SB1 Grant
Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure
Presented by Sarah Pierce & Sarah Richmond
October 4, 2018
Project Team

- SANDAG (Sarah Pierce, Katie Hentrich)
- Dudek (Sarah Richmond, Zoe Carlson)
- Moffatt & Nichol (Chris Webb, Conor Ofsthun)
- Caltrans
- Shoreline Preservation Working Group
- Local jurisdictions and agencies
Meeting Objectives

- Present scope of Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure
- Facilitate discussion of the scope
- Obtain input on risk assessment and regional adaptation measures
Existing Regional Shoreline Management Policy
Regional Beach Sand Project I (2001)

- Placed 2.1 MCY of sand on 12 beaches: Oceanside, North Carlsbad, South Carlsbad, Batiquitos, Leucadia, Moonlight, Cardiff, Fletcher Cove, Del Mar, Torrey Pines, Mission Beach, Imperial Beach
- 6 offshore borrow sites
- Funded by U.S. Navy, California Division of Boating and Waterways, and region’s coastal cities

Regional Beach Sand Project II (2012)

- Placed 1.5 MCY sand on 8 beaches: Oceanside, North Carlsbad, South Carlsbad, Batiquitos, Moonlight, Cardiff, Fletcher Cove, Imperial Beach
- 3 offshore borrow sites
- Funded by California Division of Boating and Waterways and region’s coastal cities
Shoreline Preservation Working Group

Guiding principles

- Commitment to unified approach for local decisions on sand replenishment and management of sediment resources
- Address local needs and maximize positive regional impacts
- Encourage cooperation and coordination
- Promote opportunities for beach sand replenishment and other sea-level rise adaptation strategies to enhance region-wide climate resiliency
## Sea Level Rise Planning

<table>
<thead>
<tr>
<th>Local jurisdictions and agencies</th>
<th>Vulnerability Assessment</th>
<th>Adaptation Plan</th>
<th>Local Coastal Program Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceanside*</td>
<td>Initiated</td>
<td>Planned</td>
<td>Planned</td>
</tr>
<tr>
<td>Carlsbad*</td>
<td>Final</td>
<td>Final</td>
<td>Initiated</td>
</tr>
<tr>
<td>Encinitas**</td>
<td>Final</td>
<td>Final</td>
<td></td>
</tr>
<tr>
<td>Solana Beach**</td>
<td>Final</td>
<td>Final</td>
<td>Initiated</td>
</tr>
<tr>
<td>Del Mar*</td>
<td>Final</td>
<td>Final</td>
<td>Draft</td>
</tr>
<tr>
<td>City of San Diego*</td>
<td>Initiated</td>
<td>Planned</td>
<td>Planned</td>
</tr>
<tr>
<td>Imperial Beach*</td>
<td>Final</td>
<td>Final</td>
<td>Draft</td>
</tr>
<tr>
<td>Port of San Diego***</td>
<td>Initiated</td>
<td>Planned</td>
<td>Planned</td>
</tr>
<tr>
<td>San Diego Airport</td>
<td>Initiated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SANDAG/Caltrans (NCC)</td>
<td>Final</td>
<td>Final</td>
<td>Final</td>
</tr>
</tbody>
</table>

* CCC grant funded
** USACE 50-Year Encinitas-Solana Beach Coastal Storm Damage Reduction Project
***Representing National City and Chula Vista
Regional Transportation Infrastructure
### Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure

<table>
<thead>
<tr>
<th>This document is:</th>
<th>This document is NOT:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary of existing data</strong></td>
<td><strong>New modeling</strong></td>
</tr>
</tbody>
</table>

Vulnerability assessments completed by local jurisdictions, CosMoS 3.0, or other available data will be used to identify vulnerable assets. FHWA’s Vulnerability Assessment Scoring Tool (VAST) will be used to analyze risk.

