State and Local Government Perspective on Development and Use of LiDAR Data

State and local governments have funded development of LiDAR data to varying technical and accuracy standards for approximately 10 years. Their applications for LiDAR data often mirror those of Federal agencies, but local governments, in particular, have many additional business requirements for large scale data that is typically collected at lower altitudes with greater densities. We are only now beginning to accurately assess the technical requirements for LiDAR data in relation to state and local government business requirements due to the experiences gained over the past 10 years in using LiDAR data. The following table provides examples of how state and local governments are using LiDAR data.

Urban Planning	Map Building Footprints
	Identify Building Heights
	Determine Lines of Sight
	Site Planning for Rezoning
	Site Design
Hydraulic and Hydrologic Modeling	Stream Channel Determination
	Identification of Watershed Boundaries
	Floodplain Determinations
	Modeling Directional Flow of Water
	Determining Impervious Surfaces
	Storm Water Design and Analysis
	Risk Analysis
	Determine Landowner Assessments for Offsets
	Monitor Dams and Reservoirs
Geology	Determine Morphology
	Assess Landslides and Potential for Landslides
	Identify Faults
	Map and Monitor Volcanoes
	Mineral Identification and Extraction
	Monitoring Mining Activities
Forestry, Fisheries & Wildlife	Tree Species Identification
	Vegetation Characterization
	Tree Height Measurements

	Timber Volume Calculations
	Identifying Terrain Under Canopies
	Urban Forestry Analysis
	Determining Carbon Sequestration
	Biomass Calculations
	Habitat Assessments
	Improve Understanding of Connectivity Issues
Emergency Management	Forest Fuels Availability
	Slope Analysis for Fire Modeling
	Smoke and Chemical Plume Analysis
	Improving Applications of Oblique Imagery
	Risk Analysis
	Wildland Fire Assessment
Mapping and General	Reduce Costs for Orthophoto Production
	3D Modeling for Economic Development
	Terrain Modeling
Engineering	Site Planning
	Road Construction
	Cut and Fill Calculations
	Slope Mapping
Coastal Management	Dune Monitoring
	Coastal Inundation
	Land Subsidence
	Sea Level Rise
	Slope Stability Issues
	Beachfront Management
	Risk Analysis
	Tsunami and Hurricane Inundation Mapping
	Near Shore Bathymetry and Benthic Mapping

In January 2010, the National States Geographic Information Council conducted an informal survey of the states to characterize the extent of existing LiDAR data collection efforts and the types of products that are required to meet state needs. Thirty states (see map below), Puerto Rico and the US Virgin Islands responded to this survey.

Eighty-five percent (85%) indicated that they would very likely (21%) or possibly (64%) partner with a national program that would collect LiDAR products with a 15 cm vertical accuracy that would allow the generation of 2' elevation contour lines. Twenty-nine percent (29%) of the these respondents indicated that such a program would meet between 61% and 80% of their state business requirements, and sixty-one percent (61%) indicated that such a program would meet between 81 and 100% of their state business requirements. When asked if they would be likely to partner on a more expensive program to produce LiDAR products with a 9 cm vertical accuracy that would allow the generation of 1' contour lines, only forty-three percent (43%) said that it was possible (34%) or very likely (9%).   However, this group did indicate that the improved specification would meet a larger portion of their business needs.

Eighty-seven percent (87%) of the responding states have collected LiDAR data over an area of approximately 268,000 miles^2 or the size of the State of Texas. This data has been collected over the past 9 years. Eighty-one percent (81%) of the respondents indicated that they plan to acquire another 177,000 miles^2 (slightly larger (9%) than the State of California) of LiDAR data in the next three years.

When asked about the funding sources that they have, or plan to use to fund LiDAR data acquisition, the States provided the following information. The percentages are greater than 100%, because data partnerships usually involve funding from multiple sources.

State General Funds	39%
State Special Funds	43%
State Capital Funds	7%
Federal Grant Funds	77%
Coastal Zone Management Funds	32%
Other Federal Source Funds	66%
Partnership Funds from Local Government	52%
Private Sector Funds (Including Utilities)	26%

In order for a national program to provide the maximum benefit to state and local governments, there must be options to "buy-up" the Federal specification (base) products to meet more stringent business requirements. By doing this, there will be a much greater number of partnership opportunities in the future. Base products produced to Federal technical specifications should be acquired at the highest density feasible, because 1) they will meet a larger number of Federal business needs, and 2) this will result in a lower cost for state and local government buy-ups to encourage their participation and expand the extent of coverage using non-Federal funds.