

Capital Metro Transit Development Plan: *Final Report*

March 2017



A TRANSIT PLAN FOR THE FUTURE



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Introduction

Capital Metro's *Connections 2025* is a transit system study that rethinks public mobility in Central Texas. The study, conducted over a year by Transportation Management and Design (TMD) Inc., is the latest in a series of reviews commissioned by Capital Metro every five years. *Connections 2025* addresses both short-term (five years) and longer-term (10 years) public mobility needs and opportunities within a sustainable financial plan, based on current and potential increased funding.

Primary goals of this study include addressing declining ridership, changing demographics, population growth and emerging new development that has resulted in increased roadway congestion. The Central Texas region is rapidly growing in population, both in the urban core but also in the surrounding suburban areas. The growth has resulted in increasing affordability issues, forcing formerly transit-dependent populations to move into areas unserved or underserved by transit. Additionally, the demographics of the population are changing, resulting in a new mix of people with different mobility needs and consumer behavior. These changes all play a part in declining ridership. As a result, the focus of *Connections 2025* includes identifying strategies to respond to the shifting needs of Central Texas as well as reverse the recent ridership trends.

This study reviewed the structure of the entire transit network and the performance of specific routes in order to provide Capital Metro with a better understanding of the market in which it operates and the level of service it provides. The findings led to the development of recommendations designed to build upon the network's strengths, increase ridership, improve the overall rider experience and ensure the system's financial sustainability. The recommendations are based on board-established goals, analysis of existing and future market conditions, performance data and feedback from Capital Metro riders and key stakeholders. *Connections 2025* will help guide transit service development over the next decade.

Goals and Focus

The primary goal of *Connections 2025* is to develop a plan that increases Capital Metro ridership while using vehicle and labor resources more efficiently. As population and employment grow and demographics shift, it is important to reshape transit service to respond to new and changing public mobility demands. It is also critical that Capital Metro implement changes in a financially sustainable manner. *Connections 2025* maximizes the performance of existing services while responding to new community mobility needs. The overall strategy is to enhance service on key network routes to increase ridership and generate more fare revenue, while maintaining mobility options in lower-potential ridership areas. The recommendations also respond to key issues identified by the community to create a transit system that is more attractive to riders.

Connections 2025 addresses regional mobility issues of both existing and potential riders. To that end, Figure 1 illustrates *Connections 2025* accomplishments.

Figure 1: Connections 2025 Accomplishments



Study Process

The study began in October 2015 with an extensive data collection effort. Data was collected from automated systems to analyze rider activity, travel time and on-time performance information on all fixed-route trips operated by Capital Metro. In addition, 6,500 surveys were collected in person and online, providing valuable information on the demographics and travel preferences of Central Texas residents. Public outreach was conducted at community centers, college campuses, neighborhood gatherings and major transfer hubs to gain feedback from the public on improvements they would like to see. A summary of the study timeline is shown in Figure 2.

Figure 2: Connections 2025 Timeline

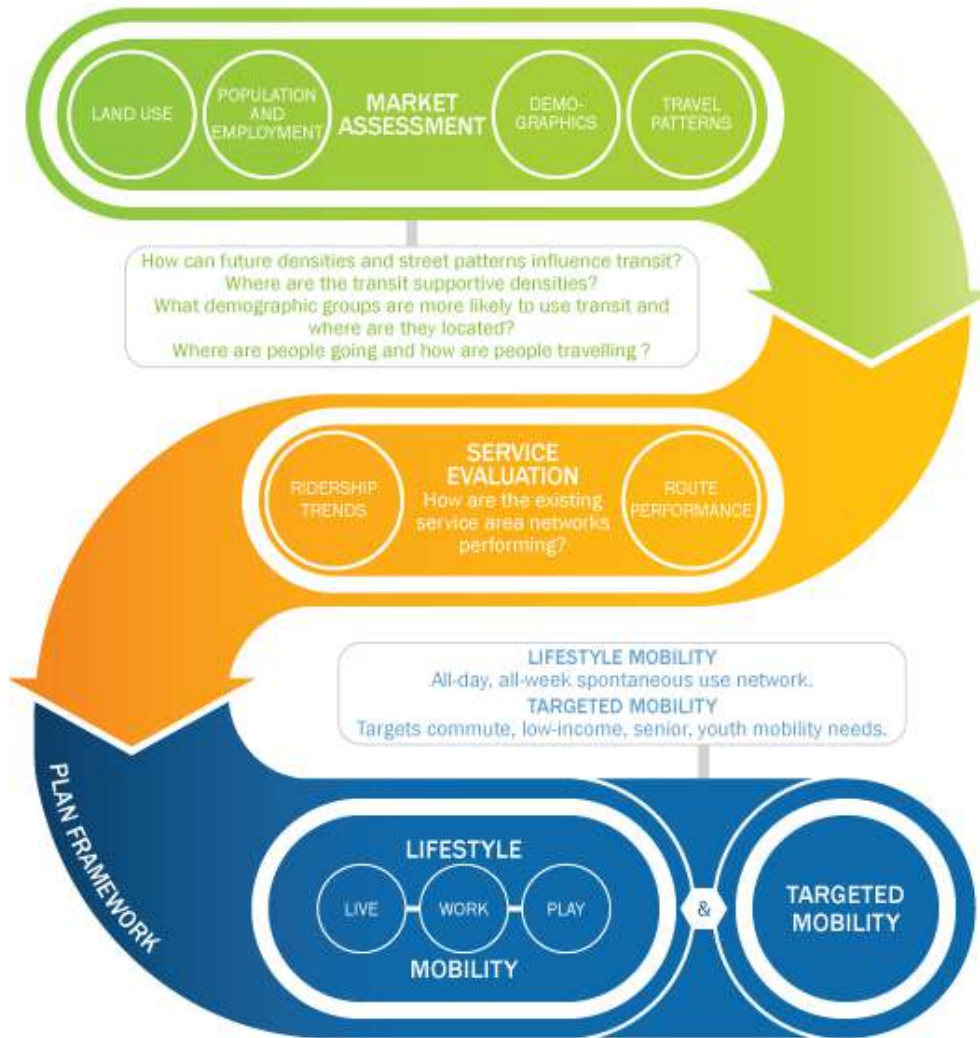


Concurrent to the initial public outreach, prior transportation studies in Central Texas were reviewed to better understand existing mobility issues and the need for future transportation options. Additionally, key transit markets were assessed to understand what demographic changes would influence transit design. These markets included college-aged students, young professionals, seniors, and minority and low-income populations, all of which have been shown to use transit in Central Texas. Existing services were also analyzed to understand which areas and corridors were successful, and which areas, route designs and service options did not meet existing service standards.

With a better understanding of the existing market and service conditions, the study then turned to designing an improved network for Central Texas. Another round of public involvement with the board and public stakeholders focused on the trade-offs needed to design a successful network. Trade-offs included frequency versus coverage, walk distance, and “all-day, all-week” versus commuter-focused service. This discussion informed the design of the draft *Connections 2025* network.

This draft network focused on a “frequency-first” approach, which consolidated several routes into attractive corridors. This included the evolution of MetroRail into an integral part of the High-Frequency Route network, as well as an expanded MetroRapid and Frequent Local route network. Supporting coverage was designed to fill gaps in the High-Frequency Network, while being as attractive and direct as possible. Areas served by Capital Metro that were insufficiently dense to support fixed-route transit service were deemed candidates for alternate mobility options. While the plan sought to minimize negative impacts to riders of the existing transit network, some individuals no longer have access to service under the proposed network. These impacts, both to existing riders of fixed-route and MetroAccess, the complementary ADA paratransit service, were quantified. Additionally, the plan was phased to realize as many of the benefits as possible early on. The draft plan was released to the public and key stakeholders in August 2016 to gather feedback on the proposed changes. This outreach engaged more than 3,200 citizens in person. Comments were incorporated into the revised recommendations presented in the final *Connections 2025* Plan, adopted in February 2017.

Figure 3: Connections 2025 Study Process



Central Texas Transportation Data Review

A thorough understanding of a community's context, both from a market and policy perspective, provides the foundation necessary to develop a successful transit system that is able to meet the needs of both residents and visitors. For *Connections 2025*, the first step in achieving this was conducting a detailed review of relevant plans, studies and related policies currently in place. These include regional, municipal, and community based plans and reports in the Central Texas region, many of which incorporate transit-related goals or a discussion of community desires for the transit system.

Detailed summaries of each document reviewed are included in the Appendix A: *Central Texas Transportation Data Review* report.

Transit Plans and Studies

A review of the transit planning studies recently completed in Central Texas provided a broad understanding of not only where the region's transit vision stands currently, but also what the region has planned for the future. Understanding what transit projects have been implemented to date allows future planning efforts to monitor and evaluate success. Taking a second look at proposals that have not been implemented provided the opportunity to determine whether they are still relevant and useful, as conditions have changed. Additionally, reviewing these plans ensured consistency with local and regional transit planning goals and the public's view on what transit's role should be within the community. Lastly, earlier planning efforts provided insight into future service options, as well as other high-value transportation investments related to both service and capital needs.

Transit planning studies reviewed included:

- All Systems Go
- Service Plan 2020
- Project Connect: Central Texas High Capacity Transit System Plan
- Project Connect North Corridor Study
- Capital Metro 2015 Customer Satisfaction Survey
- 2015 CMTA Origin and Destination Study
- Capital Metro Service Guidelines and Standards

Transportation Planning Studies

Beyond transit plans, broad transportation planning studies provided the basis for a comprehensive network in the region. Understanding connections between transit and other modes, as well as identifying where growth is expected and its impact on the transportation network, is critical to developing a sustainable region and community. By maintaining consistency with a wide range of plans and studies, each with similar goals and visions, *Connections 2025* built a reimagined network focused on multi-modal choices for residents and visitors in Central Texas. Other transportation planning studies reviewed included:

- CAMPO 2040 Plan
- Park & Ride Assessment Report

Land Use Planning & Other Relevant Studies

Livable and sustainable communities that support and encourage transit use are the result of good land use planning. Transit-supportive land uses feature increased density, concentrated mixed-use development along transit corridors and connected road and sidewalk networks, among other elements. Understanding the vision for growth and development in Central Texas is another key component of *Connections 2025*. The following documents provided context for the region's land use planning and related efforts:

- Imagine Austin
- Austin/Travis County Community Health Plan
- Mobility ATX Findings Report

Summary

The previous studies highlighted the need for a coordinated effort to develop mobility solutions that best meet the needs of Central Texas. Coordination between Capital Metro and partner institutions is essential to successfully identify and develop mixed-use corridors that encourage sustainable mobility options less reliant on automobile use. This coordination extends to communication with neighborhoods to understand and support community mobility needs in the context of regional mobility. Lastly, a review of previous and ongoing transit studies laid the groundwork to understand where transit has proven to be successful and to identify which alternatives are available that best meet recent demographic shifts in Central Texas.

Existing Conditions

The Market Assessment and Service Evaluation reports detail the existing conditions in Capital Metro's service area. The Market Assessment explored today's challenges and opportunities in attracting customers to public transit in Central Texas. It further examined the potential roles and implications for Capital Metro to help mitigate quality of life impacts from the anticipated 80 percent growth in population by 2040. The Service Evaluation sought to understand the attractiveness, effectiveness and efficiency of Capital Metro's current transit services and network in providing public mobility in Central Texas.

The findings from these documents helped inform and develop the guiding principles and framework for *Connections 2025*. Each report reviewed and analyzed the following:

- Market Assessment
 - Land Use – Review of land use densities and development patterns to understand how they influence transit requirements.
 - Population and Employment – Analysis of current and future population and employment patterns and densities to determine where transit may be most needed and successful.
 - Demographics – Review of existing population subgroups in the region, as well as projections where available, to better understand the connections to land use patterns and mobility needs.
 - Travel Patterns – Analysis of regional and community travel patterns to understand mobility needs and identify key opportunities where transit can play an increased role in travel.
- Service Evaluation
 - Ridership – Review of current use of Capital Metro service, recent trends in ridership and linkages with underlying market conditions.
 - Service Performance – Review of the productivity, quality and financial performance of the network, individual routes and route segments. Identification of where and why current Capital Metro service is successful and where there are challenges.

See Appendix B: [Market Assessment](#) and Appendix C: [Service Evaluation](#).

Market Assessment

The Market Assessment is a key component of *Connections 2025*, as it highlights the current and future market for transit within the Capital Metro service area. The assessment identified existing regional and local transit opportunities in the Capital Metro service area by providing an understanding of community demographics, where people work, land use patterns and growth trends, and major traffic generators. It is important to evaluate these factors to determine how Capital Metro can best serve the region's mobility needs and to identify where additional transit investment may be warranted in order to increase ridership in the near and long term.

Data from a variety of sources was collected, reviewed and analyzed to determine existing conditions and future trends. Sources included the U.S. Census Bureau, Texas Data Center, city of Austin studies and land use plans/policies, University of Texas, Austin Community College, the Austin City Demographer, and Capital Metro. Key findings from the Market Assessment include:



REGIONAL GROWTH

Regional Growth: Central Texas is expected to continue growing at a high rate. Many regional initiatives like Project Connect, Capital Metro's Service Expansion Policy and suburban Transit Development Plans (for cities outside the Capital Metro service area) are already working to address that growth. Leveraging the critical link between land use and transit is an opportunity for the city of Austin, Travis County and Central Texas to absorb this massive economic growth without compromising quality of life.



AUTO-CENTRIC
DEVELOPMENT

Development Patterns: The automobile-centric development patterns present in Central Texas, particularly its suburban and rural areas, create many disincentives to use transit. Coupled with low gas prices and free or employer-subsidized parking, the challenges of designing attractive transit routes and efficient networks are not solvable without rethinking land use development patterns. The region's massive growth forecast requires transit use to increase significantly if the expected traffic congestion impacts are to be minimized. However, much of the new development is expected to be concentrated in already developed areas – a strong positive outlook for cost-effective transit ridership growth and managing congestion (see Figure 4). Concentrating new Travis County development along key mixed-use corridors and within existing population and employment centers will lead to more livable communities with transit-supportive densities and transit-oriented development (TOD).



CONCENTRATED
DEVELOPMENT



AFFORDABILITY IN
AUSTIN

Affordability within Austin: The increasing cost of land and housing in Central Austin has driven lower income households to the city's periphery and beyond. Many residents, especially in lower income households, can no longer afford to live in areas with access to the High-Frequency Route Network. The more expensive short-term solution is to bring public transit to affordable housing. The more cost-effective, sustainable, longer-term solution is locating affordable housing within Capital Metro's Frequent Route Network.



EMERGING EMPLOYMENT
CENTERS OUTSIDE CORE

Employment Centers Outside of Core: As is the case anywhere there is a surplus of developable land, many large Central Texas employment centers have located in areas that are low-density and outside major mixed-use corridors. Developing high-ridership services to these areas will require partnerships, both by creating new "last-mile" access that connect riders from mobility hubs to their employers, and by rethinking development to concentrate around mobility hubs.



STUDENT
DEMOGRAPHIC

Student Population: Student travel associated with the University of Texas and Austin Community College (ACC) will continue to be a strong Capital Metro ridership constituency. Actual enrollment figures for both will continue to rise, with UT enrollment increasing 16 percent and ACC 8.5 percent by 2025.¹ Increasing student use of transit for non-school related trips by creating a more robust High-Frequency Route Network will grow ridership cost-effectively.



LOW GAS PRICES

Low Gas Prices: Gas prices both nationally and within Texas have decreased dramatically over the last five years, making automobile travel a more attractive option than transit for many people. The Austin area has even lower gas prices than the national average (\$2.19 versus \$2.39 per gallon, as of April 2017). As a result, it is less costly to drive, which makes increasing discretionary transit ridership more challenging.

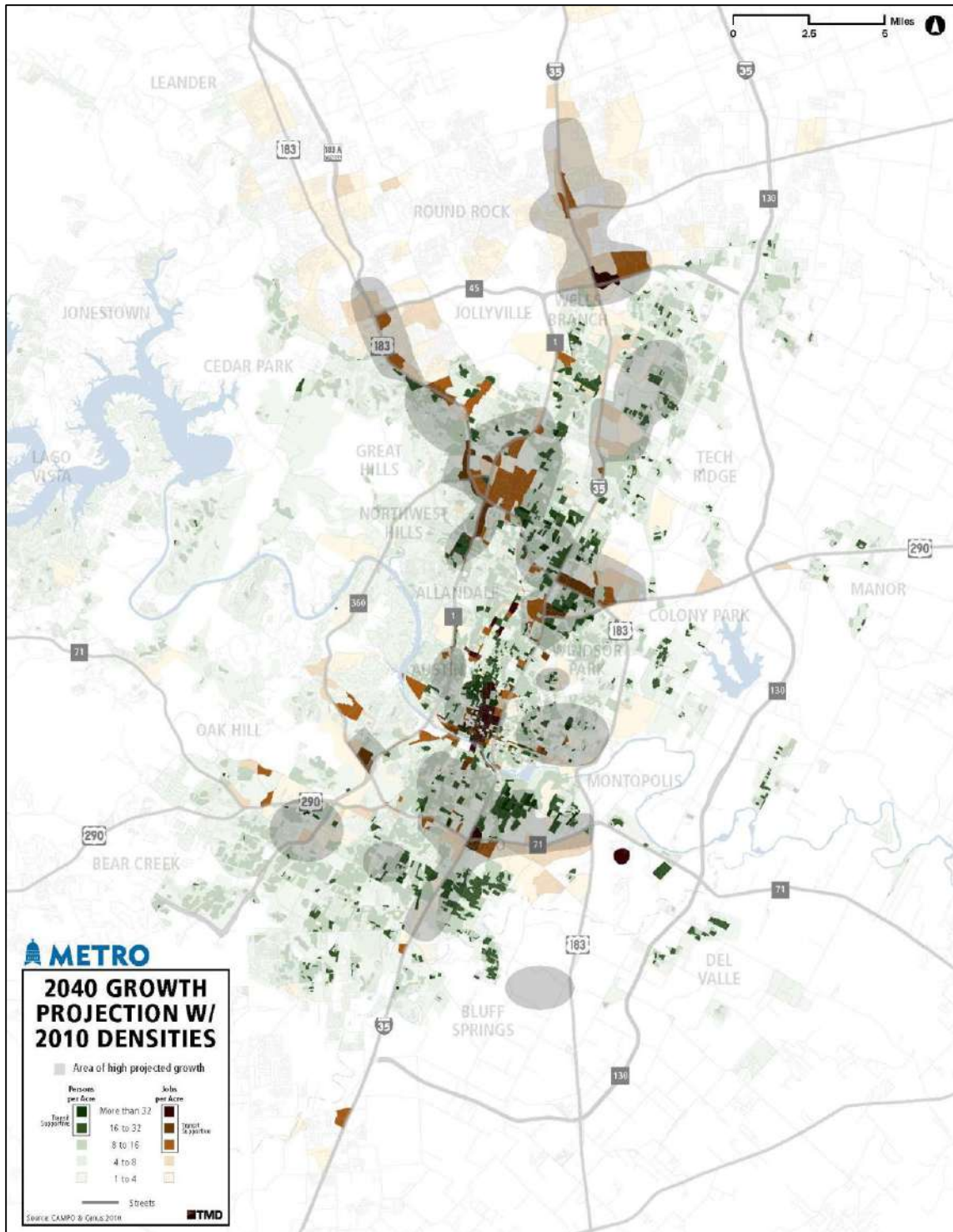


CITY INITIATIVES

City Initiatives: City of Austin initiatives like *Imagine Austin* and the forthcoming update to the Land Development Code (CodeNext) focus on policies and goals that direct development to be more compact, connected and sustainable. This includes encouraging denser, mixed-use development along transit corridors, where such land uses support transit ridership. Partnering with the city of Austin and other jurisdictions on their land use planning efforts is essential to Capital Metro rethinking public mobility in *Connections 2025*.

¹ Texas Higher Education Coordinating Board *Enrollment Forecast 2015 to 2025*

Figure 4: 2010 Population and Employment Densities with Growth Areas Map



Service Evaluation

The Service Evaluation is another key component of *Connections 2025*. While the Market Assessment provided the context for the system's operations, the service evaluation examined how the system interacts with its market.

The Service Evaluation focused on the fixed-route services Capital Metro provides in the Central Texas region, including MetroRail. It analyzed network and route ridership, service efficiency (passengers per revenue hour and trip), cost effectiveness (percent of operating costs covered by farebox revenue and the subsidy per passenger boarding), on-time performance and service levels in order to identify strengths in the system and opportunities for improvement. Figure 8 illustrates system ridership. Other key findings from the Service Evaluation include:

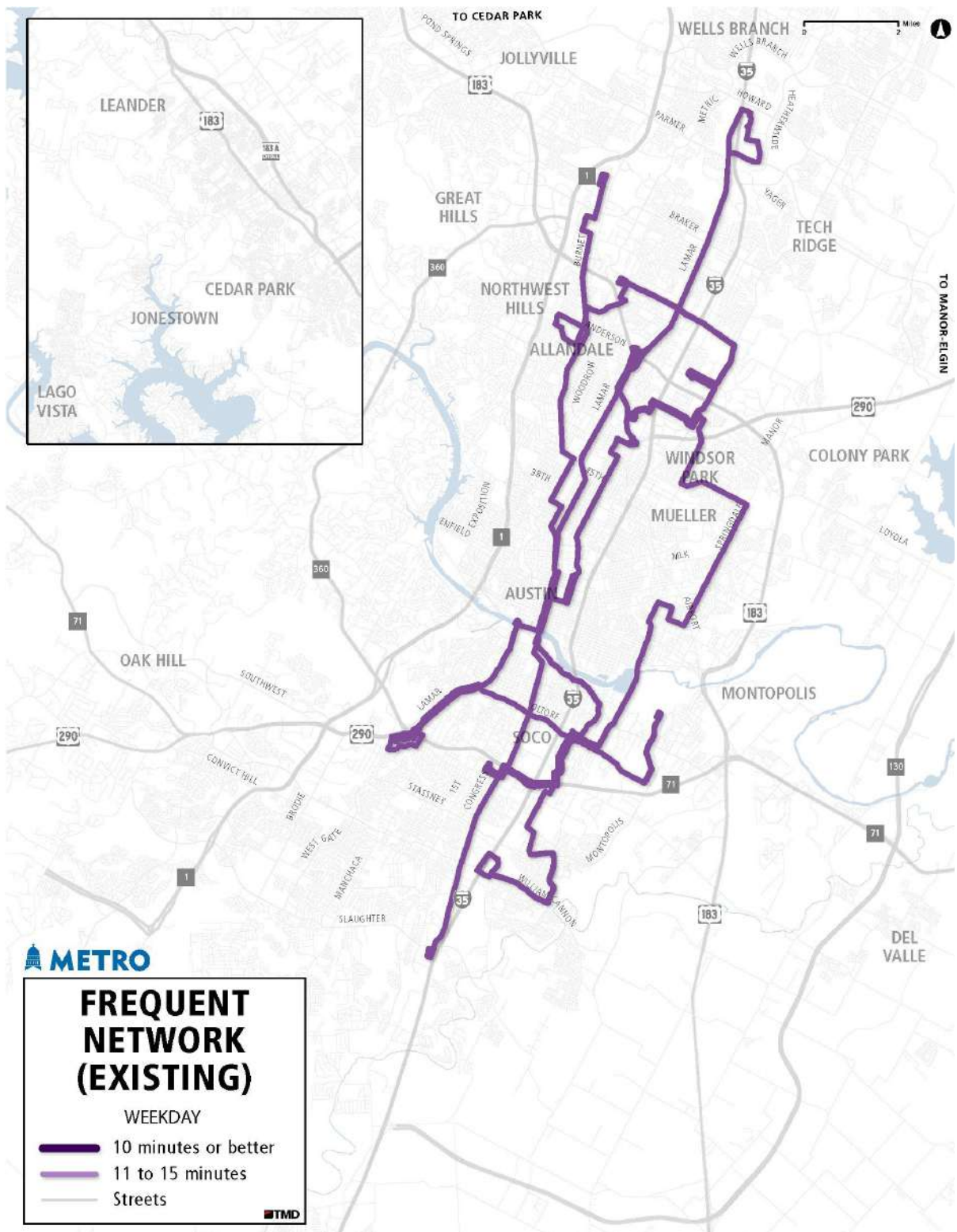


High-Frequency Route Network: Capital Metro has taken the first steps to build ridership through the implementation of the High-Frequency Route Network (see Figure 5). Since 2014 Capital Metro has improved weekday service on several route corridors to 15 minutes or better. In addition to UT Shuttle service, the two current MetroRapid routes operate frequently, with service every 12 minutes. The target frequency for spontaneous use is every 10 minutes (the threshold where riders no longer need to consult a schedule). Weekend service is less frequent, with corresponding lower ridership. The full benefit of high-frequency transit will be realized when additional routes integrate into a more robust High-Frequency Route Network that provides access to a greater percentage of the population, jobs and travel destinations all week. Further development of this High-Frequency Route Network is a key strategy of *Connections 2025*.



