

Adapting to Rising Tides project
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Oakland/Alameda Resilience Study

Meeting #2 Review – January 22, 2014

- Confirmed initial resilience goals for project
- Began Assess step
 - Vulnerability and Risk
 - Data collection
 - Relationships among assets

Updates

Related Project Updates

- FHWA Mapping/modeling
- FHWA Transportation assessment
- Hayward Focus Area
- Housing and Community Resilience
- Regional Interdependencies Study

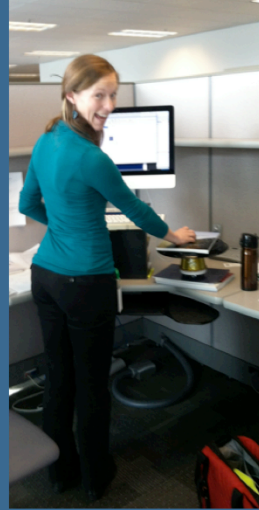


With funding from FHWA and ACFCWCD, AECOM has been doing detailed exposure mapping of the entire SF Bay, including the focus area. Another FHWA-funded project is supporting AECOM's work for BCDC, conducting detailed vulnerability and risk assessments and developing adaptation strategies for a number of transportation assets in the original ART subregion, including a number of assets in the focus area. Maggie Wenger has been leading a similar process to the OAK/ALA work in Hayward; that working group is currently in the "Plan" step of the adaptation planning process. ABAG and BCDC are leading the Bay Area Housing and Community Multiple Hazards Risk Assessment project, funded by USGS, US EPA, US FEMA, and the Strategic Growth Council. The project is assessing the vulnerability of housing and communities to seismic and sea level rise hazards, focusing on the region's planned high growth areas. This project area includes the focus area, and a case study may be conducted for Bay Farm Island. The regional interdependencies study, one of the two main projects on which the OAK/ALA work is built, is up and running again after some administrative delays.

Updates

OAK/ALA progress

- Gathered specific data on ~30 assets
- Sent vulnerability and risk summaries to asset owners and managers for review
- Compiled general data on 5 asset categories / sectors
- Dependencies mapping
- Began identifying preliminary focus area vulnerabilities



This is what the OAK/ALA team has been working on since the last meeting,

Asset specific vulnerabilities

Airport	Transportation (Roads)	Transportation (Transit)	Bay Trail and Parks	CLUFS	Utilities
Terminal 1	SR-61 (Doolittle Drive)	Coliseum Amtrak	MLK Shoreline	Oakland Fire Station #27	Harbor Bay Isle Lagoon
Terminal 2	Hegenberger Road	Coliseum BART	Bay Farm Island Bike/Ped Bridge	Oakland Fire Station #29	Pump Station G & South Int.
South Field	Airport Access Rd.	Oakland Airport Connector	Otis Wooden Bridge	Coliseum Complex	Edes substation
North Field	Harbor Bay Parkway	Harbor Bay Ferry Terminal	Bay Farm Island Bay Trail	911 Dispatch Center	Oakland J substation
Perimeter Dike	I-880	AC Transit		Alameda Fire Station #4	Zone 12 Line A
Tank Farm	98th Ave				Zone 12 Line K
Control Tower	San Leandro St.				Zone 12 Line M
FS #22	Bay Farm Island Bridge				

Table of assets for which asset-specific information was sought; grayed-out assets are those for which we have not yet been able to collect detailed information.

Vulnerability and Risk Summaries

BART Oakland Airport Connector (OAC)

Oakland Airport Connector includes the OAC airport station, the OAC coliseum station, 3.2 miles of guideway, and aerial structures, and the wheelhouse. Mechanical, electrical, electronic systems are included. It connects the BART coliseum station to a new station at the airport, roughly following the course of Hegenberger road. It was built in 2014.

