Directions	$2 e/w	$0.5 b

* Toll rate is weighted; includes higher toll rates for visitors and truck traffic
** Construction costs from the UC Davis Study, 2016

e/w = each way; o/w = one way

Note: affordability assessment includes O&M, full lifecycle and financing costs for years 1-50
High level proxy for indicative purposes only. Further analysis required.

MAXIMUM REVENUES

Tolling Scenarios		Revenues (Years 1-50)	Additional Revenues (Years 51-80)	Approximate CAPEX * affordable with additional revenue
Toll Road	$5 →	$6.3 b	$4.0 b	$0.6 b
	$5 ⇆	$12.5 b	$9.9 b	$1.5 b
	$7 →	$9.4 b	$6.9 b	$0.3 b
	$7 ⇆	$16.9 b	$14.1 b	$2.1 b
	$10 →	$13.1 b	$10.5 b	$1.6 b
Toll Bridge	$5 →	$4.6 b	$3.2 b	$0.5 b
	$5 ⇆	$9.3 b	$8.1 b	$1.2 b
	$7 →	$7.5 b	$6.1 b	$0.9 b
	$7 ⇆	$11.6 b	$10.5 b	$1.6 b
	$10 →	$9.4 b	$8.2 b	$1.2 b
Max Toll Road	**$7 ⇆**	**c. $16.9 b**	**$14.1 b**	**$2.1 b**
Max Toll Bridge	**$7 ⇆**	**c. $11.6 b**	**$10.5 b**	**$1.6 b**

* Capital expenditure approximation coefficient derived from the availability payment delivery model.

MAXIMUM AFFORDABILITY

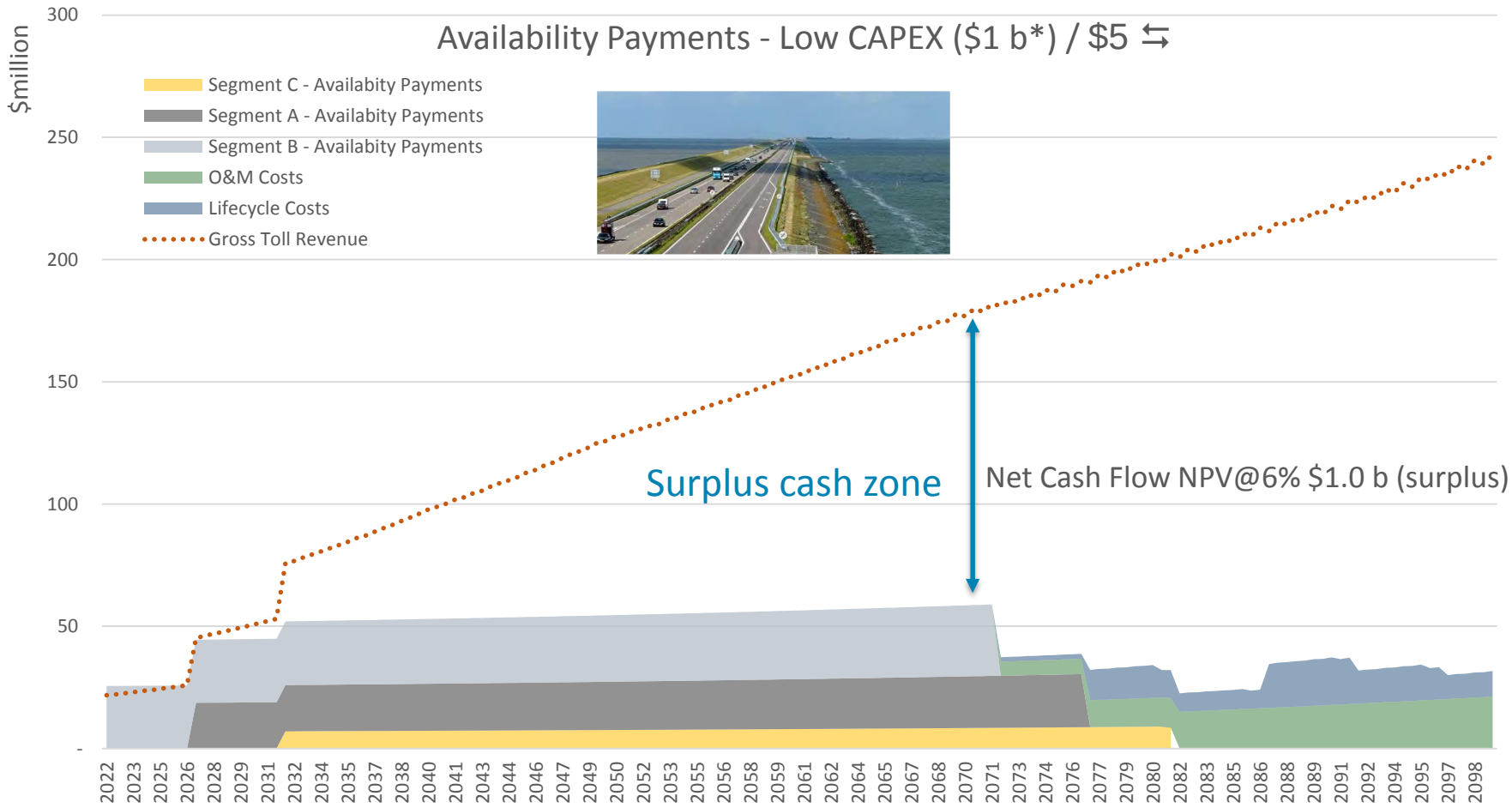
Tolling Scenarios		Max. Construction Cost Affordability*
Toll Road	$5 →	c. $0.8 b
	$5 ⇆	c. $1.9 b
	$7 →	c. $1.3 b
	$7 ⇆	c. $2.6 b
	$10 →	c. $2.0 b
Toll Bridge	$5 →	c. $0.7 b
	$5 ⇆	c. $1.5 b
	$7 →	c. $1.2 b
	$7 ⇆	c. $1.9 b
	$10 →	c. $1.5 b
Max Toll Road	**$7 ⇆**	**c. $2.6 b**
Max Toll Bridge	**$7 ⇆**	**c. $1.9 b**

* Construction cost affordability from revenue generated in years 1-50
** Construction costs from the UC Davis Study, 2016

Note: affordability assessment includes O&M, full lifecycle and financing costs for years 1-50

