FDOT TOOLS FOR ACCESSIBILITY AND TITLE VI ANALYSIS

2015 FPTA/FDOT/CUTR Professional Development Workshop

June 2, 2015

AGENDA

1. **TBEST Origin and Purpose**
2. **TBEST Framework Features**
3. **TBEST Title VI**
4. **TBEST Accessibility Measures**
5. **Q&A**

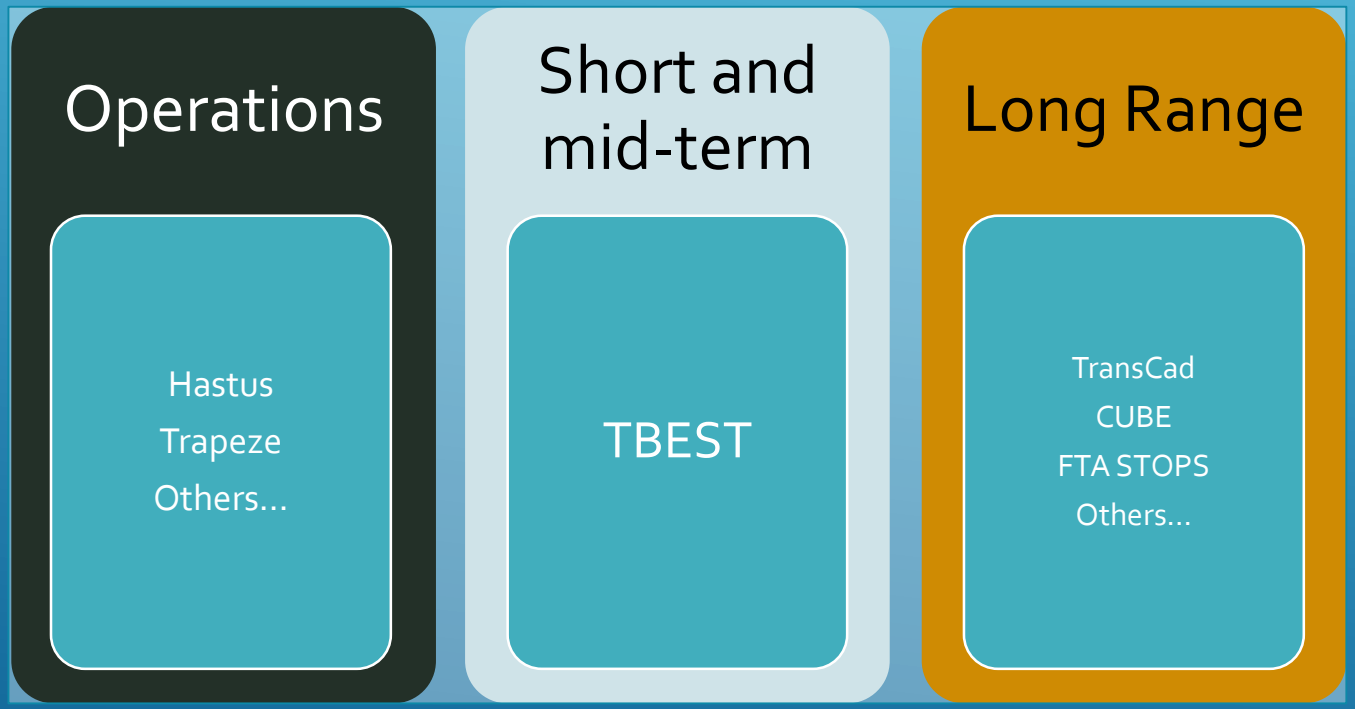
TBEST = Transit Boardings Estimation and Simulation Tool

TBEST ORIGINS

- **FDOT Public Transit Office** sponsorship for past 10+ years
- FDOT wanted a software tool for short-term transit service and strategic planning
- FDOT provides state-wide TBEST support through software improvements, training and data updates
- Community Software
- No software fees for TBEST (www.tbest.org)

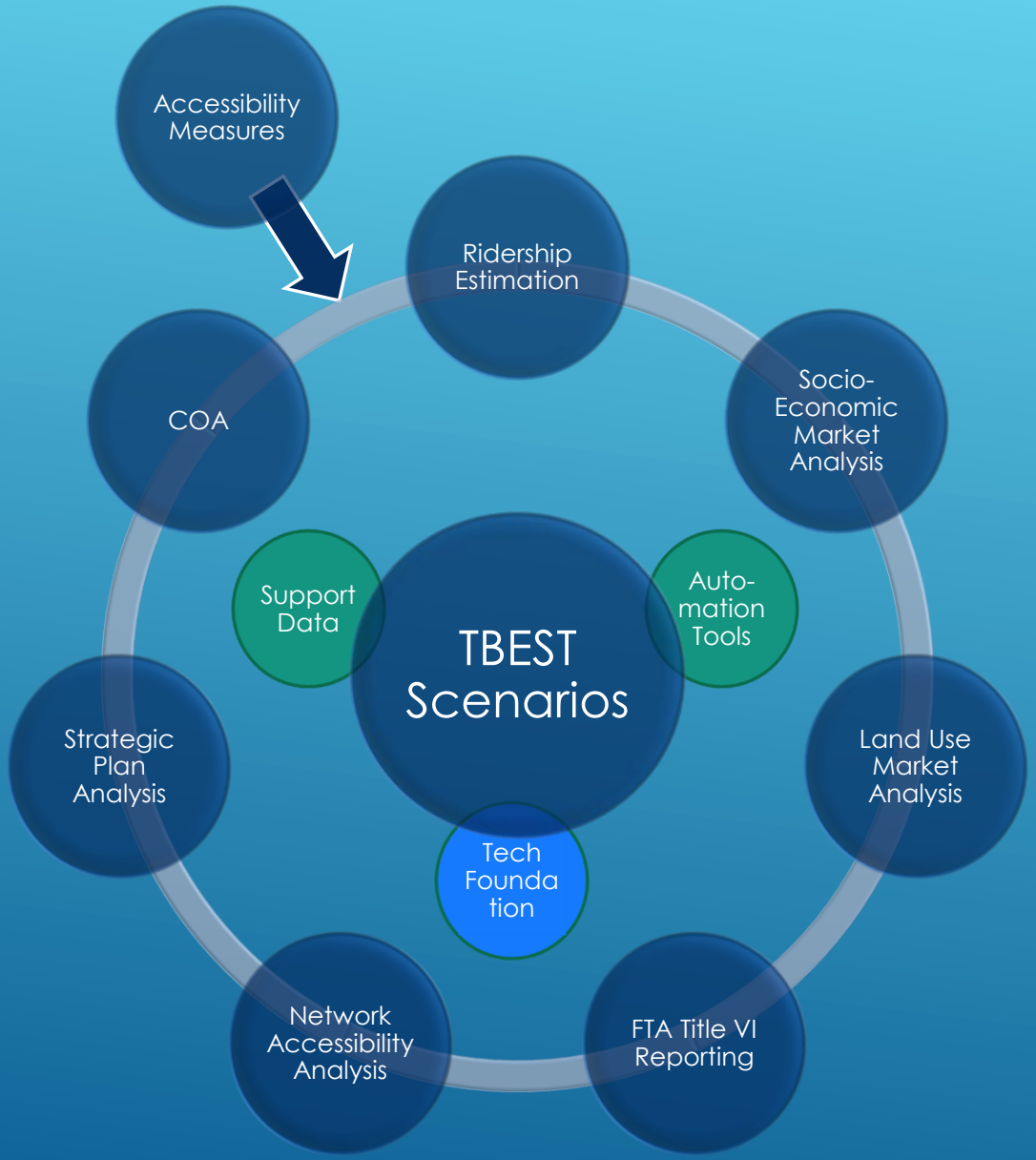
WHY TBEST?

