



DESIGNING TRANSIT ACCESSIBLE COMMUNITIES STUDY

Technical Working Group Meeting
March 29, 2012



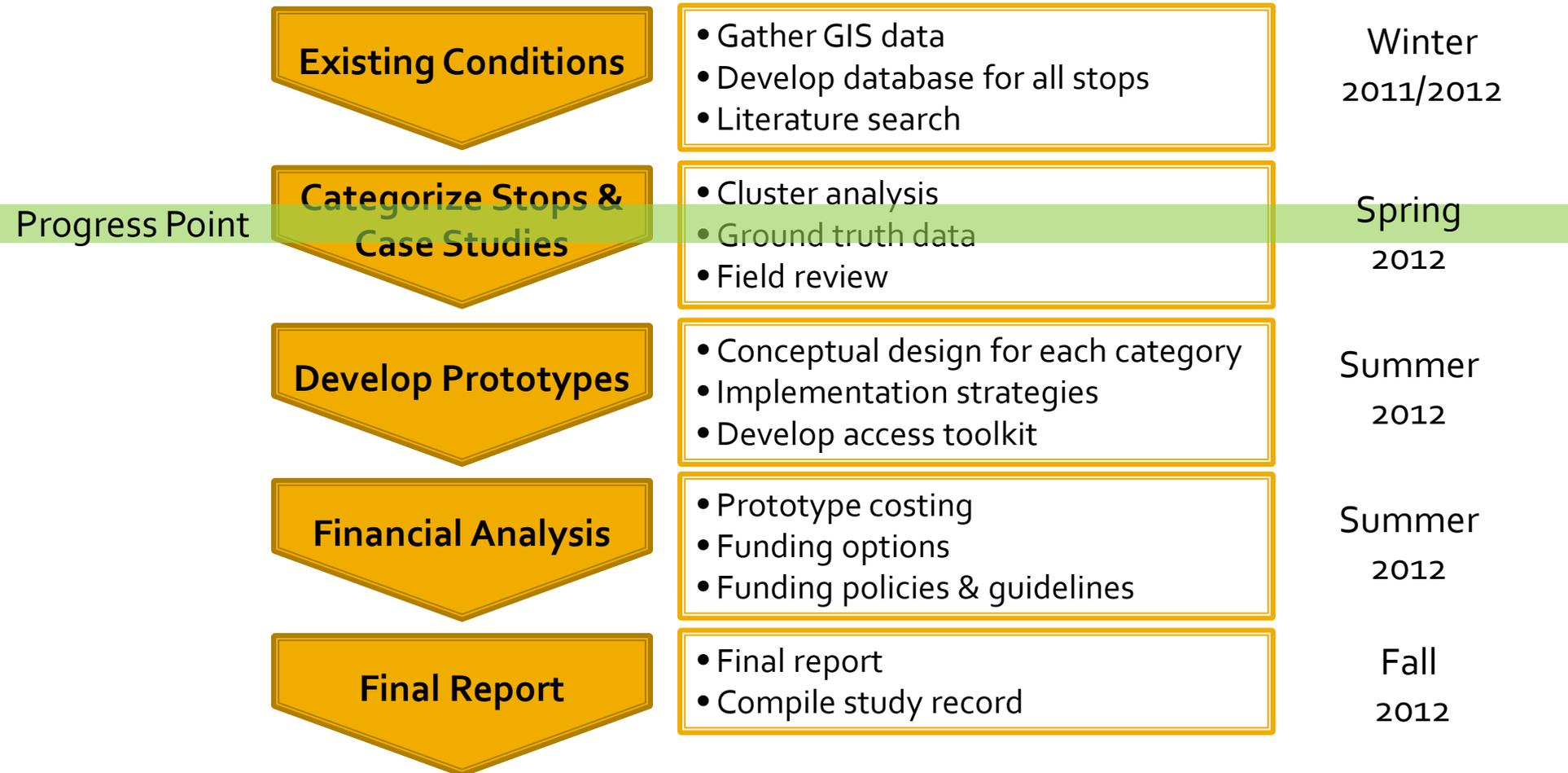


Agenda

1. Progress Report & Working Paper #1 Overview (20 minutes)
2. Bus Stop Categorization (30 minutes)
3. Case Study Selection (30 minutes)
4. Case Study Data Collection Plan (30 minutes)
5. Next Steps (10 minutes)
6. Adjourn at 3:30 pm



Project Overview – Work Program



Progress Point



Working Paper #1

Overview



Draft Working Paper #1

- Reference Library

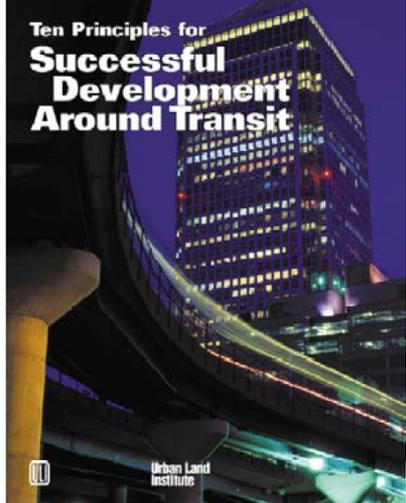


Draft Working Paper #1

Ref. No.	Document Name	Year	Sponsoring Agency	Author	Applicability to Designing Transit Accessible Communities Study									
					Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
27	American With Disabilities Act Accessibility Guidelines For Buildings And Facilities	2002	U.S. Architectural and Transportation Barriers Compliance Board (Access Board)	U.S. Architectural and Transportation Barriers Compliance Board (Access Board)			●				●	●		
28	State Wide Transit Facilities Standards, Criteria, Guidelines: A Quick Reference	2011	Florida Department of Transportation – Public Transit Office	Florida Department of Transportation – Public Transit Office			●	●			●	●	●	●
29	Transit Facility Practitioner's Handbook	2008	Florida department of Transportation Districts One and Seven	Gannett Fleming, Inc., Tindale-Oliver & Associates, Inc., USF Center for Urban Transportation Research	●	●	●		●	●	●	●	●	●
30	Transit Facility Handbook	2007	Florida department of Transportation Districts One and Seven	Gannett Fleming, Inc., Tindale-Oliver & Associates, Inc., USF Center for Urban Transportation Research	●	●	●		●	●	●	●	●	●
31	Urban Bikeway Design Guide	2011	National Association Of City Transportation Officials	National Association Of City Transportation Officials	●	●							●	●
32	RPTA Bus Stop Programs and Standards:Design Guidelines	2007	Valley Metro RPTA	Parsons Brinckerhoff (PB)							●	●	●	●
33	RPTA Bus Stop Programs and Standards: Findings and Recommendations	2008	Valley Metro RPTA	Parsons Brinckerhoff (PB)	●	●	●				●	●	●	
34	Signalized Intersection Enhancements that Benefit Pedestrians	2012	America Walks	Fehr & Peers	●	●				●	●	●		●



Draft Working Paper #1

	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
10 PINCPLES FOR SUCCESSFUL DEVELOPMENT AROUND TRANSIT <i>Date Completed:</i> 2003 <i>Sponsoring Agency:</i> Urban Land Institute <i>Author:</i> Urban Land Institute <i>Purpose:</i> To identify key design and development principals which can serve as a checklist for the development of pedestrian scale communities suitable for public transit. This study highlights good examples of development around transit stops. By illustrating a mix of development around transit, this study shows how to ensure the generation of sufficient numbers of riders to support transit and how transit can enhance the community. <i>Study Area:</i> United States and International <i>Recommendations Relevant to the Study:</i> This study provides examples of good transit accessible design.		✓	✓			✓				

	Document's Relevancy to Designing Transit Accessible Communities									
	Safety	Comfort	Policy	Funding	Wayfinding	Toolkits	Standards	Paths & Sidewalks	Bicycle	Design Standards
TRANSIT ORIENTED DEVELOPMENT IN PHOENIX <i>Date Completed:</i> Current <i>Sponsoring Agency:</i> Valley Metro RPTA <i>Author:</i> City of Phoenix <i>Purpose:</i> This study provides design standards and zoning regulations pertaining to Transit Oriented Development (TOD) around the light rail alignment within the City of Phoenix. Characteristics of Transit-Oriented Development are provided. The study defines two TOD zones around the light rail alignment; TOD 1 primarily applies to commercial and residential areas, while TOD 2 applies to industrial and support areas. <i>Study Area:</i> Light Rail Corridor within the City of Phoenix <i>Recommendations Relevant to the Study:</i> Highlights prohibited uses within the TOD zones, as well as, conditional and non-conforming uses.			✓				✓			✓



Draft Working Paper #1

Document	Year	Sponsoring Agency	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
MAG Pedestrian Policies and Design Guidelines	2005	MAG				●	●	●			
TRCP Document 44: Literature Review for Providing Access to Public Transportation Stations	2009	Transportation Research Board	●		●	●	●	●			
Toolkit for the Assessment of Bus Stop Accessibility and Safety	2005	Easter Seals Project Action				●		●			
RTD Transit Access Guidelines	2009	Denver Regional Transportation District	●	●		●		●			
Accessing Transit: Design Handbook for Florida Passenger Facilities	2008	Florida Department of Transportation	●	●	●	●					
Transit Facility Handbook	2007	Florida Department of Transportation	●		●	●					
RPTA Bus Stop Programs and Standards: Findings and Recommendations	2008	Valley Metro RPTA	●		●	●	●	●	●	●	●



Draft Working Paper #1

RTD TRANSIT ACCESS GUIDELINES	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
 <small>Regional Transportation District January 2009</small> <small>Prepared by the RTD Transit Access Committee</small>	✓	✓		✓		✓			
TRANSIT ACCESS GUIDELINES	✓	✓		✓		✓			
<p>Date Completed: 2009 Sponsoring Agency: Regional Transportation District (Denver) Author: Regional Transportation District Transit Access Committee</p> <p>Purpose: The purpose of the transit access guidelines is to improve the quality of transit access. When safety, convenience and attractiveness are maximized, transit will be both easier to use and more likely to be used. The RTD guidelines adopted an access hierarchy encouraging an optimal balance of modes accessing the transit system. Pedestrians are given the highest priority, as each transit trip begins and ends with a pedestrian trip. The guidelines address standards for pedestrians, bus transfer, bicycle, and auto access with the goal to achieve an optimal balance between them. Since each city and location is unique, the guidelines are meant to be flexible.</p> <p>Study Area: Regional Transportation District Denver</p> <p>Recommendations and/or Guidelines Relevant to the Study by Task:</p> <p>Task 4a – Categorize Transit Stops: It is of high importance and relevance to understand the existing station area conditions to successfully address transit access. The document provides a table with seven (7) Station Area Typologies relating to land use mix, housing types, employment types, and transit system function. Also, in section 2, there are interesting findings about factors that influence the access mode choice.</p> <p>Task 4f – Intercept Surveys: The document may help with the survey question composition as it points out the various themes related to transit access quality and choice. Also, section 2 summarizes access research and observed behavior and brings up important factors as to mode choice for transit access.</p> <p>Task 5a – Define Baseline and Enhanced Improvement Types: Based on task 4 and the information from the RTD documents used in task 4, task 5 can also use the standards and guidelines in section 3 of the document to ensure optimizing safety, accessibility, and design of transit stops.</p> <p>Task 5c – Develop Transit Access Tool Kit: The guidelines and standards in section 3 are intended to support the implementation of the access hierarchy with the goal of achieving an optimal balance of access to the transit system. They are categorized by access mode: walking, biking, bus transfer, and auto (kiss-and-ride and park-and-ride). The standards refer to walking distances between facilities of the transit stop, parking facilities and capacities, safety standards, design guidelines, and more.</p>									

ACCESSING TRANSIT Design Handbook for Florida Bus Passenger Facilities Version # 2008 <small>Florida Planning and Development Lab Florida State University</small>	Document's Relevancy to Designing Transit Accessible Communities								
	Task 4a – Categorize Transit Stops	Task 4f – Intercept Surveys	Task 5a – Develop Prototype Concepts	Task 5b – Define Baseline and Enhanced Improvement Types	Task 5c – Implementation Strategies	Task 5d – Develop Transit Access Tool Kit	Task 6a – Cost Analysis	Task 6b – Funding Options	Task 7a – Develop a Framework for Prioritizing Accessibility Projects
	✓	✓	✓	✓					
ACCESSING TRANSIT: DESIGN HANDBOOK FOR FLORIDA PASSENGER FACILITIES	✓	✓	✓	✓					
<p>Date Completed: 2008 Sponsoring Agency: Florida Department of Transportation Public Transit Office Author: Florida Planning and Development Lab, Department of Urban and Regional Planning, Florida State University</p> <p>Purpose: This handbook was written in order to provide a framework for transit agency staff that could ultimately be tailored to provide specific physical design criteria for identifying programs, capital resources, and operations. The proposed standards and guidelines can be integrated with local comprehensive plan policies, land use ordinances, pedestrian plans, and street design guidelines. Transit agencies can use the handbook as a basis for planning access improvements to transit facilities and for working with local jurisdictions to comply with transit concurrency levels of service in existing and proposed transit service areas. Some agencies may use the handbook when attempting to plan a bus passenger facility in tandem with street improvements. Others will want to integrate them into the broader policies of the local government and everyday practices. The handbook covers the following topics: curb-side guidelines, street-side guideline, facility prototypes, land use, and safety.</p> <p>Study Area: non-descript</p> <p>Recommendations Relevant to the Study:</p> <p>Task 4a – Categorize Transit Stops: This document proposes a bus stop prototype based upon the level of transit service provided. The prototypes are as follows:</p> <ul style="list-style-type: none"> • On-line bus stops – Provides access to transit in a variety of locations, including arterials, collectors, and local streets. May be adjacent to a variety of land uses. • Primary bus stops – Provides access to more important destinations whose density of employees or residents results in either high peak hour use or regular use several times a day. May also serve as a transfer point • Transit Malls – Provides transit access to traditional downtowns and commercial centers and serves as a base for local circulator service, express routes and other special modes of bus transit. The facility may also serve as the first element in a bus rapid transit mode of service. • University Transfer Centers – Transfer center located at a university. • Transfer Centers – Serve as major nodes in the transit network connecting various regional and local bus lines and express routes and circulator services. Designed to ease transferring between bus routes and between bus transit and other travel modes. Located within major activity centers. 									



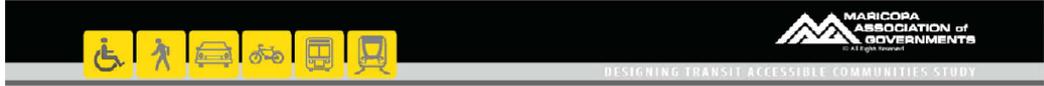
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- Peer Transit Agencies
 - San Diego, California - San Diego Association of Governments
 - San Francisco, California - Metropolitan Transportation Commission
 - Seattle, Washington - Puget Sound Transit
 - Denver, Colorado - Regional Transportation District
 - Salt Lake City, Utah - Utah Transit Authority
 - Kansas City, Missouri - Kansas City Area Transit Authority
 - Las Vegas, Nevada – Regional Transportation Commission
 - Houston, Texas – Metropolitan Transit Authority.



Draft Working Paper #1

- Data Collection
 - On-going
 - Additional Requests Forthcoming

						
DATA REQUEST LIST Designing Transit Accessible Communities Updated: 03/19/12						
Data Requested	File Type/Needs	Agency	Contact	Date Requested	Date Received	Notes
Maricopa County Trip Reduction Program Data	GIS or Database	Maricopa County Department of Air Quality	Alice Chen 602.452.5066 achen@azmag.gov	2/23/2012	3/19/2012	Alice Chen to follow up with Maricopa County to obtain the Trip Reduction Data as discussed in the TWG Meeting on Feb. 23, 2012.
Valley Metro RPTA Montly Boardings Report	GIS or Database	Valley Metro RPTA	Eric Iwersen City of Tempe 480.350.8810 eric_iwersen@tempe.gov	2/23/2012	3/19/2012	Alice Chen to follow up with Eric on obtaining the montly report as discussed in the TWG Meeting on Feb. 23, 2012.
Detailed Transit Budget	Itemized revenue sources and expenses and broken out into	Maricopa Association of Governments	Jorge Luna 602.254.6300 JLuna@azmag.gov	2/13/2012		
Bus Stop Construction Costs (new and upgraded)	Unit Costs	Valley Metro/ Regional Public Transit Authority		2/13/2012		Need to request from individual agencies. May look to the City of Phoenix as a regional indicator of construction costs.
Bus Stop Improvement Program	Goals, Funding Sources, Available Funding, and Prioritization	Maricopa Association of Governments	Jorge Luna 602.254.6300 JLuna@azmag.gov	2/13/2012		This data is agency specific. Will need to contact individual agencies for this data.
Bus Stop Maintenance Program	Goals, Funding Sources, Available Funding, Frequency of Maintenance	Maricopa Association of Governments	Jorge Luna 602.254.6300 JLuna@azmag.gov	2/13/2012		This data is agency specific. Will need to contact individual agencies for this data.
2011 O & D Study Questionnaire	Text or PDF	Valley Metro/ Regional Public Transit Authority		1/13/2012		



Draft Working Paper #1

- Alice Chen to email draft copy to TWG.
- Provide comments to Alice by Friday, April 13, 2012.
- Any questions during your review should be directed to Alice.
- Final Working Paper #1 – Friday, April 20.



