

## Chapter 12

# Getting from Here to There: Transportation and Mobility



*“I want to live in a city where I can walk, bike, and ride public transit to work, eat, and play.”*

*“We need better public transit and need to become more pedestrian-friendly.”*

*“Stable, dependable transportation throughout the area.”*

GOALS	POLICIES FOR DECISION MAKERS
<p><b>Birmingham’s transportation systems help to build the city’s 21st-century economy and a livable urban center of the region.</b></p>	<ul style="list-style-type: none"> <li>• Support strategic initiatives using private and public funds to maintain and enhance the city’s street and transit systems to support city livability.</li> <li>• Ensure that street improvements and development projects are designed to accommodate all users including motorists, pedestrians, bicyclists, and transit riders except when deviations are justified.</li> <li>• Support Complete Streets policies and practices.</li> <li>• Support the development of a multi-modal transportation plan that creates complete networks and offers high quality travel options for every budget into and within the city.</li> </ul>
<p><b>Bicycling and walking in the City of Birmingham are comfortable, safe and convenient modes of transportation and recreation.</b></p>	<ul style="list-style-type: none"> <li>• Support investments and programs that provide safe, functional, attractive pedestrian environments and walkable districts along transit arterials.</li> <li>• Support the development of a complete bicycle network of on-street and off-street bicycle routes and trails.</li> <li>• Support implementation of the Red Rock Ridge and Valley Trail System, including the on-street pedestrian segments.</li> </ul>
<p><b>Transit in Birmingham is fast, reliable, well-connected, and inviting for daily as well as occasional use by residents and visitors alike.</b></p>	<ul style="list-style-type: none"> <li>• Support coordination and policies among major employers, the City, BJCTA, ALDOT and the MPO for better transit service and efficient routing within the city and county.</li> <li>• Support coordination among the MPO, the City, and the region to improve access to private, state and federal funding for safe and high-quality transit.</li> <li>• Support compact development at potential transit stops to support high-quality transit.</li> </ul>
<p><b>Streets and sidewalks are accessible and maintained in good repair.</b></p>	<ul style="list-style-type: none"> <li>• Support a system of public criteria for street and sidewalk maintenance priorities.</li> <li>• Support establishment of a pavement management system, ideally as part of an overall asset management system.</li> </ul>
<p><b>Birmingham has state-of-the-art inter-city passenger travel and freight transportation systems.</b></p>	<ul style="list-style-type: none"> <li>• Support expeditious completion of air terminal and cargo projects and the Intermodal Facility.</li> <li>• Advocate for passenger rail and enhanced passenger air service.</li> <li>• Evaluate options to expand Birminghamport, based on market conditions and feasibility.</li> </ul>

## findings

The vast majority of federal transportation dollars in the region (over 82%) is being spent on roadway- capacity projects, most of which are outside the City of Birmingham.

Nearly 95% of Birmingham residents drive or carpool to work, among the lowest non-motorized and transit travel-mode shares of any major U.S. metropolitan area.

Greater Birmingham residents drive an estimated 34.1 miles per day per person, the fourth highest in the United States. Commuters who drive to work spend about \$133 per week on their commute.

Over 13% of households within Birmingham's city limits do not have access to a car.

While transit ridership has grown nationally over the past five years, it has decreased at a rate of almost 4% per year since 2004 in greater Birmingham.

Regional roadways identified as congested: I-65, I-20, I-59, US 11, US 31, US 78, and US 280.

Downtown Birmingham is bounded on three sides by elevated freeways: I-65 to the west, I-20/I-59 to the north, and US 280 to the east, creating major barriers to pedestrian and bicycle travel and connectivity between neighborhoods, districts, complementary land uses and potential redevelopment opportunities.

The design of the BJCTA's bus service forces most passengers to route through downtown to the system's only hub, the intermodal center

All City traffic signals can be controlled and operated from a centralized location, the Traffic Management Center (TMC). This Intelligent Transportation Systems (ITS) investment currently has limited ability to effectively manage traffic congestion due to a lack of City personnel available to staff the TMC.

There is redundancy among many of the interregional freight travel corridors.

Both the City Planning Commission and the Greater Birmingham Region Planning Commission have recently adopted Complete Streets resolutions.

Important recent current transportation planning initiatives include the Freshwater Land Trust's Red Rock Ridge and Valley Trail System plan, the City's accessible sidewalk inventory, the GBRPC's regional transit system plan, and Birmingham Jefferson County Transit Authority's (BJCTA) 2012 Transit Development Plan.

The City has neither clear criteria nor a formal process for prioritizing transportation projects and allocating staff resources for project development to see them through; it struggles to match federal funding for projects; and the City's record of project delivery, due in part to local match, does not put it in a sufficiently competitive position for limited federal funds.

The City lacks a formal (and predictable) process for identifying and mitigating traffic impacts for new development.

Strip development and lack of coordinated transportation planning for corridor growth and development has led to high levels of congestion along important regional access routes, including US 280.

Downtown parking supply is not managed or priced to encourage any mode other than the private automobile.

Downtown areas and many neighborhoods lack Americans with Disabilities Act (ADA) compliance and sidewalk and street maintenance. The Planning Commission's Complete Streets Resolution recognizes Public Right of Way Accessibility Guidelines (PROWAG) for ADA compliance on all public rights-of-way (ROW).

Right-of-way space, design and road operations is generally dedicated to private automobiles. This is particularly a challenge for downtown areas like the UAB Campus and Five Points South, where walking and bicycling might otherwise be encouraged.

Street resurfacing and repair, both in terms of funding and design, focuses only on vehicular needs on the road surface without providing for pedestrian and bicycle users within the road's ROW.

## challenges

Meeting local funding match requirements to use federal dollars for needed transportation systems improvements.

Strengthening city government to effectively prioritize transportation projects, pursue funding, and allocate appropriate staff resources.

Gaining necessary public, private and cross-jurisdictional collaboration and support for a transit system that attracts new riders rather than being the travel option of last resort.

Establishing adequate funding for transit operations and service upgrades.

Establishing transportation, zoning and land use policies and initiatives to support transit and other alternatives to auto travel.

Implementing the Planning Commission's recent Complete Streets policies.

Including bicycle routing with pavement space, marking and signing to encourage bicycling on roads where they are not prevalent today.

## A. What the Community Said

- Transit in Birmingham needs to be much better:
  - > More frequent and more dependable service
  - > Expanded service hours and more convenient transfer locations
  - > Downtown circulator service to connect multiple downtown locations
  - > Transit for commuters within the city and the region
- Walking and bicycling should be safe and comfortable, especially downtown:
  - > More dedicated rather than shared bicycle lanes on city streets
  - > Better maintained sidewalks without gaps citywide
  - > More pedestrian and bicycle recreational trails
- The impact of the I-20/59 elevated highway should be reduced as a barrier downtown.
- Greater coordination among agencies is needed to improve the City’s transportation resources.
- Regular street maintenance and sidewalk repairs are needed citywide.

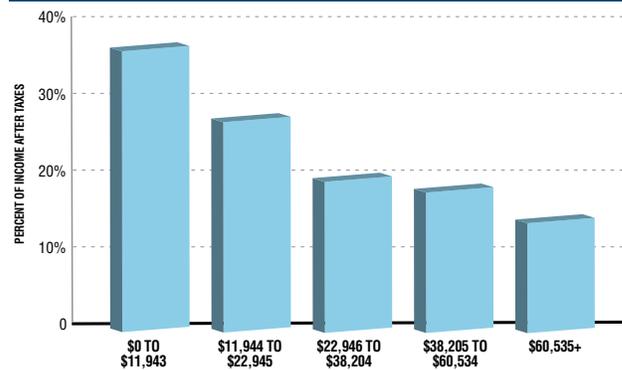
### TRANSPORTATION TRENDS

#### Transportation for mobility and access

An excellent transportation system provides an efficient and effective balance between access and mobility. The overall goal of transportation is access: we travel to reach destinations and the opportunities that those destinations represent, such as jobs, stores, schools, friends and family, and entertainment. Transportation is accomplished through mobility: our physical movement through space. For a long time, we have tended to measure the quality of modern transportation systems by mobility—more specifically, by speed and lack of congestion. More recent thinking suggests a broader way of looking at transportation needs and considers what people actually want, which is access at a reasonable cost and with a high level of convenience. We often hear today about the importance of integrating transportation decisions and investments with land use choices. What this means is that transportation systems should serve land use choices—not the reverse.

Transportation in Birmingham has long focused on the automobile. In order to have both good access and good mobility, Birmingham households need to have a private vehicle. This is particularly costly for lower-income households, which spend a much greater percentage of income on transportation than households with incomes over \$60,000 a year. Reestablishing high access at more manageable transportation costs for a greater number of people will require a major shift in investment focus, both public and private, to more mixed use and higher density neighborhoods, as well as a greater diversity of transportation options for areas already housing Birmingham residents. While uncongested travel for motorists and freight haulers inside and to and from the city will continue to be fundamental goals for Birmingham’s regional transportation system, high-quality motorist access should be balanced with livability and accessibility for city residents.

**FIGURE 12.1: HOUSEHOLD TRANSPORTATION SPENDING BY INCOME GROUP**



#### The importance of connectivity in transportation system design

Transportation is a basic building block of urban form. The rail tracks, city streets and highways, rolling stock of trains and buses, signals and their timing plans, sidewalks and curb ramps, and trails and pathways connect people and goods across time and space. Historically, as technology introduced more diverse transportation options, connectivity and access has been reduced for others. Birmingham was founded because of the railroad—the central location of the railroad reservation leading to the Norfolk Southern Line being called Birmingham’s “river.” As more rail track was laid to serve industry, it crossed many city streets, and hemmed in neighborhoods, creating long delays at busy crossing points. As grade-

separated highways were built, travel improved for people and freight passing through and across the city, but some neighborhoods such as Collegeville and Thomas continued to be cut off by rail. The map in Figure 12.2 shows the impact of major regional rail and highway infrastructure as it crisscrosses the city. The photograph helps to visualize the barriers that are created in some locations. Birmingham’s rail network continues to be very active and an integral part of the city’s economy and its urban character.

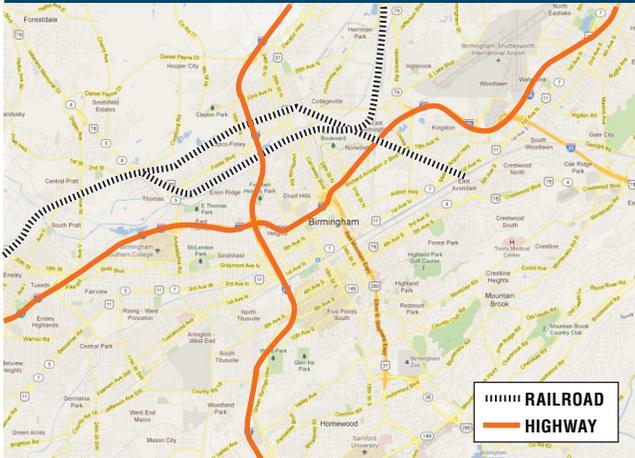
How connected a city is internally, to its surrounding region, and to places beyond, determines its most basic attributes: its character and appeal in the market, its cost of living to residents, and the level of ease and efficiency of living and doing business within its borders. Transportation choice and quality are important to businesses and households as a factor in their location decisions. A move to cities rather than to sites and subdivisions in the suburbs occurs in part because of the concentration of transportation connections. These connections found in

cities typically provide the greatest access within any region to its goods, services, entertainment, higher education, labor supply and employment.

In Figure 12.3, the graphic on the left shows a mix of land uses: shades of red for office and retail, yellow and orange for low to medium-density residential and purple for civic uses such as libraries and schools. The graphic on the right shows lengths and routes of travel between different destinations for its corresponding land use pattern. Travel distance for the suburban-style development pattern, on the upper portion of the images, is longer and ultimately requires each local trip to use the arterial road. This is one of the reasons why suburban arterials are often congested, particularly at the few intersections with collector streets. Building cul-de-sac subdivisions that create dead-end rather than connected street networks is one of the factors contributing to the growing problem of traffic congestion. This typically suburban pattern puts more trips on fewer streets and reduces the effective value of road investment. In the more connected street grid, local travel is more direct and does not unnecessarily add to traffic on the main road. These shorter trips can also be made by walking or bicycling, and on safer and more comfortable lower order streets with less traffic and lower speeds.



**FIGURE 12.2: MAJOR REGIONAL RAIL AND HIGHWAY INFRASTRUCTURE**



**Rail and highway infrastructure that ties Birmingham to the region and beyond creates major barriers for in-town travel and connectivity.**

### Livability as a transportation value

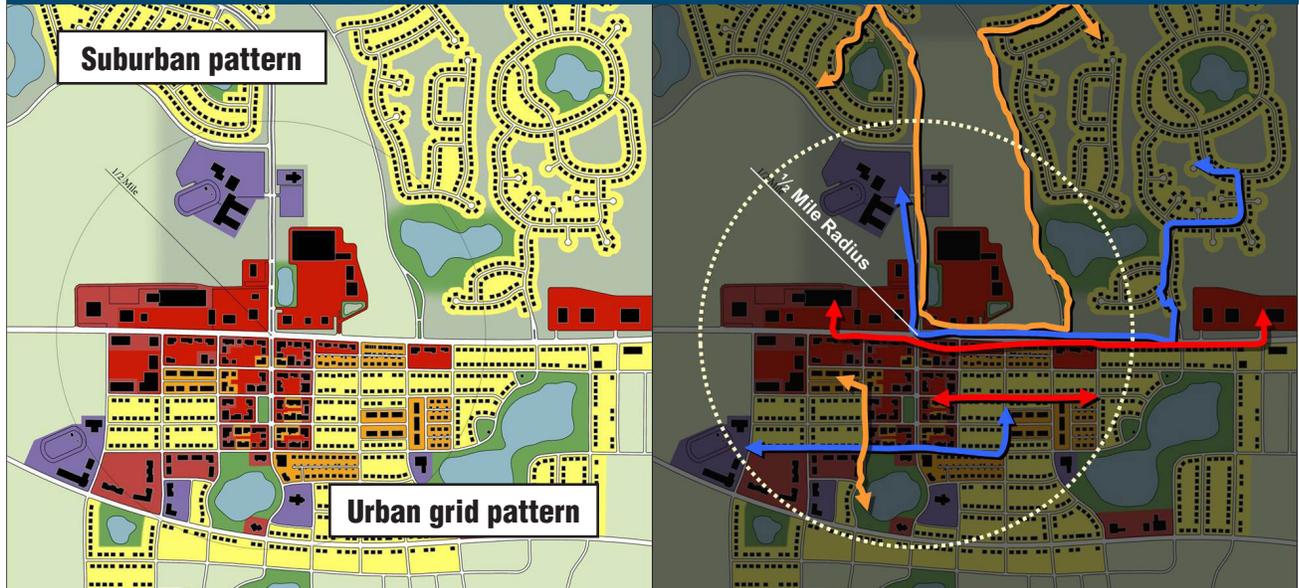
A healthy economy can be influenced by the quality and choice available to users of a city’s transportation assets. One example of this is the recognition by *CEOs for Cities* that neighborhoods with good walkability have higher housing values and walkability is an increasingly important attribute for attracting talent.<sup>1</sup> In marketing residential properties, many real estate agents are now including an area’s Walkscore® in the home’s listing to indicate its level of proximity to a broad range of goods and services including shopping, entertainment, restaurants, doctors, churches and parks. The City of Birmingham as a whole has a Walkscore® of only 40, though select areas downtown have scores as high as 96. ([www.walkscore.com](http://www.walkscore.com))

Recent studies show a lower percentage of young people are becoming licensed to drive.<sup>2</sup> Explanatory factors

<sup>1</sup> <http://www.ceosforcities.org/>

<sup>2</sup> An analysis of Federal Highway Administration data showed a drop in the share

**FIGURE 12.3: URBAN AND SUBURBAN STREET PATTERNS**



include the growing cost of fuel and owning a car and a shift in values that has led many members of the Millennial generation to choose to locate in walkable places where they have transportation options. They experience the health benefits and lower costs of bicycling to work, and the social benefits of living in walkable places. They are willing and wish to take transit and will rent or car-share when a car is needed as a part of a “car-light” lifestyle. Increasing numbers of healthier seniors contribute to this trend.

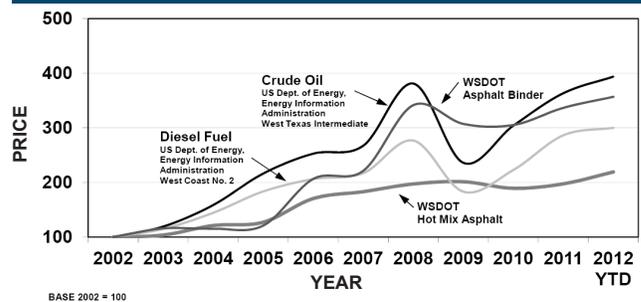
### Understanding transportation’s fiscal impacts and opportunities

Fiscal concerns are causing cities to rethink their transportation investments in several ways by focusing on “fix it first” strategies rather than building new roads. Increasing oil prices have caused asphalt and other construction materials to nearly double in the last 10 years, causing roads to be more expensive to build and maintain.

### Gaining more capacity from arterial corridors

Cities are also placing planning and funding priority on streets that can serve more users more efficiently. The trend is moving toward measuring person trips rather than auto trips to improve transit and bicycle options on

**FIGURE 12.4: ASPHALT, CRUDE OIL & DIESEL FUEL PRICE INDICES**



SOURCE: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

**The cost of fuel has directly affected the price of important road maintenance materials. Washington DOT reports a doubling of the price of asphalt between 2002 and 2012.**

busy commute corridors. Congested arterial roads that have demonstrated potential to carry significant numbers of transit riders are prime candidates for transit upgrades. Memphis has partnered with Memphis Area Transit Authority (MATA) to target its three express bus corridors. The City joins Tennessee DOT, and other jurisdictions in the region to equip signal controllers with transit signal priority so signals can receive radio communications from MATA buses. This effectively ensures that people wishing to commute by bus on these priority transit corridors have comfort, convenience, and travel speed during peak hours that rivals or surpasses that of motorists, thereby rewarding people using transportation that uses less road space and reducing traffic for those who must drive.

of 20- to 34-year-olds with a driver’s license: 84.3% in 2010 compared to 89.6% in 2000. Benjamin Davis and Tony Dutzik, Frontier Group; Phineas Baxandall, U.S. PIRG Education Fund, *Transportation and the New Generation: Why Young People Are Driving Less and What It Means for Transportation Policy*, April 2012.

Memphis also joins Austin, Chicago, Portland, San Francisco and DC, in being selected for a “green lanes” technical assistance project. They rank among 42 cities nationally with plans to give over travel lanes on major corridors for dedicated and buffered bicycling lanes. For Birmingham’s growing bicycle advocacy, whose members urged City action during the development of this plan, and for those within the City responsible to that constituency, these will be cities to watch and emulate as experimental protected bicycle lanes are installed, evaluated and introduced into national street-design guidelines. Birmingham’s significant number of redundant streets and those designed for much higher traffic volumes than needed present an opportunity to introduce many more bicycle-friendly streets. Livable Memphis, a non-profit that supports livable transportation, has developed concept plans for that city’s first separated bicycle lane project, the Overton-Broad Connector. A recent study of such lanes in Washington, DC shows a doubling of the number of cyclists using study streets since the lanes were created. Further, surveys indicate that drivers also prefer separated spaces for bicyclists.

**Bike share stations.** Bike share stations combined with a robust bicycle-network expansion program has caused dramatic growth in bicycling where they have been introduced, improving healthy and affordable transportation options for both residents and visitors. Leading the way in Birmingham, Alabama Power cut the ribbon in 2012 on a bikeshare program for employees. The City or advocacy groups could work with Alabama Power to monitor this program to inform decisions and actions the City can take as it expands bicycling opportunities for residents and visitors. This collaboration should discover how people have responded to the program, who is



**Alabama Power initiated an employee bike share program in 2012.**

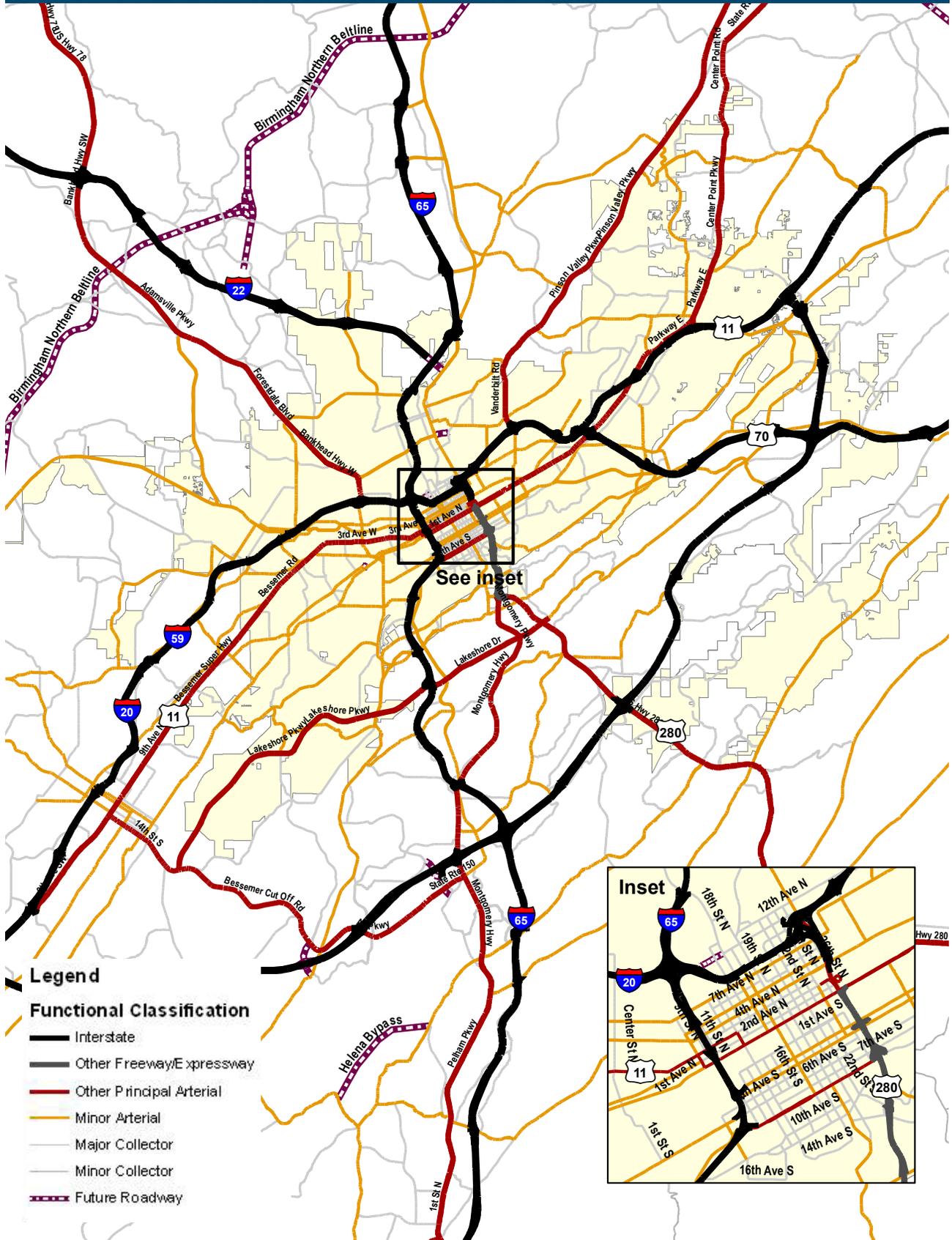
participating, whether the trips they take are for running errands or recreation, the characteristics of their routes, and what they believe could be done to make them feel safer.

