NYSDOT Task 2.A Extension

Transit Schedule Data Exchange Architecture (TSDEA)

SDP Guidance Documentation

EXECUTIVE OVERVIEW
Part 1

FINAL
Version 1.0

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By

ConSysTec Corp

Consensus Systems Technologies, Inc.

617-983-3364

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Revision Table

Filename	Version	Author	Comments
SDPGuidance_Part1_draft_v1.0	Draft 1.0	PEO	Initial Draft Version
SDPGuidance_Part1_draft_v1.1	Draft 1.1	PEO	Fixed typos
SDPGuidance_Part1_V1.0Final	1.0	PEO & LD	Final edit and formatting

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1. Overview

1.1. Purpose of Document

This SDP Guidance Document is intended to assist agency personnel in understanding the Schedule Data Profile and in understanding how to convert agency schedule information into SDP format to allow the efficient exchange of schedule information between agencies in the New York City region.

1.2. Document Structure and Objectives

This SDP Guidance Document is meant to serve users from Project Managers and Analysts to System Integrators and Application Developers. In order to meet the needs of this varied set of stakeholders, the document is divided into four high level sections as shown in Figure 1.

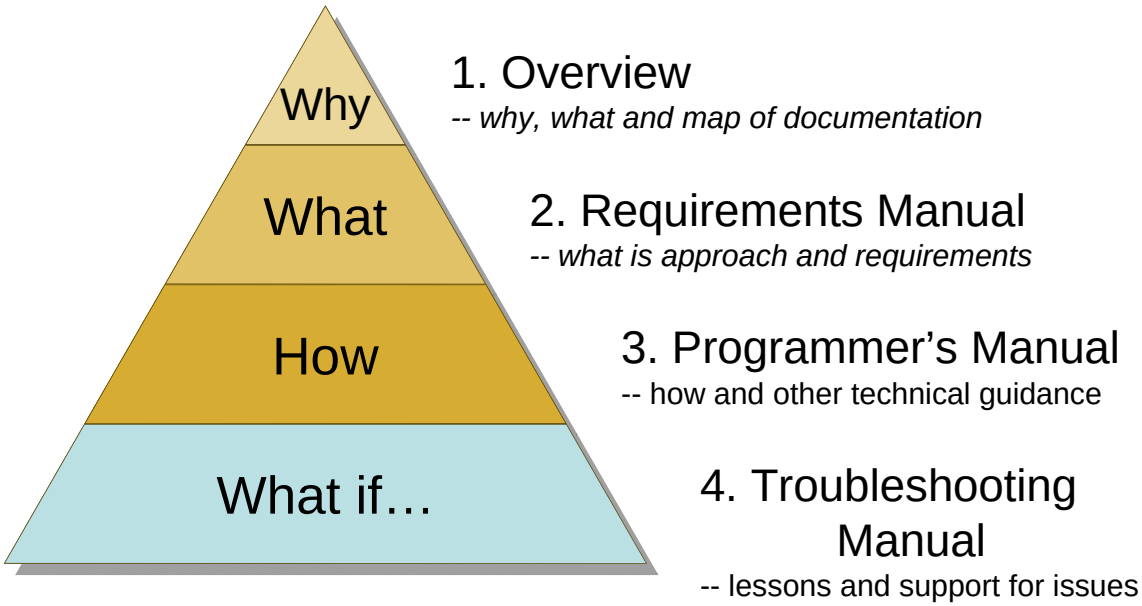


Figure 1: Structure of SDP Guidance Document

These sections will provide increasing level of detail in understanding SDP and performing conversion of agency data to this standardized format.

- Section 1 is intended for Program Managers, Analysts, Developers, and System Integrators. It provides an overview of SDP, including a high level overview of SDP model, as well as a discussion of resources and a glossary.
- Section 2 is intended for Analysts and provides a more detailed framework and approach for the SDP, as well as a summary of the requirements that drove the development of the SDP.
- Section 3 is intended for Application Developers. It includes the data mapping approach, detailed discussion of data model examples, transformations, algorithms, "cheat sheets" and modules, as well as implementation of Physical Model (with script) and XML validation.

- Section 4 is intended for System Integrators and Developers. It answers implementation questions, addresses integration issues (i.e., FAQ), and suggests solutions to commonly encountered problems.

