projectconnect

north corridor

THE LOCALLY PREFERRED ALTERNATIVE

Executive Summary

August 2014

HDR

METRO

CONTENTS

FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

AA	Alternatives Analysis
ACC	Austin Community College
AIM	Austin in Motion
BRT	Bus Rapid Transit
CAMPO	Capital Area Metropolitan Planning Organization
Capital Metro	Capital Metropolitan Transportation Authority
CBD	Central Business District
CARTS	Capital Area Rural Transportation System
CFR	Code of Federal Regulations
CTRMA	Central Texas Regional Mobility Authority
COA	City of Austin
CR	County Road
DOT	U.S. Department of Transportation
EA	Environmental Assessment
ECT	Envision Central Texas
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
FM	Farm-to Market Road
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
HOV	High Occupancy Vehicle
HUD	U.S. Department of Housing and Urban Development
IH	Interstate Highway (IH-35)
ITS	Intelligent Transportation System
LOS	Level of Service
LPA	Locally Preferred Alternative
LPS	Locally Preferred Strategy
LRP	Long Range Plan
LRT	Light Rail Transit
LSRD	Lone Star Rail District
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
PAG	Project Advisory Group
PE	Preliminary Engineering
RM	Ranch to Market
ROW	Right-of-Way
RR/GT/PF	Round Rock/Georgetown/Pflugerville
RTP	Regional Transportation Plan

SH	State Highway
SOV	Single Occupancy Vehicle
TAC	Technical Advisory Committee
TSZ	Traffic Serial Zone
TIP	Transportation Improvement Program
TSM	Transportation System Management
TSP	Transit Signal Priority
TTI	Texas Transportation Institute
TWG	Transit Working Group
TxDOT	Texas Department of Transportation
UP	Union Pacific
U.S.	United States
US	U.S. Highway (US183, US290, etc.)
USBC	United States Bureau of the Census
UT	University of Texas

CHAPTER ES-1

INTRODUCTION

1.1 OVERVIEW

This executive summary has been developed to provide an overview of the study process and resulting findings for the potential transit and land use improvements for the North Corridor. The full documentation of the methodologies used, alternatives considered, the evaluation of those alternatives, and the selection of the locally preferred alternative are detailed in the complete Volume 1 and Volume 2 reports. This document also references the appendices of those reports, but the appendices have not been included in the executive summary.

The purpose of the Project Connect: North Corridor study is to identify and advance towards the implementation of public transportation projects and services that improve mobility and access in the corridor, meet community needs consistent with Livability Principles, and support regional growth objectives. The six Livability Principles, developed by the federal Partnership for Sustainable Communities (HUD, DOT and EPA), and supported by the Federal Transit Administration (FTA) are intended to enhance the economic and social well-being of Americans. The Principles are intended to help create and maintain a safe, reliable, integrated and accessible transportation network that provides transportation options for users, provide access to employment opportunities and other destinations, and promote community sustainability (FTA, Livable and Sustainable Communities, 2012). These expectations are incorporated into the development of the alternatives and will lead to a more responsive and integrated locally preferred alternative (LPA). The North Corridor encompasses multiple municipalities and multiple roadway corridors, and almost half of the study area is outside of the Capital Metro service area. Consequently, the LPA includes a multi-jurisdictional transit development strategy to guide incremental implementation of a more expansive system.

1.1.1 Background and Study Area Characteristics

The Capital Metropolitan Transportation Authority (Capital Metro) is conducting an Alternatives Analysis (AA) using FTA Livability Funding Opportunity: Alternatives Analysis Program monies to evaluate potential transportation improvements within the Central Texas region. This region includes north central Austin and the cities of Pflugerville, Round Rock, and Georgetown. Transportation improvements to be considered in the AA include roadway improvements, upgrades and/or an extension to the existing Capital Metro MetroRail Red Line, and other transit improvements such as the implementation of Bus Rapid Transit (BRT) corridors to supplement the two MetroRapid BRT routes projected to begin service in 2014. Integral to this study is consistency with the Centers Concept of the 2035 Capital Area Metropolitan Planning Organization (CAMPO) Regional Transportation Plan (RTP) and continuance from Project Connect, the implementation step for the high-capacity regional transit system envisioned in the RTP.

A high capacity system for the region will likely require a multimodal and balanced transportation solution that integrates modes. Project Connect is a partnership of the four

regional agencies planning or providing high capacity transit. The CAMPO's Transit Working Group (TWG) is composed of:

- CAMPO;
- Capital Metro;
- City of Austin Transportation Department; and
- Lone Star Rail District.

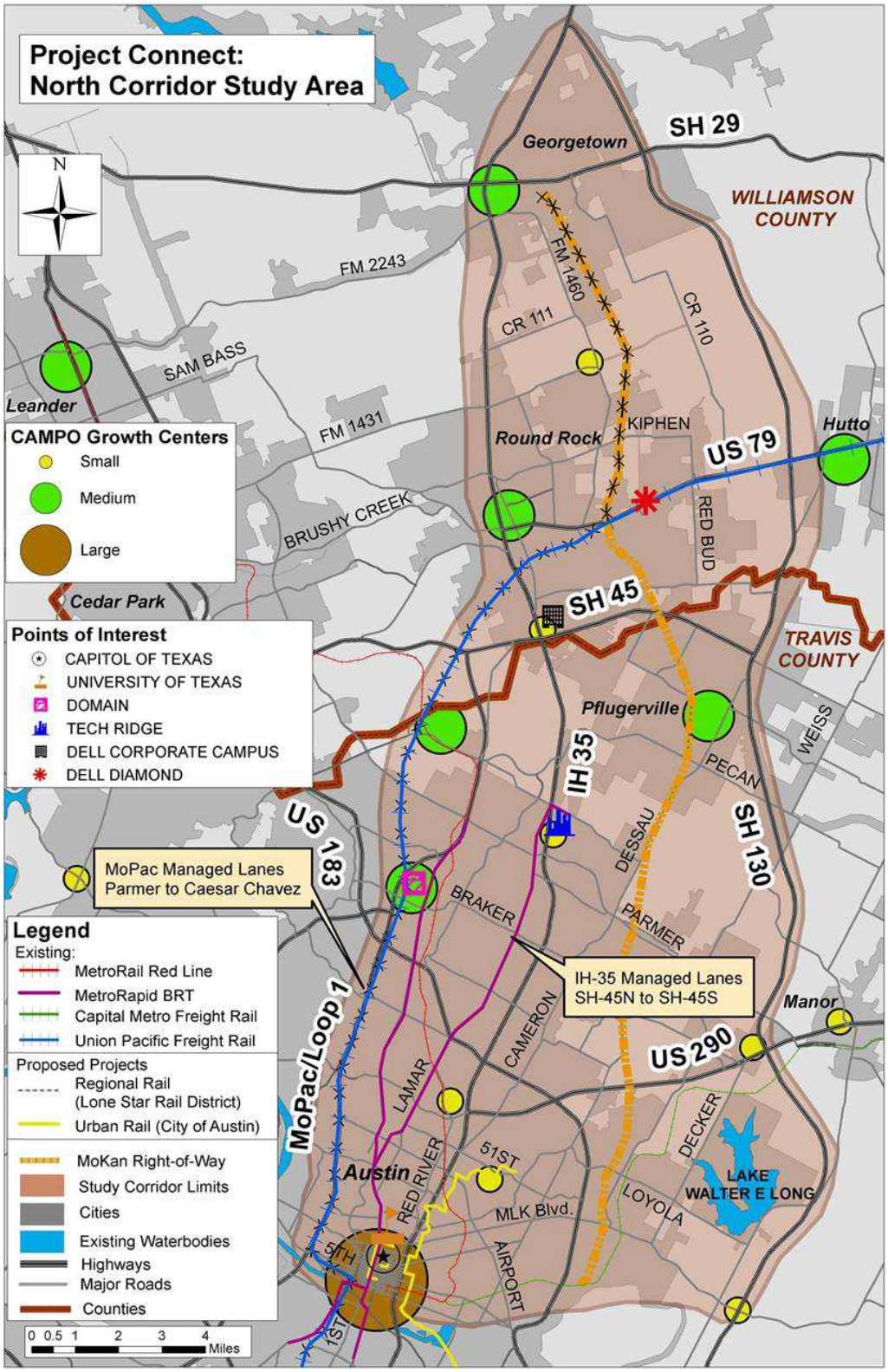
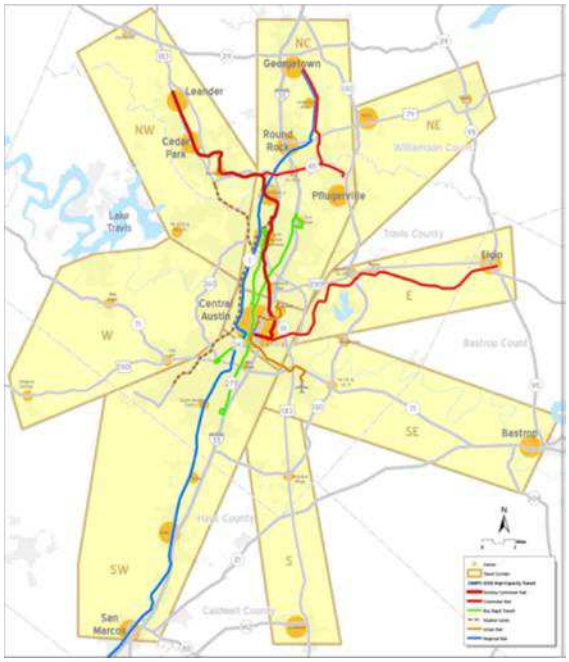


Figure ES-1-1. Project Connect: North Corridor Study Area

The RTP is primarily based on the vision developed in 2004 by a broad public-private consortium, Envision Central Texas (ECT), with a progress update survey in 2008 (ECT, Vision Progress Assessment, 2008). The 2008 ECT survey found that the most important issues for respondents were the following:

- Transportation/Congestion – 67 percent;
- Land Use – 34 percent
- Cost of Living – 31 percent;
- Water Availability – 28 percent; and
- Air Quality – 28 percent.



The North Corridor was identified as the highest priority corridor of those studied in Project Connect, the transit vision for the Austin metropolitan region. Each of the nine corridors considered by Project Connect was ranked based on the CAMPO-developed criteria - Congestion, Core, Centers, Constraints, and Growth. This study embraced those five criteria and added two additional criteria – Complexity and Livability. The result was an expanded set of criteria that corresponds specifically to the North Corridor dynamics. The enhanced criteria are Congestion, Core, Centers, Constraints, Complexity, Growth and Livability. .

Of the 100 most congested roadways in Texas (TxDOT, 100 Most Congested Roadway Segments in Texas, 2010), six are in the North Corridor. As of 2004, nearly 30 percent of all jobs in the Austin region were in four central Austin zip codes (78701, 78703, 78704, and 78705). These four form the southern part of the North Corridor (Capital Area Council of Governments (CAPCOG, Revised Commute and Labor Shed by Zip Code, 2012). Existing transportation rights of way and funding for transportation improvements in the region are limited. Fourteen of the regional growth centers identified in CAMPO's long-range transportation plan are in the North Corridor; the most in any corridor studied in Project Connect. From 2005 to 2035, the region's population and employment are forecast to increase by 123 percent and 135 percent, respectively (CAMPO, CAMPO 2035 Regional Transportation Plan, 2010).

- Almost half the population (1.5 million people) of the two most populated counties in the region will reside in the North Corridor by 2035.
- Almost two-thirds of jobs in the two most populated counties will be located in this corridor by 2035 and will account for 58 percent of all jobs in the five-county region.

Corridor Demographics

Population and employment growth within the Corridor are following a linear north south growth pattern, with substantial growth occurring between downtown Austin and the City of Georgetown. This is primarily attributed to the orientation of IH-35 and MoPac Expressway, the lack of a continuous loop road system, and a limited grid of arterials outside central Austin.

Because of the historical growth pattern in the Austin region, the north-south transportation options within the Corridor are limited and highly congested. According to the Texas Transportation Institute (TTI), Austin is the third-ranked city in the nation for traffic congestion with associated commuter stress and congestion costs (TTI, 2011 Urban Mobility Report, 2011a). Therefore, the overarching goal of the AA study is to determine a set of reasonable and feasible transportation options that could mitigate growth in congestion and provide a more complete mobility system within the Corridor. Other goals of the proposed AA study include finding transportation choices that link major regional traffic generators, serve existing communities and neighborhoods, and promote economic development

In spite of the economic downturn in 2001 and the recent recession beginning in 2008, Austin continued to grow, with the historic increase in population and job growth projected to continue. Austin was ranked 12th in the world for employment growth from 2009 to 2010, making it the only U.S. city to be included in the top 20 worldwide for employment growth (Cushman & Wakefield Capital Markets Research [C&W], 2011). The growth of Austin can be attributed to its national recognition as a technology center, with a relatively low cost of living, and a highly-educated labor pool. Austin achieved a reputation for its high quality of life, continually listed as one of the top 10 places to live and do business. The region's economy depends on transportation infrastructure to create the community's desired compact and connected places to accommodate future growth. Eighty-four percent of the region's 2010 population is concentrated in Travis and Williamson counties. (CAMPO, Technical Report #1: Needs Assessment, 2009; CAMPO, CAMPO 2035 Regional Transportation Plan, 2010).

As shown in **Table ES-1-1**, the population of the five-county CAMPO region tripled between 1980 and 2005; it is projected to double again by 2035 (CAMPO, 2010). Similarly, **Table ES-1-2** shows that employment in the five-county CAMPO region more than tripled between 1980 and 2005; it is expected to more than double by 2035 (CAMPO, CAMPO 2035 Regional Transportation Plan, 2010).

Table ES-1-1
Population Trends in the Five-County CAMPO Region

	1980	2005	2015	2025	2035
Regional Population	585,051	1,458,641	1,919,900	2,506,800	3,250,600
Increase		873,590	461,259	586,900	743,800
Percent Increase		149.3%	31.6%	30.6%	29.7%

Table ES-1-2
Employment Trends in the Five-County CAMPO Region

	1980	2005	2015	2025	2035
Regional Employment	178,000	698,400	970,100	1,243,600	1,642,800
Increase		520,400	271,700	273,500	399,200
Percent Increase		292.4%	38.9%	28.2%	32.1%

Austin's growth is one of the challenges the region faces as it builds transportation infrastructure to help it achieve its goal of being a compact and connected city. Further, the region is challenged to create enough affordable housing. The pressures of high growth too often result in working families spending time and money on long commutes while centrally located housing prices climb. Over the past two years, in developing a new comprehensive plan, the citizens of Austin emphasized the desire to grow as a "compact and connected city" (City of Austin [COA], Imagine Austin Comprehensive Plan, 2012d) The RTP proposes implementation steps to achieve this goal that include more transit, more development served by multiple modes, and more walkable communities. The proposed projects support implementation of this plan.

The latest CAMPO 2035 RTP supports higher density, mixed-use development oriented around public transportation. This supports reducing vehicle miles traveled on the regional roadway system and increasing transit and bicycle ridership through the designation of centers around which projected growth and development will be focused. The RTP proposes the implementation of a regional network of 37 higher density, mixed-use centers oriented around the transportation investments included in the RTP. Currently, 16 percent of the regional population and 36 percent of regional employment are within these centers. By 2035, the regional goals from the CAMPO 2035 RTP are for 31 percent of population and 38 percent of employment to be within these centers (CAMPO, CAMPO 2035 Regional Transportation Plan, 2010).

As shown in **Table ES-1-3**, forecasts indicate that the two-county region's population is targeted to increase by 77 percent between 2010 and 2035, increasing from nearly 1.5 million persons to nearly 2.6 million persons by 2035, while the Corridor's population is projected to increase by 99 percent, from 661,341 persons to 1,317,785 persons. **Table ES-1-3** shows the projected population for the two-county region and the North Corridor between 2010 and 2035 (CAMPO, CAMPO 2035 Regional Transportation Plan, 2010).

Table ES-1-3
Population Comparison Travis and Williamson Counties to Corridor

Region	Population					
	2010	2015	2025	2035	Percent Change 2010-2035	Percent Regional Population in 2035
Travis	1,038,595	1,105,083	1,318,041	1,555,281	50%	60%
Williamson	418,000	473,316	702,694	1,026,484	146%	40%
North Corridor	661,341	721,120	981,504	1,317,785	99%	51%
Total (2 Counties)	1,456,595	1,578,399	2,020,735	2,581,765	77%	100%

Forecasts indicate that the two-county region's employment is targeted to increase by 78 percent between 2010 and 2035, increasing from 800,746 employed persons to approximately 1.4 million employed persons by 2035; the employment within the Corridor is projected to increase by 83 percent, from 515,870 employed persons to approximately 945,973 employed persons. **Table ES-1-4** shows the forecast employment change for the two-county region and the Corridor between 2010 and 2035 (CAMPO, *CAMPO 2035 Regional Transportation Plan*, 2010).

