

Welcome!

Behind the Numbers: Exploring Transportation Statistics
BTS Webinar Series

October 25, 2016

Data, Maps and Apps

The Data, Maps and Applications
offered by the
Bureau of Transportation Statistics's
Office of Spatial Analysis and Visualization

What is BTS?

Principal Federal Statistical Agency that provides objective, comprehensive, and relevant information on:

- extent and use of the Nation's transportation system
- how well the system performance
- effects of the system on society and the environment.

What is OSAV?

- Develops geospatial data and visualization tools
- Conducts spatial and network analysis
- Develops performance measures
- Prepare maps for BTS publications
- Coordinates the transportation layer of the NSDI
- Publishes the NTAD

Where, oh where, are the OSAV products?

www.maps.dot.gov

[Geospatial Portal](#)

[Applications Gallery](#)

[Map Gallery](#)

The screenshot shows the top portion of the Bureau of Transportation Statistics website. At the top left is the United States Department of Transportation logo and name. To the right are links for 'About DOT | Briefing Room | Our Activities'. Below this is the 'OFFICE OF THE ASSISTANT SECRETARY FOR RESEARCH AND TECHNOLOGY' and the 'Bureau of Transportation Statistics' name. Further right are links for 'About OST-R | Press Room | Programs | OST-R Publications | Library | Contact Us' and a search box. A navigation bar contains links for 'Data and Statistics', 'Subject Areas', 'Library', 'News', 'Policies and Methods', 'About BTS', and 'Contact Us'. The main banner features the text 'Geospatial at the Bureau of Transportation Statistics' over a background of a network graph.



Data

Our geospatial data portal featuring the National Transportation Atlas Database (NTAD)



Applications

Mapping applications to dynamically visualize and analyze geospatial data, and tools to make your own custom maps.



Maps

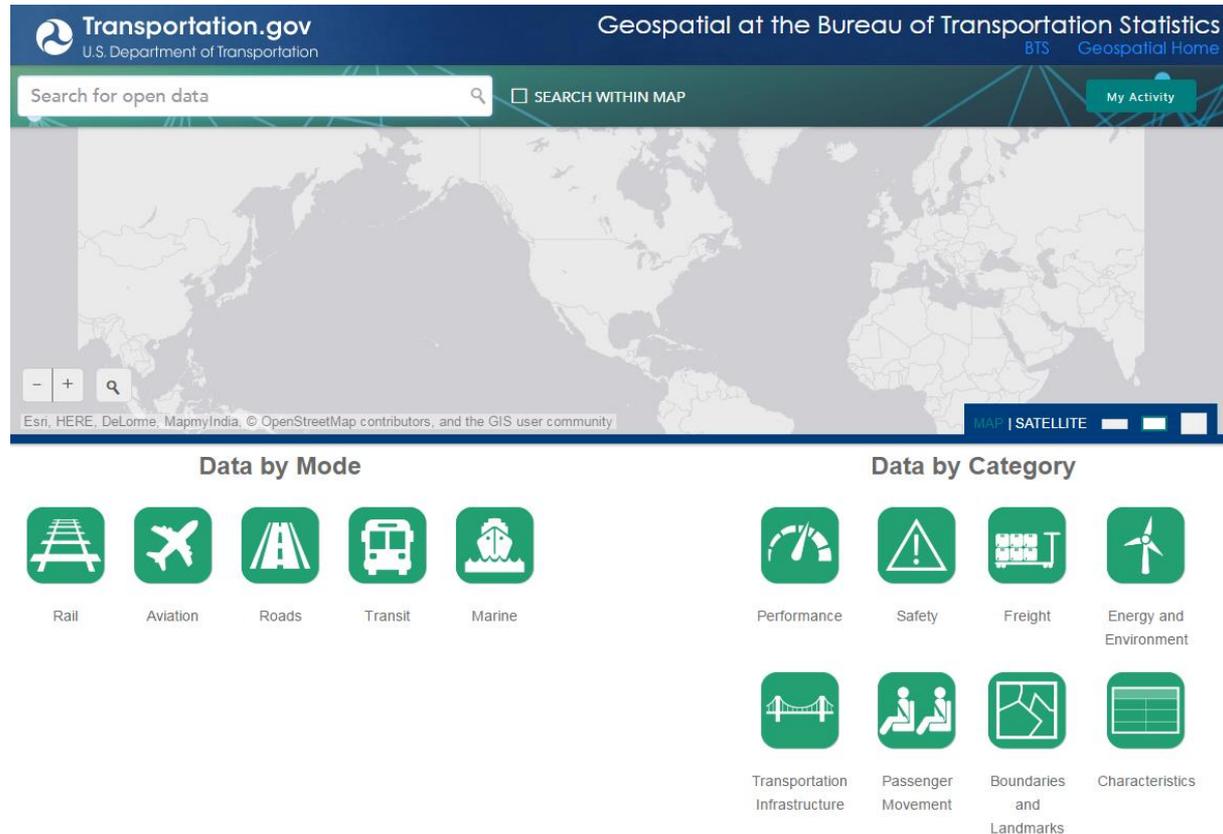
A collection of reference, thematic, and story maps

Geospatial Portal

- Catalog of data offered by USDOT
 - Mostly Transportation Related
 - Some Contextual Layers
- Benefits
 - Provides a central location from which data can be accessed
 - Facilitates Data Discovery

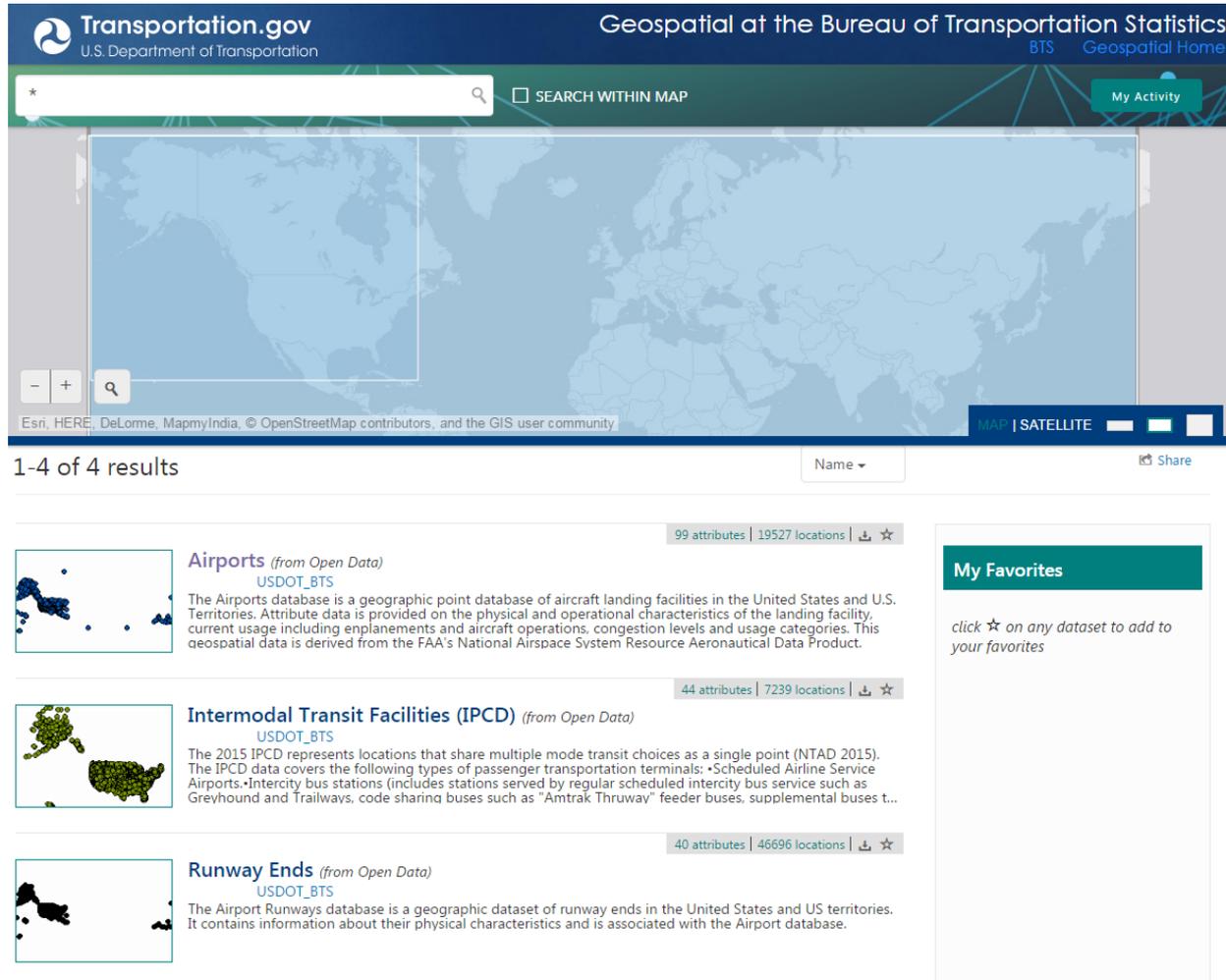
Landing Page

- Data by Mode
 - Rail
 - Aviation
 - Roads
 - Transit
 - Marine
- Data by Category
 - Performance
 - Safety
 - Freight
 - Energy and Environment
 - Transportation Infrastructure
 - Passenger Movement
 - Borders and Landmarks
 - Characteristics
- Discover data by browsing or by searching
- Search with in Map
- My Activity
- Change map size