### Birmingham’s road system and travel trends

**Functional Classification of Roads.** Transportation system design has traditionally organized roads by functional classification in a hierarchy of streets defined by the type and typical trip length of the traffic usually found on each roadway category. The implicit user in the traditional classification system is the automobile and how it will safely “function” on a network of streets that must accommodate other traffic and provide access to adjacent land. The “higher” a road is classified, the greater the speed of travel, and the lower the level of land access. Functional classifications in Birmingham include:

- *Other Freeway/Expressway:* Continuous routes with trip lengths and volumes that show substantial statewide or interstate travel. I-20 and I-65 are examples in Birmingham. Divided highways with partial (freeway) or full (expressway) control of access. These routes primarily serve through traffic and major circulation movements within federally defined urban areas. The Red Mountain Expressway is a freeway.
- *Other Principal Arterial:* Highways that provide long-distance connections but do not fit the two categories above, such as portions of US 11, US 78, and State Route 79. In-town portions of Lakeshore Parkway are principal arterials.
- *Minor Arterial:* Continuous routes that provide for relatively high travel speeds and minimum interference for through-movements. An example is 4th Avenue N.
- *Major and Minor Collectors:* Streets that primarily serve intra-city rather than statewide routes and travel distances that are shorter than those on arterial routes. They can be divided into major and minor collectors. Major collector roads (a) serve larger towns not directly served by higher systems; (b) link nearby larger towns, cities, or routes of higher classifications; or (c) serve more important intra-county travel corridors that could connect consolidated schools, shipping points, important agricultural areas, etc. Minor collectors are spaced to reflect population density and to accommodate local roads within reasonable distance of collector roads,

**FIGURE 12.5: MAJOR STREET PLAN WITH FUNCTIONAL CLASSIFICATIONS**



provide service to smaller communities, and link locally important traffic generators with the arterial system.

- *Local Streets:* Provide access to adjacent land and provide service to travel over relatively short distances as compared to higher-level roads.

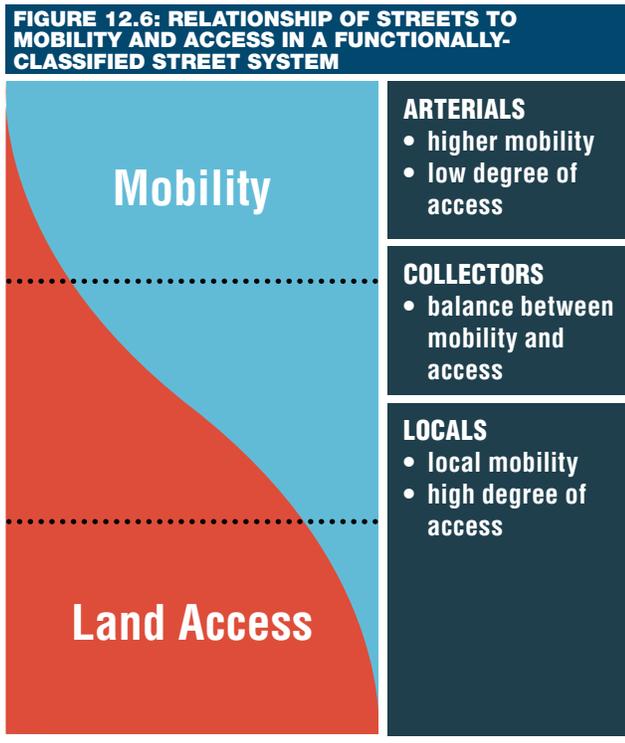
The creation of a road hierarchy of this type, focused on cars and combined with declining population in most of the city, has resulted in very little congestion on city roads with the exception of the main commuter routes, such as US 280, from downtown to the Cahaba area of the city and bedroom communities. The suburban-style system found in the parts of the city developed since the 1960s is not easily adapted to transit, bicycle and pedestrian travel modes. Growth of the roadway network over time has led to a decline in the ability to maintain streets, since costs for maintenance have outstripped available maintenance funding.

The City of Birmingham Planning Commission has adopted a “Complete Streets” resolution indicating that streets should be designed and operated to accommodate a full range of users. Many cities are adding mode priority plans to the functional classification plans as a way of implementing Complete Streets Policy. The mode priority plans classify

streets according to whether they are particularly suitable for transportation other than cars. The classification, for example a priority transit street or bicycle street, is based upon land use, urban design, the need for certain streets to contribute to the complete user network and a range of other factors that influence mode choice. Transit, for example, needs transfer points between lines to provide access to the broadest area. Bicyclists and pedestrians are particularly deterred by barriers and obstructions within their networks. Refocusing on walking, transit and bicycling as key transportation modes and mixing land uses so these modes can reach them create new transportation patterns that return value to the traditional street grid of Birmingham’s downtown and historic neighborhoods. The region’s major road system provides the framework for patterns of land use and commuting in the City. Birmingham has a strong radial network of limited-access highways that meet and cross downtown.

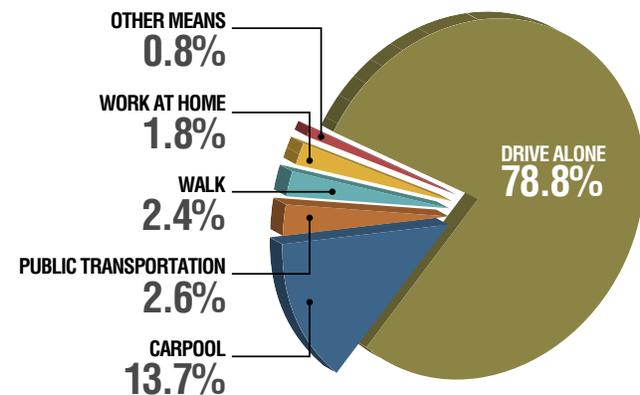
**Commuting Patterns.** According to the 2010 census, nearly 79% of residents in the region drive alone to work. The relatively high share of carpooling, nearly 14%, suggests that there may be potential demand for more and better transit service. It also suggests that the MPO’s CommuteSmart program is an important service in the region to broadly market services and inform commuters, assist with ride-matching, and identify and support employers to improve affordable commute options for their employees.

Figures 12.8 to 12.10 show commute patterns for downtown, Woodlawn, and the West End. Darker shades of blue show the most important origins and destinations. The highest concentrations of downtown workers are found in

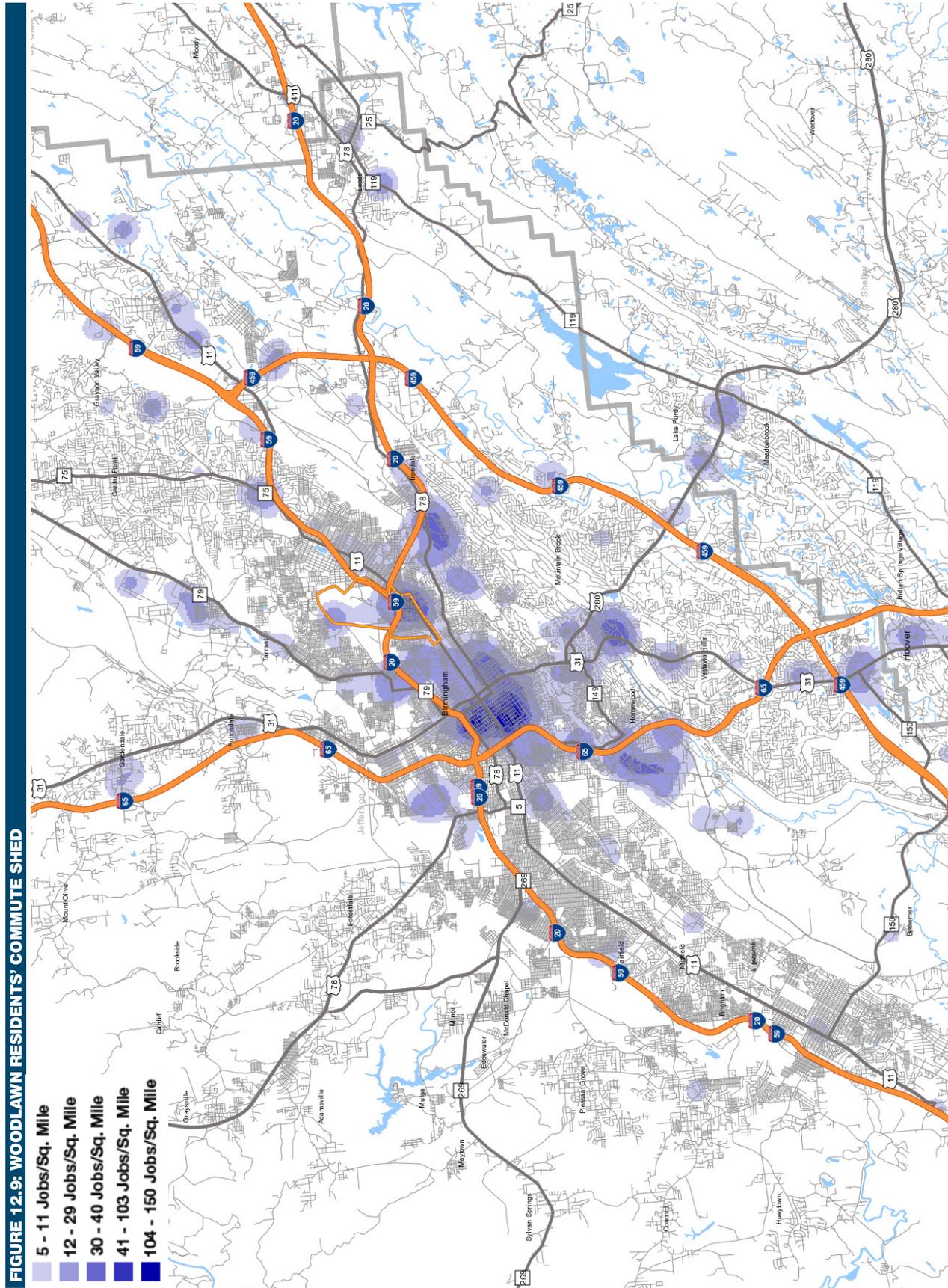


SOURCE: SAFETY EFFECTIVENESS OF HIGHWAY DESIGN FEATURES, VOLUME 1, ACCESS CONTROL, FHWA, 1992

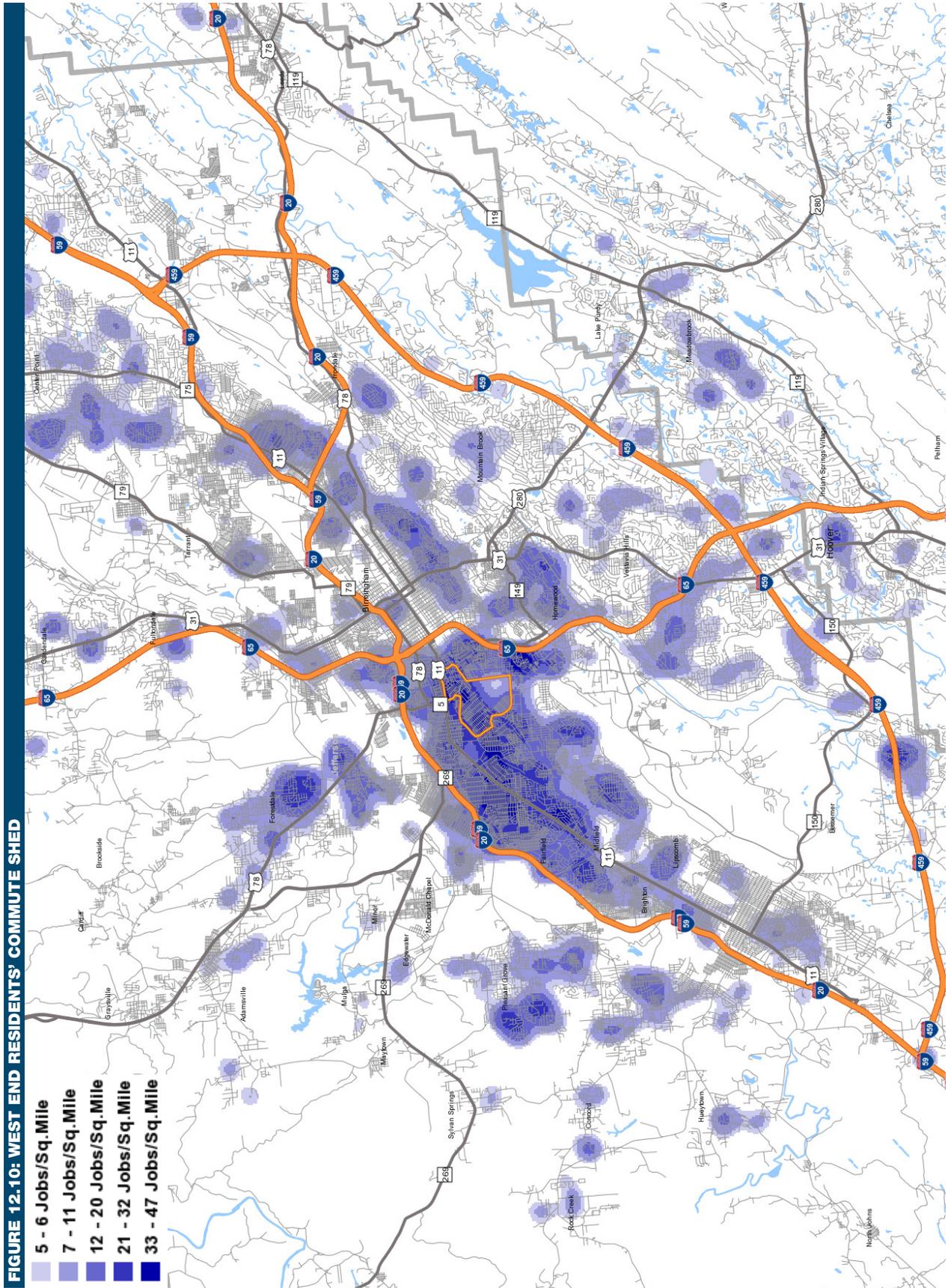
**FIGURE 12.7: CITY OF BIRMINGHAM COMMUTE TO WORK, 2010**







SOURCE: CENSUS LEHD (LONGITUDINAL EMPLOYER-HOUSING DYNAMICS) DATA 2005



SOURCE: CENSUS LEHD (LONGITUDINAL EMPLOYER-HOUSING DYNAMICS) DATA 2005

city neighborhoods along the southern ridge and the “over the mountain” towns of Homewood, Mountain Brook, and Vestavia Hills established early in the 20th century. Newer residential clusters are evident around the region’s arterial roads, State Routes 79 and 75 to the north, reaching along I-65 in Hoover and Shelby County to the south, and along I-20/59 to the southwest. The downtown draw of employees from all around the region is significant.

The next two maps compare the work locations of Woodlawn residents with those of West End residents. The maps are at two different scales, in part because Woodlawn residents are working closer to home, with largest concentrations at the UAB medical center and downtown. West End residents are traveling all around the region for work in areas of less concentrated employment but with some focus along the US 11 West corridor. Improving transit to serve existing work trips for West End residents would be more difficult than for Woodlawn, due to the dispersed nature of travel, but also might open up opportunities downtown for West End residents. The dispersed pattern of jobs around the region reflects the influence of the automobile on development and employment.

**Traffic congestion.** Participants in the planning process did not identify congestion within the City as a matter of concern. RPC data showed that Birmingham’s traffic congestion is mostly confined to ingress and egress to and from highway ramps during peak travel times (i.e., I-65 and University Boulevard) and on its major commute corridors (US 280). While actual traffic counts were unavailable for this study, many of Birmingham’s arterial and downtown streets have excess capacity: more lanes than needed to

support traffic demand. They could be altered to provide space for better transit service, pedestrian and waiting space, and use by bicyclists.

Reports and visual observations of relatively low traffic on Birmingham’s arterial streets are in part due to the city’s network of connected streets. As neighborhoods change and the city gains more residents, this growth can continue to generate less traffic than most regional growth if Birmingham follows the recommended strategy of creating compact urban villages and Strategic Opportunity Areas well connected to shopping, services and other destinations of daily living. National transportation studies report that the average American household generates an average of 10 trips per day. About 80% of these daily trips are for purposes other than commuting to and from work. If more of these non-work destinations are located closer to or within neighborhoods and within a walkable, connected street system, more travel in the city can be made by walking or bicycling.

**Return to downtown two-way streets.** Following the Center City Master Plan, a 2010 study analyzed seven one-way streets:

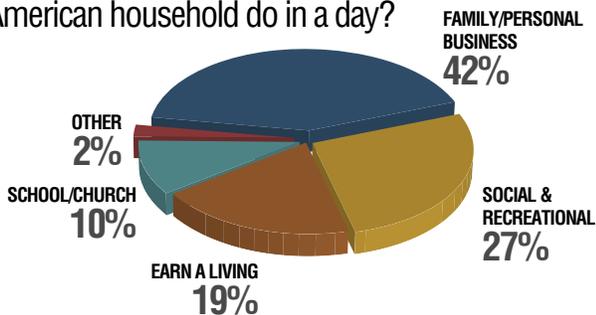
- 4th Avenue N
- 2nd Avenue N and 3rd Avenue N one-way pair
- 13th Street N and 14th Street N one-way pair
- 17th Street N and 18th Street N one-way pair

The study found that it was feasible to convert these streets to two-way traffic, but a comprehensive signal-timing study would be needed to determine the signal timings at all affected signalized intersections. A signal-timing study has not yet been done.

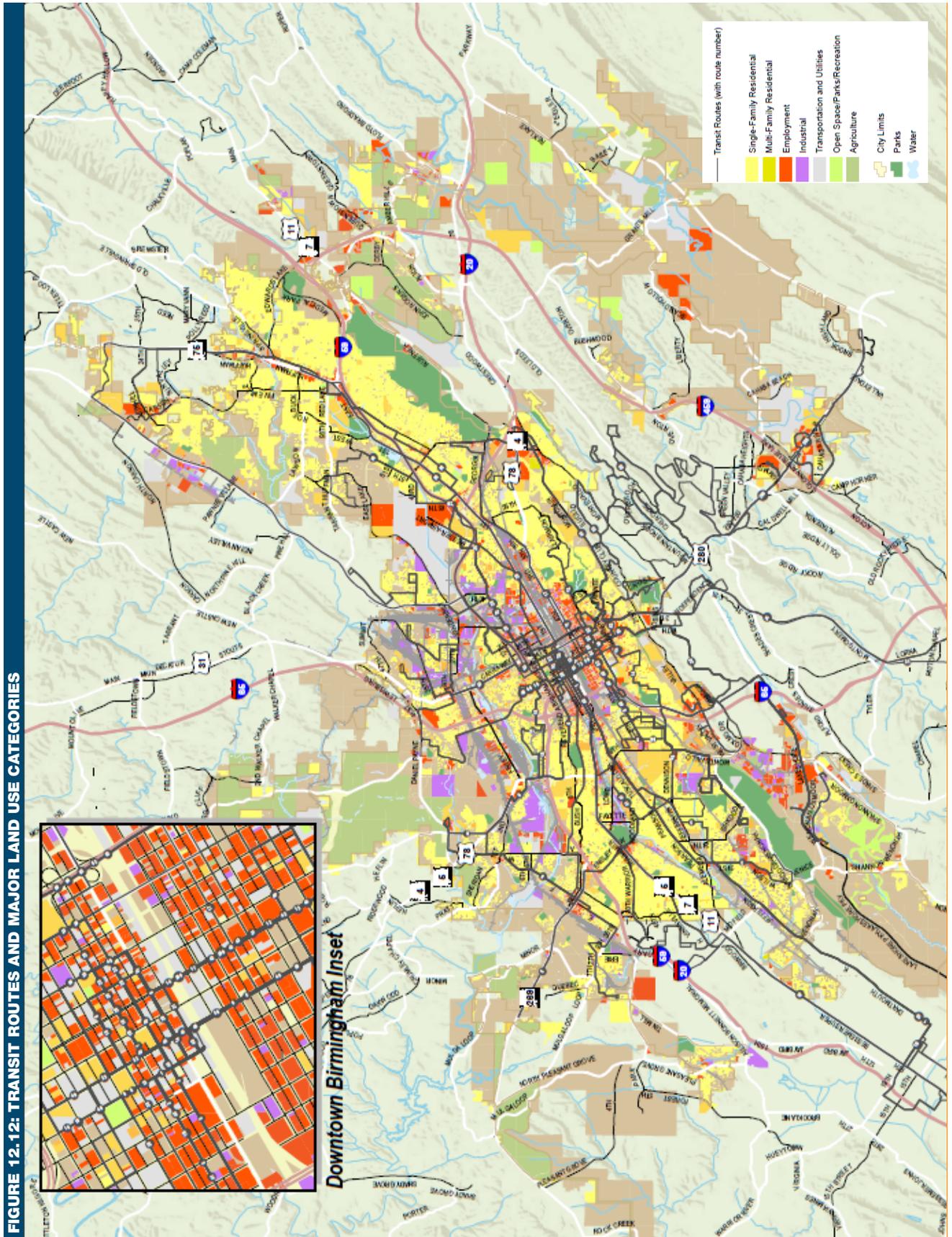
Other downtown street conversions to two-way travel are possible and should be evaluated in the Framework Plans recommended for the city, in order to reinforce connections between neighborhoods as well as to and from the interstates. The “Do Not Enter” sign at the entrance to downtown from the BJCC district on Richard Arrington Jr. Boulevard North is an example of how the termination of two-way access occurred to manage traffic flows related to interstate access—but created a very unwelcoming condition for visitors.

**FIGURE 12.11: DAILY TRIP CHARACTERISTICS**

What travel does the average American household do in a day?



SOURCE: NATIONAL HOUSEHOLD TRAVEL SURVEY (2010)



SOURCE: CITY OF BIRMINGHAM GIS

## Birmingham transit today

The City of Birmingham is a member jurisdiction of the Birmingham Jefferson County Transit Authority (BJCTA) and provides \$11 million annually for operational funding, more than any other jurisdiction. BJCTA operates both DART downtown circulator service and MAX regional service. The majority of BJCTA’s service, just over 89%, lies within the city. Some of the highest ridership is found on lines serving suburban locations, including the over the mountain communities, likely due to the concentration of service jobs and shopping (some within the city limits) found there. Many cities have recognized the value of transit investment to insure access to the labor force of service workers and hourly wage earners. The Birmingham Business Alliance (BBA) in its 2010 *Blueprint Birmingham* five-year strategic plan declared the need to “Develop a consensus on local and regional transit capacity and needs” as part of the Community and Regional Stewardship goal.

## Laying the foundation for a brighter transit future

Birmingham’s sprawling geography and low housing density present challenges for its ability to support investment in rail-based transit in the foreseeable future. The red areas in Figures 12.13 and 12.14 show the city’s highest levels of housing and employment density, the trip ends of the most prevalent transit trip types. Areas with densities of 6–9 units per acre provide the minimum concentration of people needed to support local bus service.

**The regional transit plan.** The region has taken several important steps recently to prepare for the potential for more desirable and efficient transit connections. The proposals are based on the 2007 BJCTA Comprehensive Transit Development Plan and envision using the major arterial corridor network to provide a high quality transit alternative to the automobile. The MPO’s Regional Transit System Plan identifies seven major transit corridors, and the In-Town Transit Partnership (ITP) Bus Rapid Transit for premium transit service. The ITP is the linchpin that connects them all through downtown. The images to the right show the vehicle types and service characteristics of these proposed transit concepts. Express bus is anticipated for most of the seven corridors recommended in the MPO’s plan. Bus Rapid Transit or Limited Stop service is proposed on the In-Town Transit Partnership and Bessemer Highway

### CIRCULATOR/SHUTTLE SERVICE/PICK-UP LINES



- 8 to 30 passengers
- Used in defined campuses and districts, such as schools, hospitals, business parks, downtown areas
- Operated and funded by self-taxing districts, transit agencies, business owners, etc.
- Flexible or fixed-route service
- Flexible or fixed-schedule service
- Typically curb-to-curb service
- Connects to other transit modes- i.e. regular city bus, commuter rail, etc.



