5. ASSETS AND NEEDS METHODOLOGY

This report provides asset and need information for highways miles and number of bridges, intelligent transportation systems, freight rail track and ownership, passenger rail stations, public ports, locks, and public airports in the DRA region. Identifying and collecting multimodal transportation assets and needs required continual coordination between federal, regional, state, and local agencies. This section of the report provides an overview and methodology used to collect the multimodal transportation assets and needs.

5.1 Modal Asset Methodology

Based on the asset collection process discussed in this chapter, **Figure 1** shows the multimodal transportation assets in the DRA region. The CD that accompanies this report provides additional multimodal transportation maps for each of the eight states, as well as assets and needs for each mode.

Figure 1: Multimodal Transportation Assets

5.1.1 Highways and Bridges

Highways and bridges are the life blood of the transportation system. There are 230,396 miles of roadways and 44,538 bridges in the DRA region, as certified by each of the eight state DOTs. This transportation network serves international, regional, and local markets and provides an efficient way of moving people and goods. The following provides the databases used to collect highway and bridge assets in the DRA region and the general process of collecting and certifying the highway and bridge assets in the DRA region.

I-10 over the Mississippi River in Baton Rouge, Louisiana

5.1.1.1 Methodology

All highway and bridge assets in the DRA region were initially identified through databases maintained by FHWA and then certified by each of the eight state DOTs. The following provides a description of each of the databases.

Highways – The National Transportation Atlas Databases 2007 (NTAD2007) is a set of nationwide geographic databases of transportation facilities, transportation networks, and associated infrastructure. These datasets include spatial information for transportation modal networks and intermodal terminals, as well as the related attribute information for these features. NTAD2007 is the result of cooperation throughout the U.S. Department of Transportation, the U.S. Army Corps of Engineers, the U.S. Bureau of the Census, the Environmental Protection Agency, the Surface Deployment and Distribution Command - Transportation Engineering Agency (SDDCTEA) and the National Park Service. NTAD2007 provided asset information for the following transportation modes and/or infrastructure:

National Highway Planning Network (NHPN) – The National Highway Planning Network is a comprehensive network database of the nation's major highway system. It consists of the nation's highways comprised of Rural Arterials, Urban Principal Arterials and all National Highway System routes. The data set covers the 48 contiguous states plus the District of Columbia, Alaska, Hawaii, and Puerto Rico. The data is maintained by the Federal Highway Administration (FHWA), 2006.

Highway Performance Monitoring System (HPMS) – The HPMS provides data that reflects the extent, condition, performance, use, and operating characteristics of the nation's highways. The HPMS database was used to identify the center line miles of roadway by area type (urban or rural) and functional classification in the DRA region for each of the eight states. HPMS is maintained by state Departments of Transportation and submitted to the Federal Highway Administration, 2006.

Weigh in Motion Stations – The data included in the GIS Traffic Stations Version database have been assimilated from station description files provided by FHWA for Weigh-in-Motion (WIM) stations, and Automatic Traffic Recorders (ATR). Location referencing information was derived from the National Highway Planning Network version 4.0 and state departments of transportation. The attributes on the point elements of the database have come from two primary sources, the Station Description Records and the National Highway Planning Network's Linear Referencing System.

Bridges – The NTAD2007 does not provide data on bridges. To identify bridge assets in the DRA region, the 2006 National Bridge Inventory (NBI) was used and each state verified the number of bridges in the DRA region. The U.S. Department of Transportation's Federal Highway Administration National Bridge Inventory database lists structural evaluations and codes for all bridges in the United States. This data was used to identify the number of bridges by functional classification in each DRA state.

5.1.1.2 Asset Information

The highway and bridge asset information gathered during the data collection process and provided for each of the eight state DOTs includes the following information.

Roadway Miles by Functional Classification – Using the 2006 HPMS database, roadway miles in the DRA region for each of the eight states were collected for rural and urban areas and segmented by functional classification. Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of traffic service the roadway is intended to provide. There are five highway functional classifications: Interstates, Freeway/Expressways, Arterials, Collectors, and Local Roads. All streets and highways are grouped into one of these classes, depending on the character of the traffic (i.e., local or long distance) and the degree of land access the roadway allows. Each of the eight state DOTs provided a letter certifying the roadway miles by functional classification and all letters are provided in **Appendix B**.

Roadway Miles by Ownership Type – Using the HPMS database, roadway miles by ownership were determined. Ownership identifies who is responsible for maintaining the roadway. The four ownership categories used were federal, state, county/local/municipality, or other. Each of the eight state DOTs provided a letter certifying the roadway miles by ownership.

Delta Development Highway System – Based on the report released in February 2007 by the DRA, the DDHS totals 3,843 miles of roadways throughout the region and the estimated cost to complete planned improvement projects on these roads totals $18.5 billion.

Number of Bridges by Functional Classification – Using the 2006 NBI database, the number of bridges in the DRA region for each of the eight states were collected for rural and urban areas and segmented by functional classification. Each of the eight state DOTs provided a letter certifying the number of bridges by functional classification.

National Highway System (NHS) – The National Highway System (NHS) in the DRA region comprises of approximately 8,530 miles of roadway, which includes the Interstate Highway System, as well as other roads, which are important to the nation's economy, defense, and mobility. The NHS was developed by the U.S. Department of Transportation in cooperation with the states, local officials, and metropolitan planning organizations (MPOs). Each of the eight state DOTs provided a letter certifying the NHS miles.

