



**PEOPLE, PLANNING, AND PREPARING FOR THE
FUTURE: YOUR 25 YEAR TRANSPORTATION PLAN**

TECHNICAL REPORT #6:
DEVELOPMENT AND EVALUATION OF ALTERNATIVE
CONCEPTS

September 14, 2009

Disclaimer

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About the Concepts

In order to examine the possible impacts of varied approaches to transportation investment in the region, CAMPO developed and analyzed three alternative transportation concepts. Each concept includes a unique combination of transportation projects and land use policies. Investments under each concept have been roughly financially constrained based on an assumption that the region will have access to approximately \$9.5 billion in revenues for new transit and roadway capacity between 2010 and 2035.

No Build Concept

This No Build Concept assumes that growth trends continue in the region and current committed projects are built, but that no investments are made to add capacity to the transportation system between 2010 and 2035. Under this concept all available funding would be invested in additional operations and maintenance activities.

Trend Concept

The Trend Concept assumes that the density, location, and mix of future development will be driven by a continuation of current policies and market trends. The concept also assumes that projects currently in the investment pipeline will be built. Under the Trend Concept, the remaining funding is invested to continue to build out the region's freeway system and to expand state highways and arterial roadways.

Centers Concept

The Centers Concept assumes that the region establishes policies and incentives to accommodate new growth into multiple high density, mixed use centers around the region. The concept assumes that some of the projects currently in the investment pipeline do not move forward over the next 25 years. Under the Centers Concept, the funding available is invested to expand the region's public transit system (including buses and rail), to implement a network of high capacity roadway lanes, and to build new arterials serving the mixed use centers.