Listing Page

- List of available data for selected mode, topic, or category
- Dataset Descriptions
- Sortable
- Favorite
- Download
 - Spread sheets
 - KML
 - Shapefiles

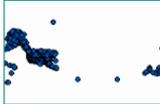


Transportation.gov U.S. Department of Transportation Geospatial at the Bureau of Transportation Statistics
 BTS Geospatial Home

* SEARCH WITHIN MAP My Activity

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

1-4 of 4 results Name ▾ Share


Airports *(from Open Data)*
 USDOT_BTS
 99 attributes | 19527 locations | ⬇️ ☆
 The Airports database is a geographic point database of aircraft landing facilities in the United States and U.S. Territories. Attribute data is provided on the physical and operational characteristics of the landing facility, current usage including enplanements and aircraft operations, congestion levels and usage categories. This geospatial data is derived from the FAA's National Airspace System Resource Aeronautical Data Product.


Intermodal Transit Facilities (IPCD) *(from Open Data)*
 USDOT_BTS
 44 attributes | 7239 locations | ⬇️ ☆
 The 2015 IPCD represents locations that share multiple mode transit choices as a single point (NTAD 2015). The IPCD data covers the following types of passenger transportation terminals: •Scheduled Airline Service Airports. •Intercity bus stations (includes stations served by regular scheduled intercity bus service such as Greyhound and Trailways, code sharing buses such as "Amtrak Thruway" feeder buses, supplemental buses t...


Runway Ends *(from Open Data)*
 USDOT_BTS
 40 attributes | 46696 locations | ⬇️ ☆
 The Airport Runways database is a geographic dataset of runway ends in the United States and US territories. It contains information about their physical characteristics and is associated with the Airport database.

My Favorites
click ☆ on any dataset to add to your favorites

Data Page

- Functions
 - Open in ArcGIS
 - Comment
 - Share
- About
 - Publisher
 - Age
 - Source
 - Metadata
 - License
- Tags
- Details
 - Description
 - Attributes with sample data
- Table
 - Full Listing of attributes and values
 - Users can filter data using the fields
- Charts
- Related Data

The screenshot shows the Transportation.gov Geospatial interface. At the top, there is a search bar with the text "Search for open data" and a "SEARCH WITHIN MAP" checkbox. Below the search bar is a map of the United States with several blue dots representing border crossings. The map includes navigation controls (minus, plus, search) and a legend for "MAP | SATELLITE". Below the map, the title "Border Crossings" is displayed, along with options to "Open in ArcGIS", "Comments (0)", "Share", "Download Dataset", and "APIs".

Below the map, there are three tabs: "Details", "Table", and "Charts". The "Description" tab is selected, showing the following text:

Description
This dataset is published by USDOT BTS to display ports of entry and its associated data as an online mapping application. Border Crossing Ports (NTAD 2015) are points of entry for land modes along the U.S. - Canadian and U.S.- Mexican borders. The ports of entry are located in 15 states along the U.S. borders. The nominal scale of the data set is 1:1,000,000 with a maximal positional error of +/- 10 meters.

The "Dataset Attributes" tab is also visible, showing a table with the following data:

Attribute	Value
Port Code Text	0104 (6), 2305 (5), 0712 (5), 0715 (5), 2304 (4), 2402 (4), 0106 (4), 0203 (4), 0209 (4), 0212 (4)... (100 more)
Port Name Text	
State Text	TX (27), ME (24), ND (18), NY (18), WA (16), VT (15), MT (13), AZ (8), MN (7), CA (6)... (5 more)

The "About" section on the right side of the page provides additional information:

About
By USDOT_BTS
Updated:
Source <https://maps.bts.dot.gov/services/rest/service>
Metadata Border Crossings
License The Border Crossing Ports, or any ...

Tags
Border | Crossing | Structures | Customs | NTAD | National | Transportation | Atlas | US | United | States | Canada | Mexico

Applications Gallery

- Catalog of applications offered by USDOT
- Provides a central location where users can find OSAV applications
- Applications are typically built to inform our stakeholders, transportation professionals and enthusiasts

Landing Page

- List Applications
- Describes Each
- Sortable
- Change Listing type

The screenshot shows the 'Applications Gallery' page on the Transportation.gov website. The page header includes the Transportation.gov logo and the text 'Geospatial at the Bureau of Transportation Statistics'. Below the header, there is a search bar labeled 'Search maps' and a 'Sort by' dropdown menu with options: Date, Title, Type, Ratings, Avg. Rating, Comments, and Views. The main content area displays four application listings, each with a map thumbnail, a title, a description, and a star rating with the number of views. The applications are: 1. 'National Transportation Atlas' (1,378 views), 2. 'National Transit Map: Stops and Buffers' (19 views), 3. 'National Transit Map: Agencies by Vehicle Activity' (13 views), and 4. 'National Transit Map: Participation' (103 views). A sidebar on the right contains the text: 'Mapping Applications published by the Office of Spatial Analysis and Visualization.'

Transportation.gov
U.S. Department of Transportation

Geospatial at the Bureau of Transportation Statistics

Applications Gallery

BTS Geospatial Home

Search maps

Sort by **Date** Title Type Ratings Avg. Rating Comments Views

National Transportation Atlas
Web Mapping Application by Derald.Dudley. Last Modified Oct 19, 2016.
National Transportation Atlas
☆☆☆☆☆ (1,378 views)

National Transit Map: Stops and Buffers
Web Mapping Application by Derald.Dudley. Last Modified Sep 1, 2016.
National Transit Map: Stops, with Quarter and Half Mile Buffers
☆☆☆☆☆ (19 views)

National Transit Map: Agencies by Vehicle Activity
Web Mapping Application by Derald.Dudley. Last Modified Sep 1, 2016.
National Transit Map: Agencies ranked by Vehicles Operated at Maximum Service (VOMS)
☆☆☆☆☆ (13 views)

National Transit Map: Participation
Web Mapping Application by Derald.Dudley. Last Modified Sep 1, 2016.
National Transit Map: Participating Agencies
☆☆☆☆☆ (103 views)

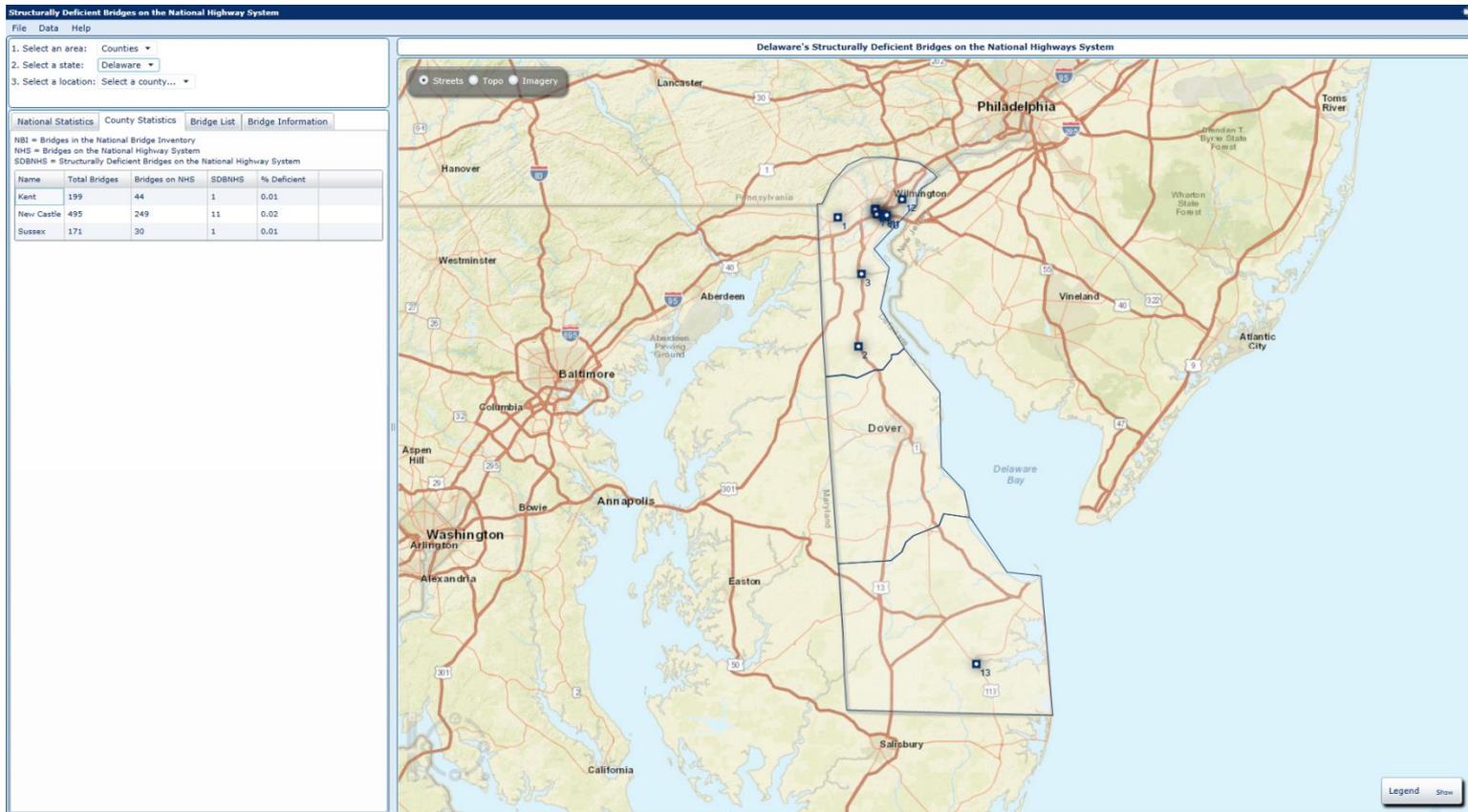
Mapping Applications published by the Office of Spatial Analysis and Visualization.