### CITY BUS



- 40 to 75 passengers per vehicle
- Fixed-route and fixed schedule
- Stops every 500 feet to 1 mile, most common spacing is 1,000 to 1,200 feet
- Generally a mix of federal and local funding



### EXPRESS BUS



- Up to 120 passengers per vehicle
- Runs in mixed traffic
- Fewer stops; farther apart
- Longer routes, connecting city centers to smaller suburban centers
- May have enhanced stations
- May have transit-signal priority
- Strong branding and image
- Peak periods or all-day service



### BUS RAPID TRANSIT



- Mixed traffic or exclusive lanes
- Station spacing dependent on land use
- Enhanced stations
- Enhanced ticketing
- Transit-signal priority
- Modern vehicle design, but rubber-tire vehicles
- Route length varies



**Different transit types are suitable for different circumstances.**

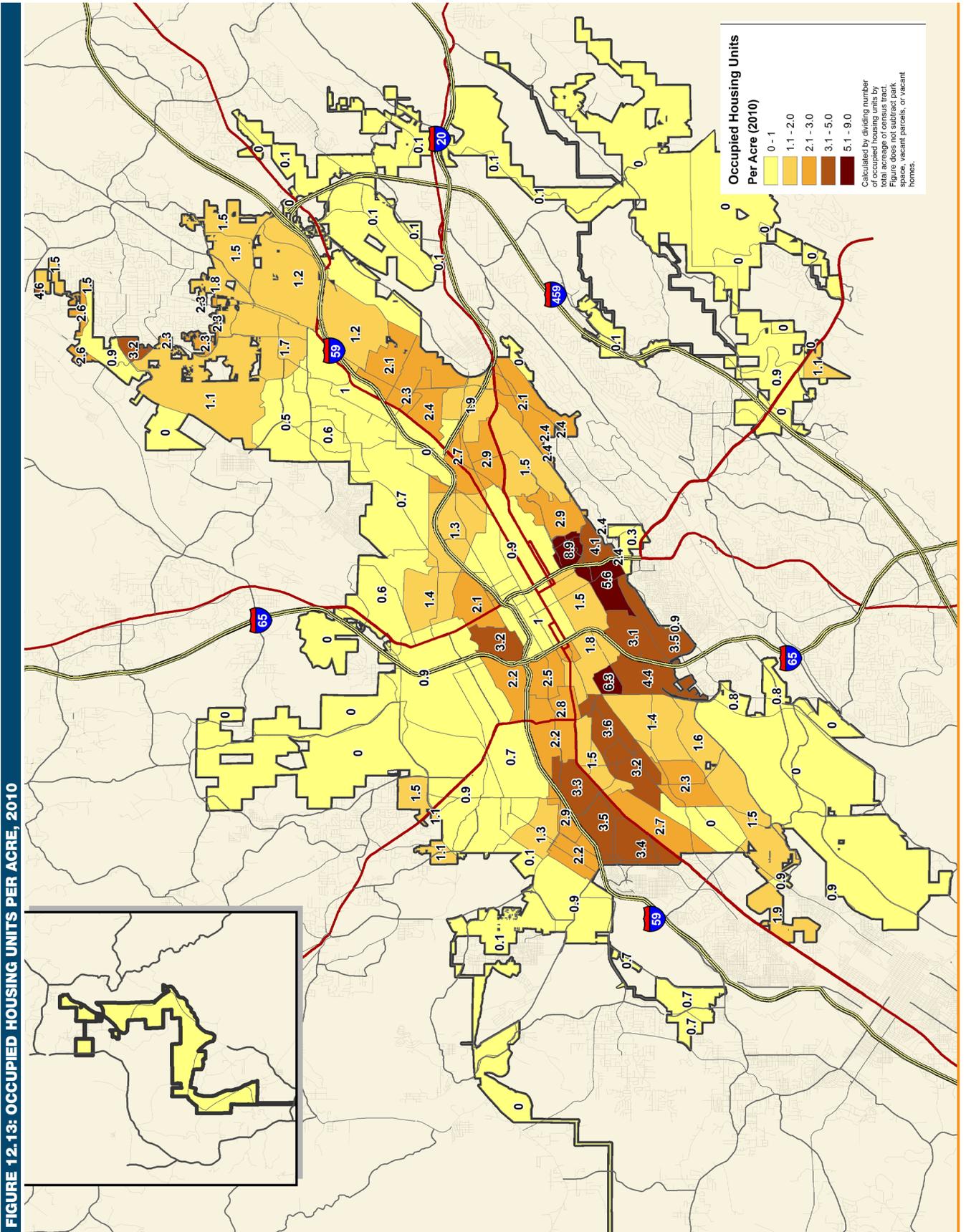


FIGURE 12.13: OCCUPIED HOUSING UNITS PER ACRE, 2010

SOURCE: BIRMINGHAM GIS



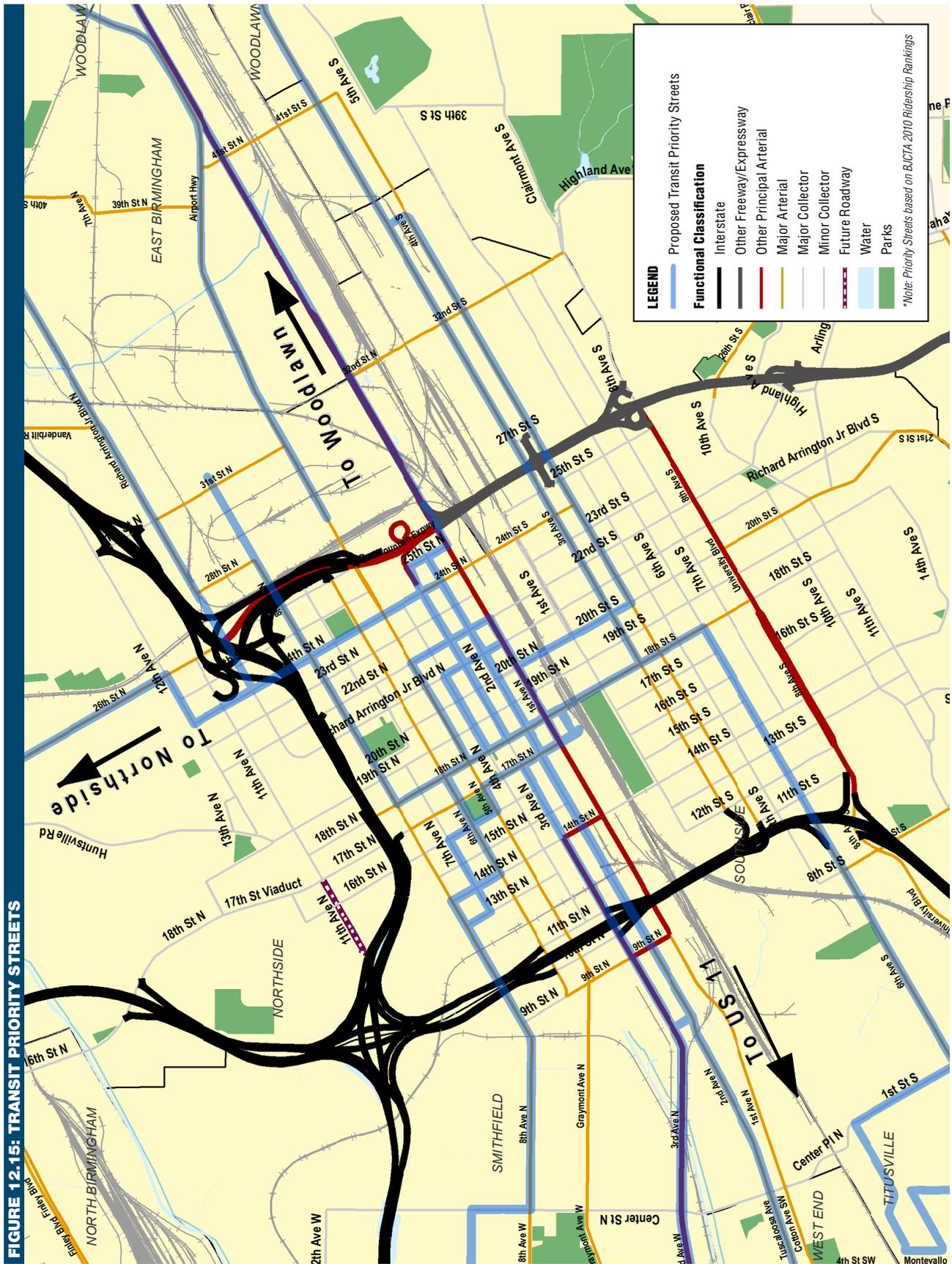
Corridor routes. Most of these plans have moved beyond the conceptual stage to identify specific alignments and possible “Super Stop” locations for transfers along the routes. These services will be challenging to fund without more compatible land use densities.

**SuperStop transfer stations.** The SuperStop is an important change that can offer greater convenience to today’s crosstown riders. SuperStop or hub locations should be planned jointly by the City and the BJCTA to meet both the operating efficiency needs of transit and the land use and neighborhood revitalization goals and strategies of the city, ensuring that the systems of streets and needed land use densities will be in place to support a high quality of service. As the land-use partner to the transit agency’s operator role, these SuperStops can be located and designed to achieve the placemaking and economic development goals of transit accessibility. People choosing an urban lifestyle that are repopulating cities generally expect that transit service is part of the urban amenity package. High-quality urban centers that offer citywide accessibility will choose areas built around Birmingham’s SuperStops. The City can play a role to ensure that transit sites are reserved during the development process and well-located for the greatest operating efficiency. A partnership that plans routes and stations together with land use and local road and path access is a collaboration vital to bringing about the “urban village” concept described in this plan.

Because of the system design as of 2012 that has all buses converge at downtown’s Central Station to facilitate passenger transfers between routes, most transit trips involve a trip through downtown and stop at Central Station. The city is large enough that this service design creates inefficiencies that not only add travel time and inconvenience for passengers and reduces the perception of service as fast and convenient; it also costs the agency more per ride. Long routes make schedules difficult to keep, causing frequent early or late bus arrivals, neither of which supports use by riders other than those who have no other choice. Routing and service inefficiencies also increase variable costs to the agency and ultimately its funders, including the City, for bus operations, fuel, and fleet maintenance.

**The BJCTA Transit Development Plan.** A new BJCTA Transit Development Plan is underway at the time this Comprehensive Plan is being written and is expected to evaluate service and routes alternatives. This study, required by the Federal Transit Administration to continue to qualify for federal funds, will produce recommendations for near-term action. Implementing recommended service changes can also provide the foundation for a long-term premium transit system in need of supportive land use densities to attract federal funding. The transit development plan is typically a five-year growth and operating plan. Because of the role transit plays in supporting City residents and serving major employers, the Birmingham Planning Commission should engage in the annual transit development update and go on record with an endorsement of its recommendation. Assumptions made in the transit plan should then inform an integrated transportation plan that identifies mode priority streets.

**New technology to improve transit service.** Automatic vehicle locator (AVL) technology, transit signal priority (TSP), and global positioning systems (GPS) are revolutionizing the ability of transit to be more efficient for both operators and users. GPS can also help riders to track the location of their bus through internet connections and LED message signs at stops. New technologies have been found to help to reduce the number of vehicles required to meet service needs by improving reliability. These costs can be significant. The City has invested in signal hardware capable of using advanced technologies that are compatible with bus and scheduling systems. But these systems must be coordinated by their owners through agreement and regular ongoing collaboration. This plan proposes the designation of transit priority streets where this coordination and collaboration should be focused to improve transit service within the City. These streets (see Figure 12.15) should also receive priority funding consideration for bus stop shelters, seating, lighting and sidewalk access improvements.



## Birmingham’s vital role in regional freight movement

The economic history of Birmingham is closely tied to its place at a critical southern crossroads of rail-based transportation. Three Class 1 railway lines, owned and operated by Norfolk Southern, CSX and Burlington Northern Santa Fe, are major assets in Birmingham’s freight distribution economy. Birmingham Southern Railroad links to Birminghamport along the Black Warrior River.

The city’s highway network is being improved with the addition of the I-22 corridor that will complete a connection to Memphis, linking industrial and warehousing districts to points north. While these transportation assets are important to the region’s economy, their placement, design and management create challenges for city residents and neighborhood livability. Issues of noisy freight traffic and the physical barriers that major roads and active freight lines create must be considered spatially as the city plans for infrastructure investment that can spur neighborhood revitalization.

## Reducing the barriers to Birmingham’s connectivity

Birmingham’s downtown network grid of streets and connectivity between neighborhoods was redefined in the 1960s with the construction of the interstate highways I-20/I-59 and I-65 and later improvements to US 280, the Red Mountain Expressway. The elevated expressway sections created large dead zones and physical barriers to connectivity in the heart of the city. The 140-foot-plus areas under the freeways are used as parking lots, and 80-foot surface streets to circulate from freeway ramps that run parallel create another large swath of road further separating activities on one side of the freeway from other areas. The character of the city’s most important destinations, including the BJCC, UAB and the Civil Rights District, is influenced by the location of these elevated highway sections, limiting their ability to influence neighboring areas and improve synergies between uses. These barrier roads effectively reduce the walkability of places and connections needed for certain business types to develop and prosper.

## Inviting active transportation back to Birmingham

“Active transportation” is the new name for walking and biking as transportation modes. Birmingham’s natural beauty and the potential for a wide-reaching trail network from miles of abandoned rail track can make it a Mecca for bicycle tourism and recreation. The Red Rock Ridge and Valleys Trail System (RRRVTS) recognizes this opportunity and has created a comprehensive vision for the future. Off-road trails can offer more than recreational and tourism value. Trails can be an important part of the transportation system during the daylight hours. Until the City develops a Citywide Transportation Plan, the RRRVTS should be referenced in this Comprehensive Plan as a guide to build the City’s bicycle network. The City will need to adapt some of the recommended routes to better fit complete systems needs.

The street corridors identified in the RRRVTS designation system are proposed to help the City begin the process of redefining user space to include all modes of transportation within the system. Those identified corridors in the RRRVTS provide the basis for bicycle priority-street classifications proposed in this plan. As Community Framework Plans are developed, new bicycle priority streets will be added to the system.

City staff participated with others in the region to develop Facility Design Guidelines for safe bicycle accommodation as part of the Birmingham Area Bicycle, Pedestrian and Greenway Plan. The City has only marked space on three streets for bicycling. National research suggests that about



***Bicycle networks need secure parking options in order to be successful.***

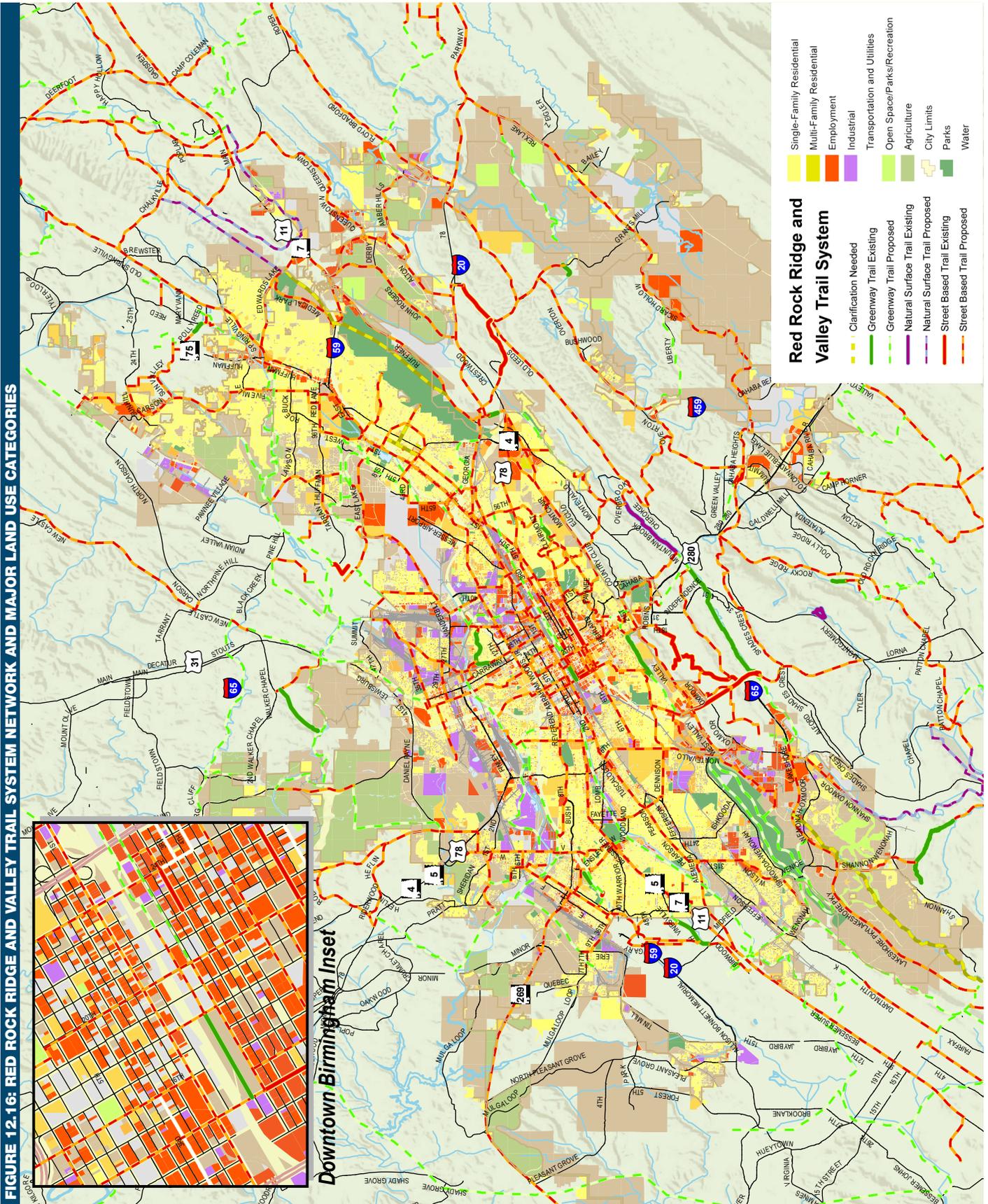
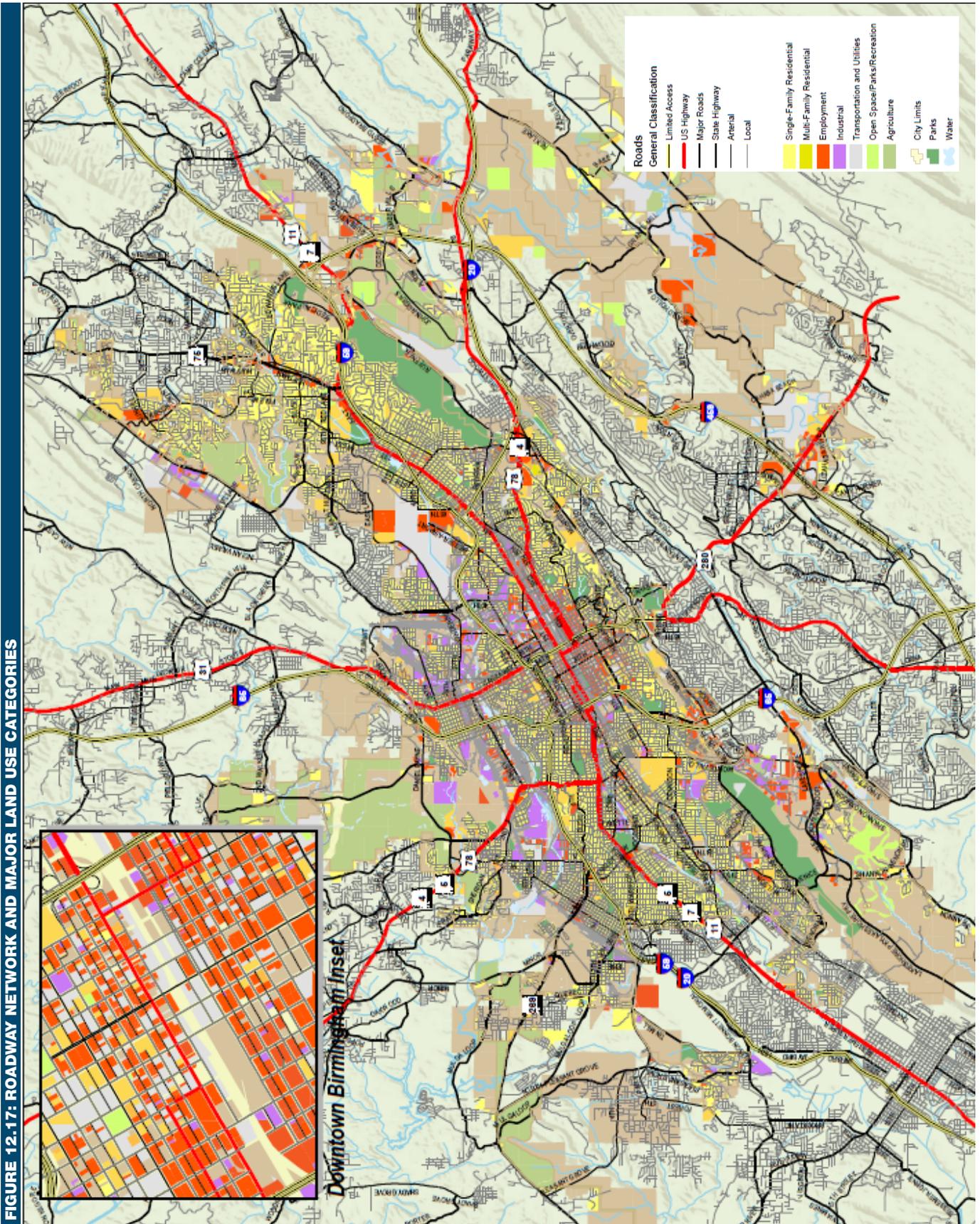


FIGURE 12.16: RED ROCK RIDGE AND VALLEY TRAIL SYSTEM NETWORK AND MAJOR LAND USE CATEGORIES



60% of most populations who do not currently bicycle would ride if safe facilities were available on streets. It is difficult to assess the city's true bicycling demand without a more complete system. The level of interest generated by the RRRVTS, the requests made by residents involved in this study, and the rapidly growing memberships of bicycling groups in the city indicate that demand for bicycling facilities is significant.

A series of ten conceptual street sections prepared for this plan appear at the end of this chapter. These sections show concepts for how bicycles can be incorporated into existing street rights-of-way. Rapid progress can be made when all public projects that reconstruct or repave streets include the consideration of bicycle accommodation. Civic uses like schools and libraries, and commercial uses such as office buildings and retail development, will need to require bicycle parking as part of new development. The requirements should consider user demand for short- and long-term space, and offer detailed design guidance. Arlington County, Virginia's requirements require that parking racks be provided within 30' of the front door, encourages access by bicycles, high visibility, and the allocation of prime space for bicyclists. Existing destinations should be targeted for retrofit parking through public or private initiatives through sponsorship programs.

## B. Recommendations

Birmingham's past investments in rail and road infrastructure, which helped make it a major industrial center from the late 19th century into the 20th century, can be transformed into new networks of transportation choice for the Birmingham of the 21st century. The recommendations are organized to engage individuals and create partnerships, presenting mutually supportive plans, processes, and practices. The Strategies and Actions can guide transportation funding, design and operating decisions for fully integrated systems that not only improve options to move people and goods, but also coordinate with land use location decisions to places where transportation is most supportive.

### goal 1

Birmingham's transportation systems help to build the city's 21st-century economy and a livable urban center of the region.

#### POLICIES

- Support strategic initiatives using private and public funds to maintain and enhance the city's street and transit systems to support city livability.
- Ensure that design of street improvements and development projects accommodates all uses, including motorists, pedestrians, bicyclists and transit riders, except when deviations are justified.
- Support Complete Streets policies and practices.
- Support the development of a multimodal transportation plan that creates complete networks and offers high-quality travel options for every budget into and within the city.

#### STRATEGIES

**A. Enhance knowledge among Birmingham's public, private and non-profit sector leadership to achieve Comprehensive Plan goals with supportive transportation-related investment, management, planning and funding decisions.**

#### Actions

**1. Prepare and document a Peer City Tour by a diverse group of community, advocacy, business and government leaders.**

Memphis, Charlotte and Chattanooga are cities at the forefront of business-friendly, livable transportation solutions. They can provide experience and lessons for Birmingham leaders who will partner to implement this Comprehensive Plan. One or more groups of agency and government leaders should join leaders from Birmingham's business and non-profit sectors (including bicycling, transit and public health advocates) to visit and document what they find in these peer cities.

