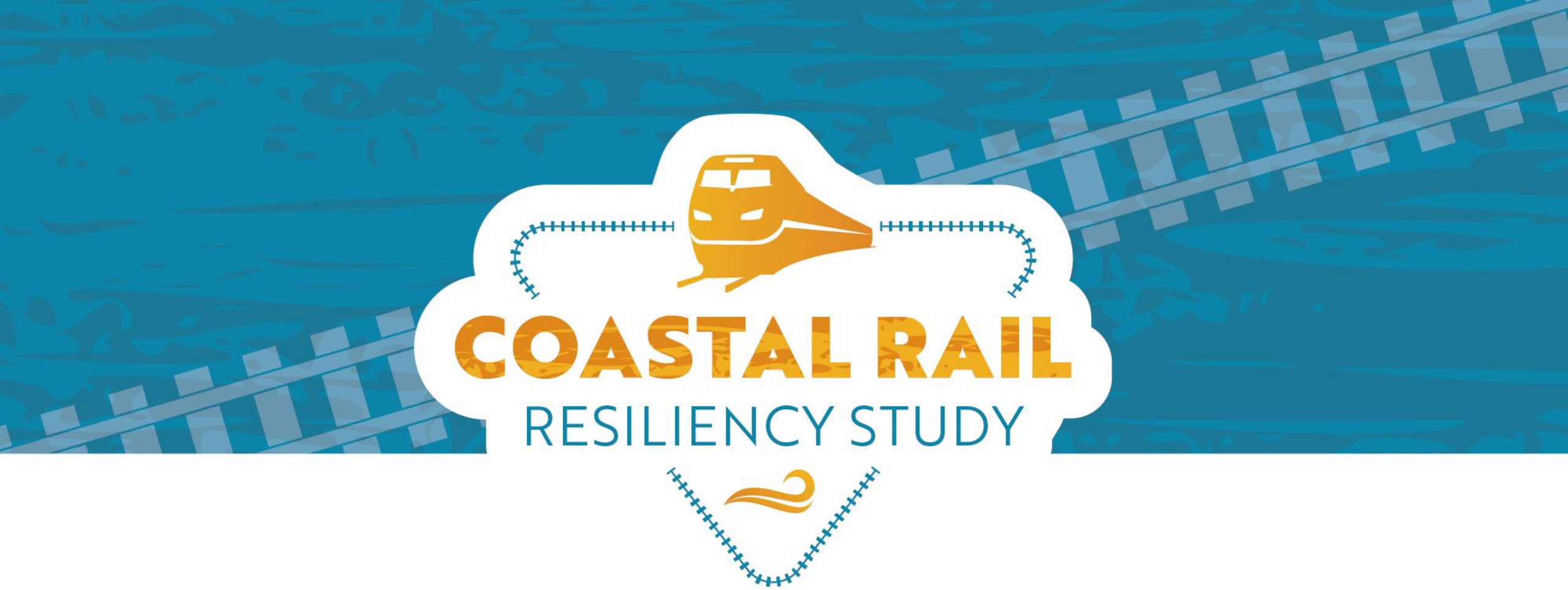


Coastal Rail Resiliency Study Update

OCTA

Purpose and Need

Purpose

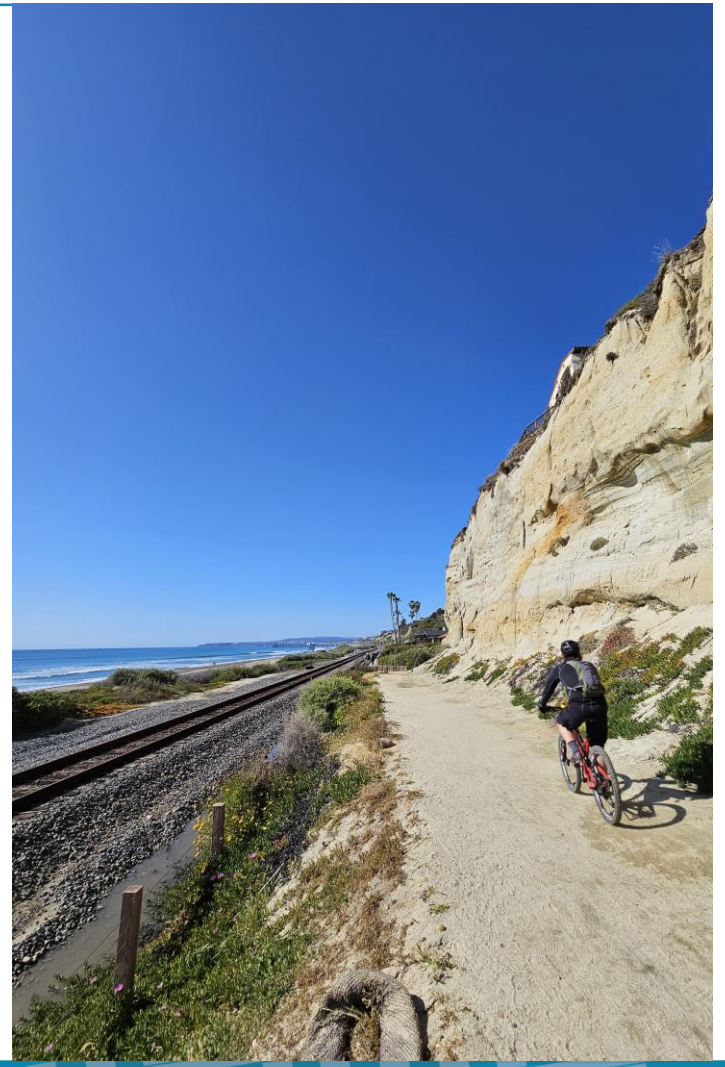
- Evaluate and prioritize adaptation strategies and engineering solutions that would maintain railroad operations generally within the existing right-of-way for up to the next 30 years.
- Identify and assess vulnerable locations that are at risk of railroad damage or operational disruptions.
- Minimize future disruptions and closures to improve service reliability.
- Support stewardship of the railroad corridor to implement multi-beneficial solutions that would positively impact the surrounding community.
- Build on the work of others in the region that would help to further protect the rail line.