National Transportation Atlas



- Presents transportation networks and features
- Informs transportation professionals and enthusiasts

Structurally Deficient Bridges on the National Highway System



- Maps structurally deficient bridges
- Reports national totals, state totals, county totals and totals for congressional districts

Map Gallery

- Catalog of maps offered by USDOT
- Provides a central location where users can find OSAV maps
- Static maps are authored for publications
- Interactive maps typically authored for use in applications

Landing Page

- Lists Maps
- Describes Each
- Sortable
- Change Listing type
 - Downloads
- Interactive Maps

The screenshot shows the 'Geospatial Home' page on Transportation.gov. The header includes the Transportation.gov logo and the text 'Geospatial at the Bureau of Transportation Statistics'. Below the header is a 'Map Gallery' section. The gallery features a search bar, a 'Sort by' dropdown menu (set to 'Title'), and a list of map entries. Each entry includes a small map thumbnail, a title, a description, the author, the last modified date, and a star rating with a view count. The entries are:

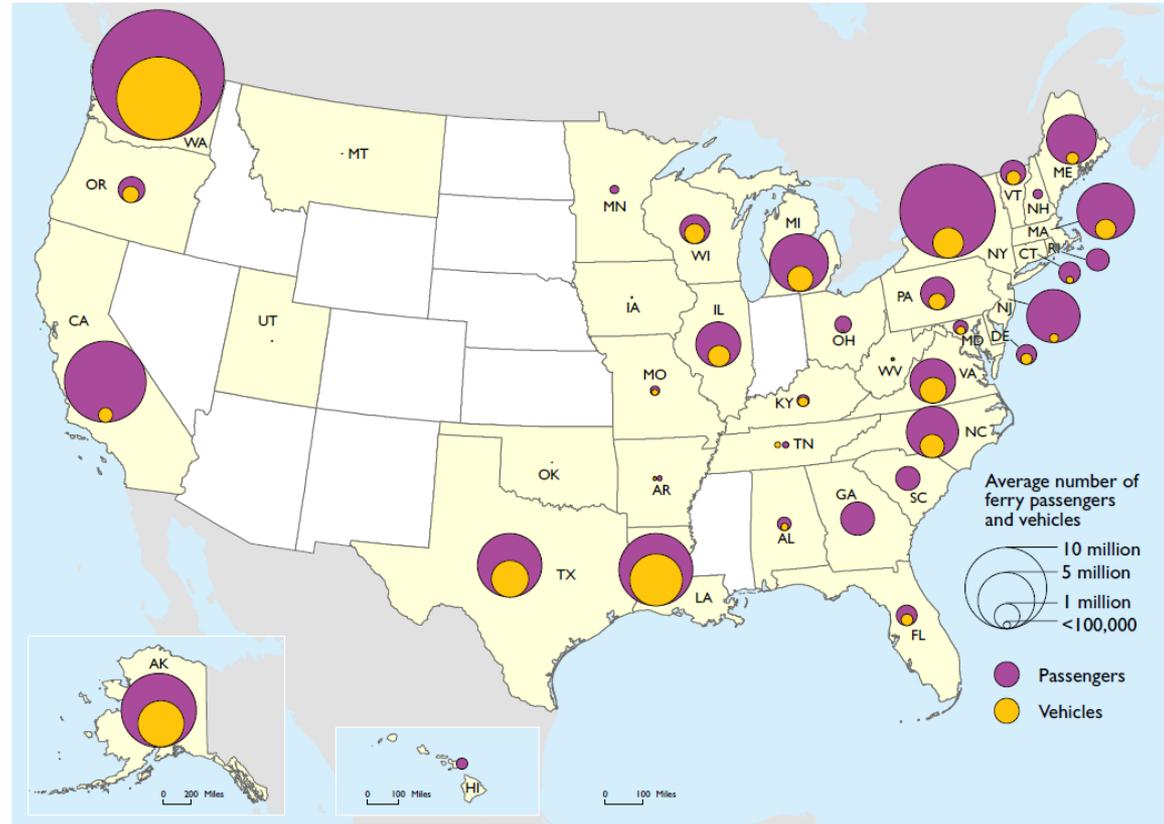
- 2015 Transportation Infrastructure of the United States**: PDF by siteadmin. Last Modified Jun 28, 2016. A large-scale, double-sided map of the transportation infrastructure of the United States, and its characteristics. (5 views)
- Amtrak Stations Along the Northeast Corridor FY2015**: PDF by siteadmin. Last Modified Jun 28, 2016. A proportional symbol map that shows the Amtrak stations with the highest ridership along the Northeast corridor, in Fiscal Year 2015. (20 views)
- Average Number of Ferry Passengers and Vehicles 2014**: PDF by siteadmin. Last Modified Jun 28, 2016. A proportional symbol map that shows the number of passengers and vehicles carried on ferries, by state, in 2014. (16 views)
- Enplanements at the Top 50 U.S. Airports 2014**: PDF by siteadmin. Last Modified Jun 28, 2016. A proportional symbol map that shows the number of passengers enplaned at the top 50 U.S. airports in 2014. (10 views)
- National Transit Map Participation**: Web Map by Derald.Dudley. Last Modified Sep 1, 2016. National Transit Map Participation. (2,225 views)

On the right side of the gallery, there is a note: 'Maps Published by the Office of Spatial Analysis and Visualization.'

Static Maps

- Image files
- Stored as .pdf
- View in browser or download

Average Number of Ferry Passengers and Vehicles: 2014



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Census of Ferry Operators*, as of May 2016.

Interactive Maps

- Legend
- Layers
- About
- Maximize
- Navigation
 - Zoom
 - Pan
 - Home
- Geo Referencing
 - Find my Location
 - Locate Address
- Switch Basemap
- Overview

Map Gallery

National Transit Map: Stops and Buffers

Transit Stops, Quarter Mile and Half Mile Buffers

🔍 Locate an address

▶ Switch Basemap



☰ 📄 ⓘ

Legend

- Transit Stops
- 1/4 Mile Buffer
- 1/2 Mile Buffer

☆☆☆☆☆ Sign In to rate. (3,576 views)

What's Next?

- First priority is to rectify the authentication issues.
- Expand the web site to include more information about our mission, activities and projects

Thank You!
Questions?

