Slide 1

FINANCE SAWG #5 10/21/09
PALISADES CENTER MALL

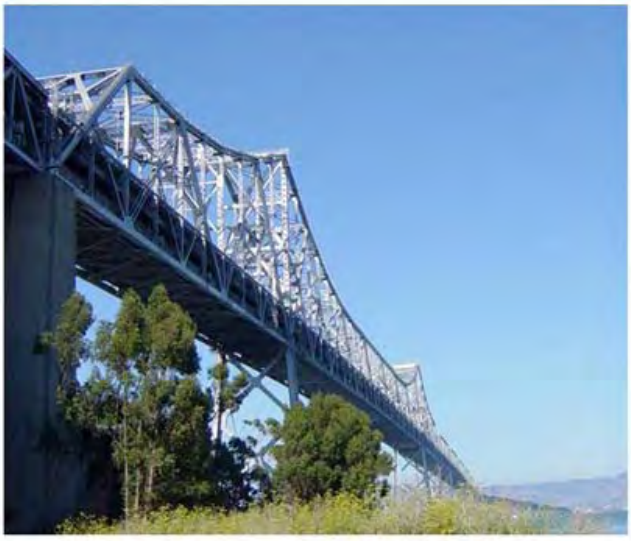
LEARNING FROM OTHER MEGA-PROJECTS

Slide 2

LIKE THE TZB/I-287 CORRIDOR, EACH PROJECT IS UNIQUE…

…WHAT INSIGHTS CAN WE GAIN FROM TWO CASE STUDIES?

Slide 3



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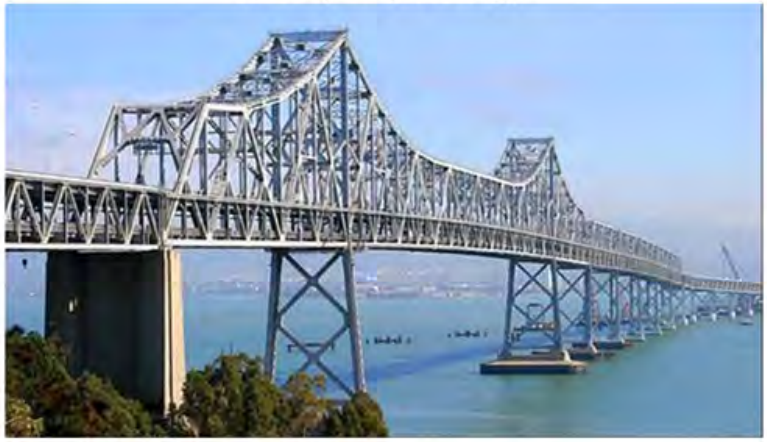
Slide 4

San Francisco – Oakland Bay Bridge,
East Span (existing)



Source: Flickr

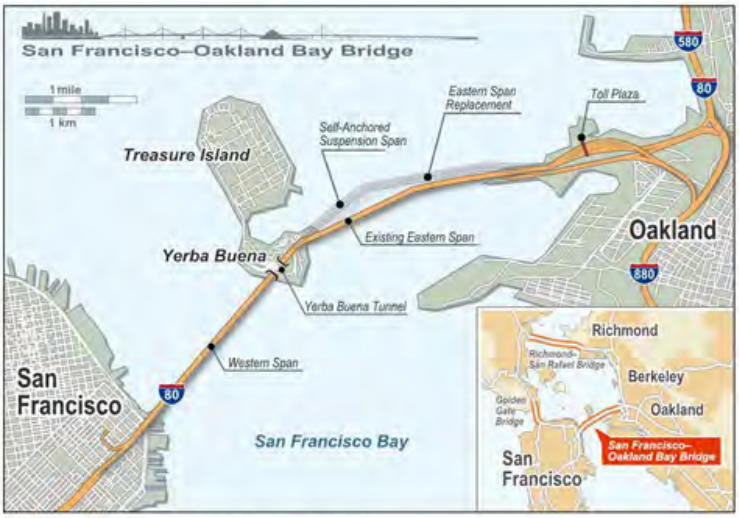
Slide 5

TZB Similarities

Besides looks…

- Heavily traveled connection
- Significant congestion during peak hours
- Must maintain traffic during construction
- Passenger tolls in 2007 were $4 (charged one dir.)
- In seismic zones across wide, shallow water bodies
- Requires a uniquely engineered crossing
- Complex institutional environment