Software Gap



TBEST PURPOSE

- Support ridership estimation TDP requirement
- Utilization as an in-house service and strategic planning tool
- Streamline reporting to be consistent with federal, state, and local requirements
- Provide flexible data input options
- Provide reporting options which communicate complex planning scenarios to internal and external customers
- Provide agencies with a tool which preserves institutional knowledge



TBEST SCENARIO FRAMEWORK

PRETTY SIMPLE!

1. Users develop alternative scenarios using Support Data and Automation Tools
2. Scenarios input into core TBEST application and analysis tools
3. Summarize results

TBEST FRAMEWORK - SCENARIOS

- Base Year or Application Year
- Input routes, segments and stops by direction and unique pattern
- Socio-Economic data and growth rates
- Fare
- Service levels and duration by time period
- Special Generators and Stop Amenities

TBEST FRAMEWORK SUPPORT DATA

Support Data

- **Demographics**
  - Census 2010 Block geography and SF1variables
  - American Community Survey (ACS) 5-Year Estimates
  - Address-level (InfoUSA) or zonal employment or LEHD (Census product)
  - Socio-economic growth projections (MPO)
- **Transit Network**
  - GTFS
  - Shapefiles
  - TBEST Network Coding
- **Land Use Data**
  - Parcel data (current year)
- **Travel Demand Data**
  - ITE trip generation data
  - National Household Travel Survey data on trip temporal distribution

TBEST FTA TITLE VI ANALYSIS

FTA Title VI Reporting

The TBEST Title VI Analysis tool supports FTA required service equity analysis

- Supports both the full triennial FTA Title VI evaluation and any required interim evaluations in response to major system service changes
- Identifies minority routes
- Summarize minority, low income and Limited English Proficiency (LEP) populations
- Provides service level summaries in both map and tabular formats
- Does not address fare equity analysis

TBEST TITLE VI ANALYSIS OBJECTIVES

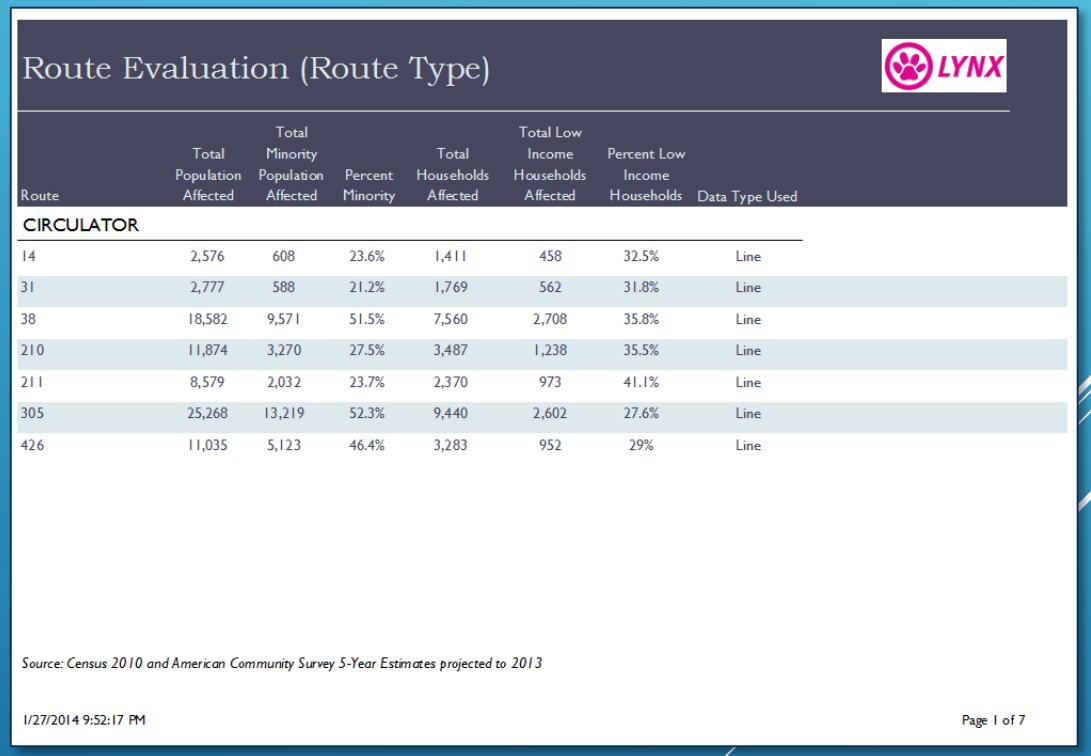
FTA Title VI Reporting

- Minimize agency effort in Title VI data collection, data analysis, report configuration and map production
- Provide print quality maps and reports which can be directly included in Title VI documentation
- Flexibility to customize maps and reports for additional equity analysis