<https://maps.bts.dot.gov/>
Derald.Dudley@dot.gov

National Transportation Atlas Database (NTAD)

Bureau of Transportation Statistics
Office of Spatial Analysis and
Visualization

A compilation of geospatial databases **that depict:**

- The Transportation System
- Flows of people, goods, vehicles, and craft
- Social, economic, and environmental conditions that affect or are affected by the transportation system

National Transportation Atlas Database (NTAD)

- Collection of spatial datasets throughout the government

Points

- Airports (ZIP - 2.0MB)
- Alternative Fuels (ZIP - 2.9MB)
- Amtrak Stations (ZIP - 78KB)
- Border Crossing Ports (ZIP - 23.6KB)
- Data of dams 50 feet or more in height (ZIP - 460)
- Intermodal Terminal Facilities (ZIP - 460)
- Intermodal Passenger Connectivity Data
- Crash characteristics and environmental
- National inventory of navigable inland waterways
- National Bridge Inventory (ZIP - 71.7MB)
- National Populated Places (ZIP - 2.5MB)
- U.S. Army Corps of Engineers Ports (ZIP - 16.0MB)
- Top 150 major ports in the United States
- Railroad Grade Crossings - (ZIP - 16.0MB)
- Travel Monitoring Analysis System (ZIP - 16.0MB)

Polygon

- Bureau of the Census Urbanized Area Boundaries (ZIP - 54.4MB)
- Core based statistical area representing Metropolitan & Micropolitan Statistical Areas (ZIP - 53.6 MB)
- The 114th Congressional Districts Boundaries (ZIP - 43.6MB)
- U.S. County Boundaries (ZIP - 111.4MB)
- U.S. County Boundaries representing the U.S. political boundaries (ZIP - 83.7MB)
- Freight Analysis Framework (ZIP - 49.4MB)
- Hydrographic Features (ZIP - 223)
- U.S. Military Installations (ZIP - 6)
- Metropolitan Planning Organization
- Non-Attainment Areas (ZIP - 42.8)
- National Park System Boundary I
- U.S. State Boundaries (ZIP - 38.7)
- U.S. State Boundaries representing

Polyline

- Freight Analysis Framework, version 3.4 (ZIP - 49.4MB)
- Hazardous Material Routes (ZIP - 9.2MB)
- Highway Performance Monitoring System (ZIP - 795MB)
- National Highway Planning Network (ZIP - 172.2MB)
- Railway Network (ZIP - 35.8MB)
- Airport Runways (ZIP - 558KB)
- Fixed-Guideway Transit Facilities (ZIP - 863.7KB)
- U.S. Army Corps of Engineers Navigable Waterway Network (ZIP - 1.3MB)

NTAD Sources



**US Army Corps
of Engineers.**



Evolution of NTAD – Beginning

- Desktop computers had 8Mb RAM / 120Mb hard drive, 50 MHz and cost \$11,000
- Windows 3.1
- 50 World Wide Web servers known to exist
- .gov was established
- Cell phones only made phone calls
- Cloud services were sold by rain makers

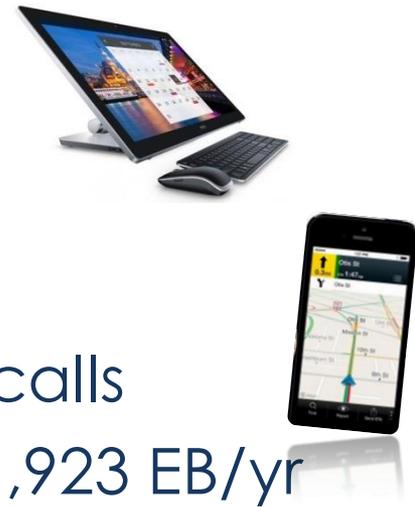


Then



Evolution of NTAD – Beginning

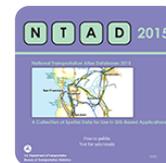
- Desktop computers now have 8G RAM / 1 Tb hard drive, 1600 MHz and cost \$1,000
- Windows 10.0
- 45 – 50 M servers currently operating
- ~ 1 B current web sites
- Smart phones rarely used for phone calls
- Cloud IP traffic (global consumers) 1,923 EB/yr



Then



, Now



Geospatial at the Bureau of Transportation Statistics



Data



Applications



Maps

Website on Cloud



Data

Geospatial Layers Performance Data Feature Services

DELIVERY MODE

- Downloads
- Feature services
- On-line mapping

SEARCH FORMATS

- Keywords
- Thumbnails
- Data Summaries



Data

Geospatial Layers

by Mode



Rail



Aviation



Roads



Transit



Marine

by Category



Performance



Safety



Freight



Energy and
Environment



Transportation
Infrastructure



Passenger
Movement



Boundaries
and
Landmarks



Characteristics



< Amtrak Routes

[Open In ArcGIS](#)
[Comments \(0\)](#)
[Share](#)
[Download Dataset](#)
[APIs](#)

[Details](#)
[Table](#)
[Charts](#)

Description

Amtrak Routes are a subset of the Railroad network. The Railroad network is a comprehensive database of the nation's railway system at 1:24,000 to 1:100,000 scale. The data set covers all 50 States plus the District of Columbia

Dataset Attributes

FRAARCID Number	min: 100,006 max: 281,979 avg: 205,155.76 count: 10,740
MILES Number	min: 0 max: 25.75 avg: 1.96 count: 10,740
STATEAB Text	CA (1110), IL (723), TX (695), WA (434), NY (425), PA (421), VA (414), MO (316), CO (307), AZ (300)... (37 more)

About

Open Data

By USDOT_BTS

Updated: a month ago

Data available to the open data portal.

Source <https://maps.bts.dot.gov/services/rest/service>

Metadata Amtrak Routes

License There are no access or use constr...

Tags

[Rail](#) | [Railroad](#) | [Amtrak](#) | [Route](#) | [Line](#) | [US](#) | [United](#) | [States](#) | [NTAD](#) | [National](#) | [Transportation](#) | [Administration](#) | [FRA](#)

Future of NTAD

- WMS, WFS, data download, data.gov (metadata), and ArcGIS Online

Services:

- [NTAD/airports](#) (MapServer)
- [NTAD/altfuels](#) (MapServer)
- [NTAD/amtrak](#) (MapServer)
- [NTAD/amtrak_sta](#) (MapServer)
- [NTAD/boc_uza](#) (MapServer)
- [NTAD/border_x](#) (MapServer)
- [NTAD/cbsa](#) (MapServer)
- [NTAD/congressionaldistricts](#) (MapServer)
- [NTAD/county](#) (MapServer)
- [NTAD/county_pol](#) (MapServer)
- [NTAD/dams](#) (MapServer)
- [NTAD/facility](#) (MapServer)
- [NTAD/faf_network](#) (MapServer)
- [NTAD/faf_regions](#) (MapServer)
- [NTAD/fars](#) (MapServer)
- [NTAD/hazmat](#) (MapServer)
- [NTAD/hpms](#) (MapServer)
- [NTAD/hydro](#) (MapServer)
- [NTAD/ipcd](#) (MapServer)
- [NTAD/locks](#) (MapServer)
- [NTAD/milbase](#) (MapServer)
- [NTAD/mpo](#) (MapServer)
- [NTAD/naa](#) (MapServer)
- [NTAD/nbi](#) (MapServer)
- [NTAD/nhpn](#) (MapServer)
- [NTAD/parks](#) (MapServer)
- [NTAD/place](#) (MapServer)
- [NTAD/ports](#) (MapServer)
- [NTAD/rail_lines](#) (MapServer)
- [NTAD/rail_nodes](#) (MapServer)
- [NTAD/rr_bridges](#) (MapServer)
- [NTAD/rr_crossings](#) (MapServer)
- [NTAD/runway](#) (MapServer)
- [NTAD/state](#) (MapServer)
- [NTAD/state_pol](#) (MapServer)
- [NTAD/StateBorders](#) (MapServer)
- [NTAD/tmas](#) (MapServer)
- [NTAD/transit](#) (MapServer)
- [NTAD/waterway](#) (MapServer)

The screenshot shows a search for 'NTAD' on Data.gov. The search results are ordered by relevance. The first result is '57 datasets found for "NTAD"'. Below this, several datasets are listed, each with a description and download options (HTML, Esri REST, XML). The datasets include:

- Altfuels (National)**: Department of Transportation - (From NTAD 2015) Through a nationwide network of local coalitions, Clean Cities provides project assistance to help stakeholders in the public and private sectors...
- Metropolitan Planning Organization (MPO) (National)**: Department of Transportation - The United States Metropolitan Planning Organization database (NTAD 2015) is a geographic database of Metropolitan Planning Organization political boundaries.
- Nonattainment Area - 1 hr Ozone (1979)**: Department of Transportation - Non-attainment and maintenance areas for the United States and its territories (NTAD 2015). The standard for the Ozone 1 hour NAA is 0.12 ppm. For more detailed...
- Nonattainment Area - 1 hr Ozone (1990)**: Department of Transportation - Non-attainment and maintenance areas for the United States and its territories (NTAD 2015). The standard for the Ozone 1 hour NAA is 0.12 ppm. For more detailed...

Each dataset entry includes a 'Federal' label and download links for HTML, Esri REST, and XML. The search interface also shows filters for location and topics.