Figure 1. No Build Concept

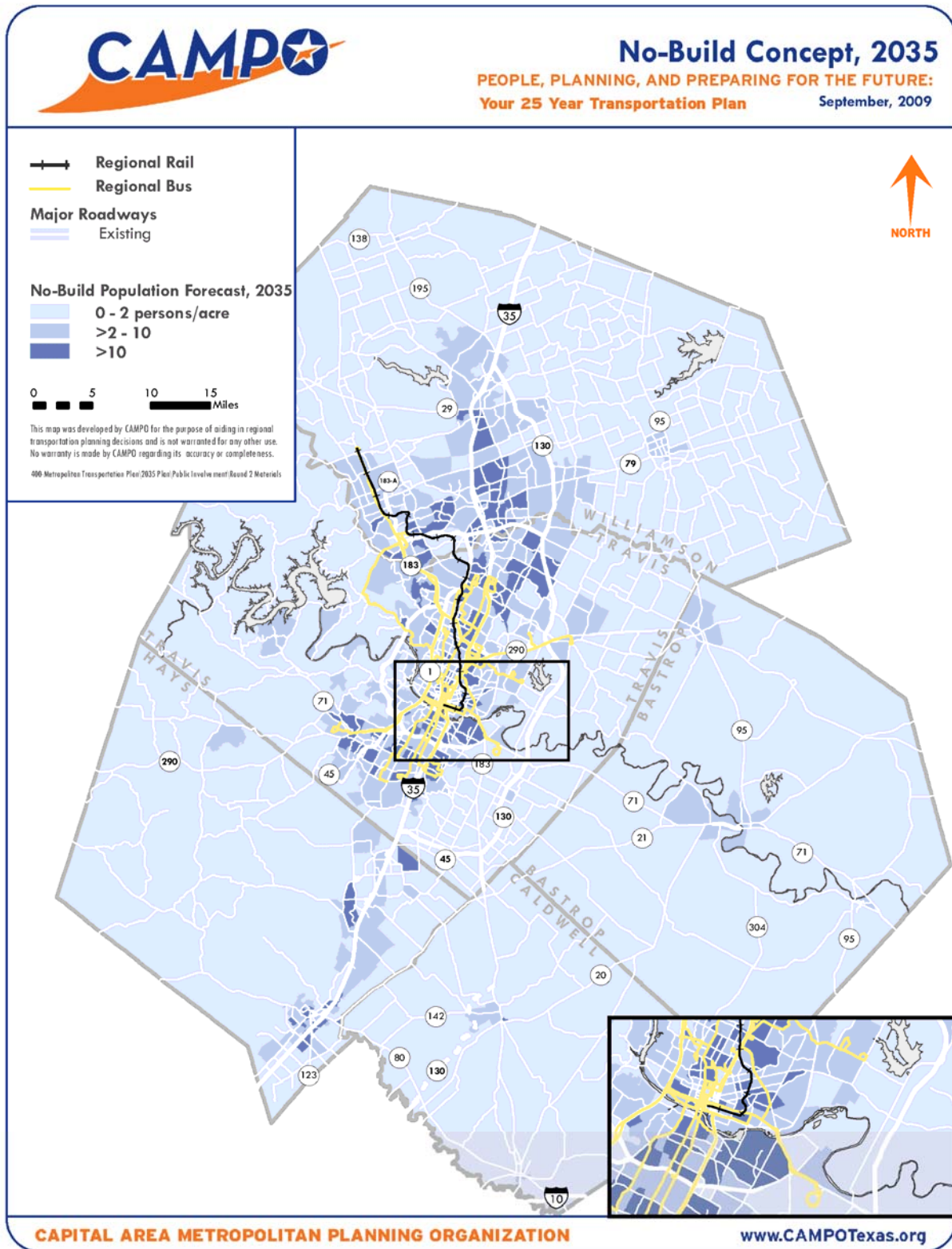


Figure 3. Centers Concept

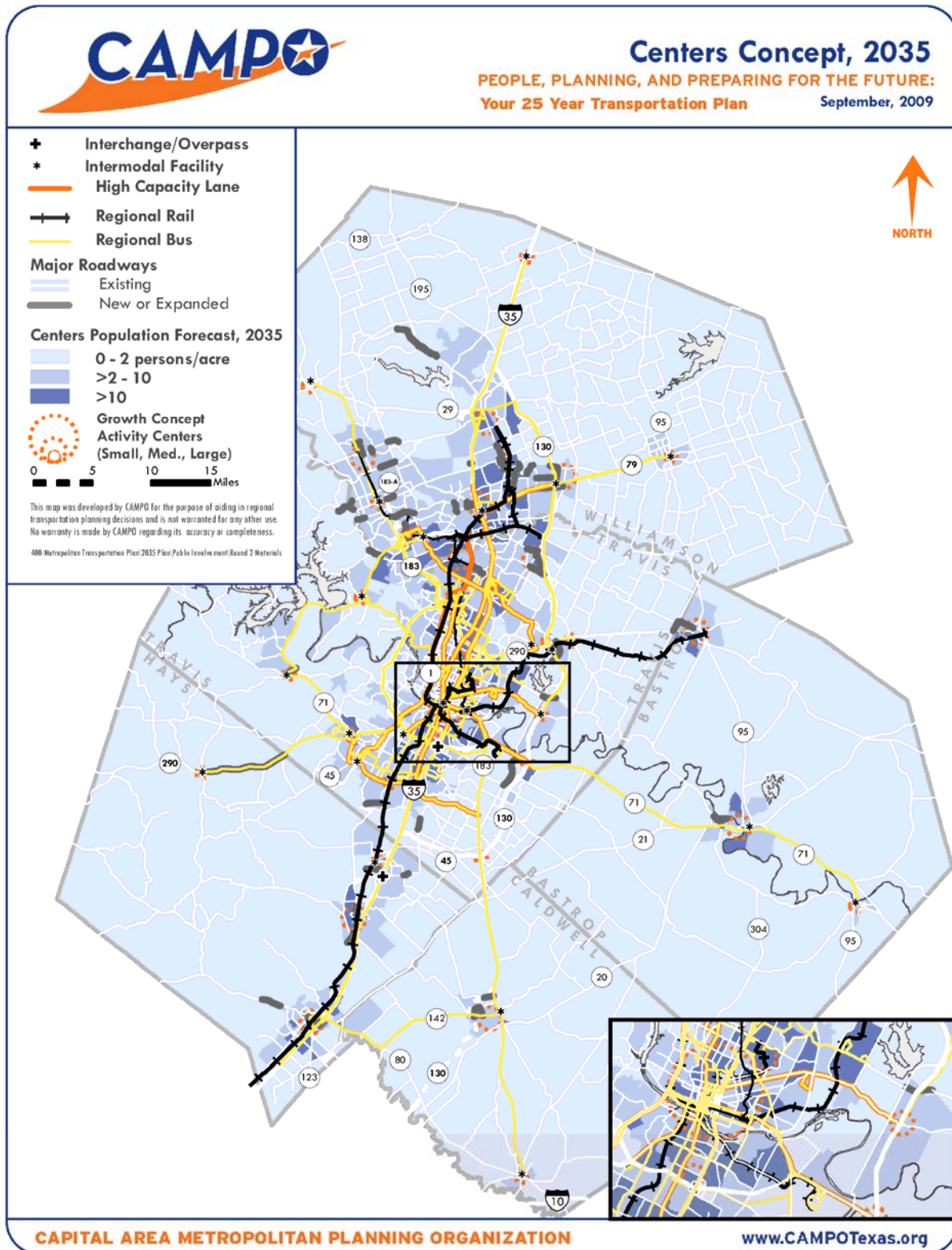


Figure 4. Trend Projects (2010-2035)

Project Name	Location/Limits	Description	Potential Sponsor
Limited Access Highways			
183 A	FM 1431-SH 29	Construct toll freeway	CTRMA/TxDOT
SH 29	Liberty Hill-Georgetown	Upgrade SH 29 to freeway	CTRMA/TxDOT
SH 45 SW	Loop 1 - FM 1626	Construct 4 lane freeway (no frontage roads)	CTRMA/TxDOT
SH 71 E	Riverside - Presidential	Upgrade SH 71 E to toll freeway with frontage roads.	CTRMA/TxDOT
US 290 E	US 183 – FM 734/Parmer	Upgrade US 290 E to toll freeway with frontage roads.	CTRMA/TxDOT
US 290 E	FM 734/Parmer – Elgin City Limits	Upgrade US 290 E to toll freeway with frontage roads.	CTRMA/TxDOT
US 183 S	Springdale- SH 71	Upgrade US 183 S to toll freeway with frontage roads.	CTRMA/TxDOT
SH 71/US 290 W Y at Oak Hill	Scenic Brook-Williamson Creek	Upgrade to toll freeway and construct interchange.	CTRMA/TxDOT
Interchanges/Overpasses			
Ben White Interchange	US 290 W at IH 35	Construct all direct connect ramps.	CTRMA/TxDOT
US 183 S @ SH 71 E Interchange	US 183 S at SH 71 E	Construct all direct connect ramps.	CTRMA/TxDOT
US 290 E @ SH 130 Interchange	US 290 E at SH 130	Construct all direct connect ramps.	CTRMA/TxDOT
US 290 E @ US 183 S Interchange	US 290 E at US 183 S	Construct all direct connect ramps.	CTRMA/TxDOT
Cement Plant Road	Cement Plant Rd at IH 35	Construct overpass.	CTRMA/TxDOT/Buda
Regional Rail			
Austin San Antonio Commuter Rail		Implement commuter rail service connecting Georgetown, Austin, San Marcos, and San Antonio.	ASARAIL
High Capacity Lanes			
Loop 1 N Managed Lanes	Parmer-Cesar Chavez.	Add 1 high occupancy toll lane in each direction.	CTRMA/TxDOT
Regional Bus--Rapid			
Route 128	South Austin-ABIA	Implement rapid bus service along SH 71.	Capital Metro
Route 126	Downtown Austin-ABIA	Implement rapid bus service along US 183 and SH 71.	Capital Metro
Route 125	Lakeline Blvd-Springdale Rd	Implement rapid bus service along US 183 N, Braker and Rundberg.	Capital Metro
Route 120	Downtown Austin-US 290	Implement rapid bus service along FM 969 and Springdale Rd	Capital Metro
Route 180	45 th – Barton Skyway	Implement rapid bus service along 51st St, Pleasant Valley Rd, and Oltorf St	Capital Metro
Route 803	Braker – US 290 W	Implement rapid bus service along Burnet, N Lamar, Guadalupe, and S Lamar.	Capital Metro