Table ES-1-4
Employment Comparison Travis and Williamson Counties to the Corridor

Region	Employment					
	2010	2015	2025	2035	Percent Change 2010-2035	Percent Regional Employment in 2035
Travis	654,433	707,253	843,546	1,026,485	57%	72%
Williamson	146,313	165,661	252,970	400,329	174%	28%
North Corridor	515,870	558,108	719,115	945,973	83%	66%
Total (2 Counties)	800,746	872,914	1,096,516	1,426,814	78%	100%

Within the Corridor, population is forecasted to increase by 99 percent, while employment is projected to increase by 83 percent. Much of the population increase will occur in the northern portion of the Corridor. The anticipated population and employment growth will place a greater demand on transportation facilities in the coming years.

Mobility Conditions in Corridor

The TTI's recently completed *2011 Congested Corridors Report* analyzes and ranks the top 40 corridors nationally. IH-35 northbound and southbound are consistently among the top 40 corridors nationally in the rankings (TTI, *2011 Congested Corridors Report*, 2011b). According

to TTI's *2011 Urban Mobility Report*, among large urban areas, the Austin area ranks fourth in congestion nationally (TTI, *2011 Urban Mobility* Report, 2011a). The Austin metropolitan region is ranked 35th out of 366 in population (USCB, *2011 Census*, 2011). For the Austin area, current conditions result in more than 31 million annual hours of delay with an average central Texan stuck in traffic for 38 hours per year (TTI, *2011 Urban Mobility* Report, 2011a).

According to Texas Department of Transportation's (TxDOT) Transportation Planning and Programming Division, Travis and Williamson counties contain 10 of the 100 most congested roadway segments in the State of Texas. Moreover, six of the 10 roadway segments are located within the North Corridor (TxDOT, *100 Most Congested Roadway Segments in Texas*, 2010). IH-35 ranks 4th on the list of 100 most congested roadway segments in Texas.

As shown on **Figures ES-1-5** and **ES-1-6**, the Corridor encompasses a significant portion of the region's congestion as of 2009 (CAMPO, *CAMPO 2035 Regional Transportation Plan*, 2010). These figures also illustrate the predominant north-south transportation pattern for the region.

Another important factor in understanding local transportation patterns is that most of the Austin region lacks substantial east-west routes (e.g. highways or arterials). The Balcones Fault runs generally north-south through Travis County, crossing just west of the center of Austin. This geological obstacle also provides environmental and resultant political challenges, since any construction crossing the fault also would cross a major recharge zone for the Edwards Aquifer. The Edwards Aquifer is home to several endangered species and is a unique resource on its own merits. As a limestone aquifer, this feature is especially sensitive to any increase in sedimentation or water pollution, and several regulations and citizens groups have been developed to protect it. This combination of regulatory requirements and active citizens groups has discouraged the development of major east-west connections in the Austin area that cross the Edwards Aquifer. Details are found in Appendix E: Environmental Constraints Analysis.

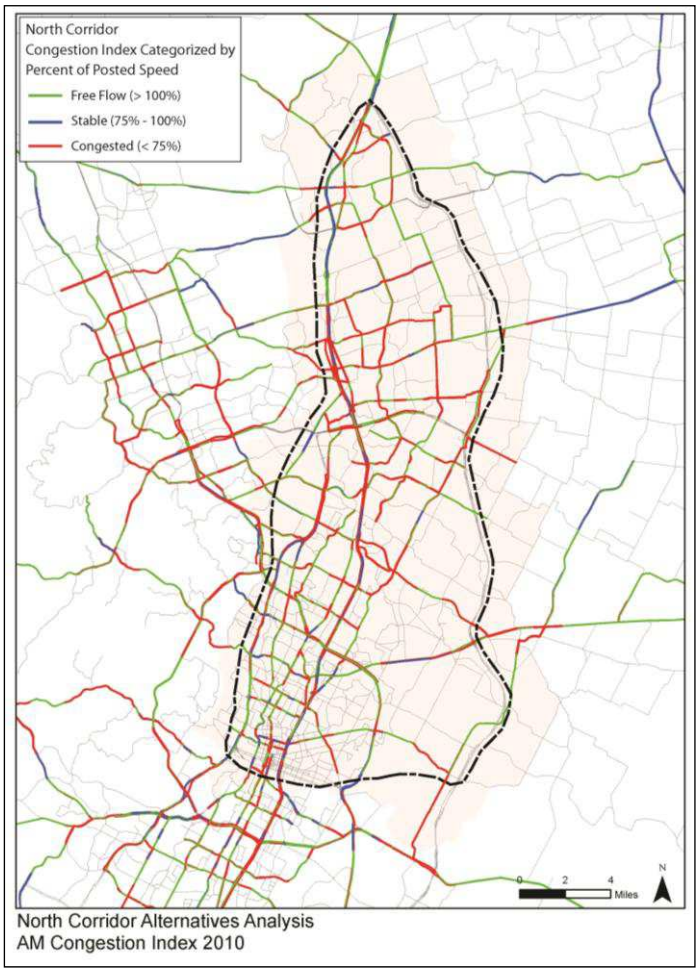


Figure ES-1-2. AM Congestion Index 2010

(Source: CAMPO 2035 Regional Transportation Plan*, 2010)*

1.1.2 Purpose and Need

The primary purpose of the North Corridor project is to provide additional transportation system capacity that improves the efficiency of the connections between the diverse population and employment centers within the North Corridor study area while remaining consistent with the regionally adopted centers concept established in the 2035 RTP.

The CAMPO 2035 RTP explicitly plans for concentration of future population and jobs in 37 centers. The infrastructure to connect these centers with adequate roadways and multi-modal transportation options must be built to keep pace with the Corridor's continued growth.

A key component of the North Corridor project would be to provide additional transportation choices within the Corridor that will improve the efficiency and reliability of all transportation options while providing cumulative long-term economic impacts for Central Texas, including economically distressed areas along the urban portion of the corridor.

1.1.2.1 Project Purpose

The purposes for enhancing the transportation system in the North Corridor study area can be summarized as:

- To provide a balanced transportation system that includes increased general purpose lanes, high occupancy vehicle (HOV) and Tollway highway capacity, as well as new high-capacity transit mode choices that are responsive to and supportive of growth in the Corridor's activity centers.
- To provide additional person-moving capacity in the Corridor that would provide mobility enhancement to diverse residential areas and housing types, and provide enhanced access to major employment, entertainment, and shopping centers. Additionally, the project would promote pedestrian- and transit-oriented residential infill developments characterized as multi-family and mixed-use growth with New Urbanism design elements.
- To provide reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanding business access to markets there by promoting economic competitiveness within the region.
- To provide additional transportation choices within the Corridor that ease existing and future vehicular congestion contributing to improved air quality.

1.1.2.2 Statement of Need

The transportation issues facing the North Corridor study area illustrate the need for improved mobility, accessibility, and connections to the activity centers in the study area through transportation capacity. The North Corridor study area continues to increase in population and employment with limited additional traffic capacity on existing streets and highways, resulting in vehicular congestion and air pollution. Portions of the study area are already developed and other areas are experiencing new development, both contributing to increased travel demand.

Three primary factors make the North Corridor important for people who live and work in the study area:

1. Corridor growth in population and employment

2. Declining mobility and severe roadway congestion
3. Limited options and funding for roadway expansion

The goals for the Capital METRO North Central Corridor study are reflective of the Livability principles identified by the HUD/EPA/DOT Sustainable Communities Initiative. The six Livability Principles are summarized as follows:

1. Provide more transportation choices;
2. Promote equitable, affordable housing;
3. Enhance economic competitiveness;
4. Support existing communities;
5. Coordinate policies and leverage investment; and
6. Value communities and neighborhoods.

The goals and objectives are also intended to support the existing regional policies and strategies on Transit Oriented Development (TOD), affordable housing, development practices, plans, and programs.

Vision

Provide a safe, efficient, economical, attractive, and integrated multi-modal transportation system that offers convenient, accessible, and affordable mobility for all people and the efficient movement of goods.

Goals and Objectives

Goal 1: Provide reasonable and feasible transportation options to mitigate growth in congestion and provide alternatives to single-occupant vehicle travel in the North Corridor.

Objective: Define and examine transportation options, such as operational improvements, BRT, managed lanes, and rail to mitigate congestion, reduce VMT, and improve mobility in the corridor.

Objective: Provide opportunities for multi-modal connectivity in the corridor, integrating vehicular traffic with bus, rail, bicycle and pedestrian modes.

Objective: Encourage land uses and development to enhance transit and bike/pedestrian activity around stations and at activity centers, such as Georgetown, the Dell complex, the North Austin Medical Center, and the Avery Centre, consistent with the CAMPO 2035 Regional Transportation Plan (RTP) “Centers Concept”.

Goal 2: Support local affordable housing policies and strategies.

Objective: Identify alignments that support affordable housing policies and ordinances, such as the Austin Transit-Oriented Development Ordinance of 2005, the 2010 Affordable Housing Resolution, and the Downtown Austin Plan, and any other similar ordinances in Round Rock, Georgetown, and Pflugerville.

Objective: Design alternatives and facilities that facilitate housing authorities and developers in locating residential development that is connected to employment and education centers.

Goal 3: Enhance regional economic competitiveness through access to employment, education and housing.

Objective: Coordinate the development of transit alternatives with the issues and strategies identified by Envision Central Texas to manage growth and development.

Objective: Improve access and mobility for goods movement in the corridor through roadway operations improvements and congestion mitigation.

Objective: Partner with other transportation providers to optimize the transportation network and enhance mobility and access to employment and education opportunities.

Goal 4: Serve existing neighborhoods and communities and activity centers and promote mixed-use TODs.

Objective: Strategically locate transportation facilities in the corridor to encourage TOD, such as placing stations near developable land and activity centers.

Objective: Develop alternatives that are consistent with the CAMPO "Centers Concept" for mixed-use development and the CAPCOG Sustainable Places Project.

Objective: Design services and facilities for activity centers along the corridor that enable TOD, walkability, and multi-modal transportation.

Goal 5: Identify alternatives that integrate with existing plans, policies, and investments to provide efficient, affordable, and accessible services for growth in the corridor.

Objective: Develop alternatives that are consistent with and that can be coordinated with the master plans in Austin, Georgetown, Round Rock, and Pflugerville to serve the needs identified in the plans and to leverage existing transportation investments.

Objective: Develop alternatives that would facilitate transportation agencies sharing resources and facilities to optimize investments and operations to accommodate projected travel demand in the corridor.

Goal 6: Provide transportation services in the corridor that are sensitive and compatible with the needs of the communities and neighborhoods and that enhancing their quality of life.

Objective: Design alternatives that serve neighborhoods without disrupting the character of the neighborhood through noise, traffic, or land use impacts.

Objective: Promote transit investments on a compatible scale with neighborhoods to encourage bicycle and pedestrian activity, as well as provide regional connectivity.

Goal 7: Develop transportation options that are energy efficient and reduce environmental impacts.

Objective: Contribute to the reduction of energy usage and associated pollution by introducing alternatives to single-occupant vehicle traffic, such as transit, bicycle, and pedestrian modes.

CHAPTER ES-2

DESCRIPTION OF ALTERNATIVES

2.1 HISTORY OF FORMULATION OF FINAL ALTERNATIVES

Initially, twelve alternatives were developed in August 2012 as shown in **Appendix A**. In November 2012, a decision was made by Capital Metro to develop alternatives that would more explicitly connect transit and land use.

Generally based on this revised direction from Capital Metro, the twelve alternatives were modified and presented to the TAC and PAG in December 2012. The December 2012 alternatives figures are shown in **Appendix A**. Input from the TAC and PAG led to a substantial revision of the alternatives, including a reduction to six conceptual alternatives that would combine modes and connect more of the centers, including east-west connections in the Corridor.

Further interaction and evaluation with the TAC and PAG in the course of early 2013 at TAC meetings held on January 29, February 13, March 26, and May 14 with PAG meetings held on February 26 and March 23, led to a set of three Final Alternatives. These were presented at three public workshops (and a webinar) on June 24, 25, 26, and 27, respectively.

Additionally a Base Alternative was developed comprising existing and committed transportation facilities relevant to transit. The Final Alternatives all assume full implementation of the Base Alternative.

2.2 MODE/SERVICE TYPES

For the Conceptual Alternatives, the mode/service types included five, only two of which currently operate in the CAMPO region: **Express** and **Commuter Rail**. **Rapid** (MetroRapid) service will begin operations in 2014, and **Rapid Plus** and **Connect** are two new mode types, although CARTS operates a Metro Connector that connects to the Capital Metro service area.

For the Final Alternatives, **Rapid Plus** was not included for any of the final three alternatives. The four modes used for the Final Alternatives are described briefly as follows.

2.2.1 Commuter Rail

Commuter rail is service similar to Capital Metro's MetroRail using Diesel Multiple Unit (DMU) trains. It is existing service and new extensions are not planned; double-tracking of the current service is included. This service can typically carry 200 passengers and operates every 20 to 30 minutes.

2.2.2 Rapid

Rapid is Bus Rapid Transit (BRT) service running on arterials operating in mixed traffic with signal prioritization; similar to Capital Metro's MetroRapid service. There are significant expansions of this service. The Rapid can typically carry 60 passengers and operates every 10 minutes during the peak period.

2.2.3 Express

Express is long haul, limited stop service buses on major highways and expressways; similar to Capital Metro's MetroExpress current commuter service. Proposed routes provide excellent north-south service for the western, central and eastern portions of the corridor to Central Austin. This service can typically carry 50 passengers and operates every 15 minutes during the peak period.

2.2.4 Connect

Connect is a new service type, designed to offer short haul, limited stop service. Running principally on east-west arterials, the intent is to connect major Centers. This service can typically carry 25 to 30 passengers and operates every 15 to 20 minutes during the peak period.

2.3 CAPITAL FACILITIES COMMON TO ALL ALTERNATIVES

While much attention is often given to the modes and service types, there are associated facilities that need to be implemented. With the expanded service base fro the North Corridor, new types of facilities and expansions of existing ones are necessary. The two facility types are transit hubs and park-and-ride lots. These facilities are not included in the Base Alternative.

2.3.1 Transit Hubs

Transit Hubs are new facilities for the North Corridor. They are designated as major intermodal transfer facilities. They can be stand-alone or integrated into larger complexes. Four transit hubs are designated: Central Austin, Howard Lane, Pflugerville and Round Rock.

2.3.2 Park-and-Ride Lots

Existing park-and-ride lots are common to all Final alternatives, including the following six: Georgetown, Round Rock, Howard Lane, Tech Ridge, Manor and Central Austin.

In addition, there are new park-and-ride facilities that are common to all Final Alternatives: University Blvd., Hutto, Pflugerville and Webberville. For Alternative 2, the Pflugerville park-and-ride was located near the intersection of SH45 and SH130, while the other two alternatives have locations at SH13 and East Pecan Street.

2.4 FINAL ALTERNATIVES

For each alternative a brief description of salient features is provided along with identification of major routes, modes, and service alignments. A figure is included showing each alternative. **Table ES-2-1** summarizes the Final Alternatives.

Table ES-2-1.
Comparison of Final Alternatives

Modes and Facilities	Alternative 1 – Connect	Alternative 2 – Express	Alternative 3 – High Capacity
Modes			
Commuter Rail	---	---	"Green Line" to Elgin
Rapid	1 Extension	---	2 Extensions
Express	---	3 Routes	3 Routes
Connect	6 Routes	9 Routes	6 Routes
Facilities			
Transit Hubs	Central Austin, Howard Lane, Pflugerville and Round Rock	Central Austin, Howard Lane, Pflugerville and Round Rock	Central Austin, Howard Lane, Pflugerville and Round Rock
Park & Rides	**Existing**: Georgetown, Round Rock, Howard Lane, Tech Ridge and Manor New: University Blvd., Hutto, Pflugerville and Webberville	**Existing**: Georgetown, Round Rock, Howard Lane, Tech Ridge and Manor New: University Blvd., Hutto, Pflugerville and Webberville	**Existing**: Georgetown, Round Rock, Howard Lane, Tech Ridge and Manor New: University Blvd., Hutto, Pflugerville and Webberville

Source: HDR, 2013.

2.4.1 Base Alternative

The Base Alternative is necessary as a means of comparison for the Alternatives. The Base comprises the existing and committed transit-related facilities as identified in CAMPO's Regional Transit Plan.

