State of Delaware


Geospatial Strategic Plan

July 2010

with support from

This document was produced by Applied Geographics, Inc. (AppGeo) under contract to the Delaware Geographic Data Committee. This project was funded by a Cooperative Assistance Program (CAP) grant provided by the United States Geological Survey (USGS).

[This page intentionally left blank.]

Table Of Contents

Executive Summary

Delaware has been an innovative user of geospatial technology and geographic information systems (GIS) since the early 1990's. Delaware state government uses GIS on a daily basis in agencies that range from State Planning Coordination to Transportation to Natural Resource and Environmental Control to Safety and Homeland Security. In addition GIS is used throughout the state, by all three counties, and by local governments. Although geospatial governance is provided by the Delaware Geographic Data Committee (DGDC) Executive Council, most activity is found at the departmental level and the DGDC Executive Council has neither staff nor any resources to pursue projects or carry out new initiatives. Thus, when intergovernmental or cross departmental coordination does take place, it happens largely on an *ad hoc* basis and with volunteered staff time.

With GIS use growing rapidly both within state government and with other governmental partners and the private sector, there is an increasing need for both orchestrated coordination and the development of resources that can be shared across multiple agencies. As documented in the accompanying Business Plan, this type of coordinated approach can help to reduce duplication of effort and increase the efficiency of state government geospatial service delivery. As such, this Strategic Plan recommends that Delaware join all of its neighboring states in **establishing small, focused GIS Office** that is dedicated to geospatial coordination and the development and maintenance shared geospatial data and services. The two overarching strategic goals identified in this plan are:

1. *Delaware will establish a formal state government **GIS Office,** led by a state Geographic Information Officer (GIO), that will report into its parent agency and fall under the current geospatial governance framework provided by the Delaware Geographic Data Committee's Executive Council.*
2. *The Delaware **GIS Office** will be provided recurring funding that is dedicated to the expansion and improvement of Delaware's framework data and spatial data infrastructure.*

Such an approach will **leverage** the state's documented geospatial **strengths** of:

- Small, manageable geography and rich existing spatial data infrastructure
- The strong collaborative spirit of the state's vibrant geospatial stakeholder community

While **addressing** the geospatial **weaknesses** identified through this planning effort:

- Lack of a focal point for state government geospatial activity
- Lack of a budget line item for *statewide* (i.e. non-departmental) GIS projects and data

While enabling the state to **capitalize on significant opportunities** that include:

- Increasing involvement and investment in geospatial technology by the Department of Technology and Information (DTI)
- Affordably extending geospatial technology into agencies such as Economic Development, Tourism and Emergency Management that are not currently using it to its full extent
- Extending existing and successful partnerships with Federal agencies that can provide funding support

This strategic plan lays out a practical course of action. The time is right to take this next step in the evolution of the state's geospatial capacity.

1 Strategic Planning Methodology

1.1 Project Team

Delaware assembled a Strategic Planning Steering Committee as a sub-committee of the Delaware Geographic Data Committee. The Committee met on a regular basis – both physically and via electronic technologies – providing project oversight and guidance throughout the duration of the project. Strategic Planning Steering Committee members included:

- **Michael Mahaffie**, Project Manager; Delaware Office of State Planning Coordination, Office of Management and Budget
- **Roger Barlow**, United States Geological Survey
- **Kim Cloud**, Delaware Department of Technology and Information
- **James Galvin**, Dover/Kent County Metropolitan Planning Organization
- **Mark Nowak**, City of Dover
- **William "Sandy" Schenck**, Delaware Geological Survey
- **Carl Yetter**, Delaware Department of Natural Resources and Environmental Control

Delaware engaged Applied Geographics, Inc. from Boston, Massachusetts to provide support throughout the strategic planning process believing that an outside perspective would assist in developing a strategic vision for Delaware. Michael Terner, a partner in the firm, served as the principal consultant and author of this report.

1.2 Project Activities

The following provides a chronology of project activities:

1. **Kickoff & Project Planning Meeting**
   - ✓ Held on Aug. 26, 2009
2. **Stakeholder Workshop**
   - ✓ Held on Oct. 20, 2009 at Kent County Administration Building (please see Appendix #1 for workshop attendance list, and Appendix #2 for presentation materials[1])

[1] Appendices are found at http://stateplanning.delaware.gov/dgdc/strategic_plan/Appendices_FINAL.pdf

3. Key Stakeholder Interviews

- ✓ County Emergency Operations Center personnel
- ✓ Local Government stakeholders
    - Kent County
    - City of Dover
    - Dover/Kent Metropolitan Planning Organization
- ✓ Governor's Economic Development Ombudsmen & Office State Planning Coordination
- ✓ Dept. of Safety and Homeland Security & State Police
- ✓ Dept. of Transportation
- ✓ Dept. of Technology & Information senior staff
- ✓ University of Delaware

4. Report Authoring

- ✓ Development, circulation, review and approval of a draft outline
- ✓ Presentation of a draft document to the DGDC Executive Council for review and comment

5. DGDC Executive Council Approval

- ✓ Following initial review and editing as part of the authoring process, the DGDC Executive Council approves and endorses the plan
- ✓ Release of document to the GIS community