Figure 4. Trend Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
Regional Bus—Rapid (Continued)			
Route 801	Howard - Slaughter	Implement rapid bus service along N Lamar, Guadalupe and S. Congress	Capital Metro
Route 134	Lakeline Blvd - Springdale	Implement Rapid Bus service along FM 734/Parmer	Capital Metro
Regional Bus--Intercity			
Route 726/Route 728/Route 952	Austin-San Marcos	Implement Intercity Express Bus Service Connecting Downtown Austin-San Marcos	CARTS
Route 753	Georgetown-Austin	Implement Intercity Express Bus Service connecting Georgetown to Downtown Austin along IH 35	CARTS
Route 704/1035	Taylor - Austin	Implement Intercity Express Bus Service connecting Taylor to Downtown Austin	CARTS
Route 950	Georgetown-Austin	Implement Intercity Express Bus Service connecting Georgetown to Downtown Austin along IH 35	CARTS
Route 1081	Bastrop - Austin	Implement Intercity Express Bus Service connecting Bastrop to Downtown Austin along SH 71 E	CARTS
Route 901	Downtown Austin – Slaughter	Implement Intercity Express Bus Service Connecting South Loop 1 Park and Ride to Downtown Austin along Loop 1	Capital Metro
Route 922	Downtown Austin – RM 620	Implement Intercity Express Bus Service connecting Downtown Austin and Slaughter along RM 2222	Capital Metro
Route 360	US 183 – US 290 W	Implement Intercity Express Bus Service along Loop 360	Capital Metro
Route 386	Oak Hill - Congress	Implement Intercity Express Bus Service connecting Oak Hill – Congress at William Cannon.	Capital Metro
Route 391	Jollyville-Dessau Rd	Implement Intercity Express Bus Service along Howard Lane, IH 35, and FM 734	Capital Metro
Route 1035	Taylor - Austin	Implement Intercity Express Bus Service along IH 35 and US 79	Capital Metro
Intermodal Facilities			
2222 @ 620 Park and Ride	RM 2222 at RM 620	Construct Park and Ride.	Capital Metro
Downtown Transit Center		Construct Transit Center.	Capital Metro

Figure 4. Trend Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
Intermodal Facilities (Continued)			
East Transit Center		Construct Transit Center.	Capital Metro
Northeast Transit Center		Construct Transit Center.	Capital Metro
Oak Hill Park and Ride		Construct Park and Ride.	Capital Metro
South IH-35 Park and Ride		Construct Park and Ride.	Capital Metro
South Loop 1 Park and Ride		Construct Park and Ride.	Capital Metro
Southwest Transit Center		Construct Park and Ride.	Capital Metro
Downtown Round Rock Transit Center	Downtown Round Rock	Construct Transit Center.	Round Rock
New and Expanded Arterial Roadways			
Congress Avenue	Eberhart Lane - Foremost Drive	Expand road to 4 lane major divided arterial.	Austin
Howard Ln/Dessau Rd	FM 734 - Dessau Rd	Expand road to 6 lane major divided arterial.	Austin
Loyola Ln	US 183 S-FM 973	Expand road to 4 lane major divided arterial.	Austin
Parmer	FM 1325-US 290	Expand road to 6 lane major divided arterial.	Austin
Decker Lake Road	US 183-Taylor Lane	Expand road to 4 lane major divided arterial.	Austin/Travis County
Brushy Creek Road	Darkwoods Trail to Parmer Lane	Expand road to 4 lane major divided arterial.	Cedar Park
County Line Rd	SH 290 - SH 95 (via N Ave C)	Expand road to 4 lane major divided arterial.	Elgin
CR 110/CR 105	FM 1460 - Arterial A	Expand road to 4 lane major divided arterial.	Georgetown
Dry Hole Road	Kohlers Crossing - IH 35	Expand road to 4 lane major undivided arterial	Kyle
Lehman Rd	CR 130 - FM 150	Expand road to 4 lane major undivided arterial	Kyle
Opal	Cypress Rd - Drue Dr	Expand road to 4 lane major divided arterial.	Kyle
Roland Rd	Old Stagecoach Rd - New Arterial	Expand road to 4 lane major divided arterial.	Kyle
Goforth	Darcy Ln - Burton Ln	Expand road to 4 lane major divided arterial.	Kyle/Hays County

Figure 4. Trend Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
New and Expanded Arterial Roadways (Continued)			
Pflugerville Parkway	Greenlawn Blvd - Manda Carlson Rd	Expand road to 4 lane major divided arterial.	Pflugerville
Creek Bend Blvd	Wyoming Springs Dr - Sam Bass Rd	Expand road to 4 lane major divided arterial.	Round Rock
Oakmont	CR 111/Westinghouse Rd - .76 miles south of Westinghouse Rd	Expand road to 4 lane major divided arterial.	Round Rock
Post Rd	FM 110/San Marcos Loop - Loop 82/Aquarena Springs Dr	Expand road to 4 lane major undivided arterial	San Marcos
Frate Barker Rd	Brodie Ln-FM 2304	Expand road to 4 lane minor arterial	Travis County
Peterson Rd	SH 71 E	Expand road to 4 lane minor arterial	Travis County
Ross Rd	SH 71 - Pearce Ln	Expand road to 4 lane major divided arterial.	Travis County
FM 1100	US 290-SH 95	Expand road to 4 lane major divided arterial.	TxDOT
FM 1431	Crystal Falls Pkwy-Chandler Rd	Expand road to 6 lane major divided arterial.	TxDOT
FM 1460	FM 2243-CR 112	Expand road to 4 lane major divided arterial.	TxDOT
FM 2338	FM 970-IH 35	Expand road to 4 lane major divided arterial.	TxDOT
FM 2769/Anderson Mill	RM 1431-RM 620	Expand road to 4 lane major divided arterial.	TxDOT
FM 3407/Wonderworld	RM 12 - SH 123	Expand road to 4/6 lane major divided arterial.	TxDOT
FM 685	US 79 - Dessau Rd	Expand road to 6 lane major divided arterial.	TxDOT
FM 973	US-290-US 183	Expand road to 4 lane major divided arterial.	TxDOT
RM 12	Fulton Ranch Rd-Stone Way, CM Allen Pkwy-IH 35	Construct Continuous left turn lane.	TxDOT
SH 195	Williamson County Line - IH 35	Expand road to 4 lane major divided arterial.	TxDOT