Categorizing Bus Stops



Review of Key Steps in Task 4

■ Categorize Transit Stops

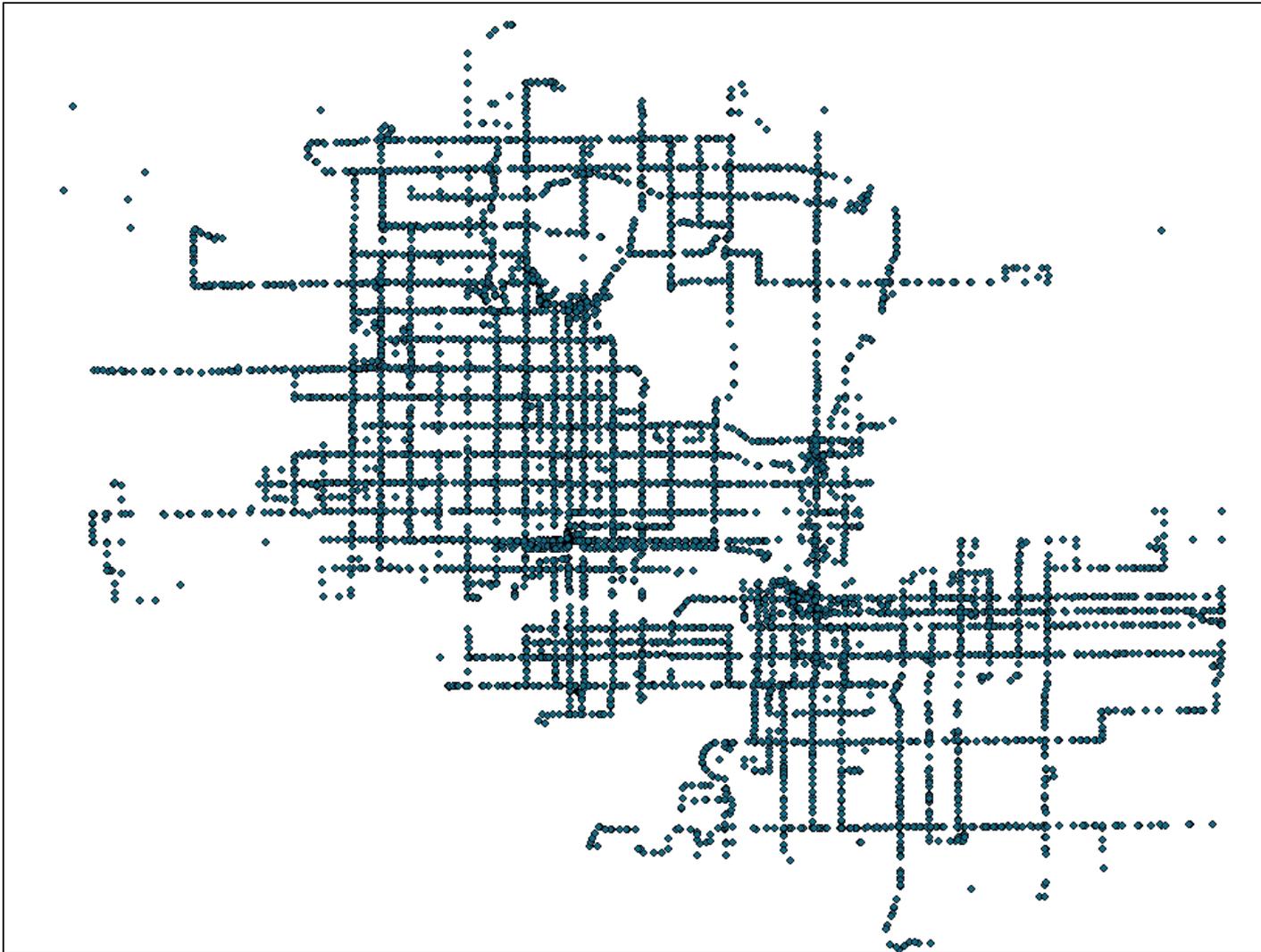
1. Develop GIS database of variables describing transit stop areas (*Potential Demand and Transit Service Quality*)
2. Perform cluster analysis to identify groupings of stops
3. Ground-truth cluster analysis results

■ Case Studies

1. Select case study sites
2. Data collection at case study sites



Problem At Hand





Inputs to Categorization

- *Transit-Bike-Pedestrian Demand Characteristics*
 - Population Density
 - Employment Density
 - Zero-Vehicle HH Density
 - Acreage of Retail

- *Bus Service Quality Characteristics*
 - Location of bus stop at arterial-arterial intersection
 - Number of routes per bus stop area
 - Frequency of bus service at bus stop area



Cluster Analysis

- Used SPSS Segmenting Routine
- Finds optimal number of clusters
- Describes cluster sizes
- Displays “predictive” importance of each input to clustering
- Assesses overall cluster cohesion and separation with the “Silhouette Measure”



Approach to Exploring Clustering

1. Do we see clusters using just the *demand* measures?
2. Do we see clusters using just the *transit service quality* measures ?
3. Do we see clusters using the *both* demand and service quality measures?



Analysis Approach

Run #	Pop Density	Emp Density	Zero Vehicle HH Density	Retail	Pop + Emp Density	No. of Routes	Freq. of Service	Arterial - Arterial
	Demand					Transit System		
#1	√	√	√	√				
#2	√	√	√					
#3			√		√			
#4			√	√	√			
#5						√	√	√
#6			√	√	√	√	√	√
#7			√	√	√	√	√	
#8			√		√		√	
#9					√		√	
#10				√	√		√	

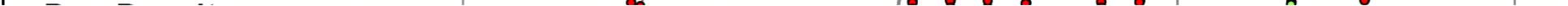


Criteria for Assessing Cluster Results

1. Workable number of clusters
2. Strong predictive power associated with each input variables
3. High silhouette measure for overall cluster model

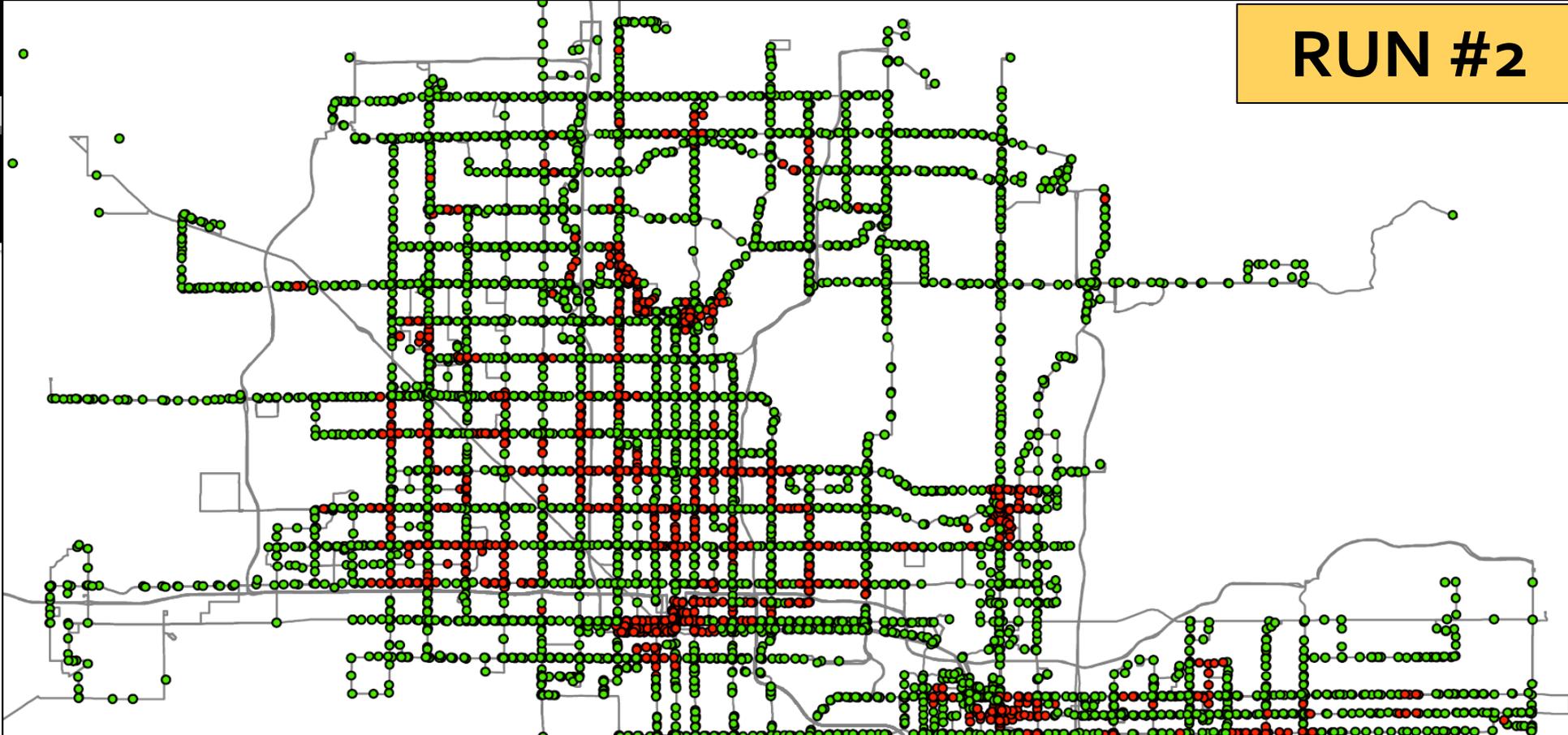
RUN #1

Demand Only



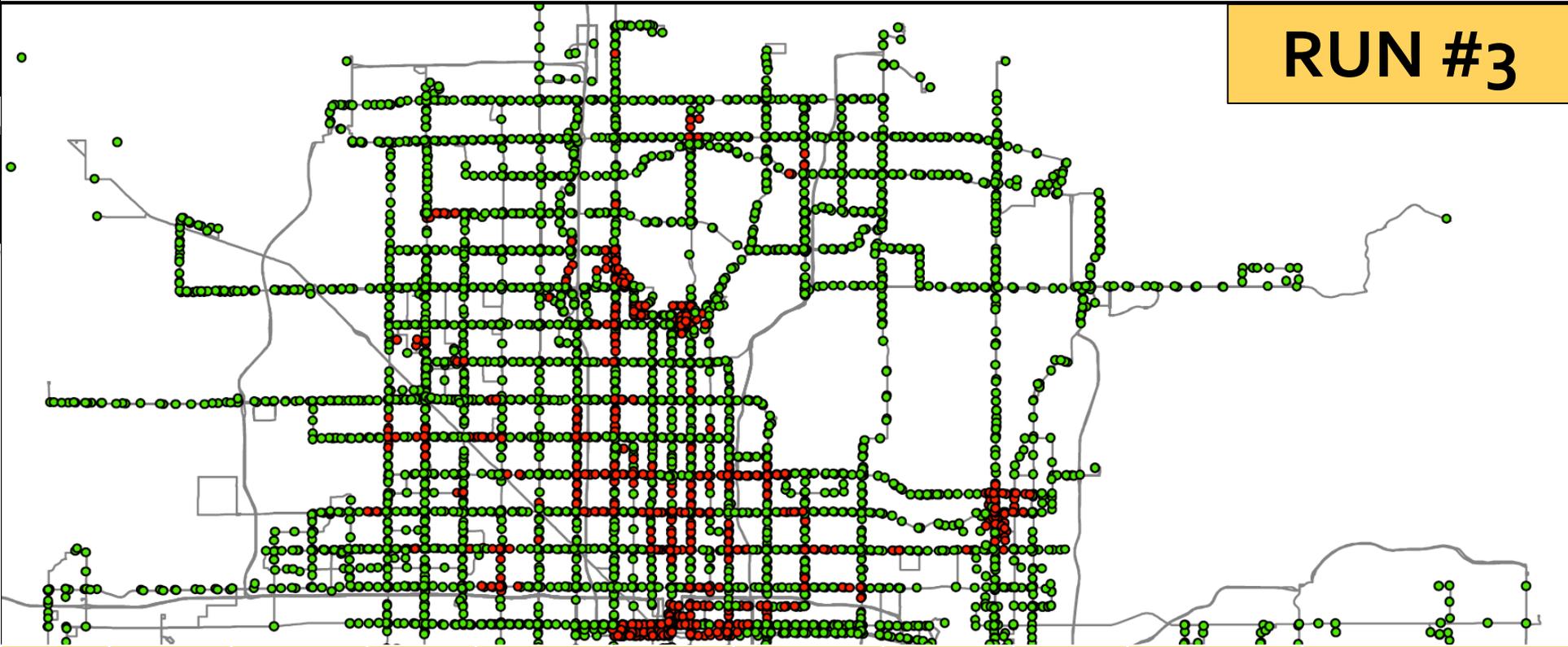
Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand				Transit System			Cluster Assessment		
#1	√	√	√	√					2	<i>Good (0.7)</i>

RUN #2



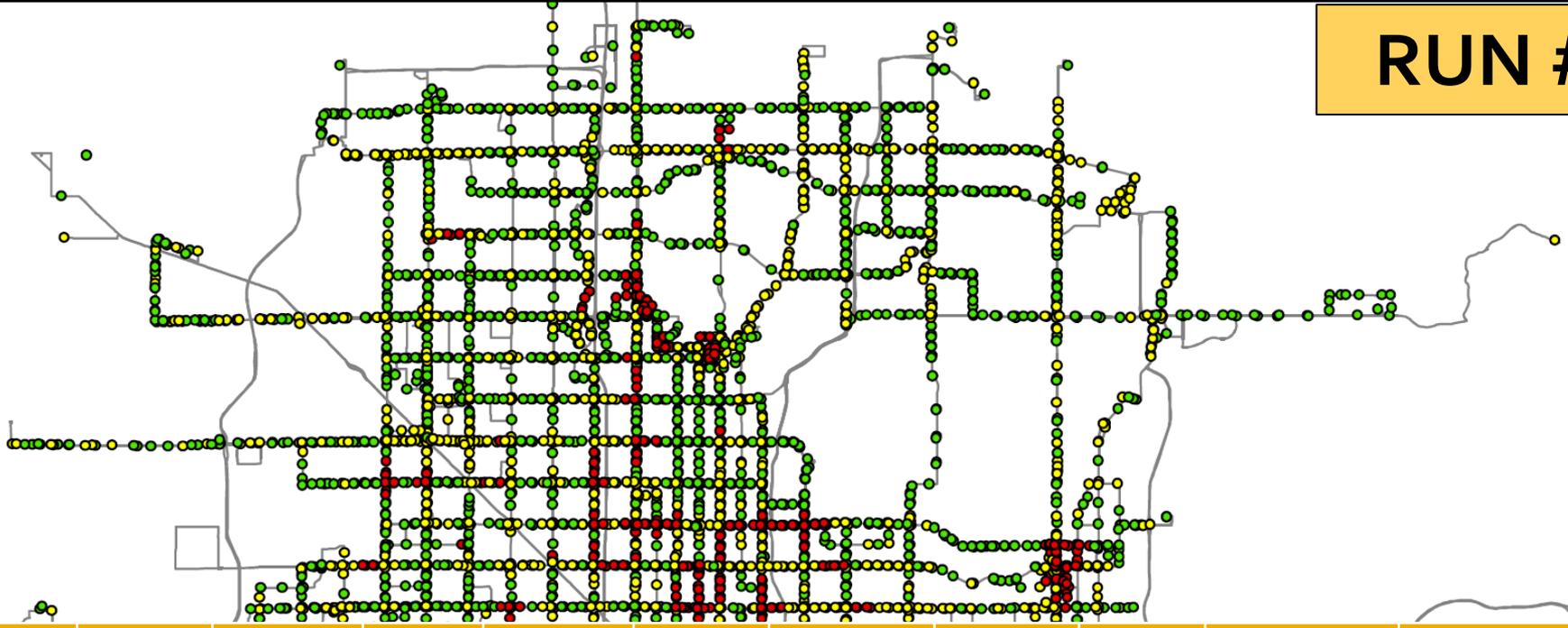
Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	√	√	√	√					2	Good (0.7)
#2	√	√	√						2	Fair (0.5)

RUN #3



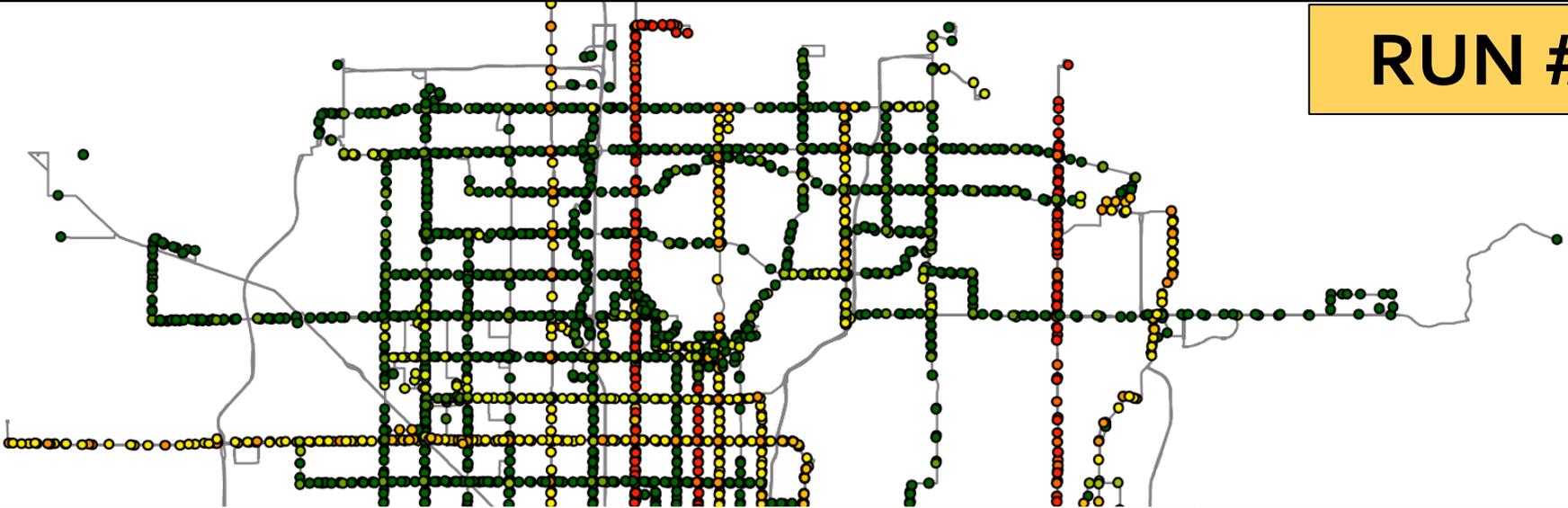
Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand				Transit System			Cluster Assessment		
#1	√	√	√	√					2	Good (0.7)
#2	√	√	√						2	Fair (0.5)
#3			√		√				2	Good (0.7)