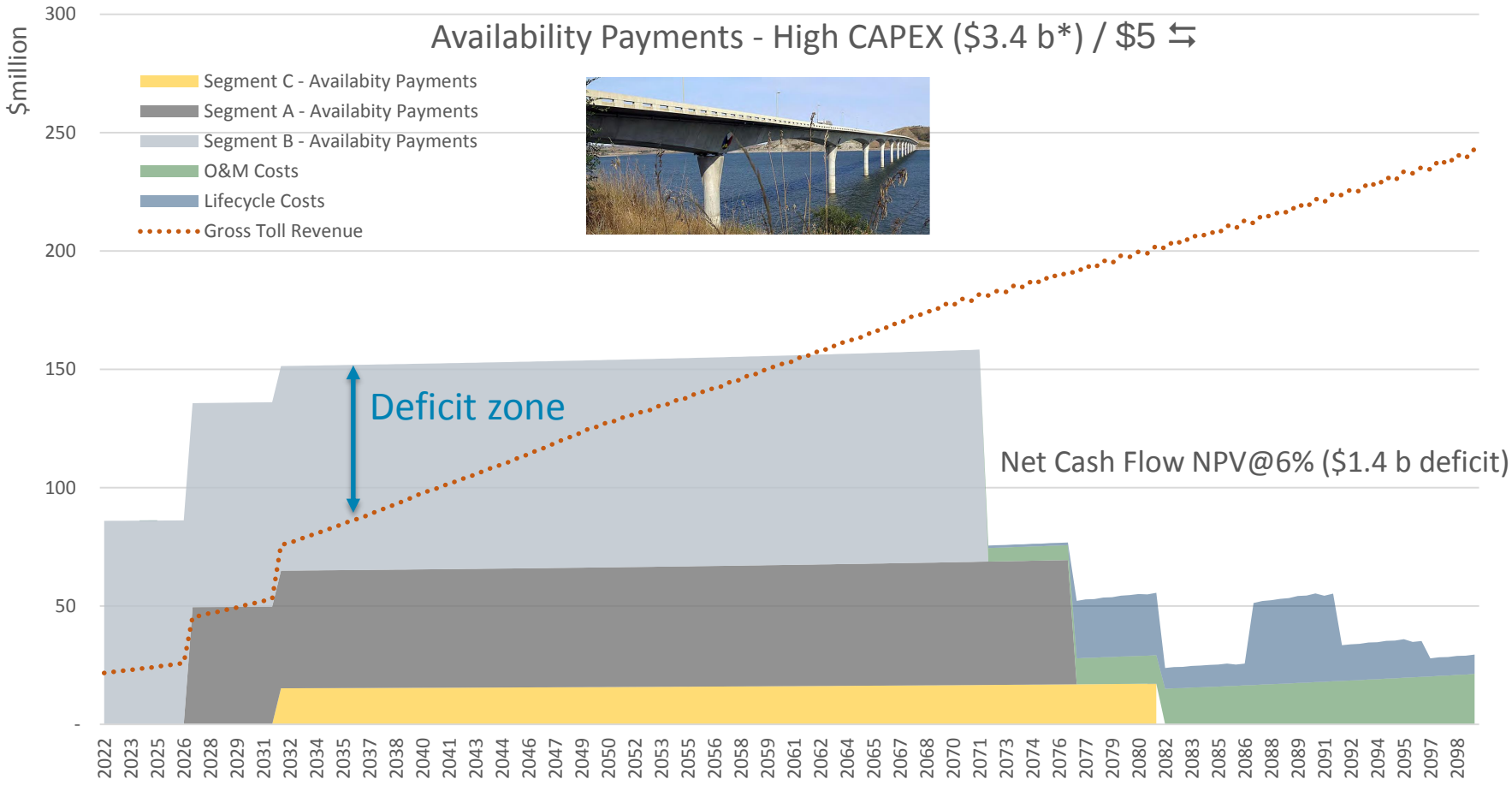
Technical Alternatives	Construction Cost in 2022**
1. Levee/Embankment	$1.0 b
2. Slab Bridge Causeway	$3.0 b
3. Box Girder Causeway	$3.4 b

P3: FULLY FUNDED PROGRAM



* Construction costs from the UC Davis Study, 2016.
NPV means Net Present Value.

P3: UNDERFUNDED PROGRAM

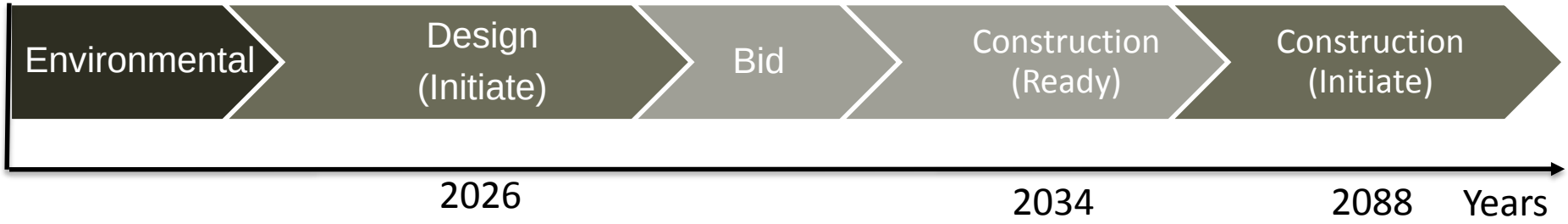


* Construction costs from the UC Davis Study, 2016.
NPV means Net Present Value.

TRADITIONAL ALTERNATIVE

Traditional funding approach with STIP/ITIP*:

- Design-bid-build delivery model
- $1 b construction cost (Segment B)
- $20 m environmental
- $90 m design
- $30 right-of-way
- Estimated start of construction 2088
- Delayed due to funding shortfall



* STIP/ITIP share for four North Bay Counties

CONCLUSIONS

Tolling at least 2 lanes is necessary in order to fund a viable project.

Tolling only segment B can fund a $1.9 b project.

Toll rates and project size can vary to define a suitable project within the affordability envelope.

Will have to address increased traffic diversion rate to “free” alternatives.