Need

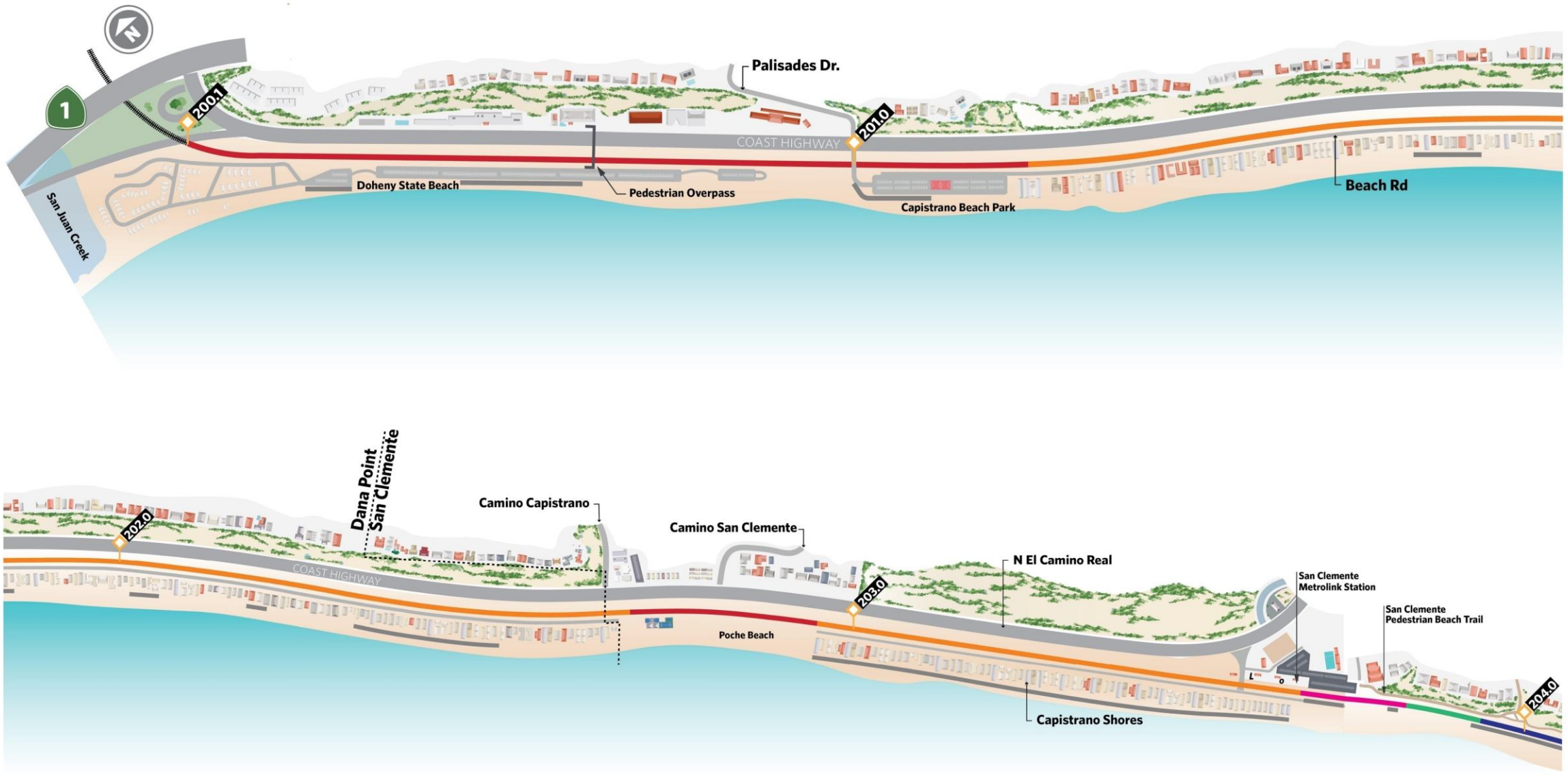
- A safe and reliable railroad corridor that can support the movement of people, freight, and national military readiness.
- A stable and dependable railroad corridor that is resilient against natural coastal erosion, increasing storm frequency and intensity, and accelerated sea level rise.
- Improved regional and freight operations by mediating continuous bluff failure and landslides that are impacting the railroad tracks.