Lack of Network: Capital Metro today remains a route-oriented service, with many routes operating along the same corridor before branching out to different locations. Additionally, Commuter routes often provide very limited "one-seat rides" that may be better served through feeder routes into a High-Frequency service. The lack of an interconnected transit network that serves many destinations and trip purposes reduces the usefulness of the Capital Metro system as a whole. *Connections 2025* will focus on growing and expanding a High-Frequency Route Network that is easy to understand, use and operate.

Figure 5: Existing High-Frequency Route Network Map





Matching Services to Markets: Ridership and service performance on the UT Shuttles are significantly stronger than the remainder of Capital Metro services (see Figures 6 and 7). Figure 6 shows that UT Shuttles are the most frequent and most productive services, while Figure 7 shows UT shuttles generate proportionally more ridership for service provided. Part of the success of these routes is attributed to a key market provided by dense student populations with a single, shared daily destination, the UT campus. Further integration of these routes with the mainstream Capital Metro High-Frequency Route Network should be pursued to strengthen UT-area commuting while enhancing student transit use beyond just school trips. Other services such as senior shuttles and school trippers should be tailored to meet specific community needs.

Figure 6: Weekday Productivity vs. Frequency

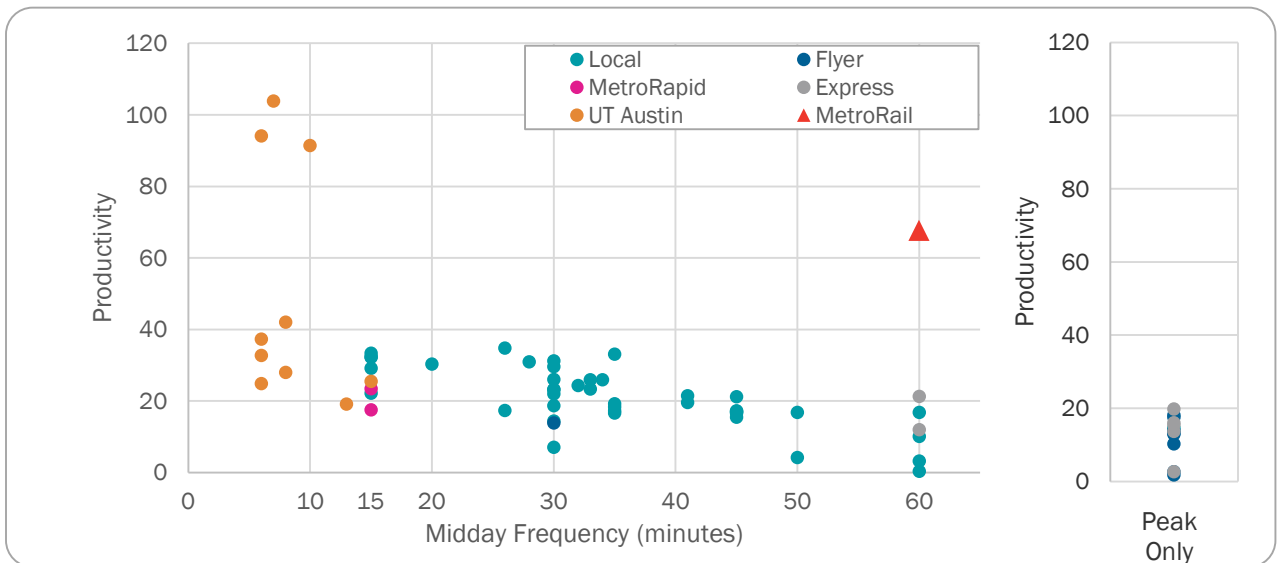
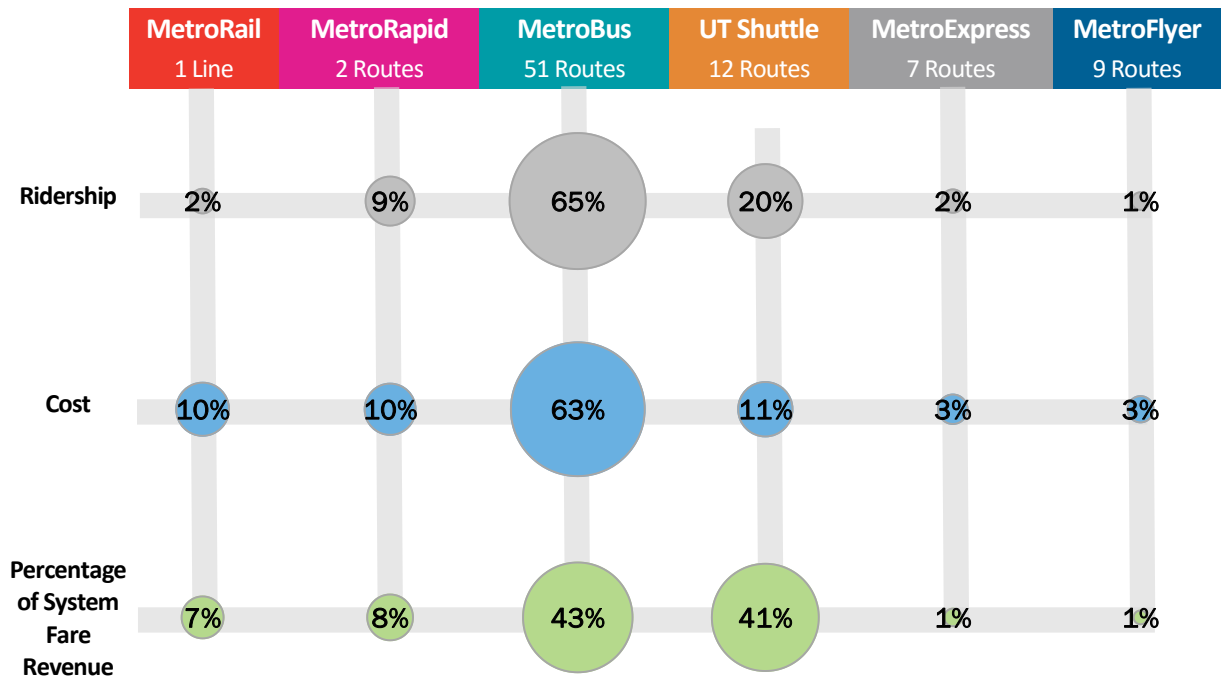


Figure 7: Summary of Weekday Ridership, Cost and Revenue by Service Tier



Enhanced Facilities: Capital Metro has a large number of transit centers and Park & Rides that can support the development of an enhanced High-Frequency Route Network. Transit center locations will likely change over time as ridership and transfer patterns evolve, making high quality street corner transfers in the core High-Frequency Network grid a priority. New mobility hubs should be placed in locations where key transit corridors meet and provide links between the High-Frequency and basic coverage networks. These transit centers should also provide opportunities for riders to connect seamlessly with other mobility options, such as car-, ride- and bikesharing services, public or private shuttles and pedestrian/bike paths. Optimizing the location will be key to ensuring they function efficiently for both Capital Metro operations and for customers transferring. They will need to facilitate rider connections, address parking needs and provide operator rest facilities (where routes terminate). Additionally, Park & Rides need to be located at sites easily accessible to commuters, allowing them to integrate effectively into the transit system, encouraging transit use for a broad range of mobility needs.

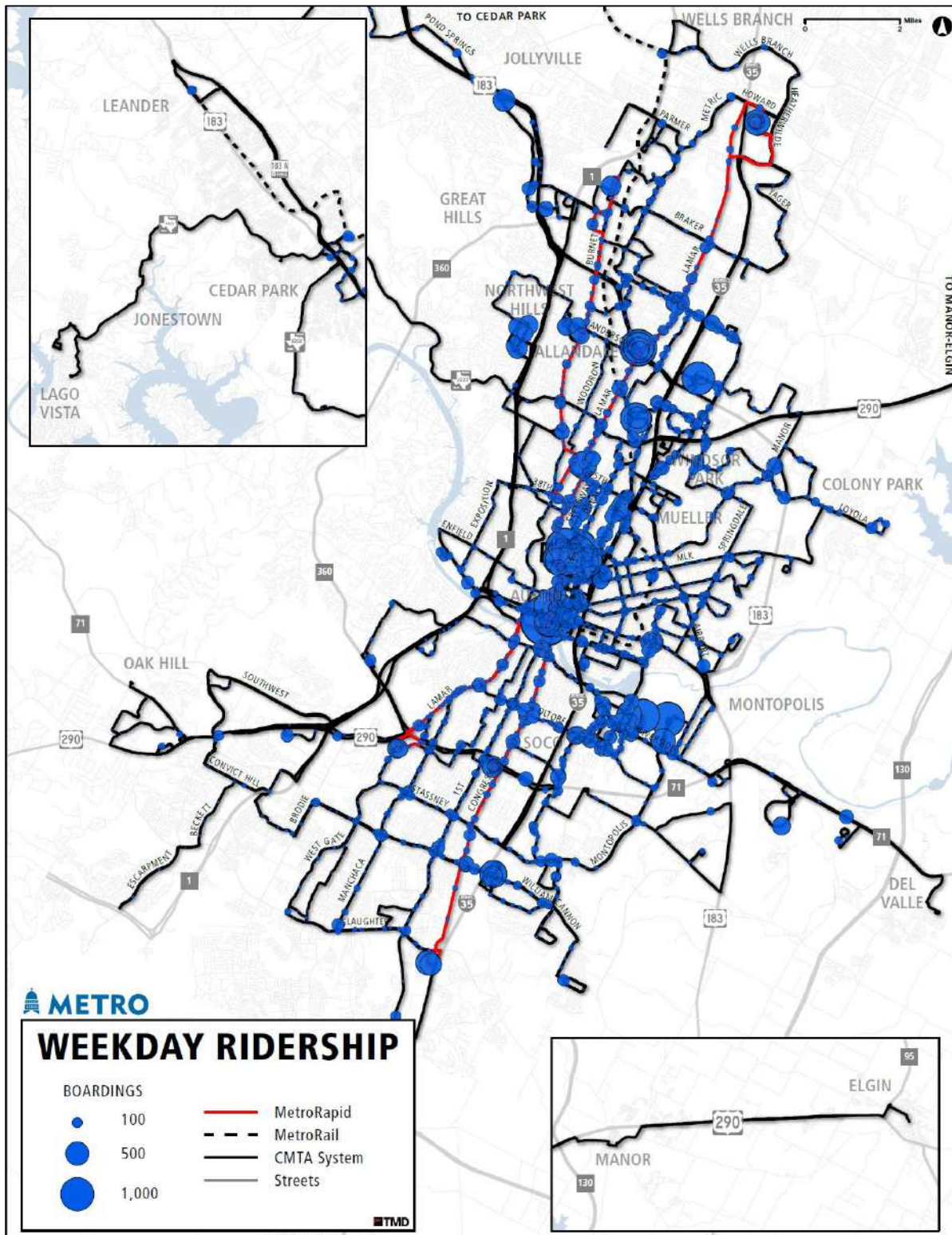


Low Farebox Recovery: Capital Metro recovers slightly more than 10 percent of its costs through fares. Improving this rate will generate funding for additional service while supporting financial sustainability. Increasing fares now would negatively impact ridership and should therefore be delayed until riders and the community recognize the value of a more frequent, more connected transit network provided by *Connections 2025*. However, other elements associated with increasing farebox revenue – carrying more riders per revenue hour (effectiveness) and using vehicle and labor resources to better advantage (efficiency) – are central themes in *Connections 2025*.



Fare Structure: Capital Metro's previous three-tiered fare structure consisted of Local, Premium and Commuter fares. The tiered system encouraged riders to select the cheapest service, but not necessarily the best service for them or the most cost-effective service for Capital Metro. *Connections 2025* migrates away from just trips and routes (commute thinking) to a High-Frequency Network that supports lifestyle mobility (live-work-play transit). Capital Metro's board of directors has already chosen to implement a simple, flat fare structure for the core service network in response to a *Connections 2025* recommendation. The Premium level was discontinued, effective January 8, 2017. Additionally, an integrated fare approach that encourages riders to use transit in conjunction with other third party mobility providers (e.g., bike and carsharing) should also be considered.

Figure 8: Weekday Ridership by Stop Map



Public & Stakeholder Outreach Activities

Capital Metro recognizes that the process of realizing a vision for improved public mobility in Central Texas requires an extensive, collaborative conversation with the community. Throughout the *Connections 2025* visioning process, Capital Metro engaged key stakeholders, current riders and the public to learn about priorities and preferences for public mobility in the region.

The initial round of outreach was conducted between December 2015 and March 2016 and provided an overview of the project and information about Capital Metro's existing service. The next round of outreach was conducted in May 2016 to present key findings from the Market Evaluation and Service Analysis, and to better understand the public's priorities in developing *Connections 2025*. The final round of outreach occurred in coordination with the release of the draft plan on August 22, 2016, and staff received feedback until plan adoption in February 2017. The feedback informed multiple updates to the plan including the evaluation of route extensions and the development of Mobility Innovation Zones. Multiple methods were used to hear from participants about their priorities for transit service and their vision for public mobility in the region as outlined below. All online materials were available in both English and Spanish and made available to the visually impaired community. Figure 9 provides a high-level overview of the outreach methods used and volume of feedback received throughout the study.

Figure 9: Community Feedback Infographic



Project Website

The project website, Connections2025.org, went live in December 2015. This website became the central clearinghouse for information about the project and upcoming events. Project presentations and documents were posted regularly for public review, and a “Public Outreach Events” page included the dates, times and locations of all public meetings in both list and map forms. Outreach tools such as online surveys were posted on the project home page, and citizens could review the draft plan by clicking on route maps and links to proposed schedules. Overall, more than 25,000 users viewed nearly 75,000 pages on Connections2025.org over the course of the project.

Newsletters

The project team began preparing and distributing monthly newsletters starting in February 2016. They were sent to nearly 3,000 community members in the *Connections 2025* email database, and kept stakeholders updated on project progress and ways to provide input. The newsletters provided links to the website, dates/times/locations of public meetings and events, and key project information.

Capital MetroBlog

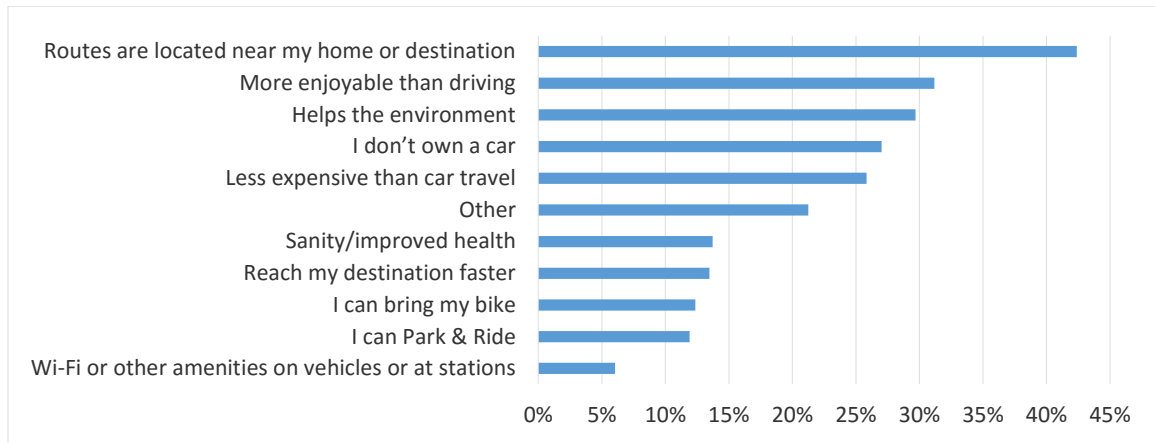
In addition to the monthly newsletters to individuals who subscribed through *Connections 2025*, Capital Metro published several posts on its blog. These provided status updates throughout the course of the project and encouraged public feedback through links to the survey and the website. Specific blogposts were created on topics of community interest, including the new High-Frequency Network, updates to the plan, as well as responding to community concerns with the potential loss of fixed-route service.

Online Surveys

The first online survey, which was available on Connections2025.org between December 21, 2015 and March 13, 2016, asked respondents to let Capital Metro know why they use or don’t use public transportation in Central Texas, and which attributes would encourage them to ride more often. Capital Metro collected 4,886 responses from current riders (3,515), former riders (442) and non-riders (929). A more complete summary of the initial findings can be found in Appendix D: [Community Survey Summary](#). Key findings from the survey included:

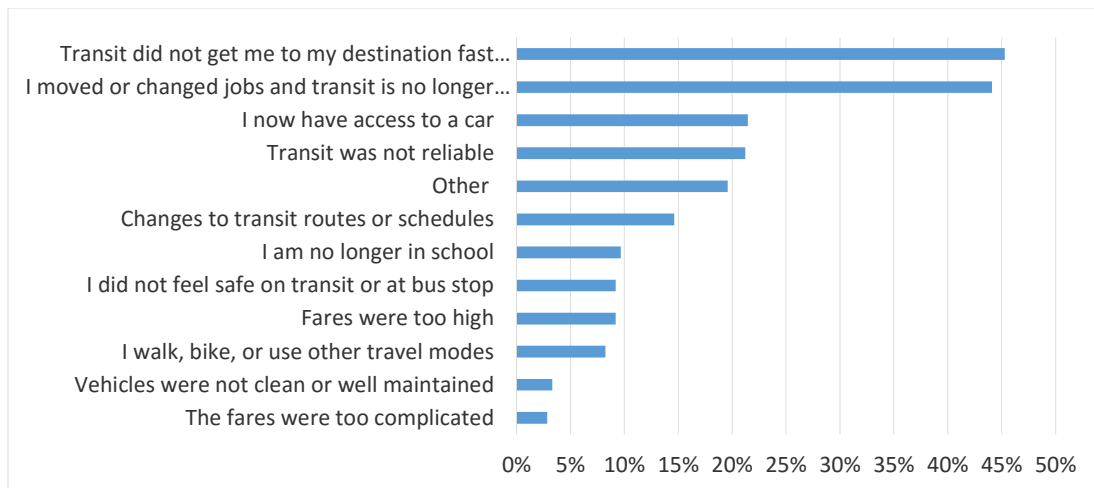
- The top three reasons **riders** use Capital Metro are having routes close to their home or destination (42 percent), having a more enjoyable experience compared to driving (31 percent) and helping the environment (30 percent).

Figure 10: Reason Riders Use Capital Metro



- The top two factors to encourage **former riders** to ride again are if transit operated more quickly (51 percent) and if stops were located closer to their home or destination (50 percent).²

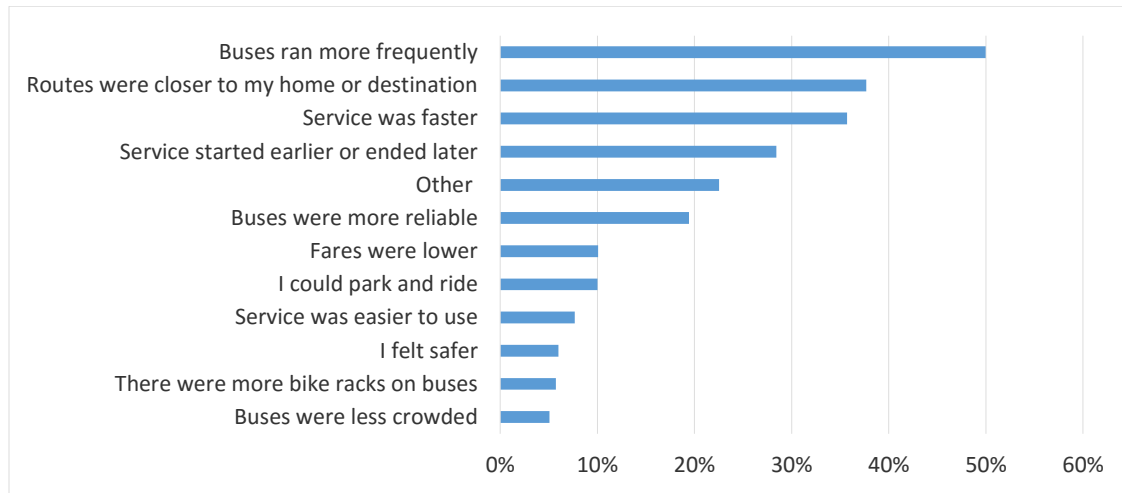
Figure 11: Reasons Former Riders Stopped Riding



- The top three factors to encourage **current riders** to ride more often are if transit operated more frequently (50 percent), service operated closer to their home or destination (38 percent) and if service operated faster (36 percent).

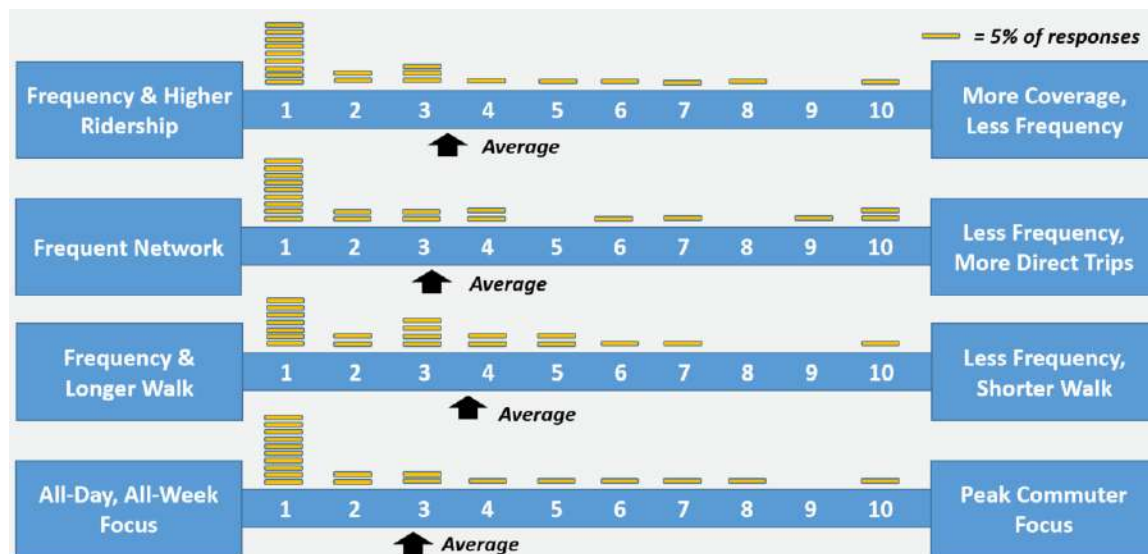
² Respondents could select up to three choices.

Figure 12: Factors to Encourage Current Riders to Ride More Often



The second online survey was available between May 18, 2016 and June 24, 2016, and asked individuals to consider “trade-offs” inherent in improving the transit network. Respondents were invited to prioritize specific elements, such as providing more frequent service with transfers versus less frequent, direct service. A total of 510 survey responses were collected. On the whole, respondents preferred frequency over coverage, and recommended that service operate all day, all week rather than focus on a commute-oriented service. These results helped guide the design of the *Connections 2025* network.