6. Roll-out the plan

- Educational meetings to describe the plan
- Advocacy for carrying out the recommendations
- Internal (Executive Department) meetings to discuss implementation strategies

2 Current Situation

2.1 Who Is The Delaware GIS Stakeholder Community?

The Delaware geospatial stakeholder community is a diverse and engaged group that spans multiple sectors. The attendance from the ½ day Strategic Planning Workshop held on October 20, 2009 reflects this diversity and level of engagement. The full attendance list, including agency affiliation is found as Appendix #1.[2]

At a minimum, the following organizations are represented:

- **State government**

At least 28 people from state government participated in the information gathering workshop conducted as part of this project and are interested in and/or utilize the technology within state government. These personnel represented 16 state agencies including:

1. The Office of State Planning Coordination
2. The Division of Facilities Management
3. The Delaware Geological Survey (DGS)
4. The Department of Transportation (DelDOT)
5. The Delaware Transportation Management Center
6. The Department of Resources & Environmental Control (DNREC)
7. The Delaware State Police
8. The Department of Safety and Homeland Security
9. The Delaware Department of Technology & Information (DTI)
10. The Delaware Health Statistics Center
11. The Division of Public Health
12. The Department of Agriculture
13. The State Forest Service
14. The Division of Historical & Cultural Affairs

[2] Appendices are found at http://stateplanning.delaware.gov/dgdc/strategic_plan/Appendices_FINAL.pdf

15. The Department of Education (DOE)
16. The State Housing Authority

- **Federal government partners**

At least three separate federal agencies are actively engaged with Delaware state government on geospatial matters, including the United States Geological Survey, the US Department of Agriculture and the Department of Defense (e.g. via Dover AFB).

- **County government**

All three of Delaware's county governments take leading roles in geospatial data creation and maintenance. And all three have staff among the leadership in the DGDC.

- **Municipal government**

The use of geospatial data and GIS tools is increasing among Delaware's municipal governments. Some of the largest cities in the State (including Dover, Wilmington, and Newark) have strong, active GIS programs. Others, though lacking GIS staff, contract for GIS and related services with private sector entities that are themselves members of the Delaware Geographic Data Committee. Mayors, city managers, and elected council members are increasingly aware of the value and importance of GIS data and tools to their constituents.

In addition, Delaware's two Metropolitan Planning Organizations maintain GIS staffs and a strong presence in the DGDC.

2.2 Where Does Delaware Geospatial Development Currently Stand?

2.2.1 Relative to National States Geographic Information Council (NSGIC) "9 Criteria for a Successful Statewide GIS Program"

The National States Geographic Information Council has published a listing of "9 Criteria for a Successful Statewide GIS Program[3]". While these are not firm, binary criteria, and most states "self assess" themselves, they do provide a lens through which state-by-state comparisons become possible. As stated in the Fifty States Initiative Action Plan (see footnote #1 below), the criteria "establish a benchmark for statewide coordination activities…(and) are essential for effective statewide coordination

[3] Please see the NSGIC/FGDC 50 States Initiative NSDI Action plan. Section 3.1.2 of that document describes these criteria in fuller detail. http://www.nsgic.org/hottopics/fiftystates_initiative.pdf

of geospatial technologies. In other words, the most successful states tend to have these criteria in common.

The following provides an overview of how Delaware rates against these criteria. Please note that for several criteria a "yes" or "no" answer is not possible and the Delaware situation reflects some shade of gray.

1. A **full-time, paid coordinator position** is designated and has the authority to implement the state's business and strategic plans:
   - **PARTIAL.** There is not a full-time, paid "statewide geospatial coordinator" in Delaware. However, "departmental people" principally from the Office of State Planning Coordination and the Delaware Geological Survey perform some of these functions on a *de facto* basis. Although the Office of Management and Budget (OMB) is identified by statute (Title 29, Sub-chapter IV, Section 9141) as housing a person who is "assigned the role of State Geospatial Data Coordinator and shall serve as the nonvoting Chair of the Executive Council of the Delaware Geographic Data Committee", this is **not** a *full time* position. Rather, a Principal Planner – Mr. Michael Mahaffie - within the Office of State Planning Coordination (i.e. a sub-division of OMB) currently serves as the State Geospatial Data Coordinator. Mr. Mahaffie has many additional planning duties beyond geospatial coordination.

2. A **clearly defined authority** exists for statewide coordination of geospatial information technologies and data production:
   - **YES**. The Executive Council of Delaware Geographic Data Committee (DGDC) and the DGDC itself, as chartered in statute (Title 29, Sub-chapter IV, Section 9141) serve as the formal "authority" for this function.

3. The statewide coordination office has a **formal relationship with the state's Chief Information Officer** (CIO):
   - **PARTIAL.** The Delaware Department of Technology and Information (DTI) is represented on both the DGDC Executive Council and the DGDC and participates in the meetings. While there is formal *involvement* in geospatial coordination and a formal *association* there is not actually a "statewide coordination office" (see #1 above) to have a formal relationship with. That said,

there is increasing geospatial activity within DTI through their multi-phased Enterprise GIS Program (eGIS).

4. A **champion** (politician, or executive decision-maker) is aware and involved in the process of geospatial coordination:
   - **MARGINAL.** There is awareness at senior staff levels, but currently there is limited direct advocacy for GIS or direct involvement in GIS initiatives.