The NHS includes the following subsystems of roadways:

- **Interstates:** The Eisenhower Interstate System of highways retains its separate identity within the NHS.
- **Other Principal Arterials:** These are highways in rural and urban areas that provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.
- **Strategic Highway Network (STRAHNET):** This is a network of highways that are important to the United States' strategic defense policy and that provide defense access, continuity and emergency capabilities for defense purposes.
- **Major Strategic Highway Network Connectors:** These are highways that provide access between major military installations and highways that are part of the Strategic Highway Network.
- **Intermodal Connectors:** These highways provide access between major intermodal facilities and the other four subsystems making up the National Highway System.

Strategic Highway Network (STRAHNET) – This network of highways is important to the U.S. strategic defense policy and provides defense access, continuity and emergency capabilities for defense related purposes. Each of the eight state DOTs provided a letter certifying the number of STRAHNET miles, which total 3,129 miles in the DRA region.

Weigh Stations - Most states collect taxes based on the weight of transported goods. Truck weigh stations are used for these tax purposes, as well as to monitor the weight of a truck to ensure that it falls within the safety guidelines that each state has in place for its road system. Each of the eight state DOTs provided a letter certifying the number of weigh stations.

Rest Areas - To enhance traveler safety and comfort, state DOTs, maintain a system of rest areas on highways throughout the DRA region. Amenities at these rest areas vary, but the most common include parking, rest rooms, picnic areas, and visitor information. Each of the eight state DOTs provided a letter certifying the number of rest areas and welcome centers.

Missouri Highway 34 and Illinois Highway 146 bridge over the Mississippi River in Cape Girardeau, Missouri

US 60/US 62 bridge over the Mississippi River from Cairo, Illinois to Missouri

5.1.2 Intelligent Transportation Systems

Like other regions across the U.S., many urban areas in the DRA region are facing a growing congestion problem. Growth in traffic volumes in many regions is outpacing new road construction, resulting in more vehicles trying to squeeze into less space. Adding lane capacity and building new highways has traditionally been the remedy for congestion. However, an alternative to traditional capacity-adding projects is integrating Intelligent Transportation Systems solutions to improve traffic operations on existing roadways and enhance public transportation services. Capital infrastructure such as roadways, intermodal ports, airports, and transit facilities are extremely vital components of the transportation system in the DRA region. In order to manage these resources more efficiently, ITS solutions are being deployed throughout the region by state DOTs, as well as larger cities.

5.1.2.1 Methodology

The ITS assets included in the DRA assets inventory were gathered directly from the ITS managers from each of the eight state DOTs and the city engineers from each city in the DRA region with an ITS infrastructure currently in place. This information was gathered through an on-line internet survey and by contacting each stakeholder individually by phone and email.

5.1.2.2 Asset Information

The following ITS asset information was gathered during the data collection process from each of the 12 ITS providers in the DRA region:

Number of Weigh-In-Motion truck scales – Usually placed along interstate routes to capture and record truck axle weights and gross vehicle weights as the truck drives over a sensor.

ITS Traffic Management Centers (state and city) – The TMC is the hub of a transportation management system. This is where real time information about traffic conditions is gathered and using ITS assets, it allows engineers to identify incidents to more effectively manage traffic flow and reduce congestion in a timely manner.

Fiber optic cable – In ground cable used to link traffic signals, cameras, and message signs to the traffic management center.

Interconnected traffic signal systems – Traffic signals connected and working together to improve traffic flow through high volume, congested areas.

Closed Circuit Television (CCTV) Cameras – Cameras used for traffic surveillance along roadways and at intersections.

Dynamic Message Signs – Electronic traffic signs used on roadways to give travelers updated information and warnings on traffic congestion, construction zones, accidents, weather information, and any required actions to perform.

Availability of roadway weather information – Weather information available to travelers by means of dynamic message signs, radio, phone, or internet service.

Highway Advisory Radio – Low power AM radio stations set up by state or local transportation departments to provide bulletins to motorists and other travelers regarding traffic and other delays.

Availability of toll free cellular information to travelers – The 511 service designated by the FCC as the single 3-digit traffic information telephone number to be made available to states and local jurisdictions as a means of enhancing mobility and improving safety on roadways.

Travel information websites – Websites offering updated information on traffic conditions, construction zones, accidents, weather conditions, etc.

5.1.3 Freight Rail

Freight rail plays a critical role in the DRA transportation system. While this transportation mode is predominantly private, millions of tons of goods use rail to transport goods to and from market. Intercity passenger rail, AMTRAK, use the same tracks for moving passengers. There are currently 9,674 miles of track in the DRA region and 7,228 miles are Class I, 190 miles are Class II and 2,256 miles are Class III.

Class I train traveling parallel to the Mississippi River under the I-57 bridge in southern Illinois.

5.1.3.1 Methodology

The majority of the DRA railroad geography and quantification of assets came from the National Transportation Atlas Databases 2007 (NTAD2007). The NTAD2007 is a

nationwide geographic dataset that has been collected from various sources by the U.S. Department of Transportation - Research and Innovative Technology Administration, Bureau of Transportation Statistics. Specifically, the NTAD2007 sites its source for rail as data obtained from the Federal Railroad Administration (FRA).

During the first round of state meetings throughout the DRA region, several abandoned tracks were identified. To ensure active rail track was identified, the DRA freight rail database was updated by reviewing markups from individual state maps. This phase primarily involved the removal of abandoned lines, identifying line owners/operators, and documenting other rail line attributes (trackage rights, density range, signal system). The primary source for this information was the "North American Railroad Map" Version 3.0.