**A PEER CITIES TOUR ENGAGES BALTIMORE LEADERS TO LEARN ABOUT BEST PRACTICES.**

*A Baltimore housing advocacy non-profit, Citizen Planning and Housing Association, partnered with the Maryland Transit Administration and the City of Baltimore on events and activities to engage communities and businesses along a planned transit corridor. Community and government leaders visited Boston, Los Angeles, Denver and Portland to learn about bus rapid transit and light rail and how they could help improve neighborhoods and attract development along their routes.*

Volunteers representing a variety of incomes and interests can be change agents within their communities, particularly when they have firsthand knowledge of the possibilities. These tours also help people with different interests find common ground and ways to work together toward shared interests. Participants can help to bring the lessons from other cities back to Birmingham, create needed alliances for change, and adapt lessons learned and best practices to fit Birmingham. Having several groups meet with their peers in several cities and learn about resources they have used, how they have organized their interest groups, and see changes firsthand can do a great deal to bring this plan to life.

**2. Create and staff multimodal transportation planning and design competency within City government.**

The City of Birmingham today lacks staff dedicated to coordinating transportation policy and planning for all modes of travel within the city and linking the city to the region and the world. At one time there was a transportation planner in the Planning Division, but the position has not been filled for some time. Transportation planning-related issues today are typically handled by one person in the Mayor’s office, the City’s traffic engineer (who focuses on motorized vehicle travel), and a land use planner.

While there are transportation planners at the MPO, it is critical that the City have its own in-house expertise in the form of a transportation planner with transportation education or commensurate experience. The transportation planner must understand all modes of travel, how they can be coordinated, their

relationship to land use policy, and how they can be funded. S/he must be able to do the following:

- Provide decision-makers with data, technical analysis, and specialized knowledge in urban multimodal systems, including transit and active transportation best practices. The office or individual should engage at the cabinet level to provide transportation guidance to City economic development and investment decision-making.
- Recommend policy and oversee programs, working with implementation staff within City agencies responsible for City public works projects and development, oversight and regulatory compliance.
- Represent the City on regional transportation issues, initiating and tracking progress, and participating as a City representative with the following agencies: ALDOT, BJCTA, Birmingham MPO and Regional Planning Commission, Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and bicycle and neighborhood advocacy groups.

The City of Charlotte, NC, offers a model of cooperation and coordination that brings together staff from the transit agency, development review, public works, traffic engineering, and other offices as needed to review development proposals and organize new initiatives in support of its Centers, Wedges and Corridors policies for growth and development. Implementation in Birmingham could include leading and organizing existing City staff to coordinate mutually supportive land use, transportation and fiscal initiatives.

**3. Support staff participation, training and leadership in national urban transportation research and peer group organizations.**

Organizations like the National Association of City Transportation Officials (NACTO) and urban issue committees of the Transportation Research Board (TRB) and Transit Cooperative Research Board (TCRB) are leading transportation practice research that can be applied in Birmingham. Participation in these organizations is typically free to officials and permits

staff to stay abreast of the industry's evolving technical, management and financial resources. Birmingham could also be a test and research city for innovations in urban transit.

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## **B. Establish and implement fully integrated systems plans informed by local neighborhood and district experience.**

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Integrated transportation systems plans are designed to provide seamless, convenient, safe, and secure services. They are intermodal, providing convenient and efficient connections and transfer facilities in and among all modes. Moreover, they are inclusive, providing safe, reliable, affordable, and convenient service to all of our citizens, wherever they may live, work, or travel.<sup>3</sup> The most important streets in the system are the arterial network streets. They are generally needed for efficient transit, auto and truck freight mobility. As transit streets, they should also be safely crossed by pedestrians, particularly in employment, retail and residential zones. Parallel streets with lower traffic volumes can be joined together as a safer alternative for bicyclists.

### **Actions**

#### **1. Adopt a plan establishing Mode Priority Streets for truck, transit and bicycle routing to guide public and private improvements to City streets as a means to implement the Planning Commission's Complete Streets Policy Resolution.**

A number of cities and counties such as Austin (TX), Denver (CO), and Arlington County (VA), have established a system of classifying streets by priority travel mode in addition to the traditional functional classifications that focus on moving vehicles. All streets have a limited amount of right of way to be allocated to different modes, but the streets can be designed so that they are particularly suitable for certain travel modes. Transit, truck, bicycle and walking priority designations for streets help transportation engineers make design decisions as they resurface and restripe or mark individual streets. A scope of work would involve

identifying major generators of certain trips, overlaying the existing mode-based plan and addressing conflicts to separate modes where possible. Then establish priorities and identify necessary funding or exaction methods for implementation.

The concept of mode priority streets for Birmingham can be seen in Figures 12.18–12.19. These maps have been assembled using the existing individual regional or local plans for bicycling, transit and truck routes.

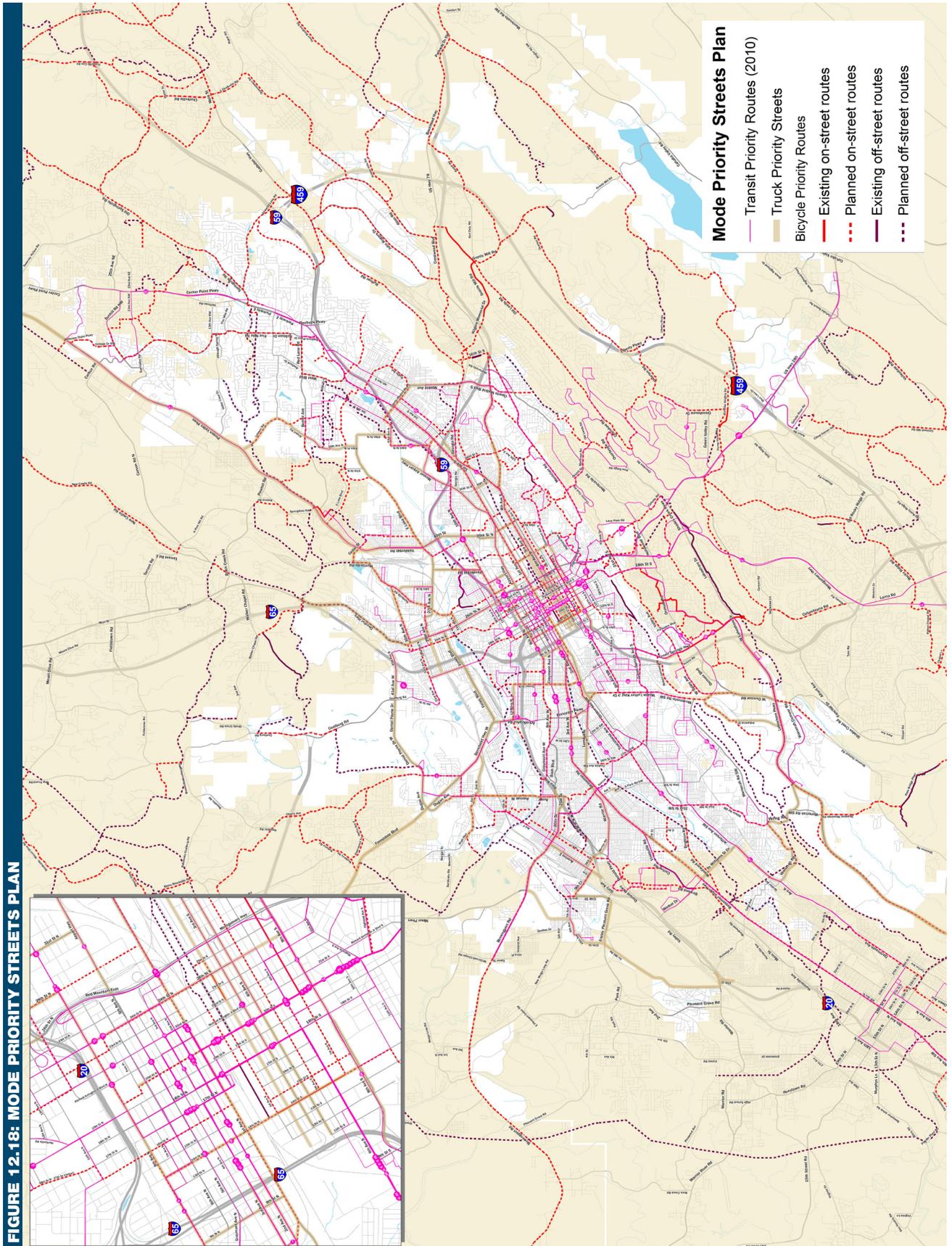
#### **2. Prepare a Citywide Transportation Plan that establishes a Mode Priority Streets Plan to fully adapt and integrate current plans for transit, greenways and bicycling routes, and freight routes.**

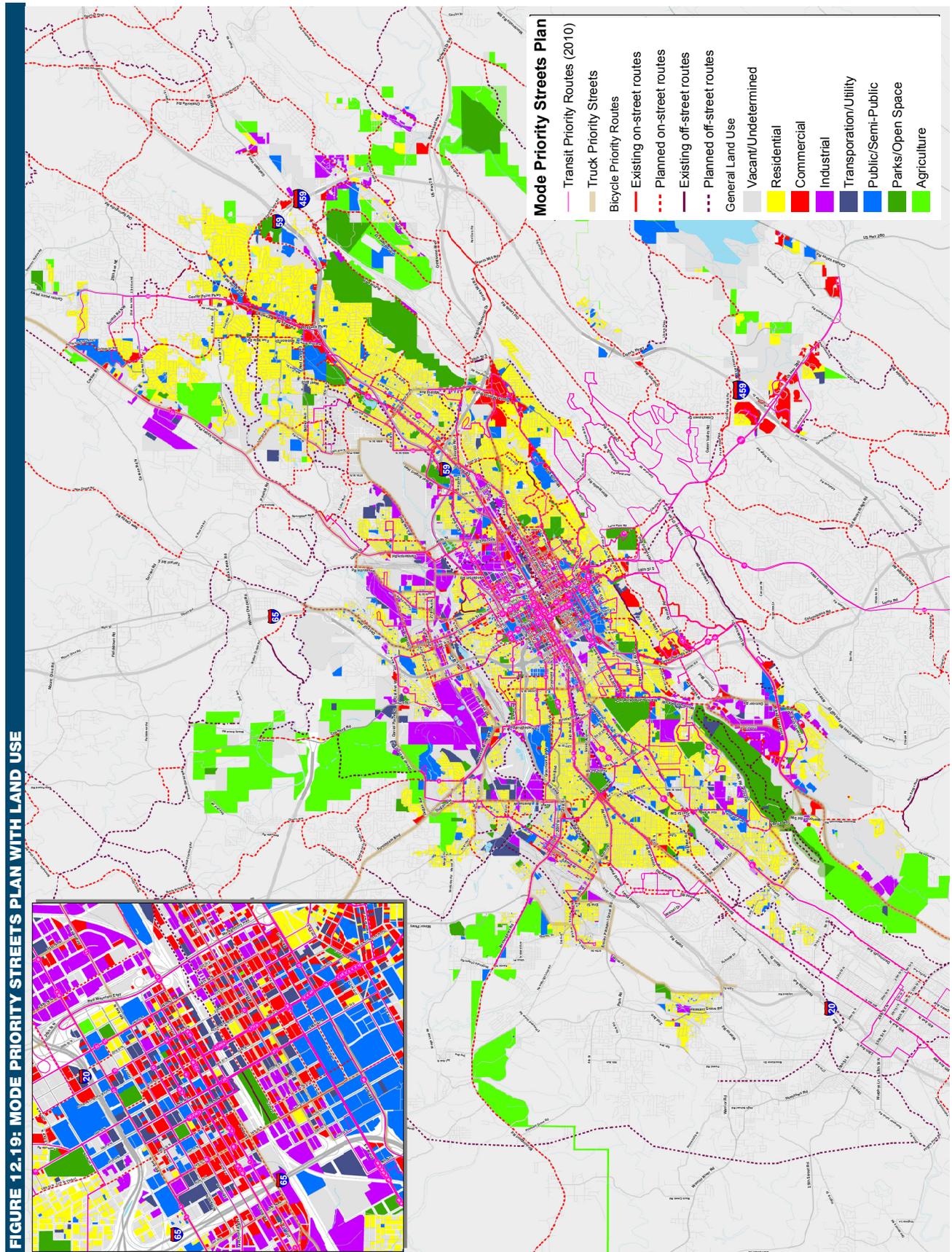
Different agencies and sponsors in the Birmingham region have developed plans focused on a single purpose or mode. This Comprehensive Plan takes a first step at integrating plans prepared for freight, transit and bicycling that identify streets important to the operation of those users into a Mode Priority Streets Plan. This integrated transportation network map appears in Figure 12.19 as the Mode Priority Streets for Transit, Trucks and Bicycling. The existing plans used to create this map are the 2012 BJCTA Routes, freight routes documented by the Birmingham MPO, and the recently completed Red Rock Ridge and Valley Trail System, a collaboration of the Freshwater Land Trust and the Jefferson County Health Action Partnership.

This Mode Priority Streets Plan should be updated with the support of a task force comprised of users and transportation professionals. Mode priority on city streets helps designers as they consider lane widths and marking of street space, traffic engineers appropriately equip and time traffic signals for the priority mode type, and help businesses and households make location choices compatible with the transportation service they need. Truck priority streets are based upon needed connections to the regional highway system and intermodal freight transfer sites. Arterial streets, typically those that connect many areas over a long distance, are those most often used by transit vehicles to make using transit as fast and efficient as possible for riders. Examples of how a mode priority system can make a difference include:

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<sup>3</sup> Federal Transportation Advisory Group, Vision 2050: An Integrated National Transportation System (2001), p. 9. <http://web.mit.edu/aeroastro/www/people/rjhans/docs/vision2050.pdf>





- *Signal timing.* A series of connected signals can be timed by the traffic engineer for a given traffic progression speed. If the street has bicycle priority, the progression speed can be set so the cyclists travelling at that speed will make fewer stops at red lights. On transit streets, signal controllers can be equipped with communications equipment that helps them to respond to a bus's request for signal priority, helping to keep the bus on schedule.
- *Land use.* An individual household or business seeking high transit mobility can use the map to identify locations where two transit priority streets cross. Zoning for warehouse, distribution and manufacturing can consider proximity to truck priority streets.
- *Lane markings.* Knowing which modes will need to use a street, particularly for streets with high concentrations of traffic, can help to identify for the designer how lanes should be organized and marked to reduce and manage conflicts between users.
- *Bicycle alternative routes.* Since bicyclists are the most vulnerable users of general traffic lanes and can also navigate smaller spaces, arterials with high truck and transit value are identified first. Local parallel streets can sometimes be found and improved as part of a bicycle network. These parallel routes, often residential rather than commercial, usually carry less traffic and can be organized with a variety of speed reduction techniques that make them even more comfortable for bicycling.
- *Transit priority.* A priority transit street through downtown will typically be the street on which the majority of transit routes operate, and in some cities that street becomes the spine of the system. So rather than a single stop where all transfers take place, the street can serve double duty, creating layers of service through downtown that help to support more frequent service along that street and also facilitate transfers between bus lines. The street will be an obvious place where even occasional riders can expect to find service with covered shelters at key stops. Examples in Bir-

mingham are 18th Street and 5th Avenue South as proposed in the In-Town Transit Partnership.<sup>4</sup>

- *Truck routes.* Designated truck access roads are proposed in Figure 12.20 as part of a mode-based street classification system. Designation ensures that the City preserves and improves its important connector streets for the movement of freight to attract manufacturing and distribution activities to priority destinations and opportunity sites. Recognizing streets that are required to serve this function can help to inform plans as they reassess those streets and rails no longer critical to freight movement to improve local connectivity and circulation.

**3. Fine-tune and coordinate separately planned general traffic, truck, bicycle, transit and pedestrian routing needs as part of the Framework Plans for each of Birmingham's 23 communities.**

As the recommended Framework Plans are created, transportation elements should include taking a closer look at opportunities to identify and improve connectivity between neighborhoods, from housing to schools, parks, bus stops, within communities and beyond. For commercial centers and employment areas, access routes for trucks, employees and customers arriving by transit, walking and bicycling should be identified. The effort should include work with BJCTA, advocacy groups for disabled persons and bicyclists, and freight industry representatives (where appropriate) to reaffirm, designate and implement transportation mode priority on key city streets.

**4. Review existing approved and funded transportation projects for consistency with the Comprehensive Plan, future Citywide Transportation Plan, incorporating the proposed Mode Priority and Sidewalk Plans, and strategic needs.**

Many transportation projects have been approved for the City of Birmingham in regional transportation plans prepared by the MPO but they have not received the local funding match that would allow them to proceed. Projects should be reviewed and identified to go forward if they meet the following criteria:

<sup>4</sup> <http://www.rpcgb.org/transportation/projects/itp/>

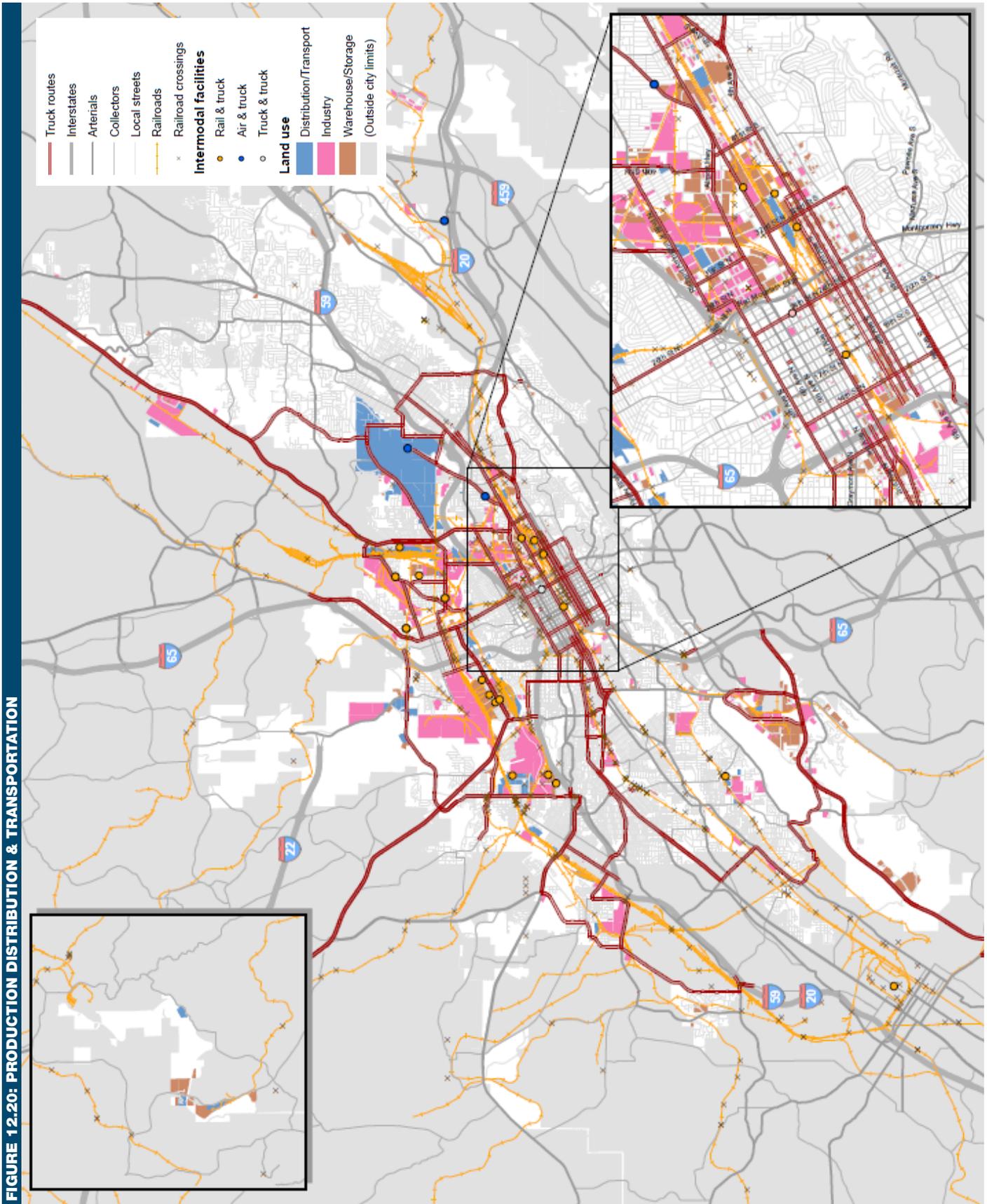


FIGURE 12.20: PRODUCTION DISTRIBUTION & TRANSPORTATION

- Responds to health and safety needs
- Avoids deterioration that would be more costly if not repaired or replaced
- Supports a strategic asset (such as the Intermodal Facility or advancing the In-Town Transit Partnership)

Other projects should be reviewed for consistency with the Comprehensive Plan and the future Citywide Transportation Plan. All resurfacing projects should be reviewed for appropriate pedestrian and bicycle facilities.

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### **C. Continue to expand and support the introduction of state-of-the-practice transportation analysis and planning compatible with successful urban cities.**

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#### **Actions**

##### **1. Develop and use Multi-Modal Level of Service (MMLOS) standards for all improvements under consideration.**

Improvements to city streets should include multi-modal level of service measures and evaluations in order to provide the improved pedestrian and bicycle conditions and connectivity that residents repeatedly requested during the planning process. Proposed projects can be required to collect data and consider the “level of service” (LOS) for pedestrians, bicyclists, and transit riders as well as motorists. Until recently engineers measured service quality of road improvements based only on vehicle congestion and delay, using an A-through-F grading system which gave the highest grades to quick, uncongested motor vehicle travel.

The 2010 Highway Capacity Manual, published by the Transportation Research Board and the National Academy of Sciences, now provides methods to measure the quality and proposed improvements to transportation facilities based on the factors important to each type of user. The criteria considered for these Multimodal Level of Service measurements requires that designers think differently about what is needed. For example, bicyclists are more comfortable on streets with less traffic and slower speeds; transit quality considers the availability of a shelter, seating and convenient sidewalk access, as well as service frequency and on-time arrivals.

##### **2. Establish performance measures and track progress on key indicators of plan progress.**

State and city departments of transportation throughout the country increasingly use performance management to make data-driven decisions, measure program outcomes, and demonstrate progress to key constituencies. Birmingham’s Comprehensive Plan provides an excellent opportunity to further integrate multimodal performance measures into City transportation decision-making.

An effective set of multimodal performance measures for Birmingham will help to ensure that individual transportation decisions help to move the City toward the goals of the Plan including a multimodal transportation network. Transportation performance management is an emerging topic, and there are no standard guidelines to follow. In general, three key principles should guide a performance measurement and monitoring program tailored to the goals of the Plan:

- *Determining the performance measures most appropriate for a given situation.* The set of performance measures will depend both on plan objectives and available data (existing and/or expected).
- *Developing a data collection plan to support selected performance measures.* Note that performance measures and data collection should be planned together to ensure that the required data collecting effort is realistic.
- *Setting performance standards (i.e., targets) for specific measures.* Depending on the application, standards may be set for only some or none of the measures.

Ideally, performance measures relate to outcomes rather than actions, allowing them to measure not simply whether an action was taken but how well that action addresses a given issue. For instance, if the goal is to reduce speeding, the solution may be installation of speed humps. Using “Number of Speed Humps Installed” as a performance measure demonstrates responsiveness, but “85th Percentile Traffic Speed” (or the speed at or below what 85% of motorists are driving) describes the results. Such outcome-oriented performance measures allow agencies to tailor responses

over time to focus resources on the most effective treatments. Continuing with the example above, measuring speed could allow an agency to compare the effectiveness of speed humps and curb extensions to inform subsequent traffic calming investment decisions.

TABLE 12.1: POTENTIAL PERFORMANCE MEASURES FOR BIRMINGHAM	
	TYPE
<b>INFRASTRUCTURE</b>	
Miles of New Bikeways	Action
Miles of New Sidewalks	Action
Number of Crosswalks Improved	Action
% Signals without Pedestrian Countdowns	Action
<b>SAFETY</b>	
Crash Frequency at Key Intersections	Outcome
Traffic Fatalities	Outcome
Pedestrian Crash Frequency	Outcome
Bicycle Crash Frequency	Outcome
<b>SYSTEM PERFORMANCE</b>	
Commute Mode Share	Outcome
Traffic Volume on Key Streets	Outcome
Traffic Speed on Key Streets	Outcome
Number of Citizen Complaints	Outcome
<b>TRANSIT SYSTEM PERFORMANCE</b>	
On-time Performance	Outcome
% of residents within ¼ mile of transit stop	Outcome
% of bus stops with shelters	Outcome
<b>ASSET MANAGEMENT</b>	
% Arterial Lane-Miles with Good/Excellent Pavement Condition	Outcome
% Sidewalk Miles in Good Repair	Outcome
% Signals Retimed in Past 5 Years	Action
% Signs less than 10 years old	Action

## D. Leverage agency partnerships to advance Birmingham’s transportation priorities with program and technical support.

### Actions

#### 1. Partner with ALDOT during the planning and design of interstate and state highway projects to reduce interstate highway impacts and improve local street connectivity, especially downtown.