Figure 4. Trend Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
New and Expanded Arterial Roadways (Continued)			
SH 21	Bastrop County Line - Caldwell County Line	Expand road to 4 lane major divided arterial.	TxDOT
SH 80	IH 35 - Old Bastrop Hwy	Expand road to 6 lane major divided arterial.	TxDOT
University Blvd	Sessoms Dr - Loop 82 Aquarena Springs Dr	Expand road to 6 lane major divided arterial.	TxDOT
US 290 W	SH 71-Circle Dr	Expand road to 4 lane major divided arterial.	TxDOT
US 79	IH 35 - Taylor	Expand road to 4 lane major divided arterial.	TxDOT
Crystal Falls Parkway	FM 1431 - Sam Bass Rd	Expand road to 4 lane major divided arterial.	Williamson County
Westinghouse Road	IH 35 - Arterial A	Expand road to 4 lane major divided arterial.	Williamson County
CAMPO ID #9287	SH 21-.94 mile south of SH 21	Construct 2 lane minor arterial.	Bastrop
Carl Sern Dr	US 79 - CR 134	Construct 4 lane divided major arterial.	Hutto
Hero Way	RM 2243-San Gabriel Pkwy	Construct 4 lane undivided major arterial.	Leander
San Gabriel Parkway	FM 734-RM 2243	Construct 4 lane divided major arterial.	Leander
Lockhart Arterial A	SH 142 - 1.15 mile north of SH 142	Construct 2 lane minor arterial.	Lockhart
Lockhart Arterial B	FM 2001 - 1.3 miles north of FM 2001	Construct 2 lane minor arterial.	Lockhart
Lockhart Arterial C	US 183 - .83 miles west of US 183	Construct 2 lane minor arterial.	Lockhart
Pflugerville Parkway	Greenlawn Blvd - Manda Carlson Rd	Construct 4 lane divided major arterial.	Pflugerville
Arterial H	New Hope Dr - IH 35	Construct 4 lane divided major arterial.	Round Rock
Arterial J	Arterial H - IH 35	Construct 4 lane divided major arterial.	Round Rock
Chisolm Trail	Arterial J- US 79	Construct 4 lane divided major arterial.	Round Rock
Creek Bend	Wyoming Springs Dr	Construct divided major arterial.	Round Rock
Decker Lake Road	US 183-Taylor Lane	Construct 4 lane divided major arterial.	Travis County
O'Connor Dr	Howard Ln- Great Oaks Dr	Construct 4 lane divided major arterial.	Williamson County

Figure 5. Centers Projects (2010-2035)

Project Name	Location/Limits	Description	Potential Sponsor
Interchanges/Overpasses			
Ben White Interchange	US 290 W at IH 35	Construct all remaining direct connect ramps.	CTRMA/TxDOT
Cement Plant Road	Cement Plant Rd at IH 35	Construct overpass.	CTRMA/TxDOT/Buda
Regional Rail			
Austin San Antonio Commuter Rail	Georgetown-Austin-San Antonio	Implement commuter rail service.	ASARAIL
Austin-Elgin Commuter Rail	Austin-Elgin	Implement commuter rail service as extension of Capital MetroRAIL.	Capital Metro
Round Rock Rail Link	Round Rock – Downtown Austin	Implement commuter rail service connecting Round Rock to Downtown Austin	Un-sponsored
Central Austin Streetcar	Mueller-UT-Downtown Austin-Bergstrom	Implement modern streetcar rail service connecting Mueller, UT, Capitol Complex, Downtown Austin, and extending to Austin Bergstrom International Airport along Riverside.	Capital Metro/City of Austin
High Capacity Lanes			
IH 35 Managed Lanes	SH 45 N-Slaughter	Provide additional capacity within existing right of way by repurposing shoulders for use by buses, by converting existing lanes to high occupancy toll lanes, or other option.	CTRMA/TxDOT
Loop 1 N Managed Lanes	Parmer-Cesar Chavez.	Add 1 high occupancy toll lane in each direction.	CTRMA/TxDOT
Loop 1 S Managed Lanes	Cesar Chavez - Slaughter	Add 1 high occupancy toll lane in each direction.	CTRMA/TxDOT
High Capacity Lanes	Various	Provide additional capacity within existing right of way by repurposing shoulders for use by buses, by converting existing lanes to peak period bus only lanes, or other option.	Un-sponsored
Regional Bus--Rapid			
Route 126	Downtown Austin-ABIA	Implement rapid bus service along US 183 and SH 71.	Capital Metro
Route 125	Lakeline Blvd-Springdale Rd	Implement rapid bus service along US 183 N, Braker and Rundberg.	Capital Metro
Route 120	Downtown Austin-US 290	Implement rapid bus service along FM 969 and Springdale Rd	Capital Metro
Route 180	45 th – Barton Skyway	Implement rapid bus service along 51st St, Pleasant Valley Rd, and Oltorf St	Capital Metro