2.4.1.1 Modes

- Urban Rail, Commuter Rail, Rapid and Express

2.4.1.2 Urban Rail (*now* Central Corridor)

- Operational Urban Rail service from downtown Austin to Highland Mall[1]

2.4.1.3 Commuter Rail

- Expanded service on the existing Red Line with double-tracking and additional train sets

2.4.1.4 Lone Star Rail (LSTAR)

- Operational LSTAR service within the North Corridor from downtown Austin to Georgetown

2.4.1.5 Rapid

- Operational (2014) MetroRapid service on two lines – Burnet Road from Central Austin to the North Burnet/Gateway Center and Lamar Boulevard from Central Austin to Tech Ridge

2.4.1.6 Express

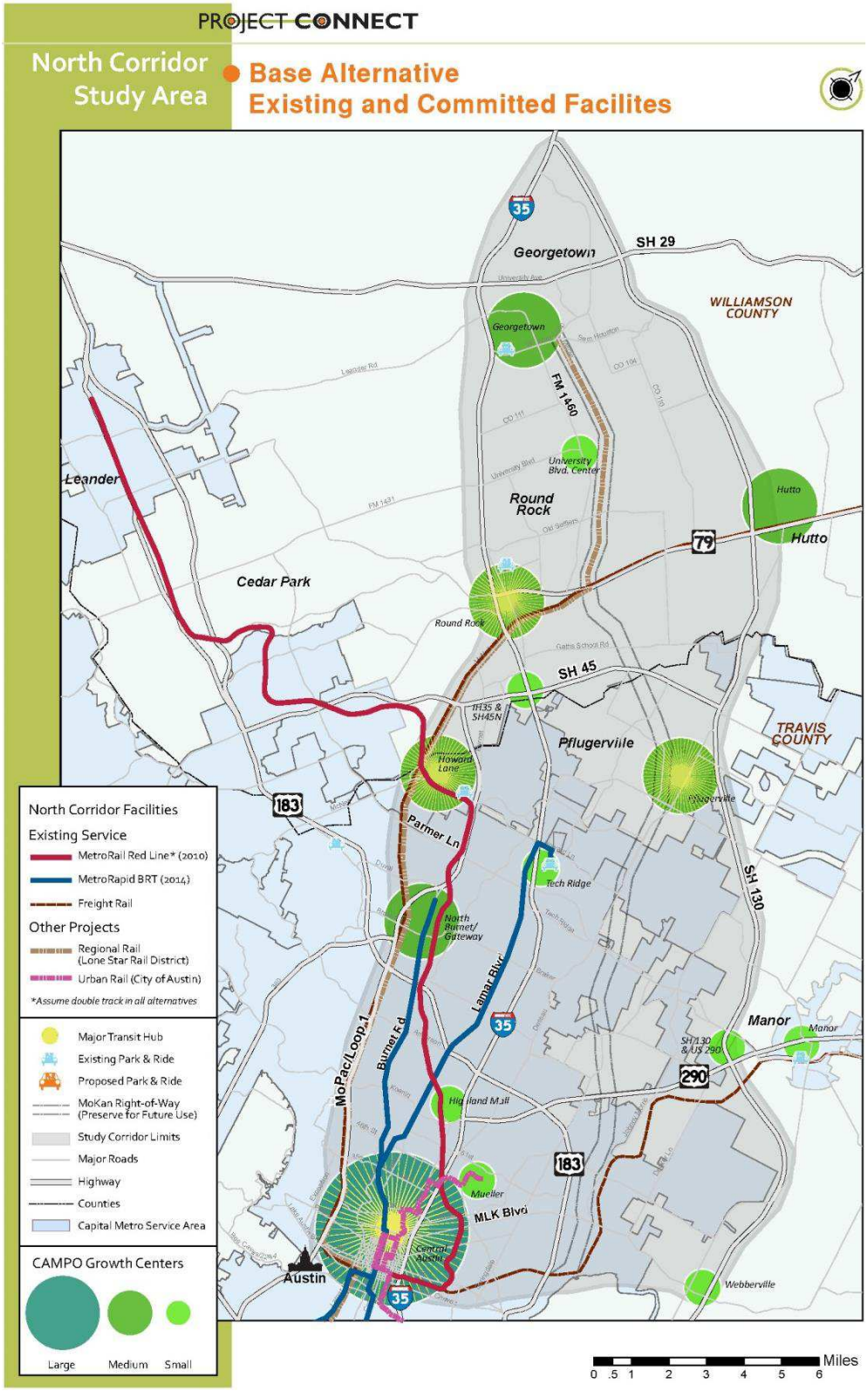
- Current Capital Metro MetroExpress service on IH35, MoPac and US183

2.4.1.7 MetroConnector

- Current CARTS Metro Connector service in Round Rock

[1] The current alignment for the Central Corridor project extends fron south Riverside to Highland Mall.

Figure ES-2-1. Base Alternative



2.4.2 Alternative 1: Connect

This Alternative, shown in **Figure ES-2-2,** offers the new Connect service supported by expanded Rapid service. An important emphasis in this Alternative is to facilitate Center-to-Center service as identified in the project planning process. It also calls for an extension of Rapid service to Georgetown from the current terminus of Capital Metro's Burnet Road MetroRapid service at the North Burnet/Gateway Center. The Burnet Road service began operation in 2014. This Alternative would use existing arterials and highways.

2.4.2.1 Modes

- Rapid and Connect

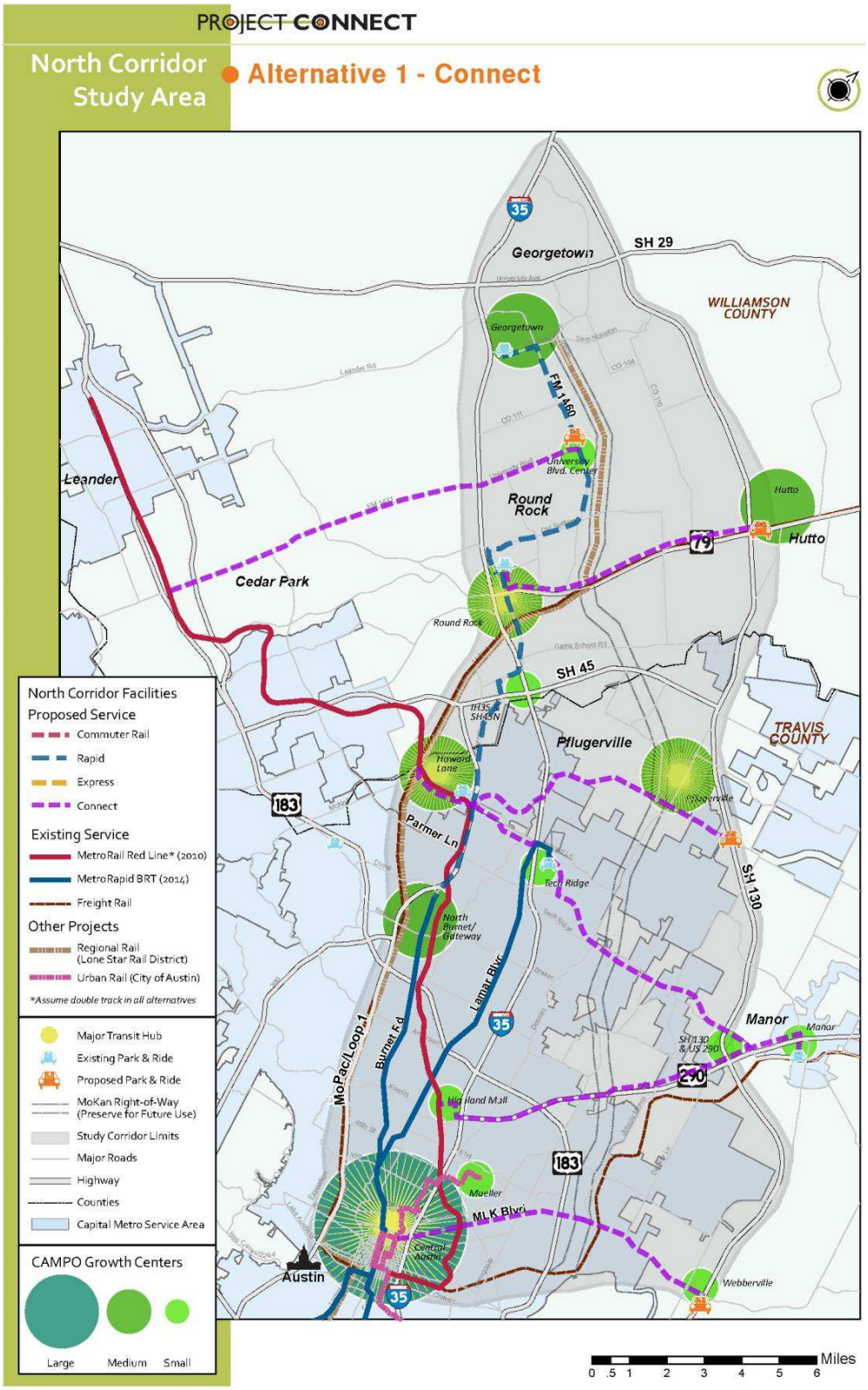
2.4.2.2 Rapid Route

- Extend Burnet MetroRapid from North Burnet/Gateway Center through Round Rock to Georgetown via Burnet/Hesters/Mays/Old Settlers/FM1460/Inner Loop

2.4.2.3 Connect Routes

- University Blvd towards Cedar Park via FM1421
- Hutto to Round Rock via US79
- Pflugerville to Howard Lane/LSTAR via Pecan/Wells Branch/Howard
- Manor to Howard Lane/LSTAR through Tech Ridge via Parmer/Howard
- Manor to Highland Mall via US290
- Webberville to Central Austin via MLK

Figure ES-2-2. Alternative 1 – Connect



2.4.3 Alternative 2: Express

The second Alternative features three Express routes, offering coverage for all areas of the corridor. As significant feature is a dedicated busway for Express service on the MoKan ROW. The busway accommodates Express service from Hutto to Central Austin. The busway would begin south of US290 and connect with Capital Metro's freight rail ROW. . As in Alternative 1, Connect service would operate between other centers.

2.4.3.1 Modes

- Express and Connect

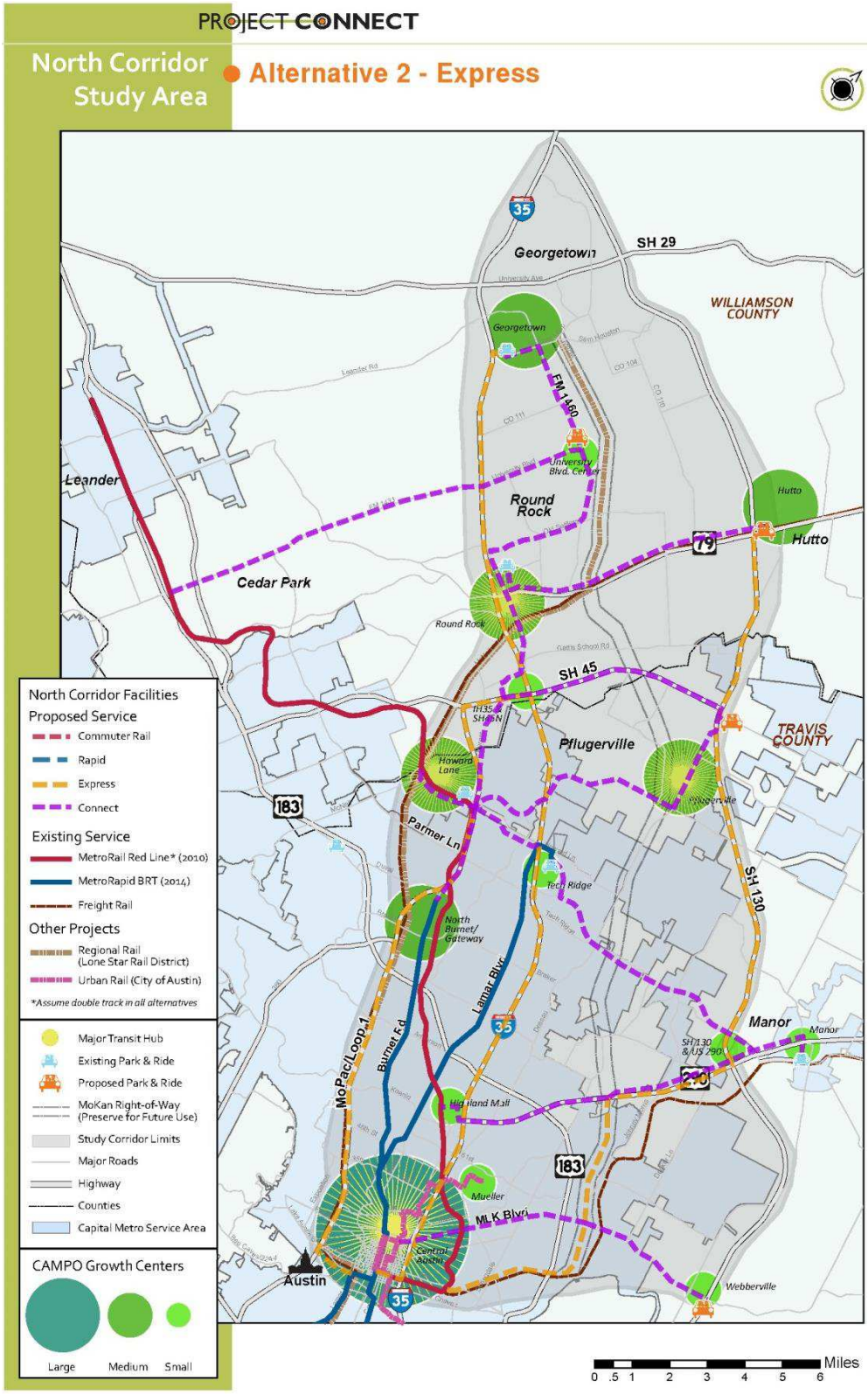
2.4.3.2 Express

- Georgetown to Central Austin via IH35/SH45/MoPac
- Hutto to Central Austin via SH130/US290/MoKan/Freight Rail ROW
- Round Rock to Central Austin via IH35

2.4.3.3 Connect

- Georgetown to Round Rock through University Blvd. via Inner Loop/FM1460/Old Settlers/Mays
- Round Rock to MetroRapid Burnet via Mays/Burnet
- University Blvd towards Cedar Park via FM1421
- Hutto to Round Rock via US79
- Pflugerville to Round Rock via SH45
- Pflugerville to Howard Lane/LSTAR via FM685/Dessau/Pecan/Wells Branch/Howard
- Manor to Howard Lane/LSTAR through Tech Ridge via Parmer/Howard
- Manor to Highland Mall via US290
- Webberville to Central Austin via MLK

Figure ES-2-3. Alternative 2 – Express



2.4.4 Alternative 3: High Capacity

This Alternative provides the most robust mix of modes and service to the north Corridor. The four principal types are included. Commuter Rail is shown from Central Austin to Elgin, east of the Corridor limits. There is an extension of Rapid service to Round Rock and Georgetown from the terminus of Capital Metro's MetroRapid Burnet Road service at the North Burnet/Gateway Center. New Rapid servide will also connect Pflugerville to Howard Lane via the Tech Ridge Center, where Capital Metro's MetroRapid Lamar Boulevard service ends. Express service is added from Georgetown and Round Rock, utilizing IH35 and MoPac and the MoKan ROW. Connect service would operate between other Centers.