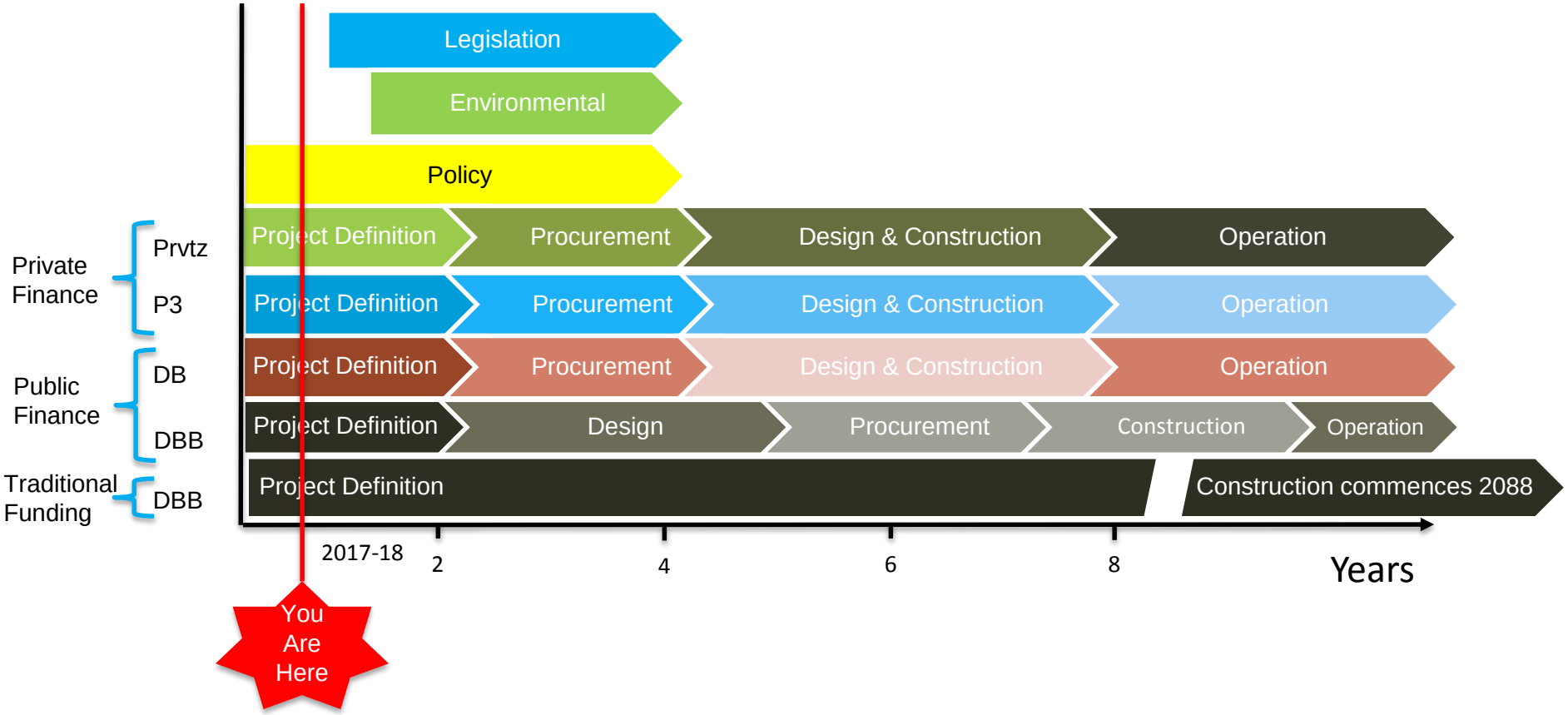
Tolling only one lane (leaving one lane free) is not enough even to fund Technical Alternative 1 ($1.0 b).

Potential for “additional cash” beyond initial investment scope.

4 SR 37 DECISION ROADMAP

PFAL

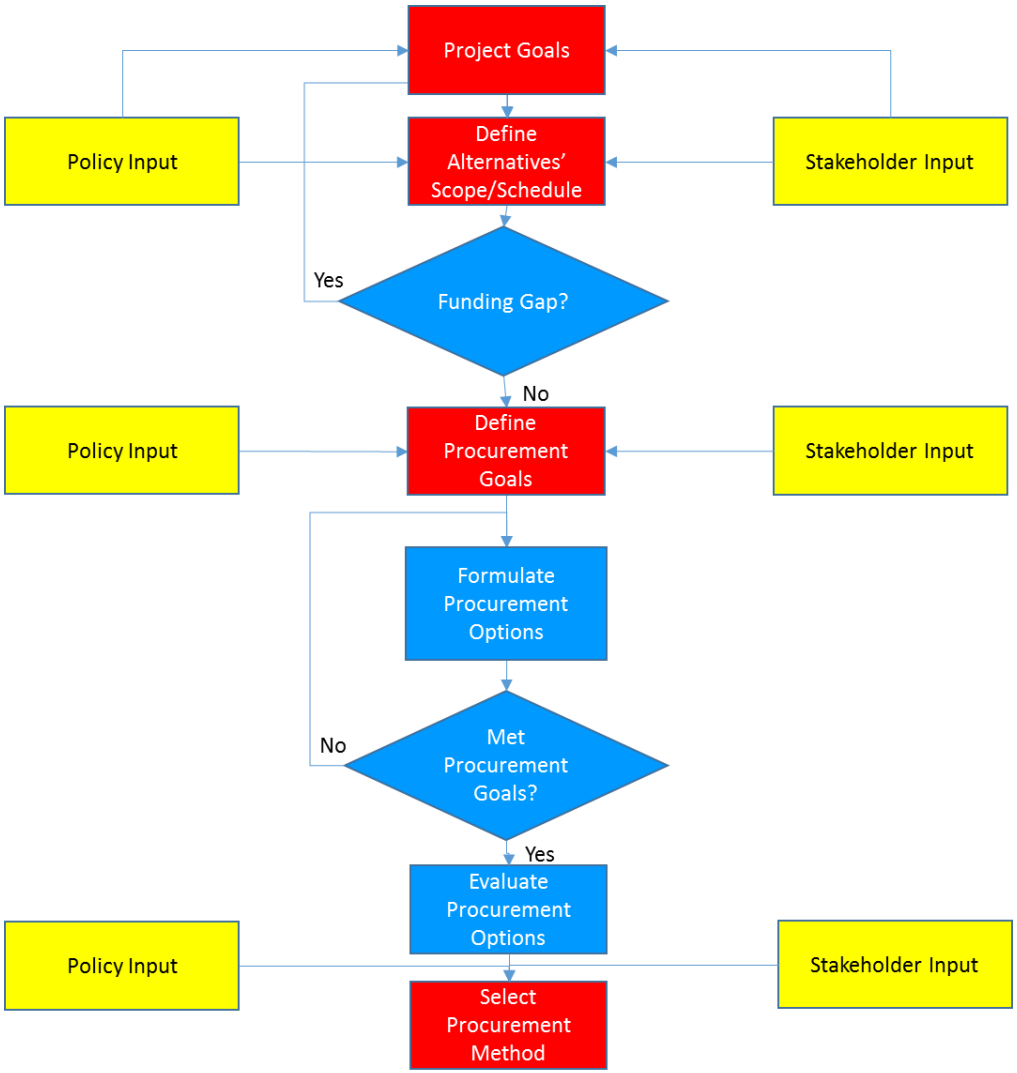
PROJECT DEVELOPMENT INDICATIVE TIMELINES



Delivery models: Prvtz = Privatization, P3 = Public Private Partnership, DB = Design Build, DBB = Design Bid Build

Private finance means private debt/equity e.g. developer/infrastructure funds, bank debt, private placement, PABs;
Public finance means municipal/federal debt e.g. revenue bonds, TIFIA loan;
Traditional funding means the highway is not tolled e.g. federal/state/local funding such as STIP/ITIP;