Figure 13: Trade-off Prioritization Results



The final online survey asked for feedback on the draft plan, and provided an opportunity for respondents to submit specific comments on plan elements. The survey was released in conjunction with the public release of the *Connections 2025* Draft Plan on August 22, 2016 and continued through October 16, 2016, collecting 1,583 responses.

Board Engagement

At the outset of the project, each Capital Metro board member was interviewed to better understand their goals for the plan. Key takeaways from these interviews included:

- Improve the public perception and understanding of the Capital Metro system.
- Increase ridership through an efficient reallocation of service while being cognizant of existing transit-dependent populations.
- Have an inclusive, transparent stakeholder and public engagement.
- Coordination with other agencies to improve public mobility planning.

The project team regularly presented *Connections 2025* progress during both board and committee meetings (see Table 1). Board members provided input on prioritizing system improvements, including discussions on frequency versus coverage, and responded to draft and final plan recommendations.

Table 1: Board and Committee Meeting Presentations

Date	Presentation Topic
April 13, 2016	Market Analysis Key Findings
May 11, 2016	Service Evaluation Key Findings
June 15, 2016	Service Framework and Guiding Principles (Part I)
June 27, 2016	Service Framework and Guiding Principles (Part II)
August 22, 2016	<i>Connections 2025</i> Draft Plan
October 24, 2016	Community Feedback on the Draft Plan
November 7, 2016	Draft Plan Revisions Work Session
November 16, 2016	Draft Plan Revisions Update
December 14, 2016	Draft Plan Update
January 9, 2016	<i>Connections 2025</i> Final Plan Board Work Session
February 17, 2016	<i>Connections 2025</i> Final Plan Board Work Session
February 27, 2016	<i>Connections 2025</i> Final Plan – Action Item for Approval

Stakeholder Engagement

Early in the process, the *Connections 2025* team convened two stakeholder advisory committees to bring together representatives from local community groups and agencies with an interest in public mobility. The Community Advisory Committee included members from accessibility, bicycle and pedestrian, environmental, affordable housing, senior, urban planning and other organizations. The Executive Advisory Committee included representatives from chambers of commerce, schools and universities, health and medical centers, the City of Austin, other local and regional government officials, among others. The project team held three rounds of advisory committee meetings throughout the *Connections 2025* process.



- Meeting 1 was held on January 20, 2016. The project team presented an overview of *Connections 2025* and led a discussion group exercise regarding ways to improve the Capital Metro system.
- Meeting 2 was held on May 10, 2016. Team members presented key findings from the Market and Service Analyses, and asked committee members to prioritize various trade-offs inherent in improving the transit network.
- Meeting 3 was held on August 23, 2016. The project team discussed the draft transit plan as part of *Connections 2025* and solicited feedback on specific concepts.

The advisory committees provided a valuable forum to hear from a diverse array of local stakeholders, who provided the project team with input from the groups they represent. At each meeting, team members discussed how input from each group and the public helped to shape plan recommendations.

Public Meetings

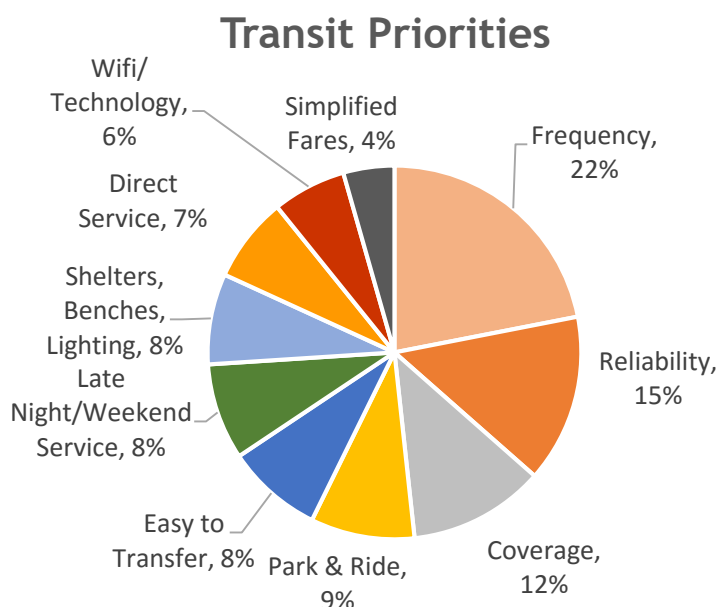
In conjunction with the online surveys and stakeholder engagement, Capital Metro held numerous public meetings and drop-in sessions to inform riders and members of the public about the plan. Additionally, meetings were scheduled with neighborhood associations, as requested, to talk through specific route and network changes in their neighborhoods. Three rounds of public meetings provided opportunities for input throughout the *Connections 2025* process.

Figure 14: Public Investment in Service Improvements

Round 1 (February-March 2016)

provided high-level information about *Connections 2025* and aimed to solicit initial input from the community as the project started. The meetings included three “activities” to engage stakeholders – an investment game to prioritize improvements, a large board where attendees could answer the question “I would ride transit more often if ...” and a map for participants

to label where they would like to travel on transit. The game invited participants to “invest” five “dollars” into various service improvements. Figure 14 above shows the result of the investment exercise. Frequency received the most investment, while reliability and coverage were also important attributes prioritized by riders and members of the public.



Round 2 (May 2016) provided an update on results from *Connections 2025*’s Market and Service Analyses. Outreach focused on obtaining our community’s priorities regarding the frequency versus coverage trade-off through an online survey.

Round 3 (September-November 2016) presented the draft *Connections 2025* plan recommendations to stakeholders and the public. These meetings included a brief overview presentation by Capital Metro staff, and opportunities for attendees to ask questions and provide input one-on-one with project team members.

Table 2 lists the public meetings held during each round of outreach. Meetings were promoted through flyers at bus stops, online through the Capital Metro and Connections2025.org websites, the Capital MetroBlog, as well as through local media outlets.

Table 2: Public Meetings

Date	Time	Location
Round 1		
February 16, 2016	5:30 PM – 7:30 PM	ACC South Austin
February 17, 2016	8:00 AM – 12:00 PM	City Hall
February 17, 2016	5:30 PM – 7:30 PM	ACC Riverside
February 17, 2016	5:30 PM – 7:30 PM	Northwest Austin Rec Center
February 18, 2016	5:30 PM – 7:30 PM	ACC Pinnacle
February 18, 2016	5:30 PM – 7:30 PM	Pleasant Hill Branch Library
February 18, 2016	6:00 PM – 8:00 PM	North Austin YMCA
February 20, 2016	9:00 AM – 11:00 AM	Asian-American Resource Center
February 20, 2016	9:00 AM – 10:30 AM	Faith United Methodist Church
February 23, 2016	5:30 PM – 7:00 PM	Manor City Hall
March 1, 2016	5:30 PM – 7:00 PM	Lago Vista Public Library
Round 2		
May 17, 2016	5:00 PM – 6:30 PM	University Hills Library
May 18, 2016	11:30 AM – 1:00 PM	Republic Square
May 18, 2016	5:00 PM – 6:30 PM	Pleasant Hill Branch Library
May 19, 2016	5:00 PM – 6:00 PM	Capital Metro Headquarters
Round 3		
September 6, 2016	5:00 PM – 6:30 PM	Dove Springs Recreation Center
September 7, 2016	5:00 PM – 6:30 PM	Pleasant Hill Branch Library
September 8, 2016	10:00 AM – 2:00 PM	Austin City Hall
September 8, 2016	5:00 PM – 6:30 PM	Terrazas Branch Library
September 10, 2016	9:00 PM – 10:30 AM	Faith United Methodist Church
September 12, 2016	5:00 PM – 6:30 PM	Leander Station
September 13, 2016	5:00 PM – 6:30 PM	North Lamar YMCA
September 14, 2016	5:00 PM – 6:30 PM	Milwood Branch Library
September 15, 2016	5:00 PM – 6:30 PM	University Hills Branch Library

Station Outreach



In addition to the scheduled and noticed public events, Capital Metro encouraged feedback at existing transit stops to ensure riders had the opportunity to voice their opinion on existing service as well as potential service changes. These functioned in a similar manner to the other events described in previous sections, with branded engagement and information available for customers to understand the process and the outcomes of *Connections 2025*.

Table 3: At-Stop/Station Outreach

Date	Stop / Station
February 8, 2016	Leander Station
February 9, 2016	Lakeline Station
February 10, 2016	Howard Station, Bluff Springs
February 11, 2016	North Lamar Transit Center
February 17, 2016	Republic Square
February 20, 2016	North Lamar Transit Center
February 21, 2016	North Lamar Transit Center
February 25, 2016	Republic Square
May 18, 2016	Republic Square
September 1, 2016	Parker Acres/Tuscany Way
September 19, 2016	Oak Hill Park & Ride
September 20, 2016	Lakeline Station, UT – West Mall
September 26, 2016	Tech Ridge Park & Ride
September 28, 2016	Rutherford Walmart
September 29, 2016	Bannister at Southridge
September 30, 2016	South Congress Transit Center
December 12, 2016	Leander Station
December 13, 2016	Lakeline Station
December 14, 2016	Pavilion Park & Ride
December 15, 2016	Howard Station

Neighborhood Outreach

The *Connections 2025* team actively sought to engage neighborhood associations during the planning process. Team members contacted more than 80 neighborhood associations in the region, and offered to attend regularly scheduled meetings to present information and gather feedback from community members. A summary of the neighborhood meetings attended by Capital Metro is shown in Table 4.

Table 4: Neighborhood Association Meetings

Date	Neighborhood Association (NA)
February 20, 2016	University Hills NA
March 1, 2016	North Shoal Creek NA
March 10, 2016	Southwood NA
March 22, 2016	Southeast Combined NCT
April 5, 2016	Heritage NA
April 28, 2016	NASWC (Anderson Mill NA)
June 11, 2016	Agave NA
June 11, 2016	North Hills NA
September 14, 2016	OHAN
September 27, 2016	Northwest Hills
October 3, 2016	West Balcones Neighborhood Association
October 3, 2016	West Austin Neighborhood Group
October 4, 2016	Colony Park NNO
October 4, 2016	St. John's NNO
October 13, 2016	Milwood Baptist Church
October 15, 2016	SANA Fall Picnic
November 5, 2016	Maple Run NA
December 20, 2016	Mueller NA
February 13, 2017	Ridgelea NA

Community Events

To reach people unlikely or unable to attend scheduled public meetings, the team hit the streets to reach people where they were at public gathering places like farmer's markets; community events like the



Chinese New Year Festival and the Kite Festival; and where they access transit at bus stops, transit centers and train stations. Volunteers from a variety of Capital Metro departments staffed a branded engagement bus, distributed information on *Connections 2025*, and invited people to complete the survey on iPads, smart phones or paper.

Table 5: Community Events

Date	Community Event
February 10, 2016	ACC Highland Spring Fling
February 11, 2016	Austin Marathon
March 1, 2016	ACC Riverside Spring Break Survivor
March 6, 2016	Kite Fest 2016
March 23, 2016	NAAO General Meeting
March 26, 2016	Sunset Valley Farmer's Market
August 25, 2016	CNU Film Festival – Alamo South Lamar
August 25, 2016	Thinkery 21
August 26, 2016	ACC General Assembly
August 27, 2016	Bike Austin – Ciclovia North Austin
September 15, 2016	El Grito de Independencia
September 27, 2016	Greater Austin Hispanic Chamber General Meeting
September 28, 2016	TxDOT Wellness Fair
October 13, 2016	Healthy Families Fair – Widen Elementary School
October 15, 2016	Dia de los Muertos – Festival Beach
October 26, 2016	Network of Asian American Organizations
November 9, 2016	Austin Black Chamber

Other Organizations

Additional presentations were prepared to update transportation-related committees both within Capital Metro and in local government. These gave various constituents, including the MetroAccess community, the opportunity to learn about the project's progression.

Table 6: Committee & Commission Meetings

Date	Committees & Commissions
January 6, 2016	Access Advisory Committee
February 10, 2016	Customer Satisfaction Advisory Committee
May 11, 2016	Customer Satisfaction Advisory Committee
June 6, 2016	Pedestrian Advisory Council
August 10, 2016	Customer Satisfaction Advisory Committee
September 6, 2016	Pedestrian Advisory Council
September 7, 2016	Access Advisory Committee
September 14, 2016	Customer Satisfaction Advisory Committee
September 20, 2016	Bicycle Advisory Council
September 27, 2016	Planning Commission
October 5, 2016	Access Advisory Committee
October 12, 2016	Customer Satisfaction Advisory Committee
November 2, 2016	Access Advisory Committee
November 11, 2016	Pedestrian Advisory Council
November 30, 2016	Access Advisory Committee

Key Themes from Public & Stakeholder Outreach

Throughout the comprehensive stakeholder engagement process, the *Connections 2025* team received a highly diverse array of comments on ways to improve the system. Feedback from the community was used to shape and update plan recommendations.

Across all meetings, surveys and events, *transit frequency* and *reliability* were top priorities for local residents. The riding and non-riding public is looking for convenient service they can use without consulting a schedule, and wants to depend on transit to get them to their destination on time. *Transit service coverage* is also important to community members. Many people

mentioned they would use transit more if it was available in their neighborhoods, or if it conveniently served certain destinations. The balance between frequency and coverage was a much-discussed and frequently debated issue throughout *Connections 2025*. Many of these trade-offs were refined in the framework and guiding principles section to develop the *Connections 2025* network.

After the public release of *Connections 2025*, many communities negatively impacted by the draft network expressed their desire for changes, either through service restoration or through alternate replacement options. Capital Metro worked with various members of the public to understand the local needs and to identify potential solutions (both fixed-route, as well as Mobility Innovation Zone alternatives) to best meet their needs. Several rounds of alternatives were presented and revised before the *Connections 2025* network was finalized.

Endorsements

Prior to the adoption by the board of directors *Connections 2025* received support from these organizations:

- Downtown Austin Alliance
- Rocky Mountain Institute
- Urban Transportation Commission
- AURA
- Alliance for Public Transportation in Austin
- Austin Chamber of Commerce
- Vision Zero
- Pedestrian Advisory Council
- Bicycle Advisory Committee
- Downtown Commission
- Zipcar

Framework & Guiding Principles

Based on the findings of the Market Analysis and Service Evaluation, together with input gathered from the public and stakeholder groups, the *Connections 2025* goals were developed to guide the development of short- and long-term recommendations for future Capital Metro transit service. The framework focuses on sustainably growing system ridership and presenting a long-term vision for public mobility options in Central Texas within established financial constraints. Efficiency and effectiveness are built into the service restructuring plan to maximize mobility benefits from current funding and reduce dependency on external funding. These goals are achieved in *Connections 2025* through the Service Design Principles.

Connections 2025 Goals

Goal 1: Build Ridership

The primary goal of *Connections 2025* is to reverse the existing ridership decline. The network should be attractive to all customers, including existing users, former users and potential new users. To accomplish this, the constituency for Capital Metro service must be broadened and strengthened. Strong support from the community and key stakeholders is needed to build the partnerships and make the changes necessary to improve public mobility in Central Texas.

A broader transit constituency encourages more people to ride transit, with a greater number of people recognizing the value of transit's role in public mobility. Building transit constituency is fostered by a transit plan that is responsive to community priorities and supports mobility partnerships throughout the service area. Having a transit constituency will allow goals 2 and 3 to successfully build ridership.

Goal 2: Match Service to Markets

Changes to transit service have traditionally been responsive to political needs as well as local community activism. While some services have been successful through this incremental process, *Connections 2025* offers the opportunity to rethink the entire network by appropriately matching service to individual market types. Service is enhanced on major arterials with healthy mixes of land use, while alternative modes are proposed for lower density areas with suburban-like road networks. The end result of this redesign is a transit network that best meets both regional and community mobility needs in a fiscally responsible manner.

Goal 3: Enhance the Customer Experience

Capital Metro can only be successful if it provides a service that consumers want to use. In order to be attractive to consumers, Capital Metro must provide a service that is competitive with other modes of travel, especially with automobile travel.

Enhancing the customer experience will both attract new discretionary riders and encourage existing riders to use transit more frequently and for more trip purposes. Enhancing the customer experience can be achieved by improving wait times and facilities, travel times and reliability, and making the network easy to understand and use. Streamlining route alignments also improves the customer experience by reducing travel time and providing more direct trips.

Creating an all-day, all-week comprehensive transit network with streamlined route alignments and higher service frequencies will provide an enhanced customer experience that attracts riders to use transit for more of their variable daily trips.

Goal 4: Ensure Financial Sustainability

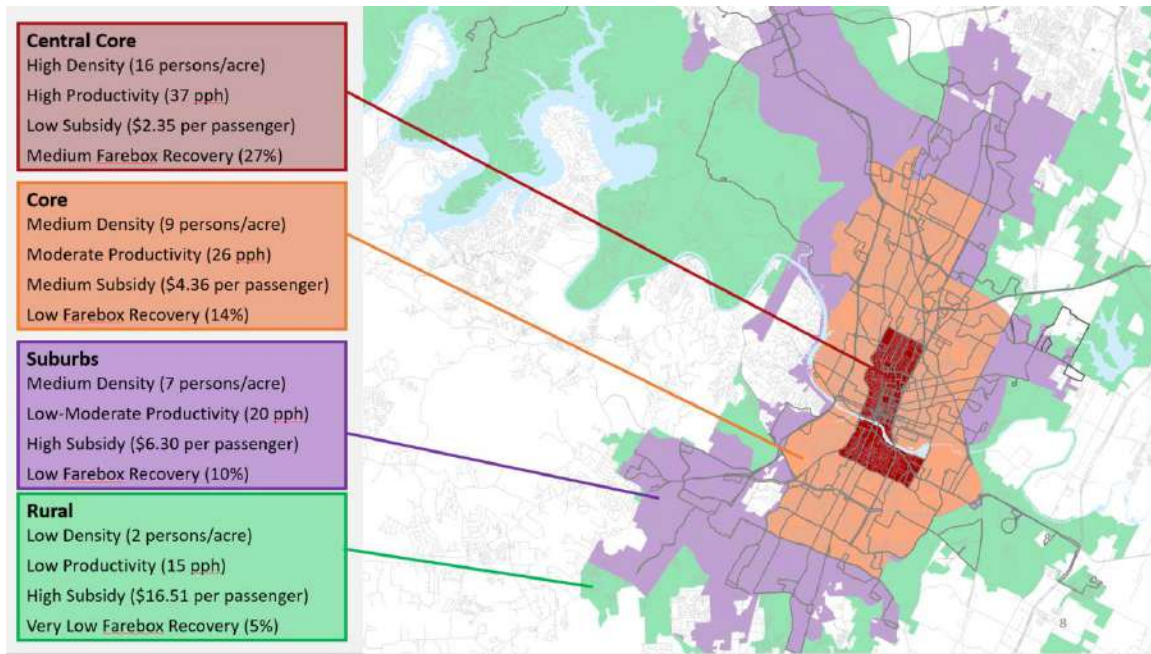
Financial stability allows Capital Metro to maintain an effective and robust transit network. Since Capital Metro is working with limited financial resources, focusing on route and network improvements that will yield a higher return on investment (more riders and fare revenue) supports financial sustainability. Improving routes that are already successful will generate more ridership and fare revenue for Capital Metro. Tailoring service to markets will help ensure that resources are being used effectively.

Transit Markets

Differentiating between transit markets provides a framework for identifying where transit can be most successful within a region. Success of potential transit service is influenced not only by the presence of population and employment densities, but also by the surrounding built environment. For transit to be truly successful, an area must have a strong mix of population and employment densities, as well as a street and sidewalk network that promotes walkability and transit access. Higher densities support improved transit options because they provide a larger potential customer base. The local roadway network's lack of a clear, connected grid presents significant challenges for Capital Metro in developing a simple, easy-to-use and cost-effective network in the city of Austin and beyond. The quality and completeness of the sidewalk network, together with the availability of street crossings, impacts the pedestrian experience and access to transit. Because most transit trips begin and end as pedestrian trips, a high-quality walk environment is a key to successful transit.

Varying development patterns and demographic characteristics create four distinct transit markets within Central Texas, each with different opportunities and challenges for transit service. Figure 15 shows generally where these transit markets are located within the Capital Metro service area and Capital Metro's service performance in each area. Areas in the Central Core and Core are more cost-effective for Capital Metro to operate and generate more ridership per hour, while Suburban and Rural areas are costly to operate in and have lower ridership per hour.

Figure 15: Market Segment of Capital Metro Service Area



Central Core



The Central Core which encompasses downtown Austin, the UT Austin campus and east Riverside Drive has the highest density and concentration of population and employment centers in the region. The area is one of the most walkable and bikeable in the Capital Metro service area, and transit plays a key role in providing mobility. Consumers can rely on transit for “lifestyle mobility,” using transit for a variety of trip purposes, rather than just commute trips. The Central Core

supports higher levels of transit service investment, and route segments operating in the Central Core are the most productive in the Capital Metro network.

Core



The Core surrounds the Central Core, and its population and employment densities also support all-day, all-week lifestyle transit mobility. The street network is mostly walkable and bikeable, but destinations may be more spread out, with dense mixed-use development focused on the major corridors.

Suburban



Suburban areas lay outside of the Core with lower densities and development patterns that are more automobile-centric. Residential and commercial/retail land uses are separated from one another, making it more convenient to use personal vehicles for trips. Infrastructure catered to automobile traffic, such as large parking lots and limited sidewalk infrastructure, make the suburbs less hospitable to walking and biking. Traditional all-day, all-week transit is less productive in the suburbs and requires higher subsidies per passenger to

operate. Together, the high levels of car ownership, extensive free parking, and less-friendly pedestrian and biking environment make transit less competitive for lifestyle trip-making. Consequently, transit strategies in the suburban areas should focus on where transit can be competitive or needed to meet specific mobility needs. Targeted mobility entails service with narrower applications, such as commuter service, community circulators, “first-mile, last-mile” feeder services and other innovative mobility solutions.

Rural

Rural areas are located beyond the Suburban area in the outskirts of Capital Metro’s service area. Rural areas have low-density development patterns and minimal pedestrian facilities. There are limited opportunities for ridership generation, as dispersed development makes it difficult to identify key destinations within the market. A lack of pedestrian facilities and long distances to major transportation corridors make walking to access a transit stop less attractive. Finally, bus operations are inefficient and ineffective because Capital Metro incurs high costs from providing service that benefits only a few people.

Creating successful outcomes in this automobile-centric environment will require refocusing resources on very specific travel market needs. Key strategies in this market area include introducing innovative mobility solutions including “on-demand” transit options, integrating community initiatives, and creating cooperative funding partnerships. Market-tailored services should interface with the regional all-day, all-week network to provide connections to the rest of the Capital Metro network.



Transit Network Development Trade-offs

Capital Metro faces challenging trade-offs in determining how to allocate its limited resources throughout its service area. These trade-offs affect network design, levels and types of service,

and service coverage. *Connections 2025* follows industry best practice with adjustments based on community, stakeholder and board feedback.

Maximizing Ridership versus Maximizing Coverage

Two primary options exist when designing transit networks: maximizing ridership or coverage.

- **Maximize Ridership:** Maximizing ridership requires investing resources in higher ridership market areas and corridors at the trade-off of less service in areas that are less productive.
- **Maximize Coverage:** Maximizing service area and span gives more people access to the transit network; however, resources are spread across more routes, resulting in a less attractive transit network.

Connections 2025 looks to enhance the customer experience and match service to markets in order to maximize ridership and ensure financial sustainability. Coverage-based services attract fewer riders and require much higher subsidies per passenger boarding, allowing less overall service to be provided. Consequently, *Connections 2025* does not prioritize expansion of service coverage except where positive market conditions or unique unmet mobility needs are present. At the same time, *Connections 2025* seeks to maintain existing basic service coverage where alternative options can deliver mobility more cost-effectively.

Frequent Network versus Less Frequent Direct Trips

In designing the proposed network, Capital Metro had the option of designing a frequent transit network with transfers at primary intersections or at transit hubs, or a system composed of less frequent but more direct “one-seat” trips.