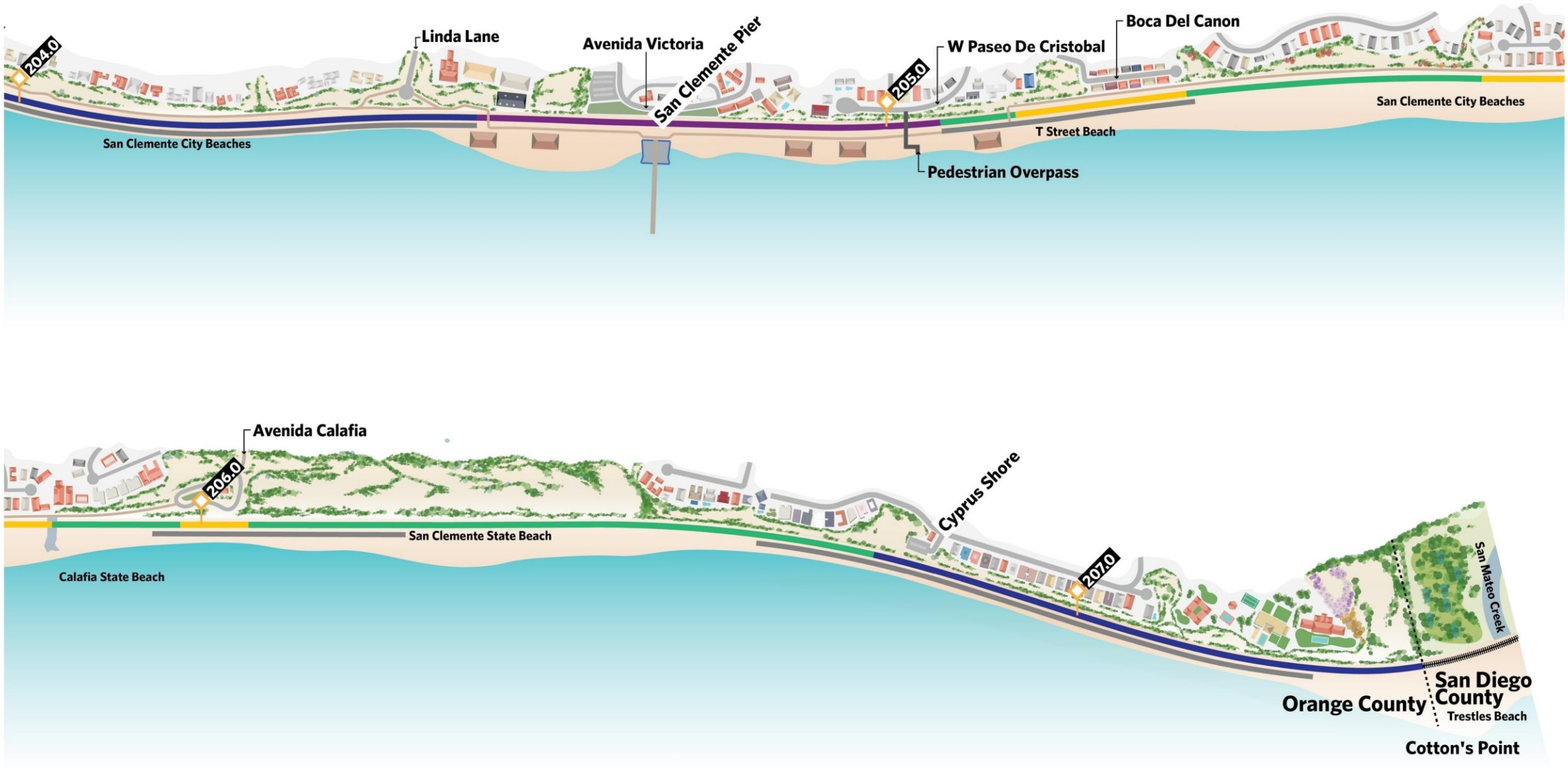
Goals & Objectives for Short- & Mid-term Study

- Continual stakeholder engagement
- Minimize passenger and freight service disruptions
- Protect the railroad in place (up to 30 years)
  - Assess, identify, and develop a program of capital projects within the OCTA ROW
  - Develop short-term (ten years) and mid-term (30 years) conceptual alternatives
  - Work with adjacent stakeholders to develop a comprehensive coastal capital program with roles and responsibilities beyond the OCTA ROW



OCTA – Orange County Transportation Authority
ROW – Right-of-Way


1
200.1
Palisades Dr.
COAST HIGHWAY
201.0
Doheny State Beach
Pedestrian Overpass
San Juan Creek
Capistrano Beach Park
Beach Rd
Dana Point
San Clemente
202.0
Camino Capistrano
Camino San Clemente
COAST HIGHWAY
N El Camino Real
203.0
San Clemente
Metrolink Station
San Clemente
Pedestrian Beach Trail
Poche Beach
Capistrano Shores
204.0
Mile Post
Existing rip-rap
Typical Section 1
Typical Section 2
Typical Section 3
Typical Section 4
Typical Section 5
Typical Section 6
Typical Section 7


204.0
Linda Lane
Avenida Victoria
San Clemente Pier
205.0
W Paseo De Cristobal
Boca Del Canon
San Clemente City Beaches
T Street Beach
San Clemente City Beaches
Pedestrian Overpass
Avenida Calafia
206.0
San Clemente State Beach
Calafia State Beach
Cyprus Shore
207.0
San Mateo Creek
San Diego County
Orange County
Trestles Beach
Cotton's Point
Mile Post
Existing rip-rap
Typical Section 1
Typical Section 2
Typical Section 3
Typical Section 4
Typical Section 5
Typical Section 6
Typical Section 7