Slide 6



Source: Wikipedia Author: Alexander Karnstedt Licensed through "Creative Commons"

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SF-Oakland Bay Bridge Seismic Safety Project

- Bridge = West Span, Yerba Buena Island, East Span
- Project = 7 elements, starting from west approach
- **THIS STUDY: Replacement of East Span**
  - with new bridge of two side-by-side decks (5 lanes + shoulders)
  - Includes a new bicycle/pedestrian path
  - Cost estimated at $5.5 B
  - Construction began 2002

Slide 8

San Francisco – Oakland Bay Bridge

MAY 2008

(Scheduled Opening 2013)

Source: Wikipedia
Author: Brevodog
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Slide 9

How'd they do that???

Slide 10

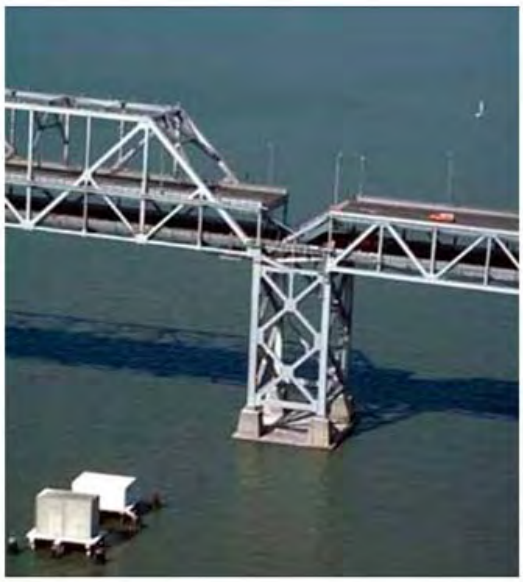
Origins

1989 Loma Prieta Earthquake

- One segment of East Span collapsed, killing 1
- Collapse of Oakland viaduct, approach to bridge killing 42
- 1,300 buildings destroyed, 20,000 damaged
- Total of 62 deaths and 3,757 injuries

East Span repaired that year, seismic retrofits required

Slide 11



Collapse of East Span segment during 1989 Loma Prieta earthquake

Source: C.E. Meyer, U.S. Geological Survey

Slide 12

$ for Seismic Safety

Major CA earthquakes in 1971, 1989, 1994

- 1971 CALTRANS establishes SS Retrofit Program
- 1991 financing seismic projects from motor vehicle fuel tax revenues and other mechanisms
- 1996 Seismic Retrofit Bond Act (@$2B, $650M for toll brdgs)

Slide 13

More $ for Seismic Safety

- 1997 authorized $2.6B for Toll Bridge Seismic Safety Retrofit Program **includes $1B for East Span **
  ($1 incr on tolls on 7 state-owned brdgs; addit. State Hwy $'s)
- 2001 authorized another $5.1B for TBSSR Program
  ** mostly for East Span project **
  (by bonding against future revenues from toll surcharge thru 2038)
- 2005 East Span total budget of $5.5B approved
  ($630M in State funds, plus additional toll increase to fund locally preferred design concept)

Slide 14

Concentration

- **1997 Bay Area Toll Authority (BATA)** created
  - Administers $1 toll surcharge to fund program
  - Share with CALTRANS administration of 7 toll brdgs
  - Programming authority for toll brdgs transferred from California Transportation Commission
- 2005 Bill 144
  - Fully authorizes BATA to manage toll revenues & prgm
  - Funds East Span to max amt thru tolls & State funds
  - Establishes project oversight and control by new Toll Bridge Program Oversight Committee (TBPOC)

Slide 15

Current Primary Roles

Caltrans owns and operates the bridges; manages the design consultant and construction contracts

BATA administers programs, allocates toll revenues, funds day-to-day operations and administration of bridges
- Also funds long-term capital improvement and rehab of bridges, including seismic retrofit projects

Bridge Program Oversight Committee (TBPOC)
- independent board, provide oversight and control of TBSSR
- Director of Caltrans, Executive Director of BATA, Executive Director of California Transportation Commission

Slide 16

Final Revenue Sources

- @33% from State fuel tax earmarked (1991) for seismic upgrade projects
- @30% from State Seismic Retrofit Revenue Bonds (1996) (debt paid from General Fund – mostly state personal and corporate income taxes and sales taxes)
- @37% from toll surcharges on the 7 Bay Area toll bridges (some paying off $450M TIFIA loan)

Slide 17

Meanwhile…

What to build?