- **Grid Network:** A grid network consists of routes serving individual corridors oriented along two dominant patterns (i.e. parallel north/south and east/west or radial/crosstown depending upon the roadway network). By operating a series of frequent corridors, passengers will have reliable, frequent access to the entire network by transferring between routes in the grid. These networks are most beneficial where travel is dispersed among many potential destinations (i.e., lifestyle mobility covering all daily trip-making) instead of single purpose mobility such as commute travel to a central location like a downtown. However, grid networks require frequent transit (minimum of 15 minutes, with 10-minute service desirable) to minimize street corner transfer wait times. Grid networks are productive in areas like the core market area, where densities and development patterns support sustainable lifestyle mobility³.
- **Hub-and-Spoke Network:** A hub-and-spoke network consists of routes that travel to and from one or more central locations. For Capital Metro, these would include downtown

³ Most transit system networks are hybrids, combining a grid configuration in the core market area with hub-and-spoke or all-to-all structure in the less dense suburban service and rural periphery.

Austin, UT and employment centers (e.g., Domain, Tech Ridge) where transit centers (hubs) have been developed. Riders have access to the entire network by transferring at the hub. A hub-and-spoke network is most beneficial if the hub is the destination for most trips or when the road network is less linear. Hub-and-spoke networks often provide enhanced facilities for transferring, but at a cost of significant out-of-direction travel and lower frequencies.

- **All-to-All:** An All-to-All network focuses on providing one-seat rides for all trip purposes with a decreased emphasis on transferring. An All-to-All network requires a large number of resources to serve all potential origins and destinations within a service area, so frequency is very limited. Since an All-to-All network focuses on one-seat rides, riders whose origin and destination are not on the same route have difficulty using the network. Examples of this strategy are vanpools and on-demand services.⁴

Connections 2025 emphasized a “Frequency First” approach to both expanding the network of frequent transit and to increasing levels on key corridors to provide spontaneous-use frequencies (10-minutes or better). As a result, corridors with multiple routes were consolidated, and resources were devoted to providing more frequent corridors throughout the system. Increased frequency allows for an increased propensity to use transit with reduced wait times, and follows the trend Capital Metro has seen with increased ridership on the current High-Frequency Network. While some existing riders will have to transfer under the proposed frequent core transit grid, primary travel patterns were preserved where possible, and the increased frequency will offset the increased time waiting for a specific, less frequent, bus.

The High-Frequency Network provides a much more attractive transit system for current and potential riders to make many new trips not easily possible on the current network. Ridership growth requires Capital Metro to capture a greater number of “lifestyle” trips beyond its current focus on work and school commuting.

Frequent Service, Longer Walk versus Infrequent Service, Shorter Walk

With limited resources at its disposal, *Connections 2025* had to balance service frequency and walk access in network route spacing.

- **Frequent service and greater route spacing:** Capital Metro could focus its resources on providing more frequent service on fewer corridors. Since there is more distance between routes, there would be areas with a greater walk distance to service. Increased walk

⁴ Short distance zone-based “on-demand” service can provide cost-effective mobility while wide area, longer distance on-demand service is much less cost-effective (e.g., MetroAccess).

distances are mitigated by the fact that most consumers walk longer distances to access more frequent service.⁵

- **Less frequent service on closer-spaced routes:** With the same number of resources, Capital Metro could provide service on more routes, but with less frequency. This would decrease the walking distance to transit but would limit transit attractiveness by reducing frequencies to basic or lifeline levels.

Connections 2025 adopted an approach that prioritized increased frequency over closely spaced routes. The plan calls for the consolidation of closely spaced infrequent parallel routes into fewer frequent routes. Transit access was preserved such that nearly all current customers would remain within a reasonable walk of frequent transit service within the core.

All-day, All-week Service versus Peak Commuter Service

Transit can be used for a variety of trip purposes, and Capital Metro needed to balance providing mobility solutions catered to all-day, all-week lifestyle transit use with commute travel.

- **All-Day, All-Week Service:** Providing an all-day, all-week network is critical to generating lifestyle transit use that supports community mobility initiatives to become more sustainable. Lifestyle transit can work in concert with active modes (e.g., walking and biking) to reduce dependency on personal vehicle use. In addition, using transit resources (e.g., buses/trains, facilities and rights-of-way) over an extended all-day, all-week period increases the value of capital investments.
- **Peak Commuter Service:** A major public issue for work travel is traffic congestion. Focusing on commute travel increases transit's value in offsetting new congestion as the region grows, possibly deferring new roadway development. Concentrating service in peak-period trips would serve a broad range of the service area population that has traditional work or school hours. However, because work trips make up only a small portion of a household's total daily trips, concentrating on commute travel would limit Capital Metro's ability to serve a more diverse range of mobility needs. Additionally, focusing on traditional commuter trips does not benefit the growing segment of the population with non-traditional work schedules.

The *Connections 2025* network focuses on creating an all-day, all-week network to support a broad range of transit trip-making, from work to errands to recreation. Work schedules today vary beyond the traditional 9-5 workday, and college students in particular have highly variable class schedules and extracurricular activities. Accounting for the variability of departure times and trip

⁵ Typical transit walk access is between ¼ mile (5-minute walk) and ½ mile (10-minute walk). Frequent transit draws from ½ mile (80 percent of the riders come from a ½ mile catchment area) while the 80 percent catchment area for infrequent transit is smaller at ¼ mile. Federal ADA regulations assume a ¾ mile walk access distance.

purposes requires a strong transit network that operates throughout the day and week. Special commuter options (i.e., service overlays or standalone service) were retained and in some cases enhanced, where significant commuter demand could not be met with the proposed all-week transit network. Most of these commuter services focus on attracting riders to Park & Ride facilities and operate with limited or no stops to major Central Texas job centers. Job centers without enough market demand to support regular transit service have Capital Metro ridesharing options.

Service Design Principles

The following service design principles were followed in meeting the goals set forth in *Connections 2025* and informed the development of service recommendations.

Figure 16: Service Design Principles



Create an Easy to Understand Network

One of the key design principles in attracting ridership is to create a transit network that is easy to understand and use. Such a network has several characteristics:

- **Clock-face headways:** One of the primary elements in creating an easy to understand network is implementing clock-face frequencies, where buses arrive at regular intervals (i.e., every 10, 15, 30, 60 minutes). It is much easier for a consumer to remember a 30-minute schedule where the bus arrives every :12 and :42 than it is to keep track of a 26-minute schedule where the trip times vary every hour. While achieving a comprehensive clock-face schedule can be challenging when runtimes vary throughout the day, it should be prioritized at key service connecting hubs to make the service more consumer-friendly.
- **Straightened alignments:** Streamlining alignments makes route operations easy for riders to understand, and high frequencies reduce the need to understand complex schedules.

Minimizing nonlinear alignments and unproductive deviations has the added benefit of reducing both mileage and operating costs allowing for more frequency at the same cost. Effective scheduling and interlining will allow Capital Metro to extract the most out of their limited resources.

- **Enhanced network synergies:** Creating an easy to understand network also means enhancing network synergy by making transfers easier to understand and more reliable. Improving synergy within the network will make it more convenient to make all kinds of short and long lifestyle mobility trips within the service area via transit. Transfers will be facilitated by improved frequencies and designing an effective grid network. By improving the ability to transfer, Capital Metro is able to service a wider variety of trips for a greater number of consumers.
- **Customer Information:** Capital Metro has already begun the process of making the transit system more customer friendly. Through a new system map that highlights frequent service, riders can quickly understand the transit network. Customer information is also available through the CapMetro App, which provides real-time departure information and helps people plan their trips. Continuous improvements in the app are recommended to better convey customer information, including transfer opportunities, service delays, upcoming events and service changes within the Capital Metro network. Integration of both regional Central Texas transit partner information/fares and sharing mobility partners (bike, car, ride) should be near future priorities. Additionally, improved wayfinding signage at major destinations or transfer points helps with directing passengers to the correct bus stop for increasing system ease-of-use.



Create A Stronger Frequent Network

Frequency is the number one factor that attracts new riders to transit and encourages existing riders to use transit for additional trip-making. Capital Metro should focus its investment on building a strong frequent network in order to increase ridership and allow transit to play a more significant role in providing regional mobility. Routes with spontaneous-use frequencies (service every 15 minutes or better) benefit passengers by reducing their out-of-vehicle wait times. At these “spontaneous-use” service levels, passenger reliance on consulting timetables and planning their arrival at bus stops is less necessary with consumers catching the “next trip” rather than “a trip.” This is a critical element in attracting transit lifestyle riders, or those who choose to use transit [and walking and biking] over other transportation options. It also encourages current riders to use the system for more trip purposes throughout the day and week, and reduces rider attrition by maintaining transit system value over the long term.

Higher service frequencies also provide more convenient and reliable transfer connections with other transit services, making network transit use attractive. Investing frequency in the core network will generate additional ridership on services that are already productive, resulting in additional fare revenue that can be reinvested into further frequency improvements. Since 82

percent of today's riders use only 17 service corridors in the network, concentrated investment in these services will benefit the majority of Capital Metro's riders.



Match Service to Current and Future Markets

Mobility needs vary throughout the Capital Metro service area, and it is important that service levels and types are matched to markets in order to ensure the efficient and effective use of resources. The established transit markets indicate network configuration and types of services that may be most appropriate in certain geographic areas. In addition, Capital Metro serves a variety of rider markets, including commuters, students, lifestyle transit users, seniors and visitors. Each market has its own unique set of mobility needs that should be addressed in Capital Metro's service delivery. Overall, service investment should be focused where transit is most competitive – transit-oriented, high-density areas with a mix of land uses and walkable street network – in order to ensure the success of the overall network. In these transit "lifestyle" areas, residents may choose to take transit because it is convenient, opting to make it part of their daily lifestyle. For areas that can only sustain commuter-type services, Express routes must offer fast travel speeds and focus service on Park & Rides to be competitive.

Capital Metro should also work to ensure that the network continues to meet regional mobility needs as they evolve. Monitoring industry best practices, new technologies and projected population growth and travel demand will allow Capital Metro to incorporate changes into its service delivery each year so the network keeps pace with future changes.



Concentrate on Key Customer Experience Attributes

Improving key customer experience attributes is important in both attracting and retaining riders. Frequency is by far the number one factor in attracting new transit users and encouraging existing riders to use transit for more trip purposes. Travel time is the second most important factor, but it is valued at half the weight of frequency when people evaluate whether to use transit. Finally, reliability is the number one factor that retains riders – they want to be able to depend on transit to get them to their destination at the scheduled time every day. Focusing on improving these three attributes will help Capital Metro build a stronger transit network and increase ridership.

Frequency of service affects out-of-vehicle wait time. People fall into two categories – those who plan their trip and those who spontaneously show up at a stop. At frequencies of 15 minutes, about half of riders plan their trip and half spontaneously show up. Since market research has shown that the number of people who will show up spontaneously is much greater than those who will plan their trip, it is important that services operate every 15 minutes or less in order to capture this market segment.

Travel time affects in-vehicle journey time. Travel delay is perceived by riders as twice the actual time, so it is important to reduce delay wherever possible. Delay can be reduced by optimizing stop spacing and location, introducing transit priority measures and streamlining route

alignments. Special attention should be given to out-of-direction deviations, as they impact the riding experience of passengers traveling beyond the deviation. Passengers “dragged” through a long deviation to pick up few riders may stop riding due to the inconvenience of the increase in travel time.

Reliability can be improved by first designing service that is easier to operate and second by close supervision of operations to ensure adherence to schedules. Transit-only lanes, queue jumps and bus bulbs will also aid in maintaining reliable schedules. Additionally, reliable real-time information signs at bus stops can improve the customer experience by reducing travel uncertainty.



Complement Emerging Mobility Initiatives

Most people today choose the mobility option that makes the most sense for that trip at that time. Capital Metro must build an integrated public mobility network that embraces more than just traditional fixed-route bus and rail service. Efforts should be made to integrate the transit network with bicycle, pedestrian, ride hailing and carsharing infrastructure. By integrating the transit network with other mobility modes, customers will have community-friendly options to make all kinds of new and existing trips, including opportunities to use transit to connect to destinations beyond the regular service network (e.g., first-mile, last-mile).

In order to make transit initiatives and bicycle/pedestrian initiatives work well together, there should be a concerted effort to coordinate all transit, bicycle and pedestrian plans. Improving the bike and pedestrian environment in the service area will also make more people comfortable in biking and walking to the service network, increasing the attractiveness of transit in the region and extending access to the fixed route network.



Increase Ridership and Productivity

For transit in Central Texas to be successful, it is necessary for Capital Metro to be an effective transportation choice to as broad a market as possible. Increasing the size of the transit-using population will also provide Capital Metro with the support it needs to pursue further system improvements. To do so, Capital Metro must attract and retain long-term riders; not only does the service have to be attractive to get people to try transit, but it must be reliable enough to retain them for the long term. Providing a strong, frequent core network that allows consumers to rely on Capital Metro for lifestyle mobility trips will attract riders to the service. Retaining riders can only be accomplished by providing service that is reliable.

High ridership and productivity will also help ensure the financial stability of Capital Metro. Maintaining high productivity requires that service adheres to effective performance and productivity standards. Evaluating current performance and productivity standards and updating them if necessary will help ensure that resources are being used effectively.



Lay the Groundwork for the Future

Connections 2025 is the ideal place to set the groundwork for a future robust and sustainable transit network. Resources should be focused where transit is most competitive and will yield the highest return on investment. Since the majority of riders utilize select High-Frequency routes, investments to improve these successful routes will provide a large benefit to the most consumers and will generate more ridership and farebox revenue. Increasing ridership and farebox revenues makes Capital Metro more sustainable by increasing the resources that are available to maintain service in the future. Capital Metro should support increased investment in transit mobility in order to increase the size of its High-Frequency Network and pursue new technological innovations.



Coordinate Land Use, Housing, Infrastructure

As shown in the discussion of transit markets, transit is most cost effective in areas with a strong mix of population and employment densities, as well as a connected street and sidewalk network that promotes walkability and access. By advocating for transit friendly land development patterns, Capital Metro can ensure that transit is a competitive transportation option in Austin. This will become increasingly important as Central Texas looks to mitigate the traffic impacts of nearly doubling in population over the next three decades.

Capital Metro should be proactive in meeting with communities to ensure it has a place at the table when plans for future development are being discussed. Through discussions with the city of Austin during the CodeNext process, existing land use policies should be updated to support a more compact and connected development pattern. Of particular importance to Capital Metro will be that density be linear, continuous, mixed-use and “pyramid” along the MetroRapid and High-Frequency network corridors. This way, transit can be integrated into plans instead of being considered as an afterthought. Capital Metro can work to encourage sustainable development and incentivize businesses and housing⁶ developments to locate within easy access of the High-Frequency Network. Where this is not the case, access to Capital Metro through first-mile, last-mile mobility options should be part of the ongoing responsibility of those making the location choice to be off-network. Being proactive will allow Capital Metro to mitigate cost increases and encourage development along proposed transit investment corridors.

⁶ One critical issue is locating affordable housing with access to the High-Frequency Route Network. Efficient and effective access to public mobility is a key ingredient in escaping from poverty. Also, providing transit to remote locations will usually cost more over time than properly locating the facility in the first place.

Connections 2025 Plan

Recommendations Approach

The development of the draft plan recommendations focused on achieving the *Connections 2025* goals through application of the service framework and guiding principles. The data-driven findings from the Market Assessment and Service Evaluation together with input from the community, stakeholders and Capital Metro board and staff prioritized an expanded High-Frequency Route Network over service coverage, retention of service coverage where there were unmet mobility needs and improvement to the overall customer experience. The Mobility Innovation Zones were developed as alternatives for areas that would lose existing fixed-route bus service. The resulting plan should increase transit ridership while maintaining a financially sustainable system.

The draft plan was released on August 22, 2016 and Capital Metro continued to receive feedback until plan adoption in February 2017. After the development of draft recommendations, Capital Metro conducted another round of public outreach between August and October 2016 that sought feedback on the proposed draft plan. During this period, more than 3,200 people attended public outreach events and another 1,500 comments were received online. The feedback informed multiple updates to the plan, including the evaluation of route extensions and the development of Mobility Innovation Zones.

Service Tiers

One of the key strategies for achieving the goals of *Connections 2025* is to make sure that Capital Metro is effectively matching the right transit service to the appropriate market. Using a mobility toolbox consisting of multiple service tiers will allow Capital Metro to meet the various mobility demands and transit opportunities found in different markets. The service tiers vary in service types, frequency, vehicles, and operating speeds. Figure 17 illustrates the service tiers included in the mobility toolbox.

Figure 17: Service Tiers



Rapid Transit: Rapid Transit provides fast, frequent, regional service along a dedicated right-of-way using high-capacity vehicles. MetroRail is an example of Rapid Transit. These routes serve as the structural spine of the network and are an integral part of the all-day, all-week service.

MetroRapid: MetroRapid is frequent, fast bus service along major corridors providing short- and medium-distance travel. MetroRapid would offer the highest levels of frequency in the Capital Metro network, providing service at least every 10 minutes. MetroRapid routes would have moderate stop spacing to reduce travel times while maintaining convenient access. This service benefits from enhanced transit infrastructure, including in-lane stopping (bus bulbs or islands), transit signal priority, station upgrades, expedited fare payment with all-door boarding and dedicated or transit priority lanes along key segments with the potential for level platforms and precision docking at stations.⁷ MetroRapid complements the Rapid Transit service tier to form the key structural spines of the Capital Metro transit network.

Frequent Local: This service operates every 15 minutes or better on transit-supportive corridors and completes the all-day, all-week High-Frequency Route Network, which will carry more than ¾ of system riders. Due to their high frequency and linear alignments, these routes also facilitate effective connections within the Capital Metro network. For consistency with MetroRapid and improved travel times, all-door boarding is proposed with potential future rollout system-wide.

Local: Local services complement frequent services by completing and extending the fixed-route network. Local routes provide service every 30 minutes with additional peak service if warranted. Supporting Local routes operate in areas where land use patterns, population and employment densities, and/or travel patterns do not support frequent transit service. Local routes serve a key role as a connection between communities, the High-Frequency Route Network and major destinations.

Express: Express service provides longer-distance, peak-hour commuting travel between key regional destinations. It provides faster travel times by operating on freeways and, when available, on the new MoPac Express lanes. In order to provide a competitive commuter option, Express service focuses on Park & Ride facilities for community access. Depending upon demand levels, service may be provided with an over-the-road (OTR) transit bus, vanpool or microtransit on-demand ridesharing. The latter two options may use Park & Rides and destination hubs or provide direct home and work pickup.

Community Services: Community Services provide local mobility as circulators for short-distance neighborhood trips or as “first-mile, last-mile” connections to the core transit network. Fixed-route community circulators provide all-day service in areas with a high demand for short-distance community travel. These are primarily targeted at specific connections between rail and

⁷ Precision docking allows the bus to stop with a tight gap to the platform, allowing direct level access to the vehicle for all patrons like the MetroRail Red Line. Level platforms and precision docking are maturing technologies that are recommended pilot projects to confirm operability and benefits to customers and Capital Metro.

community destinations (such as between the Kramer MetroRail station and The Domain) or as a neighborhood circulation service.

Mobility Innovation Zones: As described in the Transit Market Typologies and the Service Evaluation, several areas with existing transit service do not meet minimum service performance standards. These areas typically have lower residential and employment density, segregated land uses and a road network incompatible with fixed-route transit, resulting in low productivity and high subsidies per passenger boarding.⁸ While there is a desire to maintain mobility for individuals in need, Capital Metro should still look to use its scarce resources responsibly by finding alternatives to high subsidy fixed-route transit. Partnerships should be developed with local communities, businesses and institutions to tailor these options to the needs of the community. Capital Metro, as part of *Connections 2025*, recommends that these areas be candidates for innovative community mobility, as described below.

- Shared-ride or microtransit options (using vehicles smaller than a standard-size transit



bus, including vans and automobiles) allow riders to travel within a designated area or to connect with the core transit network by requesting an on-demand service; riders can request a ride either through a mobile app or by calling a phone number. These mobility options include two alternatives – one where

Capital Metro provides the shared-ride service (a commitment of hours of service is a less efficient choice) versus one where Capital Metro subsidizes individual trips provided by a third party (using microtransit is more efficient because Capital Metro is only subsidizing actual trips made). These options are most effective in smaller geographic areas where trip lengths are kept short to neighborhood circulation trips or connections to the core network at mobility hubs.

- Carpools provide community connections to or from the core network mobility hubs via



a shared-ride option. Capital Metro currently provides subsidized carpool service through its [MetroRideShare](#) program, with subsidies varying from \$450 to \$500 per group per month.⁹ Carpools can also be set up as affordable short-distance “last-mile” connections to businesses, schools and other destinations from key network mobility hubs (or Park & Rides). With users self-organizing, the program can operate

independently of Capital Metro through partnerships with the business, institution or community. While Capital Metro can help provide carpool vehicles, it is likely that many corporate or institutional partners will take advantage of the advertising value of making the vehicle purchase themselves and showcasing their “green” activities. Capital Metro

⁸ Ideally, new development or redevelopment would follow best practices for sustainable communities, allowing for cost-effective deployment of regular fixed-route bus service.

⁹ The carpool approach works where travelers are coming from dispersed origins and can all access the mobility hub via the core transit network. Where there are concentrations of commute origins traveling to single or nearby destinations, Capital Metro’s regular vanpool program works well.

would provide priority parking at mobility hubs for carpool vehicles as is industry best practice.

- Carshare is an alternative car rental solution that allows users to use a shared vehicle like Car2Go or ZipCar, paying by the minute, hour or day. Carsharing provides both local community travel and “first-mile, last-mile” connections to the core transit network. It is completely flexible to the consumer’s mobility needs.



- Destination shuttles provide both local circulation and “first-mile, last-mile” connections to the core transit network at mobility hubs. Community, business or institution partnerships allow for service targeted to specific needs such as company employee shuttles providing connections to regional mobility hubs, grocery shuttles that provide community access to stores, school shuttles or senior mobility subscription services.



- Bikeshare, like B-cycle, also provides both local circulation and “first-mile, last-mile” connections to the core transit network at mobility hubs. These are primarily targeted at increasing access to transit by extending the typical quarter-mile to half-mile walkshed out to a three-mile riding distance. Shorter distance trips can also be completed by a shared bicycle system in lieu of providing a community circulator.



Connections 2025 Plan Summary

Connections 2025 refocuses the system around a best practices approach to what works: deliver a comprehensive network of frequent transit; simplify system understanding and use; and reduce delay for both consumers and operations to improve reliability, effectiveness and efficiency while minimizing the impact on current riders. Specific alignment changes within the Capital Metro system focus on increasing ridership and productivity through more direct service, as well as creating a better connected network to minimize the negative effects of transferring between routes. Key components to the *Connections 2025* Plan include the following:

Increased MetroRapid Service

MetroRapid would operate under a “frequency-first” approach¹⁰ to serve as the regional spines of the Capital Metro network. This approach balances frequency, travel time, and access to attract all-day, all-week trips, in addition to the longer commute travel that has made up the bulk of MetroRapid’s ridership. Both existing MetroRapid routes would be consolidated with the Local routes operating on the same corridor to achieve increased frequencies with minimal increases in cost. Proposed MetroRapid Route 801 is consolidated with Local Route 1, 201, and 275 to offer increased service operating at “spontaneous-use” frequencies¹¹ of every 7.5-10 minutes. Route 803 is extended to serve the Manchaca portion of the former Route 3, operating more frequently at every 10 minutes. Both MetroRapid routes would have select additional stations to maintain access to the consolidated service. Stations would be located every ¼ to ½ mile to balance the trade-off between speed and access.¹² Additionally, two new MetroRapid routes are proposed, adding additional frequent east-west connectivity on 7th Street (new Route 804) and on Riverside Drive and Manor Road (new Route 820). Table 7 and Figure 18 illustrate the proposed MetroRapid service.