The Alabama Department of Transportation (ALDOT) is responsible for performing regular maintenance, improving safety, and adding road capacity to major roads in the city. ALDOT’s program of improvements presents opportunities for the city to work with designers on important state projects to advance city goals. Rehabilitation of I-20/59 through downtown and the interchange design project of I-65 at University Boulevard, projects underway as this plan is being written, are examples of projects where the City should be prepared to exert its influence to reduce the impacts of road infrastructure and traffic patterns on the city.

As ALDOT finalizes plans to make needed structural repairs and repave I-20/59 through downtown, the City can assist ALDOT to reduce project costs and delay for permitting and construction. Two areas of potential support include: (1) the City’s control of and permit authority over local streets to be included in traffic diversion plans, and (2) facilitating communication with residents and businesses potentially impacted by the construction. In turn the City should invest the time to fully understand the range of options available. As an example, the project could extend the interstate highway’s life by 30–40 years—or improvements could be limited to critical safety and maintenance needs, with cost savings used to evaluate the benefits and costs of long-term solutions more supportive of downtown, such as relocation of I-20/59 on the other side of the BJCC, possibly along Finley Boulevard. (The City of New Orleans was awarded coordinated grants from the Federal Highway Administration (FHWA) and the Department of Housing and Urban Development (HUD) to conduct just such a study of the I-10 elevated Claiborne Avenue Expressway.)

The I-20/59 project also offers the potential to test the proposed conversion of downtown streets from one-way to two-way pairs. The highway rehabilitation will require “maintenance-of-traffic” to ensure minimal disruption to through traffic while repairs are being made. The significant size of this project makes this element potentially very costly. City transportation staff will need to have the necessary political support in place to evaluate the options proposed by ALDOT.

**2. Improve BJCTA accountability for efficient, high quality transit service for city residents with a hands-on approach to Board of Directors decision-making.**

Present analysis to the City’s representatives on the BJCTA Board to ensure that they recognize the value of responsive transit to both the direct users of transit service (existing and potential riders) as well as indirect users (employers who depend upon their employees accessing affordable and reliable transportation). The Urban Village concept presented in this plan suggests locations for some of BJCTA’s SuperStops, making the village housing attractive to households seeking good transit access. Ensuring that these areas are planned together to make the most of the transit service and investment, the City and BJCTA should collaborate to establish mutually beneficial SuperStop location and design criteria.

**3. Establish a Mayor’s Task Force on Transit.**

The Task Force should include transit advocates, riders and small business owners, as well as others, such as members of the BBA. The Task Force would make recommendations on how management and accountability of BJCTA can be improved. Members should attend Board meetings, review reports and findings, including past and soon-to-be-released Transit Development Plans, assess progress made toward implementing past plans by the agency, and investigate potential funding sources, including the existing state prohibition on using gas tax revenues for local transit operations.

**4. Work with BBA, RPCGB and BJCTA to expand the region’s CommuteSmart Program with more employers providing incentives for commuting by means other than the single-occupancy vehicle.**

- Conduct an assessment of the program’s success and identify non-participating, city-based employers for targeted needs surveys and marketing of the region’s Commute Smart program.
- Identify and work to resolve any needed legislative, financial, staff support and/or marketing initiatives.
- Ensure that BJCTA transit passes are available to participating employees on a pre-tax basis and employers are aware of commute tax benefits.
- Encourage employers with 20 or more employees to provide initiatives that improve travel options and/or introduce employees to active transportation alternatives such as Alabama Power’s recently implemented bike-share program.
- Organize employer awareness and action activities for advocacy in support of transit service and bicycling facilities improvement.
- Initiate Live-Near-Your-Work programs of employer-assisted housing. (See Chapter 7, pp. 7.31–7.32).

**TRAVEL DEMAND MANAGEMENT (TDM) PROGRAMS COORDINATE DEVELOPMENT AND TRANSPORTATION**

*TDM programs are an important tool to promote and enhance multimodal transportation. Key features of the program used by Arlington County (VA) include:*

- *Coordination of site plan development with commuter and transit services.*
- *A matrix of voluntary TDM strategies based on a site’s land-use and transportation categories. During project review, the matrix is used to identify TDM strategies that become part of an approved Site Plan Conditions and Transportation Management Plan.*
- *A requirement that developers prepare a TDM report before approval of the first certificate of occupancy and submit an updated TDM report each year.*

## goal 2

Bicycling and walking in Birmingham are comfortable, safe, and convenient modes of transportation and recreation.

### POLICIES

- Support investments and programs that provide safe, functional, attractive pedestrian environments, and walkable districts along transit arterials.
- Support the development of a complete network of on-street and off-street bicycle routes and trails.
- Support implementation of the RRRVTS, including the on-street pedestrian segments.

City streets, parks and plazas, all part of the public realm are defining features of city environments and the perception people have of their walkability. Many aspects of the built and natural environment contribute to the quality of the pedestrian experience and feelings of safety and security. As a function of transportation, nearly every person begins and ends a trip as a pedestrian. The decisions of many people help to ensure that pedestrians enjoy a continuous network of lighted, interesting, and inviting experiences along their paths of travel in the city; that they are directed to safe locations to cross the street, and that motorists know that they should expect to find them there. Awareness of how to recreate these experiences must be broad-based and available through design guidance to be effective. Property owners, developers and their professional consultants, City site plan reviewers, traffic engineers, and street designers can help to transform the city through the successful application of pedestrian-oriented design practices. Transit priority street access to bus stops, commercial and entertainment districts, and civic destinations such as libraries, schools and parks should be priority locations for pedestrian improvements. These improvements may require the enforcement of the City's sidewalk maintenance regulations.

## STRATEGIES

**A. Ensure that public and private projects, the City's capital improvement program, and new real estate development add to and complete the street network and accommodations for safe and convenient bicycling and pedestrian travel.**

### Actions

**1. Use the City Sidewalk Master Plan under development in 2012 to identify acceptable approaches to maintain and extend the existing sidewalk network.**

A City Sidewalk Master Plan will focus on the physical infrastructure and network for an excellent pedestrian experience. The City has an ordinance that places responsibility for upkeep of sidewalks on property owners, but in practice, the ordinance is not enforced and the City funds sidewalk maintenance and expansion. The needs are great and the resources have been limited. Funds for pedestrian improvements are available in the capital improvements bond passed in 2012. Priorities for sidewalk maintenance and improvements should include the Urban Villages and Strategic Opportunity Areas identified in the Comprehensive Plan, downtown entertainment

### **PRIORITY CRITERIA FOR FUNDING GUIDE DECISION-MAKING**

*Easley, South Carolina, developed an implementation strategy for its Bicycle and Pedestrian Master Plan that uses these evaluation criteria in a weighted formula to prioritize potential projects:*

- Critical gap/crossing closure
- Serves safety need
- High potential use
- Relative ease/cost
- Connects to parks, library, YMCA
- Improves school access
- Traffic calming/bike route
- Access to downtown
- Access to commercial areas
- Local political/ community support

[www.bikeeasley.com/Pedestrian-Bike-Plan/Chapter-7\\_Implementation\\_Plan.pdf](http://www.bikeeasley.com/Pedestrian-Bike-Plan/Chapter-7_Implementation_Plan.pdf)

areas and high pedestrian traffic areas, segments of the Red Rock Plan that connect with the initial greenway segments to be developed, and neighborhood connections to parks. Strategies that ensure sidewalk construction through private development should also be included.

**2. Target activity centers such as employment centers, shopping districts, high density residential areas, schools, transit stops and parks as priority for bicycle and pedestrian system improvements.**

These areas represent quasi-public places and as such should be accessible by safe, comfortable and convenient transit, bicycle, and pedestrian facilities.

**3. Finalize planning and implement the conversion of one-way street pairs to two-way streets for appropriate downtown streets.**

Many downtown one-way couplets were designed to expedite traffic movement to and from the interstate highways. An initial study suggests that traffic congestion through downtown does not affect most downtown streets and conversions would introduce a variety of livability benefits worthy of further consideration.

**4. Establish transportation project development guidelines for land use context in order to build complete networks of streets and paths for active transportation connectivity.**

The NJDOT/PennDOT Smart Transportation Guidebook (<http://www.smart-transportation.com/guidebook.html>) is a useful reference prepared for street designers with place-typing information for establishing context. It is used to determine the range of specifications of transportation infrastructure that reinforces the land use activities and area character present or desired. This is particularly important for specific design considerations of pedestrian and bicycling space requirements. For example, commercial main streets sidewalks will have different dimensions than sidewalks on a low-density residential street.

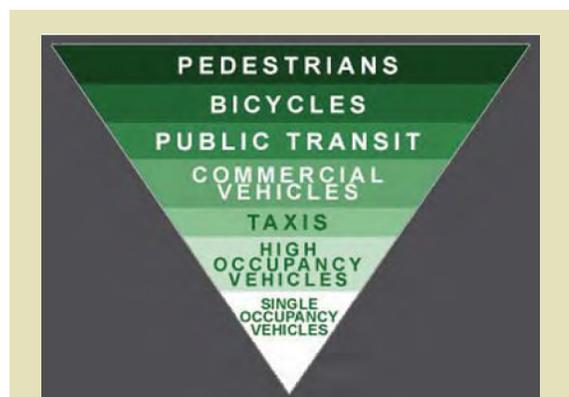
**5. Establish network-building procedures to increase the reach of transit service into neighborhoods by identifying bicycle and pedestrian route gaps.**

Working with BJCTA, identify highest transportation hub locations for transit-to-transit and transit-to-walk and bicycle networks. Prepare GIS 1/2-mile

route maps for walking and 1- to 2-mile maps for bicycling. Identify low-cost/ high-value opportunities to improve transit access for existing residents and employees.

**6. Amend development regulations to include guidelines and require consideration of active and public transportation modes in impact studies, access and circulation designs, and parking.**

Guidelines included in development regulations as part of the design standards for zoning districts can notify project proponents of the importance of pedestrian, bicycle, and transit access and circulation and the potential to improve transportation networks in project review and evaluation. The guidelines can include identification and consideration of off-site destinations (for residential projects) and origins (for employment and commercial uses) and mapping of bicycle connections (within 1 mile), and pedestrian and transit stops (within 1/2 mile). Recommended Framework Plans should identify needed sidewalk connections. Plans should also indicate whether or not ROW is needed. An impact fee or system development charge would require legislative action if funds other than general pay-as-you-go or bond funding are needed. Best practice training opportunities should be provided to staff reviewers and the local engineering and design community, as needed.



A “**GREEN TRANSPORTATION HIERARCHY**,” adopted by cities such as Portland, Oregon, promotes public works engineering for transportation that helps to create walkable places and cities pedestrian- and transit-first policies. This policy supports pedestrian-friendly street design and maintenance, parking regulations, and traffic operations.

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## **B. Promote pedestrian and bicycle safety and provide cues for drivers to anticipate the use of road space by pedestrians and bicyclists.**

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Traffic calming can improve neighborhoods and major streets for living, walking and bicycling. A toolbox of techniques is provided at the end of this chapter. These treatments include road narrowing to decrease pedestrian crossing distances and exposure to traffic, methods to divert and reduce through traffic on neighborhood streets, and measures to reduce travel speeds where speeding has been a problem. Any of these traffic calming initiatives must be balanced against the need for delivery and utility trucks to access businesses and residents in a neighborhood.

### **Actions**

#### **PEDESTRIAN**

##### **1. Promote “pedestrian first” policies for all planning, design and construction decisions in urban conditions.**

Making urban streets that are used by pedestrians more safe and comfortable for them will put their needs before consideration of potential delay to motorists. This may require staff and professional training in pedestrian oriented design.

##### **2. Promote street design for greater visibility of pedestrians by motorists and reduced pedestrian crossing distances at intersections and conflict points.**

This is particularly important on major streets where transit and commercial activity is present. Tree canopy, visible crosswalk markings, corners designed to limit turning speeds for motorists and other road features will encourage moderate vehicle speeds and provide highly visible crossing locations for pedestrians.

##### **3. Provide regular enforcement of pedestrian safety laws and provide “No turn on red” and “Yield to pedestrians in crosswalk” signage.**

Raising awareness of pedestrian vulnerability should include an educational enforcement campaign in which fines are waived.

##### **4. Conduct pedestrian (and bicycle) safety awareness campaigns through news media and in partnership with schools and public safety officers.**

All users of the transportation system will be served through greater attention and information of the rights and obligations that come with using shared road space. Safe Routes to School is an example of a low-cost program that teaches children safe pedestrian behavior through “walking school buses.” Birmingham’s program, covering only a handful of schools, should be expanded.

#### **BICYCLING**

##### **5. Integrate the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide into roadway design guidance to allow for emerging bicycle facility types (e.g., cycle tracks, bike boxes) and provide separated space for bicyclists on medium and high traffic streets.**

Studies have shown that both bicyclists and motorists favor protected bicycle lanes. On streets where space permits, bicycling for inexpensive and safe transportation should be encouraged with dedicated lanes. The Birmingham region’s 1996 Bicycle and Pedestrian Facility Design Guidelines should be updated with recent and emerging NACTO and American Association of State Highway and Transportation Officials (AASHTO) guidelines.

##### **6. Promote bicycle parking in commercial and mixed-use areas of public and private infrastructure projects.**

Encouraging bicycle transportation requires convenient, secure parking in public destinations. Many US cities have introduced bicycle parking facilities as part of development and capital facility approvals so government offices, parks, libraries, clinics and schools as well as a new shopping district or office building will be inviting to bicyclists and reduce user impacts to unintended street anchors. The City’s zoning ordinance should include both short-term and long-term or commuter parking options with new development. Short-term parking is generally located proximate to building entrances ( up to 30’ ) and in the “furniture” or landscape zone of the sidewalk in commercial areas. Long-term parking should be covered and secure in new parking structures for commercial buildings or within multifamily rental buildings. Space allocation

for future bikeshare stations should be considered with new transit centers, major cultural and civic buildings, and employment centers. The Association of Bicycle and Pedestrian Professionals is a good resource for best practice examples of bicycle parking design and regulation.

**7. Partner with local advocates on a variety of programs, including “bike-to-work” day, organized rides, and other promotional events.**

Promote involvement by local advocates with national resources that support bicycle advocacy organizations. These include the League of American Bicyclists and the Alliance for Biking and Walking.

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**C. Adapt, adopt and create an implementation plan for the city’s portion of the Red Rock Ridge and Valley Trail System Plan (RRRVTSP), including ensuring that the City’s network of low volume streets and abandoned rail corridors are used to increase routes parallel to major traffic and transit corridors.**

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**Actions**

**1. Identify important transportation corridors for bicycle transportation, locating specific low-volume streets, intersections for special conflict management treatments, segments for enhanced lighting, etc.**

Locate bicycle priority streets away from major transit streets where possible. Where alternative routes are available, design streets for safe use by all modes.

**2. Provide guidance to road resurfacing and major street construction to include bicycle accommodation.**

Very few streets in Birmingham are marked for bicycle use. Existing road maintenance, resurfacing and reconstruction projects offer a low-cost opportunity to show progress and improve safety for an increasing segment of the traveling public.

**3. Identify opportunities to improve active transportation links to nearby neighborhoods and ensure that design of new buildings or renovations improves the public realm.**

Increasingly, private development is looking beyond its site boundaries to how customers will access

businesses, and where residents will shop, recreate, and learn. A checklist for private development can help identify opportunities that may be addressed with new construction to improve site marketability and provide needed network connections for public use. (See Goal 2 Action A.6 on p. 12.35).

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**D. Ensure that the parking supply is appropriately sized, located and managed to support walking, bicycling and transit access.**

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**Actions**

**1. Explore parking solutions with design and location criteria to reduce the impacts of parking and parking access on area character and walkability.**

Parking lots and garages lining the street create dead zones that negatively impact the appearance and feel of a place. Particularly in single use office and commercial districts, its effects can discourage walking. To reduce the impact of too much parking and to encourage people to walk and use transit when it is convenient, parking solutions such as shared parking and parking maximums help to control the amount of parking provided, as well as design standards for placement of parking on the site help to create and preserve safe and attractive conditions for pedestrians.

**2. Ensure parking management strategies are in place for downtown and are extended to neighboring communities to reduce overflow parking on neighborhood streets.**

Pricing of parking at meters that does not encourage long stays, garage pricing that is competitive with the cost and reduced convenience of transit, as well as permit parking for residents, are all forms of parking management that considers parking as a use of publicly owned real estate in ways that provide some public benefit. As downtown and in-town neighborhoods gain more households, parking management should be thought of as a critical tool to enhance and preserve livability.

## goal 3

Transit in Birmingham is fast, reliable, well-connected, and inviting for daily as well as occasional use by residents and visitors alike.

### POLICIES

- Support coordination and policies among major employers, the City, BJCTA, ALDOT, and the MPO for better transit service and efficient routing within the city and county.
- Support coordination among the MPO, the City, and the region to improve access to private, state, and federal funding for safe and high-quality-transit.
- Support compact, transit-ready development at potential transit stops to support high-quality transit.

## STRATEGIES

**A. Work with partners in business, institutions and transportation agencies to investigate and weigh the value of public transportation to the City's economic health, including access to opportunity for citizens and attractiveness as a business location.**

### Actions

**1. In partnership with institution and business leaders, investigate the experience of other cities that have successfully harnessed transit investment in support of economic growth.**

Consider peer-to-peer visits with Charlotte's Transit Oriented Business Alliance (see call-out box on p. 12.39) or to Memphis to learn about its participation in the region's Transit Signal Priority program and collaboration with MATA, TDOT, and neighboring jurisdictions.

**2. Develop a robust public education campaign featuring news stories from other US cities and testimonies from employers and employees who support transit investment and participate in the region's CommuteSmart Program.**

The Mayor's Office of Public Information can assist to gain media attention for City initiatives to raise awareness and dialogue about transit.

**3. Continue to work with UAB on specific transit- and community-enhancement initiatives.**

UAB initiatives could include support for a downtown circulator service open to all or a Transportation Management Association (TMA), employer-assisted housing programs and downtown housing, and enhanced support for CommuteSmart, including subsidized transit passes. TMAs are membership associations that provide transportation in a particular area, such as downtown. They are usually public-private partnerships and are managed by the members. TMAs promote and organize efforts for employees to commute by bicycle, transit, and carpool.

**4. Establish zoning and regulatory policies described in Chapter 14 (p. 14.23) to allow and incentivize compact, transit-ready development at potential transit stop locations.**

**B. Actively work with the BJCTA to improve transit service and establish greater accountability for effective and efficient use of City transit funds.**

Birmingham citizens who participated in the planning process repeatedly cited better transit service as one of the top two priorities for Birmingham's future. Because the city's effective housing density will only support bus transit until it begins to implement the Urban Village and Strategic Opportunity Area recommendations of this plan, the highest priority in the short and medium terms is to improve bus service so that it will be used by "choice" riders, that is, people who can choose their mode of travel. Premium bus or limited-stop (express) service, longer hours of service, consolidated bus stops and routing buses to improve travel time will be needed to attract a broader range of riders.

### Actions

**1. Advocate for more cost- and time-efficient transit service driven by transit demand analysis through the establishment of SuperStop transfer stations.**

Several plans have recommended the Super Stop concept of providing several transportation transfer locations in addition to the current single transfer

station downtown, route changes, and new service to improve the efficiency of existing bus service for riders. These changes would also be cost-savings measures. To date, these plans have not been implemented.

**2. Establish staff responsibility and a transit working group to regularly attend BJCTA board meetings and track progress on implementation of recommended cost savings and enhanced service improvements.**

See discussion of transportation planning staff discussion in Goal 1.

**3. Establish a City/BJCTA collaboration to implement roadway improvements to improve the comfort and convenience of transit service, including shelters, bus stop curb extensions and transit signal priority.**

Transit agencies increasingly work with municipal public works departments to improve the road conditions for safe, efficient transit operations. Typically the City’s responsibilities would include improving waiting and sidewalk conditions, ensuring adequate access space and lighting, and providing transit signal priority or signal timing in support of transit. To be successful, these improvements will require coordination and collaboration.

**4. Investigate and target funding options to make investments to improve and expand transit service.**

Table 12.2 on pp. 12.40 and 12.41 provides a range of funding options.

**CHARLOTTE’S BUSINESS-DRIVEN TRANSIT-ORIENTED DEVELOPMENT INITIATIVE**

*In the mid-1990s, business leaders engaged with local elected officials and citizens to develop a vision for economic and regional growth. These leaders understood the need to provide transportation choices to support this future growth and the role a strong transit system would play. From this vision, the transit system in Charlotte, NC, has become a national example of integrating land use, economic development and transit planning.*

*The regional vision, developed in 1994, provided a framework for the City to create policies and incentives that would concentrate density and economic development along five radial transit corridors that connected economic activity centers in the city. The 25-year transportation plan, adopted in 1998, provided an outline of strategic land use that would support transit, economic development and growth management strategies. The City also passed a half-cent sales tax that dedicated a revenue source of \$1 billion over 20 years.*

*This integration has been strongly supported by the region’s business alliance and City investment studies and programs. CATS and the Charlotte-Mecklenburg Planning Commission completed a major investment study*

*for all five corridors. The study recommended a combination of light rail, bus rapid transit, streetcar, and commuter rail with extensive local bus systems. Specific station plans were developed for all 60 stations in the five corridors. These station plans preserved the character of station-area communities while introducing concepts for new station-area development that would be compatible with the transit service investment. This included more densely developed housing and/or employment, depending on the area’s surroundings, and the addition of retail and service uses and a walkable street network.*

*The City also held “Development Response Sessions” early in the station planning process with property and business owners and developers interested in investing around potential transit stations. Having business leaders and developers participate in early planning ensured that resulting concepts would be more likely to be built by the private sector. It also helped area residents understand opportunities and ultimately support plans as a blueprint for change, thereby reducing investor risk that often delays or reduces private development. The effort also provided support for government projects needed to leverage private dollars.*

*Several business-friendly initiatives to support economic and workforce development were established as a result of this planning. The Charlotte-Mecklenburg Business Investment Program provides a “grant” of 90% of the new property tax generated by the investment for the first three years of business for businesses meeting the following criteria:*

- *Develop within the transit corridors*
- *A minimum investment of \$3 million*
- *A minimum of 20 new jobs created*
- *Pay employees more than the Charlotte-Gastonia-Rock Hill MSA average pay rate*
- *Employ 80% Work First participating employees or development zone residents*

**Key Guidelines that encouraged transit:**

- *A strategic plan that develops and implements strategies that support transit*
- *Investment in transit corridors that connect centers of economic activity and neighborhoods*
- *A combination of transit systems supporting different types of trips and densities*
- *Land use and design that supports transit AND responds to community goals and placemaking*