Discrepancies between the DRA database and North American Railroad Map, primarily line status and Class III railroad names, were cross-referenced with other sources such as individual state rail plans, Association of American Railroad (AAR) data or through internet research. For any remaining discrepancies, priority was given to the state maps and any changes were documented.

Using the state maps as the primary source, rail within the DRA region was then classified into Class I, Class II, or Class III rail. A "CLASS" field was created in the database and attributed accordingly. The next process involved calculating the total rail mileage based on the existing "MILES" field. The total mileage was then broken down by state and class.

Calculating total rail mileage by state or by railroad results in a closer approximation of total "track miles." Track miles, in addition to accounting for track right-of-way mileage, also takes into account rail sidings and yard trackage. Track mileage is greater than the "route mileage," which measures rail lines from endpoint to endpoint.

Intermodal Terminal Facilities are also included in the freight rail asset documents. Intermodal facility data was provided by the National Transportation Atlas Databases 2007 (NTAD2007), which is a set of nationwide geographic databases of transportation facilities, transportation networks, and associated infrastructure. The public database consists of four tables. One of the tables is a spatial table: FACILITY. The three other tables consist of attribute data for the database: SHIPMENT, COMMODITY, and DIRECTION.

5.1.3.2 Asset Information

The following freight rail asset information was gathered during the data collection process and provided for each of the eight state DOTs includes the following information.

Class I Railroad – A Class I railroad in the U.S. is one of the largest freight railroad, as classified based on operating revenue. As defined by the Association of American Railroads (AAR), a Class I railway is defined as a railway company with an operating revenue exceeding $346.8 million (2006).

Class II Railroad – A Class II regional railroad in the U.S. is a mid-sized freight-hauling railroad, in terms of its operating revenue. As of 2006, a railroad with revenues greater than

$40 million but less than $346.8 million for at least three consecutive years is considered a Class II railroad. Switching and terminal railroads are excluded from Class II status. Railroads considered by the AAR as "Regional Railroads" are typically Class II railroads.

Class III railroad – A Class III local railroad is defined by the AAR as a railroad with an annual operating revenue of less than $40 million. Class III railroads are typically local short-line railroads, serving a very small number of towns or industries; many Class III railroads were once branch lines of larger railroads that were spun off, or portions of mainlines that had been abandoned.

A short-line railroad is an independent railroad company that operates over a relatively short distance. Short-lines generally exist for one of three reasons:

- Link two industries requiring rail freight together;
- Interchange revenue traffic with other, usually larger, railroads; or
- Operate a tourist passenger train service.

Often, short-lines exist for all three of these reasons. Because of the small size and generally low revenues, the great majority of short-line railroads in the US are classified by the AAR as Class III.

Intermodal Facilities - Intermodal freight transport involves the transportation of freight in a container or vehicle, using multiple modes of transportation (air, rail, water, and truck), without any handling of the freight itself when changing modes. The method reduces cargo handling, security, and may allow freight to be transported faster. Reduced cost versus over the road trucking is the key benefit for intracontinental use. Intermodal assets identified in include the following:

- Air – Truck;
- Port – Truck;
- Rail – Port;
- Rail – Truck;
- Truck – Port - Rail – Air; and
- Truck – Port – Rail.

5.1.4 Passenger Rail

Passenger rail provides a valuable transportation service within the DRA region. Passenger rail reviewed during the asset collection process entailed identifying commuter and intercity passenger rail service. There is currently no commuter rail service in the DRA, however intercity passenger rail service is provided by Amtrak and Little Rock, Memphis and New Orleans operate passenger service on trolleys.

Amtrak train passenger services in the DRA region include the following routes:

- The City of New Orleans (New Orleans, LA to Chicago, IL);
- The Sunset Limited (Orlando, FL to Los Angeles, CA);
- The Crescent (New Orleans, LA to New York, NY);
- The Texas Eagle (Chicago, IL to San Antonio, TX); and
- The Illinois Network (Carbondale, IL to Chicago, IL).

AMTRAK train in New Orleans, Louisiana

5.1.4.1 Methodology

Passenger rail assets were provided by Amtrak's Southern Region Director of Government Affairs. Amtrak state fact sheets were provided by Amtrak and are available online at www.amtrak.com. The three main passenger rail asset groups collected were the Amtrak train service routes, station (terminal) information for each state, and pertinent data from Amtrak state fact sheets.

Central Arkansas Transit (CAT), Memphis Area Transit Authority (MATA) and New Orleans Regional Transit Authority (NORTA) provided the trolley asset information for these three downtown services.

5.1.4.2 Asset Information

The following passenger rail asset information was gathered during the data collection process and includes the following information for each of the Amtrak rail stations and light rail providers in the DRA region.

5.1.4.3 Amtrak Stations:

- Station code and physical mailing address of each station;
- Availability and hours of an Amtrak ticket office;
- Availability of Quik-Trak ticketing, a 24-hour automated ticket service;
- Availability of an enclosed waiting area, restrooms, payphones, and ATM;
- 2005, 2006 and 2007 ridership numbers (total number of arrivals and departures per station);
- 2005, 2006 and 2007 employment numbers per state, along with average salary per employee; and
- Procurement and contracts for goods and services per state.

5.1.4.4 Light Rail (Trolley)

Light rail assets in the DRA region are located in Little Rock, Memphis, and New Orleans and include the number of stations, number of routes and the number of streetcar trolleys.

5.1.5 Aviation

Aviation is a vital transportation mode in the DRA region. There are a total of 993 aviation facilities in the DRA region including both public and private use facilities. The types of aviation assets inventoried include Airports, Heliports, Seaplane Bases, STOLPorts, Ultralight Flight Parks, and Gliderports.