At what cost?

Slide 18

East Span: Retrofit or Replace?

- After **1989** quake, cost comparison for East Span:
  - Replacing costs $1B more than retrofitting
  - Yet safer; in long run cheaper, easier to maintain
- **1997** replacement recommended

Senate Bill 60 called for it to be a **standard freeway viaduct bridge with a "cable-suspension span"** (to the east of Yerba Buena Island).

Design soon modified by regional input, Engineering Panel

Slide 19

Not Just Any Bridge

One suggested aesthetic criteria from the City of Oakland in 1997:

The new East Span should be
a "world-class design"
capable of "creating
an inspirational identity
for Oakland and the East Bay."

Slide 20

East Span Replacement

- CALTRANS commissioned 2 designs to 30% complete for the cable-supported segment
  - Self-anchored suspension (SAS) bridge
  - Cable-stayed bridge
- Inform on seismic performance, cost and aesthetics
- **1998 DEIS Recommended Alternative:**
  - Single tower SAS
  - Two parallel, five-lane roadways
  - Bicycle/pedestrian path
  - Provisions for future inclusion of rail

Slide 21

1998 - 2001

- 3+ yrs to reach Record of Decision (from DEIS)
- Delayed by numerous design challenges:

California State Legislature Governor Caltrans
California Business, Transportation and Housing Agency
U.S. Navy California Transportation Commission
Metropolitan Transportation Commission (MTC)
Bay Area Tolling Authority (BATA) City of Oakland
City and County of San Francisco

Also involved were the White House, the Army Corps of Engineers, and the Federal Highway Administration.

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2002 - 2005

<u>Procurement delays</u>

- Lack of bids
- Market capacity
- Multiple contracts
- Rising steel costs
- Reconsider redesign options
- Additional funding

Slide 23

Leadership Challenges

Impacting 8 yr project design & procurement process:

- 2 Governors, several Mayors
- Turnover of Caltrans staffing on project management
- Multiple transportation entities:

  Federal State Regional City

- Federal "Buy America" requirement
- Cost containment versus aesthetics
- Committed to a really complex design

Slide 24

Self Anchoring Suspension Span

Artist's rendering. Source: Caltrans

Slide 25

Disputes over SAS

- Unprecedented complexity to meet demanding combination of: environmental
  seismic and
  aesthetic requirements
- Cost severely impacted by soaring steel prices
- Early cost-effective options rejected on aesthetics
- Costs continued to soar, then too late to change design

Slide 26

Procurement Challenges

- Design-build was not an option in CA
- In 4 contracts, then 13 to increase bidding competition
- Awarded and started construction:
  - 2002 Geofill (site prep) $8M
  - 2003 Skyway $1.0B, increased to $1.3B by 2005
- 2003: SAS Tower Marine Foundation received one bid and was 63% higher than estimated
- Contracting and bidding processes reviewed
- Rebid SAS foundation, awarded in 2004 ($50M below new estimate)

Slide 27

SAS Delayed

- 2004 SAS superstructure (estimate of $0.8B)
  - One bid: $1.4B foreign steel, $1.8B domestic steel
  - Not awarded; re-design options considered
  - Cable-stayed design could save $600M but risk delays with public support and canceling work in progress
- 2005 compromise reached to proceed with SAS
  - re-bid with enhancements to encourage bidding
- 2006 two bids, winning bid of $1.4B ($49M under estimate)

Slide 28

Skyway complete

before SAS starts construction

Source: Wikipedia
Author: Brewdog
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Main Lessons?