2.4.4.1 Modes

- Commuter Rail, Rapid, Express and Connect

2.4.4.2 Commuter Rail

- Extend a new commuter rail service (Green Line) from the MetroRail Red Line in Central Austin along Capital Metro's existing freight rail ROW to Elgin

2.4.4.3 Rapid

- Extend Burnet MetroRapid to Round Rock and Georgetown via Burnet/Hesters/Mays/ Old Settlers/FM1460/Inner Loop
- Pflugerville to Howard Lane/LSTAR via FM685/Dessau/Pecan/Heatherwilde/Wells Branch/Howard

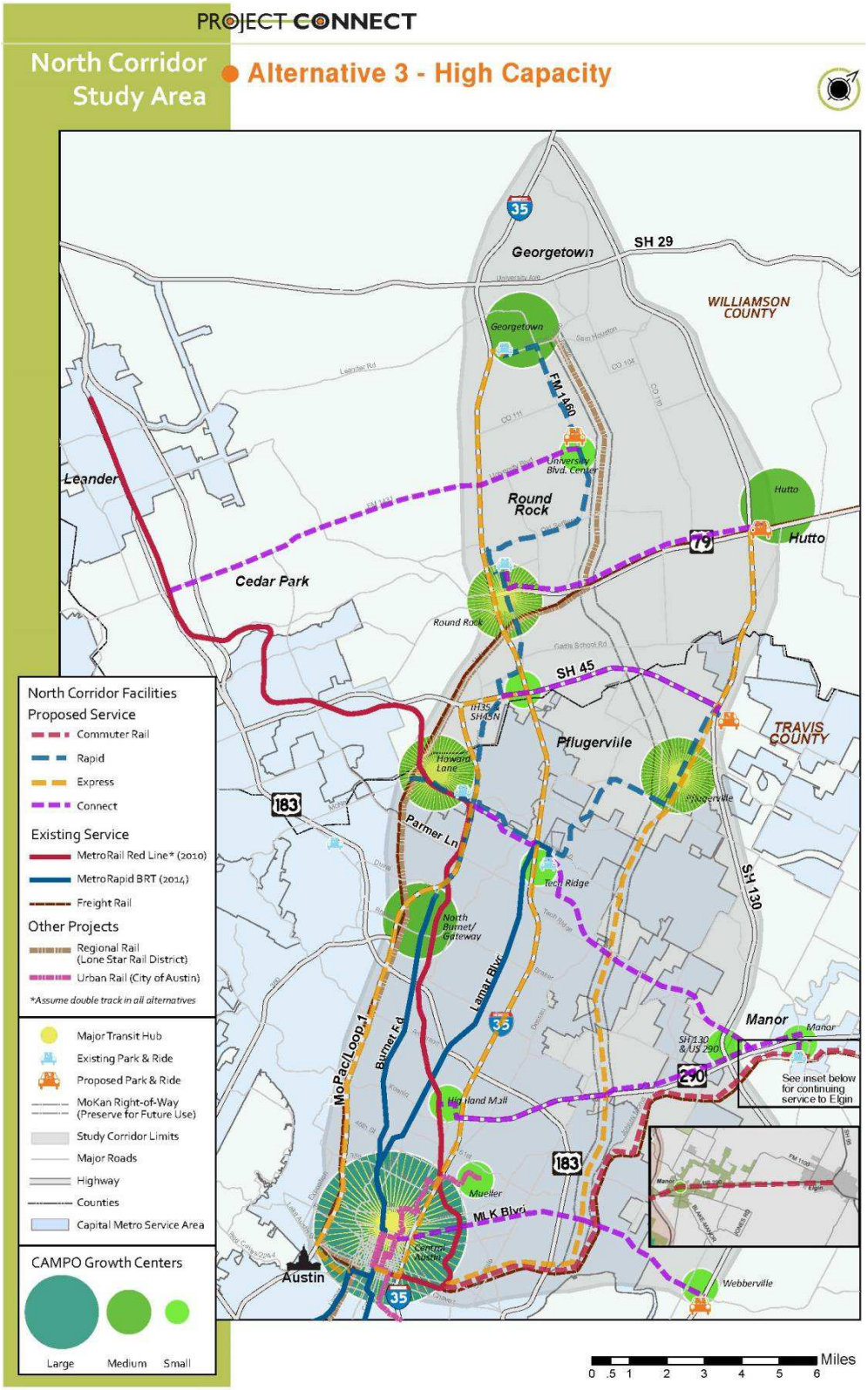
2.4.4.4 Express

- Georgetown to Central Austin via IH35/SH45/MoPac
- Hutto to Central Austin via SH130/FM685/Dessau/MoKan/Freight Rail ROW
- Round Rock to Central Austin via IH35

2.4.4.5 Connect

- University Blvd towards Cedar Park via FM1421
- Hutto to Round Rock via US79
- Pflugerville to Round Rock via SH45
- Manor to Howard Lane/LSTAR through Tech Ridge via Parmer/Howard
- Manor to Highland Mall via US290
- Webberville to Central Austin via MLK

Figure ES-2-4. Alternative 3 – High Capacity



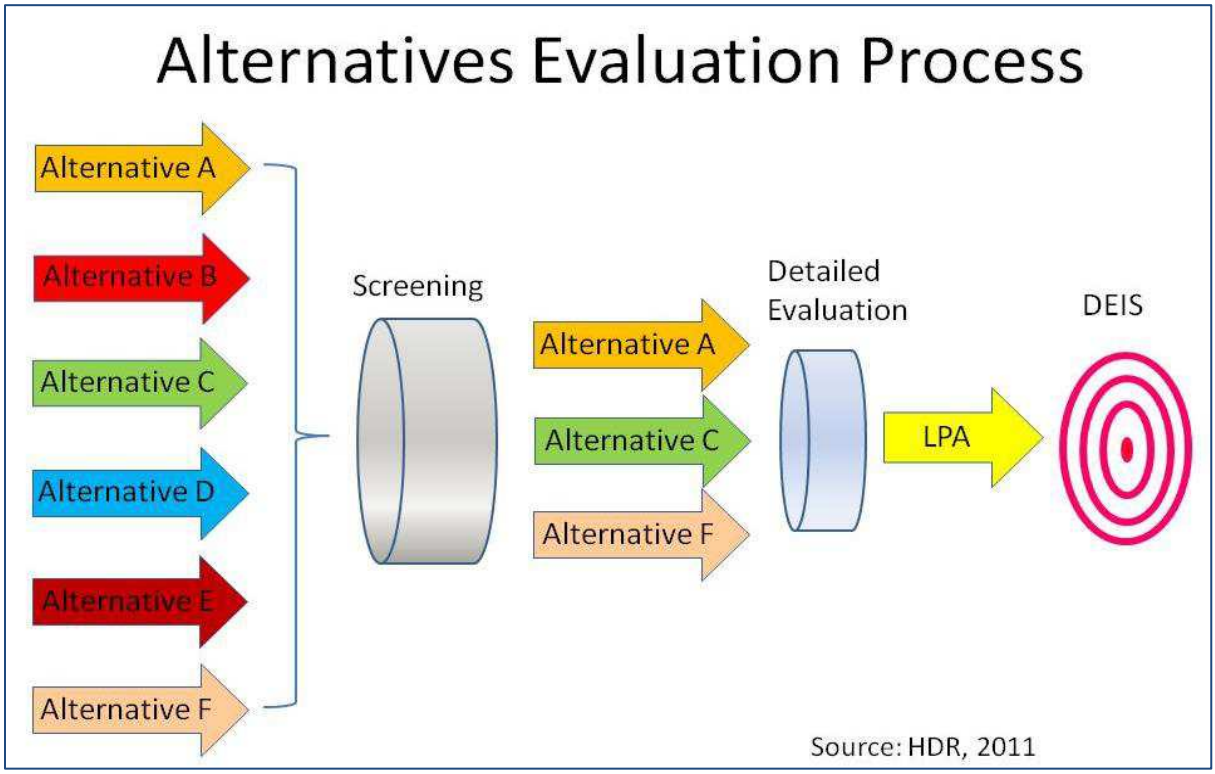
CHAPTER ES-3

EVALUATION OF ALTERNATIVES

3.1 ALTERNATIVES EVALUATION APPROACH

An evaluation and screening process identified and described an initial set of six conceptual Alternatives. They were developed by Capital Metro, the Project Connect North Corridor project team, with input, comment and guidance from the Technical Advisory Committee (TAC) and the Project Advisory Group (PAG). The overall screening process is illustrated in **Figure ES-3-1**. Further, there was a series of regional public meetings as a part of the Public Involvement Process in support the Alternatives evaluation process.

Figure ES-3-1. Alternatives Evaluation Process *(diagram for illustrative purposes only)*



3.1.1 Initial Evaluation and Screening

The initial screening of the six conceptual Alternatives utilized quantitative and qualitative criteria. High, Medium and Low measures were applied, as well as identifying “fatal flaws” in the Alternatives that did not support the project’s Goals and Objectives or the Purpose and Need. Alternatives with such “fatal flaws” were eliminated from further consideration. Alternatives that supported the project Goals and Objectives and met the Purpose and Need without “fatal flaws”, were carried forward into the next phase of evaluation. The result of the initial screening was the identification of three Final Alternatives.

3.1.2 Advanced Evaluation

The purpose of the advanced evaluation was to understand more clearly the attributes of each Alternative and compare them against the criteria and move to a Locally Preferred Alternative (LPA). Ideally, the LPA best meets the transportation goals; is cost effective and financially prudent; accounts for the desires of the traveling public and the communities it serves; and reflects broader livability, economic and environmental values.

The advanced evaluation process examined the three Final Alternatives carried forward from the initial screening and as modified with the TAC, PAG, and public. The advanced evaluation criteria used in the advanced phase were less qualitative and more quantitative.

When developing the advanced evaluation criteria, the decision was to keep the North Corridor consistent with the overall CAMPO, maintaining a regional context. The CAMPO approach was characterized as "4 C/G", and it became the basis for a more robust evaluation process. The 4 C/Gs were:

- Centers
- Congestion
- Core
- Constraints
- Growth

Given the specifics of the North Corridor and the enhanced emphasis on land use, two additional categories were added:

- Complexity and
- Livability

This became the new characterization of "5 C/GL" as the approach for the more detailed evaluation. These are more fully described in the next section.

As a complement to the above criteria and subsequent evaluation, a supporting Sustainable Return on Investment (SROI) was conducted to see if the rankings based on the 5 C/GL factors addressed the longer-term societal benefits. The SROI analysis results are presented and the full report is attached as **Appendix C**.

3.2 EVALUATION CRITERIA

For the 5C/GL evaluation, each criterion was ranked by High, Medium, or Low. Subsequently, the ratings were translated to a score of 3, 2, or 1, respectively to provide a numerical comparison between the alternatives. The evaluation was generally conducted at a more comprehensive level, with more detailed analysis than that which occurred for the initial screening.

3.3 EVALUATION SUMMARY

The matrix summarizing the preliminary screening of the three shortlisted Alternatives is presented in **Table ES-3-1**.

Table ES-3-1.
Shortlisted Alternatives Ratings and Scoring

Factor	Criteria	Description	Rating	Alternatives			Alternatives		
				1	2	3	1	2	3
Centers	Centers served	Numbers of Centers served by type of proposed service	Numerical value based on extent of land use supportive transit service provided to CAMPO Growth Centers. Proposed Rapid and Commuter Rail service scores highest; Connects service scores in the middle; and Express service scores lowest.	M	L	H	2	1	3
	Transit-friendly planning	Evaluation of transit-friendly planning by local governments in areas near planned stations and stops based on analysis of future land plans and code provisions	High/Medium/Low based on acreage of land with transit-friendly future land use planned with ½ mile of planned station or stop; the higher the acreage, the higher the rating.	M	L	H	2	1	3
Congestion	Estimated change in corridor travel time	Travel time on primary travel paths between Centers positively affected by alternative	Numerical value of change in travel time between Centers by mode compared to the Base; the faster the travel time, the higher the rating.	M	M	M	2	2	2
Core	Support vitality of the Core	Travel options to the Core	Numerical value based on number of transit links between Centers and the Core; the higher the linkages, the higher the rating.	M	H	H	2	3	3
Constraints	Environmental suitability	Initial assessment of environmental suitability	High/Medium/Low is based on occurrence of environmental constraints; the fewer environmental impacts, the higher the rating.	H	L	L	3	1	1
	ROW needs	Miles of new ROW needed as a ratio to existing ROW, by mode	High/Medium/Low rating will be based on natural breaks in ratio; the lower new ROW required, the higher the rating.	H	M	L	3	2	1
Complexity	Cost implications	Magnitude of capital costs	High/Medium/Low rating will be based on natural breaks in cost ranges; the lower the cost, the higher the rating.	H	H	L	3	3	1
		Magnitude of annual operating and maintenance costs	High/Medium/Low rating will be based on natural breaks in cost ranges; the lower the cost, the higher the rating	H	M	L	3	2	1
	Propensity of target transit markets to use transit	Understand the distribution of traditional and new market transit target markets by alternative	Traditional transit target markets High/Medium/Low based on natural breaks in numerical estimates; the higher the propensity, the higher the rating.	H	H	H	3	3	3
			New transit target markets. High/Medium/Low based on natural breaks in numerical estimates; the higher the propensity, the higher the rating.	M	M	M	2	2	2
	Intermodal connectivity	Number of multi-modal connections at transit hubs	High/Medium/Low based on natural breaks in the data; the higher the number of connections, the higher the rating.	L	M	H	1	2	3
	Sustainable Return on Investment (SROI)	Enhanced Cost-Benefit Analysis used to evaluate the business case of the three alternatives as compared to the base case.	FROI: Net Present Value (NPV) based on breaks in the data; the higher the number of connections, the higher the rating.	H	M	M	3	2	2
			SROI: Net Present Value (NPV) based on breaks in the data; the higher the NPV, the higher the rating.	H	M	L	3	2	1
			Benefit-Cost Ratio (BCR) based on breaks in the data; the higher the BCR, the higher the rating.	H	H	L	3	3	1
Growth	Estimated 2035 population changes	Evaluation based on projected 2035 population in close proximity to planned stations and stops	High/Medium/Low rating based on 2035 population within 1/2 mile of planned stations and stops; the higher the population; the higher the rating.	M	H	H	2	3	3
	Estimated 2035 employment changes	Evaluation based on projected 2035 employmrnt in close proximity to planned stations and stops	High/Medium/Low rating based on 2035 employment within 1/2 mile of planned stations and stops; the higher the employment; the higher the rating.	M	H	H	2	3	3
	Capacity to increase transit-friendly land uses at station areas	Evaluation of development potential with close proximity of planned stations and stops	High/Medium/Low rating based on acreage of vacant and underutilized land within 1/2 mile of planned stations and stops; the higher the development potential; the higher the rating.	M	M	M	2	2	2
Livability	Partnership for Sustainable Communities Livability Principles	Extent to which the alternative addresses the Principles	High means the alternative addresses 5 to 6 Principles; Medium, 3 to 4 Principles; and Low, 1 to 2 Principles.	M	M	H	2	2	3
	Access to Transit	Total Projected Population and Employment within 1/2 Mile of Proposed Stations & Stops	High/Medium/Low rating based on total 2035 population and employment within 1/2 mile of planned stations and stops; the higher the demographic activity; the higher the rating.	M	H	H	2	3	3
	Transit Friendly Land Use Opportunities	Evaluation of vacant and underutilized land within ½ mile of new Rapid, Commuter Rail, Connects, and Express stations/stops with transit-friendly future land use.	High/Medium/Low rating based on acreage of existing transit-friendly land use within 1/2 mile of planned stations and stops; the higher the existing transit-friendly land use; the higher the rating.	M	M	M	2	2	2
							47	44	43

Legend	Low	Medium	High

Source: HDR, 2013.

3.4 EVALUATION CONCLUSIONS

Each of the three Alternatives is discussed below in terms of how they compare against each other and the range of criteria. For example, one Alternative may have lower cost implications but more environmental impacts, while another may have higher Sustainable Return on Investment (SROI) but less intermodal connectivity. These trade-offs were considered to determine the characteristics of each Alternative and aid Capital Metro select an Alternative that provides the best overall benefits now, and over time, for the public funds invested.

As can be seen from this summary matrix, and **Table ES-3-2**, **Alternative 3** has the most High scores and ratings, with 9. **Alternative 1** and **Alternative 2** have scores and ratings of 8 and 7, respectively. **Alternative 1** has the most Medium scores/ratings, with 11; while **Alternative 2** and **Alternative 3** have 10 and 5, respectively. Finally, **Alternative 3** also has the lowest scores and /rating, with **6**; while **Alternative 2** has 3 and **Alternative 1** has only 1**,** making it the Alternative with the least negative impact.

From a cumulative standpoint, the evaluation favors **Alternative 1**, with a total numerical score of 42. This results from **Alternative 1** having the highest combination of High and Medium criterion scores and ratings, with 19, and the lowest number of Low scores, with 1.

Table ES-3-2.
Distribution of Criterion Scores And Ratings

Alternatives	Scores/Ratings		
	1/Low	2/Medium	3/High
Alt. 1	1	11	8
Alt. 2	3	10	7
Alt. 3	6	5	9

Source: HDR, 2013.

As for how the Alternatives perform against the range of criteria, the scores and ratings for each are shown below by criterion categories (factors).

3.4.1 High Scores/Ratings

Alternative 1 has *8 High scores/ratings* in the following criterion categories

- Constraints (2 of 2)
- Complexity (6 of 8)

Alternative 2 has *7 High scores/ratings* in the following criterion categories

- **Core** (1 of 1)
- Complexity (3 of 8)
- **Growth** (2 of 3)
- Livability (1 of 3)

Alternative 3 has *9 High scores/ratings* in the following criterion categories

- **Centers** (2 of 2)
- **Core** (1 of 1)
- Complexity (2 of 8)
- **Growth** (2 of 3)
- Livability (2 of 3)

3.4.2 Medium Scores/Ratings

Alternative 1 has *11 Medium scores/ratings* in the following criterion categories

- **Centers** (2 of 2)
- Congestion (I of 1)
- **Core** (1 of 1)
- Complexity (1 of 8)
- **Growth** (3 of 3)
- Livability (3 0f 3)

Alternative 2 has *10 Medium scores/ratings* in the following criterion categories

- Congestion (1 of 1)
- Constraints (1 of 2)
- Complexity (5 of 8)
- **Growth** (1 of 3)
- Livability (2 of 3)

Alternative 3 has *5 Medium scores/ratings* in the following criterion categories

- Congestion (1 of 1)
- Complexity (2 of 8)
- **Growth** (1 of 3)
- Livability (1 of 3)

3.4.3 Low Scores/Ratings

Alternative 1 has *1 Low scores/ratings* in the following criterion categories

- Complexity (1 of 8)

Alternative 2 has 3 *Low scores/ratings* in the following criterion categories

- **Centers** (2 of 2)
- Constraints (1 of 2)

Alternative 3 has *6 Low scores/ratings* in the following criterion categories

- Constraints (2 of 2)
- Complexity (4 of 8)

Based on the scoring/rating results of the above technical evaluation, Alternative 1 was the best overall Alternative for the following reasons:

- Alternative 1 has the highest numerical score of the three Alternatives.
- Alternative 1 has only one Low score and rating among the three Alternatives.
- Alternative 1 has the highest number of Medium scores and ratings of the three Alternatives.
- Alternative 1 has the second highest number of High scores and ratings of the three Alternatives.