Figure 5. Centers Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
Regional Bus—Rapid (Continued)			
Route 803	Braker – US 290 W	Implement rapid bus service along Burnet, N Lamar, Guadalupe, and S Lamar.	Capital Metro
Route 801	Howard - Slaughter	Implement rapid bus service along N Lamar, Guadalupe and S. Congress	Capital Metro
Route 134	Lakeline Blvd - Springdale	Implement Rapid Bus service along FM 734/Parmer	Capital Metro
Route 218	Downtown – SH 130	Implement Rapid Bus service along FM 969/MLK.	Capital Metro
Slaughter Rapid	Oak Hill – US 183	Implement Rapid Bus service along Slaughter.	Un-sponsored
Regional Bus--Intercity			
Route 726/Route 728/Route 952	Austin-San Marcos	Implement Intercity Express Bus Service Connecting Downtown Austin-San Marcos	Un-sponsored
Route 753	Georgetown-Austin	Implement Intercity Express Bus Service connecting Georgetown to Downtown Austin along IH 35	Un-sponsored
Route 704/1035	Taylor - Austin	Implement Intercity Express Bus Service connecting Taylor to Downtown Austin	Un-sponsored
Route 757	Georgetown-Austin	Implement Intercity Express Bus Service connecting Georgetown to Downtown Austin along SH 130	Un-sponsored
Route 1071	Dripping Springs - Austin	Implement Intercity Express Bus Service connecting Dripping Springs – Downtown Austin along US 290 W	Un-sponsored
Route 1081	Bastrop - Austin	Implement Intercity Express Bus Service connecting Bastrop to Downtown Austin along SH 71 E	Un-sponsored
Route 901	Downtown Austin – Slaughter	Implement Intercity Express Bus Service Connecting South Loop 1 Park and Ride to Downtown Austin along Loop 1	Capital Metro
Route 922	Downtown Austin – RM 620	Implement Intercity Express Bus Service connecting Downtown Austin and Slaughter along RM 2222	Capital Metro
Route 360	US 183 – US 290 W	Implement Intercity Express Bus Service along Loop 360	Capital Metro

Figure 5. Centers Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
Regional Bus—Intercity(Continued)			
Route 386	Oak Hill - Congress	Implement Intercity Express Bus Service connecting Oak Hill – Congress at William Cannon.	Capital Metro
Route 391	Jollyville-Dessau Rd	Implement Intercity Express Bus Service along Howard Lane, IH 35, and FM 734	Capital Metro
Route 951	Bee Cave –Austin	Implement intercity Express Bus Service connecting Bee Cave to Downtown Austin.	Un-sponsored
Route 953	Lockhart - Austin	Implement Intercity Express Bus Service connecting Lockhart to Downtown Austin.	Un-sponsored
620 Express	Parmer - SH 71	Intercity Express Bus Route connecting Parmer to SH 71 along RM 620	Un-sponsored
Jarell Express	Jarell-Georgetown	Intercity Express Bus Route connecting Jarell to Georgetown along IH 35.	Un-sponsored
Liberty Hill Express	Liberty Hill-Leander	Intercity Express Bus Route connecting Liberty Hill to Leander along SH 29	Un-sponsored
Lockhart-San Marcos Express	Lockhart-San Marcos	Intercity Express Bus Route Connecting Lockhart to San Marcos.	Un-sponsored
Luling Express	Luling-Lockhart	Intercity Express Bus Route Connecting Luling to Lockhart.	Un-sponsored
Smithville Express	Smithville-Bastrop	Intercity Express Bus Route Connecting Smithville to Bastrop.	Un-sponsored
Taylor Express	Taylor-Round Rock	Intercity Express Bus Route Connecting Taylor to Round Rock	Un-sponsored
Intermodal Facilities			
2222 @ 620 Park and Ride	RM 2222 at RM 620	Construct Park and Ride.	Capital Metro
Downtown Transit Center	Downtown Austin	Construct Transit Center.	Capital Metro
East Transit Center		Construct Transit Center.	Capital Metro
Northeast Transit Center		Construct Transit Center.	Capital Metro
Oak Hill Park and Ride		Construct Park and Ride.	Capital Metro
South IH-35 Park and Ride		Construct Park and Ride.	Capital Metro
South Loop 1 Park and Ride		Construct Park and Ride.	Capital Metro
Southwest Transit Center		Construct Park and Ride.	Capital Metro

Figure 5. Centers Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
Intermodal Facilities (Continued)			
Downtown Round Rock Transit Center	Downtown Round Rock	Construct Transit Center.	Round Rock
620 Intermodal Station	Pamer at RM 620	Construct Intermodal station.	Un-sponsored
Bastrop Intermodal Station	Downtown Bastrop	Construct Intermodal station.	Un-sponsored
Bee Cave Intermodal Station	Bee Cave	Construct Intermodal station.	Un-sponsored
Cedar Park Intermodal Station	Cedar Park	Construct Intermodal station.	Un-sponsored
Dripping Springs Intermodal Station	Dripping Springs	Construct Intermodal station.	Un-sponsored
Hutto Intermodal Station	Hutto	Construct Intermodal station.	Un-sponsored
Jarell Intermodal Station	Jarell	Construct Intermodal station.	Un-sponsored
Liberty Hill Intermodal Station	Liberty Hill	Construct Intermodal station.	Un-sponsored
Lockhart Intermodal Station	Lockhart	Construct Intermodal station.	Un-sponsored
Luling Intermodal Station	Luling	Construct Intermodal station.	Un-sponsored
Manor Intermodal Station	Manor	Construct Intermodal station.	Un-sponsored
Smithville Intermodal Station	Smithville	Construct Intermodal station.	Un-sponsored
Taylor Intermodal Station	Taylor	Construct Intermodal station.	Un-sponsored
Webberville Intermodal Station	Webberville	Construct Intermodal station.	Un-sponsored
New and Expanded Arterial Roadways			
Cameron Road	FM 1825-FM 973	Construct 4 lane major divided arterial.	Austin
Howard	US 183 N-IH 35 N	Construct 4 lane divided major arterial.	Austin
Pleasant Valley Rd	Onion Creek Drive-FM 1327	Construct 4 lane divided major arterial.	Austin
Decker Lake Rd	US 183-Taylor Lane	Construct 4 lane undivided major arterial.	Austin/Travis County
Bastrop Arterial A	North of SH 71-SH 71(1.5 miles)	Construct 2 lane minor arterial.	Bastrop
Bastrop Arterial B	Bastrop Arterial A -.76 miles east	Construct 2 lane minor arterial.	Bastrop
Bee Cave Parkway	SH 71 W -RM 620	Construct 4 lane divided major arterial.	Bee Cave

