Data Visualization in Transportation: GIS and Planning Tools at NJTPA

November 29, 2018

Gabrielle Fausel
Principal Planner-GIS & Planning Tools, NJTPA
Agenda

• ViZtools
• NOTIS
• Freight Activity Locator
• County Profile App
• Open Data Portal
ViZtools

A web-based tool to illustrate how a wide range of factors relate to the multiple facets of regional planning.
ViZtools: The Need

• Needed a tool to support the Regional Transportation Plan in both analysis and visioning.

• Looking for a better way to engage the public and partner agencies in planning activities in the NJTPA region.

• Wanted a more interactive and dynamic way to disseminate data to the user.
ViZtools: Overview

- Assess Current Conditions.
- View Forecast Tools.
- Sketch a Future Scenario.
ViZtools: Functionality

Planning and visualizing the future.

Making the technical knowledge of planning agencies more accessible to the general public and set the stage for meaningful dialogue about planning challenges.

Search by Address, Municipality, or County. Not sure where to start? Try your town or address.

Search for areas by Interests

Try the Advanced ViZtool

How to use ViZtools (it’s easy!)

Learn all about transportation planning in northern New Jersey—your town, or compare between towns. More open space? What about your maps, charts, search features?

Do these tools start you down the path? Or are you starting here? What you’d like to do with it—is working on the NJTPA 2040—a plan that quality funding each year—and...
ViZtools: Functionality
ViZtools: Functionality

The Urban Centers are the largest municipalities in the region in terms of both employment and population. They serve as dominant economic centers for the entire region and provide housing to a large number of households belonging to diverse demographic and socioeconomic groups. Their housing stock consists of a large proportion of multi-family units. They are served by multiple modes of surface transportation. They serve as transit hubs, providing direct access to different areas of the region. The diverse economic activities in these centers include offices, airlines, light industries, warehouses, institutions of higher education, large hospitals, etc.

Livability

Strategies and projects intended to promote multiple, convenient transportation and housing options as well as destinations easily accessible to people traveling in and out of cars. Typical projects are transit-oriented development (TOD), mixed-use development (MUO), complete streets, a more even job-housing balance and walkable communities.

Livability Principles

- Enhance economic competitiveness
- Promote equitable, affordable housing
- Coordinate policies and leverage investment
- Provide more transportation choices
- Support walkable communities

- Population of NJTPA region over 8.8 million
- Over 3.5 million jobs in the NJTPA region
- Approximately 2.6 million housing units in the NJTPA region
ViZtools: Functionality

Indicators that have to do with the overall economic health and prosperity, particularly with respect to employment and economic self-reliance of an area.

Access for Disadvantaged
An index measuring the distance from disadvantaged neighborhoods to parks, water bodies, and employment.

Brownfields
The term "brownfield site" means real property, the expansion, redevelopment, or release of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. This indicator counts the number of brownfield sites in the study area.

Employment (Jobs)
Jobs are documented tasks, assignments, charges, duties, enterprises, functions, and get paid to perform.

Employment Density
Employment density is the total number of jobs divided by the total area (in acres) of the economic lens.

Jobs-Housing Balance
The ratio between the total number of jobs and the total number housing units within the Jobs-Housing Lens.

Retail Space
Retail spaces are where you shop and dine. They include everything from grocery stores and drug stores to fine dining. To consumers, retail stores are a part of everyday life. To employees of jobs, a typical specialty shop represents a few thousand square feet of retail, while a 100,000 square foot mall on average, 455 square feet of retail space correspond to 1 retail job.

Brownfields [2010]

Middlesex County / New Brunswick
75 brownfields

Compared to study areas in NJTPA region of like geographic levels:

Regional Comparisons
Regional trend data is not currently available for this indicator.