3.5 RECOMMENDATION

The overall evaluation findings for the Alternatives were described in the preceding sections, and the trade-offs among the measures of the various criteria discussed. The development of a recommendation for a single Alternative to carry forward into the Project Development process was a collaborative effort of the Capital Metro staff, the PAG and TAC, and the consultant team. Following is the discussion of the process used to develop a recommendation for Alternative 1 as the Locally Preferred Alternative (LPA).

As a part of the LPA selection process, **Alternative 1** fulfilled the project's Purpose and Need.

3.5.1 Public Involvement Process Input

Another consideration was to obtain input from a variety of public and stakeholders. As a result of a broad range of public Open Houses, Community Workshops, Elected Official Briefings and Questionnaires, feedback was provided on what was expected and desired by the participants. Listed below is a summary of what was said and heard:

- High-capacity transit can be part of the transportation solution.
- Identify and address mobility challenges
- Address peak hour congestion in/out of Core
- Address congestion between other activity centers
    - Connect Round Rock and the University Blvd area
    - Connect Round Rock with Leander and Cedar Park
- Lack of transport choices within Centers - first and/or the last mile of the trip
- Connectivity issues with existing roadways and transit
- Pflugerville wants Metro Rapid extension in lieu of Connect route to Tech Ridge
- Relocate the Pflugerville proposed Park and Ride lot

As the selection of the selection of the LPA was being deliberated; these comments, ideas, and desires were considered.

3.5.2 Selection of Locally Preferred Alternative (LPA)

On November 21, 2013, utilizing the information described in the previous sections, the Project Team, comprised of the Capital Metro and consultant team, conducted a joint meeting of the Technical Advisory Committee (TAC) and Project Advisory Group (PAG) to present the Locally Preferred Alternative (LPA) recommendation and achieve concurrence from these advisory groups. Based on technical analysis and public input, the Project Team recommended an enhanced version of Alternative 1. The major features of the LPA are:

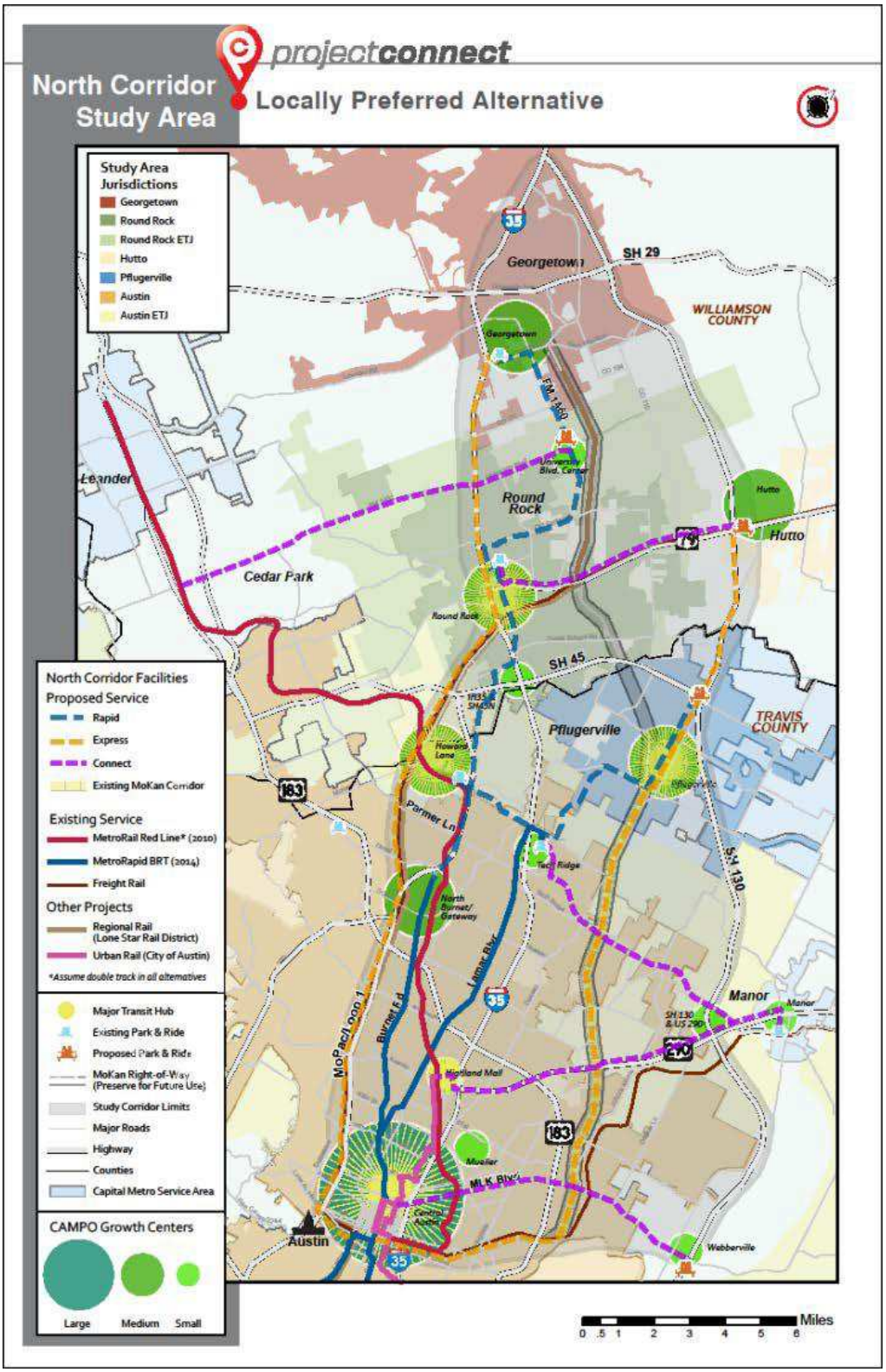
- Extension of Rapid service from Tech Ridge to Pflugerville
- Implementation of Express service on MoPac to Austin
- Relocation of the Pflugerville Park and Ride lot to the vicinity of SH 45 and IH 130
- Phase in development of MoKan as a busway to preserve it as a transportation corridor for future

The principal benefits of the LPA are that it

- Complies with the Purpose and Need statement
- Provides direct and frequent service to Austin's core
- Links Centers with Connect and Rapid service
- Serves traditional and new target transit markets
- Maximizes planned future land use opportunities
- Represents a readily expandable transit network

The LPA major is depicted in **Figure 3-2.**

Figure ES-3-2. Locally Preferred Alternative



CHAPTER ES-4

THE LOCALLY PREFERRED ALTERNATIVE (LPA)

4.1 INTRODUCTION

As a result of the evaluation as previously presented, Alternative 1 was recommended as the LPA to the Technical Advisory Committee (TAC) and Project Advisory Group (PAG) during a joint meeting. They reviewed and approved the recommended LPA with specific enhancements. The rationale for the LPA selection is based on the benefits that flow from it to the entire region and the North Corridor communities. The defined benefits are that the LPA:

- Provides direct and frequent service to Austin's core
- Links Centers with Connect and Rapid service
- Serves traditional and new target transit markets
- Maximizes planned future and vacant land use opportunities
- Represents a readily expandable transit network

As part of the LPA deliberation process, there were specific enhancements proposed by the TAC and PAG. The enhancements were based on technical analyses and public input. The enhancements are to:

- Extend Rapid service from Tech Ridge to Pflugerville
- Phase in the development of MoKan as a busway, but preserve it as a future transportation corridor
- Implement Express service on MoPac to Austin
- Relocate the Pflugerville Park and Ride facility to vicinity of SH 45 and IH 130

4.2 FEATURES OF THE LPA

The Locally Preferred Alternative is built around three principal bus modes: Rapid, Express and Connect, as described in Chapter 2. For these modes, there are two Rapid extensions, two Express extensions, and five Connect routes.

- One Rapid service extends from the current Burnet MetroRapid terminus to Round Rock and Georgetown via Burnet/Hesters/Mays/Old Settlers/FM1460/Inner Loop.
- A second Rapid route is new and runs from Pflugerville to Howard Lane with an intermediate stop at Tech Ridge, where the current Lamar MetroRapid service ends.
- One Express route connects the greater Georgetown area with Central Austin via IH35/SH45/MoPac.
- A second Express route runs from Hutto to Central Austin via MoKan and Capital Metro's freight rail ROW into Central Austin. This alternative also identifies the MoKan Corridor to be preserved for future use.

- Connect routes are from:
  - University Blvd towards Cedar Park via FM1421
  - Hutto to Round Rock via US79
  - Manor to Tech Ridge
  - Manor to Highland Mall via US290
  - Webberville to Central Austin via MLK

4.3 THE RECOMMENDED MODES

One of the values of the LPA is that it incorporates known vehicle types and extends current service. In addition, it responds to specific guidance about linking the key Centers in the northern reaches of the corridor. This is a direct result of TAC and PAG guidance of having a dual focus – supporting the vitality of Central Austin while reinforcing connectivity between the northern communities and identified Centers. That latter desire led to the creation of the new Connect service. Following is a brief summary of the modes.

4.3.1 Rapid

Bus Rapid Transit (BRT) operating on arterials in mixed traffic with signal prioritization - similar to Capital Metro's MetroRapid service. Rapid has fewer stops and branded shelters and can serve multiple transit markets.

4.3.2 Express

Long-haul, limited stop service on major highways - similar to Capital Metro's MetroExpress commuter service. Express is generally morning and afternoon commuter-focused service.

4.3.3 Connect

New short-haul, limited stop service operating on arterials between communities and major Centers.

4.4 CAPITAL FACILITIES COMMON TO ALL ALTERNATIVES

4.4.1 Transit Hubs

Transit Hubs are important new facilities that will be needed as the service becomes more robust. With MetroRail, Rapid, Express, Connect and future Lone Star service coming together at key locations, this facility type will be a requirement. Four intermodal Transit Hubs were designated: Central Austin, Howard Lane, Pflugerville, and Round Rock.

4.4.2 Park and Rides

Park and Rides lots are typically associated with Express type service and placed in suburban locations. There are six existing park and rides common to all four alternatives:

- Georgetown
- Round Rock
- Howard Lane
- Tech Ridge
- Manor
- Central Austin

Due to the system expansion, four new park and rides are recommended:

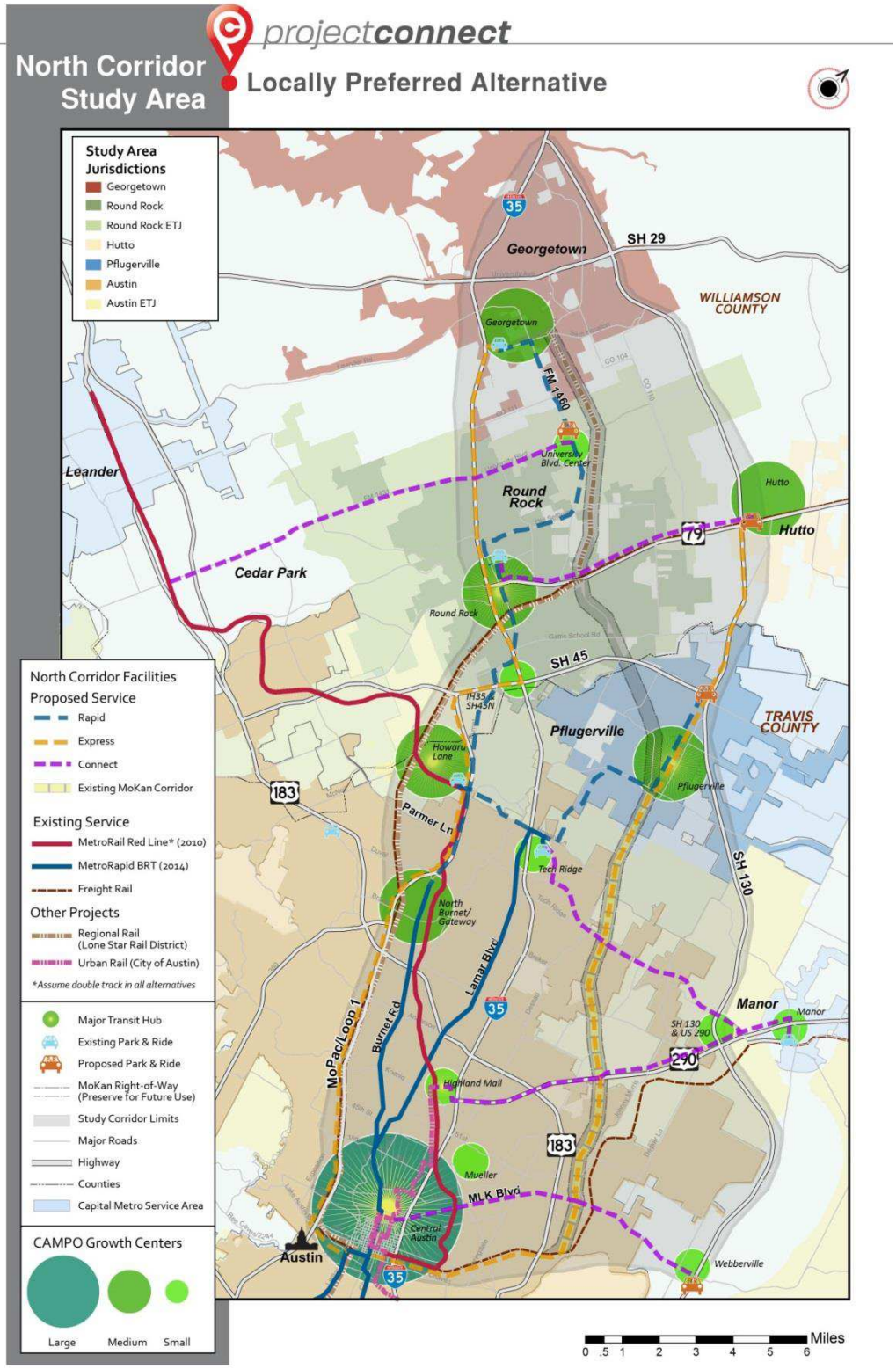
- University Blvd
- Hutto
- Pflugerville
- Webberville

Table ES-4-1
Summary of the Locally Preferred Alternative

Modes and Facilities	Locally Preferred Alternative
Modes	
Commuter Rail	–
Rapid	2 Extensions
Express	2 Routes
Connect	5 Routes
Facilities	
Transit Hubs	Central Austin, Howard Lane, Pflugerville, Round Rock, Highland Mall
Park & Rides	**Existing**: Georgetown, Round Rock, Howard Lane, Tech Ridge, Manor **New**: University Blvd., Hutto, Pflugerville, Webberville

Source: HDR, 2013.

Figure ES-4-1. The Locally Preferred Alternative



4.5 CONCEPTUAL CAPITAL COSTS

4.5.1 Capital Costs

The unit costs for the capital cost elements are based on average costs realized on similar transit projects in the nation and in the region. Cost for improving the MoKan for Express bus use assumes a 24-foot pavement width with ten feet on either side for shoulders, and including bridges, signs, environmental, drainage, utilities, etc. The unit cost is estimated as $5 million to $6 million per mile. Right-Of-Way (ROW) is not included in this estimate. The capital costs for Rapid service were based on actual costs realized by Capital Metro for the existing Rapid routes. The all-in price for MetroRapid is approximately $1.5 million per mile. This figure includes vehicles, stations, TSP, and other defined capital elements. The total cost for MetroRapid is approximately $50 million for 37 miles.

A detailed assumption of capital cost factors has been included in **Appendix B**.

4.5.2 Operating Costs

The estimates used for cost per vehicle hour and cost per vehicle mile are based on the Capital Metro cost allocation model for FY2013 modified budgeted costs which include direct and allocated overhead costs. The table below identifies the operating cost factors assumed for this study. The cost per vehicle mile and cost per vehicle hour provided by service type is based on Capital Metro's FY 2013 cost allocation model. The cost per vehicle hour assumed for the MetroRapid is a preliminary estimate not adjusted for inflation. This factor was provided for study purposes prior to the start of revenue operations of the actual service. A detailed assumption of operating cost factors by alternative has been included in **Appendix B**.

Table ES-4-2
Operating Cost Factors

Service Type	Cost Per Vehicle Hour	Cost Per Vehicle Mile
MetroBus	$111.60	$8.84
Express Bus	$140.32	$6.62
Redline (Commuter Rail)	$1,177.37	$49.31
MetroRapid	$132.00	

Source: Capital Metro Cost Allocation Model, FY 2013.

CHAPTER ES-5

POTENTIAL FUNDING STRATEGIES

This chapter summarizes the potential funding sources identified and evaluated to support future implementation of the LPA elements. Specifically, the sections below provide a summary of 28 potential federal, State and local revenue sources; describes the funding source evaluation process; and provides a summary of the most promising revenue sources for the LPA elements. It is important to note that at this stage of the financial planning process, the focus is on funding and revenue sources and not public, private, and/or innovative financing mechanisms. As the LPA elements move through the project development process, a financial model will be developed to evaluate project specific and program level funding and financing scenarios reflecting the individual services or combination of services, implementation schedules, and timing of revenue availability.