2. Introduction

The goal of this Schedule Data Profile (SDP) overview provides a brief orientation to the Schedule Data Profile (SDP), including its purpose, history, the SDP's Data Model relationship to transit data, and how best to benefit from the SDP. This Overview section also discusses the Transit Schedule Data Exchange Architecture and its relationship to the SDP. Finally, the overview describes what resources or documentation exist that more fully describe these concepts.

2.1. What is the SDP?

The Schedule Data Profile, or SDP, is a data specification that describes operator generated schedule and related data. It is a key output of the New York State Department of Transportation's Transit Schedule Data Exchange Architecture (TSDEA)/SDP project to provide an efficient, standards-based, framework to assist the public transit providers in the Downstate region with managing and exchanging schedule data.

The SDP uses industry standards, best practices, and software tools such as XML, to describe and exchange transit schedule data in a standardized manner. Among the valuable components of the SDP are the development of standard terms and definitions pertaining to transit schedule data, the XML Schema and the Reference Data Model.

Although the TSDEA will store transit operator schedule data in a native XML or XML-enabled database management system, the SDP requirements are detailed using a relational database model as described in an entity relationship diagram (ERD). The purpose of the ERD is to enable a conceptual representation that other relational models (the more pervasive data storage method used by transit agencies and vendors) may use to reframe their data in order to convert it to the SDP format. The ERD also provides a robust method to validate logical consistency among data elements and data concepts. Many of the quality checks may be derived from the referential integrity relationships among ERD entities.

The purpose of the SDP is to facilitate the seamless exchange of *transit operator schedule data* throughout the region and State to improve operational efficiencies and meet downstream application requirements. The effort focused on collaboratively defining a framework, as well as tools for data development, conversion and exchange, to support regional multi-agency initiatives that use schedule data, including TRIPS123.

2.2. Who Should Use the SDP?

The SDP was designed to support the schedule data exchange needs of the transportation providers in the Downstate NY region. However, it can likely support schedule data exchange for many other transit agencies with minimal or no adjustments beyond those needed in the Downstate area.

2.3. What is the TSDEA?

The TSDEA is a framework for managing and exchanging schedule data through the deployment of the Transit Schedule Data Exchange Architecture. The TSDEA should be viewed as an engine that integrates regional transit data, providing consistent data across the region. It enables a scalable, modular, computing framework to deploy regional transit business services.

The TSDEA uses recognized IT standards, existing NYSDOT and regional IT infrastructure, and IT best practices to specify web services and exchange methods (e.g., message protocols, file transfers) that use the SDP. Elements of the TSDEA have been prototyped as part of this project. Lessons learned in this prototype effort will be incorporated in the Statewide Deployment Plan, which will be a high level plan for the deployment of TSDEA. Tools to enable the development of services, and representative "mini" applications were also developed to demonstrate the approach. Application examples include the Dynamic Timetable Generator and TriMet's Timetable Publisher applications.

The TSDEA can be modified to support additional transit data sets, beyond the schedule data, such as transit infrastructure data, interagency transfer and connection data and other key transit data sets. More information on the TSDEA can be found in the Concept of Operations. Additional information regarding deployment of the TSDEA will be found in the Statewide Deployment Plan which is under development.

2.4. TSDEA/ SDP Background

Need for the TSDEA/SDP Project

Transit schedule data serves a wide range of applications. Transit staff, transit customers and transit IT/ITS systems rely on schedule data for a variety of decisions and purposes. On-board and train tracking applications use schedule data to monitor performance and provide en-route traveler information. Fleet management, executive decision support, service and operations planning also use scheduling data to meet their objectives. Travelers seek instant, comprehensive, readily available information about transit products and services.

For years, the transit industry has faced a universal obstacle to quickly and easily use schedule data in a wide range of regional and internal applications. The primary obstacle has been the complexity and lack of standardization in the definition, organization and exchange of schedule data between applications that produce schedules and those that use schedules as a core element of their function.

The lack of a well designed, consistent approach to schedule data creation, management and exchange can provide frustrating limitations on how far transit management and customer information initiatives can go toward increasing efficiencies, and improving customer satisfaction. Some examples of how the absence of a plan and tools to support data exchange can impact an organization are included below:

- Higher expenses can occur that are associated with the ongoing development and maintenance of custom data interfaces to support the exchange of data between vendor products.