5. **Responsibilities for developing the National Spatial Data Infrastructure** and a State Clearinghouse are assigned:
   - **YES.** Through their leadership position in coordinating the DGDC Executive Council the OMB, Office of State Planning Coordination (OSPC) has had these responsibilities assigned. The Title 29 statute that creates the DGDC enumerates one of the responsibilities as: "oversight of the Delaware Geospatial Information Clearinghouse." It should also be noted that organizations such as the Delaware Geological Survey (DGS), which hosts the Delaware DataMIL are involved in implementing a clearinghouse by providing public access to data download and metadata for Delaware's framework data layers.

6. The ability exists to **work and coordinate with local governments**, academia, and the private sector:
   - **PARTIAL.** While these abilities exist, and there is local government and academic involvement in the DGDC Executive Council (i.e. one statutory member from local government; one from academia), the lack of a full-time Coordinator and a formal statewide "GIS Office" greatly limits these collaborations. Currently, collaboration and coordination largely take place on *de facto* and opportunistic basis through agency-based projects and involvement.

7. **Sustainable funding** sources exist to meet project needs:
   - **NO.** Delaware does not have a formal identified budget for pursuing a coordinated, enterprise GIS at the state level. While one position from the OMB, Office of State Planning Coordination is identified to lead and support the DGDC Executive Council, there are no other budgetary resources directly at the council's disposal. The two independent areas where *some* funding is available for enterprise level GIS are the ongoing operation of the DataMIL, by DGS, and funding for an ELA with ESRI and for construction and operation of the new Delaware Geospatial Data

Exchange infrastructure at DTI. Both of these efforts, however, are funded with discretionary funds that are not sustained.

8. GIS Coordinators have the **authority to enter into contracts** and become capable of **receiving and expending funds**:

   - **YES.** There are numerous formal, governmental programs involved with GIS in Delaware that can receive grants and expend funds for contracting. These include, but are not limited to OMB-OSPC[4], DGS and DTI.

9. The **Federal Government** works through the statewide coordinating authority:

   - **PARTIAL.** The federal government has a seat on the DGDC Executive Council which is currently filled by the USGS state liaison. While this form of active participation in the coordinating council is a start, State-Federal geospatial coordination is not yet universal across either state, or federal agencies. There continues to be some direct and independent agency-to-agency interactions on geospatial matters outside of the DGDC's view.

2.2.2 Relative to Framework Data Layer Development Status

In addition to the seven, "federal framework" layers associated with the National Spatial Data Infrastructure, Delaware considers "geographic names" and "land use/land cover" to also be "Delaware Framework."

Most *public* framework data are available from the Delaware DataMIL maintained by the Delaware Geological Survey (DGS). In one case, a county government, concerned about the use of outdated parcel data, has removed its public parcel information from download via the DataMIL. Those needing that county's parcel data are directed to county staff for access to the data.

The following synopsizes the status of Delaware's framework data sets, and further details on these data can be found at the DataMIL web-site: http://datamil.delaware.gov. It should be noted that this table reflects what has been an ad-hoc approach to maintaining a centralized collection of framework data. Not all data stewards are active and currently there are no formal agreements between the DataMIL managers and all of the data stewards.

[4] The OMB-OSPC received the CAP Grant funding for this project from the USGS and entered into the contract with Applied Geographics, Inc. to facilitate the strategic planning work.

Framework Layer	Data Steward	Delaware Status
1. Geodetic Control	Federal Government via NOAA-NGS	Geodetic control is maintained by the NOAA National Geodetic Survey (NGS). While considered a "federal framework" data set, these data are not part of the DataMIL and NGS distributes them directly via their own web-site.
2. Parcels	Parcel data are individually maintained by each of the three counties: Kent, Sussex and New Castle.	Statewide parcels are available for viewing via the on-line "map lab" of the DataMIL. New Castle and Sussex County parcels are available for download.
3. Transportation & Roads	DelDOT and TeleAtlas, via contract with DelDOT.	The TeleAtlas road data are presently considered Framework, but will be replaced in the near future by a statewide centerline data set being developed by DelDOT. This new data set will be a joint project of DelDOT and the three counties. The TeleAtlas data set can be shared with public sector partners, based on the terms of the DelDOT/TeleAtlas contract. Only a limited portion is available to the public via DataMIL.
4. Hydrography	DNREC and USGS	USGS and DNREC have collaborated to develop a National Hydrography Data Set (NHD) covering the entire state. These data are available to the public via the DataMIL.
5. Elevation Contours	There is currently **not a formal data steward** for elevation data. The contour data were derived from separate LiDAR data collection efforts coordinated by the Delaware Geological Survey and the DGDC.	Two-foot LiDAR-derived contours are Delaware's elevation framework data and are available statewide. These data are available to the public on a county by county basis via the DataMIL.
6. Aerial Photography	There is currently **not a formal data steward** for orthophotos. The 2007 Project was coordinated by the Delaware Office of Management & Budget.	2007 ¼ meter resolution orthophotos from original 4-band imagery are available statewide. The DataMIL also serves 2002, 1997, 1992, 1968, 1961, 1954, and 1937 statewide aerial imagery. 2010 imagery of New Castle County will be available in 2011 and there are plans for collection of imagery for Kent and Sussex Counties in 2011.
7. Political & Administrative Boundaries	OMB, Office of State Planning Coordination and USGS	State and county boundaries created by USGS. Municipal boundaries created and maintained by OMB, Office of State Planning Coordination. These data are available to the public via the DataMIL.
8. Geographic Names	Counties and USGS	Statewide data set of "place names" comes from a combination of federal and local sources. Names in the database come from the counties and the USGS Geographic Names Information System (GNIS). These data are available to the public via the DataMIL.
9. Land use/ Land Cover	There is currently **not a formal data steward** for land use/land cover data. The 2007 project was coordinated by OMB.	2007 land use/land cover data set with a 56 category classification scheme is available statewide. These data are available to the public via the DataMIL.