This block contains a vertical stack of small map thumbnails, each representing a different geospatial dataset. The thumbnails are arranged vertically and include the following titles and descriptions:

- Hazardous Materials Routes**: The Federal Motor Carrier Safety Administration (FMCSA) Hazardous Material Routes.
- Waterway Locks**: Monthly summary statistics are based on data from the Lock Performance Monitoring System (LPMS). The LPMS was developed to collect a 100% sample of data on the locks that are owned and/or operated by the U.S. Army Corps of Engineers.
- County Boundaries**: In order for others to use the information in the Census MANTISER database in a geographic information system (GIS) or for other geographic applications, the Census Bureau releases to the public extracts of the database in the form of TIGER/Line Shapefiles.
- Airports**: The dataset provides users with information about airport locations and attributes and can be used for national and regional analysis applications.
- Border Crossings**: This dataset is published by USDOT BTS to display parts of entry and its associated data as an entire mapping application.

Each thumbnail includes a small map preview and a 'Federal' label.



Federal Geographic Data Committee (FGDC) Transportation Subcommittee (TSC) Briefing

*U.S. DOT | BTS Webinar Series
October 25, 2016*

Briefing Outline

- ◆ Background
- ◆ TSC Goals/Objectives
- ◆ TSC Partnering Agencies
- ◆ Current Activities
- ◆ Planned/Future Activities

Background

◆ OMB Circular No. A-16

- Provides direction for Federal agencies that produce, maintain, or use spatial data
- Provides for improvements in the coordination and use of spatial data
- Established a coordinated approach to develop the National Spatial Data Infrastructure (NSDI)
- Established the FGDC (in 1990) to manage various initiatives pertaining to the NSDI
- Designated U.S. DOT as the lead agency for coordinating transportation data-related efforts



Background (cont'd)

◆ FGDC Subcommittees

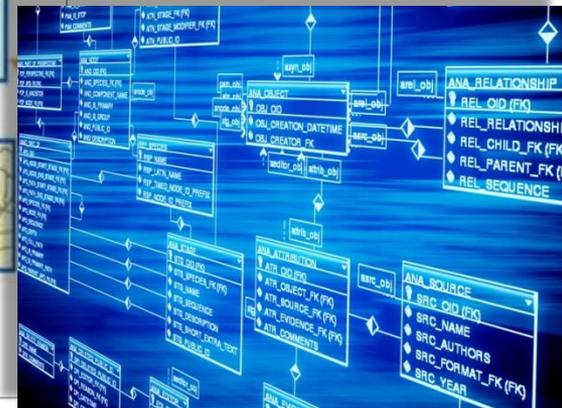
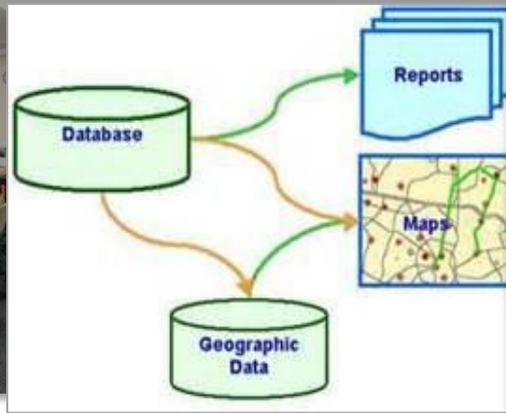
- Cadastral
- Cultural Resources
- Federal Geodetic
- Geological Data
- Homeland Infrastructure
- Marine and Coastal
- Ortho-imagery
- Transportation
- Vegetation
- Water
- Wetlands



TSC Goals/Objectives

◆ Support the NSDI by:

- Facilitating partnerships and coordination efforts among Federal stakeholders
- Defining transportation data requirements
- Promoting cohesive efforts for data development, database design, standards, and best practices



TSC Partnering Agencies

- ❑ **Army Corps of Engineers**
- ❑ **Center for Disease Control (CDC)**
- ❑ **Department of Agriculture**
 - ❑ Forest Service
- ❑ **Department of Commerce**
 - ❑ Census Bureau
- ❑ **Department of Defense (DOD)**
 - ❑ National Geospatial-Intelligence Agency
- ❑ **Department of Health & Human Services (HHS)**
 - ❑ Indian Health Service
 - ❑ National Institutes of Health (NIH)
- ❑ **Department of Transportation**
 - ❑ Federal Highway Administration
 - ❑ Federal Motor Carrier Safety Administration
 - ❑ Federal Railroad Administration
 - ❑ Federal Transit Administration
 - ❑ Pipeline and Hazardous Materials Safety Administration
- ❑ **District Dept. of Transportation (DDOT)**
- ❑ **Environmental Protection Agency (EPA)**
- ❑ **General Services Administration (GSA)**
- ❑ **National States Geographic Information Council (NSGIC)**
- ❑ **Transportation Research Board (TRB)**

Current Activities

- ◆ TSC Charter Review/Update
- ◆ ARNOLD Minimum Content Standards Development

TSC Charter/Review Update

- ◆ Review and update existing charter to ensure that scope aligns with subcommittee's current and planned activities
- ◆ Review 2015 'GAO Report on Geospatial Data' to determine if recommendations to be addressed are included in the committee's scope of work
- ◆ Anticipated completion date: 1/31/2017

The image shows two overlapping documents. The top document is the 'Transportation Subcommittee Charter (October, 2010)' from the Federal Geographic Data Committee (FGDC). It includes sections for PURPOSE, AUTHORITIES, and SCOPE. The bottom document is a GAO report titled 'GEOSPATIAL DATA: Progress Needed on Identifying Expenditures, Building and Utilizing a Data Infrastructure, and Reducing Duplicative Efforts', dated February 2015. The report includes a disclaimer at the bottom regarding a reissue on March 18, 2015.

Transportation Subcommittee Charter
(October, 2010)

PURPOSE
This charter describes the Federal Geographic Data Committee (FGDC) Transportation Subcommittee responsibilities for the coordination and support for the National Spatial Data Infrastructure (NSDI), and other transportation data-related activities among stakeholders including the construction, publication and maintenance of a national transportation dataset.

AUTHORITIES
This Subcommittee is granted authority through the current version of the Office of Management and Budget Circular A-16 and Executive Order 12906. From these documents the United States Department of Transportation (US DOT) is designated the lead agency and is responsible to coordinate transportation data-related activities. This government-wide leadership for transportation data coordination is carried out under the policy guidance and oversight of the FGDC.

Pertinent enabling authority also resides in the language of:

- TITLE 49, U.S.C. - Transportation, 2011, 2014
- Intermodal
- Transportat
- Norman V. 108-426

SCOPE
Support the N of partnership transportation database desi support all as various multi-Stakeholders state, local, tr

United States Government Accountability Office
Report to Congressional Requesters

GAO

February 2015

GEOSPATIAL DATA

Progress Needed on Identifying Expenditures, Building and Utilizing a Data Infrastructure, and Reducing Duplicative Efforts

On March 18, 2015, this report was reissued to (a) clarify that GSA responded that it did not have comments on a draft of our report, and (b) ensure consistency in reporting that the Department of Transportation has begun to implement procedures for using the Geospatial Platform's Marketplace. These changes had no impact on the conclusions of our report.

