

## CHAPTER 5: TRANSPORTATION



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### **Theme Description:**

Transportation, within the context of spatial data infrastructure, pertains to facilities and assets involved with moving people and goods from one location to another via land, water or air. These facilities include airports, harbors and roads.

The initial focus of most transportation framework data projects has been on the creation of comprehensive road network datasets, beginning with accurate street centerline base maps. With respect to the extent of the State's road network, in 2002, public agencies throughout Hawai'i reported a total of over 4,200 miles of roads open to the public as defined under [Title 23 Code of Federal Regulations \(CFR\) Part 460](#). The bulk of these public roads included approximately 3,200 miles under County jurisdiction and roughly 900 miles under State jurisdiction. There are also hundreds of miles of roads throughout Hawai'i under private or military jurisdiction, including unpaved/unimproved roads.

### **Status:**

There are a number of datasets for all major transportation facilities with varying degrees of completeness and accuracy. Many of the datasets, which contain very accurate facility or asset specific information, are not publicly available. Therefore, different agencies use different datasets between agencies and even within agencies. For example, the Army Corps of Engineers, U.S. Navy and various state agencies maintain separate datasets for harbors and navigable waterways in Hawai'i. The same is true for air travel, where agencies such as the U.S. Air Force and State Department of Transportation, Airports Division maintain separate datasets.

Street centerlines: The State of Hawai'i does not have official current street centerline base maps. With easily more than 10 known datasets, there is often not a consistent use of road networks even within one agency. References include:

Tiger	<a href="http://www.state.hi.us/dbedt/gis/tgrmjrd.htm">http://www.state.hi.us/dbedt/gis/tgrmjrd.htm</a>
	<a href="http://www.state.hi.us/dbedt/gis/tgrothrds.htm">http://www.state.hi.us/dbedt/gis/tgrothrds.htm</a>
USGS	<a href="http://www.state.hi.us/dbedt/gis/majroads.htm">http://www.state.hi.us/dbedt/gis/majroads.htm</a>
	<a href="http://www.state.hi.us/dbedt/gis/othroads.htm">http://www.state.hi.us/dbedt/gis/othroads.htm</a>
City & County Honolulu	<a href="ftp://gisftp.hicentral.com/LayrZips/streets.zip">ftp://gisftp.hicentral.com/LayrZips/streets.zip</a>
	<a href="ftp://gisftp.hicentral.com/LayrZips/majroads.zip">ftp://gisftp.hicentral.com/LayrZips/majroads.zip</a>
GDT Dynamap	<a href="http://www.bts.gov/gis/download_sites/gdt/maindownload.html">http://www.bts.gov/gis/download_sites/gdt/maindownload.html</a>

BTS National Highway Planning Network	<a href="http://www.bts.gov/gis/download_sites/ntad02/newusdownloadform.html">http://www.bts.gov/gis/download_sites/ntad02/newusdownloadform.html</a>
Hawai'i DOT	State Federal-Aid Highway Network
	County Federal-Aid Highway Network

Before 1991, when the Highways Division disbanded its Mapping Section, the State Department of Transportation (DOT) in partnership with the United States Geological Survey (USGS) maintained statewide base maps of the entire road network in Hawai'i. No comprehensive or coordinated effort has taken place since that time. Only two counties, Hawai'i and the City and County of Honolulu, have made concerted efforts in updating and correcting their respective road network base maps. Of these two counties, currently only the City and County of Honolulu makes its data available for public use and incorporates a regular workflow for updating the road network. The road network Hawai'i County developed under its 911 project is generally accessible only to those that provide emergency services such as the police and has not been regularly updated.

Of the 4,200 miles of public roads, roughly 600 miles under County jurisdiction and 900 miles under State jurisdiction or roughly 1,500 miles statewide are classified as Federal-Aid highways (as defined under 23 CFR Part 470) <http://www.fhwa.dot.gov/hep/23cfr470.htm> and are eligible to receive Federal Highway Trust Fund monies. The State Department of Transportation, as the pass-thru agency for these federal funds, is required to maintain an updated dataset and base maps of these facilities under the Highway Performance Monitoring System (HPMS). The State's HPMS is part of the national highway transportation system database, which incorporates a nationwide inventory of highway systems.

Maintaining a valid HPMS dataset is considered to be an item of *national significance*, and is considered fundamental for each state in meeting the requirements established under 23 Code of Federal Regulation (CFR), Part 1.5. Its purpose is to provide data that reflects the extent, condition, performance, use and operating characteristics of the nation's highways. The Federal Highway Administration (FHWA) requires annual HPMS updates from all State highway agencies, and this data is in turn utilized to help determine each states fair share annual apportionment of Highway Trust Fund monies.