Concepts*

Bluffside

1. Catchment walls (block slide debris)
2. Stabilization grading (buttress slide toe)
3. Tieback / soil nail / pin-pile walls (mitigate larger slides)
4. Ground improvement (bluff stabilization)
5. Surface matting & deep-rooted vegetation planting (reduce sediment erosion)
6. Drainage improvement via grading / detention basins / undertrack outlets
7. Deflection walls in tributaries (reduce flood and sedimentation flow rates)
8. Up-gradient cut-off drains (reduce source of water)
9. Hydraugers (lower hydraulic pressure and slide potential)

Beachside

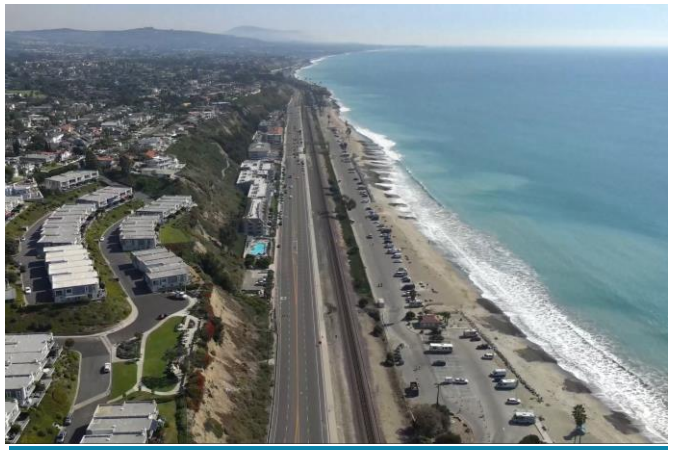
1. Riprap placement
2. Engineered rock revetment
3. Vertical seawall
4. Hybrid structural solution
5. Beach nourishment with shoreline protection structure (1-4 above)
6. Beach nourishment with sand retention measures & shoreline protection structure (1-4 above)
7. Watershed modifications to increase beach sand supply (implemented by others)
8. No railroad action - monitor regional beach nourishment activities and participate as appropriate

Rail

1. Elevate tracks
2. Alternative materials for critical railroad infrastructure to reduce lifecycle costs
3. Ground improvement (track-bed stabilization)

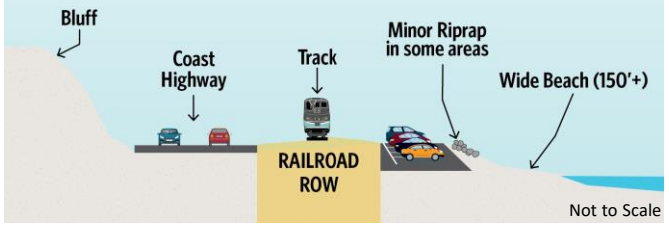
*No order of preference

Typical Section 1: Railroad between Roadway and Beach



Typical Section (Existing Condition):

MP 200.20 – 201.20
MP 202.60 – MP 202.95



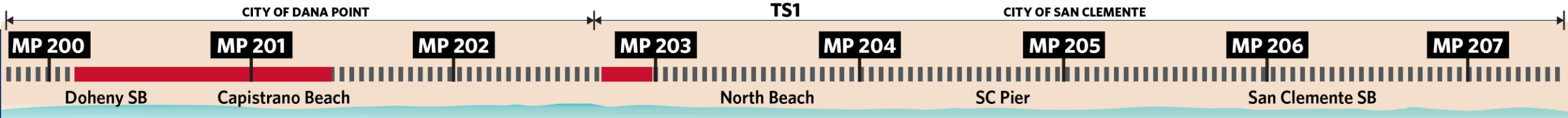
SB – State Beach/SC- San Clemente

Beachside

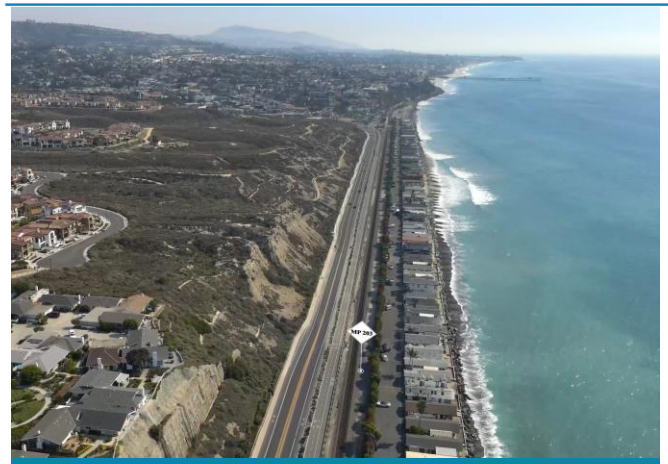
- ✓ Watershed modifications to increase beach sand supply (implemented by others)
- ✓ No direct railroad action – collaborate with regional beach sand project

Rail

- ✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs

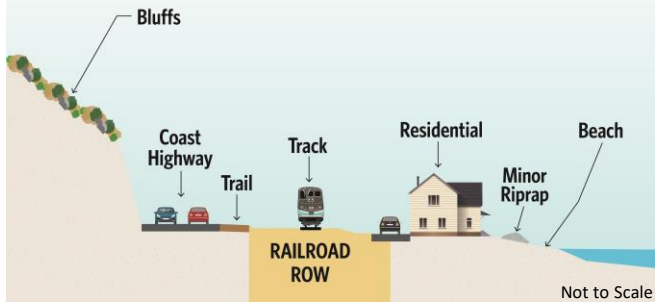


Typical Section 2: Railroad between Roadway and Homes



Typical Section (Existing Condition):