TBEST TITLE VI OUTPUT REPORTS

FTA Title VI Reporting

- System Evaluation
- Route Evaluation (Route Type)
- Route Evaluation (Mode)
- LEP System Evaluation
- LEP Route Evaluation
- Minority Route Designations
- Service Availability (Minority Routes)
- Service Availability (Route Type)
- Service Availability (Mode)
- Revenue Service Miles by County
- Poverty Income Levels



Route Evaluation (Route Type)

LYNX

Route	Total Population Affected	Total Minority Population Affected	Percent Minority	Total Households Affected	Total Low Income Households Affected	Percent Low Income Households	Data Type Used
CIRCULATOR							
14	2,576	608	23.6%	1,411	458	32.5%	Line
31	2,777	588	21.2%	1,769	562	31.8%	Line
38	18,582	9,571	51.5%	7,560	2,708	35.8%	Line
210	11,874	3,270	27.5%	3,487	1,238	35.5%	Line
211	8,579	2,032	23.7%	2,370	973	41.1%	Line
305	25,268	13,219	52.3%	9,440	2,602	27.6%	Line
426	11,035	5,123	46.4%	3,283	952	29%	Line

Source: Census 2010 and American Community Survey 5-Year Estimates projected to 2013

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Page 1 of 7

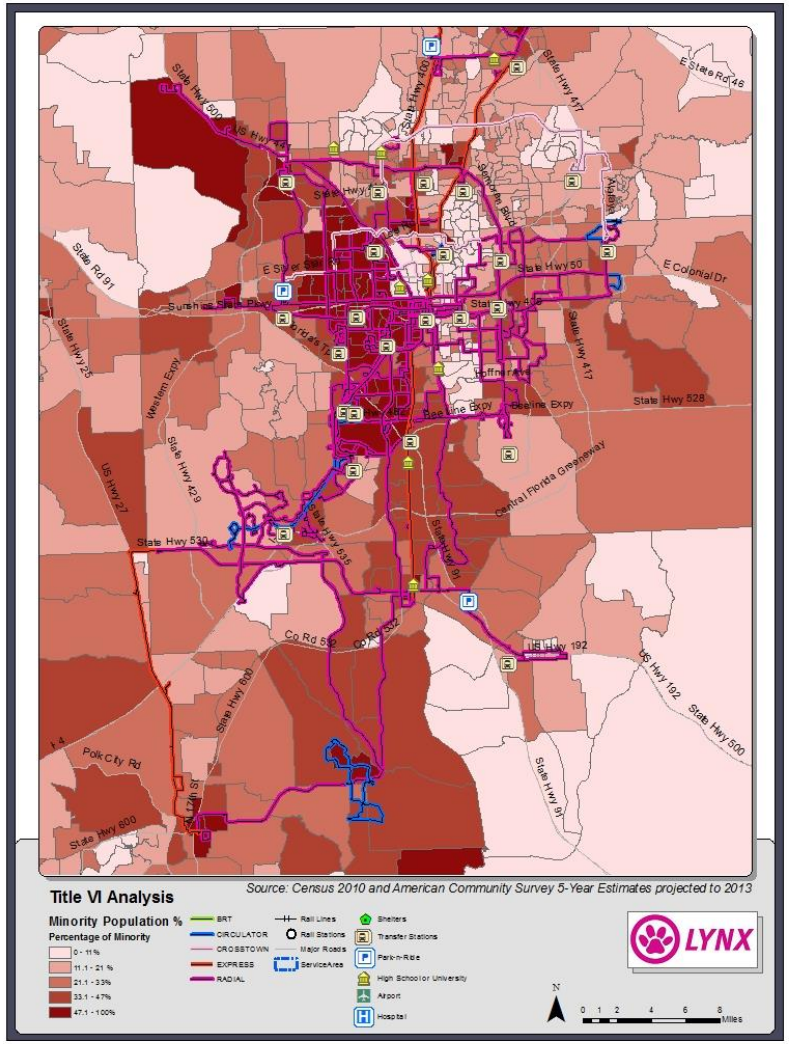
TBEST TITLE VI MAP SERIES

FTA Title VI Reporting

- Provides a composite view of the minority population, poverty-level households, and Limited English Proficiency (LEP) population distributions within the agency service area
- Consistent with the FTA Circular map samples
- Opens in ArcMap layout view with a print ready map layout which includes a title, legend, scale bar, and the transit agency logo.
- The ArcMap environment allows for additional user data and symbol modifications prior to map publishing. User edits to map content can be saved within the ArcMap document.