<b>TABLE 12.2: FUNDING OPTIONS</b>		
<b>PUBLIC FUNDING OPTIONS</b>	<b>PRIVATE FUNDING OPTIONS</b>	<b>COMBINATION OF PUBLIC AND PRIVATE FUNDING OPTIONS</b>
<p><b>Federal Funding</b>                      The Moving Ahead for Progress in the 21st Century Act (MAP-21) signed in July 2012 went into effect in October 2012 for two years. It authorized funding to be administered by the Federal Transit Administration (FTA) to support locally planned and operated public mass transit systems.</p> <p>This funding is in turn awarded in the form of grants that typically require matching funds depending on the type of program, to individual transit systems by formulas that may vary from year to year. State funds may be used by providers to meet the matching requirements of federal grants.</p>	<p><b>Advertising</b>                      A common source of revenue for transit providers is income from advertisements placed on vehicles, facilities and transit related materials such as schedules and maps. These revenues; however, are generally modest, accounting for anywhere between 0.1% and 3% of total operating income.</p> <p><i>Examples: LYNX (Orlando, FL)                      Chicago Transit Authority (Chicago, IL)</i></p>	<p><b>Public Private Partnerships (PPP)</b>                      The US DOT has prepared model legislation. The model provides states with examples of the basic elements to consider in authorizing PPP legislation.</p> <p><i>Examples: BART Oakland Airport Connector (San Francisco Bay Area)</i></p>
<p><b>General sales taxes</b>                      Sales taxes are the most common source of funding for local and regional transit services. They generally provide the greatest revenue yield and stability and are broadly accepted as a source of revenue for public transportation.</p> <p><i>Examples: Athens Transit (Athens GA);                      Regional Transportation District (Denver, CO)</i></p>	<p><b>Corporate franchise taxes</b>                      Franchise taxes are generally levied on the profits and other taxable assets of a corporation. It is considered to be a tax on business operations and is most often based on the par value of the corporation's outstanding shares and surplus. Franchise taxes are often targeted at specific types of industries and economic activity.</p> <p><i>Example: New York Metropolitan Transportation Authority (New York, NY)</i></p>	<p><b>Tax-increment Financing Districts</b>                      Tax-increment Financing Districts (TIF) are focused on capturing the added increment of a future stream of increased taxes that result from an increase in property values due to public investments. The excess tax increment is used to repay the public improvement bonds used to fund the improvements that led to the increase in value and tax returns. The revenues derived from these districts may be used for a number of purposes, including transit development.</p> <p><i>Examples: City of Irving (TX);                      City of St. Louis (MO)</i></p>
<p><b>Occupational Taxes</b>                      An occupational tax for Jefferson County could be orchestrated to require that a defined percentage of the total be set aside to fund BJCTA operations.</p>		

PUBLIC FUNDING OPTIONS	PRIVATE FUNDING OPTIONS	COMBINATION OF PUBLIC AND PRIVATE FUNDING OPTIONS
<p><b>Tollway revenues</b>                      Revenues from toll facilities are often dedicated to providing for enhanced transit services within the tolled corridor.</p> <p><i>Example: San Diego, CA</i></p>	<p><b>Sponsorship Funding</b>                      Transit agencies give local businesses the opportunity to sponsor transit vehicles, stations, educational materials or tickets. In exchange for different levels of sponsorship, businesses receive advertising opportunities as well as “transit-friendly” logo’s to put in their business window.</p> <p><i>Example: Trimet (Portland, OR)</i></p>	<p><b>Transportation Development Districts</b>                      Transportation Development Districts (TDDs) are a form of community improvement or community facilities district that is intended to provide a means of raising funds specifically for transportation improvements. They are generally aimed at financing the cost of a specific project and may be applied to developing or improving transit services. These districts typically raise funds through the issuance of bonds, which are generally supported by tax increment procedures or dedicated sales taxes. Tax increment procedures are established by various state and local entities as a process for determining the value of land prior to development so that the incremental increase in value due to development can be appropriately credited to the desired programs. Bonds are issued based on the expected incremental increase and the revenues directed to the project.</p> <p><i>Examples: Knox County (TN); City of Lenexa (KS)</i></p>
<p><b>Parking fees and fines</b>                      Parking fees may be imposed to achieve a number of municipal goals including revenue generation, traffic management and mode shift. Local transit agencies may receive significant levels of funding for operations from the parking fees and parking fines levied by the city or other regional government or they may receive parking related revenues generated at facilities owned by the transit authority.</p> <p><i>Example: San Francisco Metropolitan Agency</i></p>	<p><b>One-Time Tax for Capital Cost of Premium Transit</b>                      An aggressive strategy that generates revenue for Capital costs for implementing premium transit. This one-time tax is imposed on businesses and is normalized based on the businesses proximity to the planned premium transit and the size of the business.</p> <p><i>Example: City of Portland (OR-Trimet Streetcar)</i></p>	<p><b>Business Investment Incentives</b>                      Incentives, such as temporary tax-relief and low interest loans, can encourage local developers and businesses to develop and invest along major transit corridors. This creates land uses and development that is transit supportive and is conducive to Transit Oriented Development.</p> <p><i>Example: CATS (Charlotte, NC)</i></p>

SOURCES: NCHRP REPORT 89: <http://utcm.tamu.edu/tfo/transit/summary.stm>; CHARLOTTE AREA TRANSIT SYSTEM (CAST): <http://charmeck.org/city/charlotte/cats/Pages/default.aspx>; PORTLAND STREETCAR: <http://www.portlandstreetcar.org/>

**HALF-CENT SALES TAX SECURES LONG-TERM BONDS TO FINANCE THE TRANSFORMATION OF LOS ANGELES FROM A CAR-CENTRIC TO A TRANSIT-FRIENDLY REGION**

In November 2008, Los Angeles County voters embraced an aggressive transit-expansion plan by approving, by a two-thirds vote, a 0.5 cent sales tax that will generate a projected \$36 billion to transportation upgrades over the next thirty years. A strong public desire to improve transit and a healthy dedicated revenue stream enabled the County to create a “30/10 Initiative” for transportation projects. The concept is to use the sales tax as collateral for long-term bonds and federal loans, such as Transit Improvement Bonds, Transportation Infrastructure Finance and Innovation Act (TIFIA) and Early Systems Work Agreement (ESWA). This will allow the County to build 12 key mass transit projects over 10 years instead of 30 years. The project breakdowns are:

- Transit capital (new light rail, commuter rail, and bus rapid transit projects) 39.4%
- Highway Capital (new carpool lanes, and extension of I-70 and other projects) 19.7%
- Transit Operations (including a discount Metro fare freeze until 2013) 24.6%
- Local return (for cities to spend on anything transportation related) 14.8%
- Administration 1.5%

This strategy was motivated by the Los Angeles County Metropolitan Transportation Authority’s (Metro) desire to accelerate the construction of transportation projects, allow construction projects to beat future inflation, giving Metro the revenue it needs to take advantage of historically low interest rates, and accelerate the creation of jobs in the county. The strategy has become a national model for leveraging funds for transit enhancements and large-scale transit projects that require significant capital and maintenance funds.

**goal 4**

Streets and sidewalks are accessible and maintained in good repair.

**POLICIES**

- Support a system of public criteria for street and sidewalk maintenance priorities.
- Support establishment of a pavement management system, ideally as part of an overall asset management program.

**STRATEGIES**

**A. Establish criteria for City funding priorities on street and sidewalk maintenance and improvement projects and allocation of resources.**

**Action**

**1. Identify and fund needs based on investment strategies, including the Urban Villages and Strategic Opportunity Areas, and from plans such as the Red Rock Trail System Plan and the Sidewalk Master Plan.**

Capital improvement and investment criteria related to adopted plans and programs should be made public,

**COMMUNITY INPUT IDENTIFIES STREET REPAIR NEEDS**

In Philadelphia, Operation Smooth Streets brings the community into the City’s asset management program. Residents are encouraged to make pothole repair requests by phone or through a Web portal ([www.potholes.phila.gov](http://www.potholes.phila.gov)). The City promises that potholes will be repaired within three business days. The website is also used to provide information about other issues concerning city streets maintenance. Since key commuter routes in the city are on state-maintained roads, requests are also forwarded to the Pennsylvania Department of Transportation, and citizens are provided the phone number for follow-up.

Other cities have opted to use the website [SeeClickFix.com](http://SeeClickFix.com) to encourage citizens to send information on needed repairs.

so that the reasons why funds are allocated to specific projects are made available to the public.

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**B. Establish a pavement management system so that, over the long term, maintenance costs will be reduced.**

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**Actions:**

**1. Evaluate and document the cost of deferred maintenance in Birmingham to establish a baseline standard for a regular, cost-efficient maintenance program.**

Deferred maintenance typically increases the lifetime costs of major infrastructure. The City should know what level of maintenance is necessary to avoid major reconstruction costs given weather, use and other local conditions affecting infrastructure life cycle. A pavement management system should be incorporated into an overall asset management system for the City.

**2. Establish and publicize a program to engage residents in the identification of needed repairs to streets.**

Use the public’s interest in and daily experience of pedestrian and driving conditions to keep the City’s inventory of maintenance needs up-to-date. Efforts like Operation Smooth Street in Philadelphia also offer strong public relations messages that the City is interested in and responsive to constituent concerns and complaints.

**3. Establish and fund a schedule for pavement condition inspection and assessment.**

Reports on infrastructure conditions should be available to City leadership during the annual budget cycle in order to identify pavement maintenance needs and funding options, allocate resources, and track on-schedule progress.

**4. Engage building inspectors to investigate all utility and other construction activity within the right-of-way to ensure that permits were purchased and require the City Engineer to inspect repairs for compliance with guidelines.**

**goal 5**

Birmingham has state-of-the-art inter-city passenger travel and freight transportation systems.

**POLICIES**

- Support expeditious completion of air terminal and cargo projects and the Intermodal Facility.
- Advocate for passenger rail service and enhanced passenger air service.
- Evaluate options to expand Birmingham based on market conditions and feasibility.

**STRATEGY**

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**A. Continue to establish and seek regional and state support for Birmingham’s transportation priorities that will advance progress towards achieving the goals of the Comprehensive Plan.**

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The City of Birmingham has an important role to play as the largest municipality in the Birmingham MPO, the economic engine of the region, and the most important economic center in the State of Alabama. Inter-city passenger service today includes Amtrak’s Crescent line daily travel between New York and New Orleans through Birmingham and direct flights to 40 US cities from Birmingham-Shuttlesworth International Airport.

Alabama’s largest airport had nearly 1.5 million commercial passenger boardings in 2011. Like the airport, currently completing a major expansion, the city’s rail gateway at Central Station will undergo major improvements. The project to rebuild Central Station can be an important statement with a futuristic vision. It can link national and regional rail service to downtown and citywide connections with attractive and safe pedestrian and bicycle ways and premier transit connections to businesses, universities and neighborhoods beyond. Transit and land use relationships in cities, unlike in the suburbs, must be synergistic. This will require attention and collaboration, particularly as the city prepares for a future based on the historic foundation of its urban form.

## **Actions**

### ***1. Continue to actively participate in regional policy making and project identification for high quality inter-city freight and passenger service and infrastructure.***

Through its role on the MPO, the City should provide capital programming and City-oriented study initiatives that support its reinvestment goals and opportunities. Carefully evaluate proposed transportation investments, such as commuter rail to Montgomery, that could potentially draw private capital away from Birmingham's neighborhoods, commercial districts and industrial zones, considering both long-term costs and benefits.

### ***2. Work with the freight industry to confirm major truck routes for priority designation to connect industrial areas to interstate access points for enhanced efficiency and safety.***

Participate with the MPO and ALDOT to assess connectivity and road-condition needs for short and long-term economic development priorities. Allocate sufficient annual funds for regular maintenance and needed upgrades of priority freight routes. Ensure that private development not only adds identified capacity but upgrades existing infrastructure related to site activity.

# Traffic Calming & Active Transportation Safety Toolbox

## HIGH VEHICLE SPEED (TRAFFIC CALMING) TREATMENTS



### 1. Fog Lines or Wide Parking Lines

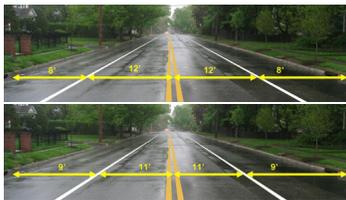
Wide edge-lines used to precisely define and limit the space for moving traffic. Usually widens parking lanes and narrows travel lanes.

**Advantages:**

Narrows travel lane, thus reducing speeds.  
 Can offer space for bicyclists, especially if space does not exist for full bicycle lanes.

**Disadvantages:**

Not as effective as other physical traffic-calming treatments.



### 2. Narrow Travel Lanes

Restriping of existing travel lanes to reduce width.

**Advantages:**

Slows traffic.  
 Provides more space for bicyclists and possible bicycle lanes.

**Disadvantages:**

May yield an increase in vehicle-vehicle crashes.



### 3. On-Street Parking

Full-time parking provided adjacent to the curb or just beyond a buffered bicycle (protected bicycle lanes).

**Advantages:**

Increases safety by placing a physical barrier between moving vehicles and pedestrians.  
 Reduces the speed of traffic traveling adjacent to the parked vehicles.  
 Provides parking.

**Disadvantages:**

Can be dangerous for bicyclists riding in door zone.  
 Ineffective at reducing speeds if travel lane is very wide.  
 Reduces sight lines for motorists entering the street from driveways.



### 4. Rumble Strips

Pavement surface treatments intended to cause vehicle vibrations signaling drivers to slow down. Best used with other traffic-calming treatments.

**Advantages:**

Reduces speeds.  
 Low cost.

**Disadvantages:**

Vibration noise created may be inappropriate in residential areas.  
 Perceived more as a warning to slow down than a physical measure that forces slower speeds.  
 Loses effectiveness over time.



### 5. Speed Bumps/Humps

Speed bumps are narrow, mountable obstructions installed on the pavement surface across travel lanes, intended to cause vehicles to slow to almost a full stop. Speed humps are flatter and wider, creating a gentler crossing by vehicles.

**Advantages:**

- Inexpensive.
- Very effective in slowing travel speeds.
- Easily navigated by bicyclists.

**Disadvantages:**

- May be considered loud or noisy to nearby residents.
- Forces emergency vehicles to slow down.
- Inappropriate on streets with bus traffic due to rider comfort and reduced travel speeds.
- Creates a high-speed traffic hazard.



### 6. Speed Table

Wide, mountable obstructions installed on the pavement surface across travel lanes intended to cause vehicles to slow. Speed tables are similar to speed humps except they have a flat-top. Generally wider than speed humps, gentler on vehicles, and typically used on higher-order roads than bumps or humps because they allow a smoother ride and higher speeds.

**Advantages:**

- Slows traffic.
- Smoother ride than humps and bumps.
- Not as effective in reducing speeds as humps and bumps.
- More applicable for higher-order roads (collectors).
- Compatible with bicycle use, particularly on low-volume streets.

**Disadvantages:**

- Higher design speed.
- Can be expensive if used with textured materials.
- May be considered loud or noisy to nearby residents.



### 7. Chicane

A series of fixed objects, usually extensions of the curb, that alter a straight roadway into a zigzag or serpentine path to slow vehicles. Can also be created by alternating on-street parking between sides of street.

**Advantages:**

- Reduces speeds of motorists.
- Noise is not as common as with speed humps or rumble strips.
- Potential to increase trees, landscaping and water-runoff treatment.

**Disadvantages:**

- Reduces on-street parking space for parking.
- Maneuvering can be difficult for larger vehicles such as buses, trucks, and fire trucks.
- Potential for motorist collision with the physical chicane.
- Needs landscape maintenance.



## 8. Choker

Narrowing of a street, often mid-block and sometimes near an intersection. May be created with curb extensions, landscaping or edge islands in the street. They can form safe crossings if marked as crosswalks. Chokers can leave the street section with two narrow lanes or be taken down to one lane, thus requiring approaching drivers to yield to one another.

### Advantages:

- Reduces speeds and volumes of motorists.
- Shortens crossing distances for pedestrians if used at mid-block crossings.
- Provides pedestrian refuge area.
- Can reduce traffic volumes.

### Disadvantages:

- Potential for motorist collision with the physical choker.
- Reduces on-street space for parking.
- Compatible with bicycling only when specified space is provided.
- Design challenges if used on narrow streets without on-street parking.
- May divert traffic to alternate streets.



## 9. Neighborhood Traffic Circle/Mini-Traffic Circle

A small circular or oblong island used in the middle of intersections and intended to force vehicular traffic to slow and negotiate around it. When used in residential areas, they can be landscaped for aesthetic or barrier purposes, and may have mountable curbs to allow movement of emergency vehicles.

### Advantages:

- Reduces speeds of motorists.
- Improves safety.
- Reduces need for complete stops by motorists.

### Disadvantages:

- Maneuvering can be difficult for larger vehicles such as buses, trucks, and fire trucks.
- Pedestrian crossings are less managed than traditional stop-controlled intersections.
- May require eliminating some on-street parking.



## 10. Raised Intersection

The entire area of an intersection is raised above normal pavement surface level to reduce vehicle speed through the intersection and provide a better view of pedestrians and motorists in the intersection.

### Advantages:

- Reduces speeds through intersections.
- Reduces red light running at high speeds.
- Calms two streets at once where collisions are most prevalent.

### Disadvantages:

- Potential drainage issues.
- Less effective in reducing speeds than humps, tables, or raised crosswalks.
- Expensive.



### 11. Reduced Curb Radii

Reconstructing a street corner with a smaller radius to reduce vehicle turning speeds.

**Advantages:**

- Forces sharper turn by right-turning motorists.
- Improves safety of pedestrians by reducing crossing width and slowing motorists.

Reduces speed of right-turning motorists.

**Disadvantages:**

- Space may not be available.
- Can be expensive.

**HIGH-TRAFFIC VOLUME CONTROL TREATMENTS**



### 1. Half Closure/Semi-diverter

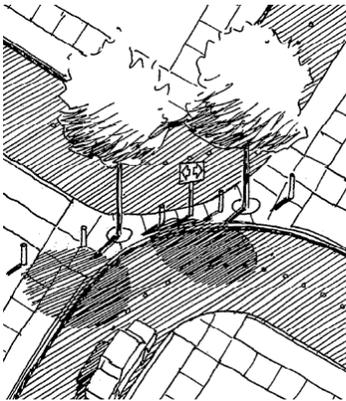
Barriers that block travel in one direction for a short distance on a two-way street.

**Advantages:**

- Diverts through traffic to other routes.
- Shortens crossing distances for pedestrians if used at crossing location.

**Disadvantages:**

- Reduces on-street space for parking.
- Can cause circuitous routes for local traffic and emergency vehicles.
- May reduce access to local businesses.



### 2. Diagonal Diverter

Barrier dividers or medians placed diagonally connecting two opposite curbs within the intersection, blocking through movements and creating two L-shaped streets.

**Advantages:**

- Reduces cut-through traffic for specific movements.
- Allows residents to access homes, albeit along a circuitous route, but discourages non-local traffic.
- Maintains full pedestrian and bicycle movements.

**Disadvantages:**

- Prevents left-turning movements.
- Can cause circuitous routes for local residents and emergency vehicles.



### 3. Forced Turn

Raised islands used on intersection approaches that force drivers to turn in only one direction (usually right). Often used at major-minor street intersections where the left-turn onto the major street is unsafe.

**Advantages:**

- Reduces cut-through traffic.
- Improves safety by eliminating left turns.

**Disadvantages:**

- Prevents left-turning movements.
- May just move cut-through traffic to another street.



#### 4. Full Street Closure

Barriers placed across an entire width of a street to completely close the street to through-traffic, usually leaving full pedestrian and bicycle access. Full street closures are also referred to as cul-de-sacs or dead ends.

**Advantages:**

- Reduces cut-through traffic and speeding.
- Maintains pedestrian and bicycle access.

**Disadvantages:**

- Adds traffic to adjacent streets.
- Reduces circulation and access to businesses.
- Can introduce security concerns in “dead zones.”



#### 5. Median Barrier

Islands constructed between travel lanes through an intersection to block movements. Median barriers are intended to prevent left turns from the major street and through movements along the minor street.

**Advantages:**

- Reduces cut-through traffic.
- Improves safety by eliminating left turns.

**Disadvantages:**

- Prevents left-turning movements.
- May move cut-through traffic to another street.
- Needs sufficient roadway width for construction.

### PEDESTRIAN INTERSECTION-SAFETY ENHANCEMENTS



#### 1. Prohibit Right-Turns on Red

Mounted sign eliminates the right of motorists to make a right turn at a red light. Can be used full-time or under restricted time intervals.

**Advantages:**

- Reduces conflicts between motorists and pedestrians.

**Disadvantages:**

- Reduces time motorists have to make a right turn.
- Potential vehicle queuing.



#### 2. Signal-Timing Modification

Adjustments of existing signal timings to accommodate all modes more readily. Could include reducing the amount of green time to decrease the amount of time pedestrians wait at signals.

**Advantages:**

- Improves conditions for pedestrians.
- Improves overall safety of intersection.

**Disadvantages:**

- Improved conditions for one mode often come at the expense of others (e.g., giving more green time to pedestrians often means motorists receive less green time).



### 3. Leading Pedestrian Interval

Pedestrians are given advance time to begin crossing at the crosswalk before conflicting vehicles start moving.

**Advantages:**

Puts pedestrians well into the crosswalk and more visible before vehicles begin moving into the crossing zone.  
 Improves pedestrian safety.

**Disadvantages:**

Reduces green time for conflicting vehicle movements.  
 Can add to delays at highly congested intersections.



### 4. Push Button Retrofit

Signs above the pedestrian push-button that indicate direction of crossing. “Confirm” press buttons acknowledge activation through a light or sound after being activated by a pedestrian.

**Advantages:**

Confirm press buttons have been shown to increase the number of pedestrians using the push-button.  
 Pedestrians more likely to wait for the Walk phase signal.

**Disadvantages:**

Expense of comprehensive implementation.



### 5. Pedestrian Countdown Signal

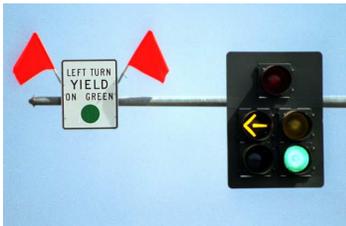
Static Walk/Don't Walk pedestrian signals with countdown signal informing pedestrians of the time remaining to cross the street.

**Advantages:**

Fewer pedestrians cross the street late in the countdown as compared to signal heads with only the Flashing-Don't-Walk light.

**Disadvantages:**

Expense of comprehensive implementation.



### 6. Protected Left-Turn

Allows left-turning vehicles a protected movement (i.e., no conflicting movements), generally involving the installation of a left-turn arrow.

**Advantages:**

Removes conflicts between left-turning vehicles and oncoming, through-movement vehicles.  
 Improves left-turning operations.

**Disadvantages:**

Less green time for through and right-turn movements.  
 Less green time for pedestrian crossings.



## 7. Reduce or Add Lane; Modify Existing Geometry

Modify the existing intersection geometry to respond to conditions including reducing pedestrian crossing exposure to traffic, adding or eliminating a traffic movement, creating space for the type and level of pedestrian activity, reducing speed of turning vehicles.

### Advantages:

Improves safety or capacity according to situation.

Increases or decreases user delay, according to situation.

### Disadvantages:

Lack of right of way and/or physical space.

High cost and long timeframe.



## 8. Roundabout

Raised circular island intersection treatment where all entries are yield-controlled, circulating vehicles have the right of way, and pedestrian access is allowed only across the roundabout legs.

### Advantages:

Yield control reduces wait times, thus moving traffic more steadily through the intersection.

Reduces the severity of crashes compared to signalized intersections.

Reduces conflict points compared to a signalized intersection.

### Disadvantages:

Requires substantial right of way for construction.

Pedestrians are not provided with a protected signal phase where all traffic is stopped and must rely on driver courtesy and respect for pedestrian right-of-way in the crosswalk.

High cost.

## PEDESTRIAN SAFE-CROSSING TREATMENTS



## 1. In-Street “Yield for Pedestrian” Sign

Signs placed in the middle of crosswalks to increase driver awareness of pedestrians and the legal responsibility to yield right-of-way to pedestrians in crosswalk.

### Advantages:

Increases the number of motorists that yield to pedestrians in the crosswalk.

Reinforces the right of pedestrian in the carriage-way.

### Disadvantages:

If used too often, motorists have a tendency to ignore the signs.



## 2. High-Visibility Crosswalk

Clear, reflective roadway markings and accompanying devices at intersections and priority pedestrian links, located only where motorists should expect pedestrians with sufficient sight distance and reaction time with prevailing travel speeds.

### Advantages:

Warns motorists of potential for pedestrians.

Designates a preferred location for pedestrians.

Alabama law requires motorists to yield to pedestrians in or near the vehicle's path in marked crosswalks.

### Disadvantages:

Most effective with other traffic control (signals, stop signs) or physical treatments (bulb outs) that help to reinforce crosswalks and support reduced vehicle speeds.

Motorists may ignore.



## 3. Raised Crosswalk

A pedestrian crossing area raised above street grade to give motorists and pedestrians a better view of the crossing area. A raised crosswalk is essentially a speed table marked and signed for pedestrian crossing.

### Advantages:

Provides better view for pedestrians and motorists.

Slows motorists travel speeds.

Lends itself to broad application on both arterial and collector streets.

### Disadvantages:

Can be difficult to navigate for large trucks, buses, and snow plows.