- Delays can really impact the project
  Make good decisions and move on
- Avoid a really complicated design
  Unique = significant risk and uncertainty
- Anticipate potential material cost risks
  Steel costs can escalate more due to foreign factors
- Recognize risks to contractors in bid process
  Provide incentives to enhance competition

Slide 30

Any questions before the 2nd case study?

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"T-REX"

Slide 32

Transportation Expansion (T-REX) Project

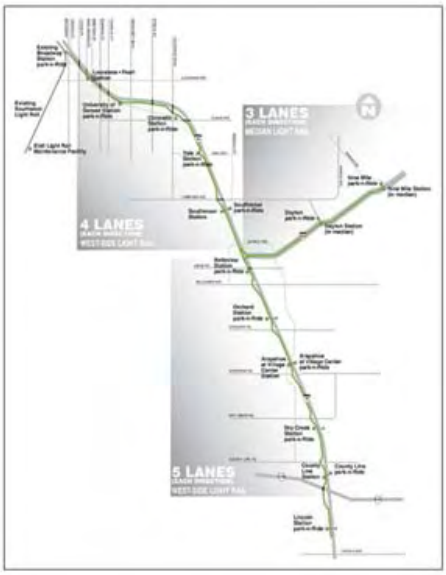
- Denver, Colorado
- Central business district southeast along I-25 Corridor and connection with I-225
- Densely populated and fast-growing
- Address mobility, congestion and safety

Slide 33

I-25 Corridor

and the

I-225 Spur



Source: T-REX Project Fact Book

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T-REX

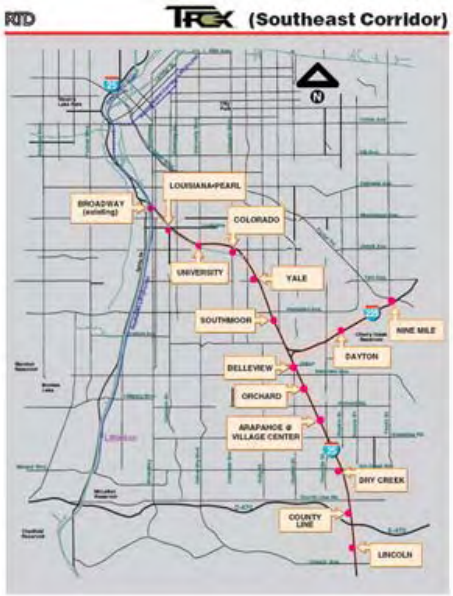
- Highways - expand 16.6 miles
  - reconstruct 8 interchanges
  - replace 13 bridges
- Light Rail - extend system 19.7 miles thru corridor
  - 13 new stations, maintenance facility
- Cost $1.67 billion (2001 start)
  (largest surface transportation project undertaken by State of Colorado)

Slide 35

Extend Light Rail

to Southeast, with

13 New Stations



Source: RTD T-REX Fact Sheet, December 2005 and FHWA

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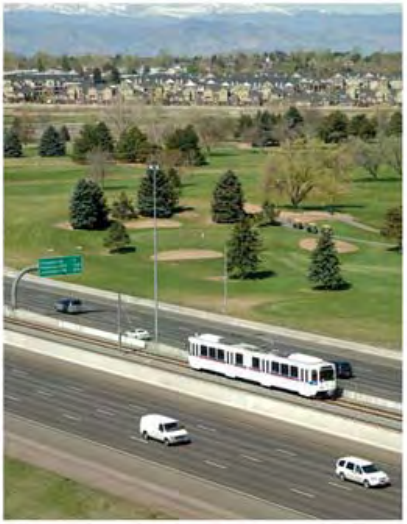


Slide 37

Project Sponsors & Oversight

- CDOT – Colorado Dept Of Transportation
- RTD – Regional Transportation District (Denver)

- FHWA – Federal Highways Administration
- FTA – Federal Transit Administration

(Simpler than with TZB)

Slide 38

Project Origins

1970's corridor recognized as needing major highway expansion

1992 study: I-25 exceeding design capacity, suggests incorporation of mass transit