TITLE VI OUTPUT MAPS

- Route Map
- Land Use
- Minority Population Distribution
- Minority Population Above System Average
- Minority Routes
- Low Income Households Distribution
- Low Income Households Above System Average
- Population + Employment per Acre
- Limited English Proficiency (LEP) Distribution
- LEP – Spanish Above System Average
- LEP – Creole Above System Average
- LEP – French Above System Average
- LEP – Chinese Above System Average
- LEP – Korean Above System Average
- LEP – No High School Diploma



FTA Title VI Reporting

SUPPORTED WORKFLOWS

FTA Title VI Reporting

Service Equity Analysis

- Most agencies will have unique variations on desired reporting and mapping to support Title VI analysis. TBEST supports the individualized approach by providing base reports and maps which can be customized to address unique equity analysis issues

Analyzing Disparate Changes for a Proposed New Service

- Supports interim analysis of "major" service changes
- Create pre and post scenarios
- Run Title VI Analysis on both scenarios

Socio-Economic Market Analysis

- Use TBEST SE Analysis tools to perform segment or stop level equity analysis

Accessibility Measures

TBEST ACCESSIBILITY MEASURES

On-going FDOT project to develop enhanced accessibility measures within TBEST

TBEST Accessibility Project Goals:

- Provide a standardized feature set of aggregate accessibility measures
- Produce easy to understand and disseminate reports/maps/charts
- Summarize access to transit and access via transit for transit agencies, MPO's and other interested agencies
- Integrate with existing TBEST features (Scenarios, GTFS Import, Workflow Tools)
- Produce measures on existing or proposed transit networks

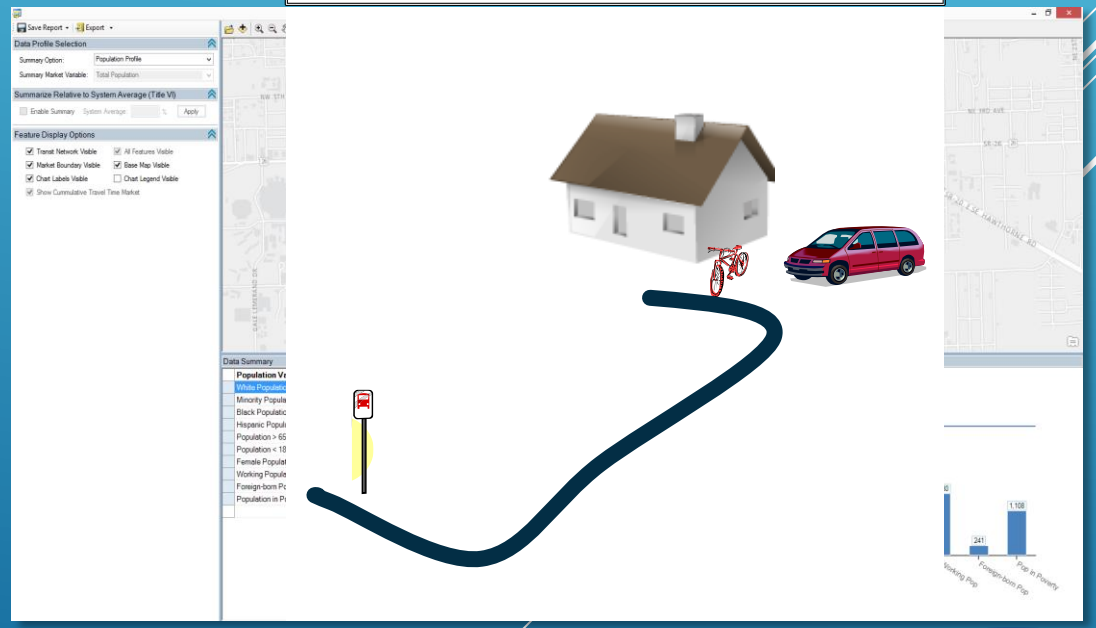
FDOT

ACCESS TO TRANSIT VIA GEOGRAPHIC PROXIMITY

Walk Access To Transit

- Evaluate walk market within ½ mile of transit stops
- Enumerate the following within the walk shed:
  - Population
  - Residences
  - Employment
- Walk shed defined by airline distance
- Walk market served by transit

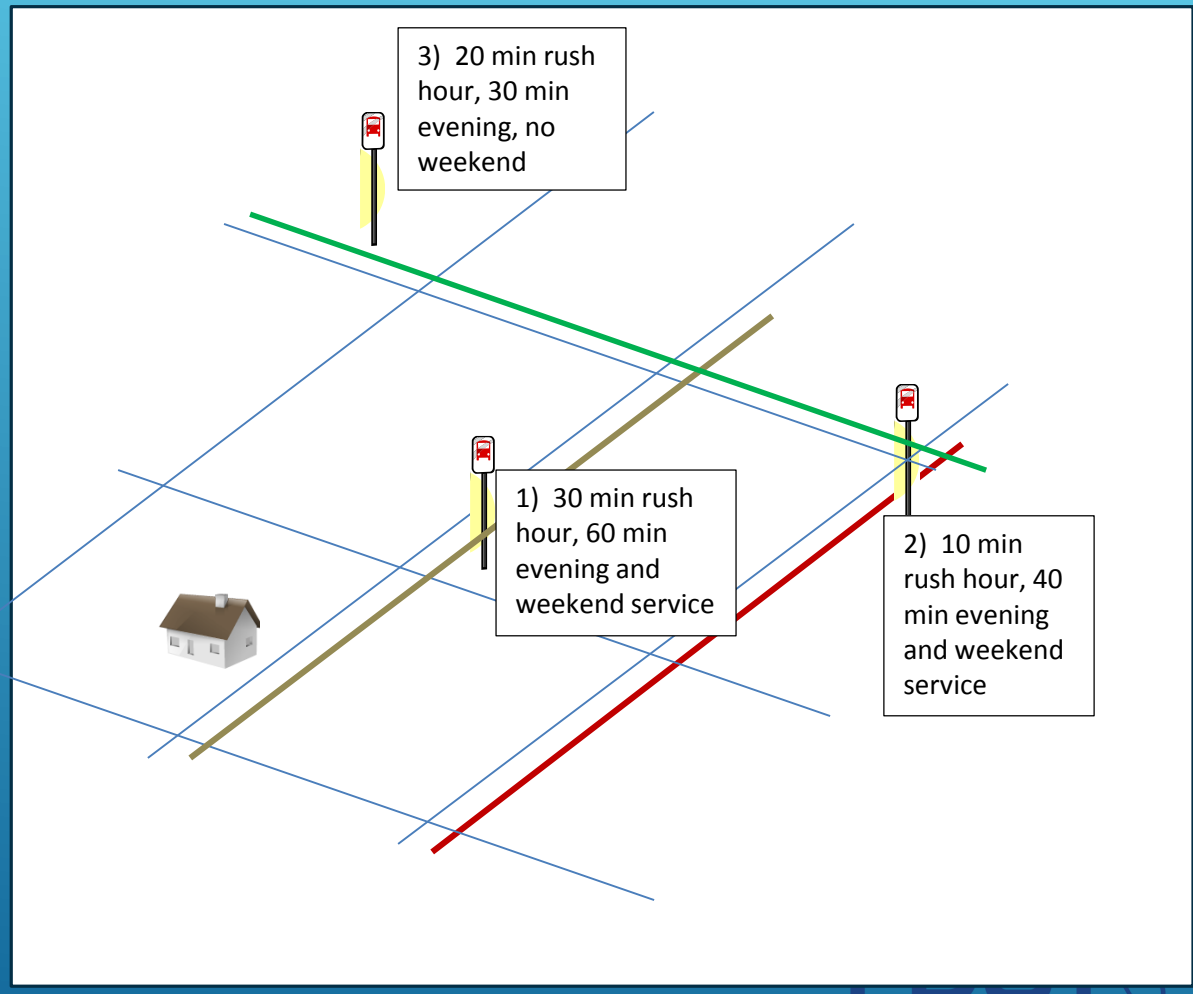
Access to Transit **=** *the ability to get to or from a transit stop.*