Strategies for Improvement
- Target for land revitalization
- Promote redevelopment opportunities
- Maximize properties into productive land uses

Putting This Number in Context

About this Indicator & Why it Matters
Brownfields are defined as any former or current commercial or industrial site, currently vacant or underutilized, on which there has been, or there is suspected to have been, a discharge of a contaminant. According to the US Environmental Protection Agency (EPA), the term "brownfield site" means real property, the expansion, redevelopment, or release of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.
ViZtools: Functionality

Choose your emphasis
- Population
- Jobs
- Jobs-Housing Balance
- Impervious Surface
- Traffic

Scenario - Key Indicators for your Study Area
- Population
- Jobs
- Jobs-Housing Balance
- Impervious Surface
- Traffic

Middlesex County / New Brunswick
Place Type: Urban Center
- Population
- Housing
- Jobs
- Open Space
- Retail Space

LIVE
- Population
- Housing

WORK
- Jobs

PLAY
- Open Space

SHOP
- Retail Space
ViZtools: Next Steps

- Update data to reflect new demographic and forecast data.
- Research new techniques for delivering data to the user.
- [http://viztools.njtpa.org/](http://viztools.njtpa.org/)
An interactive tool that allows you to explore how your state and federal tax dollars are being invested to improve the transportation system in the 13-county northern New Jersey region.
NOTIS: The Need

- Changing mapping technology.
- Outdated code.
- Antiquated interface.
NOTIS: Overview
NOTIS: Functionality
NOTIS: Functionality

Quick Text Search Summary:
NOTIS allows you to conduct custom text searches about locations and aspects of the transportation system that are of special concern to you.

The NOTIS text-based key features allow you to directly interact with our most current transportation information system data. You can use the text-based search to find all the projects in a particular county or on a particular route.

Text-search key features:
1. County Search
   - Lets you look for projects in specific counties.
2. Route Search
   - Lets you look for projects in a specific road.
3. Project ID Search
   - Lets you look for a specific project.
4. Municipality Search
   - Lets you look for projects in specific municipalities.
5. Transit Project Search
   - List transit projects.
6. Advanced Search
   - Lets you look for specific projects by county, fiscal year, funding source and/or status

The online database queries provide a summary of results. These results allow users to access “Detail” information, including funding sources, year-by-year schedules and status reports.

Search results
Summary of Selected Project
1 project(s) matched your search criteria.

- Project ID: 065C
- Title: Route 4, Bridge over Palisade Avenue, Windsor Road and CSX Railroad
- Sponsor: NJDOT
- Location: Bergen
- Project: This is a breakout of the Route 4 Corridor Multi-Bridges and Roadway Improvement project. The project will replace the existing Route 4 Bridge over Palisade Avenue, Windsor Road, and CSX Railroad. Approach roadway work and improvement of Belle Avenue intersection will be part of the project as well.
NOTIS: Next Steps

- Enhancements of user interface.
- Maintenance/Updating.
- [http://notis.njtpa.org](http://notis.njtpa.org)
Freight Activity Locator

A web-based application providing an overview of goods movement activity in the NJTPA region.
Freight Activity Locator: The Need

- 900,000 regional jobs directly related to or highly dependent on freight
- Over 100,000 daily truck trips on region’s major highways
- Over 800 million square feet of warehousing and distribution facilities
Freight Activity Locator: Overview

- Application built on Esri platform
  - Story map template
- Eight tabs
  - Overview
  - Rail Network
  - Roadway Network
  - Truck Parking
  - Facilities
  - Commodity Profiles
  - Waterborne Opportunity Sites
  - County Data
**Freight Activity Locator: Functionality**

The NITPA region is a leading North American distribution and goods movement platform serving the local, national, and global commerce markets. The region includes the largest port on the Atlantic Coast, one of the leading air cargo airports in North America, over 30 million square feet of industrial property, and extensive roadway and rail freight networks.

This Freight Activity Locator application provides access to key freight data developed and gathered by the NITPA during the course of its freight planning activities. The application presents maps of the region's freight transportation network and major freight facilities including the port, intermodal parts, and distribution centers. Freight activity summaries for each NITPA county and the top regional commodities handled are also presented.
Freight Activity Locator: Functionality

The NJTPA Regional Freight Commodity Profiles study, completed in 2015, enhanced the NJTPA’s freight modeling tools, analyzed and identified gaps in existing freight and industry data, collected data and information to fill those gaps, and prepared summary data products, including a set of Regional Commodity Profile documents for the top regional commodity groups. The summary of key information for each commodity bundle is presented here and includes commodity bundle composition by tonnage (2010), commodity bundle composition by value (2010), commodity bundle inbound tonnage by county (2010 and 2014), and commodity bundle outbound tonnage by county (2010 and 2014). The data source is the NJTPA Freight Forecasting Tool, 2012.