<table>
<thead>
<tr>
<th><strong>Guidance</strong></th>
<th><strong>Prescriptive</strong></th>
</tr>
</thead>
</table>

The document will be advisory and intended to facilitate cross-jurisdictional coordination and funding efforts to address vulnerable assets.

<table>
<thead>
<tr>
<th><strong>A menu of options</strong></th>
<th><strong>A checklist</strong></th>
</tr>
</thead>
</table>

Since the document is for the entire region, not all the content will be applicable to all users. Apply relevant concepts to respective jurisdictions/reflect findings from local planning efforts.
Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure

Vulnerability Assessment

Adaptation Planning
Best Practices

Adaptation Toolbox
Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure

Vulnerability Assessment

Adaptation Planning

Best Practices

Adaptation Toolbox

Sea Level Rise Scenarios of Jurisdictional Planning Reports
Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure

**Vulnerability Assessment**
- Assigns an asset a score that indicates the level of potential concern for SLR
- Score on a scale of 1 to 10 (low score = low risk, high score = high risk)
- Scores can be used to prioritize planning, funding, and capital improvements

**Vulnerability Assessment Scoring Tool (VAST)**
- **Exposure**: Does it get wet?
- **Sensitivity**: Does it matter?
- **Adaptive Capacity**: What can be done?
## VAST Hypothetical Example: 3 Picnic Tables

<table>
<thead>
<tr>
<th>Exposure</th>
<th>#1 Inland Park/Basic</th>
<th>#2 Beach/Basic</th>
<th>#3 Beach/Luxury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High elevation (0)</td>
<td>Low elevation (10)</td>
<td>Low elevation (10)</td>
</tr>
</tbody>
</table>

| Sensitivity | N/A                  | Concrete (1)    | Upholstered, TV, Wifi (10) |

<table>
<thead>
<tr>
<th>Adaptive Capacity</th>
<th>N/A</th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. Replace (1)</td>
<td>Elevate (2)</td>
<td>Relocate (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average score = 4/3 = 1.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total score | 0 | 12.3 | 27.8 |

1. Replace (10)
2. Remove upholstery, TV, Wifi (3)
3. Flood-proof (7)
4. Elevate (9)
5. Relocate (10)

Average score = 39/5 = 7.8
Regional Sea Level Rise Adaptation Guidance for Transportation Infrastructure

1. Choose range of SLR projections relevant to LCP planning area/segment
2. Identify potential SLR impacts in LCP planning area/segment
3. Assess risks to coastal resources and development in planning area (i.e., identify problem areas)
4. Identify adaption measures and LCP policy options
5. Draft updated or new LCP for certification with Coastal Commission
6. Implement LCP and monitor and revise as needed

Vulnerability Assessment

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Policy

Projects

Funding

Local & regional adaptation options
The Process: Timeline and feedback opportunities

- SPWG scoping meeting: June 2018
- Vulnerability Assessment: September 2018
- Draft Guidance Document: January 2019
- Two public feedback meetings: April 2019
- Revise Guidance Document: September 2019
- Finalize Guidance Document: January 2020
- Accept/publish Guidance Document: 2020
Questions?
50 cm/1.6 ft Sea Level Rise

San Luis Rey Bike Path
Carlsbad Blvd (Hwy 101)
Camino Del Mar (Hwy 101) / San Dieguito Lagoon Bridge
COASTER Del Mar
Trans County Trail

150 cm/4.6 ft Sea Level Rise

San Luis Rey Bike Path
Carlsbad Blvd (Hwy 101) / Loma Alta Creek
Carlsbad Blvd (Hwy 101) / Buena Vista Lagoon Bridge
Carlsbad Blvd (Hwy 101) / Batiquitos Lagoon Bridge (North & South bound)
Highway 101 / San Eljio Lagoon Bridge
COASTER / San Dieguito River Park
Camino Del Mar (Hwy 101) / San Dieguito Lagoon Bridge
Del Mar
COASTER Del Mar
Trans County Trail
Thank you

We look forward to working with you!

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