ACCESS TO TRANSIT BASED ON SERVICE FREQUENCY

Walk Access To Transit - Service

Estimated Access Time for Bus Service at 3 Stops				
Stop	Walk distance in feet	Average wait for unscheduled Rush-hour departure	Walk time at 3 mph	Time till boarding
Stop 1	400	15	1.51	16.51
Stop 2	1100	5	4.15	9.15
Stop 3	1200	10	4.53	14.53



ACCESS TO TRANSIT BASED ON SERVICE FREQUENCY

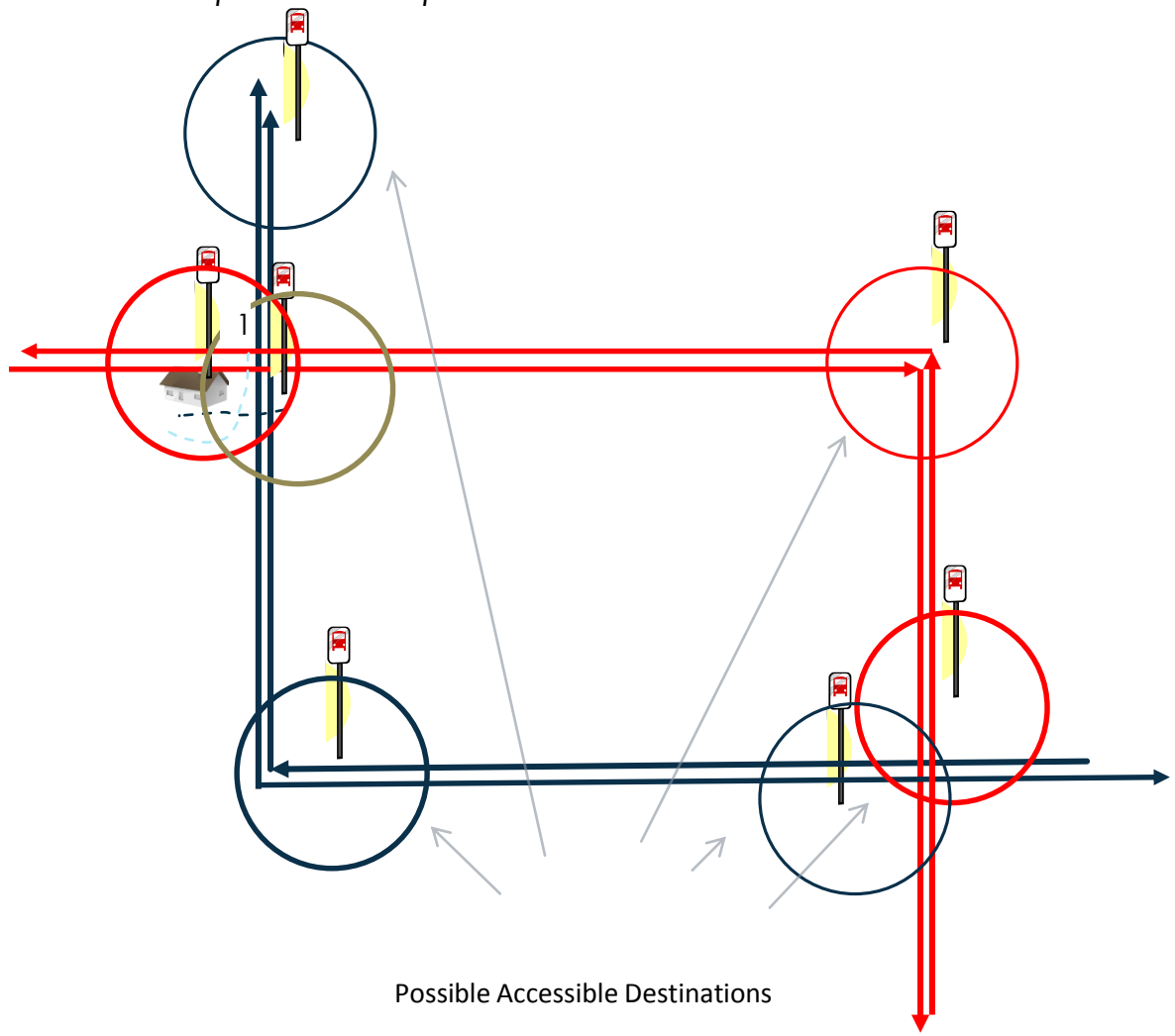
Walk Access To Transit - Service

- Evaluate walk market within ½ mile of transit stops in relation to service levels
- Time of day variation in access to employment and service locations
- Metric would identify:
  - Population/Employment accessible by number of transit trips per hour by time of day
  - Distinguish areas that are well served by transit vs. underserved

ACCESSIBILITY MEASURES

- Access via transit by zone (Aggregate)
- Access via transit to destinations (hospitals, shopping, jobs).