Figure 5. Centers Projects (2010-2035), Continued

Project Name	Location/Limits	Description	Potential Sponsor
New and Expanded Arterial Roadways (Continued)			
New Satterwhite Rd	IH 35 S - Turnerville Rd	Construct 4 lane undivided major arterial.	Buda
Truck Bypass	IH 35 S- West of FM 1626	Construct 4 lane divided major arterial.	Buda
Anderson Mill Rd	US 183-Howard	Construct 6 lane divided major arterial.	Cedar Park
New Hope	Whitestone Blvd- IH 35	Construct 4 lane divided major arterial.	Cedar Park
Park St	Anderson Mill Rd- Vista Ridge	Construct 2 lane minor arterial.	Cedar Park
CR 164	Redbus Ln-US 79	Construct 2 lane minor arterial.	Hutto
Carl Sem Dr		Construct 4 lane divided major arterial.	Hutto
Bureleson	Montopolis Dr-US 183	Construct 4 lane undivided major arterial.	Kyle
FM 2243 Realignment	IH 35 N BR- San Gabriel Pkway	Construct 4 lane divided major arterial.	Leander
Hero Way	RM 2243-San Gabriel Pkwy	Construct 4 lane undivided major arterial.	Leander
San Gabriel Parkway	FM 734-RM 2243	Construct 6 lane divided major arterial.	Leander
Lockhart Arterial A	SH 142 - 1.15 mile north	Construct 2 lane minor arterial.	Lockhart
Lockhart Arterial B	FM 2001 - 1.3 miles north	Construct 2 lane minor arterial.	Lockhart
Lockhart Arterial C	US 183 - .83 miles west	Construct 2 lane minor arterial.	Lockhart
Pfennig Lane	Dessau Rd - E Pecan St	Construct 4 lane divided major arterial.	Pflugerville
Arterial A	Fm 734-US 290	Construct 4 lane divided major arterial.	Round Rock
Arterial C	Sam Bass Road- Loop 1 North	Construct 4 lane divided major arterial.	Round Rock
Arterial J		Construct 4 lane divided major arterial.	Round Rock
Red Bud Ln	CR 111/Westinghouse Rd-IH 35 N	Construct 4 lane divided major arterial.	Round Rock
Seton Parkway	CR 114-CR 112	Construct 2 lane undivided major arterial.	Round Rock
Riverside Dr./River Rd	RM 12/Hopkins St-IH 35	Construct 4 lane undivided major arterial.	San Marcos
Pat Garrison St	Comanche St- University Dr	Construct 4 lane minor arterial.	San Marcos
Riverside Dr./River Rd	RM 12 -IH 35	Construct 2 lane minor arterial.	TxDOT
US 79 Connector	IH 35-RM 620	Construct 4 lane divided major arterial.	TxDOT
CAMPO ID # 6434		Construct 4 lane divided major arterial.	Williamson County
CAMPO ID # 9538		Construct 4 lane minor arterial.	Williamson County
CAMPO ID #9571		Construct 4 lane divided major arterial.	Williamson County
CAMPO ID #9572		Construct 2 lane minor arterial	Williamson County
CR 269		Construct 4 lane divided major arterial.	Williamson County
Congress Avenue	Eberhart Lane - Foremost Drive	Expand road to 4 lane major divided arterial.	Austin

Figure 5. Centers Projects (2010-2035), Continued

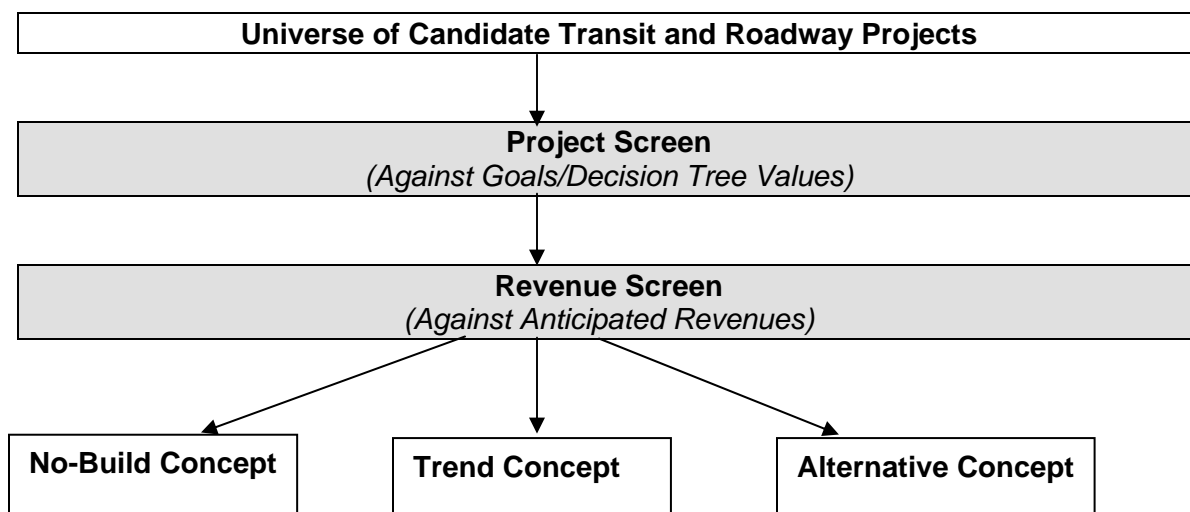
Project Name	Location/Limits	Description	Potential Sponsor
New and Expanded Arterial Roadways (Continued)			
Brushy Creek Road	Darkwoods Trail to Parmer Lane	Expand road to 4 lane major divided arterial.	Cedar Park
County Line Rd	SH 290 - SH 95 (via N Ave C)	Expand road to 4 lane major divided arterial.	Elgin
Burleson	W Center St - Opal Ln	Expand road to 4 lane major undivided arterial.	Kyle
E Pecan/Pflugerville Rd	Dessau Rd - SH 230	Expand road to 4 lane minor arterial	Pflugerville
Sam Bass rd	FM 2243-Wyoming Springs Dr	Expand road to 4 lane major divided arterial.	Round Rock
Wyoming Springs Rd	CR 111/Westinghouse Rd-Arterial C/Deepwood Dr	Expand road to 4 lane major divided arterial.	Round Rock
Frate Barker Rd	Brodie Ln-FM 2304	Expand road to 4 lane minor arterial	Travis County
FM 1100	US 290-SH 95	Expand road to 4 lane major divided arterial.	TxDOT
FM 1431	Crystal Falls Pkwy-Chandler Rd	Expand road to 6 lane major divided arterial.	TxDOT
FM 1460	FM 2243-CR 112	Expand road to 4 lane major divided arterial.	TxDOT
FM 2338	FM 970-IH 35	Expand road to 4 lane major divided arterial.	TxDOT
FM 2769/Anderson Mill	RM 1431-RM 620	Expand road to 4 lane major divided arterial.	TxDOT
FM 973	US-290-US 183	Expand road to 4 lane major divided arterial.	TxDOT
RM 12	Fulton Ranch Rd-Stone Way, CM Allen Pkwy-IH 35	Construct Continuous left turn lane.	TxDOT
US 290 W	SH 71-Circle Dr	Expand road to 4 lane major divided arterial.	TxDOT
Crystal Falls Parkway		Expand road to 4 lane major divided arterial.	Williamson County