MP 201.20 – 202.60
MP 202.95 – MP 203.62

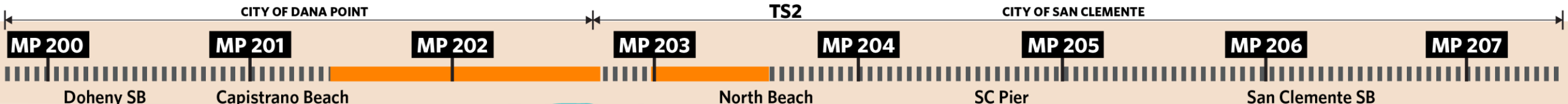


Beachside

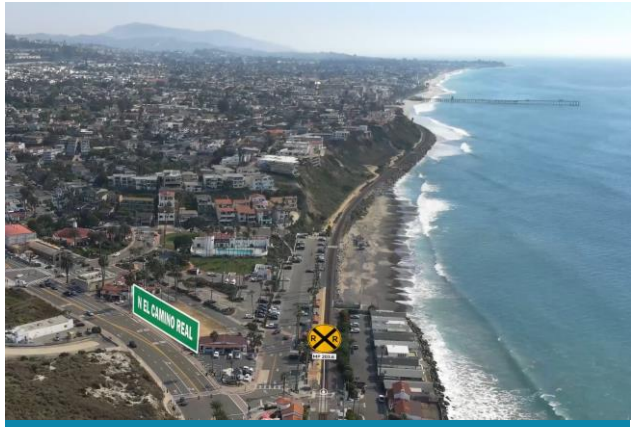
- ✓ Watershed modifications to increase beach sand supply (implemented by others)
- ✓ No direct railroad action – collaborate with regional beach sand project

Rail

- ✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs

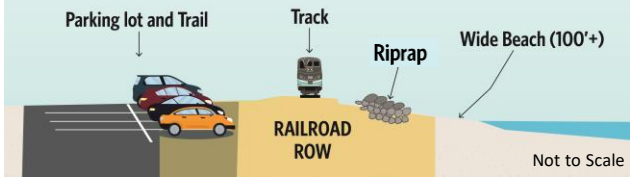


Typical Section 3: Railroad between Development/Trail and Beach



Typical Section (Existing Condition):

MP 203.62 – 203.72

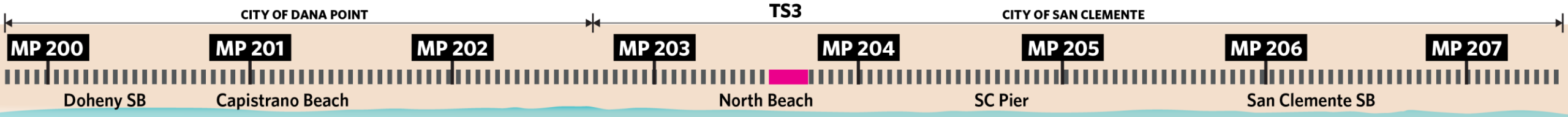


Beachside

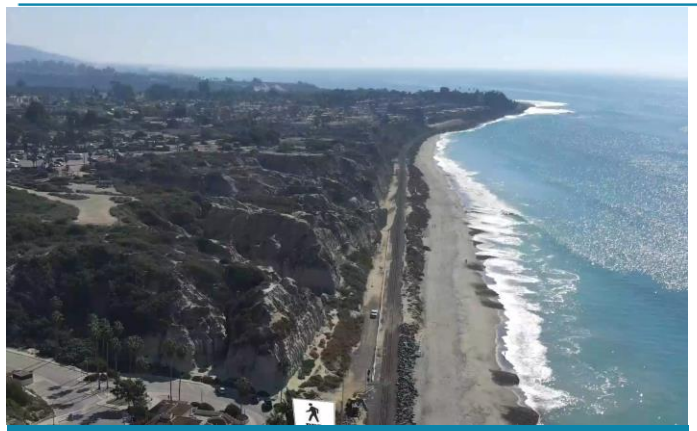
- ✓ Riprap placement
- ✓ Engineered rock revetment
- ✓ Vertical seawall
- ✓ Hybrid structural solution
- ✓ Beach nourishment with shoreline protection structure
- ✓ Beach nourishment with sand retention measures & shoreline protection structure
- ✓ No direct railroad action – collaborate with regional beach sand project

Rail

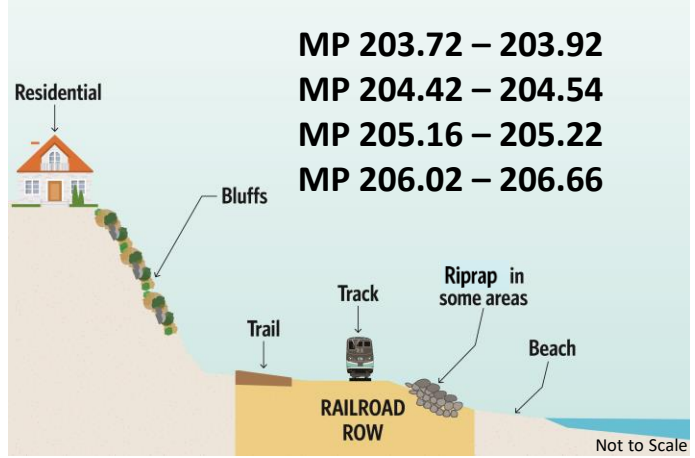
- ✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs



Typical Section 4: Railroad between Beach and Bluff/Trail



Typical Section (Existing Condition):

