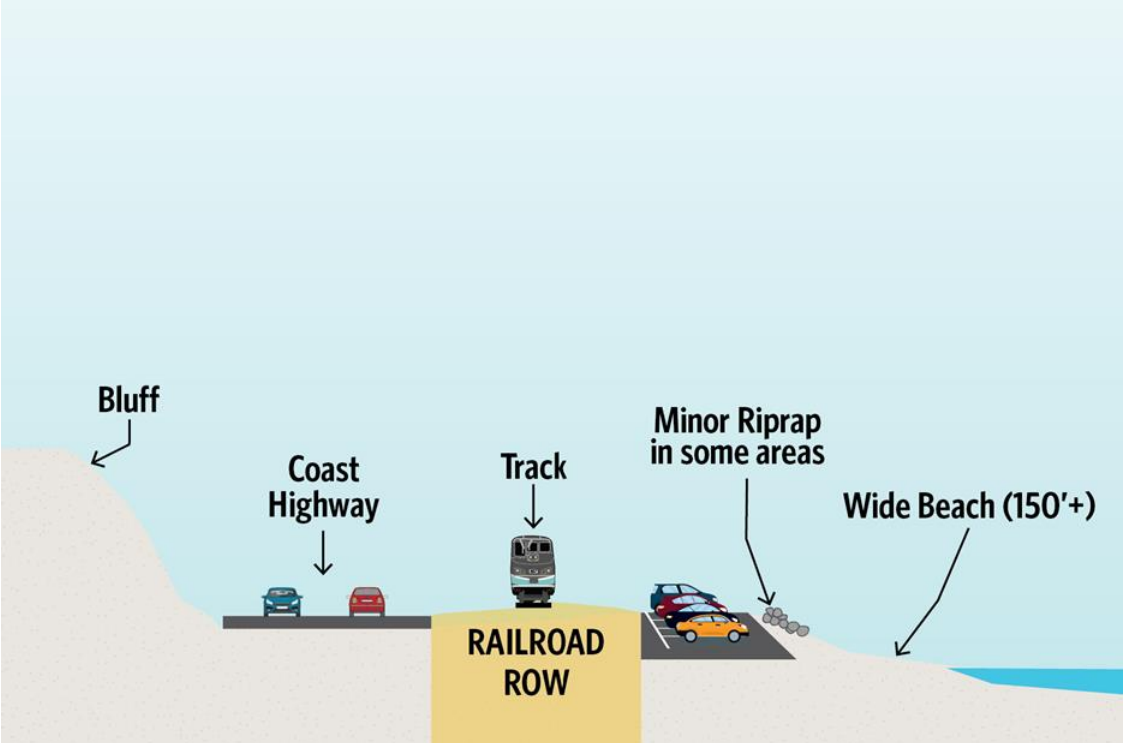
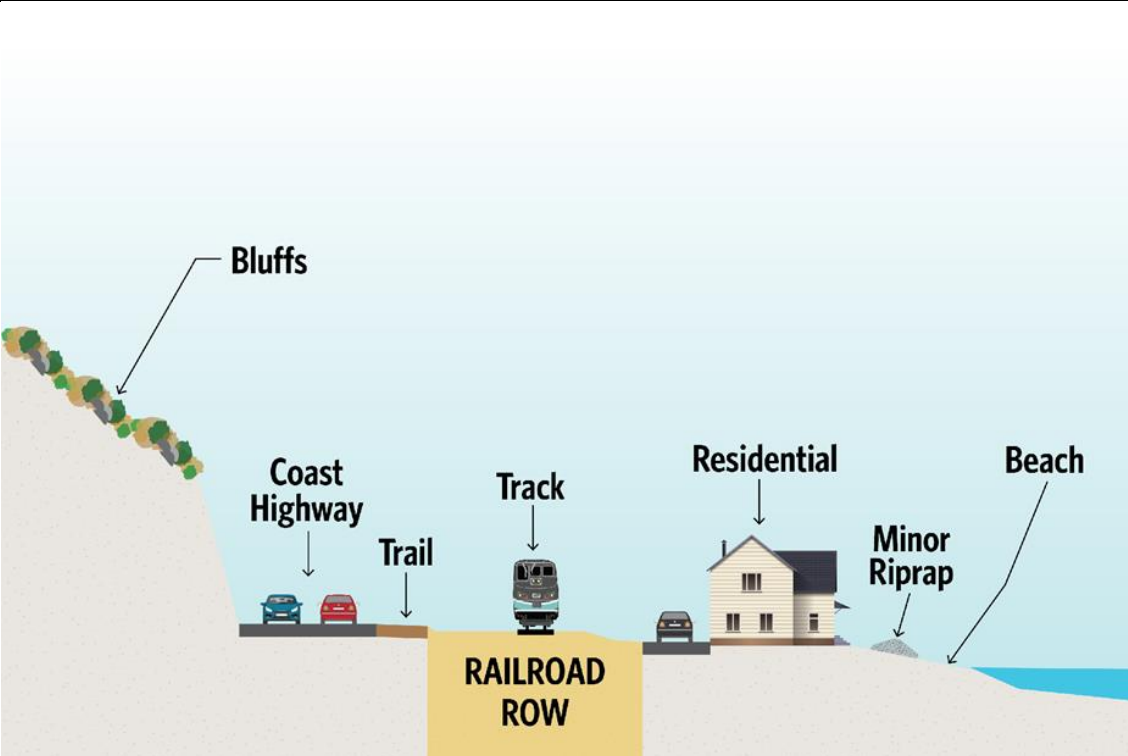
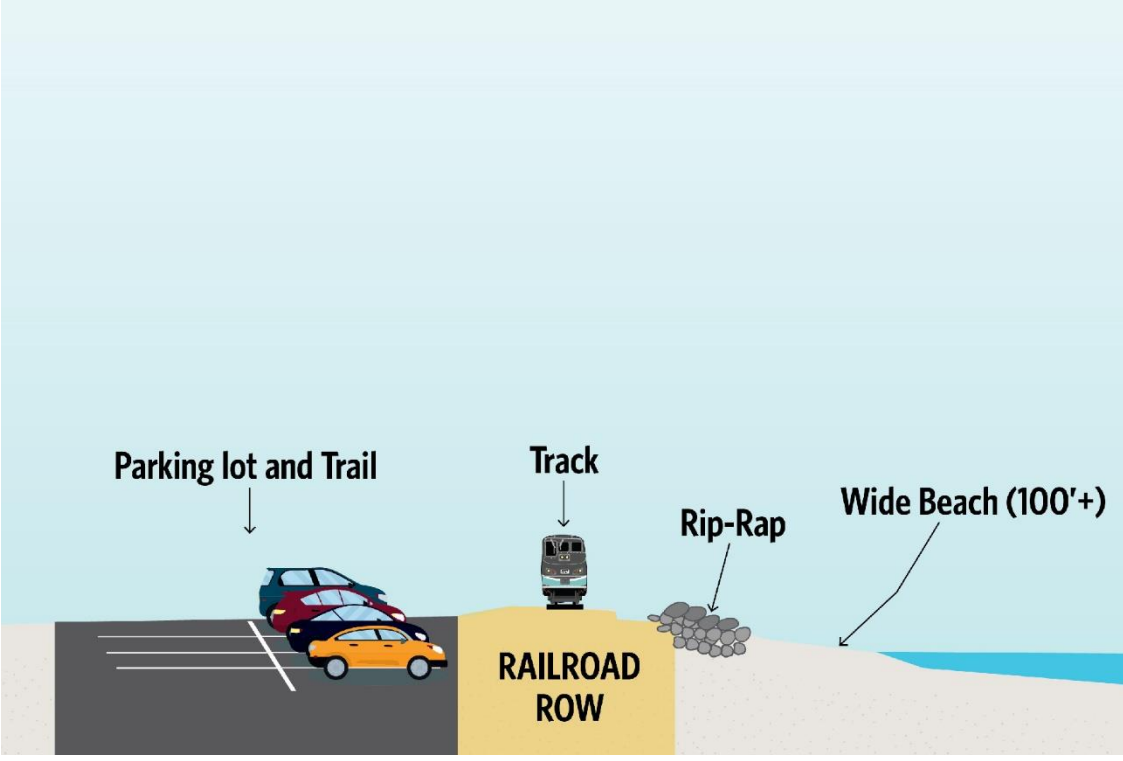
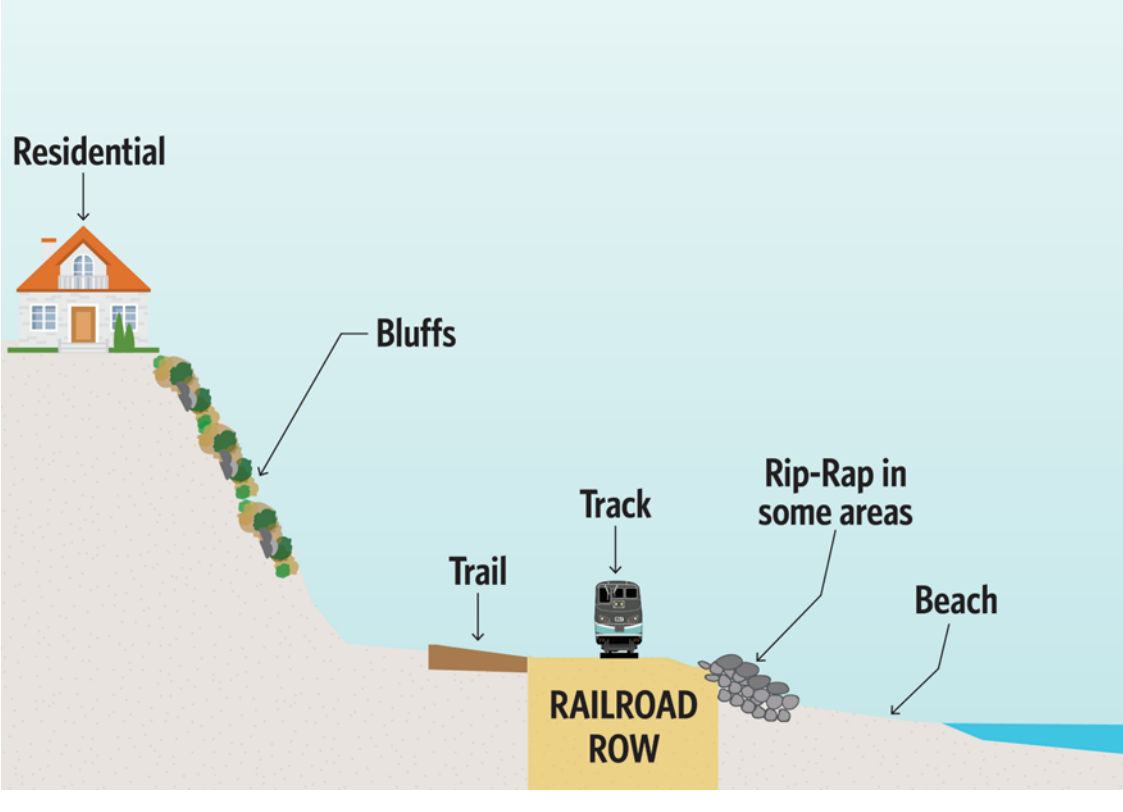


Coastal Rail Resiliency Study Typical Sections and Applicable Draft Alternative Concepts

Typical Section and Milepost(s) (MP)	Nearby Landmark(s)	Applicable Draft Alternative Concepts	Graphic Representation of Existing Condition
<p>Typical Section 1</p> <p>MP 200.20 – 201.20</p> <p>MP 202.60 – 202.95</p>	<p>Doheny State Beach</p> <p>Capistrano Beach</p> <p>North Beach</p>	<p>Bluffside:</p> <ul style="list-style-type: none"> • Not applicable <p>Beachside:</p> <ul style="list-style-type: none"> • Watershed modifications to increase beach sand supply (implemented by others) • No direct railroad action – collaborate with regional beach sand project <p>Rail:</p> <ul style="list-style-type: none"> • Alternative materials for critical railroad infrastructure to reduce lifecycle costs 	 <p>A cross-sectional diagram of a coastal area. From left to right: a sand bluff; a road labeled 'Coast Highway' with two cars; a 'Track' with a train; a yellow-shaded area labeled 'RAILROAD ROW'; a road with cars and a pile of rocks labeled 'Minor Riprap'; and a wide sandy beach labeled 'Wide Beach (150'+)' meeting the ocean.</p>
<p>Typical Section 2</p> <p>MP 201.20 – 202.60</p> <p>MP 202.95 – 203.62</p>	<p>Between Capistrano Beach and North Beach</p>	<p>Bluffside:</p> <ul style="list-style-type: none"> • Not applicable <p>Beachside:</p> <ul style="list-style-type: none"> • Watershed modifications to increase beach sand supply (implemented by others) • No direct railroad action – collaborate with regional beach sand project <p>Rail:</p> <ul style="list-style-type: none"> • Alternative materials for critical railroad infrastructure to reduce lifecycle costs 	 <p>A cross-sectional diagram of a coastal area. From left to right: