

2.6 Rapid Vulnerability Assessment Exercise

Purpose

This exercise is intended to familiarize the project team and/or advisory group with the types of information that is needed to conduct the assessment. This **Rapid Vulnerability Assessment Exercise** expedites and simplifies the Vulnerability Assessment questions to provide a quick overview of the vulnerability of an asset. It is designed to be used with a hypothetical asset and hazard, though community specifics can be used. This is designed to be a warm-up exercise, not a substitute for doing a more detailed vulnerability assessment on any asset or asset class.

Approach

Use this exercise in a workshop or group setting with the project team and/or advisory group. Have people work in small groups of 2-3 with either a hypothetical asset or a specific asset. The team may want to walk through each section and describe what people should be thinking through in each section and/or have each group talk through their results. This worksheet can be used to do a preliminary assessment to identify gaps in stakeholder representation and/or data necessary for assessments.

Outcome

This exercise is designed to give users a sense of how to proceed with a more in-depth asset vulnerability assessment. It is not intended to provide a detailed assessment on any asset or asset class.

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ASSET:

Hazard (note past occurrences):	Hazard impact statement:

Existing Conditions

Describe the asset and highlight current conditions or stressors that could affect vulnerability

Physical asset functions (e.g., type of land use, community served, services provided):	Type: <input type="checkbox"/> Residential <input type="checkbox"/> Institutional <input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Other:	Community Served (e.g., public, elderly): <hr/> <hr/> <hr/>
Who owns the asset? Are owner and manager different?	Owner: <input type="checkbox"/> Public <input type="checkbox"/> Private	Manager: <input type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Different than owner? If so, explain:
What is the current condition of the asset? Has it recently been upgraded or retrofitted?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, explain when and to what standard:	

Physical Vulnerabilities

Identify conditions or design aspects that make an asset particularly vulnerable to impacts

What characteristics make the asset more or less vulnerable to hazard? Examples include water-sensitive mechanical components, flammable building materials, or location access.

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Functional Vulnerabilities		
Describe asset function and/or relationships with or dependence on other assets that can make them vulnerable to impacts		
Is the asset part of a networked system such that damage to other parts of the system would affect the asset's ability to function?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, are there alternatives to help maintain continuity of service?	
What external services does the asset rely on?	<input type="checkbox"/> Power <input type="checkbox"/> Communications <input type="checkbox"/> Food <input type="checkbox"/> Water	<input type="checkbox"/> Fuel <input type="checkbox"/> Materials/supplies <input type="checkbox"/> Transportation <input type="checkbox"/> Other:
If external services were interrupted, are there back up supplies in place?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, how long would they last (circle one): Hours Days Weeks	

Governance Vulnerabilities	
Describe challenges with management, regulatory authority, or funding options for adapting to impacts	
Is the asset protected by land or assets owned by others?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:
What types of permits and from what agencies are necessary to maintain, repair or improve the asset?	<input type="checkbox"/> One agency <input type="checkbox"/> Multiple agencies (circle): Local State Regional Federal
Are there funding sources that can be used to assess hazard risk, climate vulnerability or resilience?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:

Consequences		
Describe potential impacts on society, equity, the economy, and the environment		
What scale of economic disruption would occur if the asset was damaged, disrupted, or failed?	<input type="checkbox"/> Local <input type="checkbox"/> Regional <input type="checkbox"/> State <input type="checkbox"/> National	Is this based on a past event or an unplanned disruption? If yes, describe:
Who in the community would be affected by damage, disruption, or loss of asset function?	<input type="checkbox"/> People where they live <input type="checkbox"/> People where they work <input type="checkbox"/> People where they recreate	<input type="checkbox"/> Elderly <input type="checkbox"/> Youth <input type="checkbox"/> Low income <input type="checkbox"/> Other:
What would the consequences be to ecological services be if the asset was damaged or lost?	<input type="checkbox"/> Habitat or species benefits <input type="checkbox"/> Public access <input type="checkbox"/> Flood risk management	<input type="checkbox"/> Water quality <input type="checkbox"/> Other:

2.7 Vulnerability Assessment Questions: Individual or Representative Assets

Purpose

Assessment questions help to understand the underlying causes and components of vulnerability and the potential consequences of those vulnerabilities. The team can answer assessment questions in a very detailed way for individual assets that either a visual map inspection or a geospatial analysis has identified as being exposed to a hazard.

Many of the assessment questions are broad and apply to all types of assets, while some are specific to a particular hazard or type of asset, so the team will not need to answer all of the questions for all assets. In addition, some questions can easily be answered with readily available information, while others will require research or external input. It can be difficult to know how much effort to expend when answering assessment questions. Instead of spending a lot of effort to uncover hard-to-find, or in some cases nonexistent information, flag critical data needs and knowledge gaps that require further consideration and come back to these when developing the mitigation and adaptation actions.