DECISION ROADMAP OVERVIEW



Step 1

Step 2

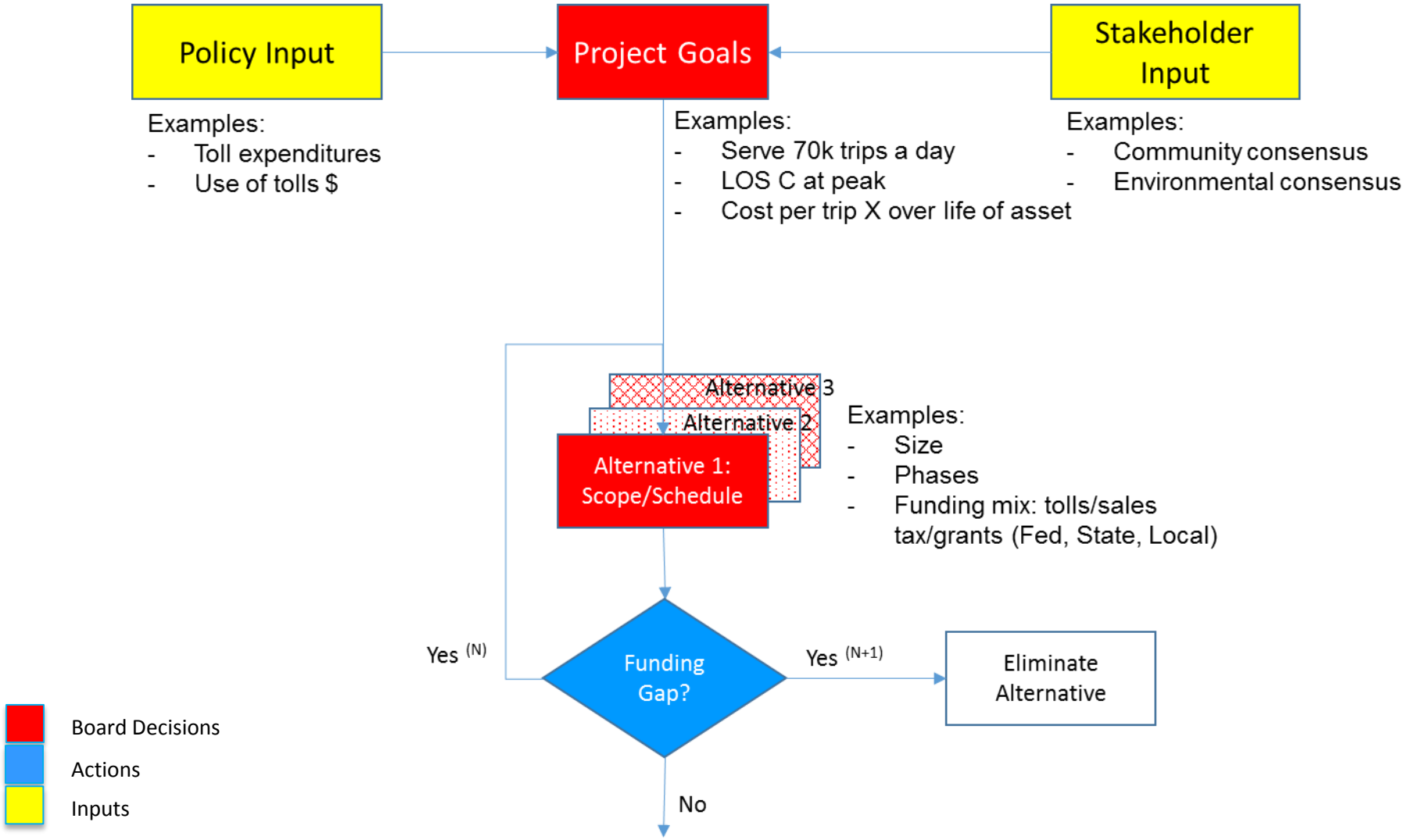
Step 3

Board Decisions

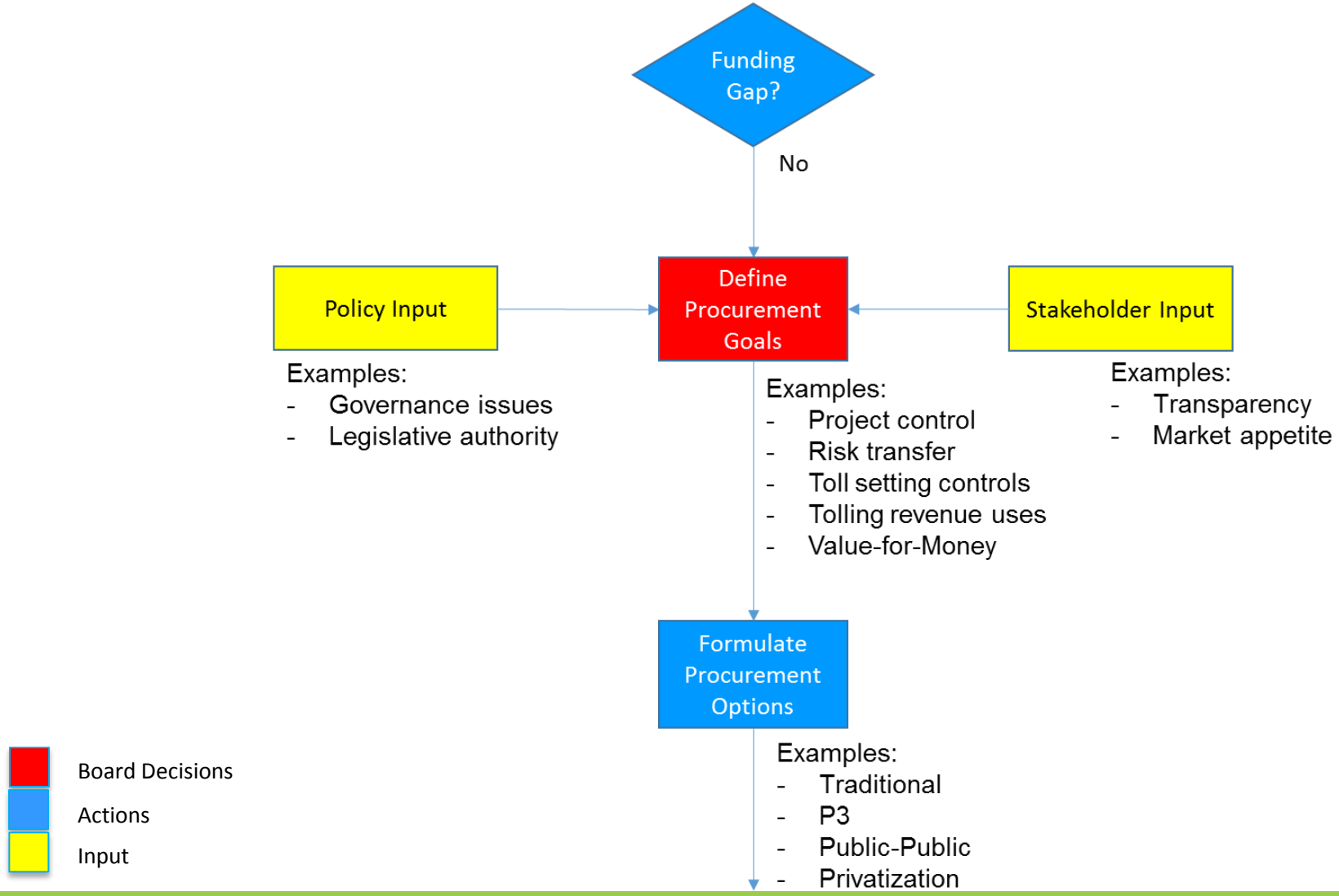
Actions

Inputs

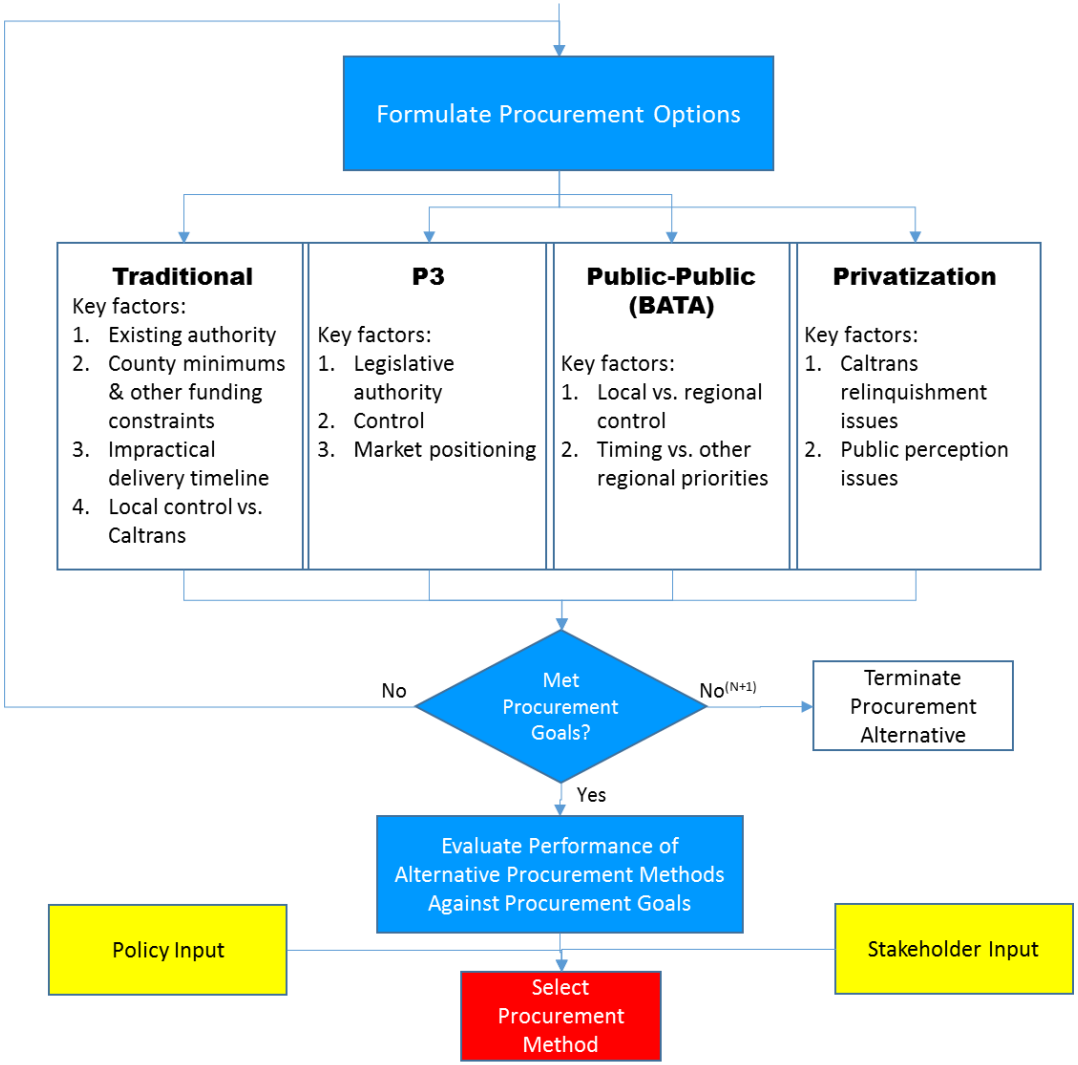
DECISION ROADMAP: STEP 1



DECISION ROADMAP: STEP 2



DECISION ROADMAP: STEP 3

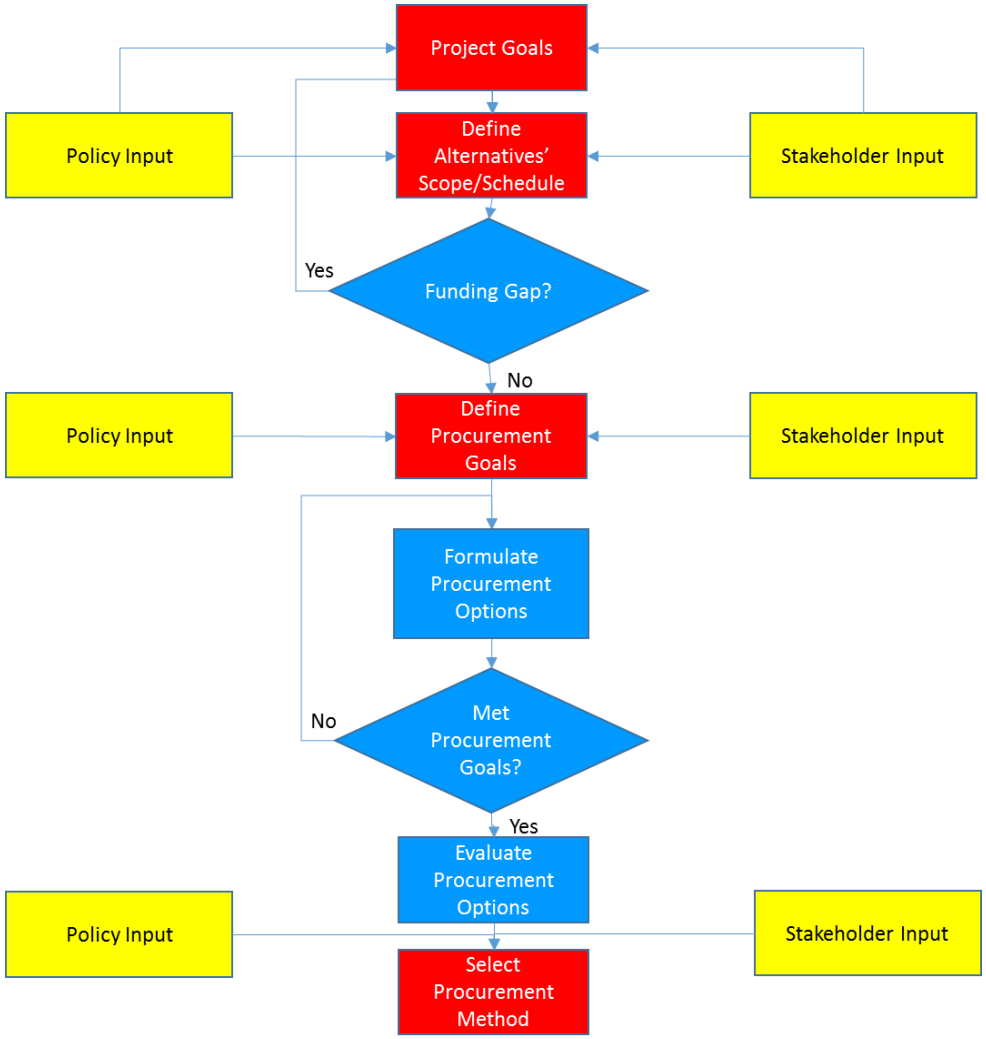


Board Decisions

Actions

Inputs

INDICATIVE TIMELINE



Step 1 6-12 months

Step 2 3-6 months

Step 3 3-6 months

Total 12-24 months

TYPICAL PROCUREMENT PROCESS

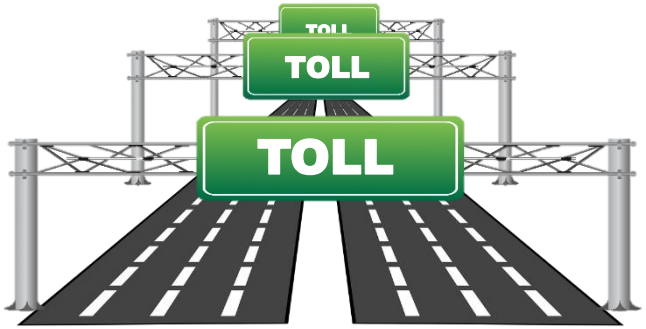
Once project(s) approved for procurement:

12–18 MONTHS

5 Q&A

PFAL

TOLLING CONCEPTS



"Toll Road"

Three toll locations
Toll charge per mile travelled

Segment	Toll
A	$1.70
