

APPENDIX F: JOB AID FOR STEP 4



JOB AID 4-1: EARTHQUAKE MODULE OUTPUTS FOR RISK ASSESSMENT

Ground Motion/Site Effect Output

Input	Description of Output	Measure
Deterministic Event	HAZUS-MH determines Census tract ground motion and develops region-wide ground motion contour maps based on a user-defined scenario event.	a. Census Tract Ground Shaking b. Peak Ground Acceleration Contour Maps c. Spectral Contour Maps
USGS Probabilistic Seismic Hazard Maps	HAZUS-MH includes spectral contour maps at two seismic hazard levels: 2 percent probability of exceedance in 50 years and 10 percent probability of exceedance in 50 years.	a. PGA Contour Maps b. Spectral Contour Maps
User-Supplied Ground Shaking Maps	The user supplies region-wide ground motion contour maps that are used as the ground motion inputs to HAZUS-MH.	a. Census Tract Ground Shaking b. PGA Contour Maps c. Spectral Contour Maps

Ground Deformation Output

Input	Description of Output	Measure
Liquefaction	HAZUS-MH determines the probability of and expected level of permanent ground deformations for liquefaction-susceptible sites during the deterministic, probabilistic, or user-defined event.	a. Peak Ground Acceleration Contour Maps b. Location-Specific PGD
Landslide	HAZUS-MH determines the probability of and expected level of permanent ground deformations for landslide-susceptible sites during the deterministic, probabilistic, or user-defined event.	a. PGD Contour Maps b. Location-Specific PGD
Surface Fault Rupture	HAZUS-MH determines the probability of an expected level of permanent ground deformations for surface fault rupture-susceptible sites during the deterministic, probabilistic, or user-defined event.	a. PGD Contour Maps b. Location-Specific PGD

Indirect Economic Impact Module Output

Component	Description of Output	Measure
Economic Output	HAZUS-MH determines the indirect economic output loss as a percentage of the original output.	Percentage
Employment	HAZUS-MH determines the indirect employment loss as a percentage of the original employment.	Percentage
Income	HAZUS-MH determines the indirect income loss as a percentage of the original income.	Percentage

Direct Physical Damage - General Building Stock

Input	Description of Output	Measure
Model Building Type	HAZUS-MH determines the damage state probabilities for each model building type by census tract in the study region. Results are presented for each design level and construction quality bias. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Building Counts
General Building Type	HAZUS-MH determines the damage state probabilities for each of seven general building types by Census tract in the study region. Results are presented for each design level and construction quality bias. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Building Counts
Specific Occupancy Class	HAZUS-MH determines the damage state probabilities for each of 28 specific occupancy classes by Census tract in the study region. Results are presented for each construction quality bias. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Occupancy Counts
General Occupancy Class	HAZUS-MH determines the damage state probabilities for each of six general occupancy classes by Census tract in the study region. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Occupancy Counts

Direct Physical Damage - Essential Facilities

Facility Type	Description of Output	Measure
Health Care Facilities	HAZUS-MH determines the damage state probabilities for each health care facility in the study region. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements. The expected reduction in available beds for each facility is also determined.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Loss of Beds and Facility Functionality
Police and Fire Stations, Emergency Operation Centers, Schools	HAZUS-MH determines the damage state probabilities for each facility in the study region. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Functionality at Day 1

Direct Physical Damage - High Potential Loss Facilities*

Component	Description of Output	Measure*
Dams	HAZUS-MH provides the locations of dams in the study region.	List of and Locations of Dams
Nuclear Facilities	HAZUS-MH provides the locations of nuclear power facilities in the study region.	List of and Locations of Nuclear Power Facilities
Military Facilities	HAZUS-MH determines the damage state probabilities for each facility in the study region. Damage state probabilities are determined for (1) structural elements, (2) non-structural drift-sensitive elements, and (3) non-structural acceleration-sensitive elements.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities

*Provides placeholders for qualitative analyses.