1995 Major Investment Study (MIS) – final recommendations became core of this project

1998 started EIS process – brought attention to questions on project funding and financing

Slide 39

1999: Foundation Building

- legislation approved for innovative financing for T-REX, other highway projects
- CDOT and Denver RTD sign inter-governmental agreement to finance and construct T-REX
- FHWA and FTA sign interagency agreement regarding T-REX responsibilities
- Voters approve separate bond acts for highway and rail portions

Slide 40

< 2 Yrs to Start of Construction

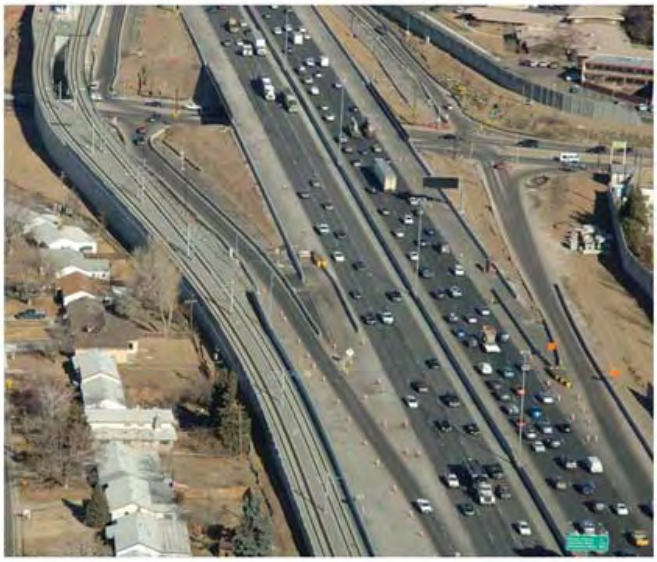
- 03/00 - EIS completed, Record of Decision (ROD) issued
- 11/00 - $525 m Full Funding Grant Agrmt (FFGA) approved for light rail portion
- 11/00 - Request for Proposals (RFP) issued
- 05/01 - selection of Design-Build Contractor
- 09/01 T-REX groundbreaking

Slide 41

5 Yrs to Construct

- 09/01 groundbreaking
- Late '01 – late '06 construction
- 08/06 final highway alignment opened
- 11/06 new light rail corridor opened

Slide 42



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How'd they do that???

1) Leadership & Legislation
2) Innovative Financing
3) Procurement Savings
4) Unprecedented Partnership

Slide 44

LEADERSHIP
&
LEGISLATION

Slide 45

Facing difficult circumstances

Colorado followed "pay-as-you-go" approach

Late 1990's – many major transportation projects on hold

Forecasting transportation revenue shortfalls

Resulting in further project delays

Slide 46

Created The "7th Pot"

- In 1996, Colorado Transportation Commission
- state's 28 highest priority transportation projects (includes T-REX)
- placed on an accelerated schedule
- $100M / yr was dedicated to this program
- Would take 50 years to complete all 28

Slide 47

Enhanced The "7th Pot"

- In 1997, legislature passed bill
- transfers 10 percent of sales tax revenue
  (considered to be motor vehicle related)
- to CDOT – earmarked specifically for the 28 projects
- Completion date reduces from 50 to 25 years

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INNOVATIVE FINANCING

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Funding Dilemma

Facing:

- T-REX cost at $1.67B
- Large number of competing projects
- Unpopularity of tax increases

Approach:

- Address all 28 projects, gain broad public support
- Use bond proceeds, Federal discretionary grants, existing sales taxes, and local funding
- Highway-transit nature of project will require sophisticated and coordinated funding effort

Slide 50

A Good Idea At The Time

No new taxes or tolls!

Get a Federal Transit Grant

And Pass a Bond Act

Slide 51

Debt without taxing

A) Use GARVEE bonds – which normally commits future Federal Aid to paying off debt service for 15 years

B) Senate Bill 1: directs to 7th Pot a portion of sales and use tax "surplus" receipts (over a threshold amount)

C) Use "surplus" receipts to pay debt service (protect Federal Aid for annual capital needs)

Slide 52

November 1999 Bond Act

- Two separate bond acts in general election
- 62% approval for CDOT to sell GARVEE bonds for T-REX and 24 other highway projects
- 66% approval for Denver RTD to issue bonds for rail
- CDOT and RTD then joined to seek further funding
  (traditionally compete against each other for $'s)

Slide 53

How Did It Turn Out?