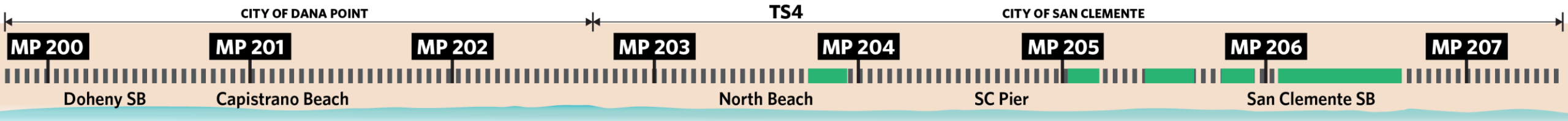


Bluffside

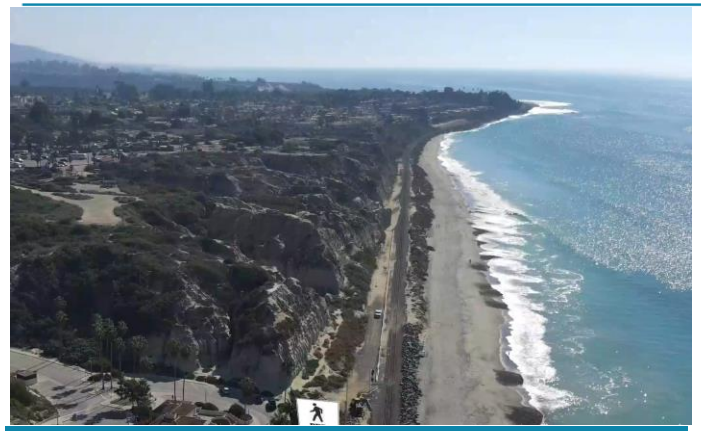
- ✓ Catchment walls (block slide debris)
- ✓ Stabilization grading (buttress slide toe)
- ✓ Tieback / soil nail / pin-pile walls (mitigate larger slides)
- ✓ Ground improvement (bluff stabilization)
- ✓ Hydraugers (lower hydraulic pressure and slide potential)

Rail

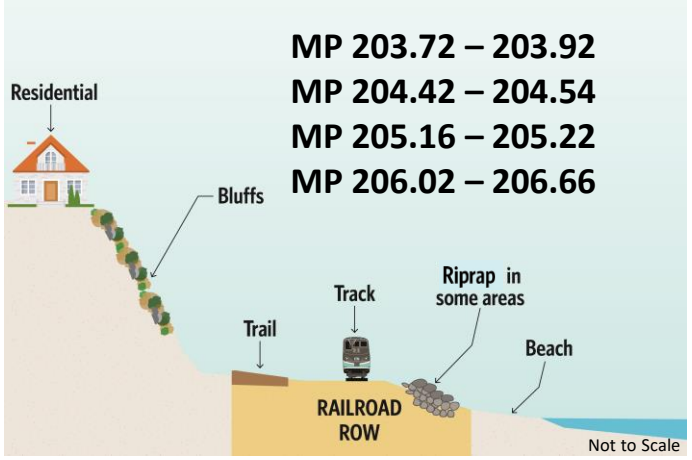
- ✓ Elevate tracks
- ✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs
- ✓ Ground improvement (track-bed stabilization)



Typical Section 4: Railroad between Beach and Bluff/Trail (cont'd)

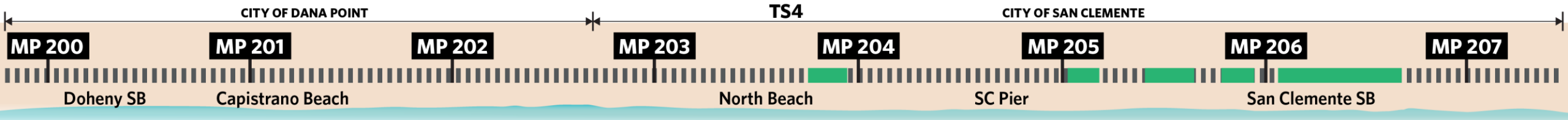


Typical Section (Existing Condition):

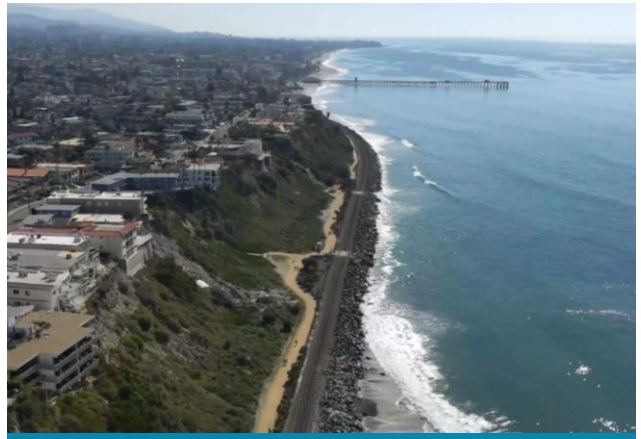


Beachside

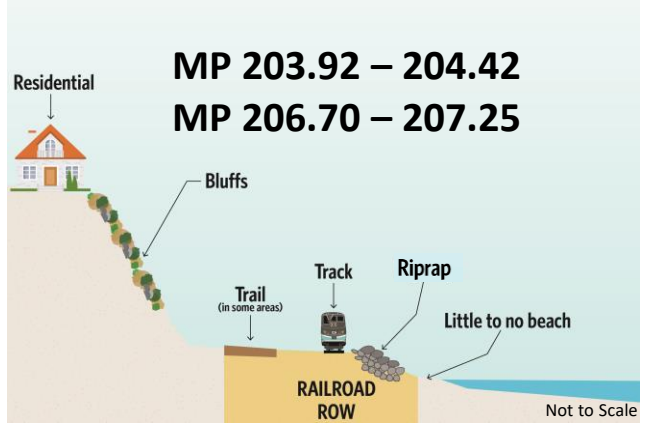
- ✓ Riprap placement
- ✓ Engineered rock revetment
- ✓ Vertical seawall
- ✓ Hybrid structural solution
- ✓ Beach nourishment with shoreline protection structure
- ✓ Beach nourishment with sand retention measures & shoreline protection structure
- ✓ No direct railroad action – collaborate with regional beach sand project