¹⁰ The “frequency-first” approach follows the industry best practice that passenger wait time (i.e., the combination of frequency and reliability) is 3-to-4 times more important than travel time. The *Connections 2025* approach for MetroRapid is to maximize effective frequency by combining all corridor transit services into one MetroRapid line, maintain corridor access through additional stations as needed and add new and improved transit delay reduction techniques to maintain fast transit speeds.

¹¹ “Spontaneous-use” frequencies operate often enough that customers simply walk out and catch the next trip – the proposed 7 ½-10 minute frequencies proposed for MetroRapid meet this threshold.

¹² Additional transit priority (e.g., exclusive lanes, bus bulbs, level platforms) and enhanced operating protocols (e.g., headway based schedule operation) are anticipated to maintain or improve current operating speeds.

Table 7: Proposed MetroRapid Service

MetroRapid Route	Frequency (minutes)					Span ¹³			Major Destinations
	Weekday			Weekend		Monday - Friday	Saturday	Sunday	
	Peak	Base	Evening	Base	Evening				
<div>801</div> North Lamar/South Congress	7.5	7.5	15-30	10	15-30	24 hours	24 hours	24 hours	Tech Ridge, North Lamar, Crestview, UT, Downtown, South Congress, St. Edwards, Southpark Meadows
<div>803</div> Burnet/South Lamar	10	10	15-30	10	15-30	24 hours	24 hours	24 hours	Domain, Burnet, Brentwood, UT, Capitol, Downtown, Zilker, South Lamar, Westgate, South Manchaca
<div>804</div> 7th St	10	10	15-30	15	15-30	24 hours	24 hours	24 hours	Govalle, Central East Austin, Downtown, Old West Austin, Clarksville
<div>820</div> Riverside / Manor	10	10	15-30	15	15-30	24 hours	24 hours	24 hours	ABIA, Montopolis, Pleasant Valley. Riverside, Downtown, Capitol, UT, Chestnut, Cherrywood, , Mueller, Springdale H-E-B

¹³ Night owl (midnight to 5:00 a.m.) service provided on the following segments:

MetroRapid 801: South Congress Transit Center to Rundberg

MetroRapid 803: Westgate Transit Center to Domain

MetroRapid 804: Entire route

MetroRapid 820: ABIA and Mueller

CONNECTIONS 2025

METRO RAPID

- Proposed MetroRapid Route (thick red line)
- Proposed Transit Network (thin grey line)
- Streets (thin black line)

Scale: 0 to 2 Miles

Map labels include: POND SPRINGS, JOLLYVILLE, GREAT HILLS, WELLS BRANCH, TECH BRIDGE, NORTHWEST HILLS, ALLAMOSA, WINDSOR PARK, COLONY PARK, OAK HILL, SOUTHWEST, MONTOPOLIS, DEL VALLE, and various street names like 163, 360, 290, 183, 71, 130, 35, 387, 45TH, 54TH, 56TH, 58TH, 60TH, 62ND, 64TH, 66TH, 68TH, 70TH, 72ND, 74TH, 76TH, 78TH, 80TH, 82ND, 84TH, 86TH, 88TH, 90TH, 92ND, 94TH, 96TH, 98TH, 100TH.

Expanded Frequent Local Network

The Capital Metro High-Frequency Network of Local routes would expand from the existing four routes to 11 under the *Connections 2025* plan (see Table 8 and Figure 19). Frequent Local service is introduced on major corridors in South Austin (Route 311 Stassney, Route 333 William Cannon, Route 10 South 1st Street), as well as East Austin (Route 2 Rosewood, Route 17 Cesar Chavez, Route 18 Martin Luther King). Central Austin would receive two new east-west corridors (Route 335 35th/38th Street and Route 345 45th Street), while in the north, service along Metric and Rundberg (Route 1) would receive frequent service connecting to MetroRapid and the IH-35 BRT corridor. These additions will join existing frequent Local routes 7 Duval/Dove Springs and 300 Oltorf/Springdale.

Another major element is the introduction of frequent service on weekends. Currently, the High Frequency Network operates every 20-30 minutes on Saturdays and Sundays. *Connections 2025* creates an all-day, all-week High-Frequency Network by improving weekend service levels to every 15 minutes. This gives Central Texans the ability to use Capital Metro for a variety of trips throughout the region all week and de-emphasizes the need to own a car. All routes that operate every 15 minutes or better on weekdays will operate every 15 minutes on weekends. Overall, *Connections 2025* offers a 30 percent increase in hours on Saturdays and a 73 percent increase on Sundays, with significant increases to weekend service in early phases of the plan.¹⁴

¹⁴ A major part of Houston Metro's System Reimagining bus ridership growth came from improved weekend service.

Table 8: Proposed Frequent Local Service

Frequent Route		Frequency				Span			Destinations	
		Weekday			Weekend		Monday - Friday	Saturday		Sunday
		Peak	Base	Evening	Base	Evening				
①	Metric/Rundberg	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Tech Ridge, Metric, Rundberg, Windsor Hills, Heritage Hills, Rutherford Walmart
②	Rosewood	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Downtown, Rosewood, East Austin
⑦	Duval / Dove Springs	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Bluff Springs, Franklin Park, Riverside, Downtown, Capitol, UT, Hyde Park, North Loop, ACC Highland, Crestview
⑩	South 1st/Red River	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Southpark Meadows, Bouldin, South 1st, Downtown, Capitol, UT, Hancock Center, Mueller, Windsor Park, Rutherford Walmart
⑰	Cesar Chavez	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Seaholm, Downtown, Convention Center, East Cesar Chavez, Holly
⑱	Martin Luther King	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Lake Austin, Enfield, ACC Rio Grande, UT, Chestnut, MLK, East MLK
③00	Oltorf / Springdale	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Westgate, South Lamar, Oltorf, Pleasant Valley, East MLK, Mueller, Cameron, St. Johns, Crestview
③11	Stassney	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	ACC Riverside, Montopolis, Stassney, South East Austin, Westgate
③33	William Cannon	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Arbor Trails, William Cannon, Southpark Meadows, Springdale/Thaxton
③35	38th	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Seton Medical Center, Hyde Park, Hancock, Cherrywood, Mueller
③45	45th	15	15	30	15	30	5 AM - 12 AM	6 AM - 11 PM	6 AM - 11 PM	Hancock Center, Triangle, Rosedale, Hyde Park

CONNECTIONS 2025
FREQUENT ROUTE

- Proposed Frequent Route
- Proposed Transit Network
- Streets

0 1 2 Miles

TMD

METRO

WELLS BRANCH

JOLLYVILLE

GREAT HILLS

NORTHWEST HILLS

ALLAN DALE

WINDSOR PARK

COLONY PARK

OAK HILL

CONVICT HILL

MANAYACA

SLAUGHTER

DEL VALLE

MONTOPOLIS

SOCO

MUELLER

TECH RIDGE

Simplified Local Service

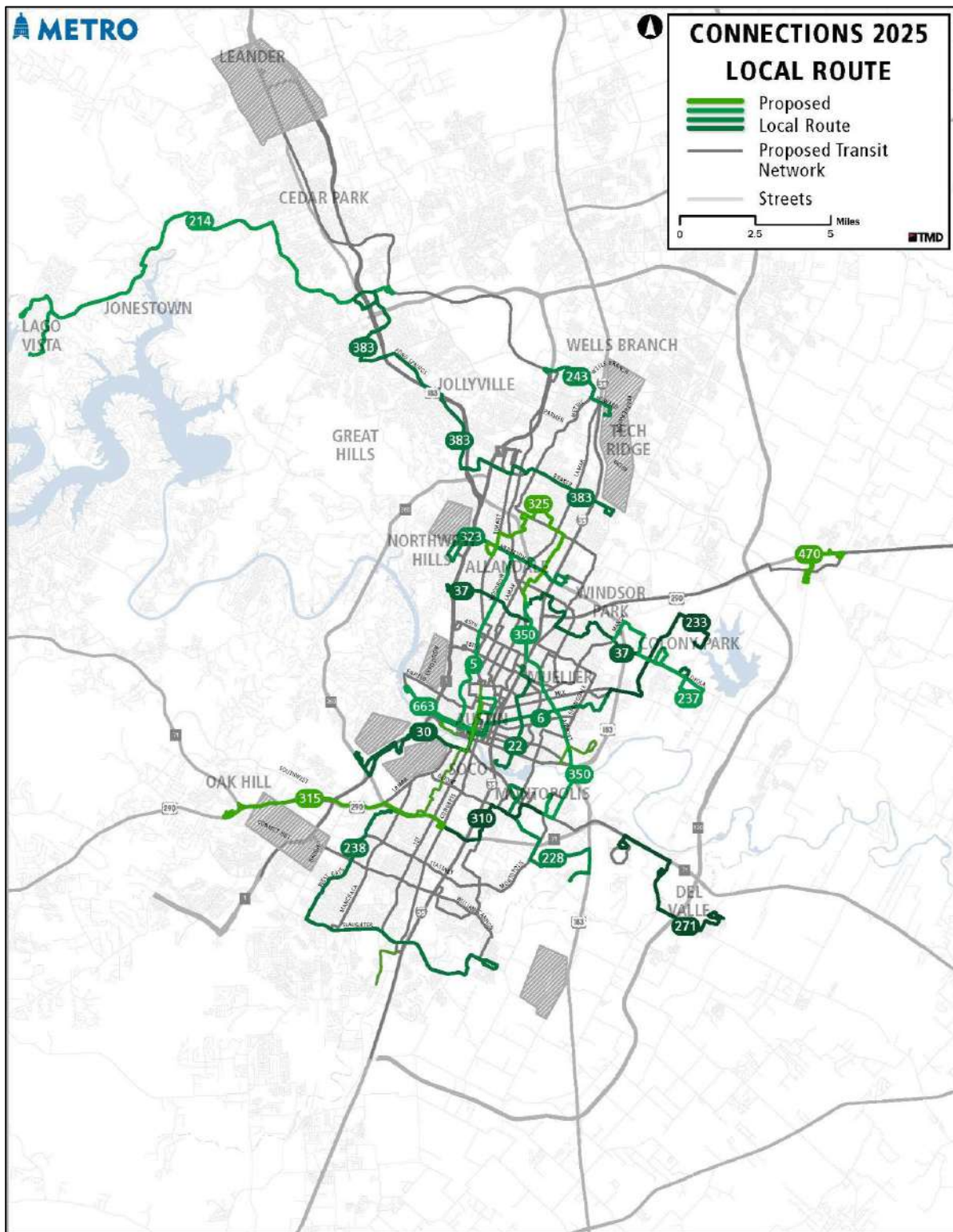
Local services supplement the High-Frequency Route Network and help complete the overall transit network by filling gaps, extending coverage to areas warranting fixed-route service and serving specific target markets. These routes follow the best practices set out in the Framework & Guiding Principles, including linear route alignments and providing east-west connectivity between High-Frequency routes. With few exceptions, Local routes are proposed to operate every 30 minutes, offering the potential to connect with every other trip within the High-Frequency Network. School trippers are proposed as extensions of routes to match school bell times in specific cases.

Table 9: Proposed Local Service

Local Route		Frequency					Span			Destinations
		Weekday			Weekend		Monday - Friday	Saturday	Sunday	
		Peak	Base	Evening	Base	Evening				
5	Woodrow	30	30	30	-	-	-	6:00 AM-11 PM	6 AM-11 PM	Northcross Mall, Brentwood, Lamar, Market District, Downtown
6	East 12th	30	30	30	30	30	5 AM-12 AM	6 AM-11 PM	6 AM-11 PM	Downtown, Capitol, East Austin
22	Chicon	30	30	30	30	30	5 AM-10 PM	6 AM-11 PM	6 AM-11 PM	RBJ Center, Blackshear-Prospect Hill, Foster Heights, Chestnut, Cherrywood, Hancock Center
30	Barton Creek Square	30	30	30	30	30	5 AM-11 PM	6 AM-11 PM	6 AM-11 PM	Barton Creek Mall, Spyglass, Zilker Park, Downtown
37	Colony Park / Koenig	15	30	30	30	30	5 AM-12 A	6 AM-11 PM	6 AM-11 PM	Colony Park, Springdale HEB, University Hills, Windsor Park, ACC Highland, North Loop, Allandale
105	South 5th Peak	30	-	-	-	-	6:30 - 9:30 AM / 3:30 - 6:30 PM	-	-	UT, Capitol, Downtown, Auditorium Shores, Bouldin, Galindo, Westgate
228	VA	30	30	-	-	-	7 AM - 7 PM	-	-	VA Hospital, E Riverside – Oltorf, Pleasant Valley
233	Far Northeast Feeder	60	60	-	60	60	7 AM - 7 PM	7 AM - 7 PM	8 AM - 7 PM	East MLK, Johnny Morris, Daffan Lane, Eagles Landing
237	Northeast Feeder	60	60	-	60	60	7 AM - 7 PM	7 AM - 7 PM	8 AM - 7 PM	Springdale HEB, Colony Park, Community First Village
238	West Gate	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	Westgate, Slaughter Lane, Southpark Meadows, Thaxton Road
243	Wells Branch	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	Howard Rail Station, Wells Branch, Howard Lane, Tech Ridge
271	Del Valle Feeder	30	30	-			6 AM - 8 PM			Berdoll Farms, Los Cielos, Oak Ranch, Travis Correctional Complex, Del Valle, ABIA

310	Wickersham	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	South Congress TC, East Riverside-Oltorf, Wickersham Lane, ACC Riverside
315	Ben White	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	South Congress TC, Westgate TC, Oak Hill, ACC Pinnacle
323	Anderson	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	Northcross Mall, Anderson Lane, North Lamar TC, Rutherford Walmart
325	Ohlen	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	Northcross Mall, Wooten, North Central Austin, Georgian Acres, ACC Highland
350	Airport Blvd.	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	ACC Highland, North Loop, Mueller, Cherrywood, Airport Blvd, East Austin, Montopolis, ACC Riverside
383	Research /Braker	30	30	30	30	30	5 AM - 10 PM	6 AM-11 PM	6 AM-11 PM	Woodcliff, Braker Lane, Lakeline Mall, Research Blvd, Pavilion P&R, Arboretum, Domain
470	Manor Circulator	60	60	-	60	-	7 AM - 6:30 PM	10 AM-5 PM	-	Manor P&R, Manor Walmart
663	Lake Austin	15	30	30	30	30	7 AM – 11 PM	7 AM – 11 PM	7 AM – 11 PM	Brackenridge Apartments, Lake Austin, Old West Austin, Clarksville, Downtown, Capitol, UT

Figure 20: Map of Local Network



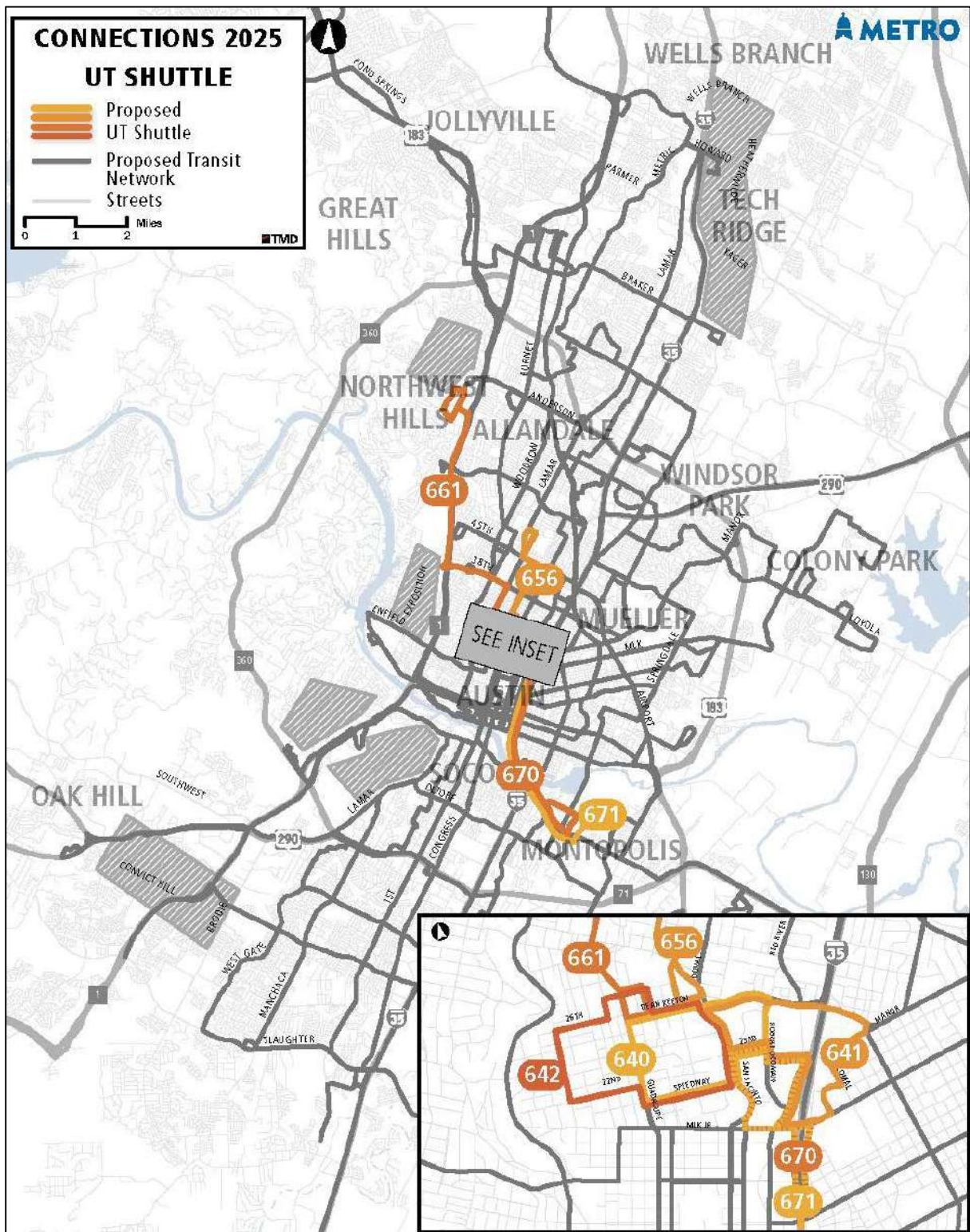
Consolidated UT Service

With the expansion of the High-Frequency Route Network, several UT routes are proposed for consolidation or discontinuation. Service is maintained on key corridors where the High-Frequency Route Network will not operate or where overcrowding would be likely during peak periods. Within the UT campus, the three campus circulators are proposed to have minimal changes in frequency or span, while service to Lake Austin would be converted to a year-round Local route.

Table 10: Proposed UT Service

UT Shuttle	Frequency					Span		Destinations
	Weekday			Sunday		Monday - Friday	Sunday	
	Peak	Base	Evening	Base	Evening			
640 Forty Acres	8	8	-	-	-	7 AM - 7 PM	-	UT
641 East Campus	10	10	20	40	40	7 AM - 1 PM	2 PM-10 PM	UT, Disch Falk Field
642 West Campus	8	8	-	-	-	6 AM - 7 PM	-	UT, West Campus
656 Intramural Fields	10	10	-	-	-	7 AM - 7 PM	-	UT, Speedway, Triangle, Intramural Fields
661 Far West	8	15-30	20	-	-	7 AM - 10 PM	-	UT, Northwest Hills
670 Crossing Place	10	20	-	-	-	7 AM - 7 PM	-	UT, Crossing Place
671 North Riverside/Lakeshore	10	30	20-40	35	35	7 AM - 11 PM	2 PM-10 PM	UT, Riverside, North Lakeshore
681 Intramural / Far West (not shown)	-	-	-	60	60		2 PM -10 PM	UT, Speedway, Triangle, Intramural Fields, Northwest Hills

Figure 21: Map of UT Service



Improved Regional Connectivity

Connections 2025 aims to improve regional connectivity with the new route network. Streamlined frequent east-west routes connect neighborhoods quickly without the need to connect downtown or with multiple routes. MetroRapid plays a larger role in the network, offering fast, frequent connections across Central Texas. Additional north-south connectivity is available with increased frequencies on MetroRail in the core service area between downtown Austin and The Domain. New MoPac express services provide faster, more reliable service using freeway toll lanes. Lastly, the introduction of a BRT service on IH-35 will offer regional connections to the north and south¹⁵.

While *Connections 2025* focused on Capital Metro's service area, facilitating broad Central Texas regional transit connectivity was also important. Providing frequent, fast Capital Metro service from major regional hubs like Tech Ridge and Southpark Meadows and from community mobility hubs like Manor Road/US 183 allows neighboring transit systems to reliably connect with Capital Metro's High-Frequency Route Network while allowing for future through-service on key transit corridors like the proposed IH-35 BRT.

Table 11: Proposed MetroExpress and Rapid Transit

Route	Frequency			Span	Destinations
	Weekday			Monday - Friday	
	Peak	Base	Evening		
<div>500</div> IH-35 Bus Rapid Transit	10	10	15	5 AM - 12 AM	Tech Ridge, Downtown, Southpark Meadows
<div>550</div> MetroRail Red Line	15	15	30	6 AM - 12 AM	Leander, Lakeline, Crestview, East Austin, Downtown
<div>901</div> South MoPac Express	30-60	-	-	6 AM - 9 AM / 4 PM - 7 PM	MoPac/Slaughter, Arbor Trails, Downtown, UT
<div>971</div> Oak Hill Express	30-60	-	-	6 AM - 9 AM / 3 PM - 7 PM	Oak Hill, Downtown, UT
<div>980</div> Howard Express	15-30	-	-	6:00 AM – 10:00 AM / 3 PM - 7 PM	Howard Station, Downtown, UT
<div>981</div> Oak Knoll Express	20	-	-	6:30 AM - 7:30 AM / 4:30 PM – 5:30 PM	Pavilion P&R, Downtown, UT

¹⁵ While this option was understood to be viable at the time of the development of the study, it was later determined to be infeasible and therefore is no longer being considered for implementation as a part of the plan.

982	Pavilion Express	10-30	60	60	5:30 AM - 10 PM	Pavilion P&R, UT, Downtown
985	N183 Express	20-30	60	60	5 AM - 11 PM	Leander, Lakeline, UT, Downtown
987	NW Express	10-20	-	-	5 AM - 9 AM / 3 PM - 7 PM	Leander, Lakeline, Downtown, UT
990	Manor/Elgin Express	60	-	-	5:30 AM - 8 AM / 4 PM - 7 PM	Manor, Elgin, UT, Downtown

METRO

**CONNECTIONS 2025
EXPRESS AND
RAPID TRANSIT**

- MetroRail Red Line
- IH-35 BRT
- Proposed Express Route
- Proposed Transit Network
- Streets

0 2.5 5 Miles

TMD

MOPAC EXPRESS LANES
980 981 985
MOPAC VIA 38th
982 987

LEANDER
LEANDER
CEDAR PARK
LAKELINE
JOLLYVILLE
HOWARD
WELLS BRANCH
TECH RIDGE
NORTHWEST HILLS
ALLAMOGOSA
WINDSOR PARK
COLONY PARK
OAK HILL
DEL VALLE
SPOCO
MOTOROLIS

985 987 980 981 982 985 982 987 971 901 990 990

More Reliable Services

Given that reliability is the key attribute to retaining ridership, it is a priority throughout *Connections 2025*. Streamlined routes and a simplified network make the service both easier for customers to understand and use, and easier to operate reliably. In addition, multiple aspects of transit prioritization are recommended in the plan. Reliability can be increased through additional transit priority lanes in key congested corridors and transit signal synchronization and prioritization to ensure that service meets customer expectations. This includes local arterials such as The Drag, as well as highways such as the MoPac Express lanes. Delay reduction at stops using bus bulbs,¹⁶ far-side stop locations, all-door boarding with fare pre-payment and level platforms (with potential precision docking) reduce variance between trips and improve reliability. Lastly, additional operating protocols reflecting current industry best practice to improve on-time performance and minimize bus bunching are proposed. These include terminal end-of-line on-time departure signals (e.g., Denver MallRide transit departure light signals and on-vehicle display signals, AVL monitoring and vehicle spacing correction through on-vehicle display signals or dispatcher direction) and use of headway-based schedules¹⁷ for high-frequency MetroRapid service.

