Guadalupe River – Tasman Dr. to I880

Conceptual Alternatives
Presented by: Katie Muller, Project Manager
Presentation Agenda

Engineering Planning Process

• Phase 1: Problem Definition
• Phase 2: Conceptual Alternatives Analysis  (19 Alternatives)
• Phase 3: Feasible Alternatives Analysis  (8 Alternatives)

Questions and Public Input
The Planning Process

1. Problem Definition
2. Conceptual Alternatives
3. Feasible Alternatives
4. Staff-Recommended Alternative

Develop Report
Public Feedback
Analyze & Refine Alternatives

Final Project
Phase 1: Problem Definition

Guadalupe River Background and History
Guadalupe Watershed

• All rain ends up in Guadalupe River
• 7 Reservoirs
• Three “sections” of river:
  • Upper
  • Downtown
  • Lower
Lower Guadalupe River Project

- Completed 2004
- 100-Year flood protection
- Levees and Floodwalls
- Bridge Improvements
Phase 1: Problem Definition

Defining the Problem and the Project’s Objectives
Problem
• Channel is under design capacity

Causes
• Vegetation overgrowth
• Levee encroachment into channel
Project Objectives

• Restore 1-percent flood capacity

Other Criteria

• Minimize future O&M activities
• Maintain/enhance public recreation and access
• Obtain community support for the Project
10 What is 100-Year?

1% probability of occurrence in a given year
• 1 in 100 chance
• 26% chance over life of 30-year mortgage

Why 100-Year?

• FEMA National Flood Insurance Program Maps
Note: Does not eliminate all flood risk!
Preparations for This Winter

Vegetation Removal
Trees cleared from levees and 15 feet from levee toe

Sediment Removal
Sediment removed from side channels to add flow capacity

Lexington Operations
Operate Reservoir for Flood Risk Reduction

Storm Preparedness
Valley Water Field Information Teams (FIT), City Coordination, and Emergency Action Plans
Phase 2: Conceptual Alternatives Analysis
Alternatives Hierarchy

Conceptual Alternatives
- High-level
- Anything within realm of possibility

- 19 Alternatives identified
Alternative A – No Project
Types of Flood Risk Reduction

Change Geometry to carry more flow

Taller

Wider
Common Flood Risk Reduction Elements

Floodwall
Concrete or sheet pile barrier

Headwall
Floodwall on a bridge
Common Flood Risk Reduction Elements

Passive Barrier
Self-raising barrier activated by water pressure

Levee
Earthen barrier
Alternative B – Floodwalls

Cost: $65 - 180 million

Bridge Headwalls

OR

Passive Barriers
Alternative C – Raise Levees

Cost: $70 – 80 million
Alternative E – Raise Bridges

Cost: $190 million
Alternative G – Replace Levee with High Floodwall

Cost: $190 million
Alternative K – Channel Widening

Cost: $650 million
Types of Flood Risk Reduction

Reduce “Roughness”

Water moves faster, has more space
Alternative L – Vegetation Removal

Cost: $100 to $840 million
Alternative M – Channel Paving

Cost: $170 million
Types of Flood Risk Reduction

Reduce High Flows

Large open space to hold flood water

OR

Large bypass Pipe (culvert)

Less flow in channel
Common Flood Risk Reduction Elements

Bypass entrance

Bypass Culvert
Concrete pipe that diverts water

Detention Basin
Open space area that holds floodwaters
Common Flood Risk Reduction Elements

Operate Reservoirs for Flood Storage
Use reservoir to store flood water
Alternative D – Off-stream Detention

Cost: $85 - 200 million
Alternative F – Bypass Culvert

Cost: $300 million
Alternative H – Add Outlet Capacity to Lenihan Dam

Cost: $33 - 110 million
Alternative I – Raise Lenihan Dam

Cost: $110 million
Alternative J – Re-Operate Lenihan Dam

Cost: $11 million
Alternatives Hierarchy

Feasible Alternatives
- More detailed
- Must be practical
- Must pass screening

- 8 Alternatives identified
Conceptual Alternatives Screening

“Level 1” Screening:

- Meets Project Objectives
- Cost ($80 M)
- Technical Feasibility
- Property Availability

Feasible Alternative
Next Phase: Feasible Alternatives Analysis
Alternative A – No Project
Alternative B – Floodwalls

Cost: $65 million
Alternative B.2 – Floodwalls & Closed Roadways

Cost: $75 million
Alternative C – Raise Levees

Cost: $80 million
Alternative C.1 – 3 ft Floodwalls & Raised Levees

Cost: $70 million
Alternative D.2 – Off-stream Detention: 5 ft

Cost: $85 million
Alternative H.1 – Outlet Capacity in Exist Tunnel

Cost: $33 million
Alternative J – Re-Operate Lenihan Dam

Cost: $11 million
The Planning Process: Next Steps

1. Problem Definition
2. Conceptual Alternatives
3. Develop Report
4. Re-Analyze & Refine Alternatives
5. Staff-Recommended Alternative
6. Public Feedback
7. Feasible Alternatives
8. Final Project
Project Next Steps

Project phases and projected schedule

- Planning
- Regulatory agency permitting
- Design
- Construction
- Periodic project updates provided
Questions

1. What did you like about the Alternatives?

2. What didn’t you like about the Alternatives?

3. Is there anything else we didn’t consider?
Alternative A: No Project

Alternative B: Floodwalls/Headwalls

Alternative B.2: Floodwalls/Close Bridges

Alternative C: Raise Levees

Alternative C.1: Floodwalls + Levees

Alternative D.2: Detention Basin

Alternative H.1: Upsize Lenihan Outlet

Alternative J: Re-Operate Lenihan
Valley Water
Clean Water • Healthy Environment • Flood Protection