Memphis International Airport

Heliport at McGehee-Desha County Hospital in Arkansas

5.1.5.1 Airport

An airport is typically defined as a facility where aircraft operate with at least one runway greater than 3,200 feet in length. Airports may be used by a wide range of aircraft from small single engine aircraft to large multi-engine jet commercial aircraft. Airports may consist of several runways and have additional facilities for aircraft fueling, parking, storage hangars, air traffic control facilities, and navigational aids to assist landings in inclement weather. Airports may also have landside support facilities, such as terminal buildings and rental car facilities.

5.1.5.2 Heliport

A heliport is a small airport suitable for use only by helicopters. A heliport will typically have one or more paved helipads to provide a landing area for helicopters and may also have lighting, a windsock, and fueling facilities. A large number of hospitals and other medical facilities maintain a heliport to provide rapid access to healthcare for critical patients.

5.1.5.3 Seaplane Base

A seaplane base is an area on a body of water designated for use by amphibious aircraft. Seaplanes are most often used for offshore corporate use and transportation to small islands without a paved runway.

5.1.5.4 STOLPort

A STOLPort is an airport designed for “Short Take-Off and Landing” operations. A STOLPort will typically consist of a single runway less than 3,200 feet in length.

5.1.5.5 Ultralight Flight Parks

Ultralight flight parks are small airports designed for the use of small, slow flying, lightweight aircraft generally used for recreational purposes. The FAA defines ultralights as a single seat aircraft with less than a 5-gallon fuel capacity, empty weight of less than 254 pounds, maximum speed of less than 55 knots, and stall speeds of less than 24 knots. Ultralights are restricted to flying during daylight hours only over unpopulated areas.

5.1.5.6 Gliderport

A gliderport is a small airport designed for the use of unpowered aircraft (gliders). These facilities are typically used for recreational purposes only.

5.1.5.7 Methodology

Information regarding aviation assets located in the DRA region was obtained using several different sources, including federal, state, and local databases and reports. The data sources included the following:

- FAA Airport Master Records (SF 5010);
- FAA's 2007-20011 National Plan of Integrated Airport Systems (NPIAS) Report;
- State Aviation System Plans published by each state's Department of Transportation; and
- On-line Survey (www.dramultimodal.com).

The primary and most comprehensive source of information was the FAA Airport Master Records (SF 5010) obtained online through www.airnav.com. This database was downloaded in Microsoft Access and used in association with the 2007 FAA NPIAS database to analyze the existing aviation assets in the DRA region. Based on this process, a total of 993 aviation facilities were identified in the DRA region. Each facility was classified as an airport, heliport, gliderport, seaplane base, ultralight flight park, or STOLPort. Two-thirds of the facilities are classified as an airport and nearly one-third are classified as a heliport.

Aviation facilities were further analyzed to determine if the facility was open for public use or for private use only. Although all aviation facilities are recorded in FAA's database, many facilities are for private use only, such as runways owned by farmers for agricultural spraying, or heliports owned by private companies for transportation of employees. The following reports provide asset information for public aviation facilities in the DRA region.

The majority of heliports located at hospitals or other medical facilities are listed as private use only. Although these facilities are not open to the general flying public, heliports are vital to ensure available healthcare to the public.

The FAA recognizes the importance of a safe, efficient civil air transportation system, and has developed a national aviation system plan to identify airports significant to national air transportation. As noted above, this plan is known as the National Plan of Integrated Airport

Systems (NPIAS). The NPIAS includes all commercial service and reliever airports, and select general aviation airports. FAA uses the NPIAS to identify airports eligible to receive federal grants through the Airport Improvement Program (AIP). The AIP provides funding to improve the safety and capacity of the nation's air transportation system.

5.1.5.8 Asset Information

The NPIAS categorizes airports into seven major categories, as shown in the following table.

Table 2: NPIAS Airports

Airport Type	Basic Description	Example Airport in DRA
Primary Commercial Service Airports	Receive greater than 2,500 scheduled passenger service enplanements per year	
Large Hub	Account for at least 1 percent of total U.S. scheduled annual enplanements	None
Medium Hub	Account for between 0.25 percent and 1 percent of total U.S. scheduled annual enplanements	Memphis International Airport
Small Hub	Account for between 0.05 percent and 0.25 percent of total U.S. scheduled annual enplanements	Baton Rouge Metropolitan Airport
Non-Hub	Account for less that 0.05 percent of total U.S., but more than 10,000 annual enplanements	Barkley Regional Airport, West Paducah, KY
Non-Primary Commercial Service Airports	Between 2,500 and 10,000 scheduled annual enplanements	Cape Girardeau Regional, Cape Girardeau, MO
Reliever Airports	High capacity general aviation airports to relieve commercial airports in major metropolitan areas.	Olive Branch Airport, Olive Branch, MS
General Aviation Airports	Provide airport facilities to communities greater than 20 miles from nearest NPIAS Airport. Must have at least 10 based aircraft.	Benton Municipal Airport, Benton, IL

Source: Federal Aviation Administration

Of the 256 public use airports located within the DRA region, 192 of these are also included in the NPIAS and are therefore eligible for AIP federal funding. These 192 NPIAS airports are categorized in **Table 3**.