The following sections provide an overview of potential capital and operating revenue sources; identification of the most promising revenue sources to target for near term use as well identification of secondary sources which should remain under consideration; and a summary of the next steps in the financial planning process.

5.1 POTENTIAL CAPITAL SOURCES

Table ES-5-1 provides an overview of the existing and potential capital funding sources identified and evaluated for each of the LPA's category of services and costs described previously in Chapter 4. As shown in the table, for each source a brief description is provided along with the evaluation results. More specifically, the evaluation results reflect a combination of the revenue potential and eligible uses for each source as well as experience of other transit systems using this source for similar projects around country. The most promising sources to target for each LPA category are identified with green shaded cells; sources that were considered to be more promising for future use (either for political or legislative issues) are indicated with yellow shaded cells, and sources that should not be considered going forward are identified with white shaded cells. Detailed descriptions of the most promising sources (green) and sources that could potentially be targeted in the future (yellow) are provided following the table.

Table ES-5-1.
Potential Capital Funding Sources by LPA Category

Program	Description	Rapid $58.1 M	Express $86.0 M	Connect $7.8 M	Park & Ride $12.0 M
FTA Formula Programs					
FTA Section 5307 Urbanized Area Formula Funds	Formula funds to urbanized areas for transit capital projects and for transportation related planning				
FTA Section 5337 State of Good Repair Program	Formula program to maintain existing fixed guideway systems in a state of good repair.				
FTA Section 5339 Bus and Bus Facilities	Formula program to support transit capital programs.				
FTA Competitive Programs					
FTA Section 5309 Capital Investment Grant Program (New Starts / Small Starts)	Supports major fixed guideway transit capital projects that are locally planned, implemented, and operated.				
FTA Section 5312 Research, Development, Demonstration, and Deployment Projects	Competitive grant program to assist agencies with purchasing low or no emissions vehicles. MAP-21 authorized $70 million annually for FY 2013 and FY 2014 subject to appropriations by Congress.				
FTA Section 5303 Transit Oriented Development Planning Pilot	Pilot program for transit-oriented development (TOD) planning grants.				
FHWA Flexible Formula Programs					
FHWA Congestion Mitigation and Air Quality Improvement (CMAQ)*	Funds projects that contribute to the attainment of national ambient air quality standards with a focus on ozone and carbon monoxide.				
FHWA Surface Transportation Program (STP)	Program with the broadest eligibility criteria. Funds can be used on any of the following: Federal-aid highway; bridge projects; transit capital projects; non-motorized paths, and bridge and tunnel inspection.				
FHWA Transportation Alternatives Program (TAP)	Provides funding for non-motorized transportation improvements.				

Program	Description	Rapid $58.1 M	Express $86.0 M	Connect $7.8 M	Park & Ride $12.0 M
FHWA / USDOT Competitive Programs					
FHWA Projects of National and Regional Significance	Funding for critical high-cost surface transportation capital projects that will accomplish national goals.				
USDOT TIGER Program	Supports implementation of "shovel ready" infrastructure projects, including highways, bridges, public transit, passenger and freight rail, port infrastructure, and intermodal facilities.				
FHWA National Highway Performance Program	Supports the condition and performance of the national highway system including the construction of new facilities				
Existing Regional/ Local Sources					
Capital Metro Sales Tax	For services and facilities within the Capital Metro Service Area.				
Local Jurisdiction Participation	Funding could be provided from existing general funds or through a comprehensive transportation bond package				
Private Participation	Private entities agree to pay for capital improvements that provide a direct benefit.				
Land Contribution or Other Asset Sales	Revenues generated from the disposition of excess land owned by local jurisdictions, including ROW contributions				
Hotel/Motel Tax	Increase/Reallocate tax levied on the gross receipts of lodging within the area served by the transportation project.				
Vehicle Registration Fee	Increase /Reallocate existing vehicle registration fees within the area served by the transportation project.				

Program	Description	Rapid $58.1 M	Express $86.0 M	Connect $7.8 M	Park & Ride $12.0 M
Potential Source – May Require Legislative Action					
Capital Metro Service Area Expansion	Residents within an outlying jurisdiction would hold a referendum to join the Capital Metro Service Area.				
Value Capture	Defined area within which businesses/residences collectively agree to pay an additional tax or fee in order to fund improvements within the district's boundaries.				
Parking Tax	A parking tax is a tax or surcharge levied on paid parking. The tax could be applied within transportation project's study area for the use of off-street commercial or employer provided parking spaces.				
Rental Car Surcharge	Taxes or surcharges imposed on rental cars that are leased, either through a countywide gross receipts tax on rental car companies (typically passed along to the customer) or a Customer Facility Charge (CFC) assessed per rental car contract				
Emission Fee	Variable fees applied to classes of vehicles based upon the amount of pollutants they emit. Typically individual vehicles are not measured, rather the charge is imposed by the classification of the vehicle or engine.				

Note: * If the Austin area becomes an air quality non-attainment area in the future, CMAQ funds would be eligible to fund a portion of transit capital improvement costs.

Source: HDR, 2013.

5.1.1 Potential Federal Capital Sources

This following provides descriptions of the federal funding sources with the greatest potential to support implementation of the LPA elements. These sources reflect programs included in the Moving Ahead for Progress in the 21st Century (MAP-21) surface transportation legislation enacted in July 2012.

Historically, federal surface transportation legislation has typically provided funding for a six year period. However, due to the ongoing political and financial challenges in Washington DC, MAP-21 was enacted as a two-year funding bill (FY 2013 and FY 2014) and to date the next transportation bill has not been enacted. Discussions regarding the next transportation bill have

been initiated within Washington DC, including the Administration's recently proposed GROW AMERICA Act however there is no timeline for when a long term transportation bill will be passed. For the purposes of this financial analysis, it is assumed the funding programs included in MAP-21 will continue in the next transportation bill.

5.1.1.1 FTA Formula Programs

FTA Urbanized Area Formula Funds

Program Description: The largest of FTA's grant programs, this program provides grants to urbanized areas to support public transportation. Funding is distributed by formula based on the level of transit service provision, population, and other factors. Eligible purposes for the FTA Urbanized Area formula funds include:

- Capital projects (bus, rail, preventive maintenance, ADA paratransit service costs)
- Planning
- Job access and reverse commute

Additionally, at least one percent of the funding apportioned to each urbanized area must be used for "associated transportation improvements", such as historic preservation, landscaping, public art, pedestrian access, bicycle access, and enhanced access for persons with disabilities.

Funding is apportioned on the basis of legislative formulas. For areas with populations of 200,000 and more, the formula is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles as well as population, population density, and low income population. **Table ES-5-2** summarizes the FY 2013 allocation among the cities based on the approximately $7.6 million available for the population, population density, and low income population components of the legislative formula. The allocation among cities reflects the following assumptions:

- Population: reflects 2010 Census results
- Funds allocated for population: reflects each city's percent of total population times the level of federal formula funds allocated to the Austin region ($4.2 million) for population. For FY 2013, the FTA used a population unit value of approximately $3.06 per person to allocate total population funding among all urbanized areas.
- Funds allocated for population density: reflects each city's percent of total population times the level of federal formula funds allocated to the Austin region ($2.8 million) for population density. For FY 2013, the FTA used a population density unit value of $0.0007809 per person to allocate total population density funding among all urbanized areas.
- Low Income Population Allocation: reflects each city's percent of total low income population times the level of federal formula funds allocated to the Austin region ($0.6 million) for low income population. For FY 2013, the FTA used a low income population unit value of approximately $2.54 per low income person to allocate total low income population funding among all urbanized areas.

Table ES-5-2.
Allocation of FY 2013 FTA Urbanized Area Formula Funds

City Allocation	Population (a)	% of Population	$ Allocated for Population	$ Allocated for Population Density	Low Income Population Allocation	Total
Austin	778,696	57.2%	$2,381,595	$1,583,936	$515,966	$4,481,497
Bee Cave	3,277	0.2%	$10,023	$6,666	$209	$16,898
Buda City	6,822	0.5%	$20,865	$13,877	$205	$34,947
Cedar Park	51,413	3.8%	$157,244	$104,579	$10,519	$272,341
Georgetown	45,743	3.4%	$139,902	$93,045	$8,992	$241,940
Hays	195	0.0%	$596	$397	$4	$997
Hutto	14,329	1.1%	$43,824	$29,146	$556	$73,527
Kyle	26,414	1.9%	$80,786	$53,728	$2,944	$137,458
Lakeway	11,338	0.8%	$34,677	$23,062	$1,655	$59,394
Leander	24,688	1.8%	$75,507	$50,218	$3,334	$129,059
Manor	1,965	0.1%	$6,010	$3,997	$52	$10,059
Pflugerville	47,086	3.5%	$144,010	$95,777	$12,089	$251,876
Rollingwood	1,482	0.1%	$4,533	$3,015	$60	$7,608
Round Rock	99,276	7.3%	$303,630	$201,936	$16,970	$522,536
San Leanna	501	0.0%	$1,532	$1,019	$32	$2,584
Serenada	2,643	0.2%	$8,083	$5,376	$326	$13,786
Sunset Valley	812	0.1%	$2,483	$1,652	$1,510	$5,645
The Hills Village	2,447	0.2%	$7,484	$4,977	$169	$12,631
West Lake Hills	3,206	0.2%	$9,805	$6,521	$338	$16,665
Unincorporated county (b)	240,083	17.6%	$734,279	$488,350	$45,771	$1,268,400
TOTAL	**1,362,416**	**100.0%**	**$4,166,867**	**$2,771,274**	**$621,703**	**$7,559,844**

Source: HDR, 2013.

5.1.2 Potential Local Capital Funds

This following provides descriptions of the local funding sources with the greatest potential to support implementation of the LPA elements. These sources could be either used as the local match requirement for the previously described federal funding programs or could be used to fund 100 percent of specific components of the LPA. Additionally, these sources are divided into existing sources and potential sources, which reflect sources that may require State or local legislative actions to be eligible to support funding the LPA.

Finally, the first two sources described below, existing Capital Metro Sales Tax and Local Jurisdiction Participation, would most likely be the primary funding sources if the region agrees to a cost-allocation approach of equitably sharing capital costs among the jurisdictions that

benefit from the individual elements of the LPA. Additional information on cost-allocation is provided in Section 6.1.1.1.

5.1.2.1 Existing Local Sources

Capital Metro Sales Tax

Program Description: Capital Metro was created in 1985 in accordance with Chapter 451 of the Texas Transportation Code. Capital Metro was established by a voter referendum on January 19, 1985, to provide mass transportation service to the greater Austin metropolitan area. The agency is funded in part by a one percent sales tax which is collected in the following member jurisdictions: the cities of Austin, San Leanna, Leander, Lago Vista, Jonestown, Manor, Volente, Point Venture, and the Anderson Mill area of Williamson County. The FY 2014 budget projects sales tax revenues of approximately $182.2 million which is approximately 64 percent of the agency's total capital and operating revenues.

Local Jurisdiction Participation

Program Description: Revenue from a city or county's general fund could be used to support implementation and operation of local projects as well as multi-jurisdictional projects as part of a cost-sharing arrangement.

Private Participation

Program Description: Work with private developers or property owners to pay for a portion of the capital costs associated with the benefit of providing access to their property/location. This could include costs associated with the station or costs related to pedestrian/bicycle access to the station.

Land Contribution or Other Asset Sales

Program Description: Revenues generated from the disposition of excess land owned by Capital Metro, cities or local agencies, including right-of-way contributions. Disposition agreements by affected agencies would need to dedicate proceeds from sales towards the LPA element.

Hotel/Motel Tax

Program Description: Tax levied on the gross receipts of lodging within the area served by a transportation project. A portion of revenues could be contributed towards an element of the LPA's capital or operating costs.

Vehicle Registration Fee

Program Description: Increase vehicle registration fee to provide a defined percentage of capital or operating funding for the elements of the LPA.

5.1.2.2 Potential Local Sources

Expansion of the Capital Metro Service Area

Program Description: Pursuant to the agency's enabling legislation, a successful public referendum would be required if an outlying jurisdiction wanted to join the Capital Metro service

area. If this were to occur, the jurisdiction with voter approval would initiate the one percent sales tax and would start receiving Capital Metro transit services.

Value Capture

Program Description: Revenue from an Assessment District is generated from a fee on properties in a specified area that is used to pay a portion of the capital improvements made within and specifically benefiting that area. In an assessment district, a connection between benefit received and cost charged is essential, in that assessments charged in these districts must be proportional to and no greater than the benefit to the assessed property.

Parking Tax

Program Description: A parking fee is a tax or surcharge levied on paid parking. The fee could be applied within the LPA corridors or within each City's limits for the use of off-street commercial or employer provided parking spaces and/or for the use of public parking meters. If applied within the corridors, there would be some degree of relationship between traffic and parking within the corridor relative to parking requirements and parking fee. If applied City-wide, the relationship between the parking fee and capital and/or operating costs within the corridor would be less direct. More likely, a City-wide parking fee would be used to fund a variety of improvements, and would not be used solely to fund costs related to the LPA.

Rental Car Surcharge

Program Description: Taxes or surcharges imposed on rental cars that are leased, either through a countywide gross receipts tax on rental car companies (typically passed along to the customer) or a Customer Facility Charge (CFC) assessed per rental car contract at airports: A portion of the rental car surcharge could be potentially contributed towards a portion of the LPA's capital or operating costs.

5.2 POTENTIAL OPERATING FUNDS

Table ES-5-3 provides an overview of the existing and potential capital funding sources identified and evaluated for each of the LPA's category of services and costs described previously in Chapter 4. Similar to the potential capital funding sources, a brief description and evaluation results are summarized for each potential operating sources. Descriptions of the most promising operating funding sources to target for the most promising sources (green) and sources that could potentially be targeted in the future (yellow) are provided following the table.

Table ES-5-3.
Potential Operating Funding Sources

Program	Description	Rapid $17.1 M	Express $3.8 M	Connect $10.3 M
Federal Funds				
FTA Section 5307 Urbanized Area Formula Funds	Formula funds to urbanized areas which can be used for preventive maintenance of capital equipment and for operating costs for populations with less than 200,000.			
Regional / Local Funds				
Fare Revenue	Conceptual ridership estimates and preliminary fare revenue level assumptions results in a fare box recovery ratio of 15-20%			
Capital Metro Sales Tax	For services and facilities within the Capital Metro Service Area.			
Local Jurisdiction Participation	Annual funding from a local jurisdiction's general funds			
Advertising Revenue / Naming Rights	Advertising revenue on bus or at stops; potential naming rights for major stations			
Capital Metro Service Area Expansion	Residents within an outlining jurisdiction would hold a referendum to join the Capital Metro Service Area.			
Value Capture	Defined area within which businesses/residences collectively agree to pay an additional tax or fee in order to fund improvements within the district's boundaries.			
Parking Tax	A parking tax is a tax or surcharge levied on paid parking. The tax could be applied within transportation project's study area for the use of off-street commercial or employer provided parking spaces.			
Hotel/Motel Tax	Increase/Reallocate tax levied on the gross receipts of lodging within the area served by the transportation project.			
Vehicle Registration Fee	Increase /Reallocate existing vehicle registration fees within the area served by the transportation project.			
Rental Car Surcharge	Taxes or surcharges imposed on rental cars that are leased, either through a countywide gross receipts tax on rental car companies (typically passed along to the customer) or a Customer Facility Charge (CFC) assessed per rental car contract			

Source: HDR, 2013.

5.3 CONCLUSIONS AND NEXT STEPS

Based on the analysis completed to date and described above, **Table ES-5-4** summarizes the most promising federal and local capital and operating sources that should be targeted to support the near term implementation of the LPA. **Table ES-5-5** summarizes other potential sources that should be considered as potential sources in the future. As implementation of the individual elements or combination of elements of the LPA move forward, detailed capital and operating financial plans using these sources as the starting point for revenue assumptions. Additionally, the regional partners may want to consider financing options to accelerate the implementation of the capital infrastructure. **Appendix E** provides additional information on potential application of a cost-allocation approach to equitably distribute capital and operating costs among the jurisdictions that benefit from the elements of the LPA.

Table ES-5-4.
Summary of Near Term Capital and Operating Sources

Program	Capital	Operating
Federal Formula Programs		
FTA Section 5307 Urbanized Area Formula Funds	X	X
FHWA Surface Transportation Program (STP)	X	
FHWA Transportation Alternatives Program (TAP)	X	
Federal Competitive Programs		
FTA Section 5309 Capital Investment Grant Program (Small Starts)	X	
FTA Section 5312 Research, Development, Demonstration, and Deployment Projects (Low / No-Emission Buses)	X	
Local Sources		
Capital Metro Sales Tax	X	X
Local Jurisdiction Participation	X	X
Private Participation	X	X
Land Contribution of Other Asset Sales	X	
Fare Revenue		X
Advertising Revenue / Naming Rights		X

Source: HDR, 2013.