a bluff with trees labeled 'Bluffs'; a road labeled 'Coast Highway' with two cars; a 'Trail'; a 'Track' with a train; a yellow-shaded area labeled 'RAILROAD ROW'; a residential house labeled 'Residential'; a pile of rocks labeled 'Minor Riprap'; and a sandy beach labeled 'Beach' meeting the ocean.</p>

Typical Section and Milepost(s) (MP)	Nearby Landmark(s)	Applicable Draft Alternative Concepts	Graphic Representation of Existing Condition
<p>Typical Section 3</p> <p>MP 203.62 – 203.72</p>	<p>North Beach</p>	<p>Bluffside:</p> <ul style="list-style-type: none"> • Not applicable <p>Beachside:</p> <ul style="list-style-type: none"> • Riprap placement • Engineered rock revetment • Vertical seawall • Hybrid structural solution • Beach nourishment with shoreline protection structure • Beach nourishment with sand retention measures and shoreline protection structure • No direct railroad action – collaborate with regional beach sand project <p>Rail:</p> <ul style="list-style-type: none"> • Alternative materials for critical railroad infrastructure to reduce lifecycle costs 	 <p>The diagram shows a cross-section of the coastline. From left to right: a parking lot with several cars and a trail; a railroad track on a raised embankment labeled 'RAILROAD ROW'; a section of riprap; and a wide beach (100'+) leading to the ocean. Labels include 'Parking lot and Trail', 'Track', 'Rip-Rap', and 'Wide Beach (100'+)'.</p>
<p>Typical Section 4</p> <p>MP 203.72 – 203.92</p> <p>MP 204.42 – 204.54</p> <p>MP 205.16 – 205.22</p> <p>MP 206.02 – 206.66</p>	<p>North Beach</p> <p>Just South of San Clemente Pier</p> <p>San Clemente State Beach</p>	<p>Bluffside:</p> <ul style="list-style-type: none"> • 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) <p>Beachside:</p> <ul style="list-style-type: none"> • Riprap placement • Engineered rock revetment • Vertical seawall • Hybrid structural