



MetroGIS – Mn/DOT Collaboration on Roads and Highways Information

Goals, Expectations and Roles



Introduction

In July of 2003, the Minnesota Department of Transportation (Mn/DOT) and MetroGIS (a consortium of regional and local governments) formally agreed to collaborate on an ambitious project of sharing information about roads and highways. This document outlines the goals, expectations, and roles of this collaboration.

Goals

Primary Goal

The primary goal of this project is to encourage and enable both public and private data providers to share information about roads and highways, thereby gaining efficiency, improving the quality of individual data sets and enhancing public access to an overall transportation data solution.

As participants in MetroGIS, many data providers in the seven-county Minneapolis/St. Paul metropolitan area of Minnesota are already committed to a vision of sharing geographic information. For this project, primary data providers include Mn/DOT, the Metropolitan Council, county and local governments, and The Lawrence Group (TLG).

These providers will attempt to establish a **common linear datum** of road sections (via Mn/DOT's Location Data Manager project, or "LDM") that can be used to translate information from one data set to another, regardless of graphic representation. If the feasibility of this linear datum can be proven in the context of a pilot project, then the providers agree to buy into the system for at least the metro area, if not the entire state. The pilot project will focus on roads and highways information for one metropolitan area city or county.

Secondary Goals

A variety of secondary goals exist for both the collaboration and the project itself, including:

1. Improve the integration and interoperability of various street centerline data sets, primarily the Mn/DOT Basemap and The Lawrence Group data. This includes finding a solution that will allow the LDM to accommodate data on private roads that are hosted outside of Mn/DOT.
2. Establish common definitions for the attribution and segmentation of public roads, including divided highways and roads that cross address, street name and political boundaries. Draw on experience from national standards where appropriate.
3. Design a continuous-feedback system for stakeholders to suggest updates to the LDM, as well as updates to the road characteristics hosted by various data providers.
4. Provide a method to document the data sets and individual components of each data set, especially when multiple data providers contribute.
5. Identify those road and highway attributes that are of highest priority to the region's users, and solicit a commitment to maintain those attributes from the responsible data providers.

Expectations

Each participating organization expects that the other collaboration partners will fulfill their roles and responsibilities as outlined in the sections below. These sections may outline some duties that are currently outside of existing business *practices*, but the end result should be a much greater satisfaction of each organization's business *needs*.

A key component to the success of this collaboration is communication. No organization can perform its roles and responsibilities inside a vacuum. Each partner should be aware of the actions, progress, successes, and failures of the others, as well as any changes in scope that affect the entire project. Once a forum is provided to enhance this communication, each partner is expected to participate in it fully. Full participation will help track the progress of each partner and the group as a whole.

Roles and Responsibilities

Four organizations are currently invested in this project: MetroGIS, the Metropolitan Council, Mn/DOT, and The Lawrence Group. There is potential for more public agencies to become involved, such as county or local governments. Potential candidates for this role are Scott County, Ramsey County, Washington County, Minneapolis, Woodbury, or Maple Grove. Roles and responsibilities for each entity are described in this section.

MetroGIS

As the initiating organization in this collaboration, MetroGIS has the following roles:

1. Plan and schedule monthly technical meetings between Mn/DOT and MetroGIS participants. These meetings will be designed to work out technical issues surrounding the project. Plan and schedule additional technical meetings as needed.
2. Gather input about the data solution from the MetroGIS community – primarily regional, county, and local governments – in terms of its ability to satisfy their common business needs for accurate and current information on roads and highways. MetroGIS will communicate this input to the collaboration partners in a coherent and consistent fashion. Through this effort, MetroGIS hopes to ensure that the data solution meets the needs of the region's users.
3. Identify data providers or users (public or private) that may be able to contribute to the accuracy and completeness of the LDM, including changes to the linear datum, and updates to the road characteristics hosted by Mn/DOT. Once identified, these providers will be encouraged to work with Mn/DOT on providing this update information, and MetroGIS will assist in defining custodial roles and responsibilities.
4. With input from the MetroGIS community and Mn/DOT, help define a set of required data organization and documentation procedures for submitting updates to the LDM. Procedures should address:
 - Ideal format and structure for incorporating into Mn/DOT's datum
 - Technical capabilities of the typical data contributor
5. Provide a simple, instructional web page with LDM documentation and links to data providers who host roadway characteristics that are not supported by Mn/DOT, but are nevertheless linked to the LDM.