- Inflexible or non-responsive systems or data structures may limit the ability to view, analyze or portray schedule information in a manner that best fits a given function or request.
- The lack of an enterprise approach to schedule data management can result in redundant data entry when supporting multiple systems.
- Extra time is spent on repetitive redesign or customization of data and systems in response to each new application (within the organization and to support regional systems) that requires schedule data.
- Regional data sharing is difficult or impossible to support customers traveling between regions or service providers.

The New York State Department of Transportation realized the need for a new approach and tools for more effectively sharing schedule data in the New York area. The region needed a less cumbersome and resource intensive approach to sharing data. In addition, there was a goal to better meet the rising expectations among transit customers that information and travel should be seamless between and among transit services provided by multiple agencies.

Project Approach

The project consisted of developing a Schedule Data Profile and describing and demonstrating a Transit Schedule Data Exchange Architecture which validated the SDP requirements. The TSDEA and the supporting SDP were developed using a system engineering process that included an assessment of the existing and planned ITS Architectures in the Downstate NY region.

The transit agencies in the Downstate NY region actively participated in the project, helping develop requirements and set priorities. Their collaborative and extremely helpful participation was instrumental in developing a Schedule Data Reference Model and SDP for the region.

These functional requirements were derived from several sources. In developing the Functional Requirements document, the authors attempted to guide the requirements development process by the best practices for representing transit schedule and related data. The primary sources that drove the requirements are the authoritative source data and business practices of regional stakeholders. Additional data requirements emerged from the SDP Concept of Operations and Use Case processes. Finally, other important sources include documents from the information technology and transit industries that were developed by professionals who contributed to key specification and standard activities both in the United States and internationally.

In addition to meeting the high level requirements identified in the Concept of Operations, Use Cases and regional ITS architecture subsystems and architecture flows, the Schedule Data Profile functional requirements met a set of objectives or guiding principles, which may be seen as best practices in the information technology world. The objectives include developing the SDP to:

- Represent schedule data concepts in an unambiguous and logically consistent manner.
- Ensure that submitted data sets are complete, accurate, and semantically equivalent from organization to organization.
- Provide a facility to ensure data consistency across the region.

- Be maintainable as a living document, which adapts to new regional requirements as they emerge.

2.5. Stakeholders

The SDP was developed in coordination with NYSDOT and the transit operators in the downstate region of New York State. The "Downstate" region of New York State was the focus of the initial phase of the TSDEA development given the extent and multi-agency nature of its transit services. The transit service options in this region provided the greatest opportunity for testing and demonstrating the benefits of coordination.

The transit carriers that participated in the development of the SDP included:

- NYC Transit (Subway and Bus)
- Long Island Rail Road
- Metro North Railroad
- Long Island Bus
- Coach USA
- Westchester (Bee-Line Bus)
- Suffolk Transit – Huntington
- Transport of Rockland – Tappanzee Express – Municipal Services
- Dutchess County Loop – City of Poughkeepsie Bus -Leprechaun
- Orange County - Newburgh Beacon - Middletown Transit
- Putnam Area Rapid Transit
- Long Beach Transit (Nassau)

Other organizations that provide services to the New York region and also participated in the project included:

- New York State DOT
- MTA Headquarters
- Transcom
- New Jersey Transit
- Connecticut Transit

The stakeholders may be schedule data providers and/or consumers. NJ Transit and Connecticut Transit are providers, while MTA Headquarters and Transcom are consumers of transit schedule data. While this effort was focused on Downstate stakeholders the intent is to adapt the results for use by other transit agencies in the state.

3. Overview of SDP Model

The Schedule Data Profile consists of scheduling and related data that help describe a schedule. The scheduling elements are constrained to those elements needed for public information dissemination (e.g., timetable and trip planning functions), regional coordination and planning activities. In particular, operator and track management functions are ***excluded*** from the current representation of regional schedule exchange. However, data concepts related to transit facilities and their location information are included in the scope of the SDP model.