Table ES-5-5.
Summary of Other Potential Capital and Operating Sources

Program	Capital	Operating
Federal Competitive Programs		
USDOT TIGER Program	X	
Local Funds		
Capital Metro Sales Tax		X
Hotel/Motel Tax		X
Vehicle Registration Fee		X
Value Capture		X
Parking Tax		X
Rental Car Surcharge		X

Source: HDR, 2013.

CHAPTER ES-6

PHASED IMPLEMENTATION STRATEGY

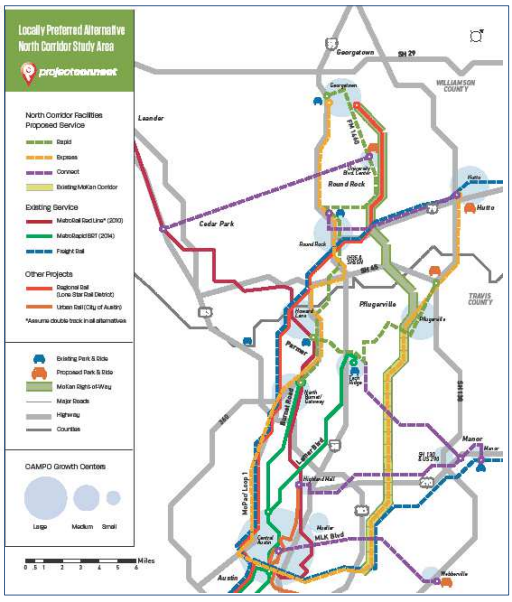
6.1 INTRODUCTION

As the Project Connect North Corridor moves toward implementation of the Locally Preferred Alternative (LPA), the partners are faced with the complexity of how, when and where future transit service will be provided. All jurisdictions represented on the Technical Advisory Committee (TAC) and Project Advisory Group (PAG) expressed interest in providing some level of transit service to their citizens. This reinforced the findings from the public involvement meetings that:

- High-capacity transit can be part of the region's solution to increasing congestion
- Transport choices are missing within and between activity centers – not only to central Austin
- Land use and transportation solutions are needed before future growth areas develop

A closer look at the LPA demonstrates the complexity facing the regional partners as they consider how to phase-in the proposed services:

- A major portion of the study area is outside of the current Capital Metro service area
- Each community beyond the Capital Metro service area has some form of proposed transit service – Express, Rapid or Connect – and in some cases, a combination of services
- The same route may be in more than one jurisdiction beyond the Capital Metro service area
- Two transit hubs – intermodal and transfer facilities – are proposed, one each in Round Rock and Pflugerville
- New Park & Ride facilities are located in Hutto, Pflugerville, Georgetown and Webberville
- All jurisdictions face land use decisions with respect to the status, definition and role of applicable CAMPO Centers
- Future land use plans and zoning decisions are crucial to increasing the demand for transit service
- Land use location, intensity, density, mix and pattern standards need to be transit-friendly



- All jurisdictions must decide on a funding strategy that delivers the desired service without limiting regional connectivity

These factors strongly suggest is that successful implementation must be effective and affordable, and continuous, cooperative and collaborative process. The manner in which the partners meet these complex challenges is the key to the success of a North Corridor system that links to the regional network. An aid in implementation is that costs will vary by jurisdiction, based on the capital and operating costs associated with the specific service types. A Cost Allocation Model was developed to facilitate discussions between Capital Metro and local governments to address this implementation component. As described in more detail in Section 5.1.1, this preliminary model allows users to input implementation schedule assumptions for each LPA element and to allocate costs among the local jurisdictions based on two potential variables: revenue hours and equally distributing costs among jurisdictions served by the individual elements. Based on future discussions among the North Corridor partners, this model could be expanded to include additional variables and used to evaluate a series of allocation approaches based on different combinations of variables and weighting assumptions.

6.2 A TIMING-BASED APPROACH TO IMPLEMENTATION

The complexity noted above led to a phasing approach that is non-traditional in scope and application – one based on timing of demand, not the traditional time periods. For example, the traditional approach is defined as specific timeframes:

- Period 1 = 1-5 years
- Period 2 = 6-10 years and
- Period 3 = 11-20 years

With the complex challenges and inter-governmental coordination, **the period-based phasing** approach is very difficult to implement. The level of unpredictability facing the North Corridor communities raises questions such as:

- Who will provide, fund and operate the service?
- What will the cost-sharing arrangements with Capital Metro be?
- How is incremental service delivery accommodated?
- How do jurisdictions cooperate on common service that crosses their boundaries?
- Will definitions of transit-friendly growth be generally uniform?

Consequently, the approach for the North Corridor is non-traditional, based on “timing” – a correlation between Capital Metro’s provision of transit service and the Cities’ increased development densities and intensities. It is driven by the transit development strategy. The strategy means that the “timing” of transit service is linked to the increase in transit-friendly development. Increased levels of transit-friendly development creates transit service “demand” that leads to the associated increased “supply” of transit service. An important implication is that the timing of transit service delivery may vary from community-to-community.

The three recommended timing phases are:

- **Phase 1 – Readiness:** This phase defines the tasks required to move the North Corridor transit plan toward implementation. The focus is to reach agreement on organizational roles and responsibilities, planning and adoption approvals, and cost-sharing arrangements.
- **Phase 2 – Launch:** The second phase allows an incremental launch of services depending on decisions and agreements in Phase 1. The intent is for all modes – Express, Connect and Rapid – to be initiated in a meaningful way to provide the services as adopted in the LPA. During this phase, the launch will be coordinated with the timing of demand based on increasing levels of transit-friendly development. This means each jurisdiction will continue to enhance its future land use and zoning regulations to yield more transit-friendly development.
- **Phase 3 – Expand:** As transit-friendly development comes on line in the communities, and demand for service builds, higher capacity transit service can be added.

Table ES-6-1 depicts the general framework of the three phases, with roles for all affected parties identified. The framework has three features for each Implementation Phases - the Transit Service Investment, specific Transit Improvement Strategies for Capital Metro and the Cities, and Transit-friendly Investment and Development Strategies for the Cities.

Table ES-6-1.
Phased Implementation Framework

Implementation Period	Transit Service Investment	Transit Improvement Strategies (Capital Metro & Cities)	Transit-friendly Investment and Development Strategies (Cities)
Phase 1 – Readiness	• LPA Adoption • Develop operational structure • Develop cost-sharing approach	• Recommend LPA to CAMPO and Cities • Agree on roles, responsibilities	• Support adoption of by CAMPO • Initiate transit-friendly development opportunity areas
Phase 2 – Launch	• Initiate service/ facilities • Express Service • Connect Service • Rapid Service • Transit Hubs • Park & Rides (P&R) • Transit Hubs	• Develop joint Capital Metro and Cities strategies • Routes • P&R • Transit hub	• Prioritize stations • Construct support facilities • Continue enhancing land use plans and codes
Phase 3 – Expand	• Expand service – Express Service – Connect Service – Rapid Service – Transit Hubs	• Develop joint Capital Metro and Cities strategies – Routes – P&R – Transit hub	• Prioritize stations • Construct support facilities • Undertake market studies and focus TODs on “Ready” locations

Source: HDR, 2013.

A central thesis of the Transit Development Strategy is the linkage between transit and land use. Internal to the Phased Implementation Framework are recommended transit-friendly land use types. **Table ES-6-2** defines and depicts these relationships by mode and eight associated development types.

Table ES-6-2.
Transit and Development Linkage Strategy Chart

Transit Service Levels	Transit –friendly Development			Development Types	
	Activity Density (Pop+Empl/acre)	Development Density/Intensity	CAMPO Proposed Center Types	Characteristics	Images
Rapid or Urban Rail 5-10 minute headways	40+	30+ du/a 1.00 FAR	Regional & Town Centers Mixed Use Activity District	High Intensity Commercial and Mixed Use • Mid to high rise buildings • Parking in podium or separate structure • Present in more urban locations	
				Medium and High Density Residential • Mid to high rise buildings • Parking in podium or separate structure • Present in more urban locations	
				Medium Density Residential – Mid Rise • 3-4 floors typical • Parking in encapsulated or podium garage • Present in urban and suburban activity centers	

Transit Service Levels	Transit –friendly Development			Development Types	
	Activity Density (Pop+Empl/acre)	Development Density/Intensity	CAMPO Proposed Center Types	Characteristics	Images
Rapid 10-15 minute headways	20-40	15-30 du/a 0.25-1.00 FAR	Community Center	Medium Density Commercial and Mixed Use • 1-3 floor mixed use • Combination of surface and decked parking • Present in urban and suburban activity centers	
				Medium Density Residential – Low Rise • 2-3 floors typical • Garden apartment and stacked flat building types • Surface parking	
Connect 20-30 minute headways	10-20	7-15 du/a Less than 0.25 FAR	Exurban Center	Compact Neighborhood • 1-2 floors typical • Detached houses on lots less than 5,000sf and town homes on lots less than 2,500sf • Rear loaded surface parking	
				Low Density Suburban Commercial • 1-2 floors typical • Commercial retail and garden office buildings • Surface parking	
Local Bus 30-60 minute headways and demand response	0-10	0-7 du/a	N/A	Suburban Single Family • 1-2 floors typical • Detached houses on lots greater than 5,000sf • Front loaded surface parking	

Source: HDR, 2013.

6.3 PHASED IMPLEMENTATION STRATEGY

The three general timing Phases described and illustrated above are given more detail in the Phased Implementation Matrix, **Appendix H**. Actions, roles and responsibilities are defined phase-by-phase. In the Transit Improvement Strategies column, the responsible entities are shown in parentheses.

6.3.1 Operating and Capital Cost Allocation

As described in Chapter 5, the LPA's future detailed financial plan will reflect a combination of the federal and local funding sources. The local sources will include participating from Capital Metro and the local jurisdictions to provide the matching funds for federal capital grants as well as the remaining annual operating subsidy after accounting for fare revenue, grant funds, and other operating revenue. As part of the regional partnership to implement and operate long-term the elements of the LPA, it will be necessary to develop a cost allocation methodology that all partners agree is an equitable distribution of expenses based on the benefits received by Capital Metro and the local jurisdictions.

The following sections provide an overview of variables typically used in the development of a cost allocation methodology, the strengths and weaknesses of these variables, and examples of cost allocation methodologies used by other multi-jurisdictional transit services across the country, and preliminary guiding principles to help facilitate the discussion among the Project Connect North Corridor Partners.

Finally, **Appendix E** and a separately submitted Excel workbook provide a preliminary regional cost allocation model. To initiate the cost allocation discussion, this preliminary model allows users to input implementation schedule assumptions for each LPA element and to allocate costs based on two potential variables. For allocation of capital costs the two variables are route length within each jurisdiction and equally distributing costs among jurisdictions served by the individual elements. For operating and maintenance costs the two variables are revenue miles within each jurisdiction and equally distributing costs among jurisdictions served by the individual elements. Based on future discussions among the North Corridor Partners, this model could be expanded to include additional variables and used to evaluate a series of allocation approaches based on different combinations of variables and weighting assumptions.

6.3.1.1 Cost Allocation Variables

The objective in developing a regional cost allocation model is to ensure there is an easy to understand methodology that balances the benefits perceived (in the form of service supply and utilization) and costs paid by funding partners for multi-jurisdictional services. Related to this objective, it is critical to 1) make the process easy to understand through verification of data collected, 2) provide results that are predictable so that funding partners are able to project contributions as part of their annual budgeting process and short range (5 year) and long range (10 to 20 years) financial planning, and 3) provide a model that is stable, yet flexible and adaptive to future capital and service mode changes.

Based on a review of cost allocation models used historically by other transit systems, each system's methodology is unique. The variations reflect: allocation variables; data used to define the variables; and the weighted percentage placed among the allocation variables. As described in more detail below, typical cost allocation variables fall into three major categories: 1) service supply; 2) service demand; and 3) regional distribution. **Table ES-6-3** summarizes the comparative strengths and weaknesses associated with the typical allocation variables.

Table ES-6-3.
Potential Allocation Variables

Allocation Variable	Strengths	Weaknesses
Service Supplied Variables		
Vehicle hours/miles	A direct level of service supplied measurement including deadhead time and miles and layover time	May overestimate hours and miles to an area depending on location of transit hubs, end of the lines, and/or location of maintenance facility
Stations/Park and Ride Facilities	Used primarily for regional fixed guideway services (BRT or Rail) Costs are assigned to jurisdiction that receives the direct benefit from fixed guideway service, including land use and economic benefits	Does not allocate cost to jurisdictions without station but have residents that use park and ride facilities Systems that use this variable typically include a service demand variable (ridership by place of origin) to address this issue
Route / fixed guideway miles	Provides a fairly accurate estimate of the level of service supplied Level of accuracy decreases if service supplied in not operated uniformly (i.e. not all trips runs the entire length of the route or travel speed varies along the route)	More appropriate for fixed guideway operations since speeds and schedules are typically more uniform May not be appropriate for bus operations as not all trips may run the entire length of the route and may not travel the same speed throughout the route
Service Demand Variables		
Ridership – Boardings	A direct measure of service demand Typically used in situation when few transfers are required or when transfers are not free Typically used by systems with high levels of commuter ridership (AM rush hour)	Overly allocates costs (or revenues) to areas where more transfers are required Requires a data collection method/process (automated passenger counters or on-board ride checks) to collect reasonable stop level information
Ridership – Boardings and Alightings	A direct measure of service demand Typically used in situation when few transfers are required or when transfers are not free	Overly allocates costs (or revenues) to areas where more transfers are required Requires a data collection method/process (automated passenger counters or on-board ride checks) to collect reasonable stop level information
Ridership – Trip Origin Jurisdiction	Provides measure of service demand based on jurisdiction of where the trip started which may be beyond where the transit trip started	Requires a statistically valid on-board survey to obtain dat An on-board survey must be conducted periodically to keep pace with fast growing region

Allocation Variable	Strengths	Weaknesses
Ridership – Jurisdiction of Residence	Provides measure of service demand for both inbound and outbound trips based on where the passenger lives Most accurate method to allocate costs to the jurisdiction that is receiving the transit benefit	Requires a statistically valid on-board survey to obtain data On-board survey must be conducted periodically to keep pace with fast growing region
Linked trips	A direct measure of the use of transit Avoids the problem of transfer rates that boardings and alighting variables have by counting as one trip travel from origin to destination, regardless of the number of vehicles ridden	Requires a statistically valid on-board survey to obtain data On-board survey must be conducted periodically to keep pace with fast growing region
Regional Distribution		
Population	Reflects the regional importance of transit as a transportation alternative	There is no correlation with population levels and the actual level of service demand (ridership) Other systems that use this variable also include service consumption and service demand variables
Population density	Reflects the regional importance of transit as a transportation alternative Allocated a greater share of costs (and revenue) to areas with denser populations where transit's benefits are perceived to be greater	May reward communities that encourage urban sprawl There is no correlation with population density levels and the actual level of service demand (ridership) Other systems that use this variable also include service consumption and service demand variables
Divided equally among member jurisdictions	Reflects the region's view that transit is an important transportation alternative. Is a good measure for the allocation of capital costs associated to elements of the transit system that benefit the region (maintenance facility, vehicles, administration facility, etc) and administrative functions that overlap the different modes that are operated	Does not equitably distribute cost directly related to on-street operations operating costs

6.3.1.2 Cost Allocation Examples

The following provides examples cost allocation variables and weighted percentages used by other multi-jurisdiction transit systems to allocate O&M and capital costs for fixed route bus and fixed guideway services. The fixed guideway examples reflect passenger rail services. While passenger rail is not an element of the LPA, these systems provide examples for fixed guideway services such as the planned MetroRapid. These approaches reflect a combination of technical analysis of multiple allocation approaches and political negotiations to develop what each system felt was an equitable distribution of costs relative to the benefits received.

O&M Cost Allocation Variables

As shown in **Table ES-6-4** and **Table ES-6-5**, each of the transit systems utilized different variables for allocating bus and rail operating and maintenance costs. For multi-jurisdiction bus operating and maintenance costs, the majority of systems use a service supplied variable (hours or miles) and a regional distribution variable (population). For fixed guideway operating and maintenance costs, the majority of systems used service demand (ridership) in combination with another variable. This reflects the fact that data on fixed guideway ridership is easier to collect than bus ridership since there are a limited number of stations and train frequencies.