Table 3: Airports Eligible for AIP Federal Funding

FAA NPAIS Classification	Number Located in DRA
Primary Commercial Service Airports	10
Large Hub	*0*
Medium Hub	*2*
Small Hub	*3*
Non-Hub	*5*
Non-Primary Commercial Service Airports	3
Reliever Airports	4
General Aviation Airports	175
Total	**192**

Source: Federal Aviation Administration

The data collected for each public facility includes an inventory of the existing physical infrastructure, as well as operational data such as the number of based aircraft and the number of annual operations (takeoffs and landings) conducted at the airport. The asset information gathered during the data collection process is shown in **Table 4**:

Table 4: Asset Information

Physical Infrastructure Assets	
Item Inventoried	**Relevance**
Runway Length	Critical in determining types of aircraft that can use the facility
Taxiway Sizes	Provides additional capacity, safety
Apron Sizes	Provides storage space for aircraft
Number and Size of Hangars	Provides storage space for aircraft
Number and Size of Terminals	Provides facilities for traveling public
Control Tower	Increases capacity and safety
Available Fuel Types	Determines types of aircraft that can purchase fuel
Approach Type (Precision Instrument, Non-Precision Instrument, Visual)	Critical in determining weather conditions in which airport is usable
Operational Data	
Item Inventoried	**Relevance**
Facility Classification	Determines types of aircraft using the facility
Public or Private Use	Determines if facility is open to the public
NPIAS Status	Determines if facility is currently eligible for federal AIP funding
FAA Airport Classification (NPAIS Airports Only)	Used by FAA in determining funding amounts and priorities.
Number of Based Aircraft	Used by FAA in determining NPIAS status and can be a factor in priority airport receives for funding.
Number and Type of Aircraft Operations (Takeoffs + Landings)	Used to justify runway extensions and can be a factor in priority airport receives for funding.

Source: DRA project team

5.1.6 Public Ports

Due to the numerous rivers, such as the Mississippi, Ohio , and Tennessee, in the DRA region, water ports provide a viable transportation option in moving bulk commodities to and from markets. The assets inventory provides information on public and private docking terminals located within the DRA region, principally as identified by the U.S. Army Corp of Engineers. The asset database contains 281 public port terminals comprised of state and federal agency docks, as well as docks owned by public port authorities. There are 48 public port authorities serving the DRA region and these authorities operate a total 192 commodity terminals. Thus, many public port authorities contain multiple terminals. For example, the Port of New Orleans is comprised of 79 terminals located on multiple waterways.

Ohio River in Paducah, Kentucky

5.1.6.1 Methodology

The primary sources for DRA region port assets were identified through examining the *Port Series Reports* provided by the United States Army Corps of Engineers Navigation Data Center. The *Port Series Reports*, which is in a database, describe the physical and inter-modal infrastructure characteristics of individual port facilities and terminals. Facility asset data extracted from the database included, but was not limited to, location (latitude/longitude, mile, and bank); operations (name, owner, operator, purpose, handling equipment, and details of open and covered storage facilities); type and dimension of construction (length of berth space for vessels and/or barges, depth, etc.), and details regarding rail access.

Public port authorities were contacted via email and phone calls to encourage each facility to document asset data by completing the port survey located at www.dramultimodal.com.

The Corp develops numerous *Port Series Reports* based on different regions of the country. The following *Port Series Reports* contain ports located within the DRA region:

- *Port Series No. 20 The Port of New Orleans, LA*, Publication Date – 2001;
- *Port Series No. 20A Mississippi River Ports Below and Above New Orleans, LA,* Publication Date – 2002;
- *Port Series No. 21 The Ports of Baton Rouge and Lake Charles, LA*, Publication Date – 2002;
- *Port Series No. 63 The Port of Louisville, KY; and Ports on Ohio River (Miles 560-980), Cumberland, and Green Rivers*, Publication Date – 1992;
- *Port Series No. 64 Ports on Tennessee River; Tennessee-Tombigbee and Black Warrior-Tombigbee Waterways; and Alabama River*, Publication Date – 1997;
- *Port Series No. 68 Ports on the Arkansas, Red, and Ouachita River Systems and Missouri River*, Publication Date – 2000;
- *Port Series No. 70 The Port of St. Louis, MO and Ports on Upper Mississippi River (Miles 0-300 AOR)*, Publication Date – 2004;
- *Port Series No. 71 Ports of Memphis, TN; Helena, AR; and Ports on Lower Mississippi River (Miles 620-954 AHP)*, Publication Date – 2004; and
- *Port Series No. 72 Ports of Natchez, Vicksburg, and Greenville, MS; and Ports on the Lower Mississippi River (Miles 255-620 AHP*, Publication Date – 2003.

The digital database associated with the *Port Series Reports* was sorted with a Geographic Information System (GIS) to extract port facilities and terminals located within the DRA region. Also, the GIS database was further coded to allow for the separation of terminals by public and private ownership. Interviews were conducted with larger public ports, such as Memphis and New Orleans, to consider the need for updating records of individual terminals owned by these public ports.

5.1.6.2 Asset Information

Port facility and terminal assets include the following:

- Port as identified by the U.S. Army Corps of Engineers;
- Terminal (name);
- Contact information;
- Location by place on waterway and lat/long;
- Waterway;
- Rail service;
- Port purpose served;

- Docking features; and
- Remarks documenting support infrastructure, storage and other features related to the capabilities of the port.

County boundaries sometimes track navigable waterways, and as a result, port facilities and terminals located in counties lying outside the DRA region may be situated across a navigable waterway from a port facility or terminal located in the DRA region. Although the facilities are served by a common navigable waterway, the facilities located outside the DRA region are not included in this report.