Development of the Concepts

Transportation Network

The transportation network included in each concept was developed using a systematic process that included identification of a universe of possible projects, prioritization of projects based on likely benefits, and assembly of financially constrained transportation networks by concept based on available funding.

Figure 6. Concept Development Process



The project screening process, including scoring criteria used in the process, is described in detail in *Appendix A: Project Screening*.

Growth Pattern

The growth pattern included in each concept was developed using a computerized demographic allocation tool. CAMPO used this tool to generate iterative population and employment scenarios by year for each concept. The tool relied on a robust set of data inputs including the following:

- County-level population and employment control totals by year (approved by CAMPO Policy Board in 2007)
- Developable land
- Allowable densities based on zoning and other inputs, and
- Regional accessibility (based in part on modeling results from previous network year model run).

The demographic allocation tool also factored in the effects of special conditions that could make a particular location more attractive to development. Under the Centers Concept, CAMPO staff assigned additional attractiveness to activity centers based on an assumption that policies would be put into place to incentivize development in those locations.

Analysis of Performance

The performance of each concept was analyzed based on a broad list of system-based performance measures designed to allow for a comparison of how well each concept implemented core regional values embodied in the Vision and Goals for the 2035 Plan. (Based on CAMPO Investment Decision Tree, and SAFETEA-LU Planning Factors). The performance measures are derived from model outputs, results of an emissions analysis, and additional geographic analysis of the concepts.

As a key part of the analysis, multiple travel demand modeling networks were coded based on the concepts, and the CAMPO 4-step travel demand model was used to perform iterative model runs for each concept by network year. *Appendix B: Model Outputs* provides a detailed summary of some of the key model outputs from each travel demand model run.

Raw Performance

Modeling data was combined with other data and analysis to develop a series of performance measures for the three concepts:

Figure 7. Performance Measures (Raw)

	#	Measures	2035 No Build	2035 Trend	2035 Centers
Mobility	Improve Mobility	1 Average Freeway Speed	47.3 MPH	52 MPH	69.2 MPH
		2 Average Network Speed	21.54 MPH	26.8 MPH	28.83 MPH
		3 Percent of Roadways Experiencing Congestion During 24 Hours	40.0%	19.5%	19.1%
		4 Vehicle hours of delay per person during 24 hours	0.65 Hours	0.44 Hours	0.37 Hours
	Improve Accessibility	5 Number of roadway system intersections	2,343	2,585	2,503
		6 Number of transit stops	5,181	8,834	9,199
		7 Number of intermodal stations	27	36	51
		8 Percent of fixed guideway and rapid bus miles serving high density areas.	98.1%	87.1%	84.4%
		9 Population within 1/2 mile of transit	700,256	1,276,368	1,479,563
	Improve System Performance	10 Vehicle hours traveled per person during 24 hours	1.07 Hours per person	0.86 Hours per person	0.78 Hours per person
		11 Percent of all trips that are non-SOV	25.9%	26.4%	27.0%
		12 Total number of transit trips	290,659	339,717	413,319
		13 Average weekday vehicle miles traveled per person	23.1 Miles per person	23.1 Miles per person	22.5 Miles per person
		14 Average home-based work trip time	14.8 Minutes	14.69 Minutes	14.36 Minutes

	#	Measures	2035 No Build	2035 Trend	2035 Centers
Economy	Maximize Affordability	15 Average private cost per trip	\$3.90	\$3.10	\$2.80
		16 Average annual maintenance cost.	\$7.6 Million	\$7.7 Million	\$7.8 Million
	Support Economic Development	17 Employment within one-half mile of fixed guideway transit, rapid bus, and limited access roadways	393,907 Jobs	946,116 Jobs	1,010,300 Jobs
		18 Percentage of population in high density traffic analysis zones	72.9%	80.2%	85.5%
		19 Square miles of redevelopable or vacant, low sensitivity land within 1/2 mile of fixed guideway transit	107.8 Square Miles	149.3 Square Miles	188.2 Square Miles
	Support Freight Movement	20 Average travel time to Bergstrom International Airport	17.43 Minutes	16.65 Minutes	17.39 Minutes
		21 Travel time for through freight traffic.	16.32 Minutes	12.53 Minutes	13.47 Minutes