2.3 Delaware's Geospatial Strengths

- Delaware's **small size** (i.e. approximately 2,500 square miles), and higher population density leads to lower data acquisition costs per capita. Lower data acquisition costs are a key factor in the strength of Delaware's statewide geospatial data (see below).

- Delaware's small size and relatively strong tax base have led to extensive geospatial data investments that have, in turn, led to **extremely strong statewide data**. In short, Delaware maintains amongst the richest and most detailed statewide data in the country. Of note, Delaware is one of only a very small number of states that have any one of the following, and the only state with all three:
    - Statewide **parcels**
    - Statewide **color orthoimagery with a 1/4-meter pixel** resolution
    - Statewide **2 foot contours**

- The **Delaware Geographic Data Committee** (DGDC) and the associated DGDC Executive Council have provided a critical focal point for statewide geospatial coordination and governance in Delaware. While there are other challenges with the DGDC (see below), the existence of the Committee and Executive Council and the activities of the membership have fostered communication, collaboration, partnership formation and data program coordination across sectors and levels of government.

- There is a **strong collaborative spirit** across the geospatial stakeholder community in Delaware. This community represents a dedicated cadre of GIS developers, users, and collaborators that, in spite of budget limitations, is seeking to improve coordination, share geospatial data and avoid duplication of effort.

- The **University of Delaware** (UD) has been involved in statewide geospatial activities for over ten years and continues to maintain strong geospatial resources in several colleges, departments, and research units to support education, research, and public service. This expertise provides a strong platform for educating a geospatial workforce as well as labs that can directly participate in state sponsored geospatial projects thereby supplementing the state's own capacity. Researchers at the UD remain engaged in statewide activities and interested in expanding collaboration potential.

- As the table in Section 2.2.2 documents Delaware has **well identified data stewards** for most framework data layers. While this does not imply that all data sets are in ideal condition, the responsibilities for update and improvement are largely assigned and well understood. Although Delaware is ahead of most states in this regard, further work is needed to help assign some of the stewardship responsibilities (e.g. orthophotos and elevation) and to formalize others with structured "stewardship agreements."

2.4 Delaware's Geospatial Weaknesses

- There is **not currently a unified focal point for state government geospatial activities**. Rather, staff are located in numerous agencies with a primary allegiance to the agency mission even as agencies work within the DGDC structure to provide some level of coordination. Further, current and increasing geospatial efforts within the Department of Technology and Information (DTI) are focused on the technical infrastructure aspects of the technology and are somewhat disconnected from the data content and stewardship issues. As was mentioned in the stakeholder workshop "collegial and cooperative efforts have gone as far as they can", with the implication being that further improvements in coordination and resource sharing will take a concerted effort.

  Many states have provided this "concerted effort" by providing a centralized staff that performs "communal" work on behalf of the enterprise, i.e., all of state government. The size of these centralized teams can vary from 15 people in Utah to 5 people in Arkansas to 2 people in Rhode Island. These state personnel work in concert with agency personnel on a dedicated basis to develop resources (e.g. technology, data, applications) that are required by everyone. Delaware does not possess a centrally-located office of this nature with coordination efforts coming only from part-time attention from agency personnel. Examples of the kinds of activities that a Delaware GIS Office might perform include, but are not limited to:

  - Planning for regular statewide orthoimagery missions
  - Developing statewide web services, such as a geocoding service
  - Providing public access to geospatial data (via both download and on-line viewers)
  - Collecting, assembling and maintaining current data sets from federal government and neighboring state partners

- Planning for cross-layer (and by association, cross data steward) data integration issues (i.e. ensuring that hydrography, parcels, contours and roads properly overlay one another).
- Updating and maintaining a Geospatial Strategic Plan for the state

- Highly related to the previously described weakness of not having a dedicated "statewide GIS team" is the fact that there is **no budget line for funding GIS statewide projects**. Currently, if there's a need – e.g. for an orthoimagery re-flight – it would be pursued via a onetime "pass the hat" mechanism with one agency voluntarily taking the lead. Whether such a line item is funded centrally on behalf of the state, or whether it is funded via agency "contributions" or assessments, there needs to be a *mechanism* that facilitates collaborative funding for geospatial projects that go beyond a single agency.