5.1.7 Locks

The U.S. Army Corps of Engineers is responsible for the operation and maintenance of the U.S. waterway system to ensure efficient and safe passage of commercial and recreational vessels. Locks play a vital role in the waterborne transportation system, especially in the DRA region in which there are 40 such devices. A lock is a device for raising and lowering boats or barges between stretches of water of different levels on a river. The distinguishing feature of a lock is a fixed chamber whose water level can be varied. Locks are used to make a river navigable and are crucial to waterborne transportation.

USACE lock in Illinois along the Ohio River

5.1.7.1 Methodology

The support and management of economically sound navigation projects is dependent upon reliable navigation data. The USACE, through the Institute for Water Resources Navigation Data Center, exercises its Federal responsibility for establishing and maintaining a variety of water transportation information systems. The source for lock related assets in the DRA region is the USACE Navigation Data Center. The lock data was first developed in 1992 and the database provides lock characteristics for the U.S. Inland Waterways.

The complete data set contains information on the physical aspects of all USACE built, maintained, owned or operated locks that includes six major characteristics: location, physical characteristics, site information, site characteristics, management information and historical changes. The data was sorted to extract locks located within the DRA region.

5.1.7.2 Asset Information

Data reported in the lock asset documents include the following characteristics:

- Lock name;
- Unique NDC dock & lock identification (ID);
- State;
- River name;
- River mile point of structure;
- Status of lock (operable or inoperable);
- Year structure opened;
- Last year of major rehabilitation;
- Highway connection near lock site; and
- Last date of data update.

County boundaries sometimes track navigable waterways, and as a result, navigation locks located in counties lying outside the DRA region may be situated across a navigable waterway from a from a DRA region county. Lock facilities located outside the DRA region are not included in this report.

5.2 Modal Needs Methodology

The DRA Federal Co-Chairman sent 453 personal letters to multimodal transportation agencies and providers requesting assistance on documenting the multimodal needs in the DRA region. Collecting the needs for highways, bridges, intelligent transportation systems, passenger rail, freight rail, airports, ports, and locks was completed by the following:

- Developing modal surveys and posting them on the project website;
- Developing modal surveys and emailing them to multimodal transportation providers;
- Reviewing hundreds of multimodal plans, reports and studies;
- Input from the DRA regional coordination meetings;
- Input received through numerous conference call with multimodal transportation provider; and
- Input received through phone interviews with modal providers and stakeholders.

5.2.1 Highways

In determining the DRA region highway needs, emphasis was placed on ensuring detailed and statistically valid data were utilized to provide credible results. Furthermore, appropriate methods and tools were employed to ensure a rigorous analytical approach yielding sound results for quantifying and understanding needs. To meet these objectives, the highway needs analysis utilized HERS-ST – Highway Economics Requirements System – State Version.

The HERS-ST model (version 4.3), developed by FHWA, is currently used by 20 state DOTs to assess state highway investment needs[12]. At the national level, HERS has been used by FHWA's Office of Legislation and Strategic Planning for nearly 10 years to develop future National-level highway investment levels, to either improve the Nation's highway system or maintain user cost levels on the system. HERS provides cost estimates for achieving economically optimal program structures. HERS can also predict system condition and user cost levels resulting from a given level of investment. These estimates provide benchmarks from which Congress considers the highway budget. In the same way, HERS-ST entails assessment of expected changes in physical system conditions, as well as economic cost behavior determining highway economic requirements at the state level. The analysis is based on an application of engineering, economic and statistical methods to a standard sample of HPMS data.

The process to analyze highway needs using HERS-ST began by reviewing each state's minimum tolerable conditions (MTCs), design standards, and improvement costs. MTCs are based on levels at which congestion, safety risk, physical and structural deterioration are expected to adversely affect system performance and the public interest. Facilities falling below the specified MTCs in any given funding period are understood as needs for improvement in the time horizon of the plan. The MTCs were altered slightly from the national default values referencing recent state plan work in the DRA region. Design standards provide engineering details on how the facility should be improved once a need is identified. HERS-ST also provides default improvement costs and right-of-way (ROW) costs per mile for each improvement type by functional classification, based on historical costs in each state. The MTCs, design standards and improvements costs were the same for each of the eight states in the DRA region. Once the data was updated and imported into HERS-ST, each of the eight state HERS-ST runs were programmed to provide a full engineering needs analysis (unconstrained by dollars), over a 25-year period, so the results provided actual highway needs not withstanding budget levels.

The result was a complete statewide needs assessment for each of the eight states in the DRA region. To ensure highway needs for the DRA region were identified, centerline miles for each state were compared to the actual miles that are contained in the DRA region for each state. This percentage was used to allocate the total cost and lane miles improved for each improvement

[12] Ten other state DOTs are currently evaluating using HERS-ST in identifying their highway needs.

type (preservation, modernization, and expansion) by roadway functional classification. The highway needs are documented in the CD that accompanies this report.

5.2.2 Bridges

The bridge needs analysis was conducted by analyzing each of the eight states 2006 National Bridge Inventory (NBI) file. The NBI file is a compilation of data supplied by the state DOTs to the FHWA as required by the National Bridge Inspection Standards for bridges located on public roads. Since the NBI is a statewide database, a DRA bridge database was created that included bridges located in the DRA region and the bridges were verified by each of the eight state DOTs.

Bridge needs were determined by identifying all structurally deficient and functionally obsolete bridges in the NBI file. Structural deficiency does not necessarily imply that a bridge is unsafe. It does, however, mean that a structure is unable to carry the vehicle loads or tolerate the speeds that would normally be expected for that particular bridge in its designated system. Functional obsolescence means that the bridge has inadequate width or vertical clearance for its associated highway system. In some cases, bridges become functionally obsolete because of highway improvements on the approaches to the bridge, such as lane additions or widening of approaching roads. In other cases, a bridge may be classified as functionally obsolete through a redefinition of desired standards.[13] The bridge needs are documented in the CD that accompanies this report.