Commodity Bundles

The NJTPA Regional Freight Commodity Profiles study, completed in 2015, enhanced the NJTPA’s freight modeling tools, analyzed and identified gaps in existing freight and industry data, collected data and information to fill those gaps, and prepared summary data products, including a set of Regional Commodity Profile documents for the top regional commodity groups. The summary of key information for each commodity bundle is presented here and includes commodity bundle composition by tonnage (2010), commodity bundle composition by value (2010), commodity bundle inbound tonnage by county (2010 and 2014), and commodity bundle outbound tonnage by county (2010 and 2014). The data source is the NJTPA Freight Forecasting Tool, 2012.

Commodity Selected:
CONSTRUCTION MATERIALS

This bundle consists of commodities: concrete, cement, asphalt, or lime products, lumber or wood products, and miscellaneous, concrete masonry products, glass, paper, paper products, and other wood products excluding furniture. Miscellaneous include tin, copper, lead, zinc, and other ores.

Commodity Data Summary

Domestic Tons in 2010

The figures at CONSTRUCTION MATERIALS that moved in, out, within and through the NJTPA region in 2010 were 118 million.
Freight Activity Locator: Functionality

The NJTPA Freight Activity Locator project, completed in 2012, developed an accurate picture of where concentrations of goods movement activity are expected to occur in the region in the future. The types of commodities that will be moving, and where strategic investments should be made. County-level summaries of freight activity developed during the study are presented here and include: county industry employment (2010 and 2040) from REOC; top 10 commodities for the counties (2010 and 2040) from IHS Global Insight; freight transportation mode split for the county (2010) from IHS Global Insight.

View the Regional Freight Profile

County Data Summary

Industry Employment Forecast, 2010-2040

Morris

Population

492,276

Economy

30,628

Jobs

281,200

Freight Facilities

Warehouses

400

Manufacturing

180

View the Complete County Freight Profile
Freight Activity Locator: Next Steps

- Integrate Video
- Additional Mapping Tabs
- Additional Data Summary Tabs
- [http://freightactivitylocator.njtpa.org/](http://freightactivitylocator.njtpa.org/)
A web-based mapping tool that provides county level demographic data for the NJTPA region.
County Profile Application: The Need

• Increased requests for demographic data.

• Ability to present data in a more user friendly way.
County Profile Application: Overview

- Developed using the Esri Platform.
- Design and content based on PDF booklets created.
- Dynamic vs. Static interaction.
County Profile Application: Functionality

- Six Planning Topics
  - Demographic
  - Economic
  - Access and Mobility
  - Transportation
  - Environment
  - Commodities

- Data displayed using infographics, charts, and graphs.
County Profile Application: Next Steps

- Populate data for other geographic areas; Municipalities and census tracts.
- Develop a report template.
- Integration of Census API.
Central repository for publicly available geospatial data.
Open Data Portal: The Need

- Increased requests for data.
- Need for central repository of data.
- Ability to share and collaborate with subregions and partner agencies.
Open Data Portal: Overview

The NJTPA Open Data Portal provides datasets that are commonly requested by our partner county and state planning agencies. The datasets include spatial data, tabular data, web maps, and web applications, and are free to download and use. The datasets range in several subject areas that align with NJTPA’s core focus areas. To start browsing the Open Data Portal, click on one of the subject areas below to see datasets.

Search by Keyword, Location, or Category
Planning Tool Spotlight: Freight Activity Locator

Every few months we will feature a different project that uses open data. This month puts the spotlight on the Freight Activity Locator, this web application provides access to key freight data developed and gathered by the NJTPA during the course of its freight planning activities. The application presents maps of the region’s freight transportation network and major freight facilities including the port, intermodal yards, and distribution centers. Freight activity summaries for each NJTPA county and the top regional commodity bundles are also presented. Try out the tool at https://freightactivitylocation.njtpa.org/.
NJTPA Open Data Portal: Functionality
Open Data Portal: Next Steps

• Continued maintenance and data update.

• Staying on-top of new releases and functionality from Esri.