Metropolitan Council

As the primary sponsor and main staff support to MetroGIS, and a data client of both TLG and Mn/DOT, the Metropolitan Council will assume the following roles:

1. Support MetroGIS in the roles and responsibilities stated above.
2. Evaluate the data distributed by Mn/DOT for the pilot study area in terms of completeness and interoperability with the TranPlan regional forecasting model. Distribute the results of the evaluation to the other partners.
3. With the help of the other partners, determine a method of documenting multiple-source attributes and intersections in the LDM.
4. Provide communication tools, such as web forums and mailing lists, for the collaboration partners to keep each other up to date on the progress of the project.

Mn/DOT

As the primary data provider for statewide roads and highways data, Mn/DOT has the following roles in this collaboration:

1. Create and publish the LDM linear datum for a pilot study area in the metropolitan area. This includes identifying all road intersections (“Anchor Points”) and all public road segments between those intersections (“Anchor Sections”) with unique identifiers. Create and publish attributes associated with the Anchor Sections in the study area. Distribute this data to all collaboration partners for review.
2. Provide documentation on the data standards followed to produce the Anchor Segment network and associated attributes.
3. Define a mechanism for submitting updates to the LDM, including new or changed intersections and updates to the included road characteristics. Enable the other collaboration partners to submit updates¹.
4. Help MetroGIS define a set of required data organization and documentation procedures for submitting updates to the LDM.
5. Demonstrate the ability of the LDM to absorb changes from several sources, and provide an estimate of the turnaround time for updates.

The Lawrence Group

As the primary data provider for regional roads and highways data within the metropolitan area, The Lawrence Group has the following roles in this collaboration:

1. Evaluate the data distributed by Mn/DOT for the pilot study area (most likely a metro city) in terms of completeness and interoperability with TLG data. Determine the percentage of Anchor Segments in the pilot that line up with TLG road segments at a one-to-one relationship.
2. Assign Anchor Segment ID’s to those TLG road segments identified as a one-to-one relationship. Use remaining road segments to submit updates to the LDM where appropriate.
3. Provide to the other collaboration partners a subset of street centerline data for the pilot study area with Anchor Segment ID’s assigned.
4. Evaluate the workload associated with synchronizing TLG centerline data with the LDM, and determine whether or not the end product meets a business need of the company.

Local, County or Other Government Agency (1 or 2)

1. Evaluate the data distributed by Mn/DOT for the pilot study area in terms of completeness and interoperability with agency-owned data. Distribute the results of the evaluation to other partners. If the agency’s base street centerline data is not derived from Mn/DOT’s basemap or TLG’s street centerlines, then perform Anchor Segment designations similar to TLG.

¹ Initially, these updates will be manual, as the creation of this update mechanism is currently out of scope for Mn/DOT’s project. However, Mn/DOT is committed to providing such a mechanism in the long term.

2. Provide to Mn/DOT updates to the Anchor Segment network, and updates to characteristics hosted by Mn/DOT, such as traffic measurements on local streets. Understand that the data provided may be “rolled up” to meet Mn/DOT’s data definitions and formats.
3. Evaluate the workload associated with synchronizing local centerline data with the LDM, and determine whether or not the end product meets a business need of the agency.
4. Provide to the other collaboration partners an evaluation set of agency-owned graphic representations or characteristics that have been aligned with the LDM.

All Data Providers

All organizations that provide data to the LDM are responsible for defining and publishing the data collection standards and procedures they follow for any graphic representations and/or attributes they own. By publishing these standards and procedures, other users can contribute to the LDM’s accuracy and quality by checking and providing updates to the data, within the context and purpose for which that data was intended.

When a user submits a data update to a data provider, it is that data provider’s responsibility to incorporate that update into their data if possible. Communication between the user and the data provider is critical to building trust in this system.

All Data Users

All users of the LDM and its associated graphic representations and attributes are expected to read and understand the documentation of the system before using it. The flexibility and sharability of the system means that the data is inherently complex. This complexity requires that users are familiar with the system before it can be effectively implemented in a local transportation data solution.

One important concept for users to grasp is that the LDM Anchor Segments maintained by Mn/DOT are *not* permanently tied to a particular graphic representation. For example, Mn/DOT may use their 1:24,000 base street data to distribute a *representation* of the Anchor Segments for use in a traditional GIS. Users should understand that this is merely one graphic representation of the LDM, and that other, more accurate (and less accurate) representations can be used. The LDM system is much more than just the 1:24,000 base data that Mn/DOT has provided in the past.

Users that submit data updates to a data provider need to follow the standards and procedures defined by that provider. Users should understand that the data they put in might not necessarily be exactly what comes out in the next update. For example, if a user provides a September traffic count to Mn/DOT, this count will most likely be seasonally adjusted and rounded to fit the rest of Mn/DOT’s traffic data. The end product is a more accurate count, but it probably will not be the exact count submitted by the user.