Access via Transit **=** *the ability to access destinations through utilization of public transportation services.*



Accessibility Measures

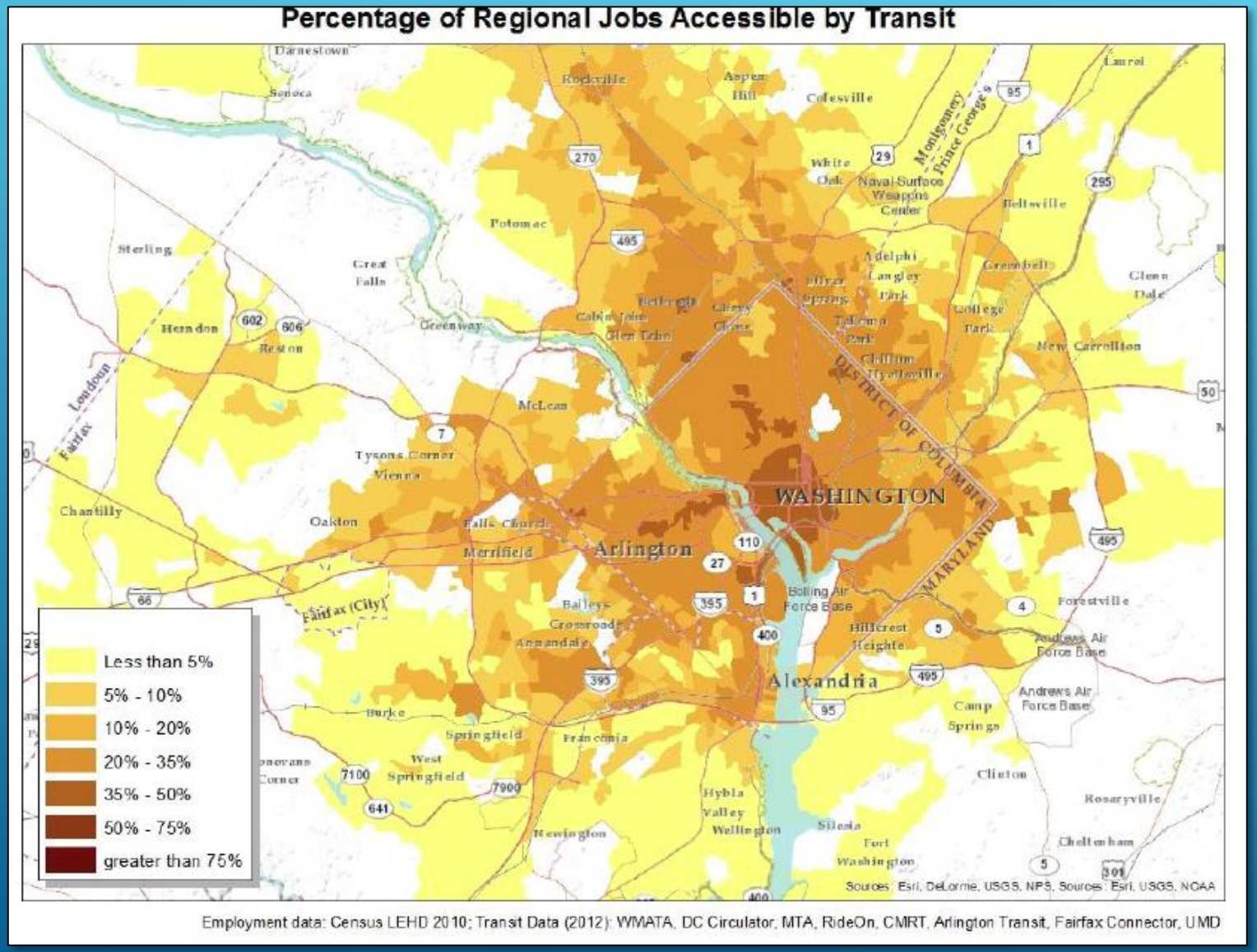
ACCESS VIA TRANSIT – ZONAL

Access via Transit - Zonal

- Provide metrics on access to employment and households via transit from each zone to all accessible zones
- Zones will be either Census Blocks or Block Groups
- Determine zone to zone transit travel times by time of day
- Determine zone to zone walk time
- Aggregate Employment data to the zone level
- Metrics would identify:
  - Destination market accessibility via walk or transit (shortest path) from each zone
  - Determine the share of the service area population/employment served each zone