RUN #4



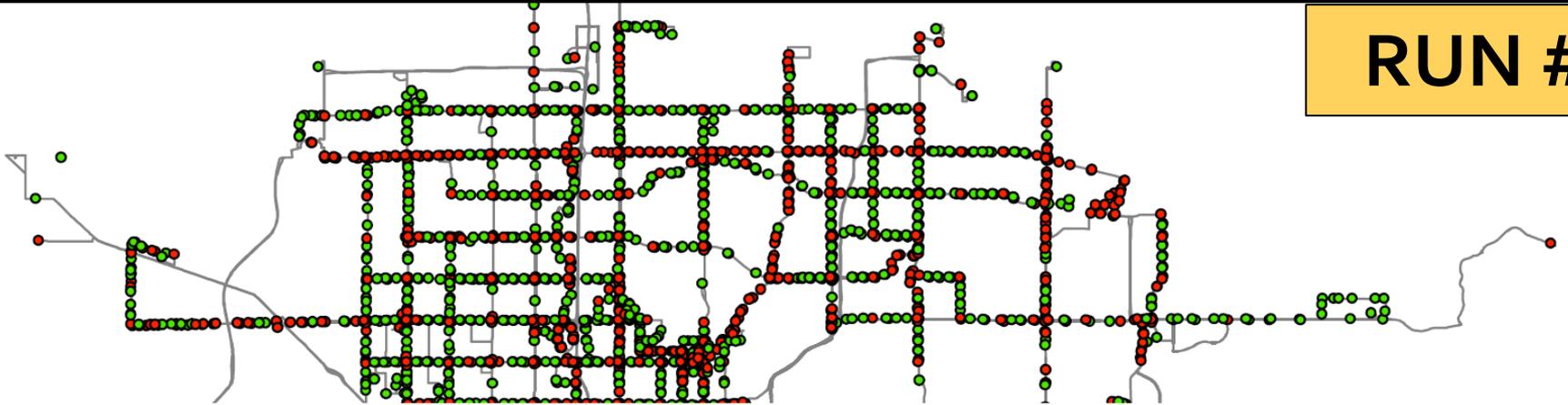
Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	√	√	√	√					2	Good (0.7)
#2	√	√	√						2	Fair (0.5)
#3			√		√				2	Good (0.7)
#4			√	√	√				3	Good (0.8)

RUN #5



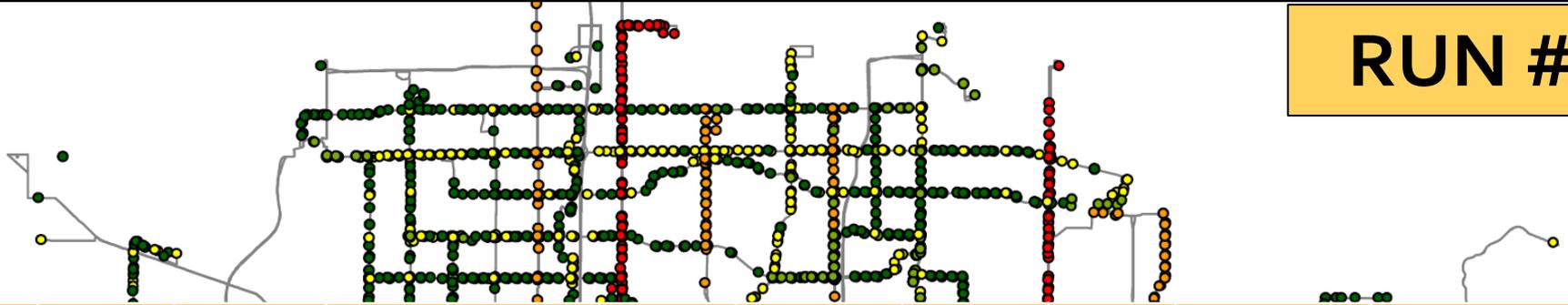
Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	✓	✓	✓	✓					2	Good (0.7)
#2	✓	✓	✓						2	Fair (0.5)
#3			✓		✓				2	Good (0.7)
#4			✓	✓	✓				3	Good (0.8)
#5						✓	✓	✓	10	Good (0.8)

RUN #6



Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	√	√	√	√					2	Good (0.7)
#2	√	√	√						2	Fair (0.5)
#3			√		√				2	Good (0.7)
#4			√	√	√				3	Good (0.8)
#5						√	√	√	10	Good (0.8)
#6			√	√	√	√	√	√	2	Fair (0.5)

RUN #7



Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	√	√	√	√					2	Good (0.7)
#2	√	√	√						2	Fair (0.5)
#3			√		√				2	Good (0.7)
#4			√	√	√				3	Good (0.8)
#5						√	√	√	10	Good (0.8)
#6			√	√	√	√	√	√	2	Fair (0.5)
#7			√	√	√	√	√		5	Fair (0.4)

RUN #8

Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	√	√	√	√					2	Good (0.7)
#2	√	√	√						2	Fair (0.5)
#3			√		√				2	Good (0.7)
#4			√	√	√				3	Good (0.8)
#5						√	√	√	10	Good (0.8)
#6			√	√	√	√	√	√	2	Fair (0.5)
#7			√	√	√	√	√		5	Fair (0.4)
#8			√		√		√		3	Good (0.7)

RUN #9

Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	✓	✓	✓	✓					2	Good (0.7)
#2	✓	✓	✓						2	Fair (0.5)
#3			✓		✓				2	Good (0.7)
#4			✓	✓	✓				3	Good (0.8)
#5						✓	✓	✓	10	Good (0.8)
#6			✓	✓	✓	✓	✓	✓	2	Fair (0.5)
#7			✓	✓	✓	✓	✓		5	Fair (0.4)
#8			✓		✓		✓		3	Good (0.7)
#9					✓		✓		4	Good (0.8)

Run #	Pop Den	Emp Den	Zero Veh HH Den	Retail	Pop + Emp Den	No. of Routes	Freq.	Art - Art	Number of Clusters	Cohesion & Separation
	Demand					Transit System			Cluster Assessment	
#1	✓	✓	✓	✓					2	Good (0.7)
#2	✓	✓	✓						2	Fair (0.5)
#3			✓		✓				2	Good (0.7)
#4			✓	✓	✓				3	Good (0.8)
#5						✓	✓	✓	10	Good (0.8)
#6			✓	✓	✓	✓	✓	✓	2	Fair (0.5)
#7			✓	✓	✓	✓	✓		5	Fair (0.4)
#8			✓		✓		✓		3	Good (0.7)
#9					✓		✓		4	Good (0.8)
#10				✓	✓		✓		7	Very Good (0.9)



Cluster Variable Recommendation

- Frequency of Transit Service
- Population and Employment Density
- Presence of Retail



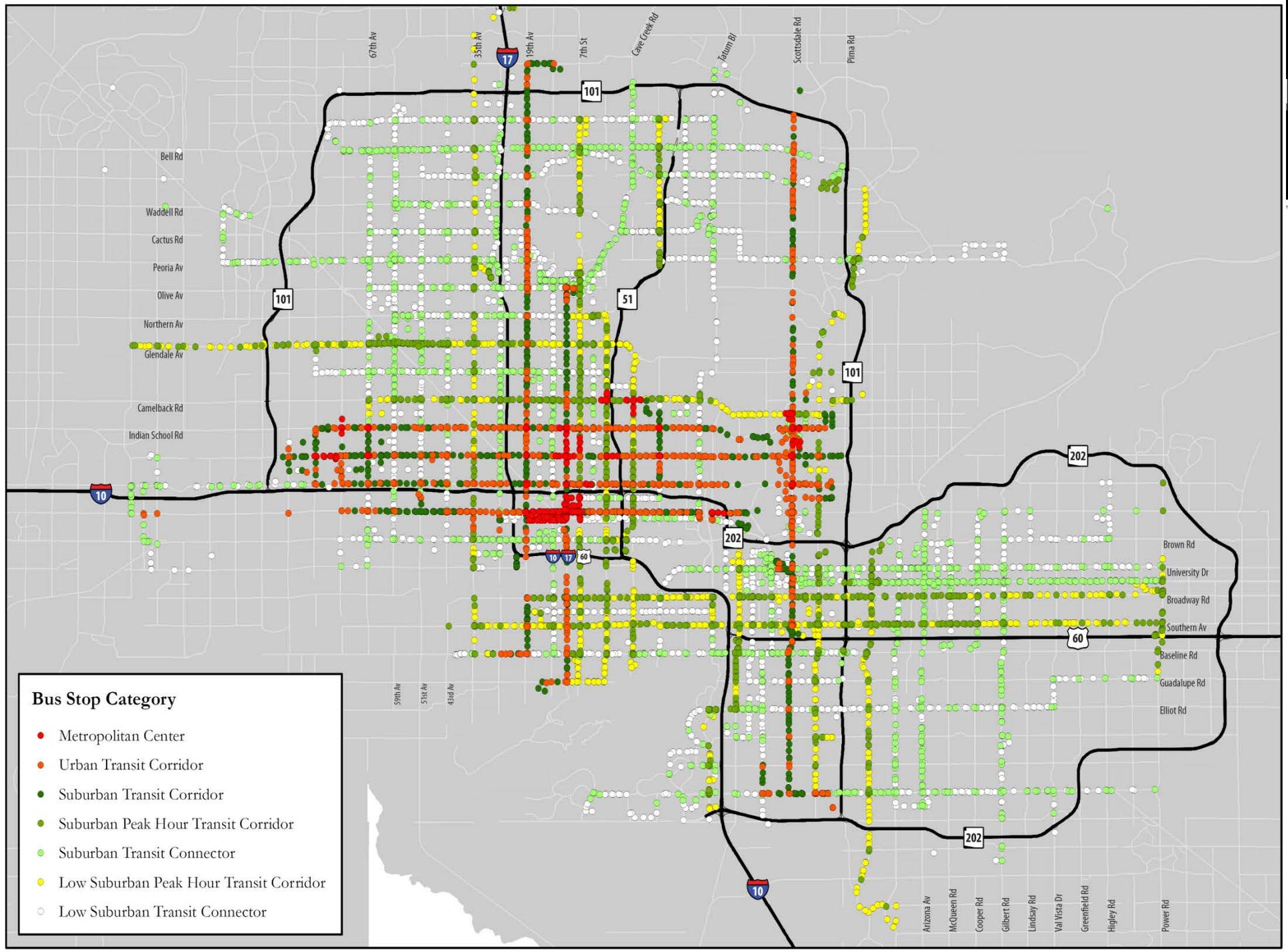
Hierarchy of Stop Category Types

Category Ranking	Category Name	Defining Characteristics	Number of Stops	Percent of Total
#1	Metropolitan Center	Some Retail; Very High Employment; Multiple High Frequency Transit	223	4%
#2	Urban Transit Corridors	Retail; High Frequency Transit; High Population and Employment	675	12%
#3	Suburban Transit Corridors	No Retail; High Frequency Transit; Medium Population and Employment	456	8%
#4	Suburban Peak Hour Transit Corridors	Retail; Limited High Frequency Transit; High Population and Employment	865	15%
#5	Suburban Transit Connectors	Retail; No High Frequency Transit; Medium Population and Employment	1,302	22%
#6	Low Suburban Peak Hour Transit Corridors	No Retail; Limited High Frequency Transit; Low Population and Employment	653	11%
#7	Low Suburban Transit Connectors	No Retail; No High Frequency Transit; Low Population and Employment	1,648	28%



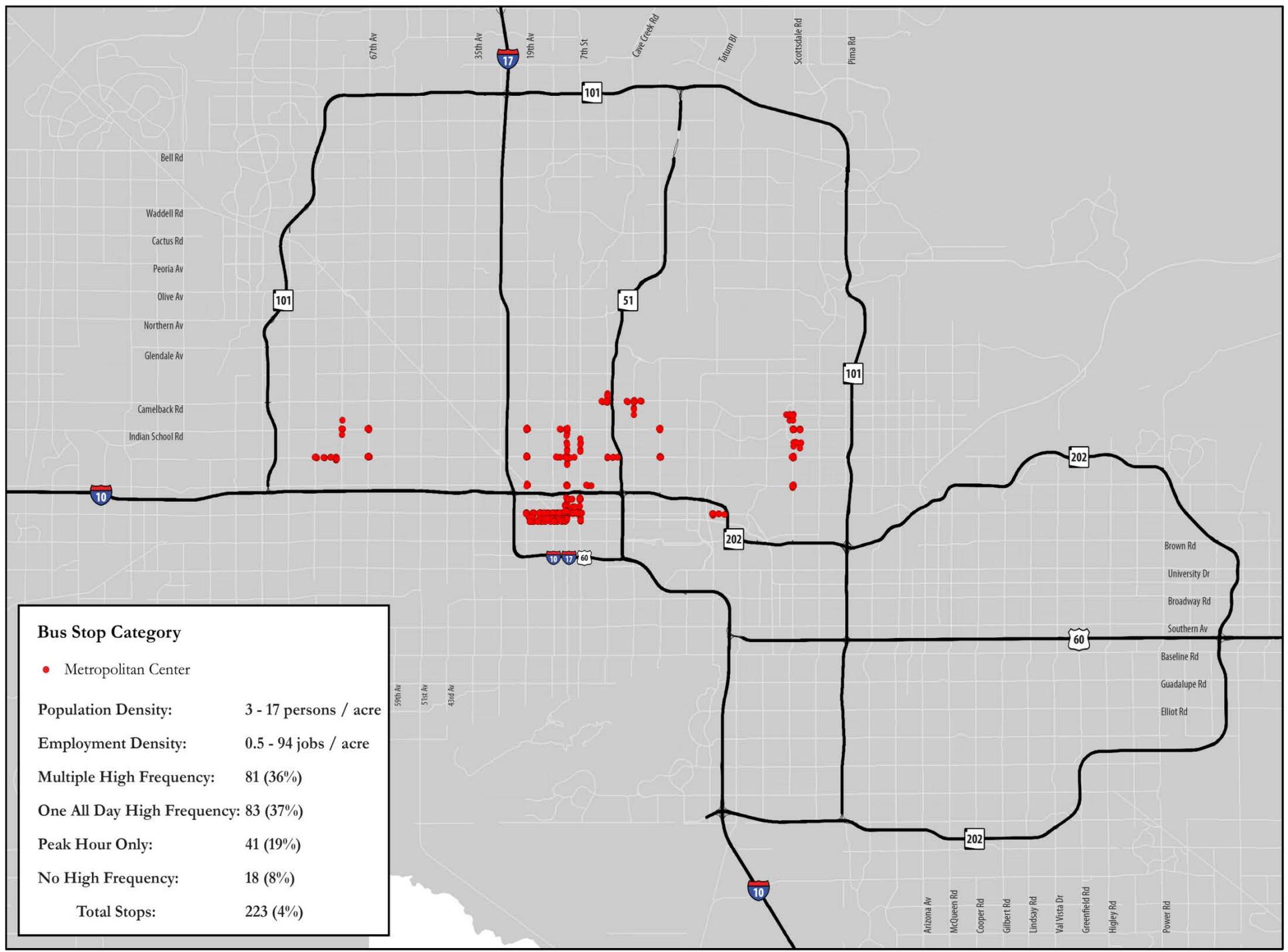
Refining Bus Stop Categories

- Mapping/Examining Categories
- Project Team MAG Review
- TWG Review
- Google Map Check
- Ground Truth /Field Check



Bus Stop Category

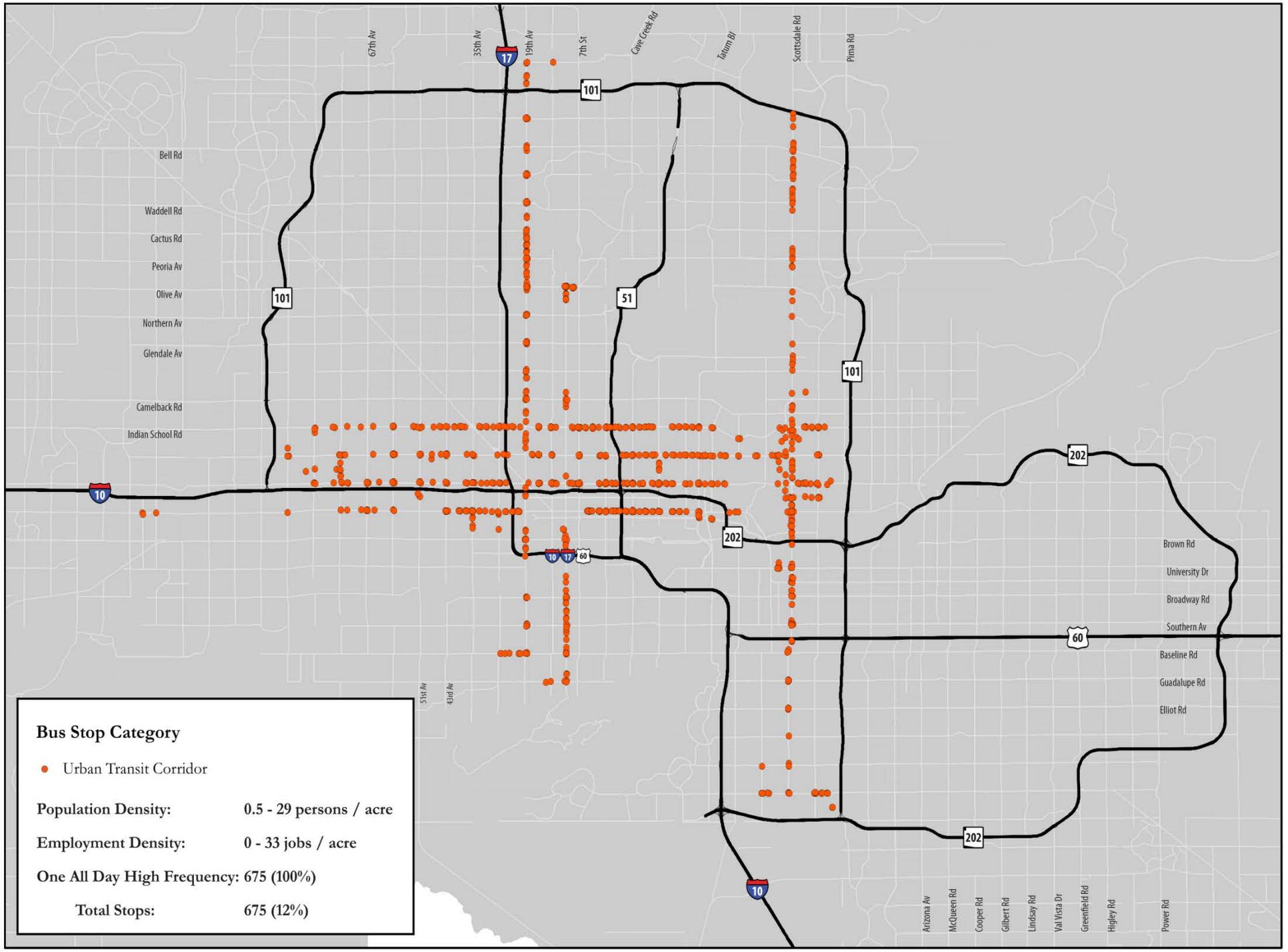
- Metropolitan Center
- Urban Transit Corridor
- Suburban Transit Corridor
- Suburban Peak Hour Transit Corridor
- Suburban Transit Connector
- Low Suburban Peak Hour Transit Corridor
- Low Suburban Transit Connector