Direct Physical Damage - Transportation Systems

System	Description of Output	Measure
Highway, Railway, Light Rail, Bus, Ferry, Port, Airport	a. HAZUS-MH determines the damage state probabilities for each transportation system component in the study region. b. HAZUS-MH determines the probability of functionality for each transportation system component at discrete time intervals.	a. System Damage State Probabilities b. Probability of System Functionality

Direct Physical Damage - Utility Systems

System	Description of Output	Measure
Potable Water	<ul style="list-style-type: none"> a. HAZUS-MH determines the damage state probabilities for each potable water system component in the study region. b. HAZUS-MH determines the probability of functionality for each potable water system component at discrete time intervals. c. HAZUS-MH supports simplified potable water system analysis for the study region. 	<ul style="list-style-type: none"> a. System Damage State Probabilities b. System Probability of Functionality c. Number of Households without Water
Wastewater, Crude and Refined Natural Gas, Oil Pipelines, Communication	<ul style="list-style-type: none"> a. HAZUS-MH determines the damage state probabilities for each system component in the study region. b. HAZUS-MH determines the probability of functionality for each system component at discrete time intervals. 	<ul style="list-style-type: none"> a. System Damage State Probabilities b. System Probability of Functionality
Electric Power	<ul style="list-style-type: none"> a. HAZUS-MH determines the damage state probabilities for each electric power system component in the study region. b. HAZUS-MH determines the probability of functionality for each electric power system component at discrete time intervals. c. HAZUS-MH supports simplified electric power system analysis for the study region. 	<ul style="list-style-type: none"> a. System Damage State Probabilities b. System Probability of Functionality c. Number of Households without Power

Indirect Physical Damage – Inundation

Component	Description of Output	Measure
Tsunami	<ul style="list-style-type: none"> a. The methodology provides rules to determine whether tsunamis are a threat to the study region. b. The user can import existing tsunami inundation maps and overlay them with population and economic value maps. 	<ul style="list-style-type: none"> a. Quality Potential Threat b. Exposed Population Exposed Value (\$1,000)
Seiche	<ul style="list-style-type: none"> a. The methodology provides rules to determine if seiches are a threat on any body of water in the study region. b. The user can import existing seiche inundation maps and overlay them with population and economic value maps. 	<ul style="list-style-type: none"> a. Quality Potential Threat b. Exposed Population Exposed Value (\$)
Dam Failure	<ul style="list-style-type: none"> a. HAZUS-MH displays the locations of all dams in the study region and (for the default database) ranks the potential impact of the dam failure. b. The user can import existing dam failure inundation maps and overlay with population and economic value maps. 	<ul style="list-style-type: none"> a. List of and Locations of Dams and Quantification of Potential Hazard b. Exposed Population Exposed Value (\$)
Levee Failure	<ul style="list-style-type: none"> a. HAZUS-MH displays the locations of the levees in the study region. b. The user can import existing levee failure inundation maps and overlay them with population and economic value maps. 	<ul style="list-style-type: none"> a. List of and Locations of Levees b. Exposed Population

Induced Physical Damage - Fire Following Earthquake

Component	Description of Output	Measure
Ignition	HAZUS-MH determines the expected number of fire ignitions by census tract for the study region.	Number of Ignitions
Burned Area	a. HAZUS-MH determines the expected burned area by Census tract for the study region. b. The expected burned area is combined with population and economic value to estimate the exposed population and inventory.	a. Percentage of Burned Area b. Exposed Population Exposed Value (\$)

Induced Physical Damage – Debris

Component	Description of Output	Measure
Brick, Wood, and Others	HAZUS-MH determines the expected amount of brick, wood, and other debris that would be generated in each Census tract of the study region.	Weight of Debris Generated
Reinforced Concrete and Steel	HAZUS-MH determines the expected amount of reinforced concrete and steel debris that would be generated in each Census tract of the study region.	Weight of Debris Generated

Direct Economic and Social Losses - Shelter

Component	Description of Output	Measure
Displaced Households	HAZUS-MH determines the expected number of displaced households by Census tract for the study region.	Number of Displaced Households
Temporary Shelter	HAZUS-MH determines the expected number of people requiring temporary shelter by Census tract for the study region.	Number of People Requiring Temporary Shelter

Direct Economic and Social Losses - Casualties

Component	Description of Output	Measure
Casualties	HAZUS-MH determines the expected number of casualties for each level of casualty severity (medical aid, hospital treatment, life-threatening, death) by Census tract for the study region.	Number of Casualties for Each of the Four Severities

Direct Economic Loss – Buildings

Component	Description of Output	Measure
Repair and Replacement Costs	HAZUS-MH determines the expected dollar loss due to repair and replacement of the general building stock by Census tract for the study region.	Dollar Loss
Content Damage	HAZUS-MH determines the expected dollar loss due to content damage by Census tract for the study region.	Dollar Loss
Business Inventory Damage	HAZUS-MH determines the expected dollar loss due to business inventory damage by Census tract for the study region.	Dollar Loss
Relocation Costs	HAZUS-MH determines the expected dollar loss due to business relocation by Census tract for the study region.	Dollar Loss
Capital-Related Income Loss	HAZUS-MH determines the expected business income loss by Census tract for the study region.	Dollar Loss
Wage Loss	HAZUS-MH determines the expected wage loss by Census tract for the study region.	Dollar Loss
Rental Loss	HAZUS-MH determines the expected dollar loss due to repair and replacement of rental buildings by Census tract for the study region.	Dollar Loss