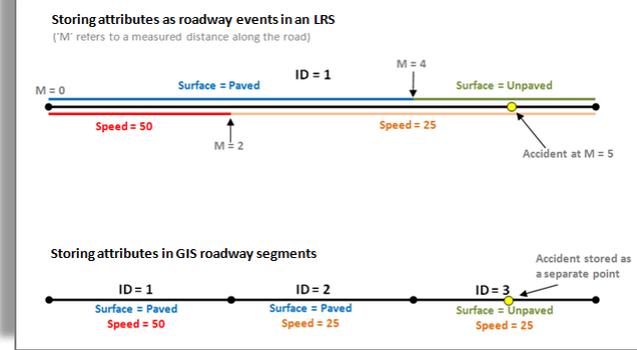
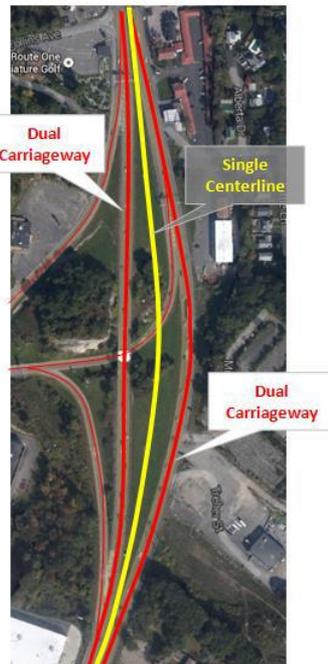
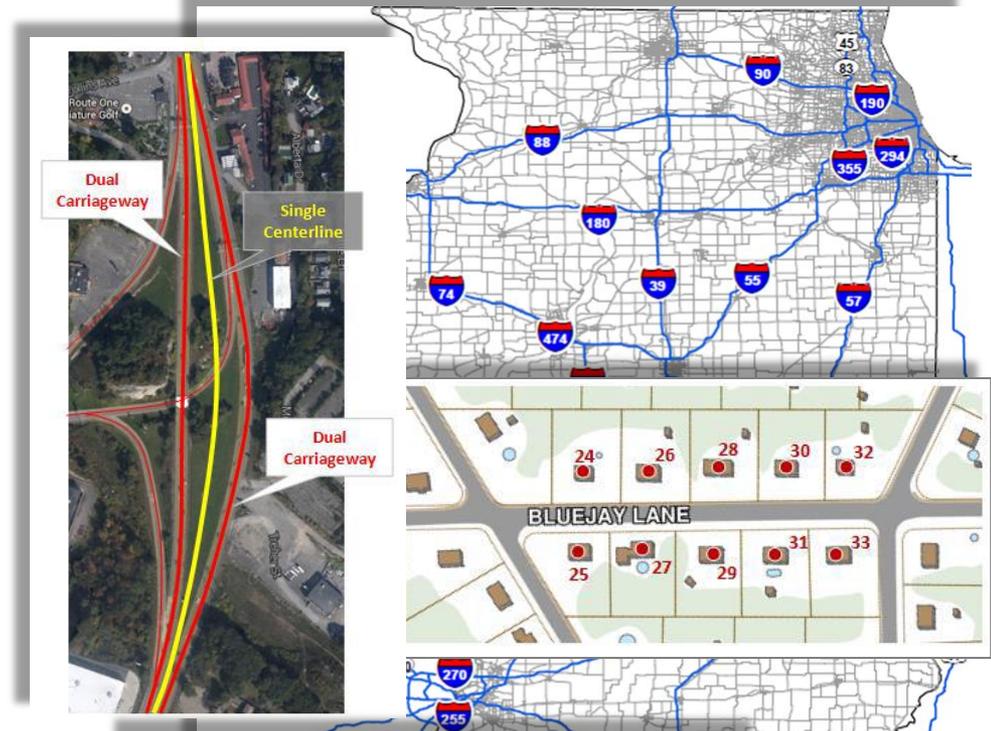
GAO-15-193

ARNOLD Minimum Content Standards Development

- ◆ All Roads Network of Linear Referenced Data (ARNOLD)
 - Geospatial roadway network dataset submitted annually to FHWA primarily for Highway Performance Monitoring System (HPMS) purposes
 - Helps support various safety, infrastructure condition and system performance-related initiatives
 - Proposed for incorporation into the NSDI as a key transportation theme

ARNOLD Minimum Content Standards Development (cont'd)

- ◆ Propose & finalize core attributes
- ◆ Develop, review and adopt data model
- ◆ Develop and finalize standards for network management & maintenance purposes



Planned/Future Activities

- ◆ Identification of stakeholder engagement opportunities
- ◆ Assessment of existing data standards and deficiencies
- ◆ Assessment of existing data assets and desired datasets

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United States of Transit

Derald Dudley

United States Department of Transportation

Bureau of Transportation Statistics

Office of Spatial Analysis and Visualization

Who we are - Bureau of Transportation Statistics

Principal Federal Statistical Agency that provides objective, comprehensive, and relevant information on:

- extent and use of the Nation's transportation system
- how well the system performance
- effects of the system on society and the environment.

The National Transit Map Initiative

- The Need
- No Problem
- The Solution
- How it Works
- How it Went
- Moving Forward
- Questions and Comments

The Need

- Premise: Transit benefits the United States.
- Provides critical ladders of opportunity for millions of Americans
 - Makes transportation available to people that don't have cars.
 - Provides access to Jobs, Healthcare, Education, etc...
 - Saves fuel, money and reduces congestion
 - Provides economic opportunities and drives community growth
 - It's better for the environment
- We should study transit and demonstrate its benefits at national and regional levels.

No Problem

- We'll just consult the national transit dataset.
- Problem
 - The national transit dataset only covers fixed guideway routes
 - It was a very small percentage of the national transit system
 - It lacked accuracy and depth

No Problem

- Most transit agencies publish GTFS Feeds
- We'll collect, compile, & publish the data
- Problem
 - Agencies set a variety of restrictive terms on the use of the data.
 - The data must be requested on a case-by-case basis.
 - Each dataset would have different terms of use

The Solution

- Create The [National Transit Map](#) (NTM)
 - a national repository of voluntarily provided, public domain transit data.
- The public, researchers and government agencies can access the repository and use the data for research
- Poof! Problem solved!

Policy Considerations

- How will we encourage participation?
- How will we get permission to use the data?
- What will be the terms of use?
- How do we track participating agencies?
- How will agencies tell us where to find the data?

Strategy Considerations

- Do we design, build and implement a complete solution or take an iterative approach?
- Do we ask for all of the data at once or do we focus on subsets?

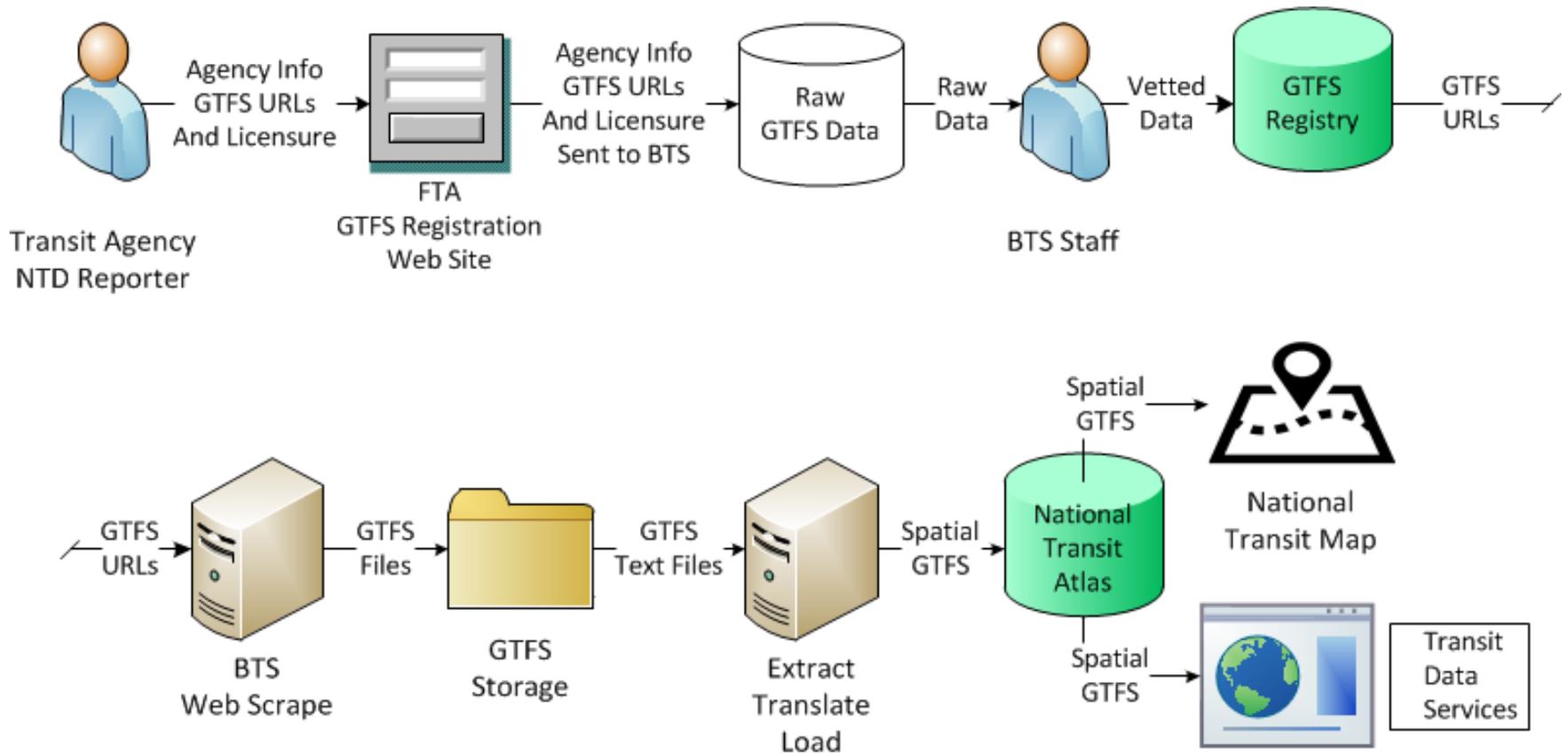
Technological Considerations

- How do we retrieve the data?
- How do we compile the data?
- How do we store the data?
- How do we publish the data?
- What products should we generate?