The FHWA, realizing that much of the HPMS dataset and base maps have not been accurately updated since the early 90s, has approved funding a Digital Videolog project that will provide panoramic (driver's perspective) digital imagery at 10.56"/.002 mi intervals, street centerline files accurate to within three meters, and the respective datasets of the inventory and condition of the associated infrastructure assets. The DOT has awarded the contract to Mandli Communications, Inc. and is anticipating most of the work to be completed by January 2004.

**Data Sources:**

There are a large number of both public and private sources for transportation data, some of which have already been mentioned. The most comprehensive publicly available general transportation framework datasets are maintained by the Bureau of Transportation Statistics ([www.bts.gov/gis/](http://www.bts.gov/gis/)), the USGS, and Census TIGER.

Street centerlines: While comprehensive and popular, the accuracy of such datasets available from the USGS and TIGER are generally not reliable to within 15 meters. The same holds true for the popular, privately developed Geographic Data Technology (GDT) Dynamap street centerline dataset ([www.geographic.com](http://www.geographic.com)). The accuracy parameters of the County of Hawai'i and City and County of Honolulu street centerlines are unknown at this time.

### **Standards:**

The FGDC is developing framework standards based on those previously established by the USGS and Army Corps of Engineers. The standard is found on the FGDC's Ground Transportation Subcommittee web site at <http://www.bts.gov/gis/fgdc/>.

Previously, the Army Corps and USGS suggested transportation base map scales of 1:24,000, which was basically mostly suitable for master planning. The National Research Council, however, suggested parcel base maps to have larger scales of up to 1:600, which were suitable for something like tax assessments. However, because of Governmental Accounting Standards Board Statement 34 (GASB 34) or more formally, Governmental Accounting and Financial Reporting Standards: Statement 34, (<http://accounting.rutgers.edu/raw/gasb/st/summary/gtsm34.html>) government agencies are now required to provide a financial accounting of all their assets. This means that not only do they have to account for all their roads and bridges, but also all the ancillary assets along these facilities. Moreover, they need to provide a suitable condition assessment of these assets to generate a valuation. For examples, the locations and conditions of the signs along the facilities or the location and condition of guardrails, streetlights, etc. To accomplish this, the base maps will need to have larger scales similar to the parcel maps; these are the types of revisions that the FGDC committee is working on.

### **Priority:**

Developing complete and current street centerline base maps for all public roads statewide with accuracy within five meters should be the top priority for this framework dataset.

### **Estimated total investment in this theme:**

Total investments in transportation framework data are unknown. The DOT's three line Divisions (Airports, Harbors, and Highways) have probably invested over \$ 3 million in the development of both the data and GIS programs.

Street Centerlines: The County of Hawai'i and the City and County of Honolulu have invested more than \$1 million. DOT Highways has invested roughly \$1 million dollars into its GIS and data.

**Estimated current state and local contributions:**

DOT Highways will be spending \$700,000 this year to complete the Digital Videolog project that will result in updated highways base maps. Local interest is high in the video log project, but current investments are unknown.

**What is needed:**

Street centerlines, accurate to within 5 meters are needed for the remaining 2,700 miles of public roads as well as those restricted access roads owned by the military or any public agency.

**What is the likely source:**

Some Federal Funds may be available, particularly for the military under Homeland Security, however the County agencies fuel tax revenues are probably the most likely source to fund the balance of this project.

**Estimated total investment needed to complete this theme:**

If other agencies would piggyback on the DOT's digital videolog project, most of these 2,700 miles of roads can be completed within \$200,000 as all mobilization and much of the equipment costs have already been covered. The basic data capturing activities can be completed within a budget of \$100,000.

**Estimated current allocation of funding**

\$700,000

**Estimated budget shortfall:**

\$300,000

**Possible ways to overcome this gap:**

County participation with the DOT's videolog project.

**Most appropriate data steward:**

The various public agencies (i.e. counties) responsible for the maintenance of these facilities would be the most appropriate data steward.

**Maintenance Process:**

The digital videolog cycle for Federal-Aid Highways should be completed at most every other year. Other public roads can go on a 4-year or more cycle.

**Estimated Maintenance cost:**

For Federal-Aid Highways: \$400,000 every two years

For other public roads: \$400,000 every four years