Bus Stop Category

- Metropolitan Center

Population Density:	3 - 17 persons / acre
Employment Density:	0.5 - 94 jobs / acre
Multiple High Frequency:	81 (36%)
One All Day High Frequency:	83 (37%)
Peak Hour Only:	41 (19%)
No High Frequency:	18 (8%)
Total Stops:	223 (4%)



Bus Stop Category

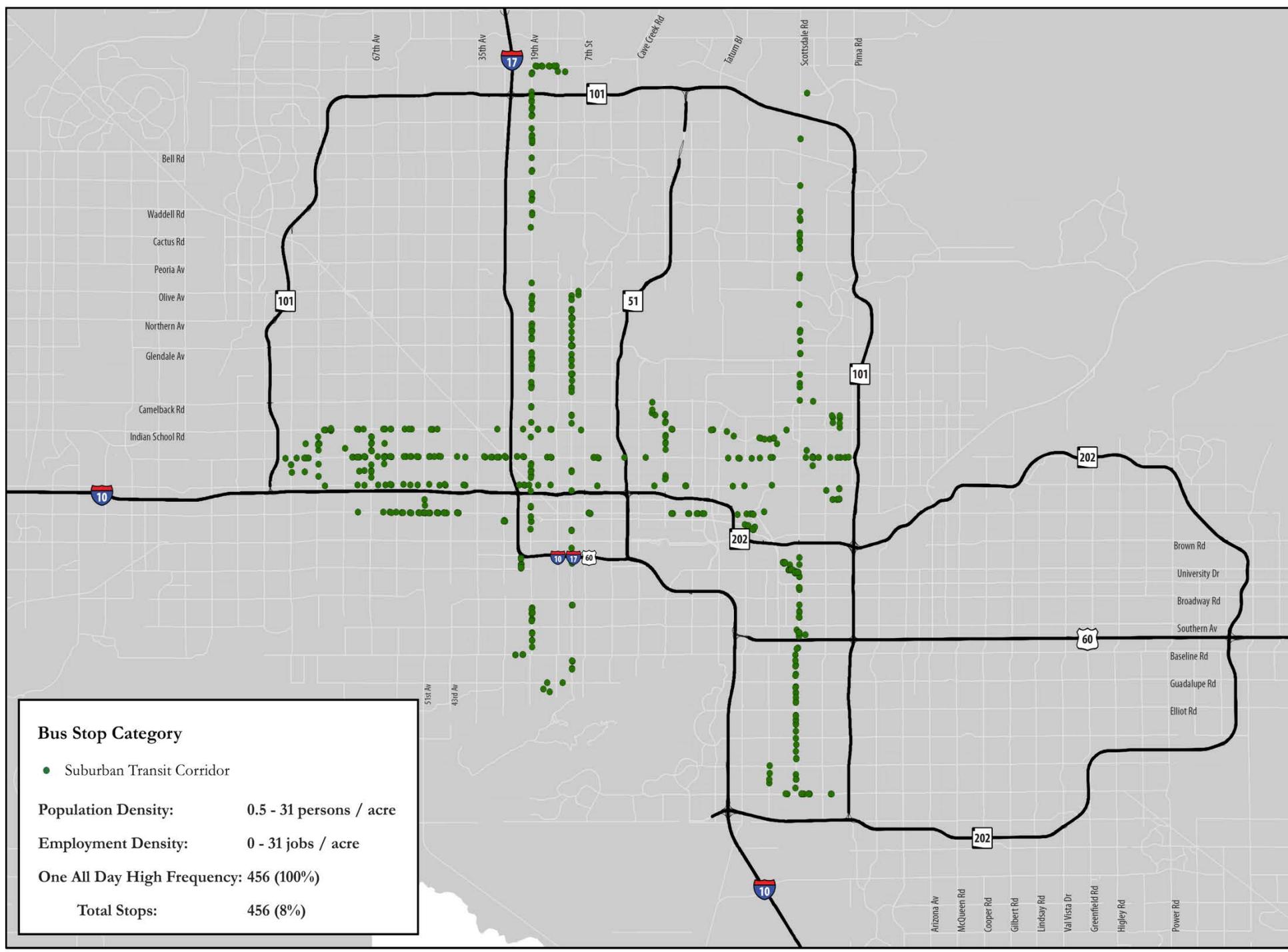
- Urban Transit Corridor

Population Density: 0.5 - 29 persons / acre

Employment Density: 0 - 33 jobs / acre

One All Day High Frequency: 675 (100%)

Total Stops: 675 (12%)



Bus Stop Category

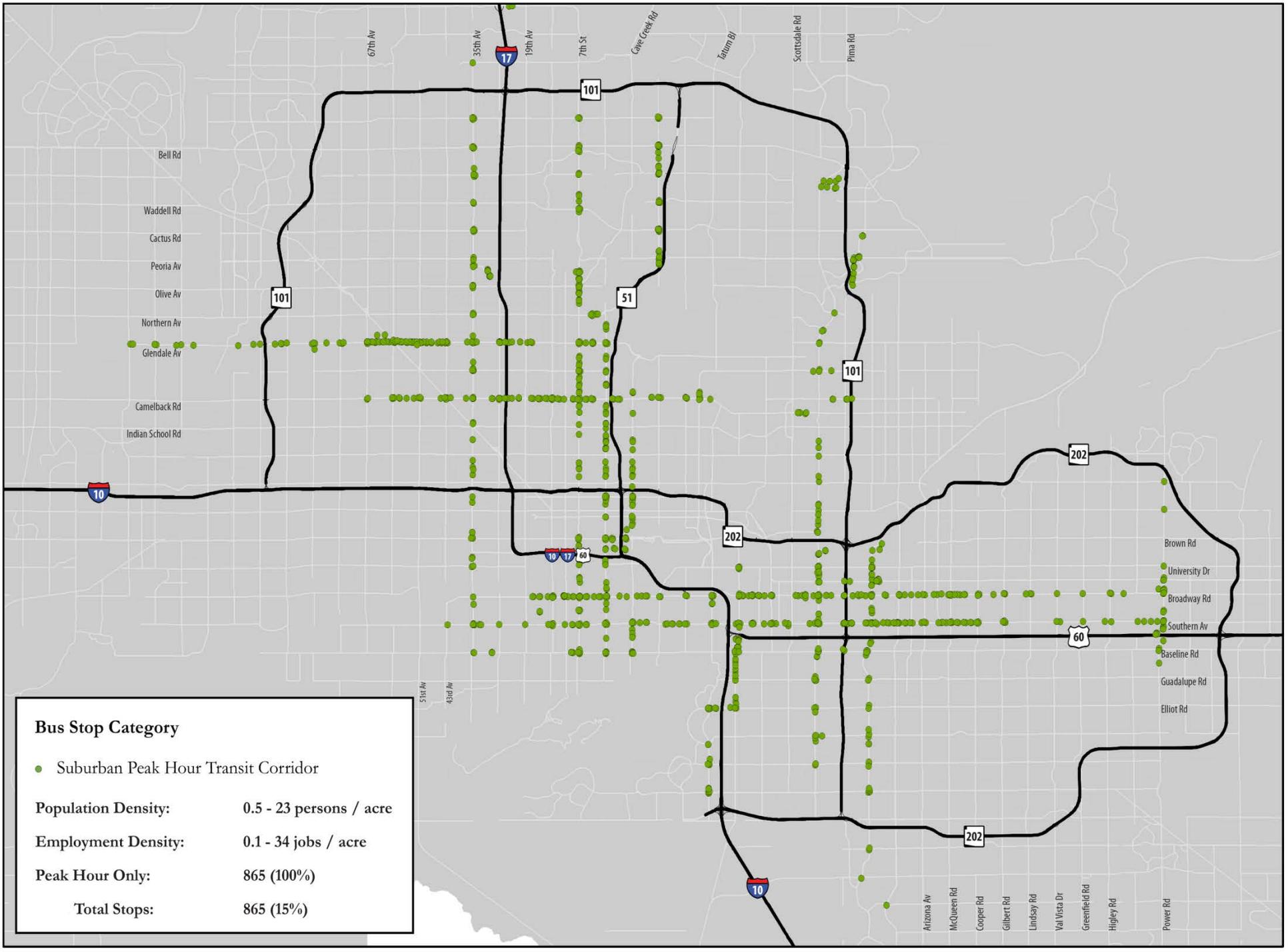
- Suburban Transit Corridor

Population Density: 0.5 - 31 persons / acre

Employment Density: 0 - 31 jobs / acre

One All Day High Frequency: 456 (100%)

Total Stops: 456 (8%)



Bus Stop Category

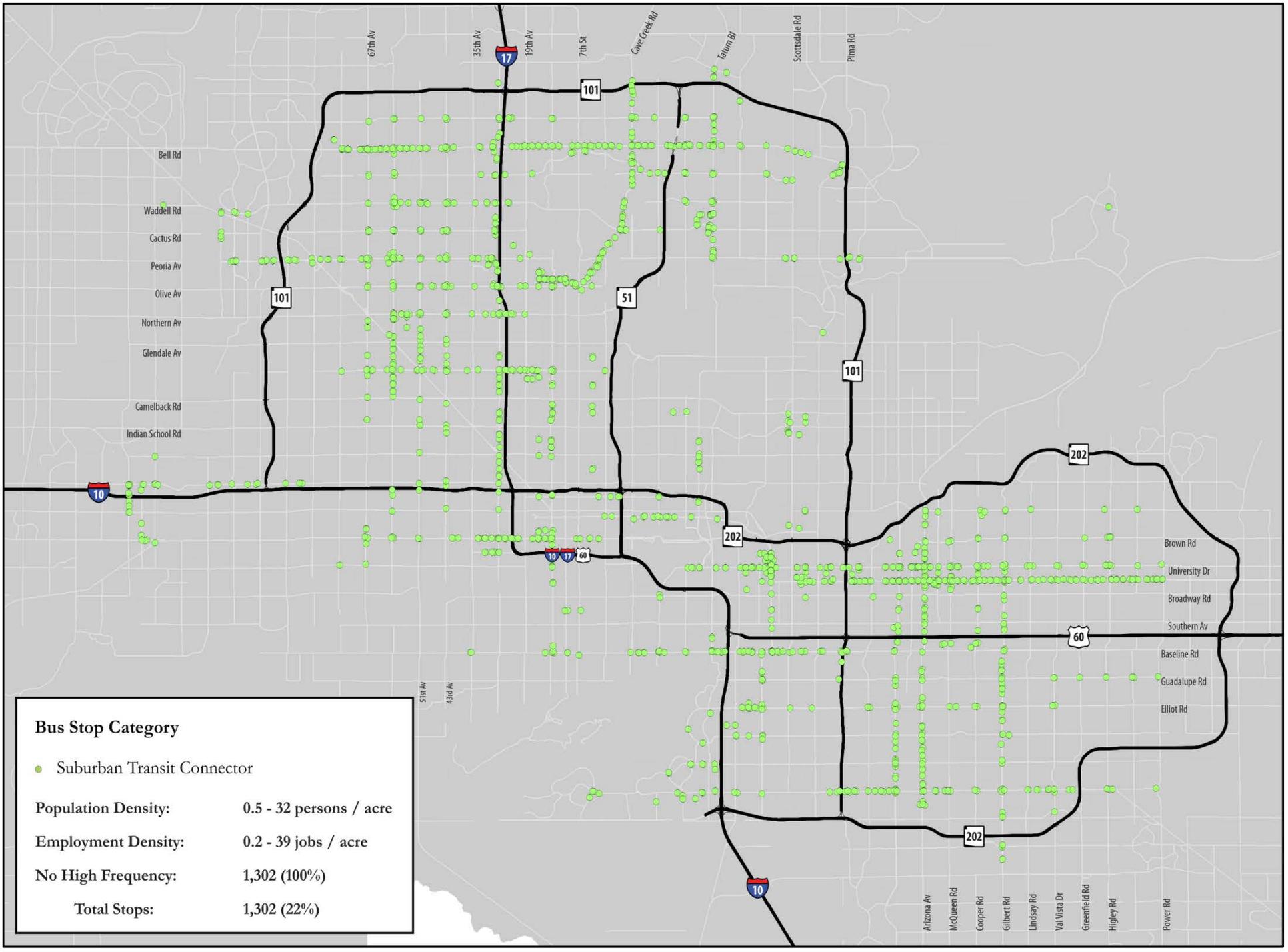
- Suburban Peak Hour Transit Corridor

Population Density: 0.5 - 23 persons / acre

Employment Density: 0.1 - 34 jobs / acre

Peak Hour Only: 865 (100%)

Total Stops: 865 (15%)



Bus Stop Category

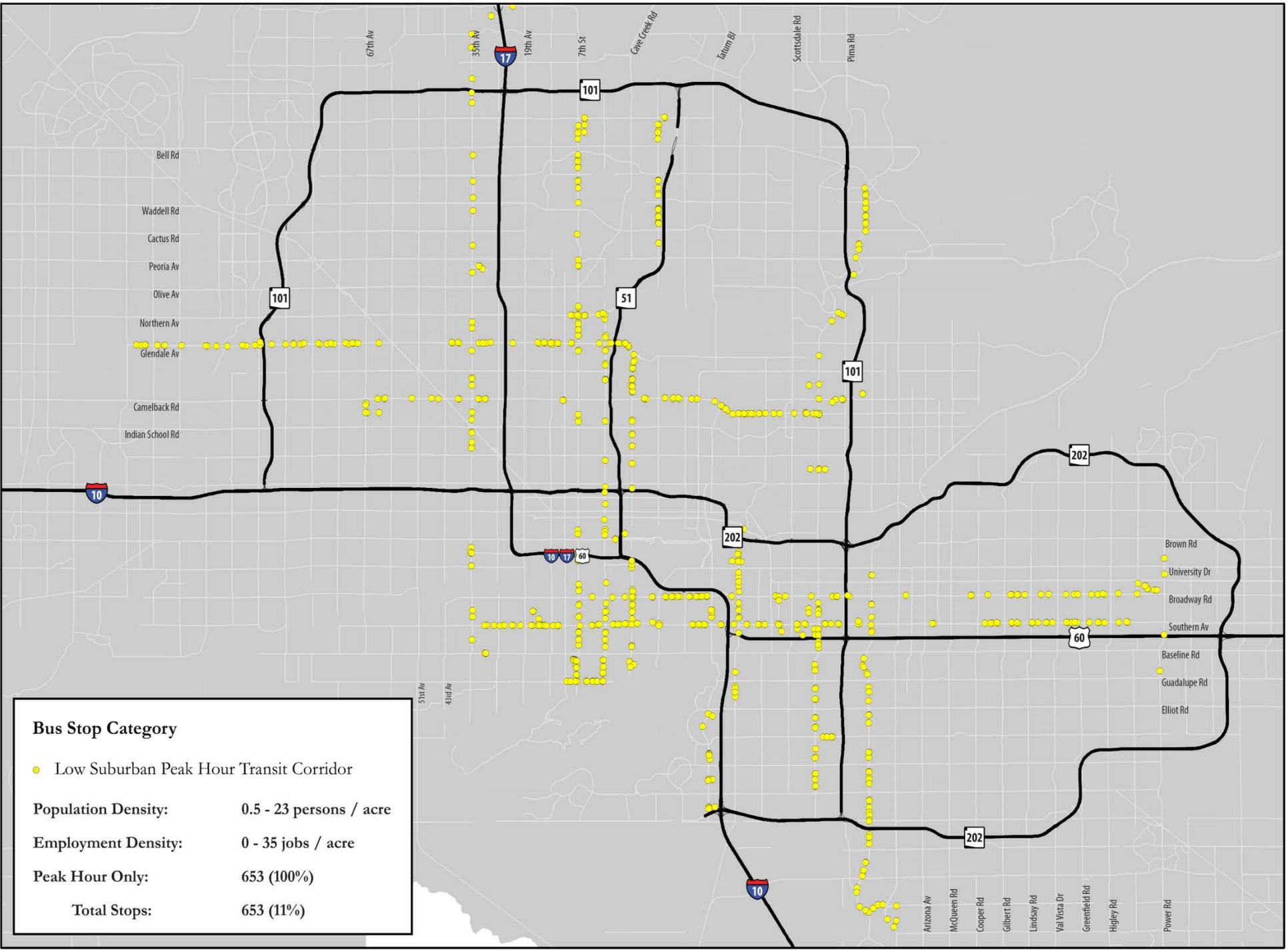
● Suburban Transit Connector

Population Density: 0.5 - 32 persons / acre

Employment Density: 0.2 - 39 jobs / acre

No High Frequency: 1,302 (100%)