Typology Used to Partition the SDP Model
Partition of a domain enables the organization of key ideas into smaller, less complex concepts. The SDP model partitioning adopted an abstract model using the following categories: definition, place, network and temporal elements. Specifically, places reference real-world locations, networks are made up of places, temporal services traverse the networks. All these data sets are organized and catalogued by organization. These translated into four categories:

- Definition: General Agency Information
- Network: Transportation Network
- Place: Transit Feature Gazetteer and Transit Facilities
- Temporal: Service Provision

Due to the complexity of transit "places," the "Place" category was divided into two—Facilities and Features (other than Facilities). Finally, the last category (though not included in the SDP model) is the transportation network, a representation of the real-world network referenced by transit network and services. These categories are illustrated in Figure 2 below.

The partitioning helps distinguish different types of information the SDP must support. Building these separate blocks of information will eventually support maintenance of the SDP models. Transit agencies update different types of information at different frequencies; additionally, various data sets require maintenance at different times. Partitioning the SDP Model into discrete logical categories identify the strong and weak relationships among the various scheduling elements. Elements within the same category are strongly related, and data in another category may be weakly related. By separating the model element, implementation alternatives enable mitigating the impact of supporting key requirements such as updating a subset of data at various frequencies.

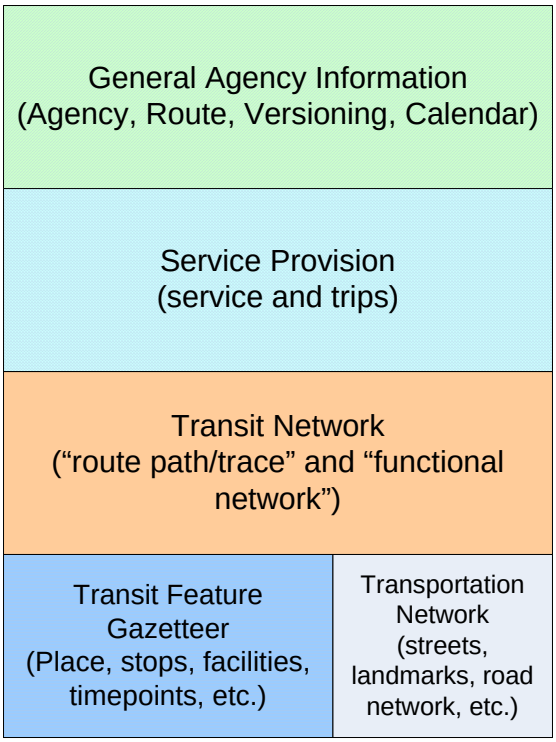
Description of SDP Categories
The categories used to partition the SDP are described below.

General Agency Information: This category describes general information related to the agency that registers the information and the information that is registered. To this end, this section includes information on the agency, schedule version and revisions, organization that submitted the data or is referred to by the data set content.

Service Provision: This category provides information on the service provided by an agency or organization unit of an agency. The scheduling elements include information on trips and trip times, scheduling notes, and bus assignment schedules.

Transit Network: This category describes the route path traversed by transit service. The network is composed of transit paths called patterns. Events occur on each pattern, and patterns may be composed of segments, often called route segments or timepoint intervals (TPI).

Transit Feature Gazetteer: This category defines places and their location. In particular, the partition includes an element which aggregates all location references. This table provides for mapping different places to the same location, and pointing locations to *equivalent* locations (which may be described using a different location referencing system). Other transit features such as timepoints and transfer locations are also included in this category.



Legend
Light Green (right diagonal) = agency description
Light Turquoise (check) = service provision
Tan = transit network (transit features)
Pale Blue (horizontal stripes) = transit feature gazetteer
Grey = transportation network

Figure 2: Partition of SDP Domain

Transit Facilities: This category includes all plant components related to a transit facility. The category includes the inventories for transit facilities, transit stops, amenities, portals, passenger access elements and tracks (associated with a transit facility). Due to the complex nature of key New York City transit facilities like Port Authority Bus Terminal, Jamaica Station and Pennsylvania Station in New York, the model enables a facility to be part of another facility.

An overview of the SDP XML Schema organization is shown in Figure 3. Additional documentation of this SDP model information is discussed in Section 1.6.