## 4. Bulb-out/Curb Extension

An extension of the curb or the sidewalk into the street (in the form of a bulb), usually at an intersection, that narrows the vehicle path, inhibits fast turns, and shortens the crossing distance for pedestrians.

### Advantages:

Shortens crossing distances for pedestrians.

Reduces motorist turning speeds.

Increases visibility for both motorists and pedestrians.

Enables permanent parking.

Enables tree and landscape planting and treatment of stormwater runoff.

### Disadvantages:

Can only be used on streets with unrestricted on-street parking.

Physical barrier can be exposed to traffic.

Greater cost and time to install than high-visibility crosswalks.



## 5. Raised Median Island/Pedestrian Refuge Area

Provides a protected area in the middle of a crosswalk for pedestrians to stop while crossing street.

### Advantages:

Reduces the number of crashes at marked and unmarked crosswalks.

Preferred on multi-lane streets.

Reduces the length of gaps in traffic during which pedestrians can cross the street.

Used to create entry point into area of high pedestrian activity.

### Disadvantages:

Must have at least 6 feet of space to accommodate wheelchairs; not all streets will have adequate space.

Physical barrier in the street.



## 6. Rectangular Rapid Flash Beacon

Signs with a pedestrian-activated “strobe-light” flashing pattern that attracts attention and notifies motorists that pedestrians are crossing.

### Advantages:

Typically increases motorists’ yielding behavior.

Pedestrians may not activate flashing light.

### Disadvantages:

Motorists may not understand flashing lights.



## 7. Pedestrian Hybrid Signal (HAWK)

Pedestrian-activated signal, unlit when not in use, begins with a yellow light alerting drivers to slow, and then a solid red light requires drivers to stop while pedestrians have the right-of-way to cross the street.

### Advantages:

Very high rate of motorists yielding to pedestrians.

Drivers experience less delay at hybrid signals compared to other signalized intersections.

### Disadvantages:

Expensive compared to other crossing treatments.

Requires pedestrian activation.

**BICYCLE ACCOMMODATIONS CONTRIBUTING TO TRAFFIC CALMING**



**1. Wayfinding**

Signs directing pedestrians and bicyclists toward destinations in and routes through the area, typically including distance and average walk/cycle times.

**Advantages:**

Eases navigation for residents and visitors by bicycle.  
 Provides guidance to destinations from streets and along multi-use trails.  
 Offers another indication to motorists of the presences of bicycles.

**Disadvantages:**

Maintenance and vandalism.



**2. Bicycle Sharrows/Enhanced Sharrows**

A shared-lane marking, or sharrow, is a pavement marking used where space does not allow for a bike lane typically indicating that bicycles have equal right to the travel lane. Sharrows remind motorists of the presence of bicycles and indicate to cyclists where to safely ride within the roadway. Enhanced sharrows include additional lines so are more visible.

**Advantages:**

Reduces wrong-way and sidewalk riding.  
 Improves cyclists positioning in the roadway.  
 Informs motorists of presence of bicyclists.  
 Marks streets without adequate space for bike lanes.

**Disadvantages:**

Pavement marking maintenance.  
 Not as effective as a bike lane.



**3. Bike Lane Markings**

The area of roadway designated for non-motorized bicycle use, separated from vehicles by pavement markings.

**Advantages:**

Improves safety and comfort by increasing the visibility and awareness of cyclists.  
 Designates carriage-way space for bicyclists.

**Disadvantages:**

May still conflict with motorists.  
 Motorists may illegally park in bike lane.



#### 4. Bike Box

Marked area in front of the stop bar at a signalized intersection that allows cyclists to correctly position themselves for turning movements during the red signal phase by pulling ahead of the queue.

**Advantages:**

Decreases conflicts and crashes between cars and bicycles.

Separates bicycles from cars at the intersection.

**Disadvantages:**

Extensive public education required.

Pavement marking maintenance and costs.



#### 5. Bicycle Boulevard/Greenway

Low-volume and low-speed streets that have been optimized for bicycle travel through treatments such as traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments.

**Advantages:**

Converts well-connected streets prone to cut-through traffic to streets well-suited for bicycle transportation.

Allows through movements for cyclists while discouraging similar through trips by non-local motorized traffic.

Creates a comfortable, low-volume, low-speed space for bicyclists and pedestrians.

**Disadvantages:**

Some treatments more expensive than others.

In areas with few alternative routes, reduces those that can relieve traffic during peak travel times.



#### 6. Cycle Track/Protected Bike Lane

An exclusive bike facility physically separated from vehicle travel lanes, parking lanes, and sidewalks. Can be one-way, two-way, at street level, at sidewalk level, or at an intermediate level.

**Advantages:**

Buffer provides higher level of safety than bike lanes.

Reduces risk of “dooring” compared to a bike lane.

Attractive to a wider spectrum of the public than bike lanes.

**Disadvantages:**

Potential conflicts at intersections.

Can be expensive.

Requires more space than bike lane



### 7. Multiuse Pathway/Sidepath

Paved pathways parallel to but away from the carriage-way and out of the path of turning vehicles; designed with space adequate for safe use by both pedestrians and bicyclists. Appropriate for roads parallel to rail track, waterway or other conditions with infrequent cross traffic.

**Advantages:**

Separates bicyclists from vehicle traffic.  
 Combination of pedestrians and bicyclists requires less space than separate facilities for each.

**Disadvantages:**

Needs adequate space to accommodate buffer from street and width to allow the passing of bicyclists and pedestrians.  
 Bicycle and pedestrian conflicts.  
 Unsafe in highly urban areas or along roads with driveways.



### 8. Bicycle Parking

Devices and/or areas that allow secure bicycle parking, often located at areas of high bicycle and pedestrian traffic such as office and industrial areas, shopping centers, schools, and multi-use trails. Can be provided on a curb extension or in on-street parking spaces.

**Advantages:**

Provides a secure location to store and lock bicycles.  
 Locations are generally very close to and visible from the point of interest.  
 Relatively inexpensive and easy installation.  
 Encourages community bicycle use.

**Disadvantages:**

Requires space in potentially busy area.  
 May remove an on-street parking space.



### 9. Bicycle-Actuated Signals

Bikes cannot activate traffic signals. Bicycle-actuated signals should be installed when bicycle priority streets cross arterial and collector streets.

**Advantages:**

Provides clear indication to bicyclists and motorists when bicyclists have the right of way.  
 Additional means to manage motorist/ bicyclist conflicts.

**Disadvantages:**

Cyclists must be positioned properly to activate the signal.  
 Installation, timing, and maintenance can be challenging initially.

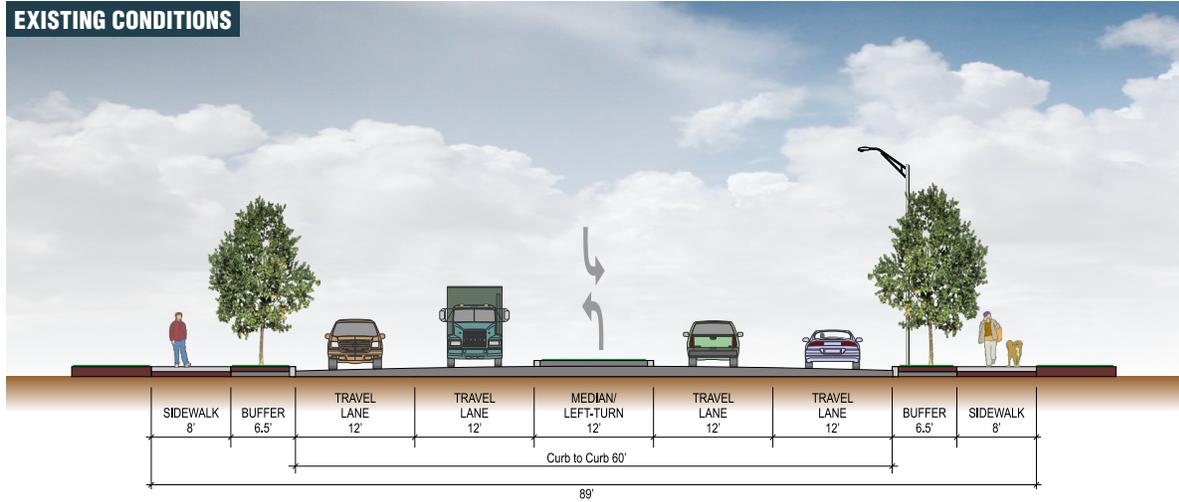
## Street Sections

The cross sections for the street locations were selected to provide conceptual guidance to build on-road options along streets identified in the Red Rock Ridge Valley Trails System to accommodate bicycles and improve the environment for pedestrians. They were selected to represent a range of roadway types—from local residential and industrial-zone streets to important arterials that may also serve as key bus and freight routes. These conceptual schematic cross section proposals present low-cost accommodation of bicycles within the existing paved and curbed street section. Pedestrian space on sidewalks is shown with more generous space that can be considered as land uses change.

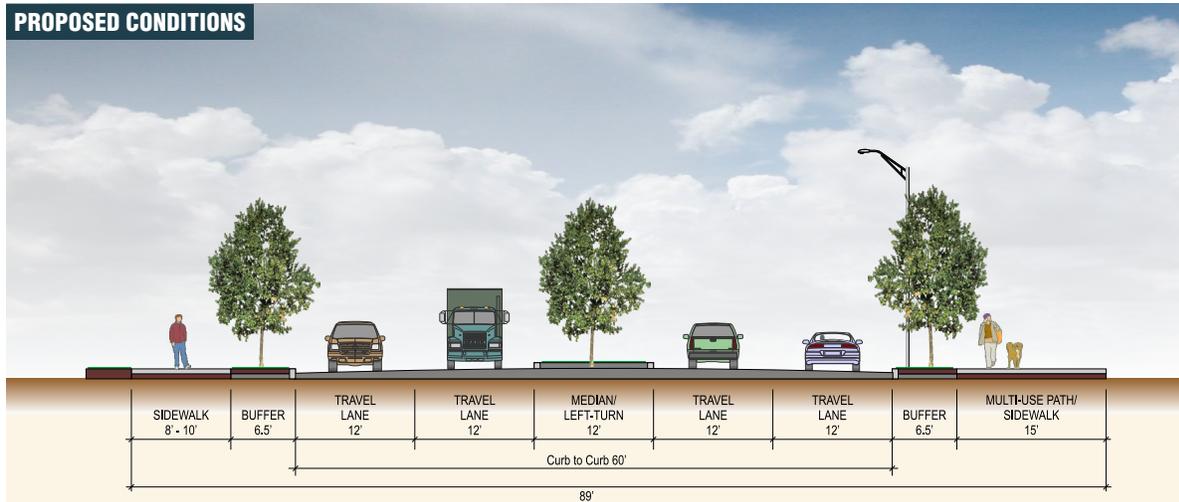
All proposals will need to be evaluated based on actual traffic volumes, travel speeds, and mix of trucks and buses. as these concepts have not had the benefit of that analysis. Transitions for bicyclists at intersections where congestion and conflicts occur will also be required for implementation. Where safe accommodation on the actual proposed streets is not possible, parallel streets must be provided to retain the integrity of the RRRVTS complete network.

### Location 1: Avenue W at 47th Street Ensley (Five Points West)

#### EXISTING CONDITIONS



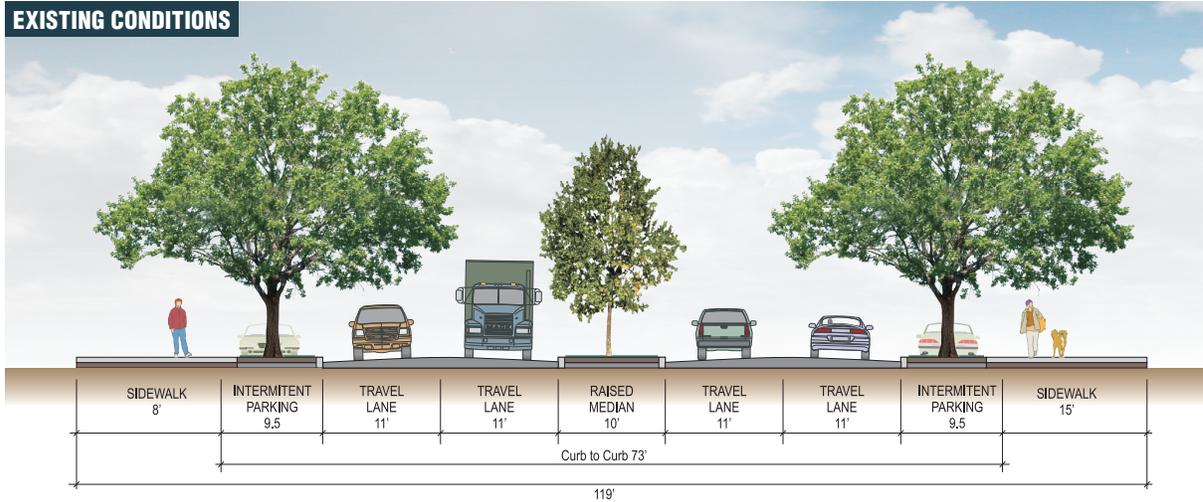
#### PROPOSED CONDITIONS



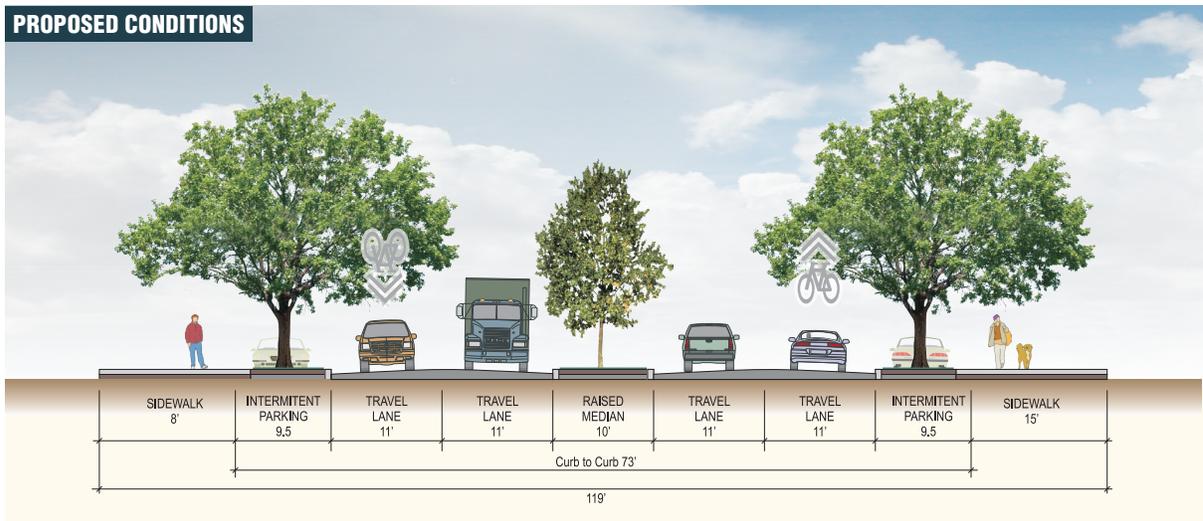
\*Proposed conditions are concepts ONLY.

## Location 2: 20th Street North at 5th Avenue North (CBD)

### EXISTING CONDITIONS



### PROPOSED CONDITIONS

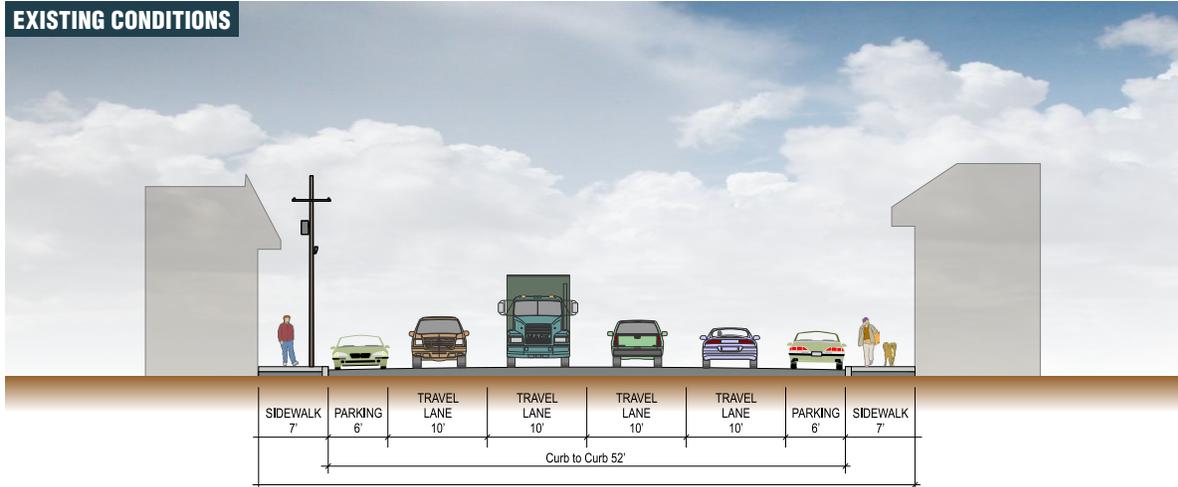


### Sharrows

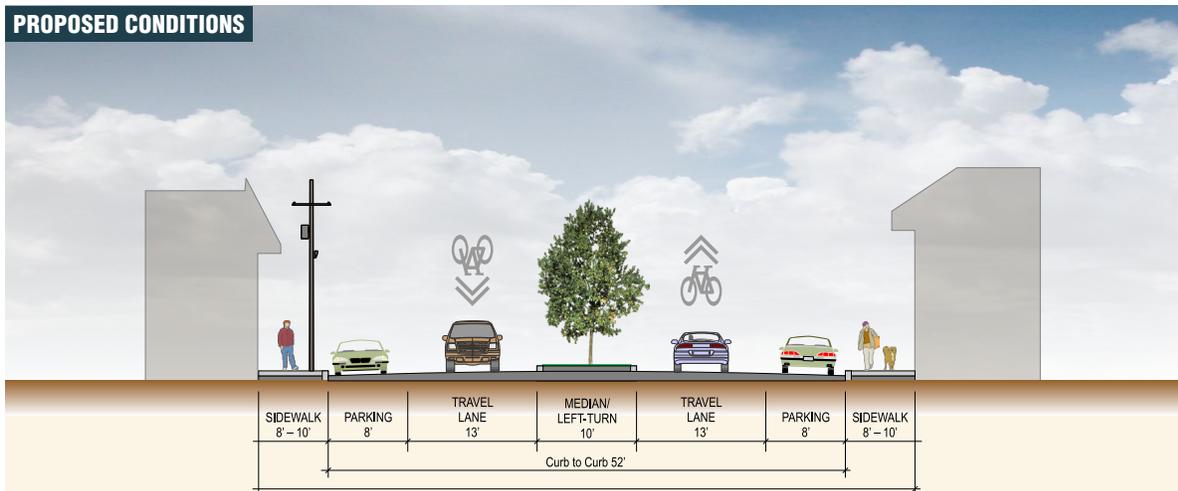
Shared-lane markings, called “sharrows,” help bicyclists and motorists share and navigate streets where there are no exclusive bike lanes. Sharrows show bicyclists where to travel on the road and alert motorists to the presence of bicyclists.

### Location 3: 1st Street North at 55th Place (Woodlawn)

#### EXISTING CONDITIONS



#### PROPOSED CONDITIONS



NOTE: Bike Sharrows on Pavement

\*Proposed conditions are concepts ONLY.

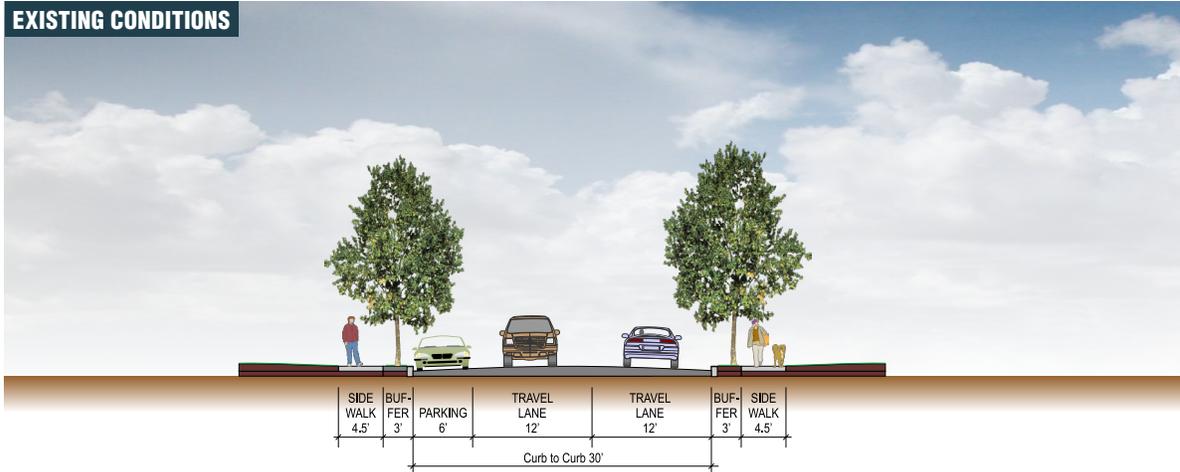


#### Sharrows

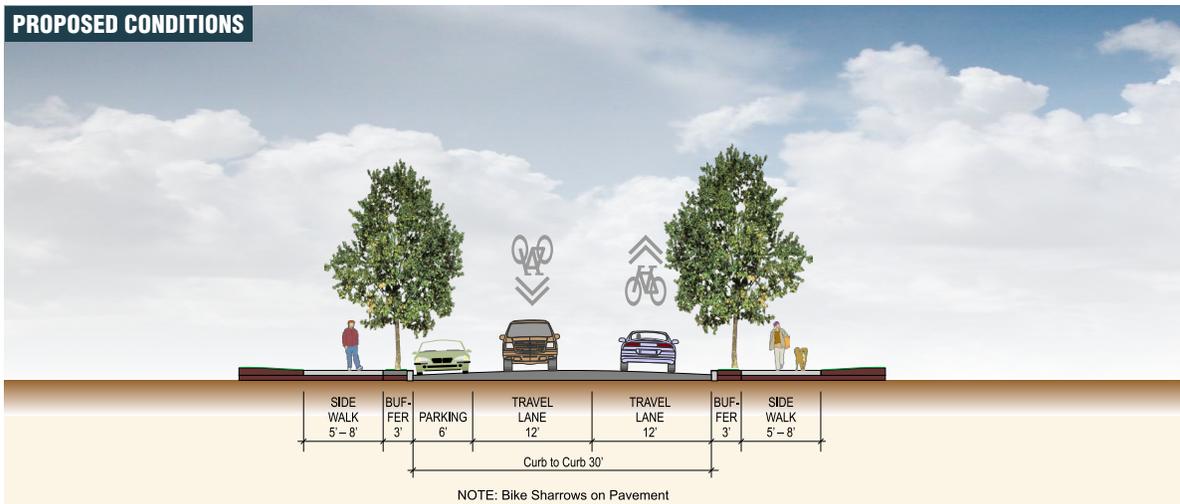
Shared-lane markings, called “sharrows,” help bicyclists and motorists share and navigate streets where there are no exclusive bike lanes. Sharrows show bicyclists where to travel on the road and alert motorists to the presence of bicyclists.

### Location 4: 5th Avenue South at 42nd Street (Avondale)

#### EXISTING CONDITIONS



#### PROPOSED CONDITIONS



\*Proposed conditions are concepts ONLY.