solution • Beach nourishment with shoreline protection structure • Beach nourishment with sand retention measures and shoreline protection structure • No direct railroad action – collaborate with regional beach sand project 	 <p>The diagram shows a cross-section of the coastline. From left to right: residential buildings on a bluff; a trail; a railroad track on a raised embankment labeled 'RAILROAD ROW'; a section of riprap labeled 'Rip-Rap in some areas'; and a beach leading to the ocean. Labels include 'Residential', 'Bluffs', 'Trail', 'Track', 'Rip-Rap in some areas', and 'Beach'.</p>

Typical Section and Milepost(s) (MP)	Nearby Landmark(s)	Applicable Draft Alternative Concepts	Graphic Representation of Existing Condition
		Rail: <ul style="list-style-type: none"> • Elevate tracks • Alternative materials for critical railroad infrastructure to reduce lifecycle costs • Ground improvement (track-bed stabilization) 	
Typical Section 5 MP 203.92 – 204.42 MP 206.70 – 207.25	Between North Beach and San Clemente Pier South of San Clemente State Beach	Bluffside: <ul style="list-style-type: none"> • 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) • Hydraulaugers (lower hydraulic pressure and slide potential) Beachside: <ul style="list-style-type: none"> • Riprap placement • Engineered rock revetment • Vertical seawall • Hybrid structural solution • Beach nourishment with shoreline protection structure • Beach nourishment with sand retention measures and shoreline protection structure Rail: <ul style="list-style-type: none"> • Elevate tracks • Alternative materials for critical railroad infrastructure to reduce lifecycle costs 	<p>The diagram illustrates a cross-section of a coastal area. On the left, a residential house is situated on a bluff. A trail is shown leading down from the house. In the center, a railroad track is elevated on a yellow embankment labeled 'RAILROAD ROW'. To the right of the track, there is a section of riprap. Further right, the beach area is labeled 'Little to no beach'. The background shows a light blue sky and a darker blue ocean.</p>