Simplified Fare Structure

The fare differential between Local services and MetroRapid was discontinued on January 8, 2017 as part of early action under *Connections 2025*. MetroRapid plays a strong network role and needs to be treated as part of the core network. The lowering of the MetroRapid fare to the standard Local fare allows users to seamlessly transition between the services without having to wait for a specific bus due to the pass purchased.¹⁸ In addition, the plan calls for MetroRapid to be the only transit service on major arterial spines, making a single fare consistent with Local transit necessary. Commuter services such as the MetroExpress routes will retain the higher Commuter fare due to the increased cost of providing peak-hour services over the all-day network. The increased costs come from additional peak vehicle requirements (including more expensive over-the-road

¹⁶ Bus bulbs are sidewalk extensions or islands that allow transit patrons to board without the bus leaving the flow of traffic, which reduces delay variability (better reliability) and vehicle conflicts. These may be used with or without exclusive transit lanes (e.g., The Drag).

¹⁷ Headway-based schedules deliver frequency intervals (e.g., every 5-10 minutes) rather than a timepoint-based schedule that sets times. Headway-based schedules allow for transit service to efficiently optimize based on real-time ridership, traffic and operating conditions and will use transit priority to maximum advantage. Headway schedules perform most efficiently and effectively when supported by line managers who actively supervise the service operation and mentor operators.

¹⁸ It is also cost-effective to maximize ridership on MetroRapid because the cost per seat-mile is lower than on regular Local bus service due to its faster operation.

coaches) and the associated labor costs for operating shorter, less efficient, shifts during peak periods.

Mobility Innovation Zones

The Capital Metro system was refocused around an expanded and enhanced High-Frequency Network where fixed-route transit mobility was cost-effective. Areas that do not support fixed-route transit due to low densities, disconnected development patterns or poor road network structure may be converted to Mobility Innovation Zones to pilot more cost-effective mobility solutions. These solutions may include shared-ride trips, destination shuttles, vanpools and carsharing options, and would be tailored to both meet the needs of individual communities and be cost-effective to provide. Areas with existing fixed-route service that is proposed for elimination under *Connections 2025* would be prioritized over proposed Mobility Innovation Zones in areas that do not currently have fixed-route service. Fixed-route service would be continued until pilot projects are fully developed and implemented. These pilot projects will be developed in conjunction with the community over a 6-12 month period to ensure that these alternatives are appropriately marketed and thoroughly evaluated.

Community Circulators

The four circulator routes proposed as part of *Connections 2025* are in a competitive transit environment where there is high demand for short-distance community trips, a need for connections to the Rapid Transit network, and where parking is limited and/or expensive. Three community circulators augment downtown Austin transit options: Medical Center Circulator, Downtown East-West Circulator, and South Congress Circulator. The Domain Circulator is the fourth and serves as a first-last mile connection between MetroRail and The Domain. In each case, community public and/or private partnerships are desired to ensure successful implementation of each circulator, including service funding (ensure spontaneous use frequencies), fare subsidies or media availability, targeted advertising and advocacy to build support for sustainable community public mobility.

Table 12: Proposed Circulators

Route	Frequency					Span			Destinations
	Weekday			Weekend		Monday - Friday	Saturday	Sunday	
	Peak	Base	Evening	Base	Evening				
421 Domain Circulator	10	10	10	10	10	6 AM - 11 PM	8 AM - 11 PM	9 AM - 9 PM	Kramer Station, The Domain
450 South Congress Circulator	10	10	10	10	10	7 AM - 2 AM	7 AM-2 AM	7 AM-12 AM	Downtown, Capitol, South Congress
451 Downtown East-West Circulator	10	10	10	10	10	7 AM - 2 AM	7 AM-2 AM	7 AM-12 AM	Market District, Seaholm, 6th Street, Convention Center
452 Medical Center Circulator	12	12	-	-	-	7 AM - 8 PM	-	-	UT, Innovation District, Convention Center

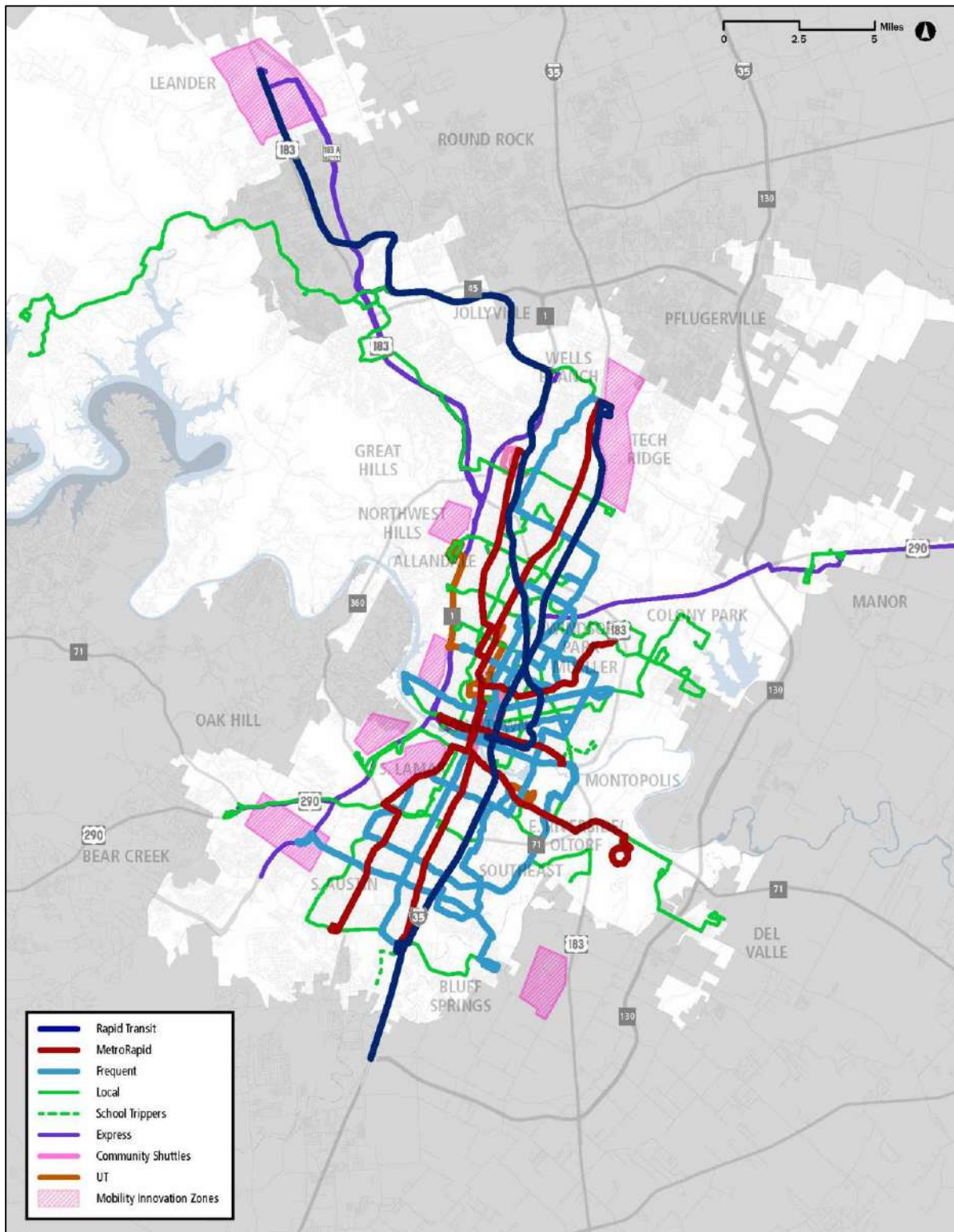
Table 13: Proposed Mobility Innovation Zones

Zone	Mobility Innovation Zone
A	Leander
B	Dessau Road
C	Steck/Mesa
D	Exposition/Tarrytown
E	Walsh Tarlton
F	Maple Run/Convict Hill
G	Pilot Knob (subject to Capital Metro service area expansion)
H	Zilker/Barton Hills

[illegible]

The *Connections 2025* Plan is illustrated in Figure 24. Detailed route-by-route recommendations are located in Appendix E: [Route-by-Route Descriptions](#).

Figure 24: Connections 2025 Network Map



Capital Program

Connections 2025 outlines major capital projects that will enhance the experience of customers and improve service operations, as well as replacement of vehicles and expansion of fleet needed to implement the 10-Year Transit Network Plan.

Fleet

The full *Connections 2025* plan requires 25 fewer vehicles to operate compared to the existing service. However, MetroRapid Route 801, which uses articulated vehicles (a higher-capacity vehicle with a bendable section in the middle) is proposed to operate with improved frequencies. The current articulated fleet is sufficient for initial service improvements on Route 801 to every 10 minutes, but further improvements to operate Route 801 every 7½ minutes requires eight additional articulated vehicles. As of this report, Capital Metro can acquire additional articulated vehicles for MetroRapid service; these vehicles cost \$250,000 more than a standard 40-foot bus.



Mobility Hubs

One solution to changing demand patterns is the integration of community services with the core transit network at mobility hubs. This concept recognizes that regular fixed-route transit is not the optimal choice for every community mobility need, and by integrating multiple forms of transportation at a single location, people can choose the mode that best meets their needs for a particular trip. Transportation modes and facilities that can be co-located at mobility hubs include, but are not limited to: Capital Metro transit service, bike storage, B-cycle stations, parking for carsharing services (car2Go), taxis/TNC stands, parking for private station vans and shuttles, and electric charging stations. Private station vans and shuttles provide “first-mile, last-mile” access to residents, employees or other community travelers. For example, if a business locates two miles from Tech Ridge Park & Ride, instead of extending fixed-route service to the business, the employer can provide station vans and/or a corporate shuttle to help employees complete their journey to and from work at a much lower operating cost.

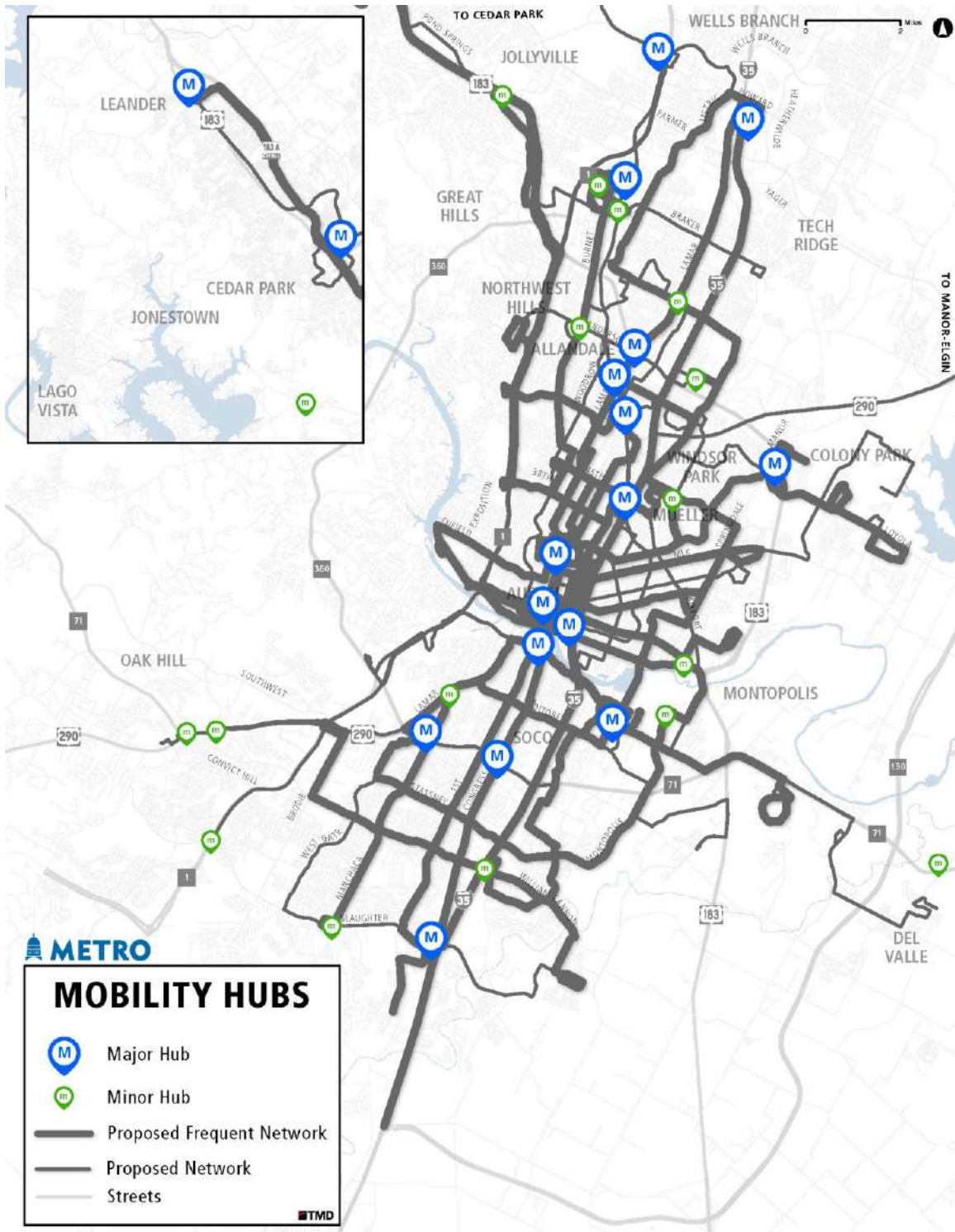
This concept allows fixed-route service to serve corridors where it provides the most benefit to large numbers of riders while alternative transportation options provide effective mobility solutions for lower demand trips.

Mobility hubs can be a variety of shapes and sizes, depending on the space available and the needs of specific communities and neighborhoods. Ideal locations for mobility hubs are at key network convergence points that maximize connections to the core transit system. Mobility hubs are also beneficial on the outlying portions of the network, places where fixed-route service

transitions to more cost-effective alternative mobility options. Here, mobility choices at the hubs provide transportation options to complete journeys beyond the Capital Metro service area. Capital Metro should work closely with member cities to identify good locations for mobility hubs in both existing and planned development areas. Partnerships should be developed with local community organizations and businesses to best site and develop these hubs to improve mobility. *Connections 2025* identifies two tiers of mobility hubs: major and minor (see Figure 25).



Figure 25: Map of Proposed Mobility Hub



Major Hubs

Major Mobility Hubs are off-street facilities at major transfer points in the Capital Metro network. One example of an existing Major Mobility Hub is North Lamar Transit Center. While the North Lamar Transit Center is today only an outdoor transit hub facilitating bus connections and a Park & Ride facility, future changes can bring a multi-modal approach with access to bikeshare facilities and an indoor waiting facility. As mentioned before, Mobility Hubs act as interfaces between the fixed-route transit network and shared mobility options such as carsharing, bikesharing and ridesharing. A primary transit hub at Pleasant Valley and Riverside would be able to facilitate transfers between the proposed MetroRapid Route 820 and several frequent and Local routes, providing regional connections between East Austin and Southeast Austin. Additionally, connections between MetroRail and frequent routes to Mueller and UT Austin would be facilitated at a new Hancock Center hub under IH-35 between Airport Blvd. and 41st St.



Source: <https://tylerstevermer.wordpress.com/2014/04/18/mobility-hub/>

Minor Mobility Hubs

Minor Mobility Hubs can be placed anywhere on the High-Frequency Route Network, and can be located on-street or off-street depending on land availability and community needs. They offer convenient access to multiple mobility modes without significant infrastructure investment. Examples of minor mobility hub opportunities are The Drag where B-cycle is co-located next to the UT/West Mall MetroRapid station and the Downtown Red Line station with B-cycle and car2Go.



Park & Rides

Park & Rides function as a transition between single-occupancy vehicles and express buses or vanpools. Two types of Park & Rides are proposed under *Connections 2025*. The first would allow passengers to utilize the MetroExpress bus network as well as shared rides to other destinations. The second type of Park & Ride would facilitate just shared rides to major destinations using either carpool, vanpool and/or a TNC/microtransit solution. Capital Metro should look to joint-development partnerships¹⁹ with nearby business, institution, community and TxDOT interests to identify existing or potential facilities for both types of Park & Ride services. Suitable locations should have enough parking to sustain ridership of 25-30 passengers per MetroExpress bus trip. In addition to the existing Park & Rides in the Capital Metro system, the following locations were identified as candidates in *Connections 2025*:

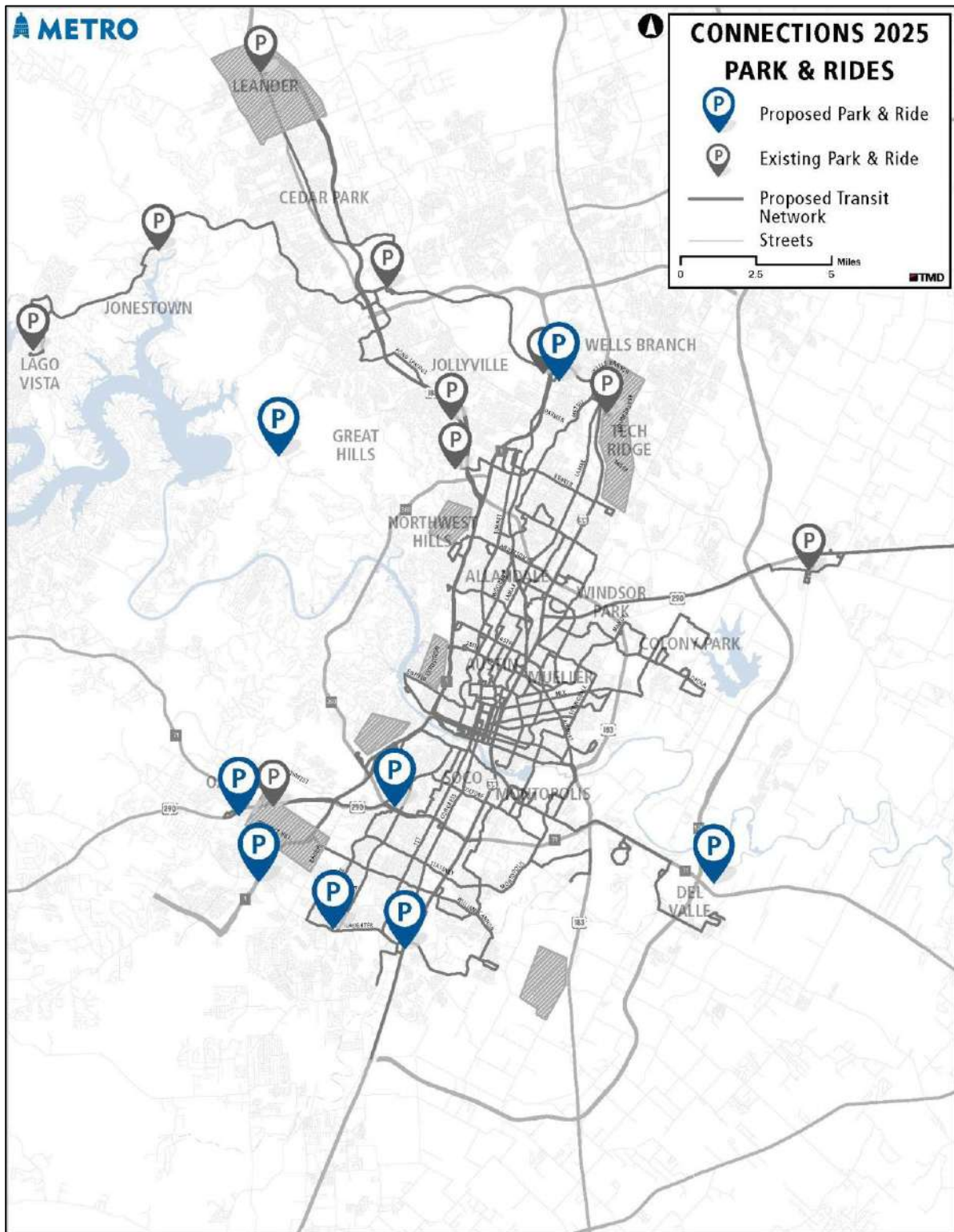
- **New Life (Howard):** Howard Station was identified as needing additional Park & Ride capacity due to overcrowding at the existing MetroRail station parking lot. An additional Park & Ride facility is available at New Life Church, which will be served by Express Route 980.
- **Westgate:** Capital Metro is proposing a new Park & Ride facility near the existing Westgate Shopping Center at the intersection of Ben White and Manchaca. This would serve as a major transfer hub between MetroRapid and frequent routes, while providing additional Park & Ride capacity for those coming from the south and southwest.
- **Manchaca at Slaughter:** The southern terminus of the extended MetroRapid 803 is proposed for improved east-west service on Slaughter Lane, as well as direct MetroRapid service north into downtown Austin and UT. This location is ideal to serve residents along Manchaca south of

¹⁹ The long term (10-20 year) need for large Park & Ride facilities is uncertain given the potential impact of autonomous vehicles replacing second cars currently used for “first-mile” commute connections to the park & ride. Prioritizing a joint development strategy will allow for easier cost-effective facility reuse as additional TOD should Park & Ride parking demand decline in future years.

Slaughter Lane, who are in less dense environments, and provides an alternative to Southpark Meadows.

- **Oak Hill Park & Ride.** As part of the introduction of express lanes on MoPac and US 290 in Southwest Austin, the Oak Hill Flyer is proposed to be upgraded to a full MetroExpress route. New Park & Ride locations are needed to sustain and increase ridership on this route, which has an existing Park & Ride facility at US 290 and William Cannon. Ideal locations in Oak Hill for Park & Ride service are at ACC Pinnacle, the intersection of US 290 and SH 71, and/or upgrading the US 290 and William Cannon Park & Ride.
- **MoPac Expressway – South Austin:** The current Route 111 operates through the Circle C Ranch and Escarpment neighborhoods. While this route is relatively productive as a commuter route, there are opportunities for improvement with faster service originating at a Park & Ride and utilizing the MoPac Express lanes described above. With the route currently operating in low density areas, these Park & Rides would aid in the conversion to a true express service. Additional Park & Ride capacity would be developed as part of this current route to help build transit ridership in Southwest Austin. An ideal commuter intercept location for this Park & Ride would be at MoPac and Slaughter Lane.
- **Southpark Meadows:** The current existing terminus of Route 801 at Southpark Meadows would also serve as the primary southern terminus for the IH-35 BRT route. Identifying partnerships for a joint Park & Ride and BRT/MetroRapid station (interim express/MetroRapid station) would benefit regional travel from South Austin.
- **Four Points (FM 2222 at FM 620):** This Park & Ride would serve as a collection point for residents in the Four Points area and along Lake Travis. No Capital Metro service is proposed from this Park & Ride, but vanpools, casual carpools and microtransit service can be facilitated from the lot.
- **Southeast Metro Park:** This Park & Ride would serve to mitigate existing congestion on SH 71 between SH 130 and US 290, serving the communities of Del Valle and points east. No Capital Metro service is proposed from this Park & Ride, but vanpools, casual carpools and microtransit service can be facilitated from this facility.

Figure 26: Map of Park & Ride Locations



MetroRapid Stations

The consolidation of Local bus and MetroRapid service on South Congress Avenue, North and South Lamar Boulevards, Burnet Road and Manchaca Road, as well as new MetroRapid corridors on Riverside Drive, Manor Road and 7th Street require additional infrastructure to be built. Based on an average distance between $\frac{1}{4}$ and $\frac{1}{3}$ mile between stops to maintain short walk access, approximately 75 additional station pairs would need to be installed. While regular MetroRapid amenities such as real-time information signage, benches and shelters are proposed, Capital Metro should consider designing a less expensive version of the MetroRapid station given that an additional 150 individual stations are proposed for installation. New MetroRapid stations are estimated to cost \$15 million over three years.