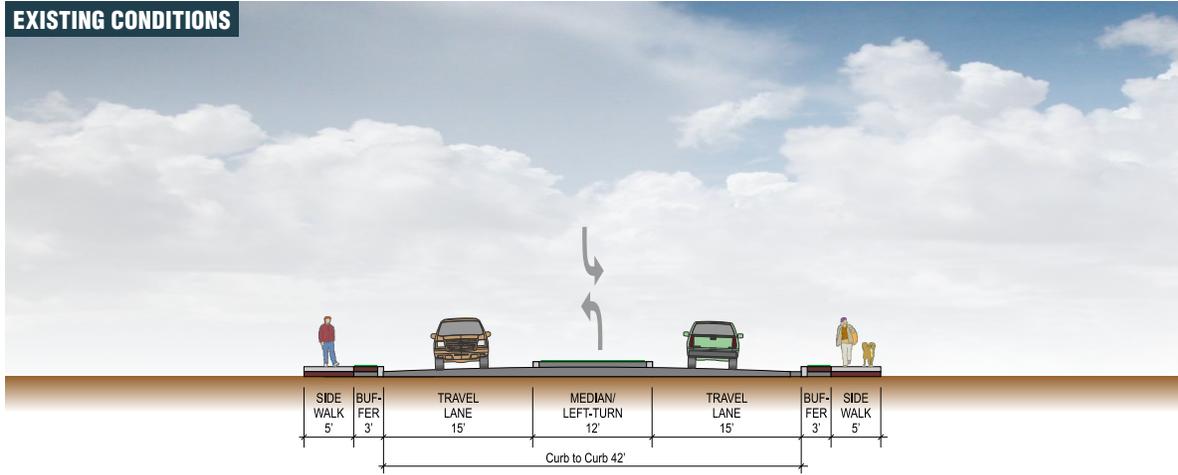


#### Sharrows

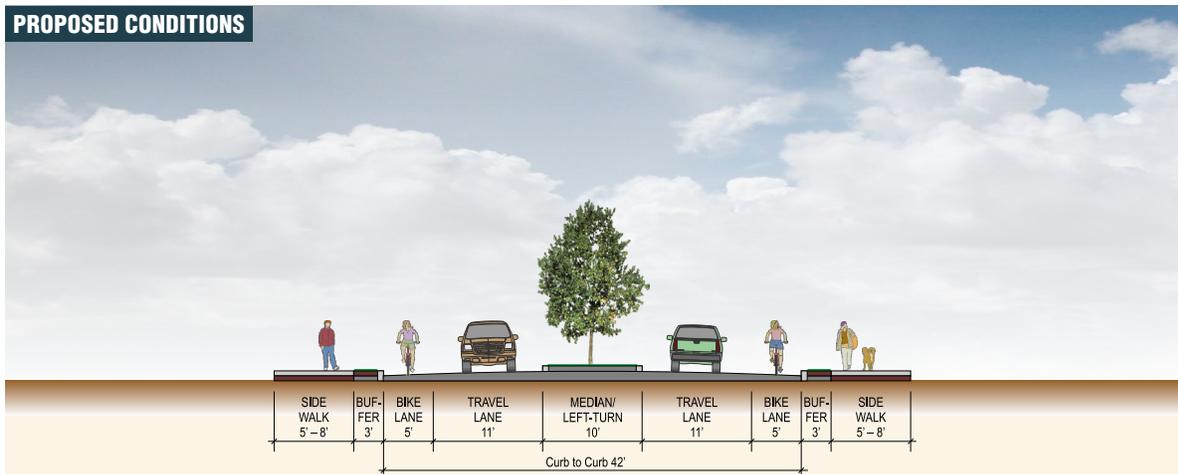
Shared-lane markings, called “sharrows,” help bicyclists and motorists share and navigate streets where there are no exclusive bike lanes. Sharrows show bicyclists where to travel on the road and alert motorists to the presence of bicyclists.

### Location 5: 8th Avenue West at Arkadelphia Road (Smithfield)

#### EXISTING CONDITIONS



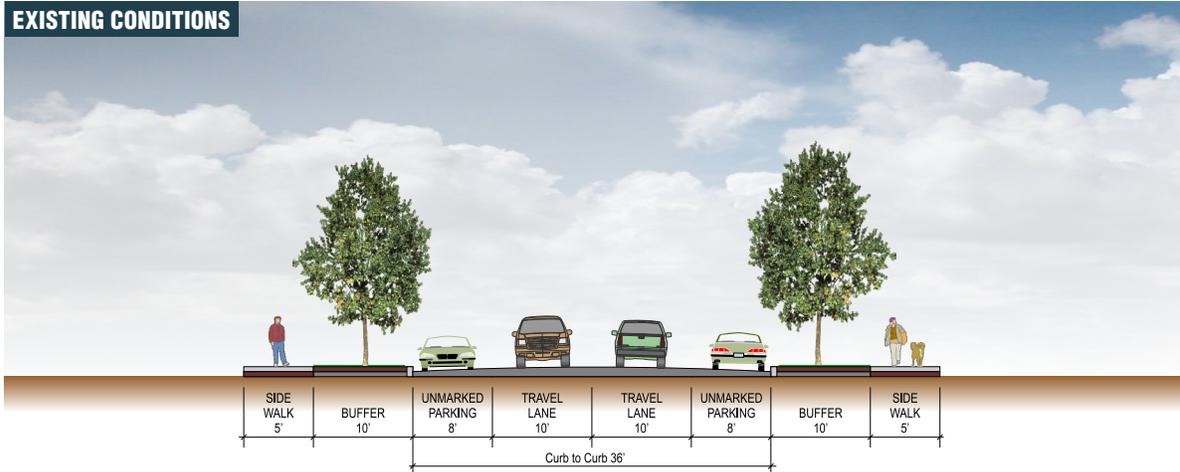
#### PROPOSED CONDITIONS



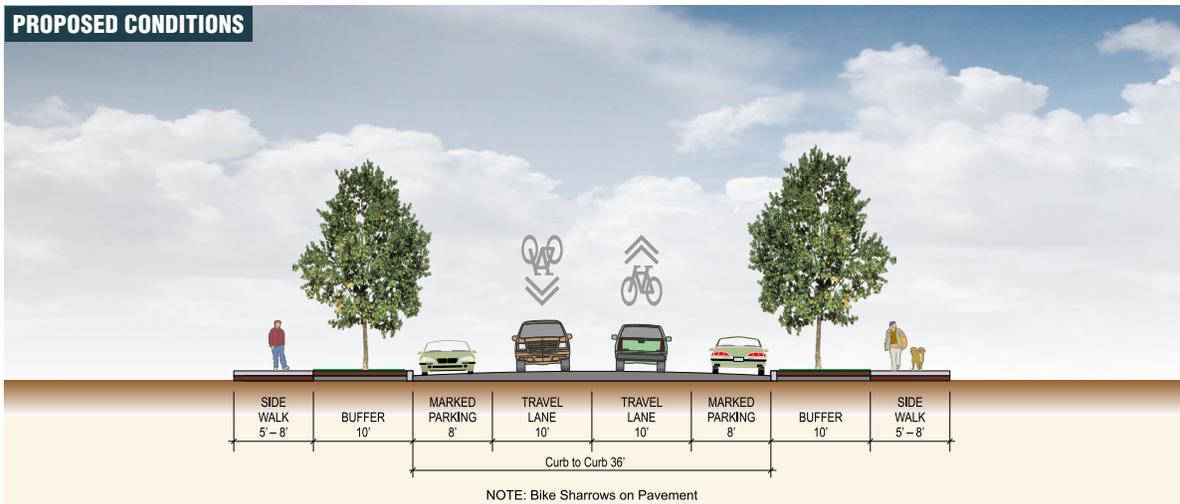
\*Proposed conditions are concepts ONLY.

### Location 6: 28th Street North (Norwood)

#### EXISTING CONDITIONS



#### PROPOSED CONDITIONS



\*Proposed conditions are concepts ONLY.

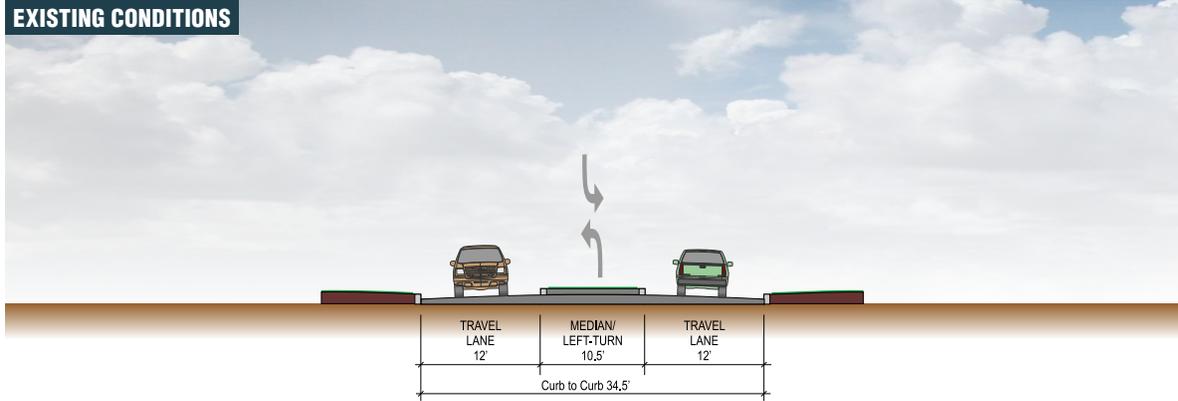


#### Sharrows

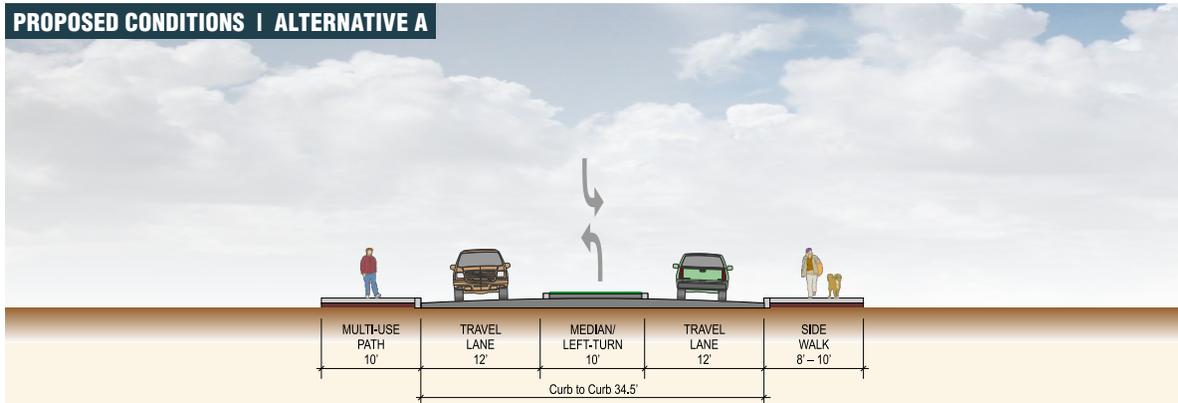
Shared-lane markings, called “sharrows,” help bicyclists and motorists share and navigate streets where there are no exclusive bike lanes. Sharrows show bicyclists where to travel on the road and alert motorists to the presence of bicyclists.

### Location 7: Lyon Lane (Access to Red Mountain Park)

#### EXISTING CONDITIONS

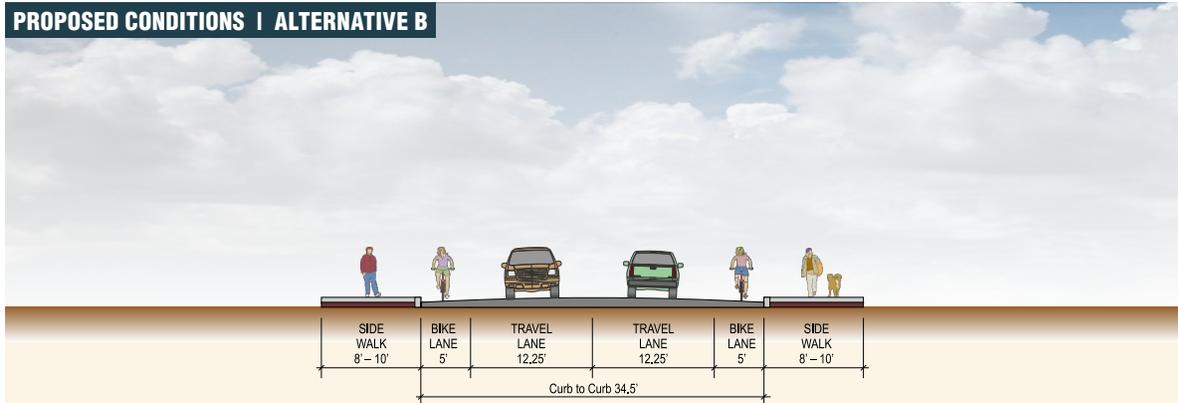


#### PROPOSED CONDITIONS | ALTERNATIVE A



\*Proposed conditions are concepts ONLY.

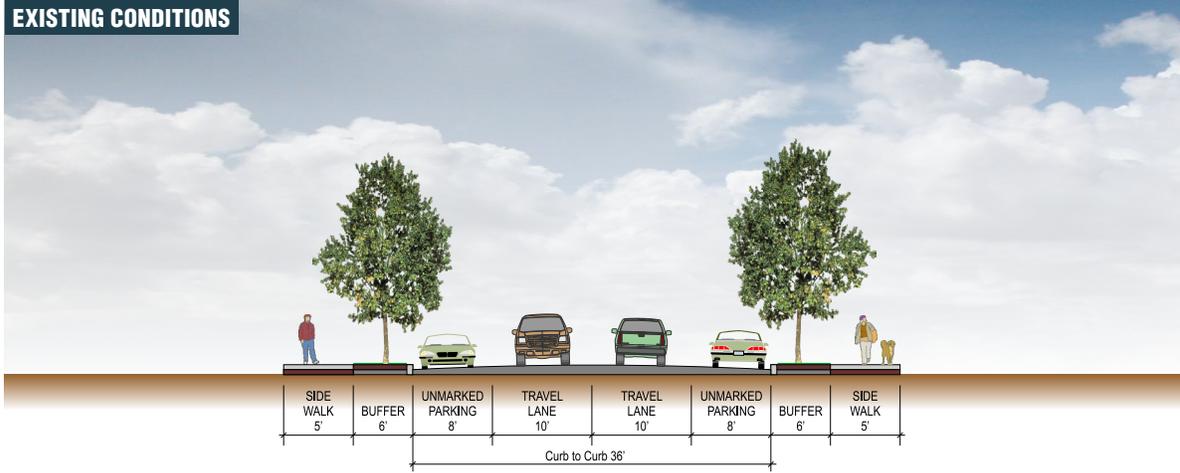
#### PROPOSED CONDITIONS | ALTERNATIVE B



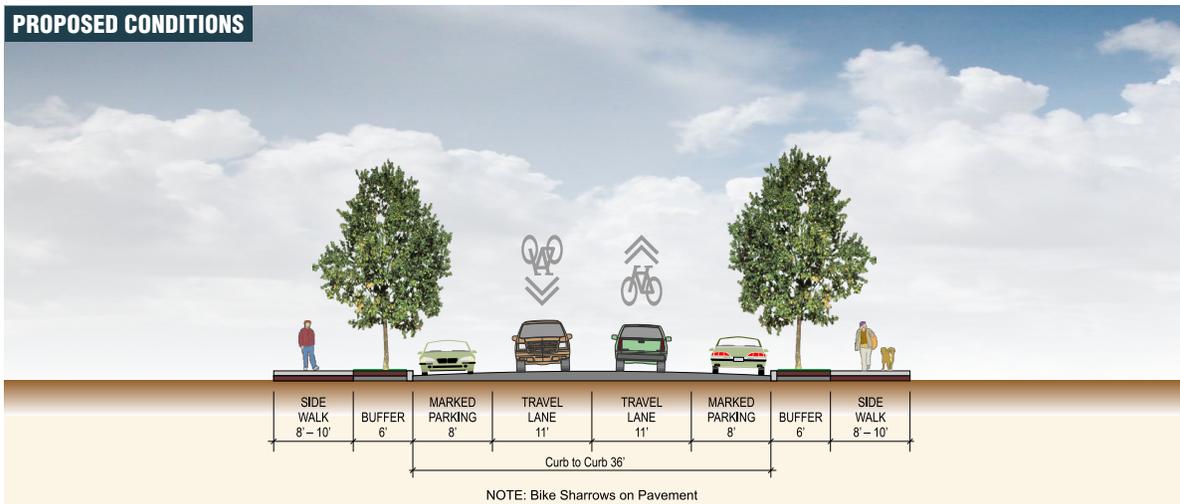
\*Proposed conditions are concepts ONLY.

### Location 8: 83rd Street South (East Lake)

#### EXISTING CONDITIONS



#### PROPOSED CONDITIONS



\*Proposed conditions are concepts ONLY.

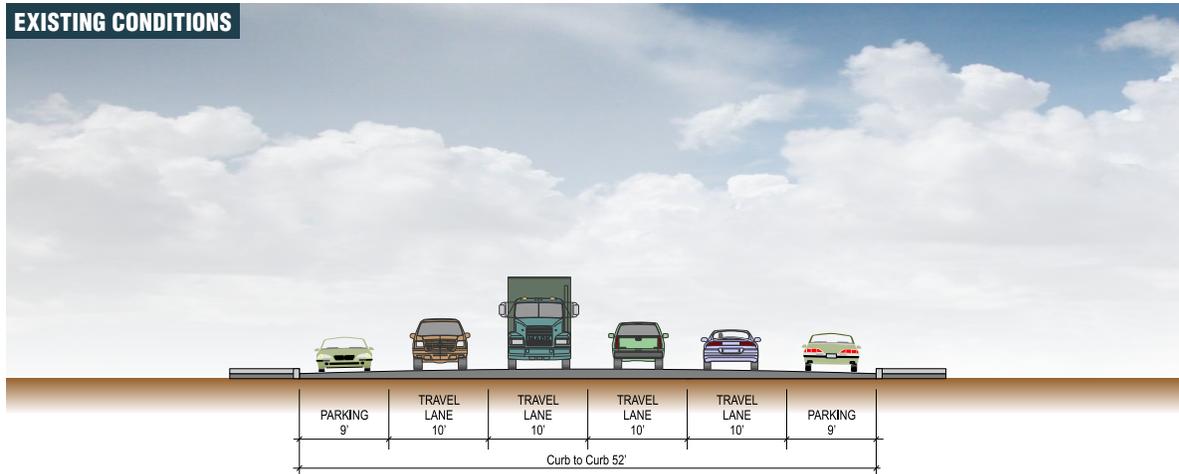


#### Sharrows

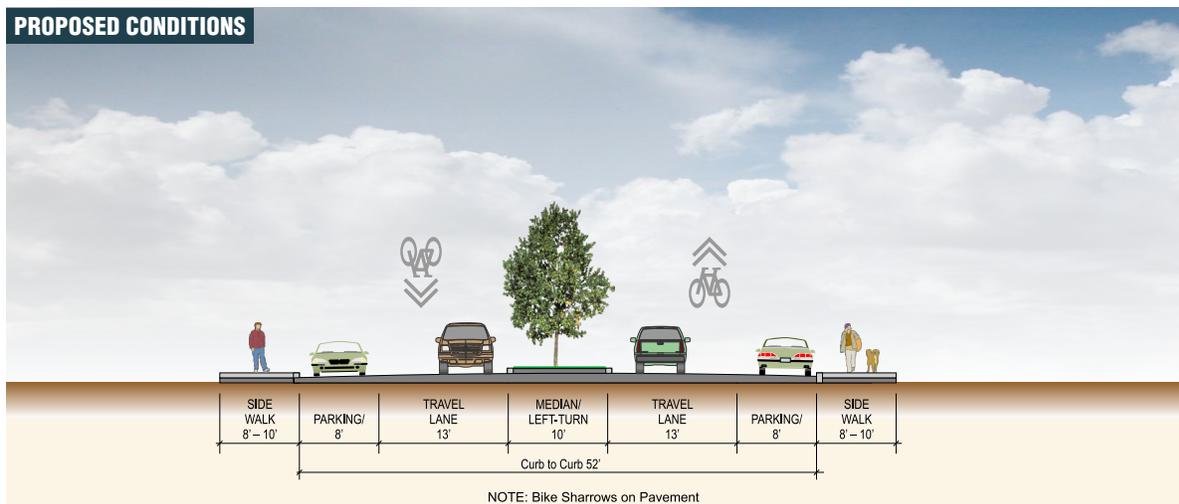
Shared-lane markings, called “sharrows,” help bicyclists and motorists share and navigate streets where there are no exclusive bike lanes. Sharrows show bicyclists where to travel on the road and alert motorists to the presence of bicyclists.

### Location 9: 5th Avenue South at 28th Street South (Lakeview)

#### EXISTING CONDITIONS



#### PROPOSED CONDITIONS



\*Proposed conditions are concepts ONLY.

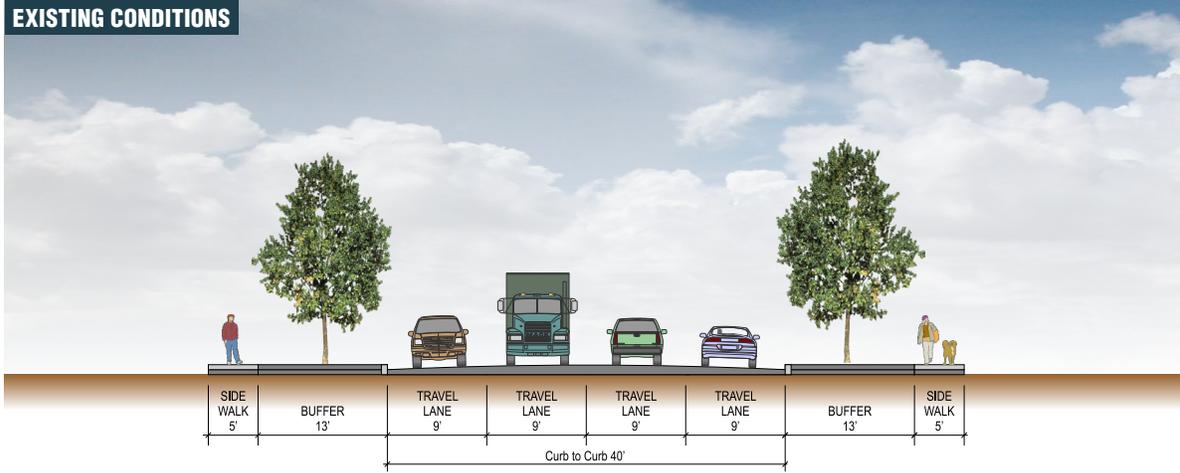


#### Sharrows

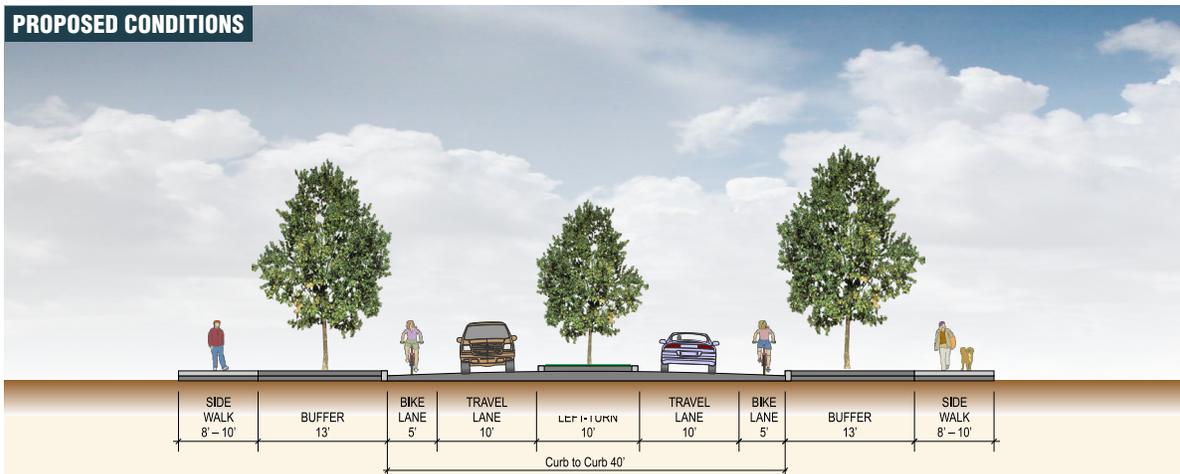
Shared-lane markings, called “sharrows,” help bicyclists and motorists share and navigate streets where there are no exclusive bike lanes. Sharrows show bicyclists where to travel on the road and alert motorists to the presence of bicyclists.

### Location 10: Tuscaloosa Avenue at Center Street (Arlington-West End)

#### EXISTING CONDITIONS



#### PROPOSED CONDITIONS



\*Proposed conditions are concepts ONLY.