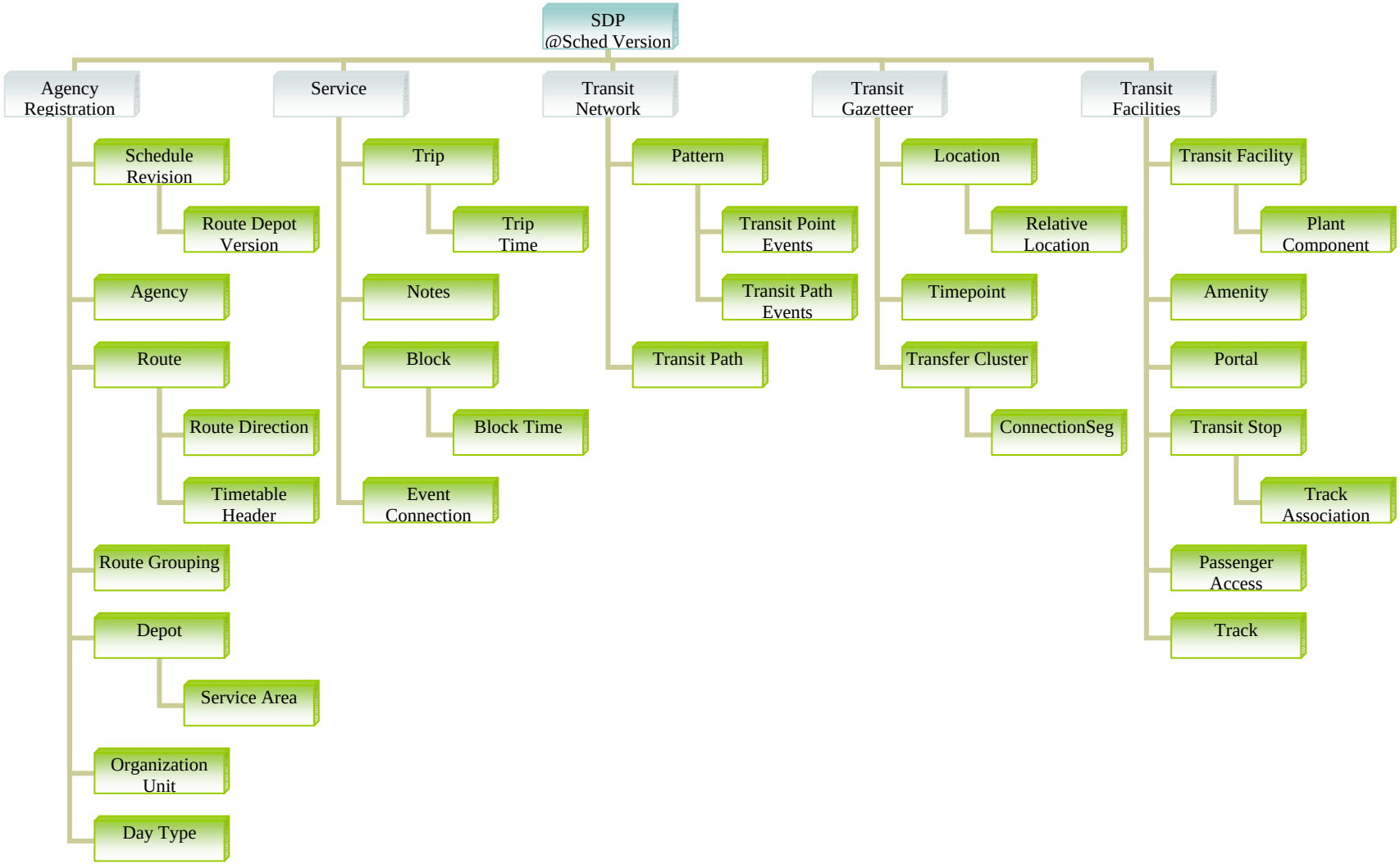


Figure 3: SDP XML Schema Organization

4. Realizing Benefits From Implementation of SDP

The SDP can benefit transit agencies in a variety of ways, but it is even more valuable when it is coupled with a transit agency-wide or enterprise-wide data management approach.

This section discusses some of the steps that can be taken by transit managers, project managers and information technology staff to help ensure the potential benefits of the SDP are realized.

4.1. Data is a Transit Asset

Data, such as schedule and related data, is an important transit asset that requires time and money to develop or acquire. It is a vital component of a transit agency's technology and information systems infrastructure. Like other more physical assets, such as vehicles, resources should be expended to preserve and maintain data assets.