Direct Economic Loss - Lifelines

Component	Description of Output	Measure
Repair and Replacement Costs	The methodology determines the expected dollar loss due to repair and replacement of lifeline components.	Dollar Loss

JOB AID 4-2: COASTAL STORMS (HURRICANE) MODULE OUTPUTS FOR RISK ASSESSMENT

Wind Speed

Input	Description of Output	Measure
Return Period (50 years, 100 years, and so on)	HAZUS-MH estimates the maximum 3-second gusts in open terrain at 10 meters above the ground at the centroid of each census tract.	Peak Wind Gust

Direct Physical Damage - General Building Stock

Input	Description of Output	Measure
Model Building Type	HAZUS-MH determines the damage state probability for each model building type by Census tract for the study region. Results are presented for each design level and construction quality bias. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Building Counts
General Building Type	HAZUS-MH determines the damage state probability for each general building type by Census tract for the study region. Results are presented for each design level and construction quality bias. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Building Counts
Specific Occupancy Class	HAZUS-MH determines the damage state probability for each specific occupancy class by Census tract for the study region. Results are presented for each construction quality bias. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Occupancy Counts
General Occupancy Class	HAZUS-MH determines the damage state probability for each general occupancy class by Census tract for the study region. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Occupancy Counts

Direct Physical Damage - Essential Facilities

Facility Type	Description of Output	Measure
Health Care Facilities	HAZUS-MH determines the damage state probabilities for each health care facility in the study region. For probabilistic scenarios, one of seven return periods must be selected.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Loss of Beds and Facility Functionality
Police and Fire Stations, Emergency Operation Centers, Schools	HAZUS-MH determines the damage state probabilities for each facility in the study region. For probabilistic scenarios, one of seven return periods must be selected.	a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Functionality at Day 1

Induced Physical Damage - Debris

Component	Description of Output	Measure
Brick, Wood, and Others	HAZUS-MH determines the expected amount of brick, wood, and other debris that would be generated in each Census tract of the study region.	Weight of Debris Generated
Reinforced Concrete and Steel	HAZUS-MH determines the expected amount of reinforced concrete and steel debris that would be generated in each Census tract of the study region.	Weight of Debris Generated
Trees	HAZUS-MH determines the expected amount of tree debris that would be generated in each Census tract of the study region.	a. Weight of Debris Generated b. Volume of Debris Generated

Direct Economic and Social Losses - Shelter

Component	Description of Output	Measure
Displaced Households	HAZUS-MH determines the expected number of displaced households by Census tract for the study region.	Number of Displaced Households
Temporary Shelter	HAZUS-MH determines the expected number of people requiring temporary shelter by Census tract for the study region.	Number of People Requiring Temporary Shelter

Direct Economic Loss - Buildings

Component	Description of Output	Measure
Repair and Replacement Costs	HAZUS-MH determines the expected dollar loss due to repair and replacement of the general building stock by Census tract for the study region.	Dollar Loss
Content Damage	HAZUS-MH determines the expected dollar loss due to content damage by Census tract for the study region.	Dollar Loss
Business Inventory Damage	HAZUS-MH determines the expected dollar loss due to business inventory damage by Census tract for the study region.	Dollar Loss
Relocation Costs	HAZUS-MH determines the expected dollar loss due to business relocation by Census tract for the study region.	Dollar Loss
Capital-Related Income Loss	HAZUS-MH determines the expected business income loss by Census tract for the study region.	Dollar Loss
Wage Loss	HAZUS-MH determines the expected wage loss by Census tract for the study region.	Dollar Loss
Rental Loss	HAZUS-MH determines the expected dollar loss due to repair and replacement of rental buildings by Census tract for the study region.	Dollar Loss

Indirect Economic Impact Module Output

Component	Description of Output	Measure
Economic Output	HAZUS-MH determines the indirect output loss as a percentage of the original output.	Percentage
Employment	HAZUS-MH determines the indirect employment loss as a percentage of the original employment.	Percentage

JOB AID 4-3: FLOOD MODULE OUTPUTS FOR RISK ASSESSMENT

Flood Depth Output

Input	Description of Output	Measure
Riverine Event	For a riverine flood, HAZUS-MH determines the depth of the flood and creates a flood depth grid map of the flooded area within the study region.	<ul style="list-style-type: none"> a. Flood Elevations b. Flood Depth Grid
Coastal Event	For a coastal flood, HAZUS-MH determines the ground surface area subjected to erosion; the flood surface, including wave heights; and the depth of the coastal flooding.	<ul style="list-style-type: none"> a. Eroded Ground Surface b. Flood Surface Considering Wave Height and Runup c. Flood Depth