- Of all the framework data layers described above (see Section 2.2.2), **statewide roads** is the most problematic for several reasons:

  - Currently, these data are licensed from TeleAtlas (TANA) and there is some **dissatisfaction with the roads data quality** and the timeliness of data updates. For example, Kent County E911 personnel reported that the TANA data were abandoned after only three months and hundreds of errors were corrected by internal staff.
  - The full extent of attribute information associated with the TANA **data are not universally available**. While the state has an enterprise license that makes the data available to all state agencies and to all local governments, only the basic road geometry and a small part of the attribute information is available to the general public or private sector stakeholders.
  - The TANA data are not **fully navigable** for emergency response. Key routing attributes such as one-way streets and speed limits are not available.
  - The TANA data do not have a **linear referencing system** attached. Thus, the Delaware Department of Transportation (DelDOT) maintains a separate and distinct centerline with linear referencing. This means that there is **duplicated road centerline data update** (which probably extends beyond DelDOT and TANA and to some county efforts to maintain their own road files).

It is feasible to envision that in a state the size of Delaware, with only three counties, there could be a single, statewide roads data set that is designed and maintained to meet a variety of needs. Such a resource would be extremely valuable; however, it would take focused coordination efforts, ostensibly led by a statewide GIS office, in association with key stakeholders such as DelDOT. These coordinated efforts would ensure that all state agencies and local governments are appropriately involved.

- Prior to this project there was no institutionalized form of **geospatial strategic planning for the future** within the DGDC governance framework. In this instance, the availability of federal funding catalyzed the strategic planning. Long-term, the DGDC Executive Council should consider future strategic planning an ongoing and recurring activity. Such planning is particularly important in arenas – such as geospatial – that are growing quickly and where there are significant changes based on emerging technology.

2.5 Delaware Geospatial Opportunities

- The **Department of Technology and Information (DTI) is becoming more involved** with enterprise GIS (eGIS) efforts for state government. This is documented through two recent initiatives:
    1. Funding and oversight of a multi-phased **Enterprise GIS Program (eGIS Program)** , the first phase of which includes the Delaware Geospatial Data Exchange, which will serve as a data gateway for dissemination of state, county, and local GIS data across state government. Expansion of the Geospatial Data Exchange to allow access by other levels of government may be considered at a later date and after the system is fully implemented.
    2. Negotiation and procurement of an **ESRI enterprise license agreement** (ELA) for geospatial software for state government.

  This activity reflects DTI's understanding of geospatial technology as an important enterprise resource that is worthy of investment and is evidence of their willingness to remain involved in the technical infrastructure that underpins enterprise GIS.

- While there are a great number of state agencies currently using GIS technology, as the technology has become more affordable, friendly and ubiquitous there remain additional opportunities for

additional state agencies to become involved with, or further capitalize on geospatial technology. Some examples of agencies and issues that might do more with GIS include:

- **OMB**: Budget analysis, fiscal analysis of proposed projects
- **Economic Development**: Site and business planning, market research, etc.
- **Workforce Development**: Matching workers to jobs by location.
- **Tourism**: Public presentation of tourism sites and opportunities, spatial analysis of shared tourism opportunities
- **Renewable energy development**: Wind and solar siting research and analysis
- **DEMA**: Planning for and response to disasters.

An eGIS approach to GIS can be of great benefit to these types of agencies as they begin, or in some cases, expand, use of GIS. Instead of needing to start from scratch, new agencies would have an existing infrastructure to "plug into" and thus the overall cost of GIS would be lowered. Similarly, a statewide GIS office would be in a position to provide startup technical support to ease adoption of the technology.

- Delaware's neighboring states – Maryland, Pennsylvania and New Jersey – all deploy GIS broadly throughout state government. As a result there are opportunities to develop collaborative pilot projects that aim to improve the quality of framework data for these **neighboring states**. For example, Delaware might work with its neighbors to improve public safety communication and geospatial data exchanges in the event of emergencies and natural disasters.

- Build on and **extend existing federal partnerships** for geospatial activity such as the current USGS partnership that has helped to fund this geospatial strategic planning effort. Other existing opportunities include, but are not limited to:

  - **National Oceanic and Atmospheric Administration (NOAA), Coastal Services Center (CSC)**: with the advent of sea level rise and other environmental issues, the NOAA-CSC is extremely active with geospatial programs and has many partnership opportunities. The Delaware Coastal Program Office could investigate expanding their ties with the CSC to explicitly pursue geospatial activity.
  - Both **Department of Homeland Security (DHS)** and its **Federal Emergency Management Agency (FEMA)** are very active with geospatial technology and provide funding and

partnership opportunities to states. Again, the Delaware Emergency Management Agency (DEMA) could investigate actively pursuing geospatial funding for emergency planning and response.

- The **Army Corps of Engineers (COE)** is a significant geospatial technology user and there may be opportunities for collaboration regarding their major land holdings adjacent to the C&D Canal.

3 Vision & Goals

3.1 Problem Statement

Although Delaware state government has been an effective practitioner of geospatial technology for well over a decade, state government geospatial programs have emerged and evolved principally on an *agency basis.* State government geospatial programs fall within an overall geospatial governance structure established by the formation of the Delaware Geographic Data Committee (DGDC) Executive Council and the broader DGDC membership. While this governance structure exists, there is neither staff nor any resources at the DGDC Executive Council's disposal to carry out its recommendations. Thus, any cross departmental coordination that does take place largely happens on an *ad hoc* basis and with volunteered staff time.