Also like transit vehicles, transit data benefits from standards and an agency-wide approach to the procurement and maintenance of it. A transit agency does not prefer to buy 10 different kinds of buses, each requiring special parts, maintenance procedures and training of maintenance staff. Most economies of scale are lost in this scenario. Similarly, data acquisition, maintenance, use and sharing efforts benefit from consistent standards and definitions, sound error checking and test procedures, non-redundant maintenance and easy, commonly understood procedures for accessing, using and sharing the data.

4.2. Transit Performance and Benefits With an Enterprise-wide Approach

Performance within transit is affected by the availability of technology elements such as an enterprise-wide database and data management approach, widely accessible core data, adequate documentation, and standards. The SDP provides some of the needed standards and a mechanism for more easily sharing data. These elements, and others, affect the following:

- The ability of a transit agency to implement information systems and applications,
- The amount of time spent updating data, troubleshooting data errors, identifying missing data and resolving data inconsistencies between different data sources,
- The level of effort required to access and share data with other applications or agencies,
- The amount of time required to complete data analyses,
- The type and quality of the analyses, and
- The skill levels of the staff needed to do the work.

The SDP can provide additional benefits to the transit agency, beyond exporting data to regional applications. The SDP can facilitate the development of an agency-wide database and data management approach. The SDP Data Model is particularly helpful to transit agencies when systems are enhanced or new systems are being implemented. The Data

Model, XML Schema, common regional data definitions and other documentation can help in the early identification of data issues and options, and can help avoid inadvertent barriers to future data sharing and analyses. If vendors and consultants are aware of the SDP before bidding on projects that involve schedule-related data, it is possible to achieve some cost savings, minimize change orders and avoid problems.

4.3. Role of Transit Management

In order to gain benefits from the TSDEA/SDP effort, leverage internal investments in transit data, and build an effective enterprise-wide approach to data management, key roles of the transit management team are to:

- Ensure the creation of a vision of an enterprise-wide data management approach.
- Communicate agency goals and champion the vision of an integrated, agency-wide or enterprise-wide approach for developing transit data and information technology solutions.
- Promote the use of standards, the SDP Data Model and the SDP XML Schema.
- Foster consideration of regional partners and their needs.
- Provide support for budget and training needed by staff, contractors, consultants on the SDP and your agency's enterprise-wide data management approach.
- Help create more effective technology procurements.
- Provide ongoing oversight and other needed support.

An enterprise-wide data management approach and some of these roles are discussed in more detail below.

4.3.1. Create an Enterprise-wide Approach

Transit managers can save data, system and maintenance costs by promoting an enterprise-wide approach to data and systems. This agency-wide or enterprise-wide approach should be compatible with regional efforts such as the SDP. By looking at datasets and technology projects across an agency, redundant development and maintenance costs can be eliminated, inconsistencies avoided and systems interfaces can be simplified. For example, it is not effective to have staff who are responsible for service planning, customer service and operations all acquiring and maintaining their own separate and independent databases and route networks.

An industry "best practice" is to define data used by many groups as agency-wide "core data." Core data, such as the scheduling data, street network, Bus Stop Inventory and routes, should be developed once and maintained without redundant updating. Some of these datasets may be maintained regionally. There should only be ONE authoritative set of core data for the agency. A long-term goal would be to have seamless data exchange between internal groups and systems.

Managers can support an enterprise-wide approach by:

- Consistently communicating a vision and expectation of integrated data and systems.
- Voicing the agency's general needs, in addition to project-specific needs.
- Helping break down barriers between transit business areas and encouraging collaboration (create incentives and remove disincentives).

- Supporting general technology improvements such as the SDP and TSDEA and a standards based approach across projects.
- Encouraging staff to manage and validate data at the agency-level so regional sources are consistent with agency data. This approach is more efficient and saves passing the data and error messages back and forth, since agency staff members know the data and agency needs the best.
- Providing direction to staff to produce and maintain one "core" set of commonly used transit data, such as scheduling data, which can be distributed to other business applications and information systems for use. The other areas or systems that receive the "core" data may need to enhance or customize the data further for their application, but agency-wide savings are still achieved by building on a common, core dataset.

4.3.2. Budget to Protect Investments

Management support of the information technology and training budgets can help ensure that long-term operations and maintenance (O & M) needs are met and that agency investments in data are protected. The capital and operating budgets both provide opportunities to leverage the SDP efforts, protect technology and data investments and minimize ongoing operating costs for data management.

