Hazus Program Infrastructure Data Updates

Detailed Methodology

In coordination with the Homeland Infrastructure Foundation Level Data Program (HIFLD) | November 2019

Summary

Updated Hazus infrastructure data are incorporated into Hazus state databases, which contain all necessary inventory data for Hazus risk assessments. If a user has previously downloaded Hazus data to their computer, the user you will need to follow the instructions below to replace older databases:

1. Download updated Hazus state databases
2. Close Hazus and any SQL programs
3. Navigate to the folder where Hazus databases are stored – generally "HazusData\Inventory" on the user's C: drive
4. Delete the file <state_name>_log.ldf
5. Extract the newly downloaded state database into the folder where <state_name>_log.ldf was stored
6. When asked to overwrite the previous <state_name>.mdf with the new one, click yes.

Data Sources & Methods

All State databases were updated except for American Samoa, Florida, Guam, Hawaii, Northern Marianas Islands, and Virgin Islands due to data gaps in HIFLD data for some of the Territories and previous enhancements provided by users in Florida and Hawaii. Refer to Hazus 4.2 SP3 Release Notes https://www.fema.gov/media-library/assets/documents/105743 for additional details. The HIFLD Open sources accessed for the dynamic update on Nov 1, 2019 are outlined below:

HIFLD Open		Hazus
Care Facilities	• Hospitals: https://hifld-geoplatform.opendata.arcgis.com/datasets/hospitals • Veterans' Health Administration Medical Facilities: https://hifld-geoplatform.opendata.arcgis.com/datasets/veterans-health-administration-medical-facilities	hzCareFlty, eqCareFlty, flCareFlty

Schools	• Public Schools: https://hifld-geoplatform.opendata.arcgis.com/datasets/public-schools • Private Schools: https://hifld-geoplatform.opendata.arcgis.com/datasets/private-schools • Colleges and Universities: https://hifld-geoplatform.opendata.arcgis.com/datasets/colleges-and-universities • Supplemental Colleges: https://hifld-geoplatform.opendata.arcgis.com/datasets/supplemental-colleges	hzSchools, eqSchools, flSchools
Fire Stations	• Fire Stations: https://hifld-geoplatform.opendata.arcgis.com/datasets/fire-stations	hzFireStation, eqFireStation, flFireStation
Police Stations	• Local Law Enforcement Locations: https://hifld-geoplatform.opendata.arcgis.com/datasets/local-law-enforcement-locations	hzPoliceStation, eqPoliceStation, flPoliceStation
Emergency Operations Centers	• State Emergency Operations Centers (EOC): https://hifld-geoplatform.opendata.arcgis.com/datasets/state-emergency-operations-centers-eoc • Local Emergency Operations Centers (EOC): https://hifld-geoplatform.opendata.arcgis.com/datasets/local-emergency-operations-centers-eoc • Federal Emergency Management Agency (FEMA) Regional Headquarters: https://hifld-geoplatform.opendata.arcgis.com/datasets/federal-emergency-management-agency-fema-regional-headquarters	hzEmergencyCtr, eqEmergencyCtr, flEmergencyCtr

Element	Legacy Source	Valuation Approach	Target States	New HIFLD Open Source
Highway Bridge	National Bridge Inventory (2001) 441,041 records	New square-footage cost table provided by Caltrans and are added to Hazus Comprehensive Data Management System (CDMS) and adjusted for other States relative to California based on RS Mean State non-residential factors.	All States, including Alaska, District of Columbia, Hawaii, and Puerto Rico	National Bridge Inventory (2018) 616,096 records: https://hifld-geoplatform.opendata.arcgis.com/datasets/national-bridge-inventory-nbi-bridges Significant improvement, more recent, better valuations, more comprehensive. Reconstruction date is used to reclassify bridges to seismic (less vulnerable) classes. Better classification using National Bridge Inventory attributes, in California Class types were directly provided by Caltrans (2019) and provided as a new table in CDMS. Deficient and functionally obsolete bridges based on NBI are now described in the Comments field. Bridges in water bodies between Tracts are now preserved and available for analysis.
Highway Tunnel	National Bridge Inventory (2001)	Escalated legacy 2003 costs to 2019 using CPI to $18.6K per foot ($60.9 per meter) and adjusted by State RS Means factors.	All States, including Alaska, District of Columbia, Hawaii, and Puerto Rico	Road Tunnels (2019) 745 records: https://hifld-geoplatform.opendata.arcgis.com/datasets/road-tunnels poly line data to convert to points. Improves valuations by calculating length, not a significant increase in coverage, locations are enhanced since points fall on line HIFLD line segments.
Railway Segment	National Rail Network Database (2000)	Use Table 3.22 Flood Tech Manual per km costs as $1,500K. Did not escalate to 2019 since there is uncertainty in base year and conversion issues in the legacy data. Adjusted by State RS Means factors.	All States, including Alaska, District of Columbia, Hawaii, and Puerto Rico	Railroads (2019) 302,118 records: https://hifld-geoplatform.opendata.arcgis.com/datasets/railroads Newer more complete data. Valuations improve based on length and State adjustments.