5.2.3 Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) is becoming more and more important in today's growing transportation world. It is an integral part of traffic management at both the local and statewide level. With this in mind, the ITS needs throughout the DRA region were gathered by coordinating closely with each ITS Manager and City Traffic Engineer for each of the eight state DOTs and local municipalities that currently have an ITS infrastructure. These needs were collected by using a specially designed ITS needs survey that was emailed to each of the ITS stakeholders. The needs survey was specifically designed to cover all ITS needs in the DRA region. The survey included the following need categories:

- New or upgraded traffic management centers throughout each state;
- Fiber optic cable and wireless communication systems;
- Traffic monitoring and management systems;
- Traffic sensors;
- Dynamic message signs;
- Closed circuit television cameras;

[13] FHWA. Bridge Research: Leading the Way to the Future.

- ITS infrastructure along the I-69/269 corridor; and
- ITS infrastructure associated with Homeland Security issues.

The ITS needs are documented in the CD that accompanies this report.

5.2.4 Freight Rail

To determine rail mainline system capacity needs in the DRA region, the *National Rail Freight Infrastructure Capacity and Investment Study***,** published by the Association of American Railroads (AAR) in September, 2007 was utilized. This study was completed at the request of the National Surface Transportation Policy and Revenue Study Commission to assess the capacity of the nation's rail system to accommodate the estimated increase in freight-rail traffic.

The Class I railroads designated "Primary Rail Corridors" and these corridors were evaluated on the basis of both current rail volumes compared to current capacity and future (2035) volumes compared to current capacity.From this, current and future levels of service (LOS) from Level A to Level F, similar to that used for the highway system, were assigned to each of the corridors.

LOS grades were generally described as follows:

- LOS Grades A, B, C – Rail volumes are generally below current capacity. Train flows are low to moderate with capacity to accommodate maintenance and recover from incidents.
- LOS Grade D – Rail volumes are near capacity. Train flows are heavy with moderate capacity to accommodate maintenance and recover from incidents.
- LOS Grade E – Rail volumes are at capacity. Train flows are very heavy with very limited capacity to accommodate maintenance and recover from incidents.
- LOS Grade F – Rail volumes are above capacity. Train flows are unstable and service breakdown conditions exist.

To determine short-line (Class III) system needs in the DRA region, the DRA project team developed the on-line freight rail needs survey, as shown in **Figure 2**, and provided it on the project website (www.dramultimodal.com). The DRA project team contacted the short-line railroad companies that serve the DRA region via phone and email to request existing and future needs. The freight rail needs are documented in the CD that accompanies this report.

Figure 2: Freight Rail Needs Survey

1	**Railroad Name** ☐ **FRA ARC ID** ☐
2	**State** ☐
3	**Type of Need:**

Rail Line Capacity Chokepoint	
Rail Line Name	☐
Miles Post	☐
Problem Description	☐
Proposed Solution	☐
When is improvement needed	☐ **1 to 5 years** ☐ **6 to 10 years** ☐ **11 to 20 years**
Estimated Cost	☐

Yard/Intermodal Facility Capacity	
Existing Facility ☐ **yes** ☐ **no** **New Facility Required?** ☐ **yes** ☐ **no**	
Facility Name	☐
Location	☐

Problem Description	
Proposed Solution	
When is improvement needed	☐ **1 to 5 years** ☐ **6 to 10 years** ☐ **11 to 20 years**
Estimated Cost	

Grade Crossing Safety/Elimination	
Rail Line Name	
AAR Crossing #	
Location	
Problem Description	
Proposed Solution	
When is improvement needed	☐ **1 to 5 years** ☐ **6 to 10 years** ☐ **11 to 20 years**
Estimated Cost	

Other	
Rail Line Name	
Location	

Problem Description	
Proposed Solution	
When is improvement needed	☐ 1 to 5 years ☐ 6 to 10 years ☐ 11 to 20 years
Estimated Cost	

4 **Contact Information**

Name	
Agency	
Address	
Phone	
Email	

5 **Track Structure Needs:**

Excepted Track	**mi.**
Estimated Cost	
Other Track Safety Needs	
Estimated Cost	

6 **Is 286,000 lb weight capability required to accommodate existing ☐ future ☐ traffic?**

Estimated cost – Track **Bridges**

5.2.5 Passenger Rail

The passenger rail providers in the DRA region are Amtrak, Central Arkansas Transit (CAT), the Memphis Area Transit Authority (MATA) and the New Orleans Regional Transit Authority (NORTA).

Amtrak is the only major rail service provider in the DRA region, and this rail system is a vital component to the growth and prosperity. Working closely with the Southern Director of Governmental Affairs for Amtrak, future needs and goals for the Amtrak rail service in the DRA region were identified. These needs were gathered from working with Amtrak staff, as well as gathering future needs from the draft version of *Amtrak's Station Program and Planning: Standards and Guidelines*.

The CAT, MATA, and NORTA transit authorities each offer a street car rail system that has both a historical significance and provides a valuable service in each community. These rail systems offer a service that contributes to local business development, serves as a public transportation system for residents and the local work force, and helps boost the tourism industry for each city. The needs for each of the rail providers were gathered by working closely, through emails and phone calls, with the executive director of each organization. Also, a questionnaire was emailed to each executive director that requested future needs and planning level costs over the next 25 years. The passenger rail needs are documented in the CD that accompanies this report.