Managers help protect data and technology investments, and improve data quality by:

- Allocating resources to **general** data infrastructure sub-tasks or projects, as needed, which will improve the long-term cost effectiveness of business-area-specific projects (e.g., support efforts to implement new standards and procedures pertaining to the SDP and TSDEA, and support efforts to create an enterprise-wide approach to core transit data).
- Setting expectations for coordinating projects both internally and externally to leverage project budgets. Check with NYSDOT for new opportunities provided by the SDP and TSDEA.

4.3.3. Create More Effective Technology Procurements

Effective IT and ITS procurements can help the transit agency capitalize on the investments in the SDP and avoid redundant data, systems and processes. Management can increase the effectiveness of procurement efforts by:

- Requiring RFPs and contracts to reflect consistent data standards and interface requirements (e.g. the SDP).
- Requiring intellectual property rights in contracts that allow easy, inexpensive data sharing.
- Including evaluation criteria in the RFP that grade the ability of the potential vendors/consultants to deliver data that are easy to maintain and integrate**.**

4.3.4. Provide for Education and Training

The SDP Data Model and SDP Schema can facilitate the sharing of schedule data with the agency and region. In order to minimize costly system/data redundancies, knowledge is required of the SDP's capabilities and how to use it. A poor decision by inadequately informed staff during a project development phase can be more costly than providing training.

4.3.5. Provide Ongoing Management Oversight and Support

Management support of data standards and technology projects is critical. When project and technical staff are assigned to discrete projects, those projects rightfully become their focus. Management needs to provide the **ongoing** vision, goals and support for the broader, long-term agency goals. Those broader agency goals may require additional tasks or budget be added to a specific project in the short-term, to save and benefit in the long-term.

Managers can provide ongoing oversight and support by:

- Asking questions (e.g., Is the project team aware of the SDP Data Model and Schema? Can you identify ways to further lower operations and maintenance costs through better data integration and validity checking?)
- Reiterating broader agency goals (i.e., data integration or resource savings through the use of the SDP Data Model and Schema).
- Helping to resolve competing priorities among different transit business functions or technology projects.

4.4. Role of Project Managers and Information Technology Staff

Project managers and information technology staff have numerous ways they can support both their discrete project assignments and their agency's ongoing transition to an enterprise-wide data management approach. In addition to supporting the general roles of transit management in moving to an enterprise-wide approach, project managers and IT staff can also:

- Refer to the SDP Data Model and SDP Schema documentation when implementing changes to existing systems or developing new transit technology systems.
- Develop and follow policies and procedures that perpetuate an enterprise-wide data management approach.
- Identify areas for improvement that perpetuate data inconsistencies, create time-consuming data troubleshooting and data reconciliation efforts, and/or redundant data maintenance.
- Support the operation of Data Committees to educate others on data requirements and to resolve agency data issues.
- Remember to periodically look beyond the current project to the general, agency-wide long-term good of the transit agency (from both a capital expenditure and ongoing maintenance perspective).
- Help ensure the implementation of an effective update and maintenance approach for transit data that is used by many transit groups and/or systems. Key elements of an

effective update and maintenance approach are described in more detail in the following section.

4.5. Implement an Effective Update and Maintenance Approach

An effective data update and maintenance approach avoids redundant and potentially contradictory data development and maintenance efforts. It also results in high quality, valid and reliable data. Data inconsistencies can be minimized or eliminated, both internally to the transit agency, and between the transit agency data sources and regional data sources.

In addition to the guidance given above for helping implement an enterprise-wide data management approach, project and technical staff can improve the data maintenance process by the following:

- Using the regional definitions for scheduling related data whenever possible. A long-term transition plan to regionally consistent definitions should be considered, but is not required.
- Use the SDP Data Model and SDP XML Schema when developing requirements.
- Error check and validate the data before sending it to internal and regional applications via the SDP:
  - Check for missing data, illogical and inconsistent data
  - Consider using more than one XML Validator
  - Develop procedures for handling common data issues
- Begin eliminating the practice of using inconsistent data identifiers that differ among data sets or data versions.
- Map the scheduling related data to the SDP and develop tools to automate the mapping.
- Support the testing and improvement of the SDP and it will provide a data sharing mechanism between existing and new applications.
- Stay informed on changes and improvements to the SDP and incorporate them as appropriate.