Direct Physical Damage - General Building Stock

Input	Description of Output	Measure
Model Building Type	HAZUS-MH determines the damage state probability for each model building type by Census tract for the study region. Results are presented for each design level and construction quality bias. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Building Counts
General Building Type	HAZUS-MH determines the damage state probability for each general building type by Census tract for the study region. Results are presented for each design level and construction quality bias. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Building Counts
Specific Occupancy Class	HAZUS-MH determines the damage state probability for each specific occupancy class by Census tract for the study region. Results are presented for each construction quality bias. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Occupancy Counts
General Occupancy Class	HAZUS-MH determines the damage state probability for each general occupancy Class by Census tract for the study region. For probabilistic scenarios, one of seven return periods must be selected.	<ul style="list-style-type: none"> a. Structural Damage State Probabilities b. Non-structural Damage State Probabilities c. Structural Damage State Occupancy Counts

Direct Economic Loss – Buildings

Component	Description of Output	Measure
Repair and Replacement Costs	HAZUS-MH determines the expected dollar loss due to repair and replacement of the general building stock by Census tract for the study region.	Dollar Loss
Content Damage	HAZUS-MH determines the expected dollar loss due to content damage by Census tract for the study region.	Dollar Loss
Business Inventory Damage	HAZUS-MH determines the expected dollar loss due to business inventory damage by Census tract for the study region.	Dollar Loss
Relocation Costs	HAZUS-MH determines the expected dollar loss due to business relocation by Census tract for the study region.	Dollar Loss
Capital-Related Income Loss	HAZUS-MH determines the expected business income loss by Census tract for the study region.	Dollar Loss
Wage Loss	HAZUS-MH determines the expected wage loss by Census tract for the study region.	Dollar Loss
Rental Loss	HAZUS-MH determines the expected dollar loss due to repair and replacement of rental buildings by Census tract for the study region.	Dollar Loss

Direct Physical Damage - Essential Facilities

Facility Type	Description of Output	Measure
Police and Fire Stations, Emergency Operation Centers, Schools, Health Care Facilities	HAZUS-MH determines the damage state probabilities for each essential facility in the study region. The building and content losses are calculated, the functionality is determined, and the time to restore the facility to 100 percent functionality is determined for each essential facility.	a. Building and Content Losses b. Functionality Assessment (yes/no) c. Restoration Time to 100 Percent Functionality

Direct Physical Damage - Transportation Systems

System	Description of Output	Measure
Highway, Light Rail, Railway, Bus, Ferry, Port, Airport	a. HAZUS-MH determines the damage state probability for each transportation system component in the study region. b. HAZUS-MH determines the probability of functionality for each transportation system component at discrete time intervals.	a. Structure and Equipment Losses b. Functionality Assessment (yes/no)

Direct Physical Damage - Utility Systems

System	Description of Output	Measure
Potable Water, Wastewater, Crude and Refined Oil Pipelines, Natural Gas, Communication, Electric Power	<ul style="list-style-type: none"> a. HAZUS-MH determines the structural and equipment losses. b. HAZUS-MH determines whether the utility will be functional. 	<ul style="list-style-type: none"> a. Structure and Equipment Losses b. Functionality Assessment (yes/no)

Direct Economic and Social Losses – Shelter

Component	Description of Output	Measure
Displaced Households	HAZUS-MH determines the expected number of displaced households by Census tract for the study region.	Number of Displaced Households
Temporary Shelter	HAZUS-MH determines the expected number of people requiring temporary shelter by Census tract for the study region.	Number of People Requiring Temporary Shelter

Direct Economic and Social Losses – Vehicles

Component	Description of Output	Measure
Vehicles	HAZUS-MH determines the expected damage to the vehicles in the study region.	Vehicle Losses

Direct Economic and Social Losses - Agricultural

Component	Description of Output	Measure
Agriculture	HAZUS-MH determines the expected damage to the agriculture in the study region.	Crop Losses

Indirect Economic Impact Module Output

Component	Description of Output	Measure
Employment	HAZUS-MH determines the indirect employment loss as a percentage of the original employment by market sector (agriculture, mining, construction, manufacturing, transportation, trade, services, government, and miscellaneous).	a. Percentage with Aid b. Percentage without Aid
Income	HAZUS-MH determines the indirect income loss as a percentage of the original income by market sector (agriculture, mining, construction, manufacturing, transportation, trade, services, government, and miscellaneous).	a. Percentage with Aid b. Percentage without Aid