5.2.6 Airports

To determine public airport needs in the DRA region, the DRA project team developed an on-line airport needs survey, as shown in **Figure 3**, and provided it on the project website (www.dramultimodal.com). The DRA project team contacted each airport that serves the DRA region via phone and email to collect these needs. The public airport needs are documented in the CD that accompanies this report.

Figure 3: Aviation Needs Survey

1 **Airport Location ID**

2 **Site Number**

3 **Airport Name**

4 **Airport Owner**

5 **Airport Location**

Zip Code

City

County

State

6

Runway Need	0 to 5 years	6 to 10 years	11 to 20 years	Cost Estimate	Project Justification	Eligible for FAA's AIP Program?
Pavement Rehabilitation						Yes No
Pavement Strengthening						Yes No
Runway Extension						Yes No
Runway Widening						Yes No
Runway Lighting/Signage						Yes No
Visual Aids						Yes No
New Runway						Yes No
Safety Area Improvements						Yes No
Drainage Improvements						Yes No

Navigational Aids	☐	☐	☐			☐ Yes ☐ No
Other	☐	☐	☐			☐ Yes ☐ No

Taxiway Need	0 to 5 years	6 to 10 years	11 to 20 years	Cost Estimate	Project Justification	Eligible for FAA's AIP Program?
Pavement Rehabilitation	☐	☐	☐			☐ Yes ☐ No
Pavement Strengthening	☐	☐	☐			☐ Yes ☐ No
New Taxiway	☐	☐	☐			☐ Yes ☐ No
Taxiway Lighting/Signage	☐	☐	☐			☐ Yes ☐ No
Taxiway Widening	☐	☐	☐			☐ Yes ☐ No
Safety Area Improvements	☐	☐	☐			☐ Yes ☐ No
New Runway	☐	☐	☐			☐ Yes ☐ No
Safety Area Improvements	☐	☐	☐			☐ Yes ☐ No
Other	☐	☐	☐			☐ Yes ☐ No

Apron Need	0 to 5 years	6 to 10 years	11 to 20 years	Cost Estimate	Project Justification	Eligible for FAA's AIP Program?
Pavement Rehabilitation	☐	☐	☐			☐ Yes ☐ No
Pavement Strengthening	☐	☐	☐			☐ Yes ☐ No
Apron Expansion	☐	☐	☐			☐ Yes ☐ No
New Apron	☐	☐	☐			☐ Yes ☐ No
Other	☐	☐	☐			☐ Yes ☐ No

Landside Need	0 to 5 years	6 to 10	11 to 20	Cost Estimate	Project Justification	Eligible for FAA's AIP

		years	years			Program?
Hangars	☐	☐	☐			☐ Yes ☐ No
Fuel Farm	☐	☐	☐			☐ Yes ☐ No
Commercial Passenger Terminal Building	☐	☐	☐			☐ Yes ☐ No
General Aviation Terminal/Public Use Building	☐	☐	☐			☐ Yes ☐ No
Site Access	☐	☐	☐			☐ Yes ☐ No
Automobile Parking	☐	☐	☐			☐ Yes ☐ No
Other	☐	☐	☐			☐ Yes ☐ No

5.2.7 Public Ports

The focus of the public port needs centered on collecting information from the 48 public port authorities in the DRA region. Needs for individual public terminals were reported by the owning port authority. To collect a comprehensive list of public port needs, the following was completed:

- Developed a public ports needs survey, as shown in **Figure 4**, and provided it to each of the 48 port authorities in the DRA region. The following methods were utilized to gather public port needs in the DRA region;
- Contacted each Port Authority to assist in completing the port needs survey; and
- Reviewed numerous national, regional, state, and local waterway plans, reports or studies to identify public port and waterway needs.

The public port authority needs are documented in the CD that accompanies this report.

Figure 4: Ports Needs Survey

Delta Regional Authority Needs Survey

Name	
Agency	
State	
Email	
Phone	
Date	

Needs		Yes/No	Explanation	Planning Priority with Planning Level Cost Noted		
				Less than 5 Years	6-10 Years	11-20 Years
Landside Access to Port Roadway Rail Note, each category could represent multiple investments made in the noted planning periods						
Waterways Maintenance Dredging Access channel widening/deepening Note, each category could represent multiple investments made in the noted planning periods						
Maintenance of Port Infrastructure Equipment, Cranes, etc. Docks Warehousing/Storage Roadway Rail Other Note, each category could represent multiple investments made in the noted planning periods						
Upgrades to Port Facilities New Terminal (All inclusive) Other Facilities Other - Equipment, Cranes, etc. Other - Docks Other - Warehousing/Storage Other - Roadway Other, Rail Other, explain Note, each category could represent multiple investments made in the noted planning periods						
Investment Summary Total Investment, by Period Total Investment Needs			$0	$0	$0	$0
Improvements to Inland Waterway Network Need 1 Need 2 Need 3			**Describe Need**			

5.2.8 Locks

There are 40 locks on navigable rivers in the DRA region, which are operated and maintained by the following U.S. Army Corps of Engineers Districts:

- Little Rock District - Seven Locks;
- Louisville District - Five locks;
- Mobile District - Seven locks;
- Nashville District – Five locks;
- New Orleans District - Six locks;
- St. Louis District – One lock; and
- Vicksburg District – Nine locks.

Operation managers at each of the U.S. Army Corps of Engineer Districts provided the lock needs in the DRA region. The individual lock needs are documented in the CD that accompanies this report.