B	$2.25
C	$1.05
Total	$5.00

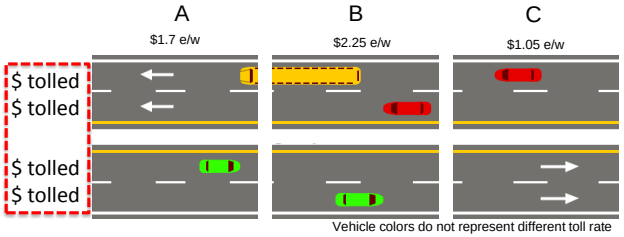
"Toll Bridge"

One toll location
Toll charge per "crossing"

Segment	Toll
A	-
B	$5.00
C	-
Total	$5.00

TOLL REVENUE SUMMARY

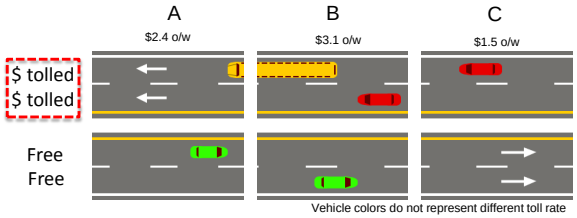
1. Four lanes tolled, $5 each way



e/w = each way; o/w = one way

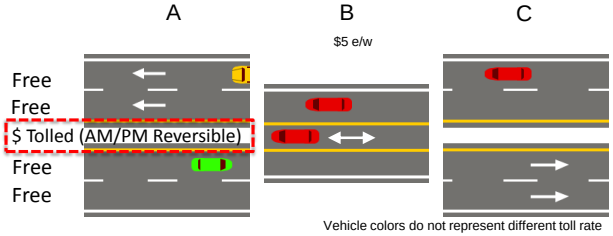
Tolling Options	A	B	C	Sum Total (over 50 Years)*
Toll Road	$3.7 b	$5.3 b	$3.6 b	**$12.5 b**
Toll Bridge	$5 in Segment B only			**$9.3 b**

2. Two lanes tolled, $7 one direction



A	B	C	Sum Total (over 50 Years)*
$2.7 b	$3.9 b	$2.7 b	**$9.4 b**
$7 in Segment B only			**$7.5 b**

3. One reversible lane tolled, $5 each way



A	B	C	Sum Total (over 50 Years)*
N/A	N/A	N/A	N/A
$5 in Segment B only Reversible toll: AM – westbound, PM – eastbound			**$0.3 b**

Scenario	Toll Rate	Toll Option	Total Revenue*
1. Four lanes tolled	$5 →	Toll Road (3 locations)	$12.5 b
		Toll Bridge (1 location)	$9.3 b
2. Two lanes tolled one direction	$7 →	Toll Road (3 locations)	$9.4 b
		Toll Bridge (1 location)	$7.5 b
3. One reversible lane tolled	$5 ⇆	Toll Bridge (1 location) AM – westbound PM - eastbound	$0.3 b

* Total revenue generated over 50 years of tolling. Toll rate escalated over this period.

Note: UC Davis Study, construction costs for technical alternatives include Levee/embankment at $1.0 b, Slab Bridge Causeway at $3.0 b and Box Girder Causeway at $3.4 b (all costs in 2022 dollars).