The Strategy

- Employ an iterative process
- Focus on the largest urban agencies
 - More likely to publish GTFS Feeds, affects more people
- The Secretary of Transportation would personally encourage participation
- The Federal Transit Agency would facilitate registrations via the FACES web site
- The Bureau of Transportation Statistics would maintain NTM registry and manage the dataset

How it works



Registration

- Transit Agencies use [FACES](#) to opt-in and
- Grant a Creative Commons Attribution 3.0 United States (CC-BY-3.0) license to the USDOT
- Register the URLs from which their GTFS feeds can be downloaded
- The registration is forwarded to BTS

Vetting the Feeds

- The URLs submitted are checked to ensure they are valid end points
- If they are not we search for the correct end point
- Sometimes valid end points cant be found

Scrapping

- The URLs are read from the Registry
- Each URL points to a zipped GTFS file
- Each .zip file is saved to a versioned directory

Building the database

- Each Zip file is opened
- Each GTFS file is opened and each record is inserted into the NTM database
- Each record is assigned an NTM ID so they maintain their unique identity

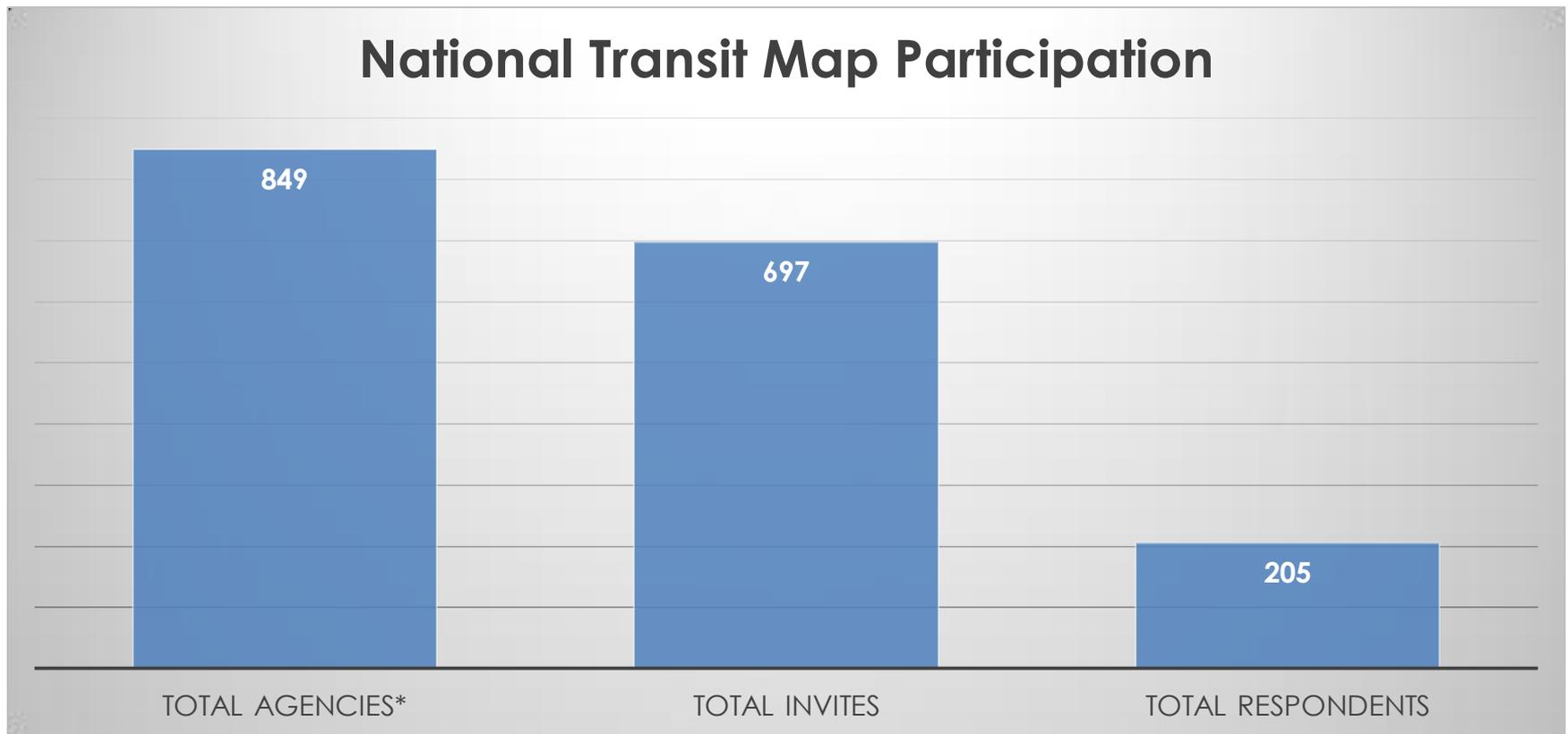
Products and Services

- Spatial
 - Participating agencies
 - Agencies by Volume
 - Stops
 - ¼ mile stop buffers
 - ½ mile stop buffers
- Tabular
 - Agencies
 - Feeds
 - Routes
 - Trips
 - Stop Times
 - Stops
 - Calendar
 - Others...

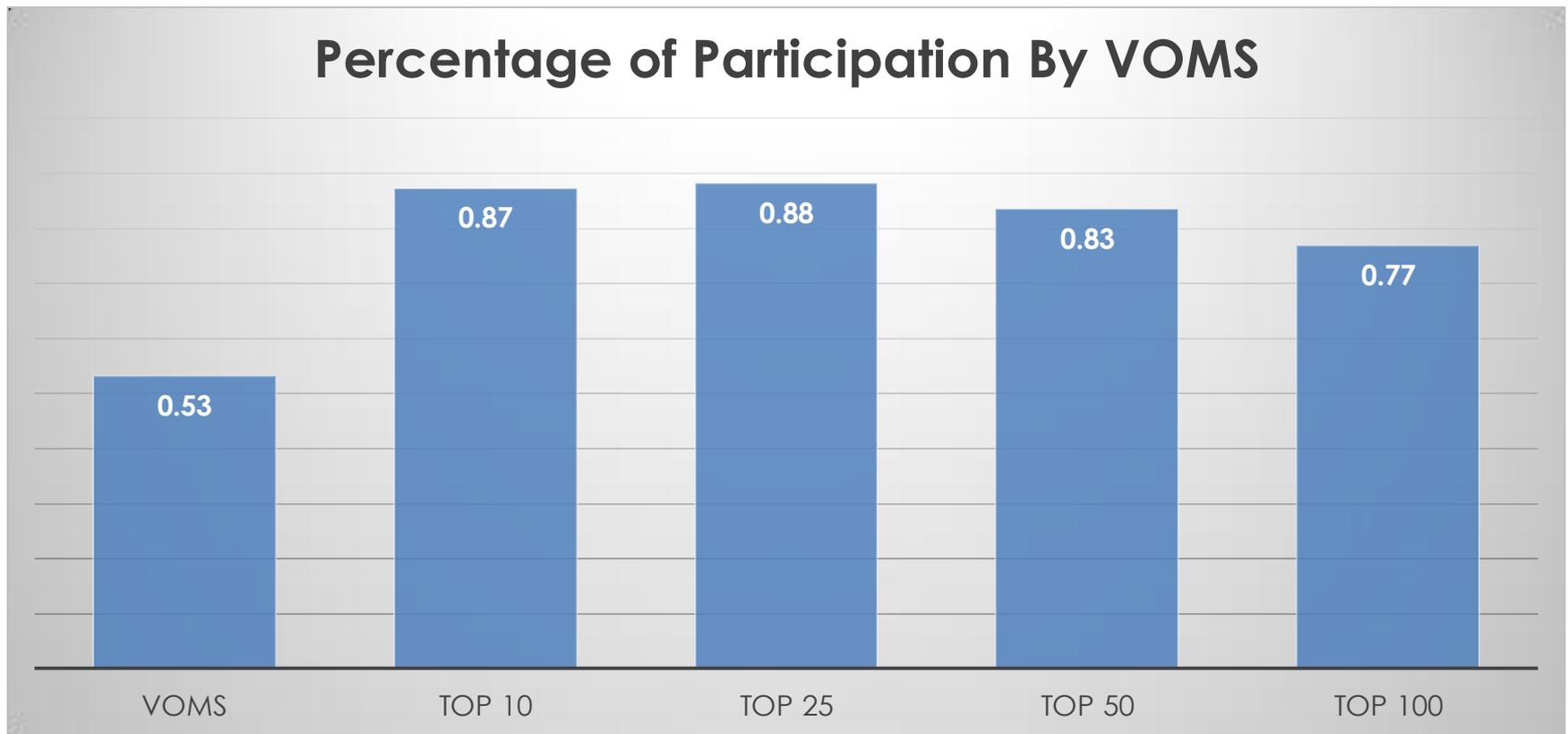
Anticipated Products

- User Guides
- System Documentation
- Agency provided routes
- Inferred Routes
 - (Eventually conflated to road networks)
- National GTFS Files
- APIs and Applications to query the data