In short, there is no centralized organization that can build shared resources or perform communal geospatial work that would assist multiple agencies. Similarly, efforts aimed at coordinating with partners in the federal government or local governments are sometimes repeated by multiple agencies. This results in funding inefficiencies and duplications of effort and it inhibits increased adoption of the technology by additional agencies. The majority of states, including all states and territories surrounding Delaware (i.e. New Jersey, Maryland, Pennsylvania, Virginia, New York and the District of Columbia) have established "GIS offices" that fulfill these functions on behalf of *state government* and aim to increase both the efficiency and capabilities of geospatial service delivery. In addition to serving internal state government needs, such offices help the state coordinate and cooperate with other stakeholders such as counties, local governments, academia and the private sector. It is time for Delaware to strongly consider the creation of such a GIS office.

3.2 Overarching Strategic Goals

This plan puts forward two simple and related overarching strategic goals:

> Delaware will establish a formal state government **GIS Office,** led by a state Geographic Information Officer (GIO), that will report into its parent agency and fall under the current geospatial governance framework provided by the Delaware Geographic Data Committee's Executive Council.

The Delaware **GIS Office** will be provided recurring funding that is dedicated to the expansion and improvement of Delaware's framework data and spatial data infrastructure.

3.3 Programmatic Goals

The programmatic goals described below identify key decisions that need to be made to properly place the new office within state government and to provide it the direction and resources required for success. Detailed planning needs to take place to determine the precise shape and organizational placement of the new office[5].

3.3.1 Finalize General Characteristics and Mandate for the Office

The general characteristics and mandate of the **new GIS Office** are recommended to include:

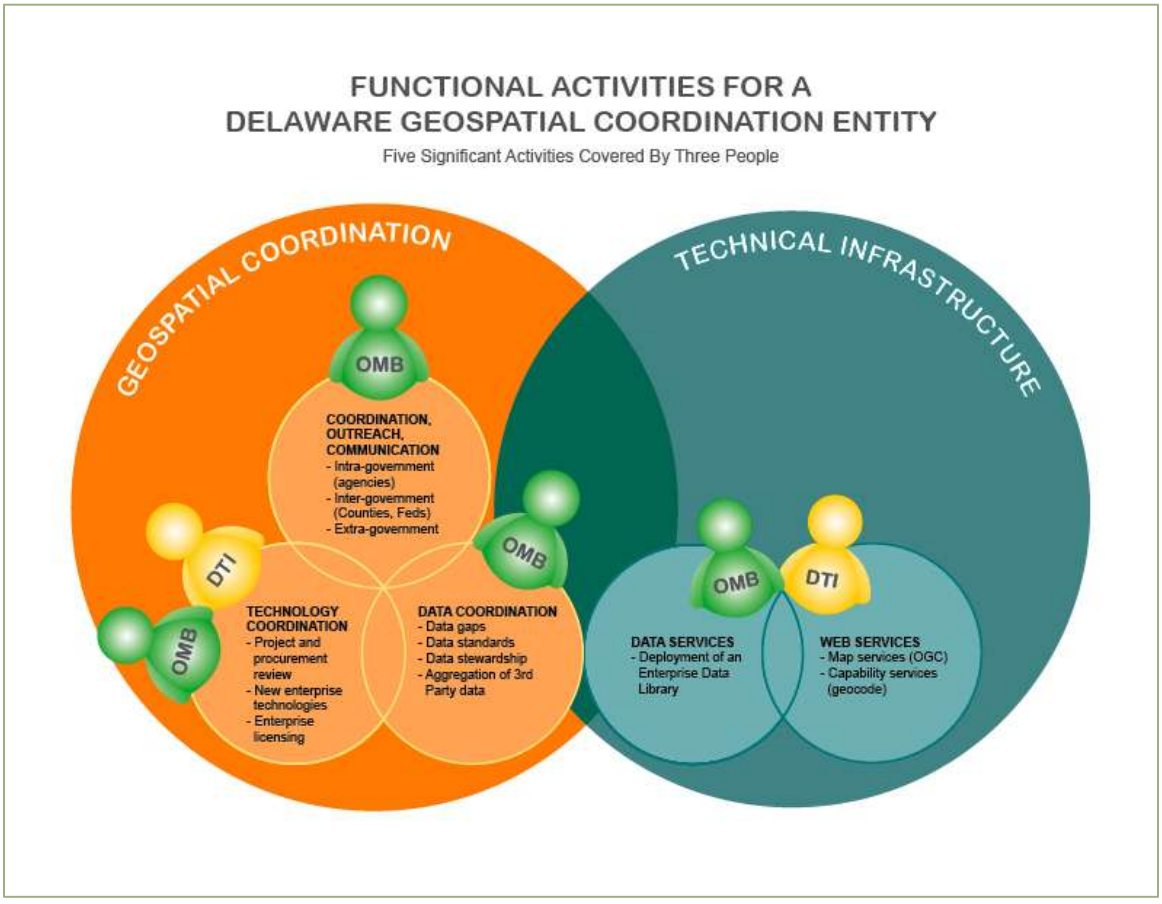
- Having as its director a dedicated, fulltime Statewide **Geographic Information Officer** (**GIO**) to provide support to the DGDC Executive Council.
- Serving as a focal point for statewide geospatial **data initiatives** that benefit multiple departments. Activities may include:
  - Coordination of annual data maintenance funding (e.g. for regularly recurring orthoimagery flyovers)
  - Coordination of agency data stewards, and management of their contributions to the statewide database
  - Management of a distributed statewide geospatial database that contains the best data holdings from a variety of state, federal and local government sources and is accessible to all agencies
- Providing high quality **geospatial services** to all state agencies and local government and other partners without inhibiting agency-based geospatial business activity. Activities may include:
  - Web mapping services
  - Web capability services such as geocoding
  - Application development and hosting technical assistance