Total Stops: 1,302 (22%)



Bus Stop Category

● Low Suburban Peak Hour Transit Corridor

Population Density: 0.5 - 23 persons / acre

Employment Density: 0 - 35 jobs / acre

Peak Hour Only: 653 (100%)

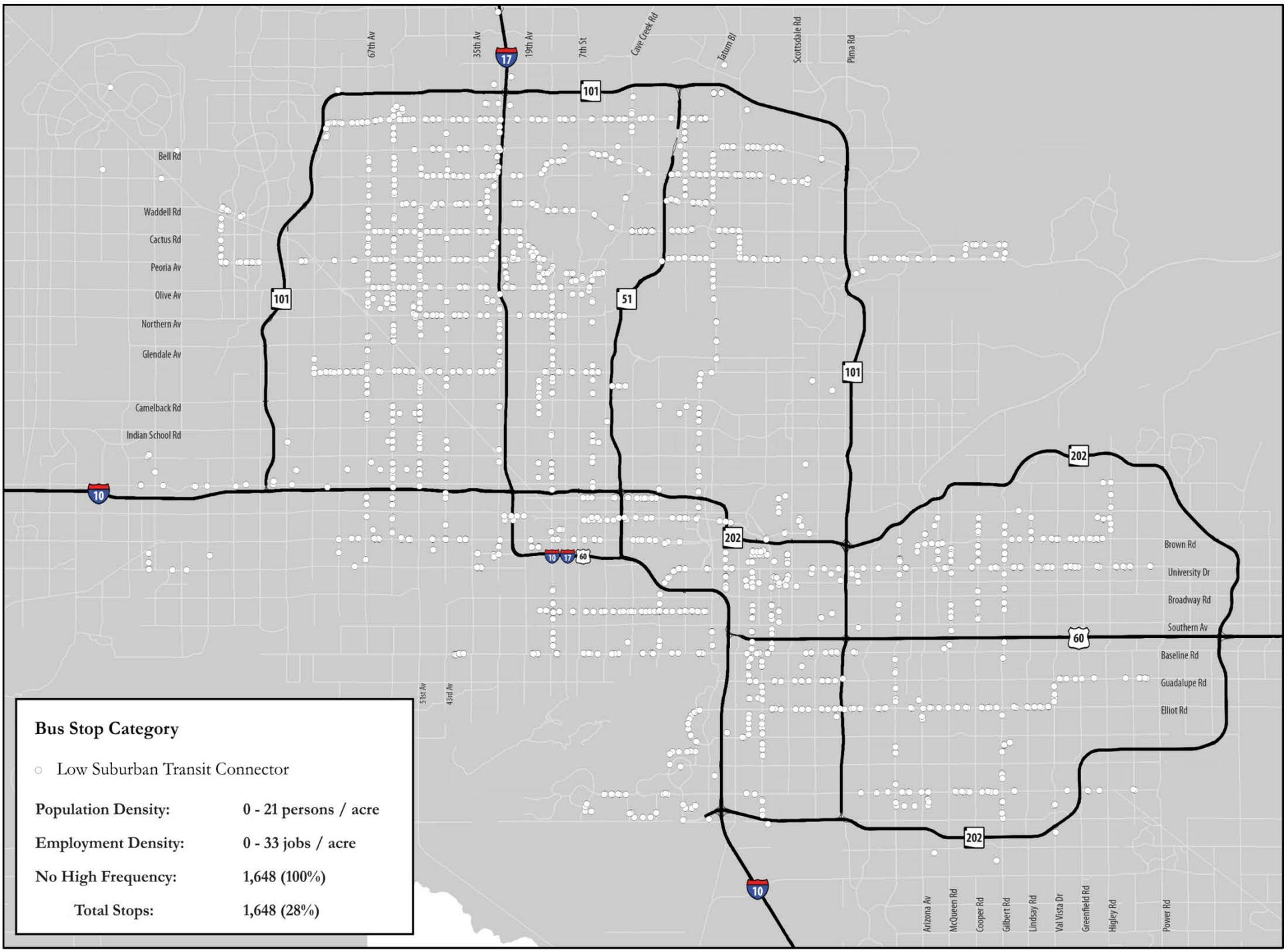
Total Stops: 653 (11%)

Bell Rd
Waddell Rd
Cactus Rd
Peoria Av
Olive Av
Northern Av
Glendale Av
Camelback Rd
Indian School Rd

67th Av
35th Av
19th Av
7th St
Cave Creek Rd
Latum Bl
Scottsdale Rd
Pima Rd

Brown Rd
University Dr
Broadway Rd
Southern Av
Baseline Rd
Guadalupe Rd
Elliot Rd

Arizona Av
McQueen Rd
Cooper Rd
Gilbert Rd
Lindsay Rd
Val Vista Dr
Greenfield Rd
Higley Rd
Power Rd



Bus Stop Category

○ Low Suburban Transit Connector

Population Density: 0 - 21 persons / acre

Employment Density: 0 - 33 jobs / acre

No High Frequency: 1,648 (100%)

Total Stops: 1,648 (28%)



Case Studies

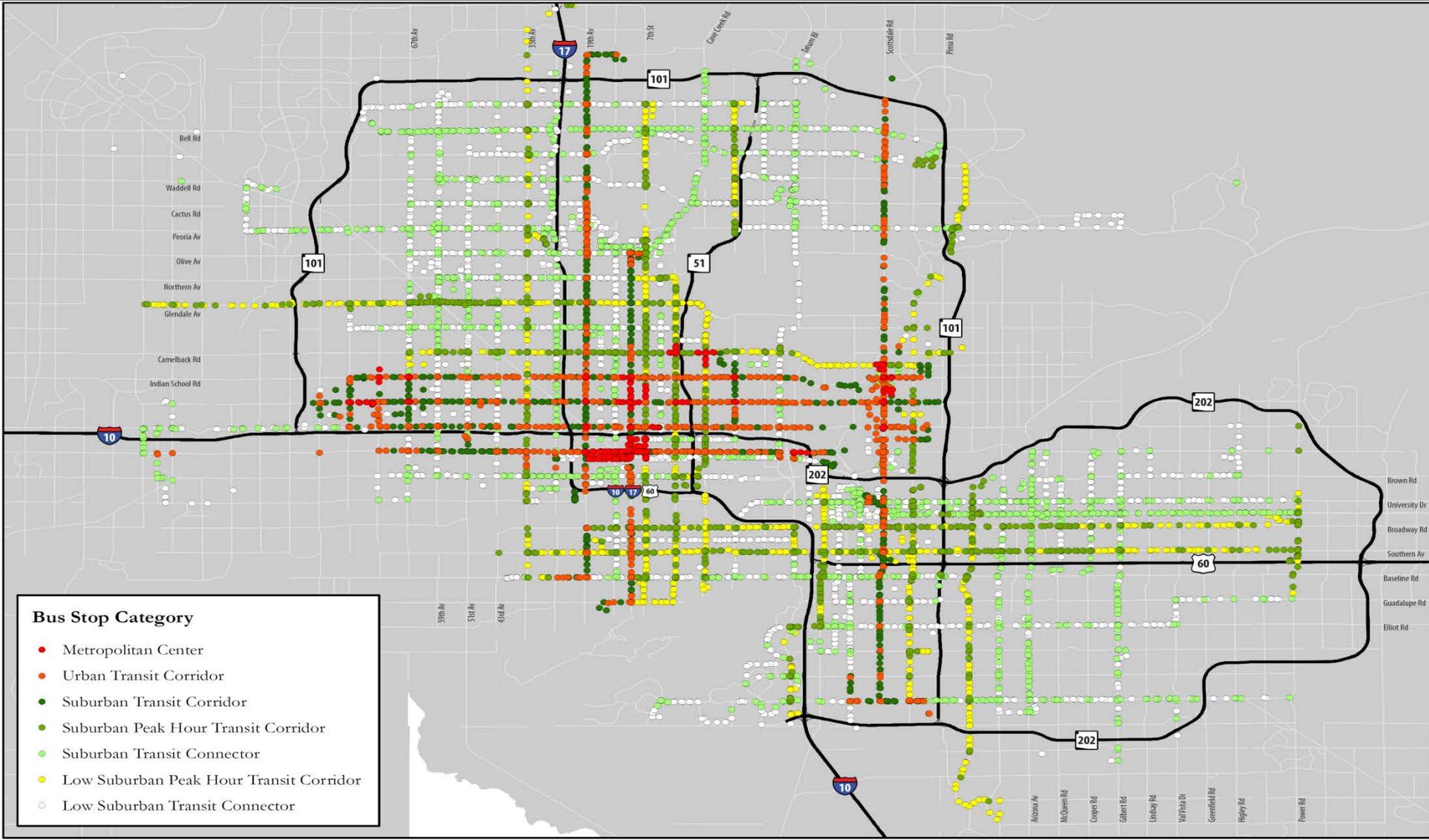


Goal of Case Studies

- Quality of experience from users perspective
- Usage rates by mode of access
- Safety issues
- Engineering constraints and deficiencies