Typical Section and Milepost(s) (MP)	Nearby Landmark(s)	Applicable Draft Alternative Concepts	Graphic Representation of Existing Condition
<p>Typical Section 6</p> <p>MP 204.54 – 205.16</p>	<p>San Clemente Pier</p>	<p>Bluffside:</p> <ul style="list-style-type: none"> • Catchment walls (block slide debris) <p>Beachside:</p> <ul style="list-style-type: none"> • No direct railroad action – collaborate with regional beach sand project <p>Rail:</p> <ul style="list-style-type: none"> • Alternative materials for critical railroad infrastructure to reduce lifecycle costs 	<p>The diagram shows a cross-section of the coastline. On the left, a steep bluff is shown with a row of trees. A yellow box labeled 'RAILROAD ROW' contains a track with a train. To the right of the track is a trail. Further right is a wide, sandy beach labeled 'Wide Beach (100'+)' that meets the ocean.</p>
<p>Typical Section 7</p> <p>MP 205.22 – 205.82</p> <p>MP 205.94 - 206.02</p>	<p>South of San Clemente Pier</p> <p>San Clemente State Beach</p>	<p>Bluffside:</p> <ul style="list-style-type: none"> • Not Applicable <p>Beachside:</p> <ul style="list-style-type: none"> • 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 <p>Rail:</p> <ul style="list-style-type: none"> • Alternative materials for critical railroad infrastructure to reduce lifecycle costs 	<p>The diagram shows a cross-section of the coastline. On the left, a residential house is shown on a bluff. A yellow box labeled 'RAILROAD ROW' contains a track with a train. To the right of the track is a trail. Further right, there is a section of rip-rap (rocks) labeled 'Rip-Rap in some areas' and a sandy beach labeled 'Beach' that meets the ocean.</p>