Exposure

Scenario	Translation	Impact
MinRW +12"	(SLR + 100-SWLL)	
MinRW +24"		
MinRW +36"		
MinRW +48"		
MinRW +72"		
MinRW +96"		
Hayward Mw6.9 - Ground shaking		
San Andreas Mw7.9 - Ground shaking		
Liquefaction		

Vulnerabilities

GOV1: BART owns the OAC, but Doppel-Mayer will manage operations and maintenance, including sump pumps to provide drainage during storm events. The Doppel-Mayer Management Plan is in progress, but only a 20-year contract and not incentivized to consider more frequent storm events due to sea level rise. Adaptation may require coordination with Doppel-Mayer, but may be out of scope with their contract.

GOV2: OAC design is highly unlikely to have considered sea level rise impacts as high level State guidance has not yet translated to project design. The lack of new design standards can potentially jeopardize the useful project lifetime.

PHYS1: The OAC has a portion that is in a tunnel below grade and vulnerable to increased flooding due to storm events and sea level rise. Sump pumps were most likely designed to manage current groundwater intrusion or rainfall runoff and will not have the capacity to handle flows during a significant flooding event.

PHYS2: The OAC has a diesel emergency generator but it is located at grade in the wheelhouse.

FUNCL: The OAC extends from the BART Coliseum Station to the Oakland International Airport and relies on existing structural shoreline protection, owned and managed by others. The system of structural shoreline protection was not designed for future storm event water levels that will occur as sea level rises.

FUNCL: Flooding of the track that passes through the tunnel would disrupt services of the OAC.

Consequences

Equity: Disruption may inhibit BART's ability to serve transit dependent populations making trips to and from the airport.

Economy: Loss of the OAC will affect BART through loss of revenue and the cost to repair damage to asset. Loss of the OAC will have consequences on the business at the airport and possibly on passenger use of the airport.

Environment: Hazardous materials (diesel in emergency generator) could be released/exposed during flooding. Alternative modes of transportation, such as personal car, may be less environmentally friendly.

Draft Profile Sheets

- Existing conditions
- Exposure
- Classified vulnerabilities
- Consequences

Example of the vulnerability and risk summaries, which serve as a first draft of the profile sheets, the communication tool for the vulnerability and risk analysis. These have been sent to asset owners and managers for review.

General asset vulnerabilities

Facility Name	Exposure	Materials & Design	Access
James Madison Middle School	Flooding: not under any scenarios considered (up to 96") Seismic: very strong ground shaking with both scenarios; moderate liquefaction susceptibility		Access roads to the west may be flooded; to the east roads are clear. To west of school is more susceptible to liquefaction and subject to heavier shaking, so those roads may be inaccessible. Water and power?
Peter Pan Academy	Flooding: possible with 36" SLR, very likely by 48," flooded by 72" Seismic: very strong ground shaking with both scenarios; very high liquefaction susceptibility.		Property to east and north flooded before school. Surrounded by land with same ground shaking and liquefaction susceptibility. Water and power?
Amelia Earhart Elementary	Flooding: Playing fields possibly flooded with 48"; whole property flooded with 72". Seismic: very strong ground shaking with both scenarios; very high liquefaction susceptibility.		The golf course, Island Drive, and some properties to the west flood before the school does; could be isolated. Surrounded by land with same ground shaking and liquefaction susceptibility. Water and power?
Bay Farm Elementary	Flooding: no Seismic: very strong ground shaking with both scenarios; very high liquefaction susceptibility.		The school will be surrounded by flooded properties with 72"; with 48" the lagoon to the south will be flooding, so access could be cut off.

Example of how information is being organized for assets for which we are not collecting specific information; these tables will help guide further investigation, if it becomes necessary during a later phase of the project.

ART Oakland/Alameda Process



Last meeting we were in the Assess step; we have moved through the components of this step into the define step.

ART Oakland/Alameda Process



Today we are discussing the Define step and preparing for the Plan step.

Oakland/Alameda Resilience Study

Meeting #3 Objectives – April 8, 2014

- Discuss exposure mapping
- Share dependencies mapping
- Share findings from vulnerability and risk analysis
- Begin identifying key focus area vulnerabilities
- Transition to Plan step