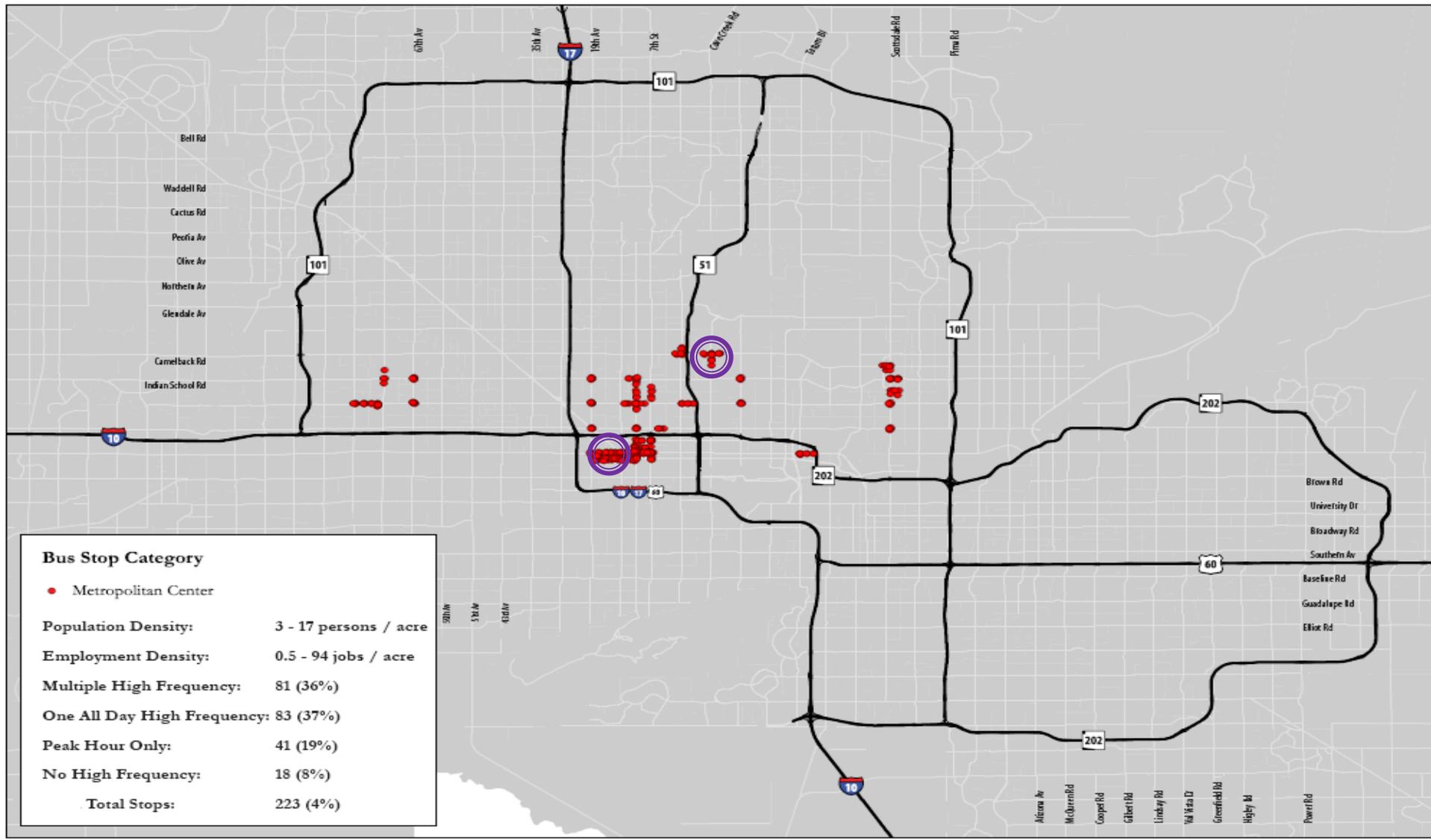


Proposed Case Study Locations





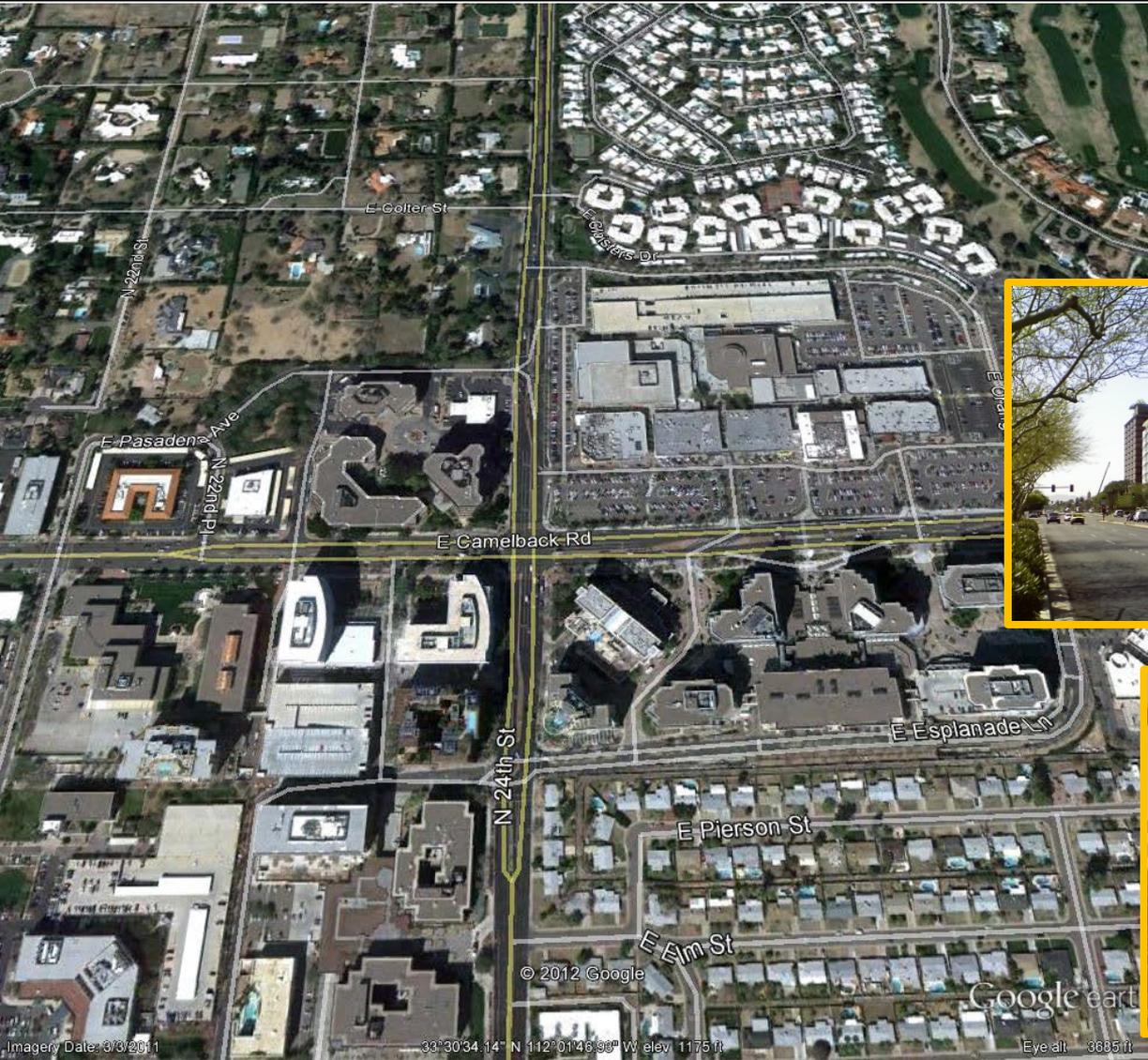
Metropolitan Center





Metropolitan Center

24th Street &
Camelback Road,
Phoenix





Metropolitan Center

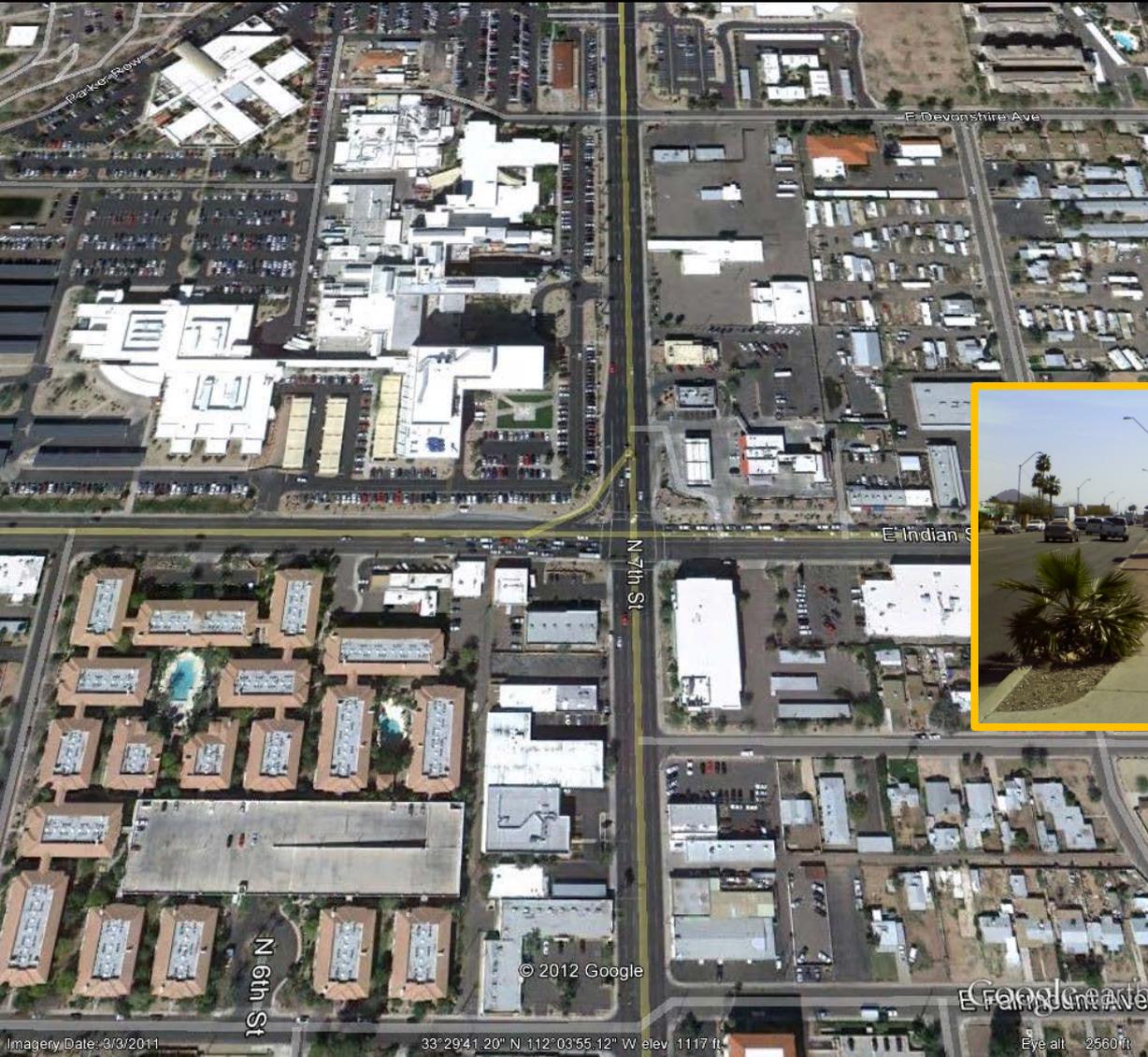
10th Avenue & Washington Street, Phoenix