Transit Priority

Transit priority measures reduce delay and speed up travel times while decreasing operational variance, which benefits reliability.²⁰ These include a variety of delay reduction strategies including relocating stops to an intersection's "far-side," reducing time spent at bus stops through all-door boarding together with pre-paid fare options and streamlined operations using bulb-outs, queue jumps and transit priority lanes. At full implementation of transit priority measures throughout an entire corridor, running times can be expected to improve by 15-25 percent over the base Local service. The following measures are recommended:

- **Transit Priority Lanes:** Transit priority lanes facilitate the movement of buses by providing an uncongested lane for bus operation. These will involve coordination with other institutions (e.g. the city of Austin, TxDOT) to construct and implement. Expansion of the priority lanes beyond those already proposed by the city of Austin are recommended on the following corridors:
 - **South 1st Street Bridge:** Expansion of the transit priority lanes on Guadalupe and Lavaca over the South 1st Street Bridge to Riverside Drive would allow for more consistent and reliable travel times on public transit. Transit currently moves as many or more people over the bridge during the morning and afternoon peak as automobiles in a

²⁰ Delay reduction is hugely important because it is a win-win-win. First, it makes transit more attractive to customers by providing faster and more reliable travel (travelers perceive delay reduction and increase at twice its real value); thus, growing ridership. Second, by reducing transit running times, resources can be used more efficiently; the reduced service operating costs are available for reinvestment (more service, more ridership). Lastly, transit priority supports city initiatives for sustainable communities both in fostering green mobility and in making a physical space commitment to livable communities.

comparable lane.²¹ On an average weekday, transit currently moves about 600 customers heading northbound during the a.m. peak. With the move of MetroRapid 803 service to the South 1st St. bridge, that number would increase to more than 700 riders. Similarly, on an average weekday, transit currently moves more than 500 riders heading southbound during the p.m. peak. With the move of MetroRapid 803, that number would increase to more than 600 riders. The installation of a transit priority lane will allow for increased person throughput and improved travel times over the limited north-south crossing.

- **Guadalupe between MLK and 38th Street:** As with the South 1st Street Bridge, expansion of the existing transit priority lanes north through The Drag and beyond will improve the reliability of MetroRapid and other bus routes. Transit currently moves more than 1,000 riders heading southbound during the a.m. peak and more than 800 passengers heading northbound during the p.m. peak.²² This represents far greater person throughput by transit than can be accomplished by automobiles in a comparable lane. Synchronizing traffic signals, optimizing Transit Signal Priority, and improving pedestrian crossings can help maximize the value of the transit priority lanes while enhancing pedestrian crossing safety. The priority lanes would operate as very effective continuous queue jumps, especially if vehicle right turns are separated from the transit lanes.
- **7th Street between Guadalupe and IH-35:** Seventh Street through downtown Austin is an eastbound four-lane, one-way street. *Connections 2025* proposes operating MetroRapid Route 804 along 7th Street in both directions. Having either dedicated transit lanes in both directions or a contraflow bus-only lane will allow for faster direct east-west service through downtown. The availability of transit-lanes also allows for improved reliability between IH-35 and the Guadalupe/Lavaca couplet for buses that start or end downtown.

Additionally, minor roadway improvements within the Capital Metro service area will greatly increase the efficiency and quality of Capital Metro transit service. These include the construction of a right-turn lane from northbound North Lamar to eastbound Howard Lane for faster connections to Tech Ridge. Intersections are also proposed for traffic signal installation to have safer left turn movements, including North Lamar at Sunshine and Montopolis at Hogan.

- **Transit Signal Priority:** Transit signal priority (TSP) facilitates the movement of buses through signalized intersections by providing early or extended green time, which reduces delay from

²¹ Passenger data referenced is from Spring 2016.

²² Passenger data references is from Fall 2015.

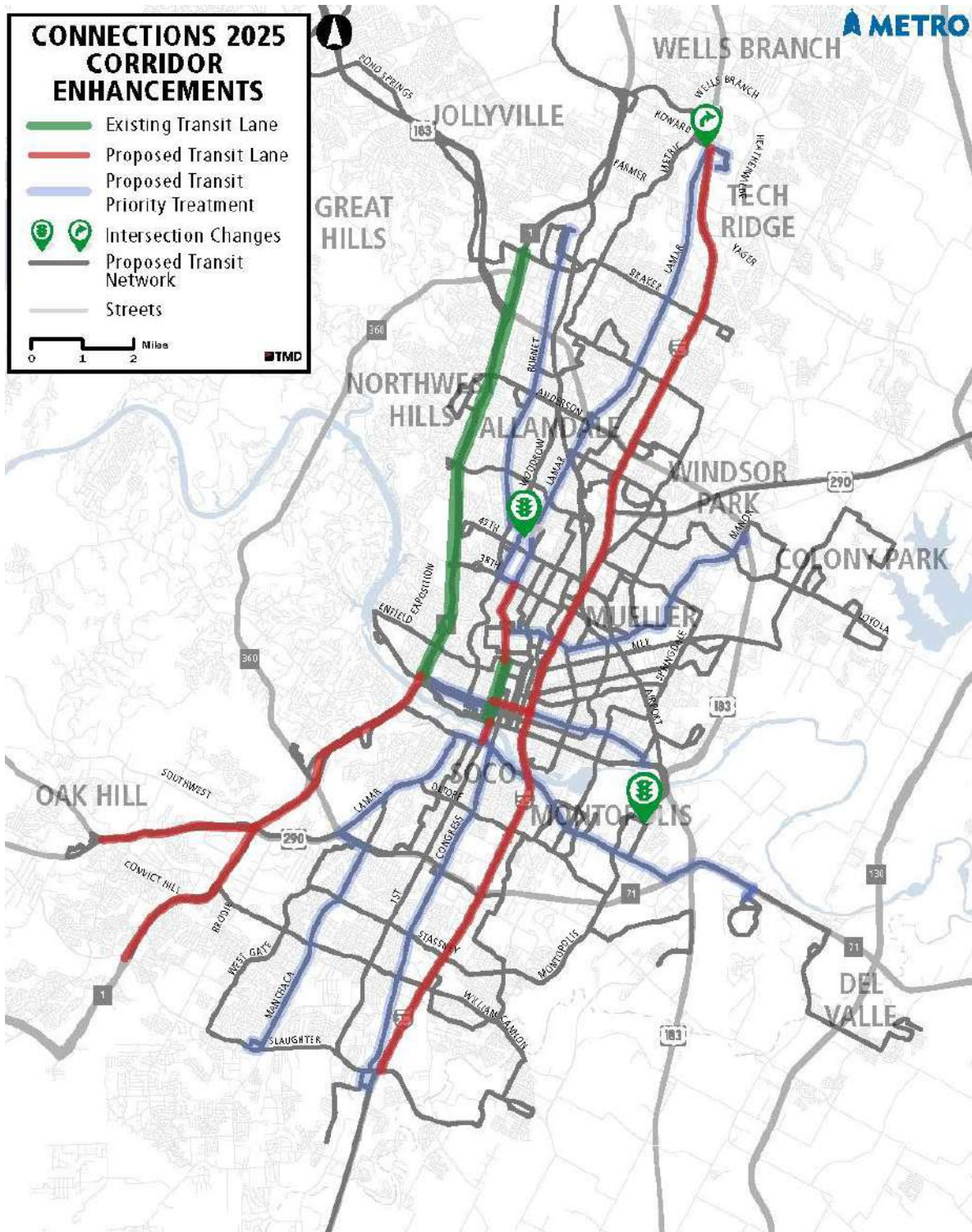
traffic signals and improves service speed and reliability.²³ However, a first step should be to re-optimize corridor signal synchronization to maximize the benefit of and minimize the need for TSP, further reducing unnecessary transit delay. These should be prioritized on MetroRapid first, then major transit trunk segments and finally for High-Frequency, routes as these offer the greatest system network benefit.

- **Bus Bulbs:** Bus bulbs are curb extensions that allow buses to board and alight passengers while remaining in the traffic lane. They eliminate the need to merge in and out of traffic, reducing delay while improving both safety and reliability. In addition, bus bulbs can be configured as transit boarding islands and allow for continuous cycle tracks out of traffic adjacent to the sidewalk.
- **Queue Jumps:** Queue jumps are short bypass transit lanes located at the nearside of intersections that allow buses to move past traffic queues and receive an early green signal to move ahead of traffic. Queue jumps are an effective method of improving bus travel times and reliability in areas of high traffic volumes.
- **Far-side stop placement:** Far-side stops are located immediately after an intersection, allowing the vehicle to pass through the intersection before stopping for passenger loading and unloading, preventing the bus from having to sit through multiple light cycles (which also allows an optimal use of a transit signal priority system). When the bus needs to reenter traffic, the intersection and traffic signal generate gaps in traffic flow. Far-side stops require shorter deceleration distances and provide for safer and greater right turn capacity by eliminating bus blockage within the curb lane on the approach to the intersection. Additionally, the location of the stop encourages pedestrians to cross behind the bus, consistent with Vision Zero safety initiatives.
- **All-Door Boarding:** All-door boarding allows passengers to board the vehicle through all available doors reducing time spent at bus stops due to people queueing to board the vehicle. Other cities, like San Francisco, have implemented all-door boarding by allowing pass holders to board through the back door, leaving the front door (farebox) to board cash passengers. MetroRapid currently has this system in place, allowing riders to purchase fares while waiting for the bus through the CapMetro App. *Connections 2025* proposes focusing fare prepayment through the app following the San Francisco model (cash payment through the front door). Focusing on an enhanced smartphone application that allows for purchase of all fares with fare capping²⁴ is cost effective and consistent with industry direction.

²³ The industry best practice is far-side stations and stops with extended green cycles, which maximizes transit benefit while minimizing impacts on cross traffic and signal cycle recovery.

²⁴ Fare capping automatically restricts the maximum cost per day, week or month. For instance, if several single ride trips are purchased during a single day, the system automatically caps the cost at a day pass.

Figure 27: Map of Corridor Enhancements



IH-35 BRT

As part of TxDOT’s planned improvements to the IH-35 corridor, Capital Metro would utilize the “managed lanes” to provide regional bus rapid transit (BRT) service between Tech Ridge and Southpark Meadows via downtown Austin and UT.²⁵ Peak hour extensions south to SH-45 are also proposed. Capital Metro should look to partner with TxDOT to plan and implement this BRT, including station facility design and key connections to the core transit network. Service operated by CARTS (north to Round Rock and south to Buda) could use the managed lanes and stop at these stations as well.



Stations would be designed to provide direct BRT connections to Capital Metro’s surface transit without leaving the managed lanes right-of-way envelope. They would provide convenient, reliable connections to the High-Frequency Route Network at the following locations:

North

- Howard Lane (Tech Ridge)
- Rundberg Lane
- Highland
- Hancock Center

Central

- UT Campus
- Downtown Austin/Capitol

South

- Oltorf Street
- Riverside Drive
- William Cannon/Bluff Springs
- Slaughter Lane (Southpark Meadows)

Phased Implementation

The service recommendations are divided into four implementation phases spread over the next 10 years, with the majority of *Connections 2025* being implemented as quickly as possible (see Figure 28). Even with most of the implementation occurring within a single year, phasing of improvements remains necessary given vehicle, facility, financial and administrative constraints. The phases were determined using a variety of factors, including vehicle and facility availability, geographic coverage, complexity of implementation and the number of riders who would benefit from improvements. Improvements that must occur together to maintain service coverage of an area are grouped together.

²⁵ While this option was understood to be viable at the time of the development of the study, it was later determined to be infeasible and therefore is no longer being considered for implementation as a part of the plan.

The top priorities are those improvements that are most likely to benefit the most riders and generate the most additional ridership and fare revenue while minimizing negative impacts to existing riders. Keeping in line with the Framework and Guiding Principles, the plan proposes that Capital Metro invest in service changes that improve existing system performance. Top priorities focus on improving frequency or hours-of-service spans on key routes or making alignment changes that are likely to greatly increase service productivity. The new farebox revenue generated from these top priority service improvements can be used to augment the overall funding available for service operations. Longer-term priority improvements that require capital infrastructure (i.e. MetroRapid stations, transit priority, major mobility hubs and IH-35 BRT) are phased in based on estimated completion dates of these projects. Plan elements that require partnerships (i.e. community circulators and minor mobility hubs) or pilot testing (innovation zones) are phased accordingly.

Figure 28: Implementation Plan

	2018	2019	2020-2022	2023-2025
New Network High-Frequency Route Network Implementation Local alignments Eliminate duplicative service MetroRapid frequency and alignments Integrate UT shuttles				
Mobility Innovation Pilot Projects Develop and implement mobility options Remove unproductive service				
Infrastructure MetroRapid stations/Priority treatments Increased core MetroRail frequency Additional Park & Ride capacity				
IH-35 BRT Integrate I-35 Express routes into new BRT Route				

Immediate-Term (FY2018)

Changes in the immediate-term focus on implementing as much of *Connections 2025* as possible using existing resources. This includes frequency enhancements on high-ridership routes and making the route adjustments that will have the most significant positive impact on the structure of the Capital Metro network. Additionally, Local services (Routes 1, 3, 4, 20) are consolidated into new or updated MetroRapid lines to build ridership prior to full MetroRapid infrastructure implementation. These MetroRapid changes also include the implementation of 10-minute service on Routes 801 and 803 in 2017. The majority of route consolidation would occur in this

phase with the implementation of the High-Frequency Route Network expansion and the consolidation of the Flyer routes.

Short-Term (FY2019)

In this phase, underutilized fixed-route service is replaced by alternative mobility options in areas designated as “Mobility Innovation Zones.” Pilot projects involving innovative mobility options will be tested and refined in these neighborhoods as part of the process finding alternatives for these existing fixed routes. Partnerships with innovative mobility options such as microtransit ridesharing providers, transportation network companies (TNCs) or destination shuttles require time to set up and conduct the pilot testing. Consequently, the fixed route service coverage in these areas will remain in place until the pilot begins on an area-by-area basis. To reasonably evaluate the effectiveness of the new mobility options, the fixed-route service would be discontinued during the pilot.

Mid-Term (FY2020 – FY2022)

Changes in the mid-term focus on service adjustments once necessary capital infrastructure work has been completed. This includes the installation of MetroRapid stations (additional and relocated ones on 801/803 and new ones for 804/820) and the implementation of proposed transit priority treatment, including improved transit signal priority, queue jumps, bus bulbs and transit-only lanes. Additional MetroRail service (15-minute frequency) and a new station at Hancock Center should be considered within this timeframe, converting the service from a commuter rail line to an all-day, all-week part of the core High-Frequency Route Network. MetroRapid Route 801 frequencies would increase to every 7.5 minutes with the arrival of additional articulated vehicles. Additional Park & Ride lots would be introduced in this time frame, allowing improved commuter express route, vanpool, casual carpool and microtransit options.

Long-Term (FY2023 – FY2026)

Long-term improvements further increase the number of trip options available to riders by implementing the full buildout of the IH-35 Bus Rapid Transit (BRT) route, facilitating regional travel between Southpark Meadows in the south and Tech Ridge in the north via downtown Austin, the Capitol and UT. Additionally, the community circulator routes would be implemented as local partnerships, both in terms of financial support as well as sponsorships, to ensure the services best meet the needs of the local communities.

Financial Impacts

Connections 2025, with its various phases, will require additional funding resources to implement. With the uncertainty of cost changes, projections are made using revenue service hours and miles, the two main drivers of cost. Initial service changes (through FY2020) are proposed to remain

revenue hour neutral compared to 2016 service levels. Several of the *Connections 2025* improvements, including additional service to expand the High-Frequency Route Network, require resource reallocations from underperforming routes within the Capital Metro service area. Budgeted contingencies provide additional resources to address potential mid-year service changes to address loading issues. Additional contingency is budgeted to fund alternative services in the Mobility Innovation Zones.

In the mid-term (FY2021), revenue hours are proposed to increase by 8 percent to account for increased MetroRapid service and increased frequencies on MetroRail. These estimates are conservative and assume minimal speed increases over existing conditions on MetroRapid even with additional transit priority. Another 7 percent increase is projected as part of the *Connections 2025* rollout to account for the full introduction of Bus Rapid Transit on IH-35, as well as circulator routes to provide short-distance trip-making. While these are currently budgeted as fixed-route transit options operated by Capital Metro, further evaluation of circulator options (such as autonomous shuttles) and funding sources will be made closer to implementation. Figure 29 and 30 summarize annual revenue hours and miles over the 10-year plan.

Figure 29: Annual Revenue Hours by Fiscal Year

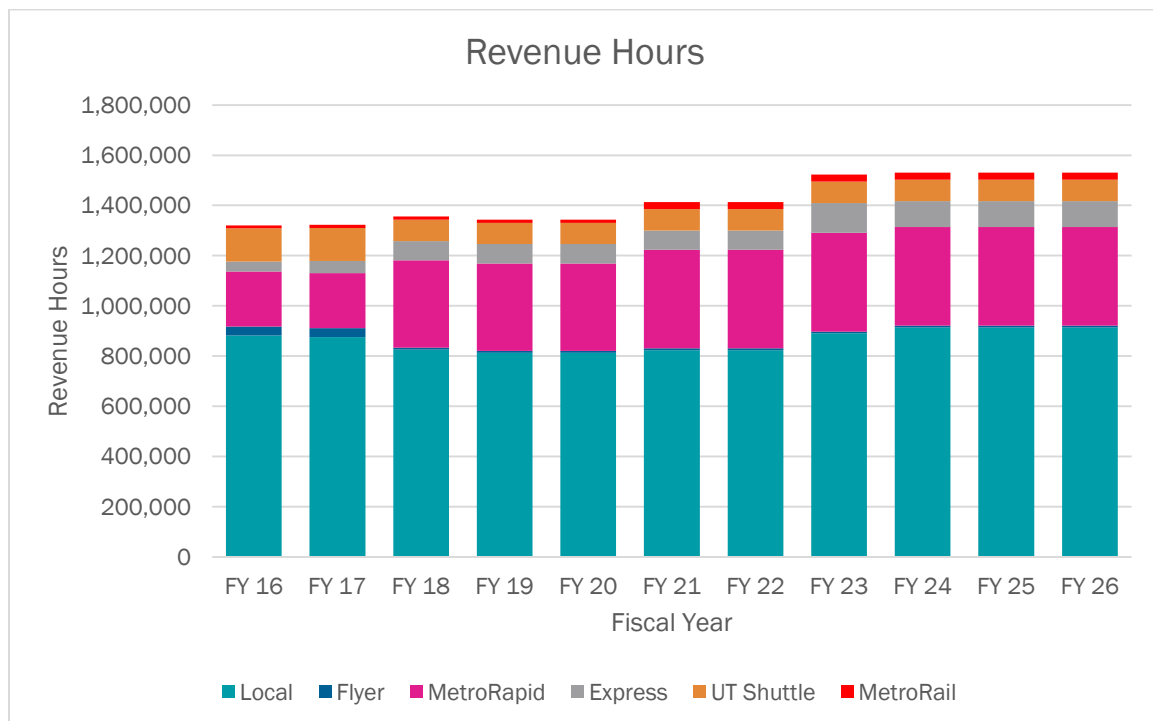
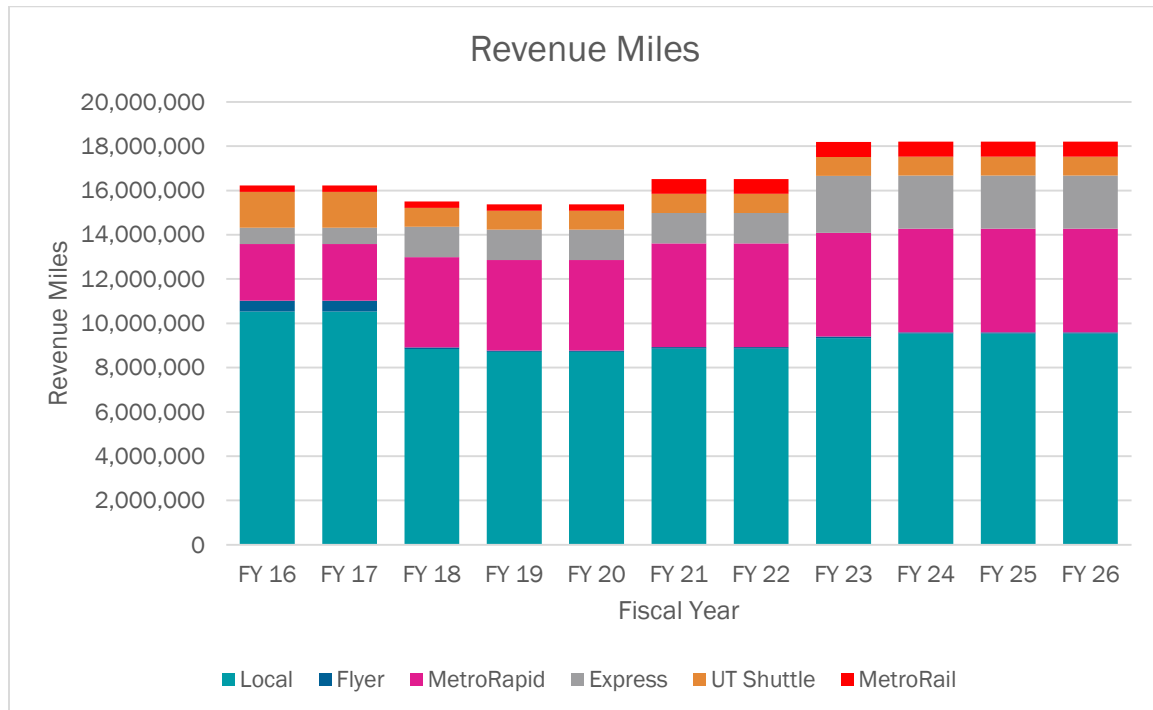


Figure 30: Annual Revenue Miles by Fiscal Year



Customer Impacts & Benefits

More than 80 percent of all Capital Metro riders will experience a positive impact in frequency from the network and individual route improvements, including reduced wait times, shorter travel times, increased reliability and more mobility options. These improvements will also generate additional use by existing riders and attract new riders based on both industry experience and Capital Metro experience with the first four frequent Local routes promoted to the High-Frequency Route Network. A small number of customers (less than 1 percent) who currently use low-ridership routes or low-ridership route deviations recommended for realignment or elimination will experience a change in type of service (Mobility Innovation Zone) or potentially a loss of service and longer walks.