PFAL

SR 37: AFFORDABILITY ANALYSIS & FINANCING OPTIONS

PFAL

May 04, 2017

AGENDA

1. Introduction
2. Affordability analysis
3. Next steps
4. Q&A

GETTING TO THIS POINT

May 2016
- Educational & Background

Jul.-Aug. 2016
- Six Case Studies

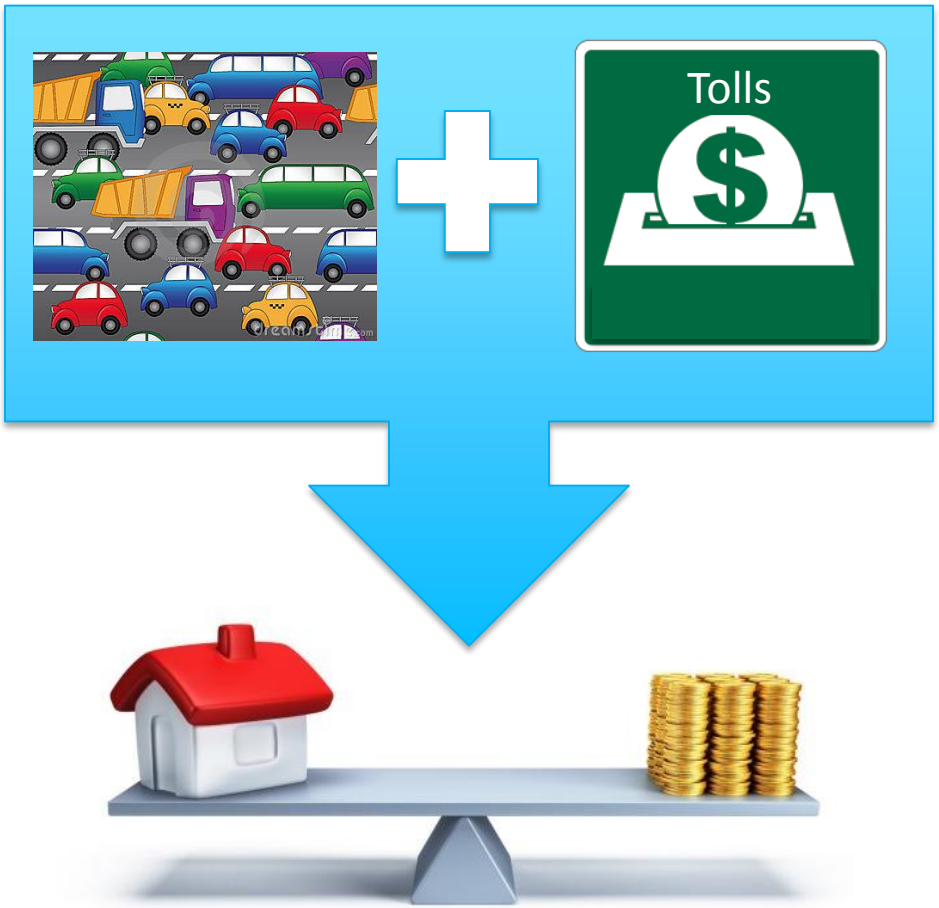
January 2017
- Introduced Key Revenue & Affordability Concepts

March 2017
- Revenue & Affordability Analysis

April 2017
- Industry/Investor Outreach & Feedback

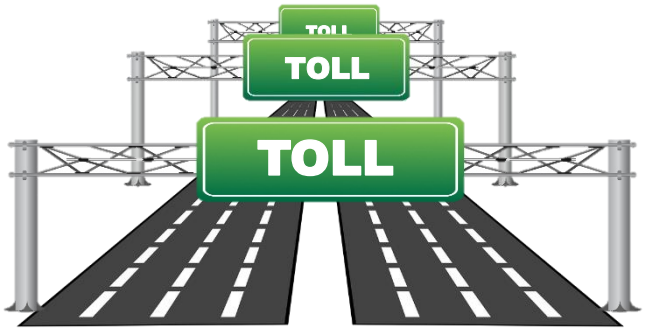
May 2017
- Summary Findings & Next Steps

PROCESS OVERVIEW



Project Affordability

TOLLING CONCEPTS



"Toll Road"

Three toll locations
Toll charge per mile travelled

Segment	Toll
A	$1.70
B	$2.25
C	$1.05
Total	$5.00

"Toll Bridge"

One toll location
Toll charge per "crossing"

Segment	Toll
A	-
B	$5.00
C	-
Total	$5.00

ALTERNATIVE TOLL REVENUE GENERATION SCENARIOS TESTED

Scenario	Toll Rate	Toll Option	Total Revenue
Four lanes tolled	$5 ⇆	Toll Road (3 locations)	$12.5 b
		Toll Bridge (1 location)	$9.3 b
Two lanes tolled one direction	$7 →	Toll Road (3 locations)	$9.4 b
		Toll Bridge (1 location)	$7.5 b
One reversible lane tolled	$5 ⇆	Toll Bridge (1 location) AM – westbound PM - eastbound	$0.3 b

* Total revenue generated over 50 years of tolling. Toll rate escalated over this period.

Order-of-magnitude comparison, for illustrative purposes only.

e/w = each way; o/w = one way

TOLL REVENUE CONCLUSIONS

Tolling

- Tolling is required to fund a replacement project.
- There are scenarios that generate enough toll revenue to fund a major replacement project.

Revenue Range

- Toll revenue generated is $300 million to $12.5 billion over 50 years depending on tolling strategy (i.e. toll road vs. toll bridge), toll rates and number of tolled lanes.

Tolling One Lane

- Tolling at least two lanes in one direction is necessary to fund a viable project.
- Tolling only one reversible lane (i.e. leaving at least one lane free in each direction) is insufficient to fund the lowest cost $1 billion solution.

Additional Cash

- Potential for “additional cash” beyond initial investment scope, which could be used for other project improvements in the corridor.

Traffic Diversion

- Further analysis required to assess the impact of increased traffic diversion to “free” alternatives, if a toll is imposed on the SR 37 facility.

FINANCING THE PROJECT - NEXT STEPS

Q1: What financing strategy(ies) should we pursue?

The strategy will determine what project size we can afford using a combination of tolling and financing options.

TECHNICAL ALTERNATIVES

1. Levee/Embankment

Segment	Construction Cost in 2030	Construction Cost in 2022
A	$0.5 b	$0.4 b
B	$0.7 b	$0.5 b
C	$0.1 b	$0.1 b
Total	**$1.3 b**	**$1.0 b**

2. Slab Bridge Causeway

Segment	Construction Cost in 2030	Construction Cost in 2022
A	$1.3 b	$1.0 b
B	$2.2 b	$1.7 b
C	$0.3 b	$0.3 b
Total	**$3.8 b**	**$3.0 b**

3. Box Girder Causeway

Segment	Construction Cost in 2030	Construction Cost in 2022
A	$1.4 b	$1.1 b
B	$2.5 b	$2.0 b
C	$0.4 b	$0.3 b
Total	**$4.3 b**	**$3.4 b**

Source: UC Davis Study, 2016

DELIVERY OPTIONS

1. Traditional

- **Revenue:** non-tolled facility
- **Facility Ownership:** public
- **Contract:** traditional inter-agency agreements
- **Funding:** only public funds (local/state/fed grants)
- **Delivery Method:** Design-Bid-Build (DBB)

2. Public-private partnership (P3)

- **Revenue:** tolls, sales tax
- **Facility Ownership:** public
- **Contract:** long term lease with private partner (e.g. 30 to 50 years)
- **Funding:** mix of public funds (local/state/fed grants) and private funds (equity & debt)
- **Delivery Method:** Design-Build-Finance-Operate-Maintain (DBFOM), DBFM and DBF