ACCESS VIA TRANSIT – ZONAL

Access via Transit - Zonal



Source: EPA Smart Database

ACCESS VIA TRANSIT – TO DESTINATIONS

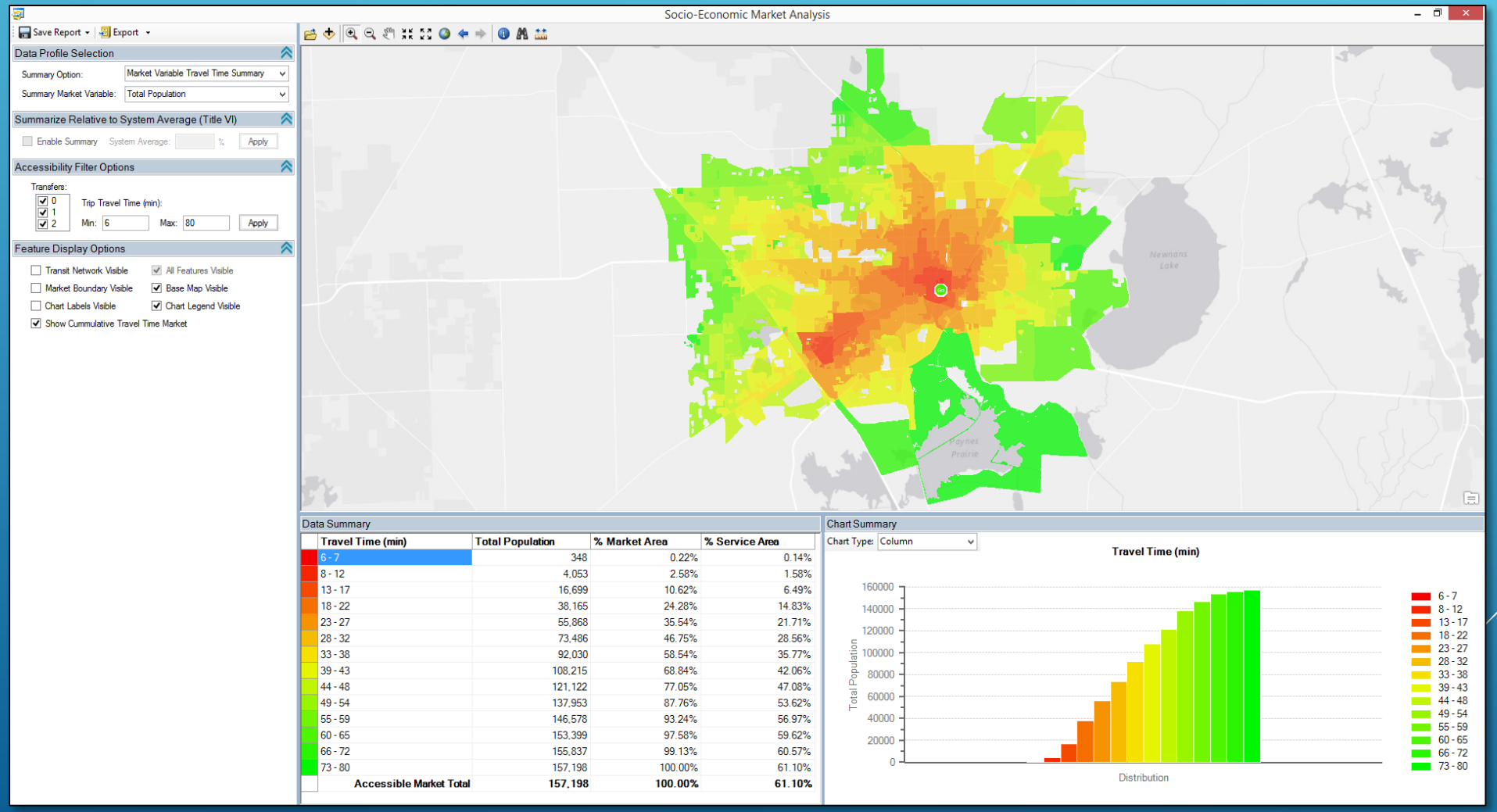
Access via Transit - Destinations

Summarizes the intensity and distribution of land use, socio-economic, and employment data for a given network accessible market

- Summarizes accessible market conditions by trip travel time and number of transfers
- Ability to determine accessibility to/from more than one location
- Summarizes destination markets relative to the service area (% service area)
- Determine market segments which have access to transit destinations such as hospitals, shopping, etc.