Typical Section 5: Railroad between Bluff/Trail and Ocean

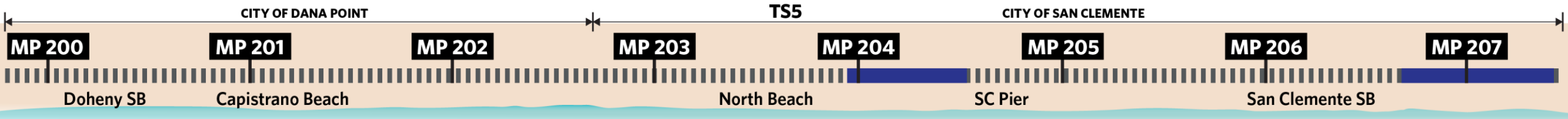


Typical Section (Existing Condition):



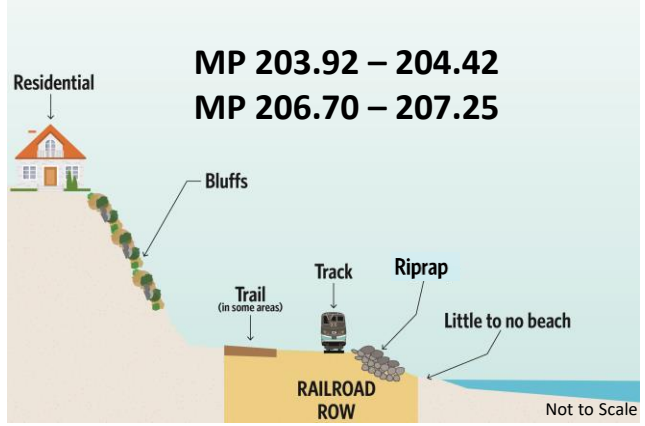
Bluffside

- ✓ Catchment walls (block slide debris)
- ✓ Stabilization grading (buttress slide toe)
- ✓ Tieback / soil nail / pin-pile walls (mitigate larger slides)
- ✓ Ground improvement (bluff stabilization)
- ✓ Up-gradient cut-off drains (reduce source of water)
- ✓ Hydraugers (lower hydraulic pressure and slide potential)



Typical Section 5: Railroad between Bluff/Trail and Ocean (cont'd)

Typical Section (Existing Condition):

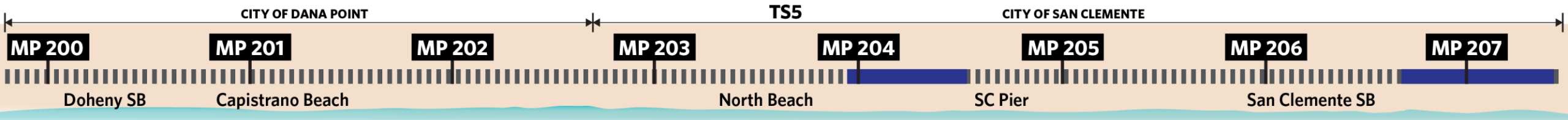


Beachside

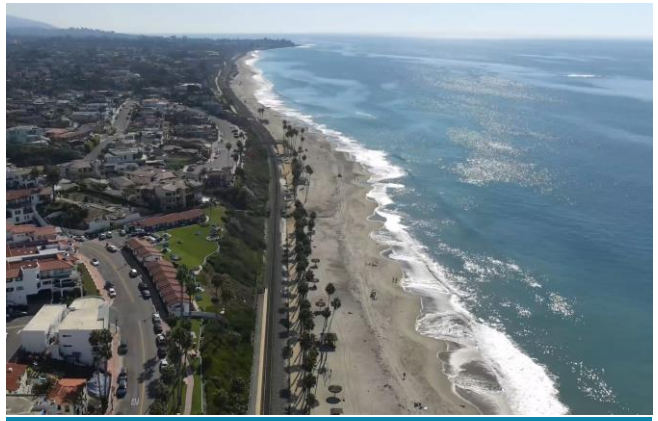
- ✓ Riprap placement
- ✓ Engineered rock revetment
- ✓ Vertical seawall
- ✓ Hybrid structural solution
- ✓ Beach nourishment with shoreline protection structure
- ✓ Beach nourishment with sand retention measures & shoreline protection structure