5. Documentation Available

In addition to this SDP Guidance document, a wide range of tools, documentation and other materials are available on the SDP and the TSDEA. The documentation is designed to have both general and more detailed technical explanations. The documentation identified below can be found on the TSDEA website at:
http://www.consystec.com/tsdea/rstwg/docs.html

Requirements Documentation

- **Concept of Operations for the Schedule Data Profile**. The purpose of the Concept of Operations is to provide the project's stakeholders with a view of how the SDP and TSDEA will function and be used by the transportation organizations. The Concept of Operations is a tool to facilitate discussion and understanding of the SDP and TSDEA. It provides an overview of the environment in which the SDP and TSDEA will operate, defines the stakeholders and their roles and describes the

operational scenarios that will drive the technical requirements. In addition, it discusses important operational issues and considerations.

- **Function Requirements for the Schedule Data Profile.** The Functional Requirements are composed of a concise set of statements pertaining to the configuration, organization, data and maintenance issues that support the Concept of Operations and the downstream application needs as described in the Use Case scenarios. The major requirements relate to the data, information organization, business rules for describing data, and quality checks to ensure semantic conformance and referential integrity (correct relationships among data concepts). Other requirements deal with the SDP Schema requirements and SDP documents (operator submitted source data).

White Papers

- White Paper 1: Transit Stop and Facility Data Concept (v1.1)
- White Paper 2: Agency Naming Conventions—The TSDEA and SDP require a formal means of identifying public and private transport operators and other key stakeholders. This technical white paper discusses two approaches for Organization Naming and Identifiers.
- White Paper 3: Location Referencing in the SDP—This white paper identifies some of the issues associated with referencing location that affect transit agencies and recommends that a "Place-Name" or Transit Gazetteer approach be used to manage the location of transit features.
- White Paper 4: Schedule Version (draft)
- White Paper 5: Data Integrity Checks - Version 0.4
- Business Rules Section of the Requirements Document for Agency, Route, Trip/Train Transit Gazetteer, Transit Stop/Facility, Time Point - NEW
- White Paper 6: ITS Standards and the TSDEA
- White Paper: SDP XML Schema Organization - Version 0.4 (Uploaded June 22, 2006)
- White Paper: SDP Metadata XML Schema - Version 0.1
- Appendix A: XML Schema for Domain and Code Types

SDP XML Schema

- SDP XML Schema – Final (Published May 23, 2008)
- SDP_XML_Schema_V1_0.zip - Published May 23, 2008 (FINAL Version 1_0: SDP Schema files and Sample XML Document)

Schedule Calendar Date (SCD) XML Schema

- SCD XML Schema – Final (Published May 23, 2008)
- SCD_XML_Schema_V1_0.zip - Published May 23, 2008 (Schedule Calendar Date Schema files and Sample XML Document)

SDP Detailed Examples

Detailed examples of various transit entities described in the SDP format.

- Schedule Calendar Date and "Special Day" Business Rules and Recommended Practices - Published May 1, 2007
- Transit Stop/Facility Examples (6M) - Published November 16, 2006
- SDP Instance Guidance Examples - Published September 28, 2006 - Example descriptions of SDP data concepts.

SDP Quick Start Guidance
A web document that provides simple, streamlined help in creating an SDP XML Document is the SDP Quick Start guidance. It may be found at: http://www.consystec.com/tsdea/rstwg/SDP_QS_web.htm.

6. Acronym List

Acronym	Definition
CSV	Comma Separated Values
DBMS	Database Management System
DTD	Document Type Definitions
ER Model	Entity-Relationship Model
ERD	Entity-Relationship Diagram
FTP	File Transfer Protocol
GML	Geography Markup Language
HTML	Hypertext Mark-up Language
IT	Information Technology
NYCT	New York City Transit
OGC	Open Geospatial Consortium
PI	Passenger Information
RSTWG	Regional Stakeholder Technical Working Group
RTIF	Rapid Timetable Interchange Format
SDP	Schedule Data Profile
STIF	Surface Timetable Interchange Format
TSDEA	Transit Schedule Data Exchange Architecture
URL	Universal Reference Locator
WDMS	Web Data Maintenance System
XML	Extensible Mark-up Language