7.4.2 Building An Enterprise Geodatabase for Transportation Planning and Modeling

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Geographic Information System is an integral part of the day-to-day planning activities for Puget Sound Regional Council (PSRC), the MPO for the Seattle region. As GIS technology is moving rapidly toward the object-relational geographic data model, PSRC decided to design and implement an enterprise geodatabase to integrate data from several applications. This paper will present these experiences and discuss major issues in building an Enterprise GIS infrastructure in support of transportation planning and modeling, which will also serve as the foundation for future plans of extending the geodatabase to encompass other applications as well as linkages to other agencies in the region.

The presentation will cover the design of the physical database, the implementation of the geodatabase model, the migration of transportation-oriented data features, and the development of GIS applications in support of the geodatabase. A Universal Modeling Language (UML) schema was produced to define data entities and their relationships that will fully accommodate the requirements of the travel demand forecasting model as well as the Transportation Improvement Projects (TIP) and Metropolitan Transportation Planning (MTP) applications. Three major applications were developed to facilitate the maintenance and application of the geodatabase: a Maintenance Application primarily for the GIS and database managers to manage the geometric network and project data; a General Use Mapping Application for non-GIS specialists who need a user friendly mapping interface to query and display projects and other business data; and a Model Preparation Application for the transportation modelers, which will convert the geometric network and projects data to EMME/2 format and vice versa. An implementation plan was also developed to specify the necessary IT infrastructure and other resources to enable the implementation and management of an enterprise system that allows multiple users simultaneous access at different privilege levels.