3. Public-Public

- **Revenue:** tolls, sales tax
- **Facility Ownership:** public
- **Contract:** Cooperative Agreement e.g. Bay Area Toll Authority (BATA)
- **Funding:** publicly financed (e.g. revenue bonds), grants
- **Delivery Method:** DBB, DB

4. Privatization

- **Revenue:** tolls
- **Facility Ownership:** private
- **Contract:** Acquisition & Development Agreement
- **Funding:** 100% privately financed (equity & debt)
- **Delivery Method:** full private responsibility for asset

Goals/Objectives: Roles & Responsibilities

Determine "Best Value" approach via Value-for-Money Assessment

Industry/Market Feedback

AFFORDABILITY CONCLUSIONS

Minimum Toll Rate

- Toll Road: $6 one-way or $3 each-way funds $1 billion solution for Segment A, B & C.
- Toll Bridge: $4 one-way or $ 2 each-way funds $500 million solution for Segment B.

Upper End Toll Rate

- Toll Road: $7 each-way funds $2.6 billion project.
- Toll Bridge: $7 each-way funds $1.9 billion project.

Responsibilities & Transfer of Risk

- Identify acceptance and transfer of risk.
- Desire for risk transfer needs to be balanced with a potential to have a higher or lower investment return.

Note: affordability assessment includes funding design, construction, O&M, full lifecycle and financing costs for years 1-50

DELIVERY - NEXT STEPS

Q1: What risks and responsibilities can the public sector transfer to the private sector?

Q2: How will the public sector fund the risks and responsibilities it choses to retain?

The trade-off analysis (considering cost, availability of funding, level of control and revenue sharing potential) will determine which delivery method is most appropriate.

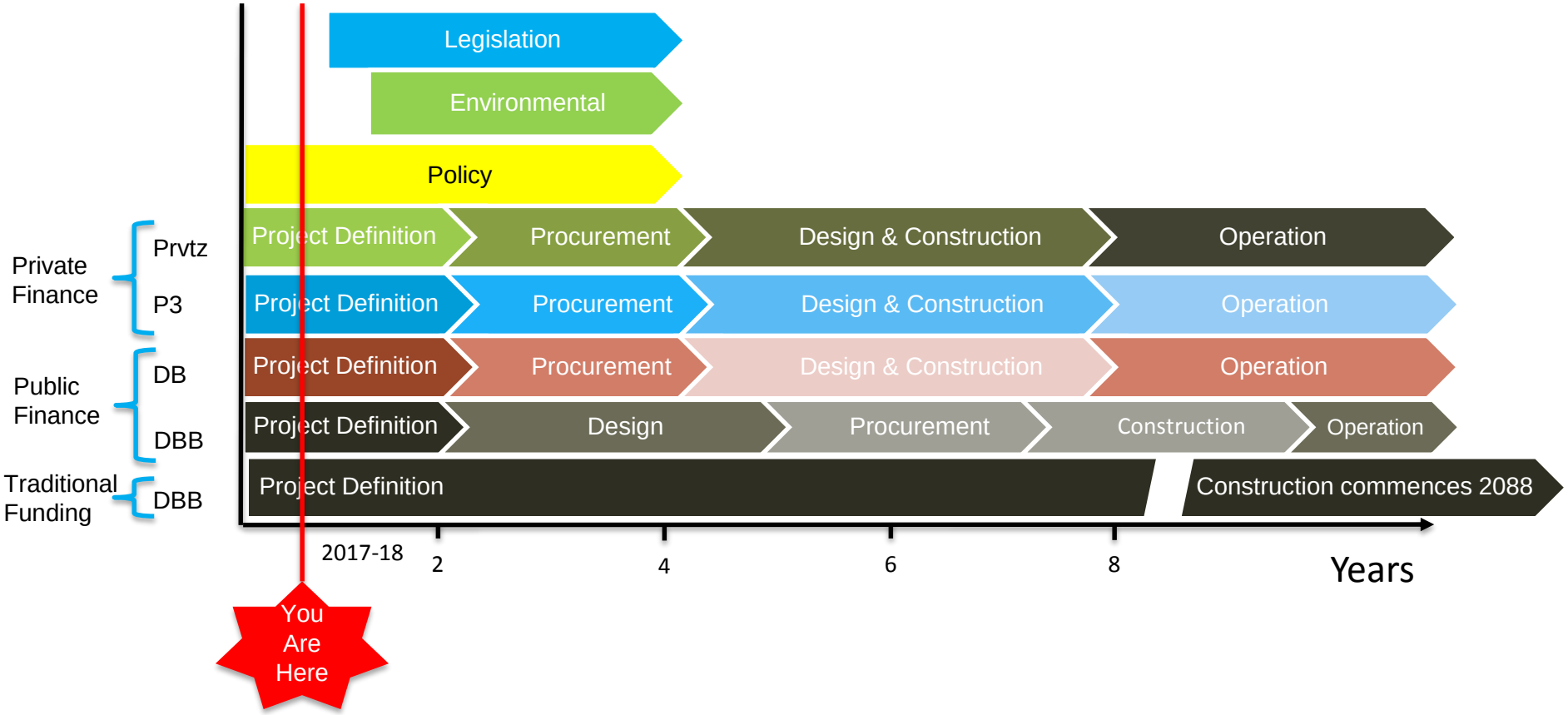
RISK TRANSFER

Typical risk transfer and funding responsibility under alternative delivery methods. Trade-offs include availability of public funding, level of control and revenue sharing.

<table>
<tr><th>Delivery Option</th><th>Project Definition</th><th>Environmental</th><th>Design</th><th>Construction</th><th>Operations & Maintenance</th><th>Toll Revenue</th></tr>
<tr><td>Traditional (DBB)</td><td colspan="5">Public</td><td>N/A</td></tr>
<tr><td>P3 (DBFOM)</td><td colspan="2">Public</td><td colspan="3">Private</td><td>Public or Private</td></tr>
<tr><td>Public (DBB or DB)</td><td colspan="2">Public</td><td colspan="2">Private*</td><td>Public</td><td>Public</td></tr>
<tr><td>Privatization</td><td colspan="5">Private</td><td>Private</td></tr>
</table>

* Private sector does not fund or finance but is compensated on a “pay-go” basis

PROJECT DEVELOPMENT INDICATIVE TIMELINES



Delivery models: Prvtz = Privatization, P3 = Public Private Partnership, DB = Design Build, DBB = Design Bid Build

Private finance means private debt/equity e.g. developer/infrastructure funds, bank debt, private placement, PABs;
Public finance means municipal/federal debt e.g. revenue bonds, TIFIA loan;
Traditional funding means the highway is not tolled e.g. federal/state/local funding such as STIP/ITIP;

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