

Adapting to Rising Tides



Community Land Use Vulnerability and Risk Profile

Community land use describes the services and facilities, such as job centers, residences, schools, and hospitals, which together make up the neighborhoods where people live and work. The nearly 800,000 residents and more than 300,000 people who work in the ART project area are served by 914 community facilities that are categorized into the following groups: emergency response facilities (37), such as hospitals, police stations, and fire stations; facilities that serve at-risk populations (218), including health clinics, homeless shelters, jails, and food banks; facilities that serve vulnerable, less mobile populations (658), such as senior housing, long-term care facilities, schools, and childcare centers; and animal facilities (1), a non-profit animal shelter.

Key Issues

Sea level rise and storm events can result in significant financial and personal losses, including the loss of lives, personal items, loss or damage to residences, relocating temporarily or permanently, and dislocation from jobs, schools, and other important community services and ties. Past events have demonstrated that some individuals are more vulnerable than others, such as the young and the elderly, people without automobiles, linguistically isolated people, those below the poverty level, renters, the uninsured and caretakers of the young, the elderly or animals. Many of the community facilities and services evaluated - such as schools, childcare centers, long term care facilities, and homeless shelters - serve vulnerable populations, and the loss of services they provide could result in additional losses during and after an emergency. Facilities that serve community members with limited mobility, such as the elderly, or who need special equipment or supervision, such as medical patients or children, are particularly vulnerable because emergency evacuation will require special equipment, trained staff, and an appropriate location to shelter displaced individuals who are hard to move and relocate. This is also true for animal facilities.

Vulnerabilities	Consequences
<p>Timing</p> <ul style="list-style-type: none">• In the near term, nearly 2,000 residents, mainly from Alameda, San Leandro, and Union City, and approximately 1,000 employees, mostly those working in Oakland, could potentially be displaced during storm events as sea level rises.• In the near term, the ability to recreate or commute along the shoreline will be periodically affected, in particular along the Hayward shoreline.• By mid-century, less than 5% of residents or employees in the project area could be displaced during a storm event.• By end-of-century, approximately 10% of residents and over 20% of employees in the project area could be displaced during a storm event.• Very few of the 914 community facilities evaluated will be affected by sea level rise in the near term; however, by mid-century 22 will be exposed to storm events and 90 additional facilities could be affected by wind waves. This includes seven fire stations, 30 senior housing facilities, 51 childcare centers/schools, and one animal shelter.• By end-of-century, 109 community facilities will be exposed to storm events. This includes eight fire stations, 45 senior housing facilities, 70 childcare centers/schools, and one animal shelter.	<p>Scale</p> <ul style="list-style-type: none">• Individuals, households and neighborhoods• City, Subregion, and Region wide, especially with respect to emergency response and recovery• State and National <p>People</p> <ul style="list-style-type: none">• Storm events can result in significant hardships, including loss of lives, personal items and financial information; dislocation from homes, jobs and schools; and disconnection from community services and ties.• Displaced residents, including socially vulnerable individuals, may not have access to equivalent or affordable replacement housing near the jobs, schools, services, and facilities they rely on.• Individuals and households with limited economic resources or education, health or mobility constraints, who do not own a home or car, or are not proficient in the English language may be disproportionately burdened by sea level rise and storm events both during and in the response to the events.• Temporary or permanent relocation of residents can sever long-standing neighborhood relationships, disrupting the social network that imparts collective strength and resilience.• Loss of access to the workplace can cause lost wages, and while some employers may relocate or allow workers to telecommute, these are not ubiquitous solutions and displaced employees may eventually lose their jobs.

Vulnerabilities

Physical & Functional Qualities

- Most residences, employment sites, and community facilities are vulnerable because they are neither designed to withstand flooding nor are constructed of waterproof or non-corrodible materials.
- Many buildings rely on electric or mechanical components, such as fans, boilers, and pumps that cannot function if wet and are often located below grade or on the ground floor.
- Structures with habitable space below grade are vulnerable to both flooding and elevated groundwater.
- Community facilities such as hospitals, long-term care facilities and those that serve at-risk, less mobile or medically dependant populations are vulnerable since the individuals they serve cannot easily be evacuated or sheltered, require on-site care, specialized equipment, and greater coordination for safe and effective evacuation.
- Residences and facilities housing animals are functionally vulnerable because evacuation requires special equipment, trained personnel, and appropriate temporary shelter or permanent relocation sites.
- Neighborhood function depends on the relationship between individuals within them, and among these individuals and the services they rely on. These informal connections are easily severed during disasters and are often difficult to rebuild once disrupted.
- Facilities that provide key community services need to maintain their connection to services such as utilities, clean water, and safe food supplies to maintain function, which is particularly important if other functioning facilities are not available or if they play a role in emergency response and recovery.

Information

- Real-time information for the location and specific needs of socially vulnerable populations, which is critical to emergency response activities, is difficult to collect and maintain and therefore is generally not available or easily accessible when needed.

Management Control

- Neighborhoods are informal networks of private and public property, with limited ability for any given resident or owner to protect his or her property. Often, there is little to no organized structure for building resilience and ensuring the safety of residents. Neighborhoods without a strong social network, where residents do not know each other, or are not invested in the overall community good, are especially vulnerable to flooding and storm events.
- Cross-jurisdictional coordination of emergency response through mutual aid agreements and other means can reduce vulnerability; however, during large-scale events, or if impacts last for an extended period of time, existing resources may be inadequate.
- Facilities with an out-of-date emergency preparedness and response plan, or that do not practice or implement plan action items, or do not adequately coordinated with local, regional and state authorities are vulnerable to storm event hazards.

Consequences

Economy

- Residents may bear some of the cost of replacing or repairing belongings and homes, the cost of temporary housing or permanent relocation, increased insurance costs, if insured, and dislocation from jobs, schools and other services. The broader community of taxpayers and ratepayers may also bear some of the expense of rebuilding areas even if they do not themselves live in affected areas.
- Property and business owners could face high costs to repair or replace damaged buildings and belongings, especially if there is specialized equipment or structures vulnerable to water, debris or salinity. This could have broad economic effects through business closures, as well as through spending being focused on rebuilding rather than other areas of the economy.
- Long-term evacuations could result in the permanent relocation of residents, employees, or entire business sectors outside of the community, with associated economic consequences for the neighborhoods, residents and employers that remain.
- The closure of schools and facilities serving vulnerable populations could result in parents and caretakers taking time off work, resulting in lost wages.
- Storm events could disrupt jobs for thousands of workers, resulting in lost company revenues, employee wages, and fees or taxes.

Ecosystem Services

- Floodwaters that pass through neighborhoods can pick up and carry debris that can impair water quality and habitats critical to biodiversity.
- Flooding of facilities that store materials such as pharmaceuticals, petroleum products, cleaners, pesticides or toxics can impair water quality if released into the Bay or near-shore habitats.