Table ES-6-4.
O&M Cost Allocation Variables - Fixed Route Bus

	Service Supply		Service Demand	Regional Distribution	
	Revenue Hours	Revenue Miles	Ridership	Population	County
Washington DC Metro	25%	35%	15%	25%	
Hampton Roads, VA	100%				
Butte County ,CA	50%			50%	
Milwaukee County Transit, WI					100%
Chapel Hill, NC				100%	
Orlando, FL	100%				
Fredericksburg, VA	100%				
Charlottesville, VA		100%			

Table ES-6-5.
Operation and Maintenance Cost Allocation Variables – Fixed Guideway

	Service Supply		Service Demand	Regional Distribution	
	Stations or Route Miles	Train Miles	Ridership	Population / Population Density	Divided Equally among County / Jurisdiction
Washington DC Metro	33% (Stations)		33%	33%	
LA Metrolink Commuter Rail	40% (Route Miles)	60%			

	Service Supply		Service Demand	Regional Distribution	
	Stations or Route Miles	Train Miles	Ridership	Population / Population Density	Divided Equally among County / Jurisdiction
Altamont Commuter Rail Express (ACE), CA			100%		
CalTrain Commuter Rail San Jose/San Francisco			100%		
South Florida RTA (Tri Rail)					100%
Virginia Railway Express			90%	10%	

Capital Cost Allocation Variables

Table ES-6.6 and **Table ES-6.7** summarize the different variables used for allocating bus and fixed guideway capital costs. As shown in **Table ES-6.6**, each system is unique in terms of the allocation of bus capital costs and there is little similarity between the systems. For example, Washington Metro uses three categories of variables while Hampton Roads follows the principle that capital improvement projects benefit the region and therefore the cost should be divided equally.

As shown in **Table ES-6.7**, there is greater similarity in the allocation of fixed guideway capital costs. For this purpose, all systems use the regional distribution variable (divided equally among counties / jurisdictions) either as a single variable or part of a multiple variable equation. This reflects the concept that the major infrastructure required for fixed guideway systems provides a regional benefit.

Table ES-6-6.
Capital Cost Allocation Variables – Fixed Route Bus

	Service Supply		Service Demand	Regional Distribution
	Revene Hours	Revenue Miles	Jurisdiction where Capital Item is Located	Divided Equally among County
Washington DC Metro		System-wide Capital Costs – 100%	Service Expansion – 100%	
Hampton Roads, VA				100%
Milwaukee County Transit			100%	
Orlando, FL	100%			
Fredricksberg, VA	System-wide Capital Costs – 100%		Service Expansion – 100%	

Table ES-6-7.
Capital Cost Allocation Variables – Fixed Guideway

	Service Supply		Service Demand	Regional Distribution
	Stations by Jurisdiction	Train Miles / Route Miles	Jurisdiction where Capital Item is Located	Divided Equally among County
Washington DC Metro			Service Expansion – 100%	System-wide Capital Costs – 5 year average of rail O&M allocation
LA Metrolink Commuter Rail		System-wide Capital Costs – 60% train miles & 40% route miles	Maintenance of Right-of-Way – 100%	
Altamont Commuter Rail Express (ACE), CA	Local Station Enhancements – 100%			System-wide Capital Costs – 100%
CalTrain Commuter Rail San Jose/San Francisco				100%
South Florida RTA (Tri Rail)				100%
Virginia Railway Express			Service Expansion – 100%	System-wide Capital Costs – 100%

6.3.1.3 Cost Allocation Next Steps

A key first step in developing a cost allocation approach will be the establishment of guiding principals to achieve an outcome where all partners agree the methodology produces an equitable outcome. Based on the experiences of other systems, these principals could include but not be limited to the following:

- Need for regional focus: A regionally accepted approach is critical to identifying and understanding how the allocation criteria relates to a partner's respective costs and will likely serves as the basis for reaching agreement between all jurisdictions. In working together to incrementally implement the LPA, it will be vital to maintain a clear understanding of the limited funding each partner has to finance transportation services at a level of service and quality which meets the needs of all entities involved. Although difficult, this process of partners working collaboratively is a vital component in developing a stronger regional emphasis, and moving away from specific jurisdictional needs.
- Develop an approach that is easy to understanding / transparent: A simplified allocation approach that can be easily replicated creates an environment that will more likely result in acceptance by all partners.

- Make use of the best data available: the availability and ability to generate the necessary data required to allocate costs is critical to developing an allocation approach. As an example, few system use ridership as an allocation variable for bus operating and maintenance costs. This is due to the cost and man-hours required for detailed bus passenger surveys.

Once the guiding principals are established, additional next steps will include:

- A review and evaluation of the potential allocation variables shown in **Table ES-6-3**. Additionally, the individual jurisdictions may develop additional variables for consideration by the other regional partners.
- Following the identification of a short list of variables, conduct a technical analysis of potential allocation approaches reflecting different combinations of variables and weighted percentages (using a model similar to preliminary model provided in **Appendix E**). The results of the analysis will include a summary of operating and capital costs that would be allocated to each partner.
- Evaluation and collaboration among the political leaders of each partner to identify which approach equitably allocates costs among the regional partners commiserate with the respective regional benefits and benefits each partner will receive.

CHAPTER ES-7

ACHIEVING TRANSIT-FRIENDLY DEVELOPMENT

7.1 LINKING LAND USE AND TRANSIT DEVELOPMENT

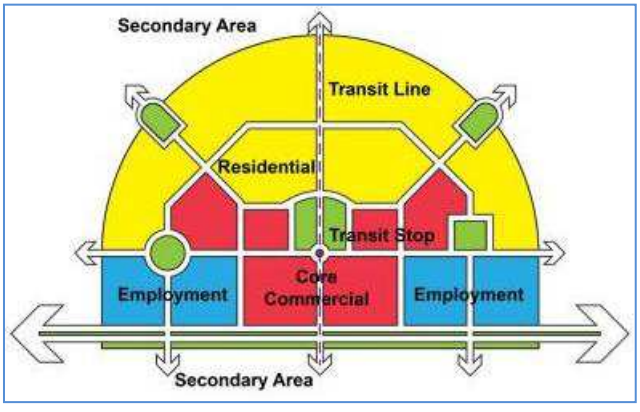
Strengthening the linkage between land use and transit development in the North Corridor is a central goal of Project Connect. To increase demand for enhanced transit service along planned routes, Capital Metro will work with communities to complete planning initiatives and capital investments designed to create more transit-friendly places. These places, referred to as Transit Oriented Developments (TODs), will provide the foundation for more transit-friendly regional patterns development consistent with the Centers Concept described in CAMPO's 2035 Regional Transportation Plan.

As emphasized in a recent report by the Center for Transit Oriented Development, *"TOD, like transit, is most successful when it is planned as part of a regional network of transit-oriented neighborhoods and destinations."* With coordinated planning, TOD can play a critical role in realizing plans for transit in the North Corridor. By increasing demand for enhanced transit service, TOD can accelerate the timeframe for introducing and extending transit service defined in the LPA.

This chapter of the Project Connect: North Corridor study provides an overview of TOD, presents preliminary priorities for TOD planning and investment in North Corridor communities, and outlines the elements of a typical station area planning process.

7.2 CREATING TRANSIT-FRIENDLY PLACES – TOD

TOD is a term that describes places designed to maximize access to and use of public transit. Compact in form, TODs are walkable, mixed use places that offer people greater transportation choices. They help build the market for enhanced transit service and result in more sustainable patterns and forms of development. In Chapter 6 and the land use section of the *Conceptual Alternatives & Screening Evaluation* document, the market is delivering acceptable transit-friendly development in the North Corridor. Essentially, the issue is the location and timing of that development.



Typically, TODs are medium- or high-density mixed use developments centered on a rail station or rapid transit stop. As all transit trips begin and end with a walking trip, pedestrian-friendliness is a key factor in TOD planning and design. Successful TODs are designed with pedestrian-friendly streets and public spaces, buildings with active ground floor uses and pedestrian-oriented entries and facades, and convenient connections to transit.

Characteristics and benefits of TOD include:

- ***Transit-Friendly Uses and Densities.*** The mix and intensity of uses in TODs are important in creating vibrant destinations and generating activity and ridership.
- ***Pedestrian Friendly Design.*** Pedestrian friendliness is a key characteristic of successful TODs. Residents and workers should easily access transit stops by walking.
- ***Reduced Infrastructure Costs.*** Because TODs are compact and have relatively high densities and intensities, they typically use infrastructure more efficiently.
- ***Higher Values and Lower Costs.*** Studies from across the country demonstrate the economic benefits of TODs. TODs tend to have higher commercial and residential property values than similar property in auto-oriented locations
- ***Increased Safety for Pedestrians and Bicyclists.*** Enhanced walkability and better bicycle infrastructure result in direct safety benefits for pedestrians and bicyclists.
- ***Improved Air Quality and Reduced Energy Consumption.*** Automobile use is one of the primary sources of air pollution, energy consumption, and greenhouse gas emissions in the United States. On a passenger-miles-traveled basis, pedestrian, bicycle, and transit trips result in lowers levels of energy use and greenhouse gas emissions.

7.3 THE FORM & CHARACTER OF TOD PROJECTS

One of the requests from the Project Advisory Group was to understand how this type development "looked on the ground". The following series of images was prepared to illustrate the form and character of a variety of types of TOD projects. Although not intended to show development potential at specific station areas in the North Corridor, the illustration provide references for use in local and regional planning and public education initiates.

7.4 TOD DEVELOPMENT TYPES

The following series of images, **Figures ES-7-1** through **ES-7-3**, shows three different scales of development, each of which has the potential to support enhanced transit service. The density and intensity of development shown the images are consistent with current local North Corridor practice and rang from 10-20 people and jobs per acre at the low end and over 40 people and jobs per acre at the high end. The low end can support Local Bus and Connect levels of transit service, while the high end can support Rapid and Urban Rail levels of transit service. As the images show, each type of development is designed with Complete Street improvements (street designs that accommodate driving, walking, biking and transit use), pedestrian-friendly sidewalks and buildings, parking on streets and in mid-block locations and enhanced transit facilities.

Figure ES-7-1. TOD Illustration with 10-20 People/Jobs per Acre

Figure ES-7-2. TOD Illustration with 20-40 People/Jobs per Acre

Figure ES-7-3. TOD Illustration with 40+ People/Jobs per Acre

7.5 EXPANDING EFFORTS TO PROMOTE TOD

North Corridor communities can follow a three-step sequence of planning activities to promote TOD. These steps include working with Capital Metro to confirm transit service alignments and planned locations for stations, setting priorities for planning and investment, and completing station areas planning and improvement initiatives. This follow-on work by the communities can be assisted by employing principles and guidance from Capital Metro's recommended "*Transit – friendly Tool Kit".* While allowing local flexibility, the Tool Kit offers a common language and approach within the Corridor.

7.5.1 Step 1: Confirm Alignments and Station Locations

As a first step, communities should work with Capital Metro to evaluate preferred alignments and refine plans for proposed station and stop sites. The transit alignments and stop locations presented in the plan are based on analyses of several factors. These include existing and projected ridership, regional travel patterns, capital and operating costs, information on existing land use, local plans, and development potential. However, the alignments and stop locations may still be refined further based on input from individual communities. As North Corridor communities conduct more detailed evaluations of existing and planned development, such information could result in minor adjustment and refinements to proposed plans. For example, a proposed station location could shift to better serve a major employer or a planned alignment between major destinations could be adjusted to serve an area planned for high intensity development. These refinements may attract higher levels of ridership and help increase service to transit-friendly locations.

7.5.2 Step 2: Prioritize Planning and Investment

As alignments and stop locations are reviewed, communities should set priorities for station area planning and capital investment. To assist in these efforts, an initial analysis was undertaken to group stations according to their general level of readiness for TOD. Based on an analysis of factors affecting transit-supportiveness, station areas in the North Corridor were grouped into three categories—TOD Ready, TOD Potential, and TOD Limited. Factors influencing the categories include existing and projected activity densities, local land use planning, vacant and underutilized land, and levels of planned transit service. A description of the categories follows.

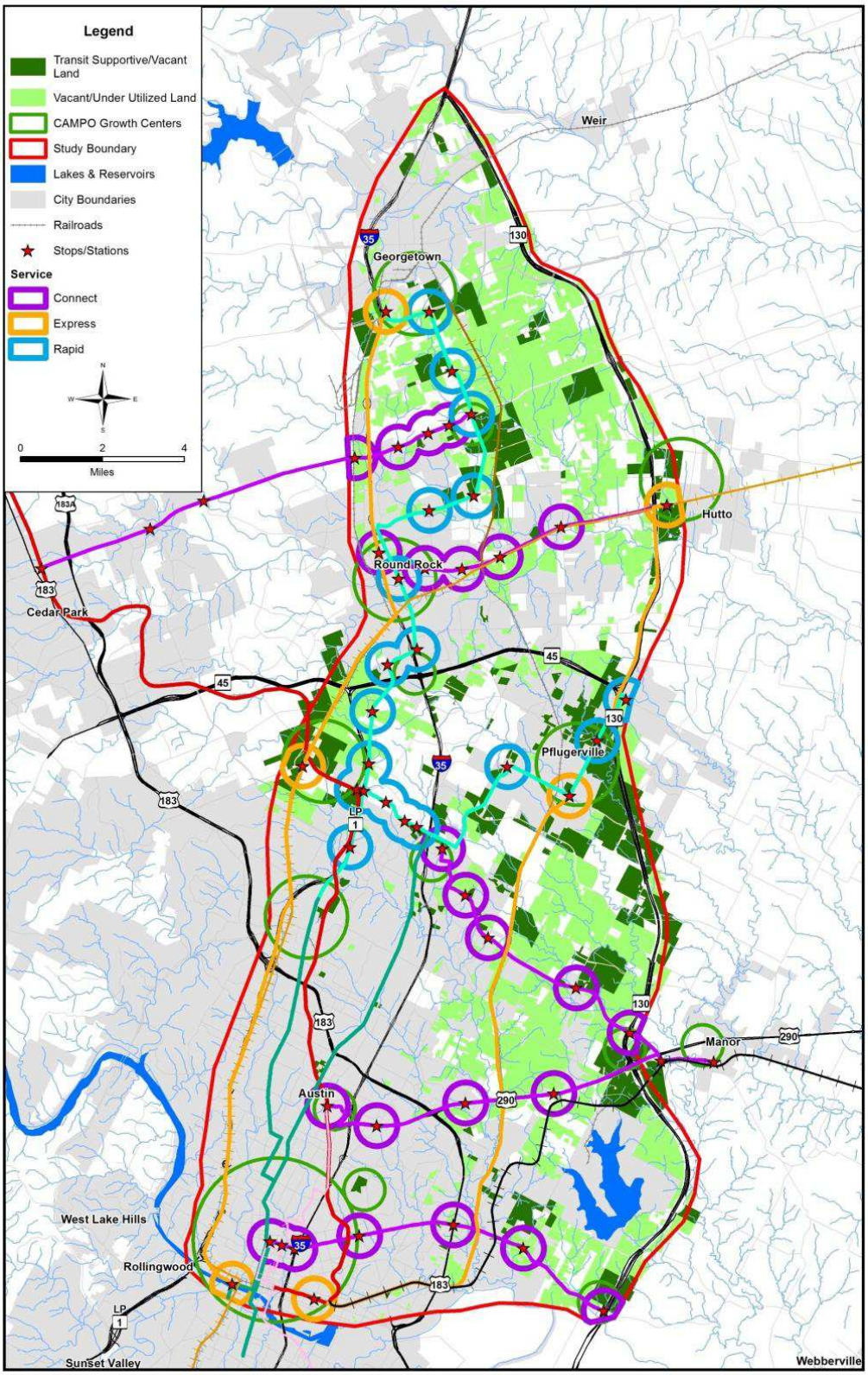
- ***TOD Ready.*** Proposed station areas in this category are those with existing transit-friendly densities, intensities and high levels of planned transit service.
- ***TOD Potential.*** Station areas in this category include areas not designated as TOD Ready, but that exhibit strong potential to deliver transit-supportive land uses.
- ***TOD Limited.*** Station areas categorized as TOD Limited include areas not identified as TOD Ready or TOD Potential and required continued monitoring for changes in the market conditions.

Figure ES-7-8 shows how planned stations areas in the North Corridor were categorized based on this initial analysis of transit-supportiveness. Proposed station areas classified as TOD Ready station areas in downtown Austin and within the North Burnet/Gateway, Howard Lane, Pflugerville, and Round Rock Centers.

Station areas classified as TOD Potential places include a number of locations along alignments proposed for Rapid service with high projected activity densities, transit-supportive land use planned, and/or high levels of vacant and developable land.

The TOD Limited station areas have lower existing and proposed activity densities, low levels of transit service planned and/or limited land planned for transit-supportive development.

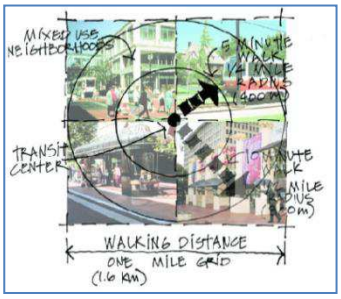
Figure ES-7-4. Preliminary Priorities for TOD Planning and Investment



7.5.3 Step 3: Initiate Station Area Planning and Mobility Improvements

Once priorities are established, North Corridor communities should undertake station areas planning processes to review development potential by location and define policy, regulatory, and capital investment initiatives to promote transit-oriented development. The proposed *Transit-friendly Tool Kit* will incorporate the following topics as part of the station area planning process.

- ***Existing Conditions Assessment***
- ***Vision and Guiding Principles***
- ***Development and Design Plans***
- ***Plan Implementation***



A expanded discussion of the alternatives reviewed and their evaluation that lead to the selection of the LPA for the Project Connect North Corridor can be found in the Volume 1 and Volume 2 reports.