Element	Legacy Source	Valuation Approach	Target States	New HIFLD Open Source
Railway Bridge	National Bridge Inventory (2001)	Use Flood Technical Manual Table 3.22 of $5M. Chose not to escalate to 2019 since the value is already well above the G&E 1994 report recommendation and with the new dataset, a large range of bridges, including more minor structures are included.	All States, including Alaska, District of Columbia, and Puerto Rico, not including Hawaii	Railroad Bridges (2018) 86,894 records: https://hifld-geoplatform.opendata.arcgis.com/datasets/railroad-bridges Significant improvement in coverage. Will include rail bridges not related to highways. No size or class related fields, cost is default.
Light Rail Segment	Fixed Guideway Transit and Ferry Network database (2007)	Use Table 3.22 Flood Tech Manual per km costs as $1,500K. Did not escalate to 2019 since there is uncertainty in base year and conversion issues in the legacy data. Adjusted by State RS Means factors.	All states and District of Columbia, not including Alaska, Hawaii, or Puerto Rico	Fixed Guideway Transit Links (2,571): https://hifld-geoplatform.opendata.arcgis.com/datasets/fixed-guideway-transit-links Improvements to valuations, not significant increase in numbers of segments.
Light Rail Facility	Bureau of Transportation Statistics (2007)	Escalate Table 3.23 Flood Tech Manual default of $2,600K to 2019 CPI of $3,200K, and adjust by RS Means State factors.	All states and District of Columbia, not including Alaska, Hawaii, or Puerto Rico	Fixed Guideway Transit Stations: https://hifld-geoplatform.opendata.arcgis.com/datasets/fixed-guideway-transit-stations Improvements to valuations, not a significant increase in numbers of facilities.

Element	Legacy Source	Valuation Approach	Target States	New HIFLD Open Source
Bus	InfoUSA (2001)	Escalate original $1M Table 3.24 of the Flood Technical manual (1997) to 2019 $1.6M per facility and apply the State RS Means factors.	All states, including Alaska, District of Columbia, and Hawaii, not including Puerto Rico	Intermodal Passenger Connectivity Database (IPCD) (2019) https://hifld-geoplatform.opendata.arcgis.com/datasets/intermodal-passenger-connectivity-database-ipcd/data where facility type = 2. Fairly significant improvement in coverage and location, represents intermodal bus stations, not just major bus companies.
Port	U.S. Army Corps of Engineers Ports Database (2007)	Escalated to 2019 to $3,160K and adjusted by State RS Means nonresidential ratios	All states, including Alaska, Hawaii and Puerto Rico	Port Facilities: https://hifld-geoplatform.opendata.arcgis.com/datasets/port-facilities almost 3x more. Did not see increase in Los Angeles County.
Airport Facility	National Transportation Atlas Database (2007)	Large passenger airports area proxy is based on annual passenger volume and COM4 replacement value. Other urban facilities use larger default from manual ($12,600K 2019), while rural facilities will use default for hangar and lighter facilities ($5,000K 2019).	All states and territories. Will use new FEMA deliverable for U.S. Virgin Islands	Aircraft Landing Facility: https://hifld-geoplatform.opendata.arcgis.com/datasets/aircraft-landing-facilities/data Current issues with legacy valuations, new approach developed and implemented provide reasonable base cost estimations.

Element	Legacy Source	Valuation Approach	Target States	New HIFLD Open Source
Airport Runway	National Transportation Atlas Database (2007)	Length and width values provided by HIFLD Open for area and $95 sqft with nonresidential state ratios.	All states and territories, including U.S. Virgin Islands	Airport Runway: https://hifld-geoplatform.opendata.arcgis.com/datasets/runways Current issues with legacy valuations, new approach developed and implemented provide reasonable base cost estimations.

Element	Legacy Source	Proposed Valuation	Target States	New HIFLD Open Source
Waste Water Facilities	Envirofacts Data Warehouse (2001)	Escalate valuation to 2019, $110,965K or $111M for every facility	All states and territories. Will use new FEMA deliverable for U.S. Virgin Islands	Processed from Environmental Protection Agency Facility Registration Service (2019) https://hifld-geoplatform.opendata.arcgis.com/datasets/environmental-protection-agency-epa-facility-registry-service-frs-wastewater-treatment-plants all States and Territories
Natural Gas Facilities	Envirofacts Data Warehouse (2001)	2019 adjusted default of $1,750K, and RSMeans nonresidential adjustment factors	Contiguous 48 states and Hawaii, not including Alaska, Puerto Rico, or Territories. Will use new FEMA deliverable for U.S. Virgin Islands	Natural Gas Processing Plants (723 records, 2019): https://hifld-geoplatform.opendata.arcgis.com/datasets/natural-gas-processing-plants and Natural Gas Compressor Stations (1,367 records, 2019): https://hifld-geoplatform.opendata.arcgis.com/datasets/natural-gas-compressor-stations Slight increase in numbers, no legacy data in AK, HI or PR.

Element	Legacy Source	Proposed Valuation	Target States	New HIFLD Open Source
Natural Gas Pipelines	NONE	Use 2019 value of $683K per km, escalated based on South Carolina values.	Lower 48 states, not including Alaska, District of Columbia, Hawaii, Puerto Rico or Territories	Natural Gas Pipelines (33,806 records, 2019) available: https://hifld-geoplatform.opendata.arcgis.com/datasets/natural-gas-pipelines Significant improvement over none in legacy data. Includes some newer lines in SC. Uncovered and existing defect/methodology gap that does not provide $ losses for natural gas pipelines.
Electrical Power Facility	Envirofacts Data Warehouse (2001)	Escalate to 2019 $174,000K for small (<100MW) and $875,000K for medium and large (100-500MW and >500MW)	All 50 states, including District of Columbia and Puerto Rico, using 10MW threshold eliminates plants in American Samoa and Guam.	Power Plants (11,085 records, 2019) available: https://hifld-geoplatform.opendata.arcgis.com/datasets/power-plants