Rail

- ✓ Elevate tracks
- ✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs



Typical Section 6: Railroad between Bluff and Beach/Trail



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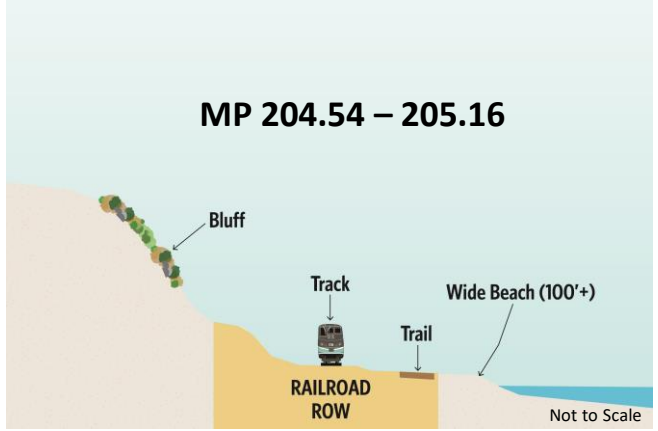


Bluffside

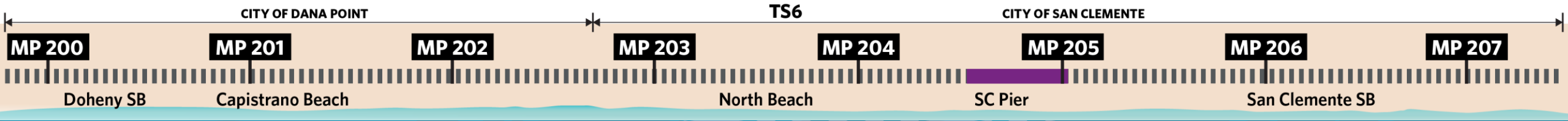
✓ Catchment walls (block slide debris)

Beachside

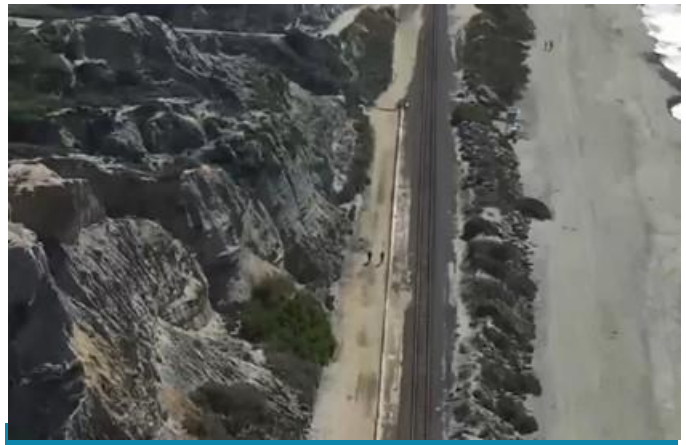
✓ No direct railroad action - collaborate with regional beach sand project

Rail

✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs



Typical Section 7: Railroad between Trail and Beach



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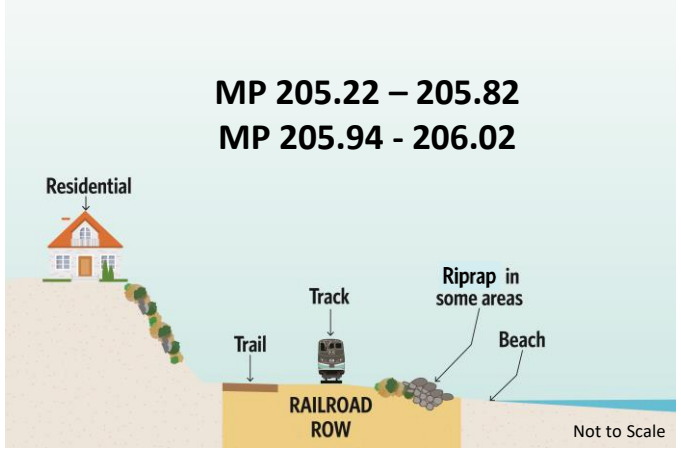
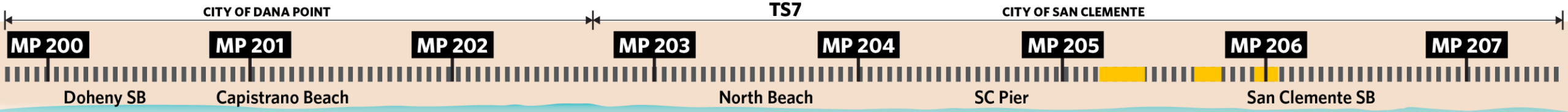


Beachside

- ✓ Engineered rock revetment
- ✓ Beach nourishment with shoreline protection structure
- ✓ Watershed modifications to increase beach sand supply (implemented by others)
- ✓ No direct railroad action – collaborate with regional beach sand project

Rail

- ✓ Alternative materials for critical railroad infrastructure to reduce lifecycle costs



Key Project Risks and Challenges

IMMEDIATE RISK: Potential additional bluff failures during the project development process could lead to immediate rail service closure and require rescoping of planned improvements underway.

CHALLENGES:

- Development of project preferred alternatives, which are acceptable to multiple permitting resource agencies
- Identification and permitting of a sufficient sand replenishment source location
- Developing and securing a timely sand transport and delivery method
- Coordination, approvals, and permitting required for additional revetment

Next Steps

- Solicit public input on draft alternative concepts
- Convene in-person and virtual meetings to gather input from the public (anticipated spring 2025)
- Refine concepts
- Return to Board of Directors with updates (summer 2025 timeframe)
- Prepare draft and final Feasibility Study Report (mid-2025 to mid-2026)
- Conduct preliminary engineering
- Perform environmental technical studies and surveys
- Identify project streamlining opportunities
- Work with regulatory agencies to expedite permitting processes
- Seek funding opportunities