[5] Please see the accompanying "Business Plan for the Establishment of a New GIS Office for Delaware" for details

- Facilitate **communication and collaboration** across and between state agencies. Activities may include:
    - Management of statewide enterprise license agreements (e.g., existing enterprise license agreement for ESRI software)

- Facilitate **communication and collaboration with other levels of government** (i.e., local government, neighboring state governments, Federal), academia and the private sector including providing access to public data resources.

The figure below provides a schematic representation of the activities that will need to be pursued to fulfill this mandate.



3.3.2 Size and Organizational Placement of New Statewide GIS Office

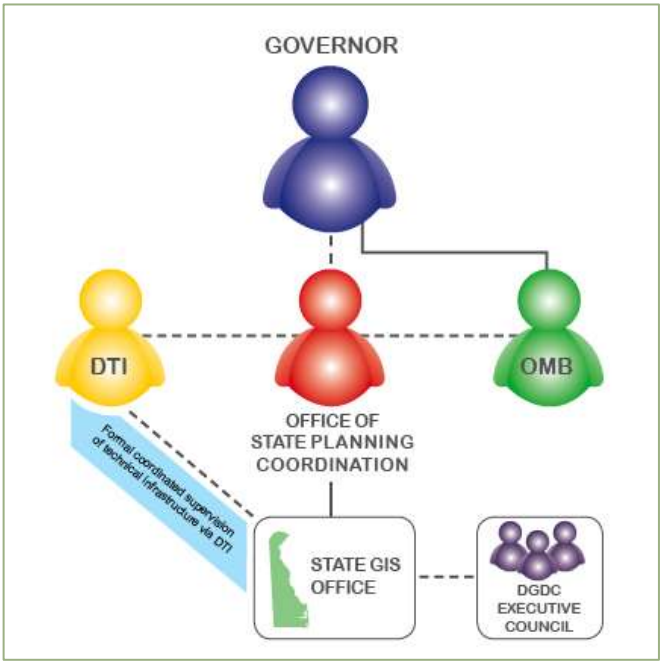
The most likely home for a **new** Delaware Geographic Information Office is within the **Office of State Planning Coordination.** To the extent possible and allowable by the state budget, the new office should

be staffed with three *new* positions. In the event that new positions cannot be created at this time, the office could be staffed with the reassignment of existing positions currently located in other offices.

The new office would be led by a Geographic Information Officer who would report into the OSPC Director and would chair the DGDC Executive Council. In addition to the GIO, one new position would be responsible for managing the enterprise geospatial database, and the other person would be responsible for facilitating application and advanced technology development.

The DGDC Executive Council would serve as a Board of Directors to this office, and the office would carry out the Executive Council's recommendations and priorities. Under this scenario, the DGDC itself would become a more independent and broad-based users' group. If this happened, it would be desirable for the "DGDC users' group" to elect its own chair, who would represent the DGDC on the Executive Council. It should be noted that this type of change in DGDC configuration and governance would likely ***require a change in the DGDC's enabling legislation***.

The GIS Office would be intentionally small and as detailed below, it would be focused on the eGIS requirements of state government for: geospatial data, services and applications. The equipment associated with enterprise GIS would be housed at DTI and there would be a formal relationship with DTI for administration and management of the technical infrastructure. The figure below illustrates this potential organizational structure.



4 Requirements To Meet The Programmatic Goals

The programmatic goals outlined above provide a sensible recommendation for meeting the strategic goals of "creating a new GIS Office" for Delaware. The following sections describe the recommended organizational and resource requirements for carrying out those recommendations.

4.1 Organizational Needs

4.1.1 Executive Support

Senior executive support will be required for the creation of a new office. Ideally, the Governor would provide this support and leadership, but at a minimum the executive management of agencies that are most impacted – in this case, OSPC and DTI – would need to be willing advocates. This will be particularly critical if the new office is staffed with existing personnel who are reassigned to work in the new office on a dedicated, fulltime basis.

With executive support, the organizational changes could be enacted via either Executive Order or Legislative action, perhaps through budgetary language.

4.1.2 Staffing

Ideally, the GIS Office would be comprised of three people with the following roles:

- **Geospatial Information Officer** (GIO): Would serve as the group leader and would be responsible for overall geospatial coordination in Delaware.
- **Geospatial Data Manager:** Would be responsible for the assembly and management of a statewide geospatial data library. The current project to develop the Delaware Geospatial Data Exchange will result in an infrastructure that could house this database. This person is anticipated to work closely with DTI staff who would manage the technical infrastructure. This person would fulfill the role of managing the data contents of that system, as well as the relationship with data contributors. See Appendix #3[6] for a more detailed job description for this role.