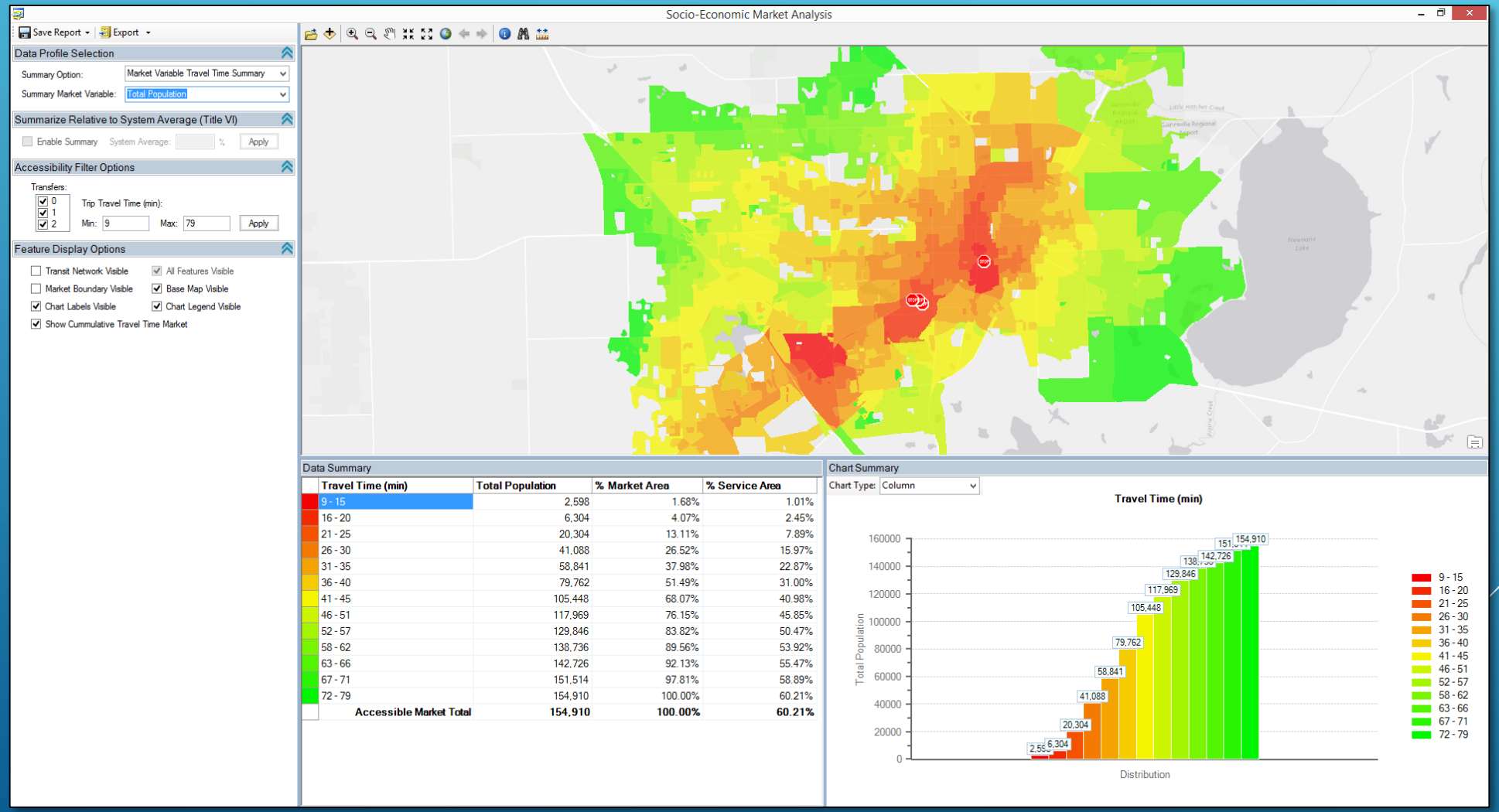
ACCESS VIA TRANSIT – FROM AN ORIGIN

Access via Transit - Destinations



ACCESS VIA TRANSIT – TO DESTINATIONS

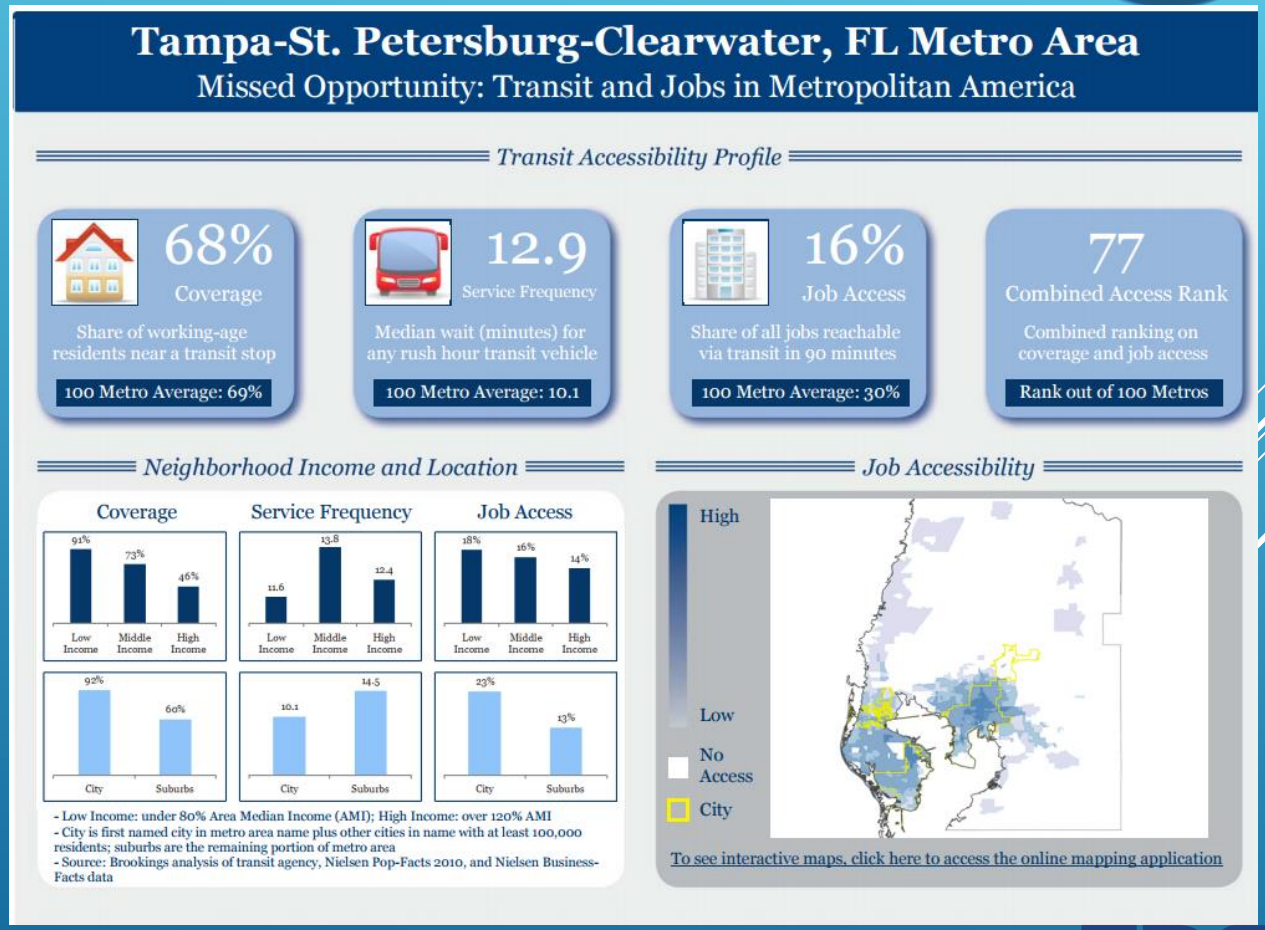
Access via Transit - Destinations



ACCESSIBILITY OUTPUT

Accessibility Measures

- Reports and Maps formatted to concisely define the measures
- Easy to understand
- Contain few numbers and more graphics



Source: Brookings Institute

UPCOMING FDOT SPONSORED TRAINING

2-Day Seminar Training Sessions

- Developing Ridership Forecasts for TDP
- Performing Title VI Analysis
- Introduce the new Parcel Editing and Comprehensive Operational Analysis COA Tools
- Training Sites/Dates:

FDOT District 3 Office – Chipley
July 15-16, 2015
Computer Training Room
1074 Highway 90
Chipley, FL 32428-0607

FDOT District 5 Office -Deland
July 21-22, 2015
PC Training Lab
719 South Woodland Blvd.
DeLand, FL 32720

THANKS FOR YOUR TIME

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