- Worked as planned for a few years
- **"Surplus" dried up** - sales and use dropped below threshold

- With no other revenue source available, CDOT had to use Federal Aid to pay off debt service
- Recurring reduction to CDOT Annual Capital Program

- Recently, "surplus" sales and use mechanism replaced by $250M/yr from higher motor vehicle fees
- Annual Capital program still not made whole

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PROCUREMENT SAVINGS

TIME & MONEY

Slide 55

Legislation Passed in 1999

To facilitate the T-REX project and allow innovative financing and project delivery for transportation projects across Colorado.

- GARVEE Bonds could be used for transp. projects
  (Grant Anticipation Revenue Vehicles)
- Design-build contracts could be awarded on a "best value" basis
  (rather than traditional design-bid-build contracts solely on a "low bid" basis)

Slide 56

RFP: Design-Build

- CDOT and RTD chose D-B contracting
- Goals: *accelerated project delivery* *reduced project cost* *increased innovation* *more effective risk management* *minimization of owner resources*
- Procurement was based on "best value" and capped by $1.225 B "upset amount" – *maximum amount CDOT & RTD were willing to pay a single contractor*
- CDOT and RTD annual funding also limited

Slide 57

RFP: Encouraging Innovation

- Certain elements were designed to 70% level to assure specific standards
- Mostly 30% designed to encourage innovations

- Proposers were allowed to suggest alternatives to certain requirements
- 58 changes submitted, 41 approved
- Cost savings ranging from $500,000 to $5M

Slide 58

Winning Bid

- Proposals from two design-build teams:
  - SECC won with final contract of $1.18 B and commitment to finish by fall 2006, two years ahead of scheduled completion date
  - Valley Corridor Constructors would have completed by end of 2005, but bid was over "upset amount" by $146 M

Slide 59

UNPRECEDENTED PARTNERSHIP

Slide 60

Intergovernmental Cooperation

- CDOT – state highway agency
- RTD – essentially a transit agency
- FHWA – federal highway agency
- FTA – federal transit agency

- Forged unique agreements, signed in 1999

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Aligned on Common Goals

All four agencies agreed on 11/11/99 to:

- Minimize inconvenience to the public
- Meet or beat a total program budget of $1.67B
- Provide for a quality project
- Meet or beat the schedule to be fully operational by June 30, 2008

Slide 62

Public meets Private

- Public-public partnership complemented the PPP with the design-build team
- T-REX Partnering Charter
  - Partnering values: community safety cost quality schedule teamwork
  - Associated values against which the success of the project would be measured
  - Rigorous structure of teams, meetings, reports and method for dispute resolution

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GAINING PERSPECTIVE

Slide 64

Keys to Their Success

Regional, multi-modal approach to congestion problem

Statewide public support based on statewide package

Financial planning at EIS stage made a difference

Early quantification of funding shortfalls and possible sources provided credibility for funding request

Intergovernmental partnership led to public confidence

Slide 65

QUICK SUMMARY ON APPLYING THOSE LESSONS TO TZB

THEN QUESTIONS ON THE ENTIRE PRESENTATION

Slide 66

Both projects…

- Active public outreach, achieved public support
- Had extensive Federal involvement (policy more than $)
- Required a new organizational structure
  (new toll authority, intergovernmental partnerships)
- Required new revenues / innovative financing
- Made critical innovations with procurement

Slide 67

For the TZB/I-287 Project

- Active public outreach through 5 SAWG's and other
- Established and expanding upon intergovernmental partnering relationships
- Looking for an optimal mix of
  - organizational and institutional arrangements
  - innovative financing and procurement for different phases of project
- Recognizing/anticipating that innovative solutions would need statutory authority and public staff to manage/oversee
- Broad based public support will be critical

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QUESTIONS
INSIGHTS
COMMENTS

Slide 69

THANK YOU FOR PARTICIPATING IN THIS WORKING GROUP!