Approach

Project team members should first fill out the assessment question worksheet as thoroughly as possible with readily available information. Then, provide a copy of the worksheet to the asset owner or manager to verify and provide additional information. A project team member should then discuss the answers with the owner or manager to ensure an accurate understanding of the assessment answers.

Outcome

Once completed, this worksheet will provide the project team all the information it needs to write a profile sheet for each selected asset that highlights its primary vulnerabilities.

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2.7 Vulnerability Assessment Questions

Existing Conditions
<i>Describe the asset and highlight current conditions or stressors that could affect vulnerability</i>
1. Who owns and manages the asset? Note if the owner and manager are different entities.
2. What year was the asset built? What is the remaining service life?
3. Has there been an effort to extend the service life (e.g. improvements, retrofit, mitigation actions)? If so, describe what was done and when.
Physical Vulnerabilities
<i>Identify conditions or design aspects that make an asset particularly vulnerable to impacts</i>
4. Does the asset have characteristics that make it vulnerable?
- 4a. Are there water-sensitive components of the asset are at-grade or below-grade, e.g., mechanical or electrical equipment, pumps, utilities, building heat, ventilation, power systems, or finished basements?
- 4b. Does the asset have openings are at-grade or below-grade that are entry points for flooding, e.g., entryways, tubes, tunnels, ventilation grates?
- 4c. Are their barriers (temporary or permanent) that can protect sensitive components or at- or below-grade entry points? Are there pumps or other systems in place to remove floodwaters if they do enter?
For building assets:
5. Does the asset have characteristics that make it vulnerable to floods, landslides, or fire?
- 5a. Is the facility or building a mobile or manufactured structure?
- 5b. Is the facility or building constructed from materials that make it more susceptible to fire or flood impacts?

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- 5c. Is the facility or building multi-story or have a weak or shallow foundation that increases vulnerability to landslides?

- 5d. Is the building on a slope or hillside?

- 5e. Is the building located in a low-lying area or known floodplain? Is the building located in a high risk fire zone?

6. Has the city taken any mitigation measures against wildfire? (e.g. does the city have an inspection system for fire mitigation actions?)

Functional Vulnerabilities

Describe asset function and/or relationships with or dependence on other assets that can make them vulnerable to impacts

7. Is the asset part of a networked system such that damage to other parts of the system would affect the asset's ability to function? Describe what alternatives exist that could help maintain continuity of service if parts of the system are disrupted.

8. What external services, such as power, communications, food or fuel supplies or materials does the asset rely on? If these external services were interrupted, are there back up supplies ready and in place, and how long would they last?

For building assets:

9. Does the asset serve sensitive populations?

9a. Does the asset serve or house the elderly or very young, mobility or medically challenged individuals, or animals? If yes, describe what systems or plans are in place to enable either shelter-in-place or safe evacuation and relocation of the facility if necessary.

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- 9b. Does the asset serve or house community members that are resource limited, e.g., are they low or very low income, housing or transportation cost burdened, renters, or without a car? If yes, what programs or plans in place to help these members prepare for, respond to, or recover from a hazard event?

- 9c. Does the asset serve or house community members that are ethnically or culturally diverse, have limited English-speaking capacity, or are non-English speakers? If yes, what programs or plans in place to help these members prepare for, respond to, or recover from a hazard event?

For transportation assets:

10. Does the asset serve as a critical access road, emergency or lifeline route, provide sole or limited access to communities or facilities, or provide service to transit dependent communities? If yes, describe the communities, services, and facilities the asset serves.

For recreation, open space, and working lands:

11. Does the asset provide recreational access or opportunities that are unique or limited in the area and/or region, e.g., access for persons with limited mobility, interpretive programs, access to the Bay, etc.? Could these functions be easily replaced in other areas?

12. Does the asset provide or protect habitat for threatened or endangered species? Is this habitat scarce in the region? Could this habitat be established in other areas?

For utility and communication infrastructure assets:

13. Does the asset provide critical services to sensitive populations (see question 9), emergency response providers, or critical facilities?

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Governance Vulnerabilities

Describe challenges with management, regulatory authority, or funding options for adapting to impacts

14. Is the asset protected from flooding by land or assets owned or managed by others (e.g., structural protection, roadways, rail embankments)?

15. What types of permits (and from which agencies) are necessary to maintain, repair or improve the asset? Are there special processes for emergency repairs?

16. What funding sources currently exist that can be used to assess hazard risk or vulnerability to climate change? To improve asset resilience?

Consequences

Describe potential impacts on society, equity, the economy, and the environment

17. What economic disruption would occur if the asset was damaged, disrupted, or failed? Local, regional, state, or national? If the answer is based on a past weather event or an unplanned disruption, describe the type and duration of that disruption.

18. How would the community, particularly sensitive populations (see question 12), be affected by damage, disruption, or loss of asset function?

19. What would consequences to ecological services be if the asset was damaged or lost (e.g. habitat or species benefits, public access to the shoreline, or water quality)? What would the effect of this loss have on locally? Regionally?