[6] Appendices are found at http://stateplanning.delaware.gov/dgdc/strategic_plan/Appendices_FINAL.pdf

- **Geospatial Developer:** Would provide application development and management capabilities to the team. Having this expertise in-house would lessen – but not necessarily eliminate - the reliance on contractors for application development and would enable this office to provide application support to agencies that are newly implementing GIS technology. When the workload is high and funding enables contractors to be involved, this person would serve as a resource in specifying the work for the contractors and assisting agencies in managing and providing quality control of the deliverables. This person would also help to administer the geospatial web services. This person would also work closely with the DTI personnel who manage the technical infrastructure.

If it is not possible to create, or staff via reassignment, all three positions, it is possible that an initial team of two would be sufficient at the outset, and that a Geospatial Data Manager could be found who possessed some application development skills anticipated to be provided by the Geospatial Developer.

It is assumed that DTI currently maintains adequate staff to work with the GIS Office to manage the technical infrastructure which will build off of the Delaware Geospatial Data Exchange project.

4.1.3 General Budget Requirements

The principal funding requirement is for the staff recommended above in 4.1.2, assuming that new positions are created. If new positions are not created, and instead staff are reassigned from existing positions, then it is assumed that the funding for the positions would be reallocated as well.

The precise salary and benefit levels would need to be determined in association with OMB's human resource management classification system; however, the following provides an estimate for salary levels based on other states and the private sector:

Position	Salary Range
Geospatial Information Officer	$70,000 - $90,000
Geospatial Data Manager	$55,000 - $75,000

Geospatial Developer	$55,000 - $75,000

In addition to salaries, the GIS Office should have a modest budget of perhaps $10,000 - $20,000 that could support routine equipment purchases and some travel to participate in regional and national GIS conferences such as the annual National States Geographic Information Council (NSGIC) conference which has participation from almost all statewide GIS offices.

As per the second strategic goal, the office should also manage a budget expressly for "data investment" which would cover data maintenance, update and the creation of new data sets. An annual data investment of $50,000 - $100,000 would help to ensure the quality and currency of the state's geospatial data holdings.

Please note, more detailed budget information is available in the companion document titled a Business Plan for the Establishment of a GIS Office for Delaware.[7]

4.1.4 Assessing Risk

There are three principal risks to achieving the programmatic goals outlined above:

1. **It will not be possible to increase staff** in the current fiscal climate of tight budgets. Given that the program hinges on the creation of a "new office" with a new mission, it is critical that there be a way to staff this office. If new positions cannot be created, then staffing the office through the reassignment of existing agency personnel remains feasible.
2. There will be a **perceived loss of flexibility with the creation of a new centralized GIS office**. Delaware's GIS has matured in an environment where agencies have moved forward and have made investment independently. Some may view a new centralized GIS office as impinging on agency autonomy in terms of geospatial planning and investment. The intent of the new office is to facilitate increased coordination and efficiency, and to assist agencies that are newly becoming involved with GIS. It is not designed to dictate agency behaviors; rather it is designed to provide agencies access to communal resources that will benefit those agencies. It will be up

[7] This document is being drafted in August 2010 and will be published with the Strategic Plan when completed

to the personnel in the new office to interact in an open fashion and to set a tone of collaboration.

3. Highly related to the previous risk is the objective of **not alienating existing departmental/agency based geospatial programs**. The new office must respect the existing geospatial programs of state agencies and position itself as a resource that can help these program become more effective (e.g. by providing communal resources on which they can capitalize; and, spearheading "group projects" such as orthoimagery re-flights).

5 Implementation Program

5.1 Phasing & Milestones

The timeline below provides an overview of the key activities necessary to create the new GIS Office. In short, the primary activities include coming to consensus on the need for the office and then commencing the advocacy necessary to establish the office as part of the state budget.

Activity	2010		2011				2012			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Finalize Geospatial Strategic Plan and begin education and advocacy for its recommendations										
Work with current Administration and General Assembly to include potential funding and language changes as part of FY2012 budget										
Work with Administration and General Assembly to sustain support for funding of new GIS Office as part of FY2012 budget.										
Establishment of new Delaware GIS Office					*					
Delaware GIS Office commences operations										

5.2 Marketing the Program

The overarching strategic recommendation is singular and straightforward: create a new statewide GIS Office for Delaware. As such, most of the marketing and outreach activities should be directed at generating the political and organizational support within state government that can lead to the legislative and budget language necessary to create the office. This includes:

- **Outreach to state governmental leaders and executives** who will be directly involved in creating the Administration's 2012 budget
- **Outreach to existing state government geospatial programs** who will be indirect beneficiaries of the activities of this office. It will be important to document that there is consensus around this proposal and that the new office *helps* existing programs, and does not compete with them.
- **Outreach to broader geospatial stakeholder community** who will also benefit from the activities of this office. Indeed, as described above, the activities of this office are directly involved in helping the state government stay better connected with its local government, academic and private sector collaborators.