Urban Transit Corridor

Indian School Road & 7th Street, Phoenix





Urban Transit Corridor



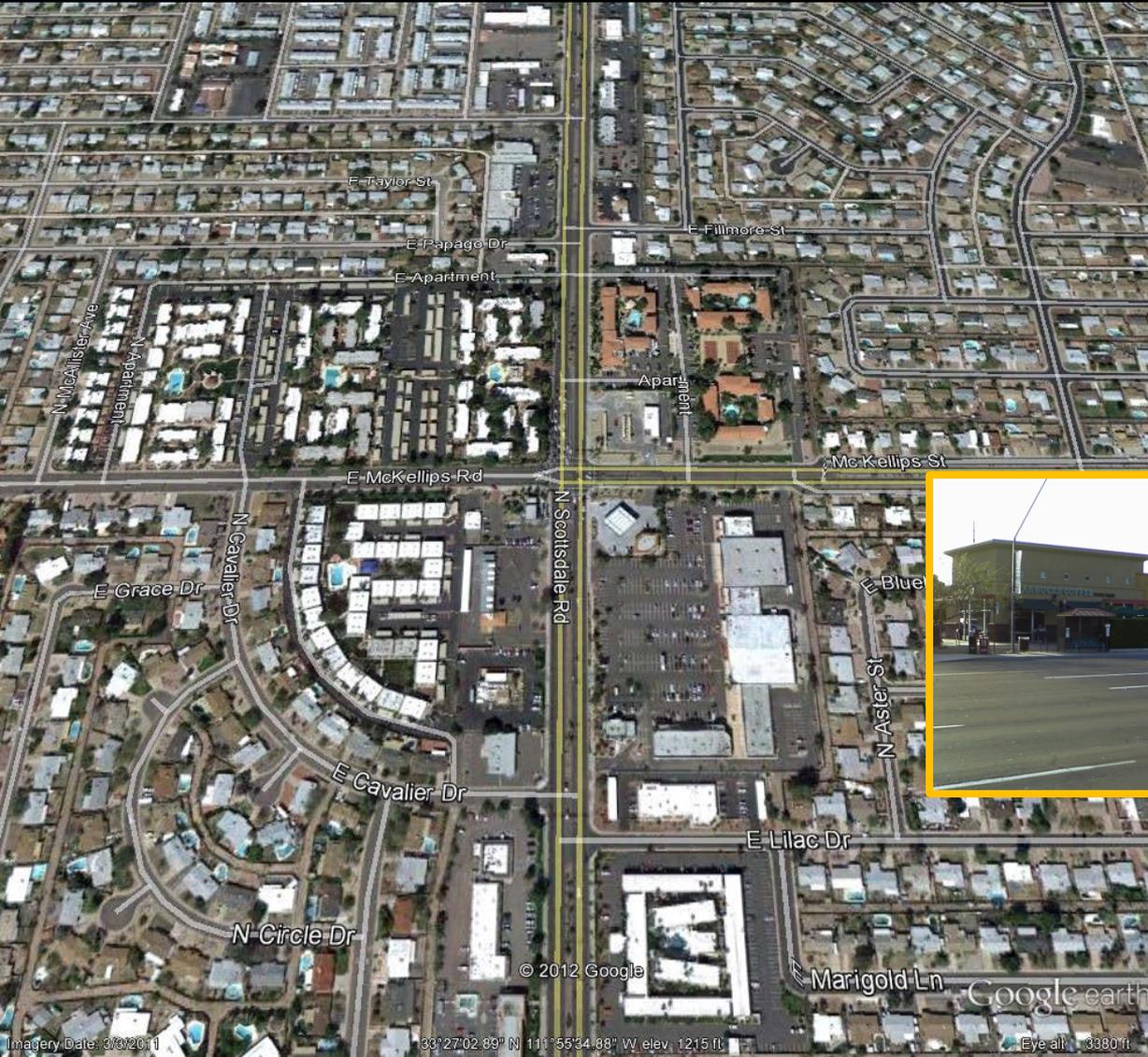
75th Avenue &
Thomas Road,
Phoenix



© 2012 Google



Urban Transit Corridor

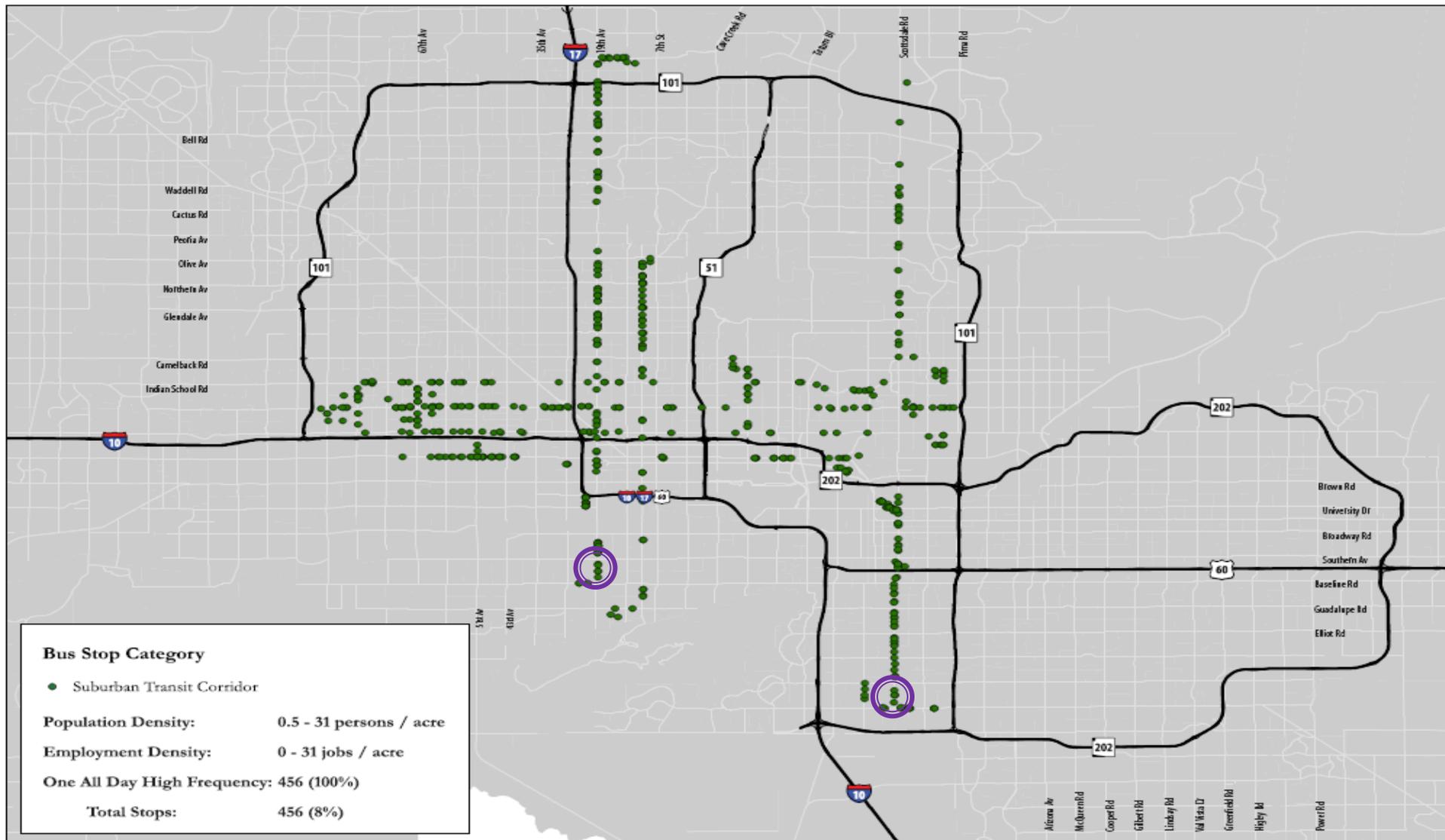


Scottsdale Road & McKellips Road, Scottsdale





Suburban Transit Corridor





Suburban Transit Corridor

Rural Road &
Galveston Street,
Chandler





Suburban Transit Corridor

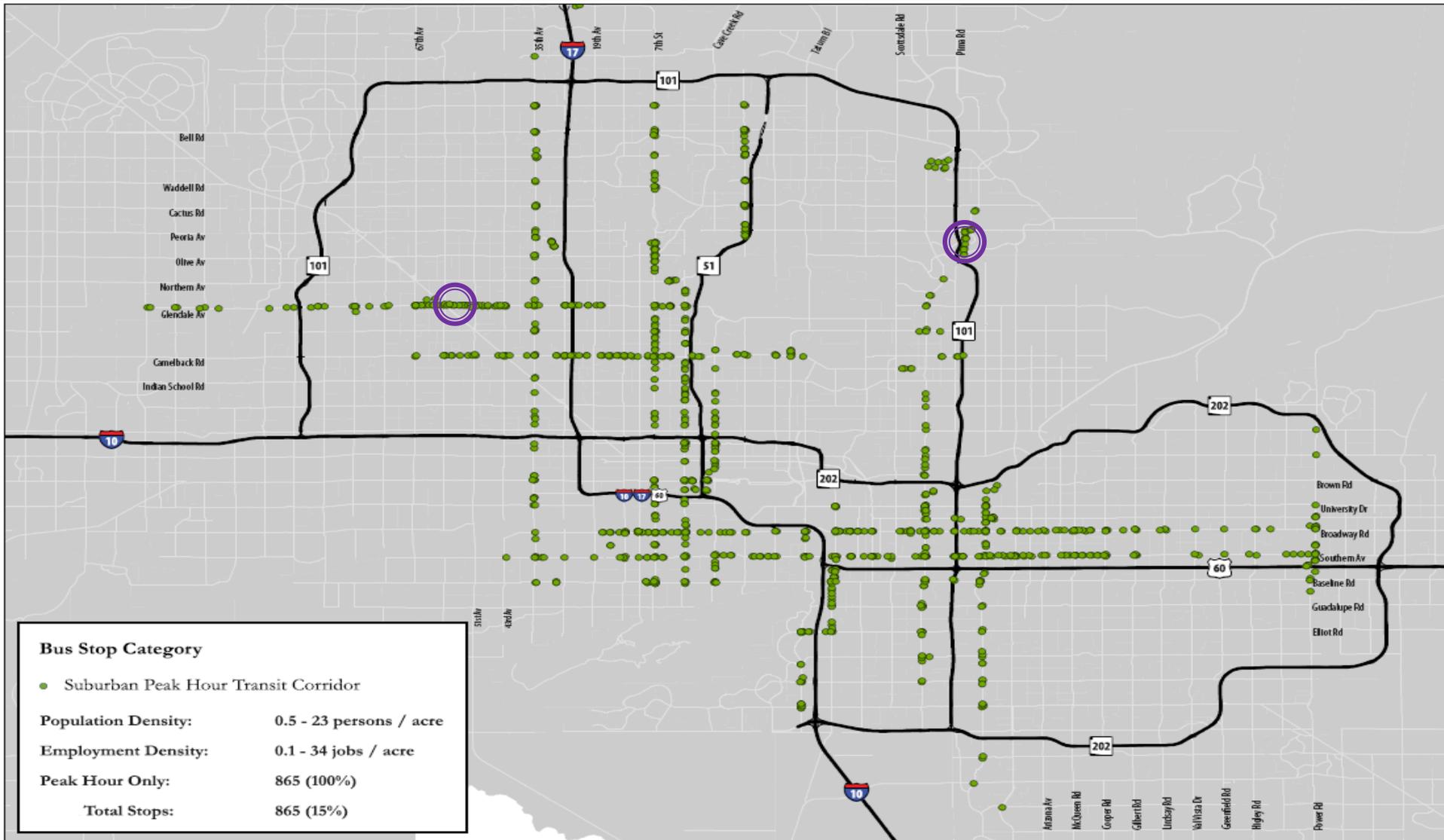


19th Avenue & Alta Vista Road, Phoenix



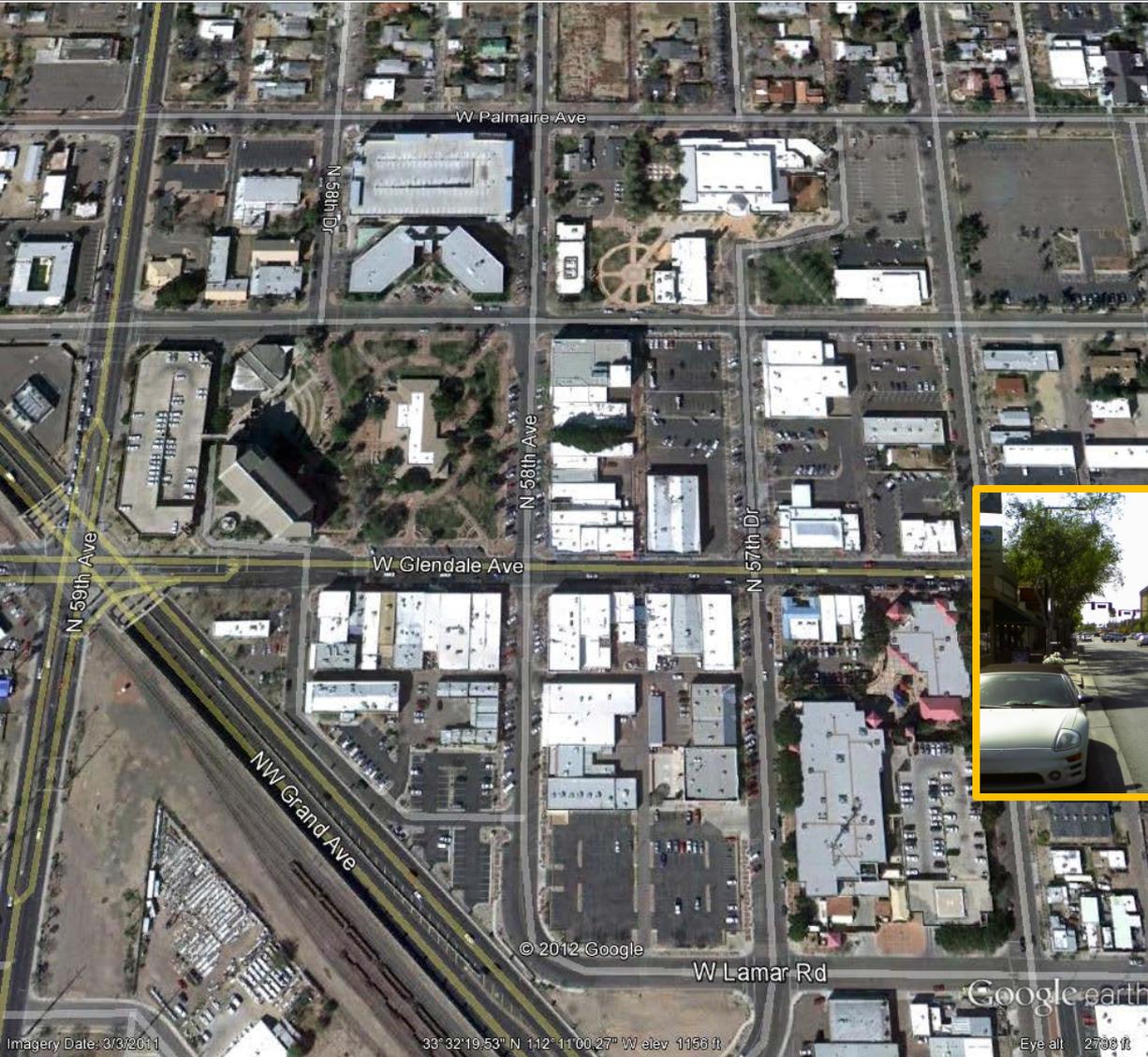


Suburban Peak Hour Transit Corridor





Suburban Peak Hour Transit Corridor



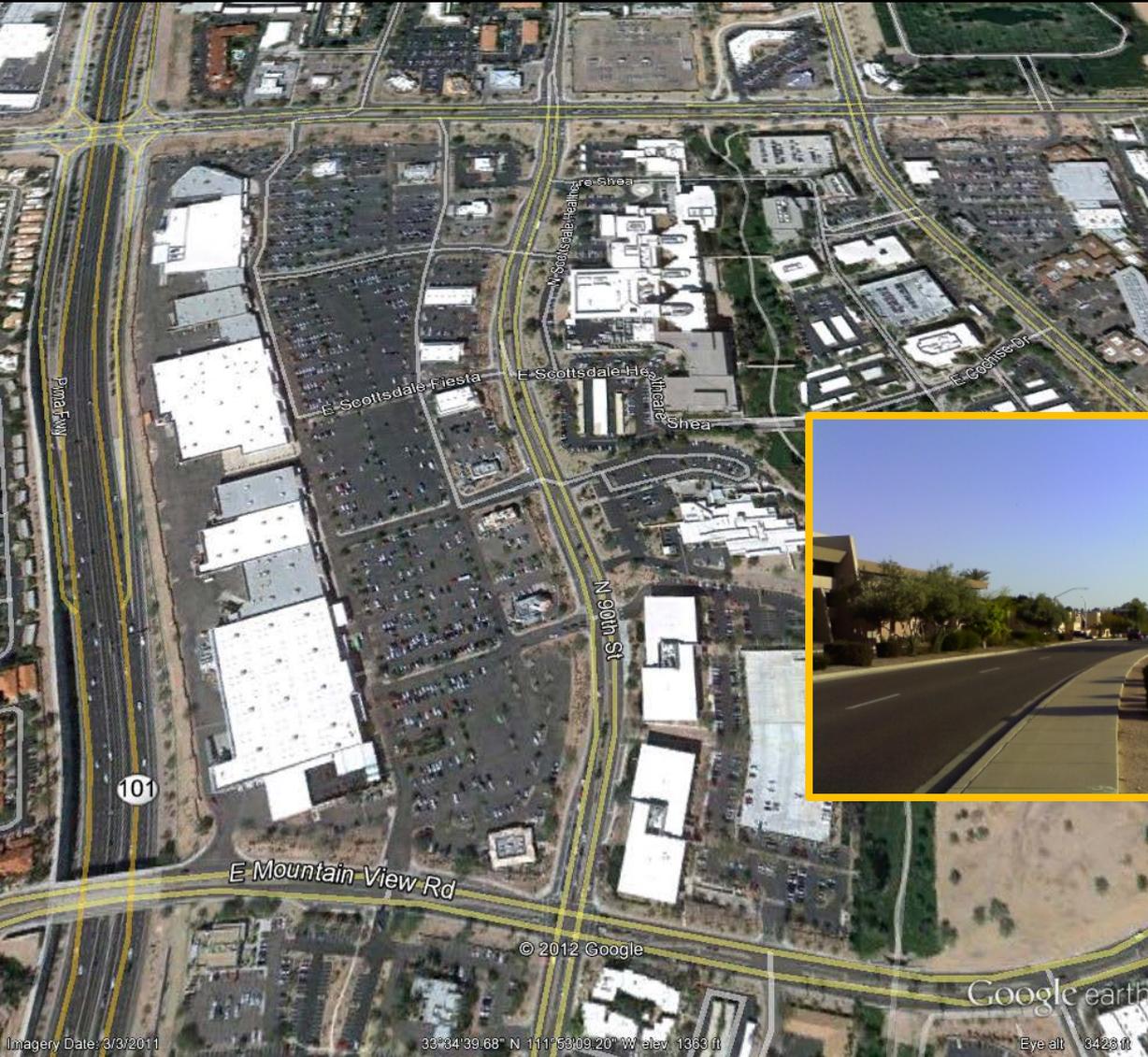
Glendale Road & 58th Avenue, Glendale





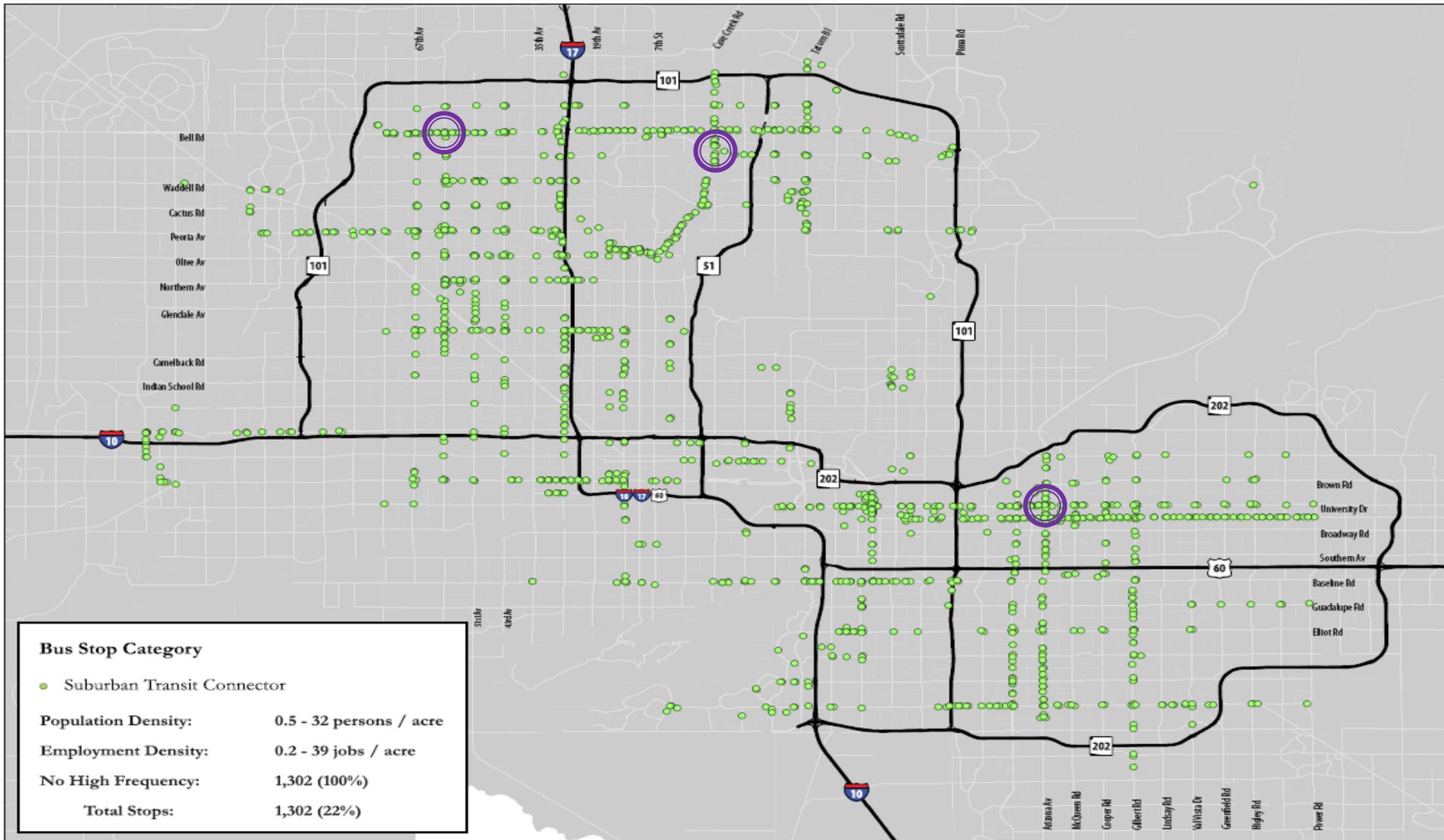
Suburban Peak Hour Transit Corridor

90th Street & Mountain View Road, Scottsdale





Suburban Transit Connector





Suburban Transit Connector



59th Avenue &
Bell Road,
Glendale



© 2012 Google

Google earth



Suburban Transit Connector

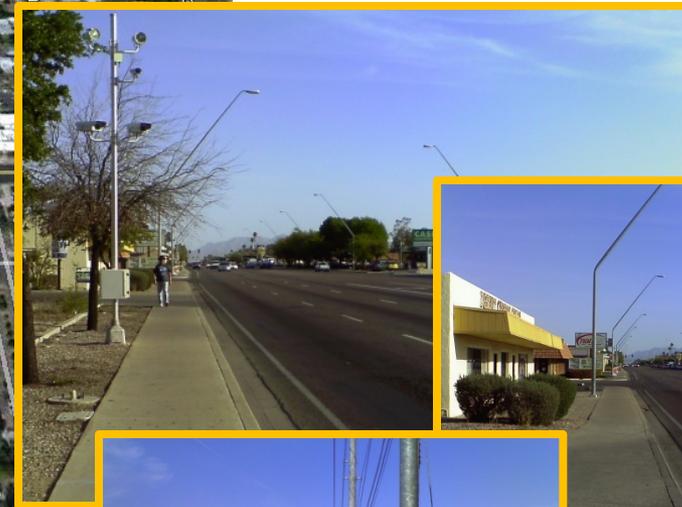
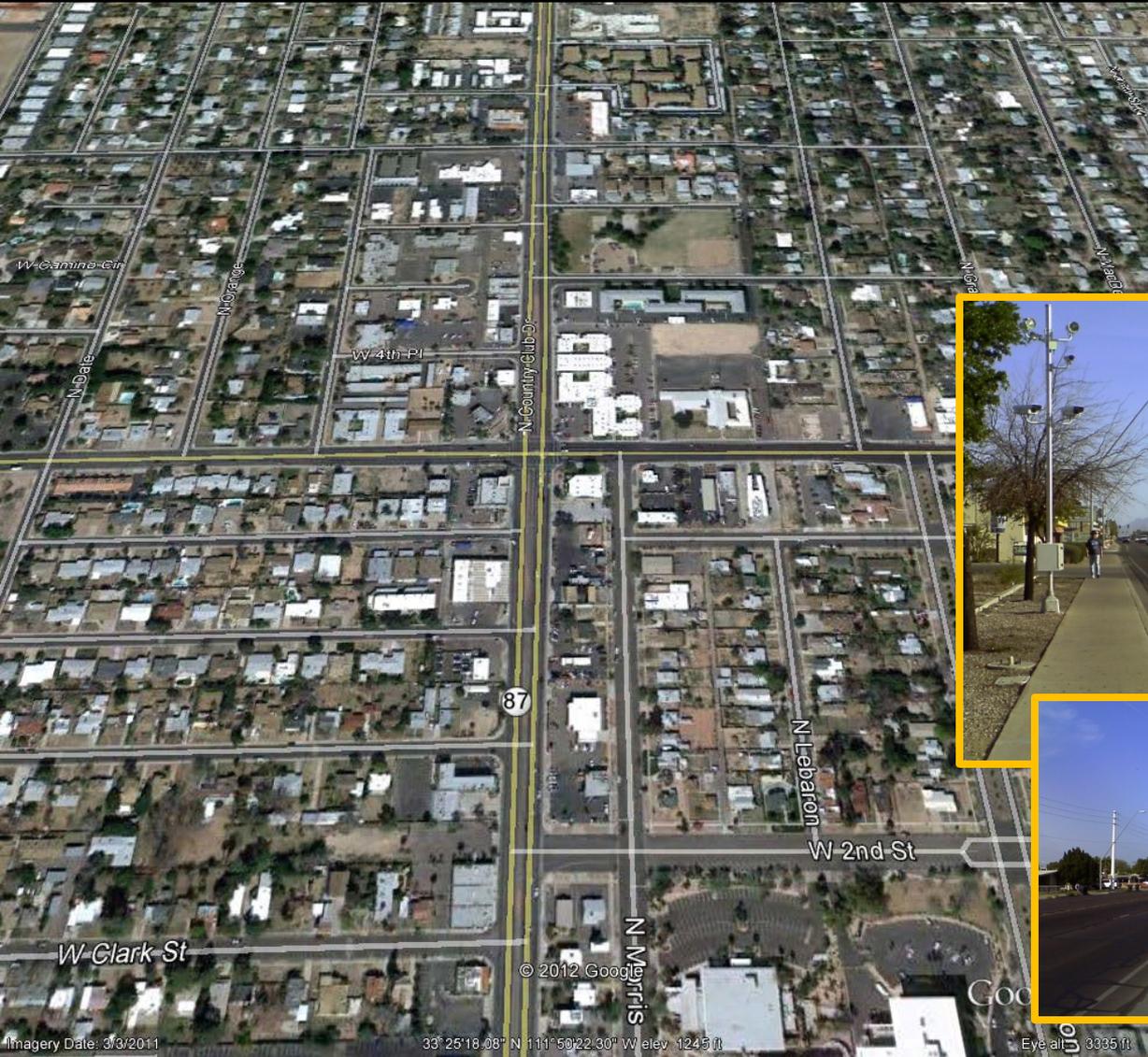
Cave Creek Road & Greenway Road, Phoenix