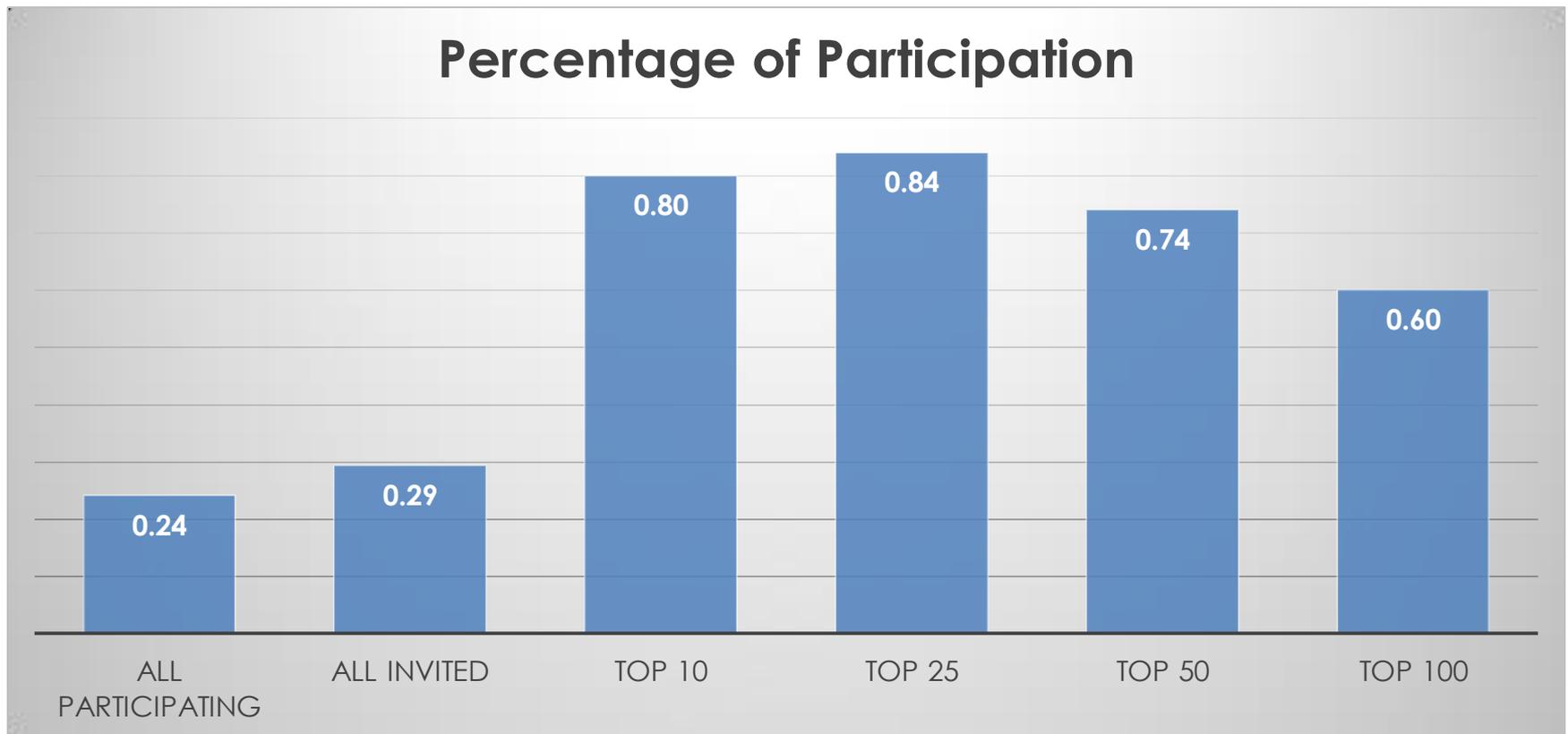
How It Went



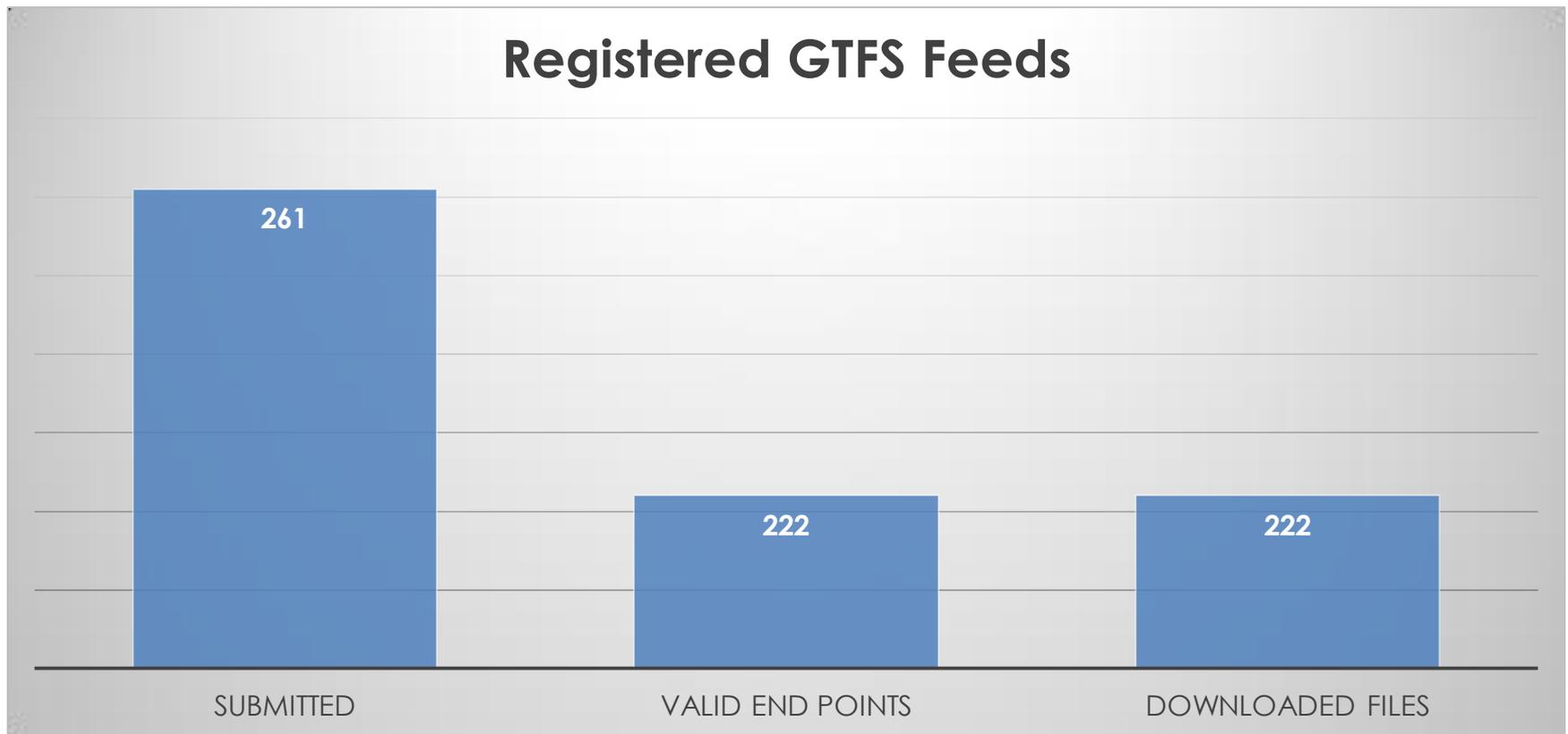
How It Went



How It Went



How It Went



How It Went

- The Build
 - Underestimated the amount of data
 - Code was written to use asynchronous processes
 - Process Files and Records One-By-One
 - Code had to be rewritten to use synchronous processes
 - Process File and Records concurrently

How It Went

- Publication
 - The amount of the data proved challenging
 - Specifically the Stop Times (67 Million Records) has been difficult to publish and serve efficiently

Moving Forward

- Consult with technical experts to optimize the database, processes and services
- Hire a Fellow whose sole focus will be the National Transit Map and Accessibility
- Work with the community to ensure we are providing what's needed

Resources

- [National Transit Map Website](#)
- [OSAV Data Catalog](#)
- Email:
 - NationalTransitMap@dot.gov

Thank you!

Questions and Comments

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