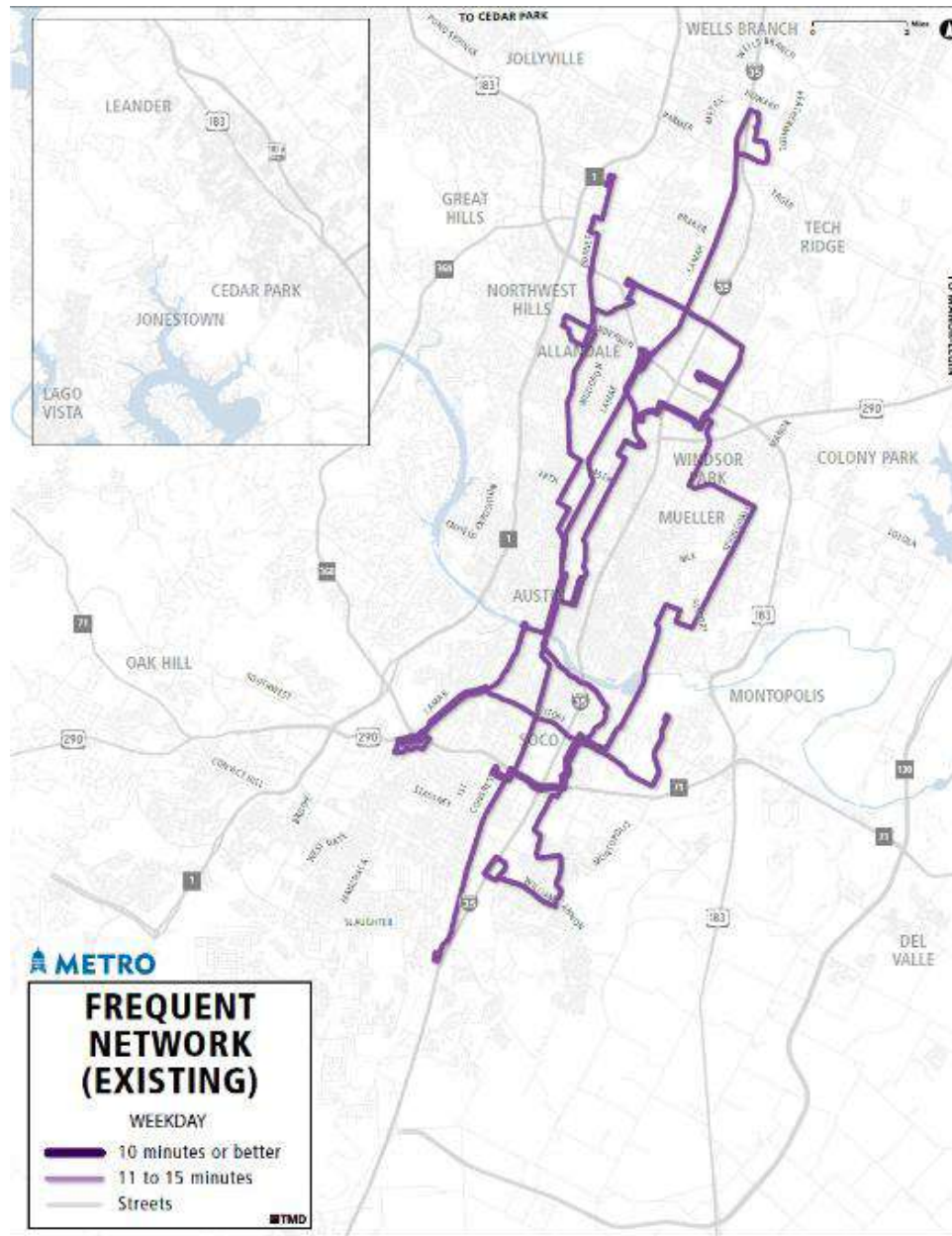
Frequency and Span

Capital Metro's current High-Frequency Route Network includes two MetroRapid routes that operate every 12 minutes during peak periods and four other routes that operate every 15 minutes. *Connections 2025* improves service frequencies on almost every Local route, with the number of frequent routes jumping from six to 17. MetroRapid routes would operate at least every 10 minutes, with Route 801 operating every 7½ minutes all day. The increase in the number of Frequent Local routes gives more than

four out of five existing weekday riders access to service that operates every 15 minutes or better, with frequent service access for residents jumping to more than 50 percent for the entire service area (more than half a million residents). High-frequency MetroRapid service will operate every 10-minutes or better on the two existing and two new routes. Weekend service is drastically improved and will more closely resemble weekday service, with many corridors offering 15-minute frequencies. MetroRapid will assume the role of overnight Night Owl service, allowing for a more consistent service for customers. Evening service hour spans will be maintained in most cases, providing riders with more travel options and increasing ridership by attracting people who require later evening service.

Table 14: High-Frequency Route Network Benefits within a Half-Mile

Existing High-Frequency Network

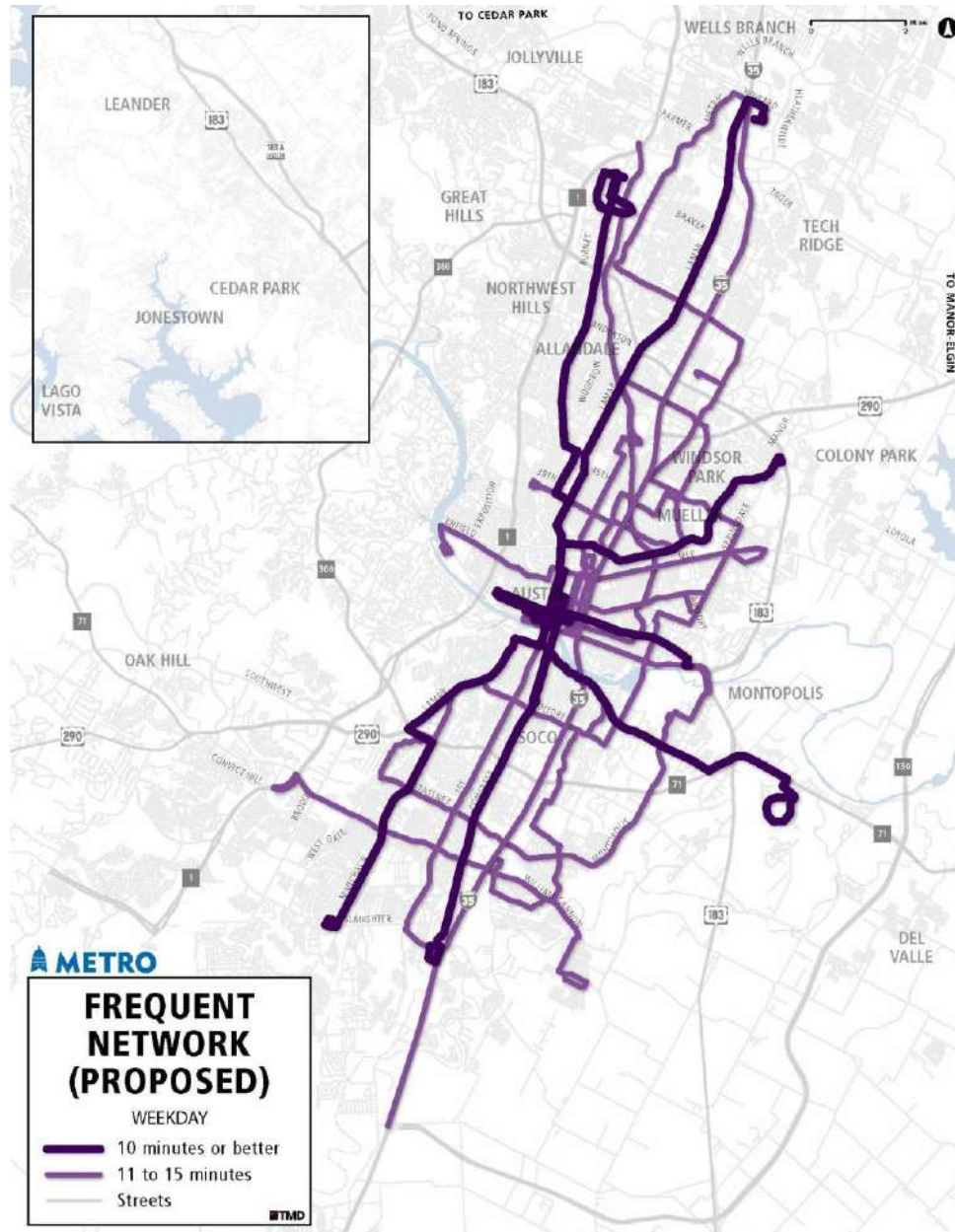


Weekday Ridership: 50,883 (50%)

Population: 331,600 (31%)

Employment: 302,600 (56%)

Proposed High-Frequency Network



Weekday Ridership: 83,697 (82%)

Population: 542,500 (51%)

Employment: 333,000 (62%)

Integrated Network Mobility

Route network transfers will be enhanced by both increased service frequencies and the emphasis of regular clock-face headways. Modifying schedules to have consistent clock-face frequencies (every 10, 15, 30, 60 minutes) makes them easier to remember and makes it easier to coordinate transfers between routes. The IH-35 BRT project will allow for improved all-day, all-week regional mobility between Tech Ridge and Southpark Meadows via downtown Austin. Introduction of frequent service (15-minute) on MetroRail will transform it from a longer distance commuter-focused service to an integral part of the High-Frequency Network providing all-day, all-week regional and community mobility.

Travel Times

In-vehicle travel time is the second most important attribute in attracting new transit customers. *Connections 2025* improves in-vehicle travel times by reducing delay from off-corridor deviations (streamlining) and from on-corridor sources (transit priority). Travel times will be reduced by streamlining routes to provide more direct links between key destinations. Straighter route alignments decrease both route mileage and travel time, speeding up service for riders and resulting in a more cost-effective service for Capital Metro. Transit priority treatment focused first on MetroRapid and second on Frequent Local corridors will reduce delay, further improving travel times and cost-effectiveness. Other transit priority projects as described in the Capital Plan will help improve reliability and travel time, especially during peak periods when congestion slows public transit.

Ridership and Customer Impacts

The goal to increase ridership includes a key objective to minimize negative impacts to existing riders. While some routes are proposed for streamlining by discontinuing low-ridership route deviations and segments, special attention was given to avoiding unnecessary impacts to riders. To that end, an analysis of current ridership reasonable walk access to the proposed network was undertaken. A customer impact is considered to occur when an existing service is restructured or discontinued, causing an existing customer to be further than ½ mile from the nearest proposed bus stop.²⁶ Overall, the proposed plan impacts 928 weekday fixed-route customer boardings, which is less than one percent (0.8 percent) of the more than 113,000 average weekday system boardings. Table 15 shows the number of average daily boardings on weekdays that are impacted.

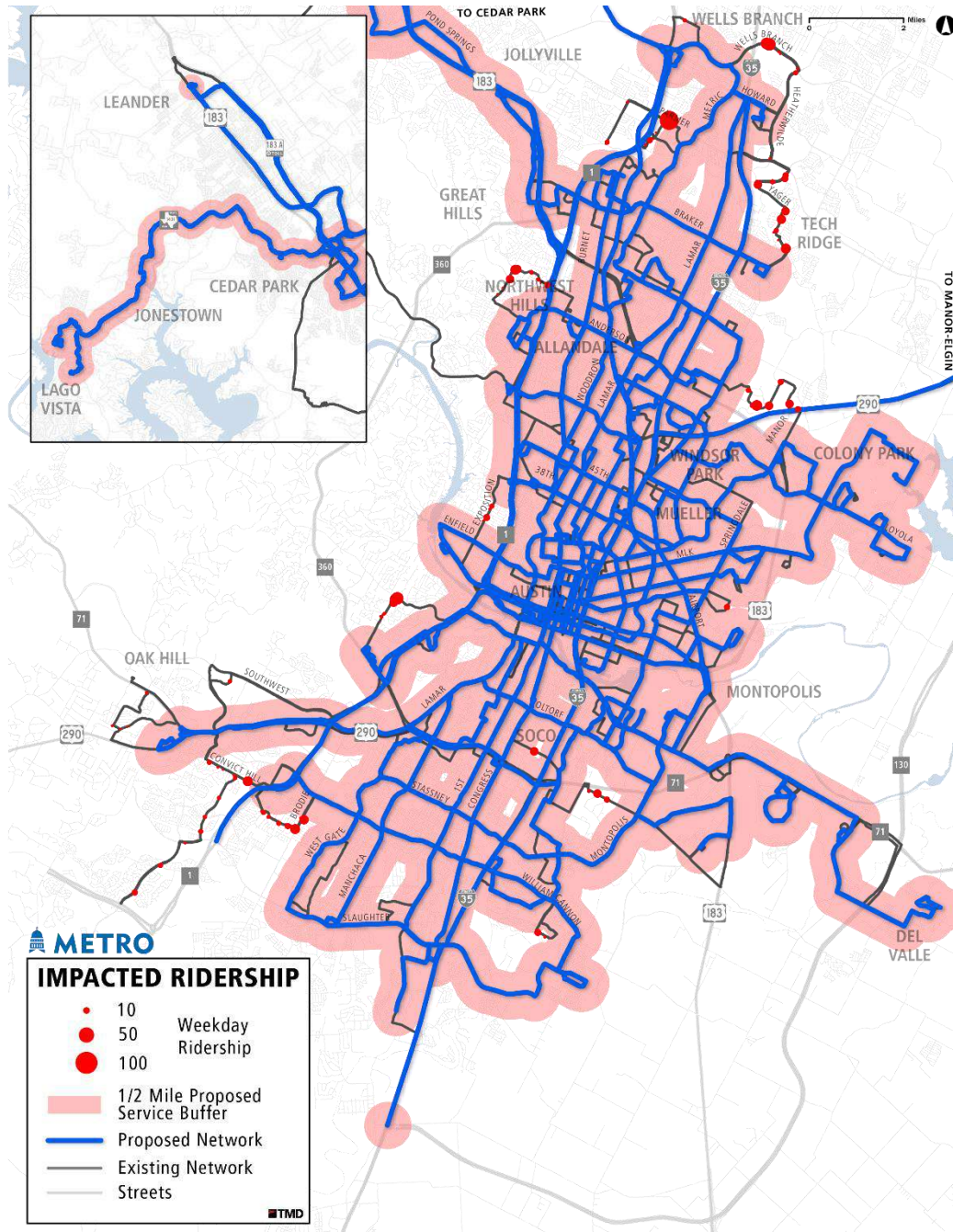
²⁶ Although the Federal walking distance is set at ¾ mile (for ADA access purposes), Capital Metro assessed impacts at both the convenient walk (¼ mile or 5 minutes) and reasonable walk (½ mile or 10 minutes) distances.

Table 15: Weekday Boardings Impacted by Service Changes

Walk Access	Outside ¼ Mile (5-minute)		Outside ½ Mile (10-minute)	
Riders Served	111,378	98.3%	112,211	99.2%
Riders Impacted	1,761	1.6%	928	0.8%

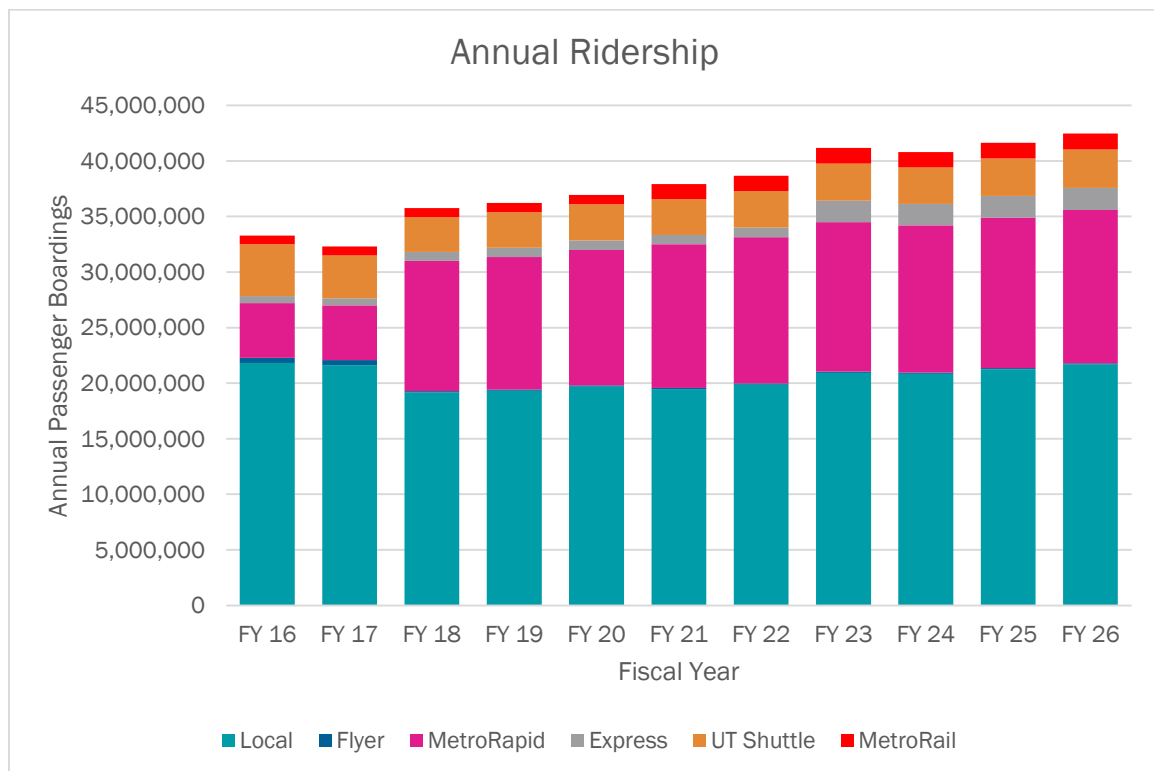
Customers affected by the loss of service may have alternate forms of transportation under the “Mobility Innovation Zone” concept described above. Specific routes that are part of the innovation zones would not be discontinued until the pilot tests have been initiated within those areas. Individuals who potentially would lose access to Capital Metro fixed-route service are shown as red dots in Figure 31.

Figure 31: Impacted Ridership Map



In addition to calculating the operating resource requirements for *Connections 2025*, ridership estimates were prepared based on changes in service levels and alignments. Additional service investments, particularly frequency improvements on highly productive routes, will generate increased ridership and revenue to support the Capital Metro system. The ridership estimates below include a growth factor to account for the growing regional population, as well as estimated ridership loss due to potential future fare increases, but does not take into account where population growth occurs, general economic trends or gasoline prices (a leading indicator of transit ridership).

Figure 32: Annual Ridership Estimates by Fiscal Year

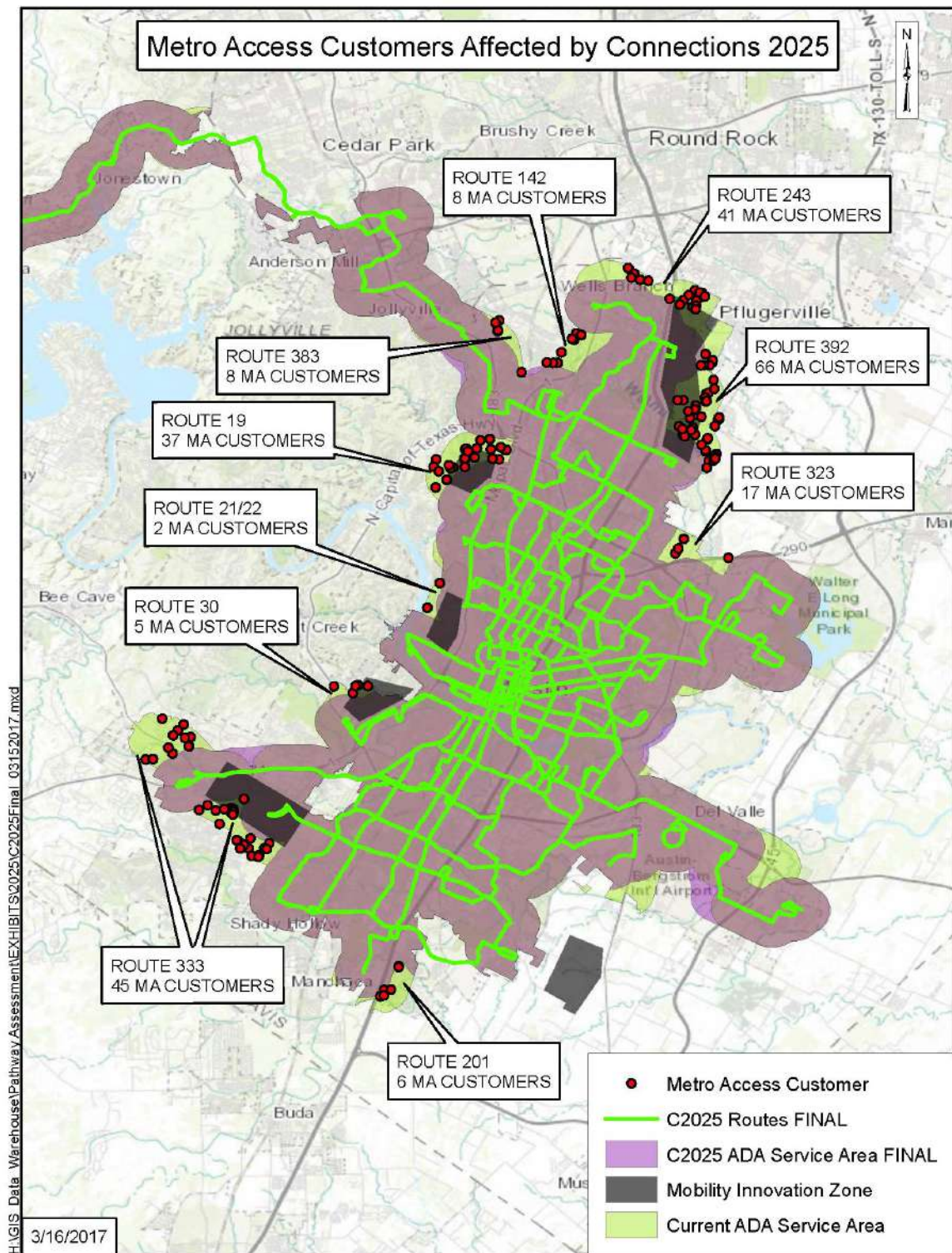


Changes in ADA Coverage Area

The Federally mandated $\frac{3}{4}$ mile buffer adopted by Capital Metro was applied to the proposed fixed-route network to identify the updated ADA paratransit service area. Overall, an average of 4.2 percent of MetroAccess trips would be affected under the proposed ADA paratransit coverage adjustment to the proposed *Connections 2025* service area. The impacted service area includes 227 existing MetroAccess customers who make an average of 69 weekday trips. Capital Metro's existing ADA coverage policy allows existing out-of-service-area travel for 90 days; individuals may petition for an extension of up to one year.

No changes to current MetroAccess policy are proposed as a part of *Connections 2025*. As a result, individuals who are outside $\frac{3}{4}$ mile of proposed fixed-route transit service would lose access to MetroAccess once fixed-route service changes are implemented. However, *Connections 2025* proposes that all implemented Mobility Innovation Zone options have accessible alternatives available for people with disabilities. With any service change, Capital Metro's board may choose to continue serving MetroAccess passengers even if they fall outside the federally mandated $\frac{3}{4}$ mile area around fixed-route service.

Figure 33: ADA Paratransit Impact Map



Next Steps

Upon adoption of the *Connections 2025* study, Capital Metro should continue to work with stakeholders and community members to ensure the successful implementation of the plan. Each phase of the plan will require a public involvement process to sufficiently notify the public of upcoming service changes, consider feedback and assess Title VI impacts prior to board approval. *Connections 2025* is one piece to improving mobility in Central Texas; other studies such as Project Connect will help Capital Metro build upon the existing network and establish a long-term vision for public mobility in the region. While *Connections 2025* focuses on improving the existing bus network, it also lays the groundwork to ensure the success of future frequent high-capacity transit service in Central Texas. Many of the corridors identified in Project Connect are already slated for frequent service under *Connections 2025*.

Capital Metro is only one of many partners focused on addressing mobility concerns in the region. The agency should continue to partner with the city of Austin, other regional government bodies and interested community groups to develop and implement cost effective mobility solutions. As mentioned in the market assessment, land use and development plays a large role in the success or failure of public transit. All parties need to address the fundamental land use patterns and development densities related to livability and social equity needed to support sustainable public mobility (e.g., CodeNext in the city of Austin).

Ongoing Monitoring and Corrective Action

In order to ensure continued progress toward the objectives and guiding principles of *Connections 2025*, the implementation phase will require ongoing monitoring of service performance and operational delivery to help prioritize subsequent service changes. New and existing services should continue to be evaluated quarterly to ensure they are meeting or trending to meet productivity and operating cost per passenger targets. Existing routes that continually fail to meet standards will require reevaluation. Routes performing below 66 percent of the service type average on productivity (passengers per revenue hour) and effectiveness (operating cost per passenger) should be classified as probationary and require corrective action. At the opposite end of the scale, ratings above 133 percent (highest-performing routes) may warrant new or additional service improvements. In addition to service type comparison, all non-special services should exceed the following minimum thresholds for route productivity:

- Weekdays: 15 riders per service hour
- Weekends: 12 riders per service hour

Financial metrics are consistent across all service tiers in order to maintain the financial stability of the system. It is proposed that regular transit and innovative mobility options have a maximum subsidy of \$5 per passenger boarding. As part of the innovative mobility option pilot testing, additional analysis of optimal subsidy levels for these services should be undertaken. When evaluating the performance of existing and future services, Capital Metro will need to find the right balance between providing

productive service and providing adequate service coverage across the service area – these metrics help guide that process.