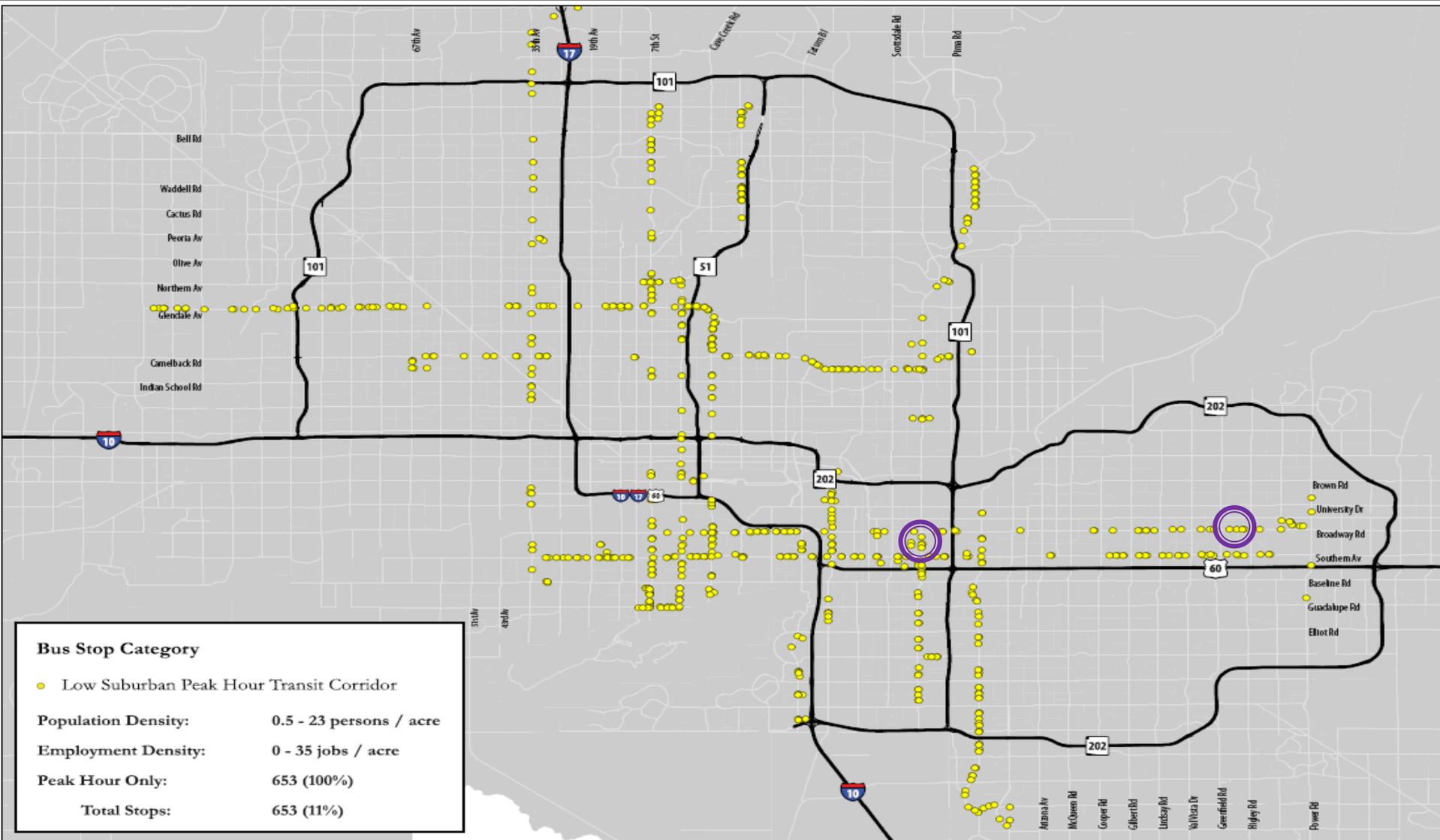
Suburban Transit Connector

University Drive &
Country Club Drive,
Mesa





Low Suburban Peak Hour Transit Corridor





Low Suburban Peak Hour Transit Corridor



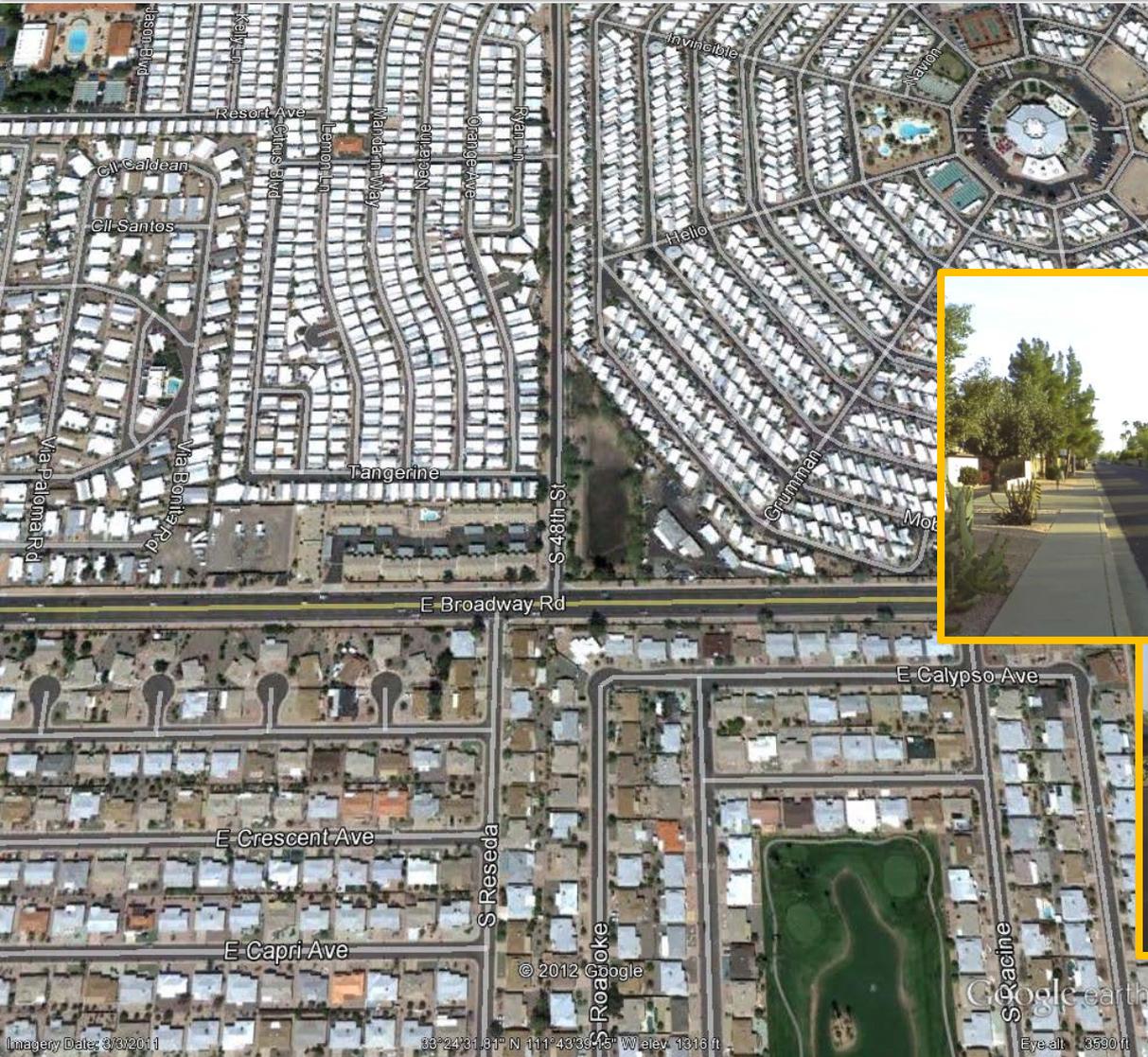
McClintock Drive &
Alameda Drive,
Tempe





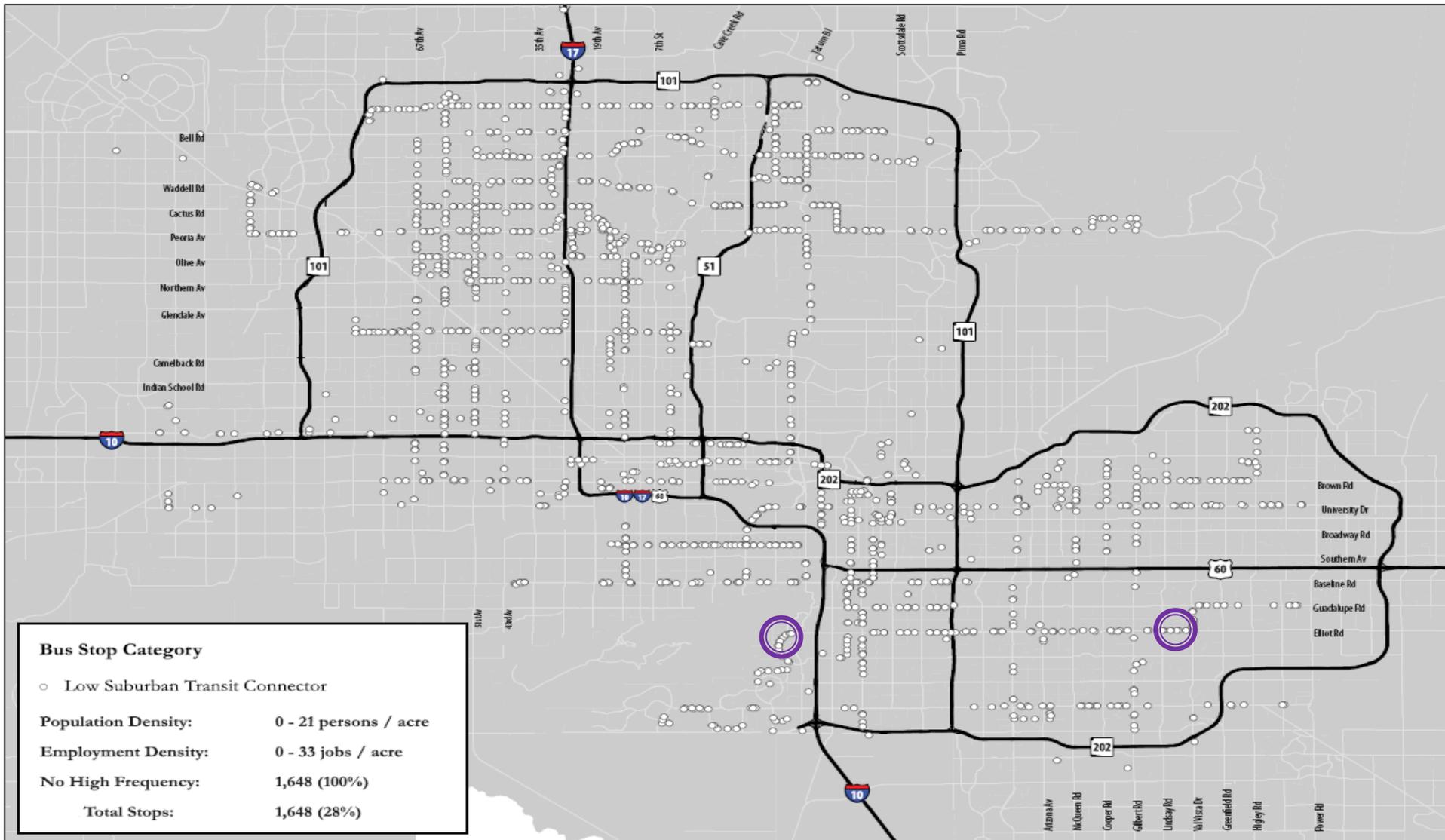
Low Suburban Peak Hour Transit Corridor

Broadway Road & 48th Street, Mesa





Low Suburban Transit Connector





Low Suburban Transit Connector

Warner Elliot Loop & Equestrian Trail, Phoenix

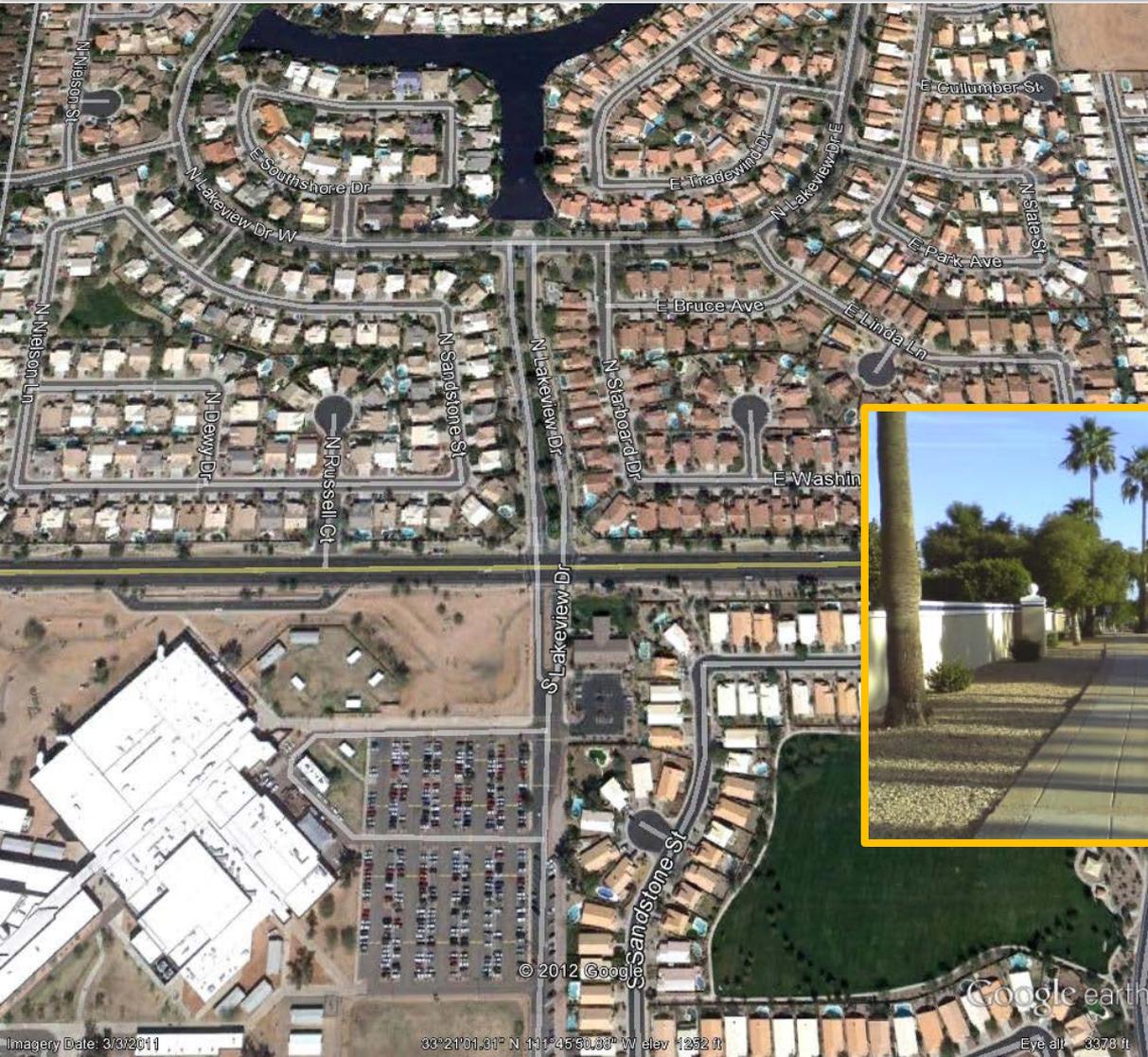


© 2012 Google

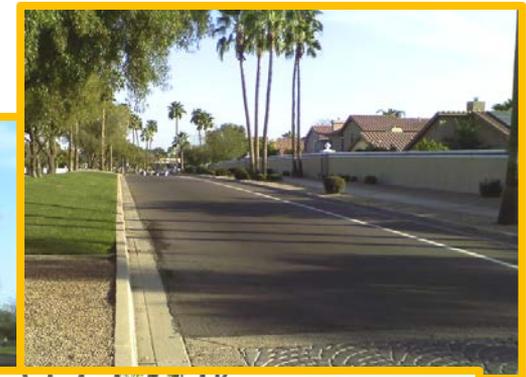
Google earth



Low Suburban Transit Connector

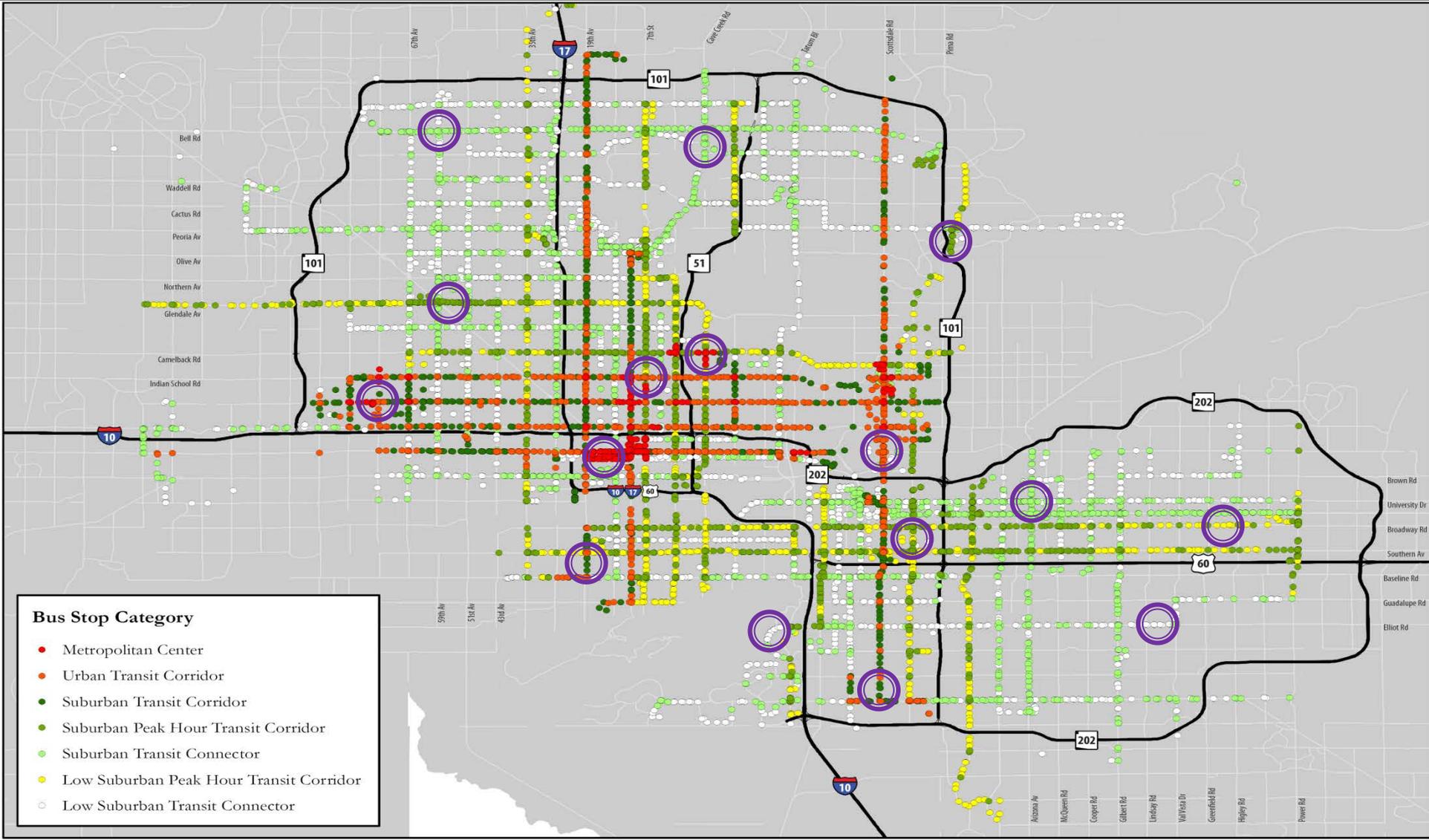


Elliot Road &
Lakeview Drive,
Gilbert





Proposed Case Study Locations





Data Collection Plan

- Case study areas defined by 1.5-mile buffer (*pedestrian*) and 2-mile buffer (*bicycle*)
- Data Sources
 - GIS Data
 - Field Reviews
 - Intercept Survey
 - Observations
- Intercept sample size: 280-300 surveys



Case Study Variable Types

GIS Data	Field Reviews	Intercept Surveys	Observations
Population	Roadway Cross-sections ; traffic controls; signing & striping	Origin & Destination	Mode of Access Counts to Bus Stop
Land Use	Pedestrian Facilities & Obstructions	Self Reported Travel Time/Distance to Bus Stop	Safe / Unsafe Behaviors of Pedestrians, Cyclists and Drivers
Bicycle Facilities	Bicycle Facilities & Obstructions	Trip Purpose	--
Roadway Type	Transit Stop Amenities & Deficiencies	Mode of Access/ SOV Mode Replacement	--
Bike-Vehicle Collisions	ADA Compliance	Perceived Safety, & Comfort Accessing Transit	--
Pedestrian – Vehicle Collisions	--	Barriers to Walking & Cycling to Bus Stop	--



Intercept / Observation Data Collection

- Recruit staff/volunteers from agencies where studies occur
- Proposed Training: Thurs, April 12th
- Data Collection on Tues-Thurs, 6:30AM - 10:30AM, 2:00 PM – 6:00 PM:
 - April 17th-19th
 - April 24th-26th
 - May 1st -3rd (Contingency)



Data Collection Tools

- Intercept Survey (handout)
- Observation Tools (handout)
- Bike and Pedestrian Count Sheets (handout)



Next Steps



Next Steps

- Finalize categorization of stops
- Finalize case study site selection
- Complete case study data collection in April 2012
- Draft Working Paper #2 - *Bus Stop Categorization* (April, 27)
- Draft Working Paper #3 – *Case Studies* (June, 1)



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