JOB AID 4-4: MITIGATION WIZARD FIGURES AND TABLES

Mitigation Wizard Figures and Tables	Description
Figure 1: County Map	Map of Study Region
Figure 2: Probabilistic Hazard Maps	Maps of Probabilistic Hazard Events
Table 1: Building Inventory by General Occupancy	<ul style="list-style-type: none"> • Occupancy: Residential, Commercial, Industrial, Agricultural, Religious, Government, and Education • Number of Buildings (total and # in hazard area), Replacement Value (total and # in hazard area), and Number of Occupants (total and # in hazard area)
Table 2: Building Inventory by General Building Type	<ul style="list-style-type: none"> • Building Type: Wood, Steel, Concrete, Masonry, and Mobile Homes • Number of Buildings (total and # in hazard area), Replacement Value (total and # in hazard area), and Number of Occupants (total and # in hazard area)
Figure 3: Historical Hazard Events	Maps of Historic Hazard Events
Table 3: Transportation System Lifeline Inventory	<ul style="list-style-type: none"> • System – Highway, Railway, Light Rail, Bus, Ferry, Port, Airport • Components, #Locations/Segments, Replacement Value
Table 4: Utility System Lifeline Inventory	<ul style="list-style-type: none"> • System – Potable Water, Wastewater, Natural Gas, Oil Systems, Electrical Power, Communications • Component, #Locations/Segments, Replacement Value
Table 5: Essential Facility Inventory	<ul style="list-style-type: none"> • Building Type – Hospitals, Fire Stations, Police Stations, EOCs, Schools • Number of Buildings (total and # in hazard area), Replacement Value (total and # in hazard area), and Number of Occupants (total and # in hazard area)
Figure 6: Map of Schools	
Table 6: Population by Age and Gender	<ul style="list-style-type: none"> • Male, Female, Total • Age < 16, 16 < Age < 65, Age > 65, Total
Table 7: Population by Ethnicity	<ul style="list-style-type: none"> • Population, Percentage • White, Black, Native American, Hispanic, Asian, Pacific Islander, Others, Total
Table 8: Household Distribution by Annual Income	<ul style="list-style-type: none"> • Population, Percentage • < 10k, 10k < x < 20k, 20k < x < 30k, 30k < x < 50k, 50k < x < 75k, > 75k, Total
Table 9: Household Distribution by Residence Type	<ul style="list-style-type: none"> • Category – Owner Occupied, Renter Occupied, Total • Single-family, Multi-family, Mobile Homes, Total
Figure 7: Population Density Map	
Figure 8: Hazardous Material Facilities	Map of HazMat Locations
Figure 9: Dams	Map of Dam Locations
Table 10: Building Damage by General Occupancy	<ul style="list-style-type: none"> • Occupancy – Agricultural, Commercial, Education, Government, Industrial, Religion, Residential, Total • Damage – None, Slight, Moderate, Extensive, Complete, Total
Table 11: Building Damage by Building Type	<ul style="list-style-type: none"> • Occupancy (Should be Building Type) – Wood, Steel, Concrete, Masonry, Mobile Home, Total • Damage – None, Slight, Moderate, Extensive, Complete, Total
Table 12: Economic Loss by General Occupancy	<ul style="list-style-type: none"> • Occupancy – Agriculture, Commercial, Education, Government, Industrial, Religion, Residential, Total • Structural Damage, Non-structural Damage, Content Loss, Business Interruption, Total
Table 13: Transportation System Lifeline Losses	<ul style="list-style-type: none"> • System – Highway, Railway, Light Rail, Bus, Ferry, Port, Airport • Component, Inventory Value, Economic Loss, Loss Ratio

JOB AID 4-4: MITIGATION WIZARD FIGURES AND TABLES (continued)

Mitigation Wizard Figures and Tables	Description
Table 14: Utility System Lifeline Losses	<ul style="list-style-type: none"> • System – Potable Water, Wastewater, Natural Gas, Oil Systems, Electrical Power, Communications • Component, Inventory Value, Economic Loss, Loss Ratio
Table 15: Building Damage for Essential Facilities	<ul style="list-style-type: none"> • Classification – Hospitals, Fire Stations, Police Stations, EOCs, Schools • Damage – None, Slight, Moderate, Extensive, Complete, Total
Table 16: Casualty Estimates	<ul style="list-style-type: none"> • Time/Occupancy – Commercial, Commuting, Educational, Hotels, Industrial, Other-Residential, Single-family • Level 1, Level 2, Level 3, Level 4