	#	Measures	2035 No Build	2035 Trend	2035 Centers
Environment	22	Total VOC	19.93 Tons per day	19.21 Tons per day	18.68 Tons per day
	23	Total NOx	14.39 Tons per day	14.21 Tons per day	13.74 Tons per day
	24	Total Greenhouse Gas Emissions (CO, CO2, CH4)	33,374 Tons per day	33,267 Tons per day	32,213 Tons per day
	25	Miles of roads and transit intersecting high sensitivity areas	87.9 Miles	100.1 Miles	88.8 Miles
	26	Miles of roads and fixed guideway transit adjacent to and intersecting vacant land	2,675 Miles	2,792 Miles	2,838 Miles

	#	Measures	2035 No Build	2035 Trend	2035 Centers
Social Equity	27	% of EJ population within 1/2 mile of transit	75.5%	82.7%	83.4%
	28	Difference between % of EJ population within 1/2 mile of transit and % of non ej population within 1/2 mile of transit.	25%	23%	19%
	29	Average travel time for trips originating in EJ TAZs.	17.2 Minutes	13.6 Minutes	14.0 Minutes
	30	Transit mode share	2.4%	2.8%	3.4%
	31	Miles of improvements to "high crash" corridors	0 Miles	12.8 Miles	6.6 Miles
	32	Miles of improvement to hurricane evacuation route (and links to hurricane evacuation route)	0 Miles	46.9 Miles	12.7 Miles

Normalization and Development of Indices

Performance data was then normalized using a linear scale, where each measure was assigned a value ranging from 0-1, with 1 representing the best performance under the scenario.

Figure 8. Normalization Example

Avg Freeway Speed	x	μ	$x-\mu$	$(x-\mu)^2$
No Build	47.3	56.16666667	-8.866666667	78.61778
Trend	52	56.16666667	-4.166666667	17.36111
Centers	69.2	56.16666667	13.03333333	169.8678

1/n	0.3333333333
$\Sigma(x-\mu)^2$	265.8466667
variance	88.61555556
Sd	9.413583566

	x	Z	p value	optimal normalize
Baseline	47.3	-0.941901307	0.173121585	0.256221
Scenario 1	52	-0.442622795	0.329019297	0.412118
Scenario 2	69.2	1.384524102	0.916900983	1

Weights were assigned to each normalized measure to allow measures to be combined into indices.

Figure 9. Criteria Weights and Normalized Values

	#	Measures	Weights	Normalized Values			
				No Build	Trend	Centers	
Mobility	Improve Mobility	1	Average Freeway Speed	0.0833	0.26	0.41	1.00
		2	Average Network Speed	0.0833	0.24	0.79	1.00
		3	Percent of Roadways Experiencing Congestion During 24 Hours	0.0833	0.31	0.99	1.00
		4	Vehicle hours of delay per person	0.0833	0.25	0.82	1.00
	Improve Accessibility	5	Number of roadway system intersections	0.0667	0.23	1.00	0.74
		6	Number of transit stops	0.0667	0.29	0.94	1.00
		7	Number of intermodal stations	0.0667	0.23	0.51	1.00
		8	Percent of fixed guideway and rapid bus miles serving high density areas.	0.0667	1.00	0.40	0.26
		9	Population within 1/2 mile of transit	0.0667	0.25	0.81	1.00
	Improve System Performance	10	Vehicle hours traveled per person	0.0667	0.24	0.80	1.00
		11	Percent of all trips that are non-SOV	0.0667	0.23	0.52	1.00
		12	Total number of transit trips	0.0667	0.23	0.53	1.00
		13	Average weekday vehicle miles traveled per person	0.0667	0.32	0.31	1.00
		14	Average home-based work trip time	0.0667	0.25	0.43	1.00
Economy	Maximize Affordability	15	Average private cost per trip	0.1667	0.25	0.80	1.00
		16	Average annual maintenance cost.	0.1667	1.00	0.55	0.22
	Support Economic Development	17	Employment within one-half mile of fixed guideway transit, rapid bus, and limited access roadways	0.1111	0.29	0.93	1.00
		18	Percentage of population in high density traffic analysis zones.	0.1111	0.22	0.68	1.00
		20	Square miles of redevelopable or vacant, low sensitivity land within 1/2 mile of fixed guideway transit.	0.1111	0.22	0.62	1.00
	Support Freight Movement	21	Average travel time to Bergstrom International Airport	0.1667	0.30	1.00	0.34
22		Travel time for through freight traffic.	0.1667	0.25	1.00	0.82	
Environment	Minimize Air Pollution	23	Total VOC	0.1667	0.22	0.67	1.00
		24	Total NOx	0.1667	0.24	0.45	1.00
		25	Total Greenhouse Gas Emissions	0.1667	0.29	0.35	1.00
	Minimize Resource Use/Impact	26	Miles of new roads and transit intersecting high sensitivity areas	0.25	1.00	0.29	0.95
		27	Miles of roads and fixed guideway transit adjacent to and intersecting vacant land	0.25	0.24	0.79	1.00
Social Equity	Maximize Equity	28	% of EJ population within 1/2 mile of transit (stops)	0.1667	0.29	0.94	1.00
		29	Difference between % of EJ population within 1/2 mile of transit and % of non ej population within 1/2 mile of transit. (stops)	0.1667	1.00	0.75	0.23
		30	Average travel time for trips originating in EJ TAZs.	0.1667	0.28	1.00	0.92
	Increase Safety and Security	31	Transit mode share	0.1667	0.15	0.53	1.00
		32	Miles of improvements to "high crash" corridors	0.1667	0.15	1.00	0.62
		33	Miles of Improvement to hurricane evacuation route (and links to hurricane evacuation route)	0.1667	0.24	1.00	0.44

Figure 10. Weighted Values and Indices

			Weighted Values			
	#	Measures	2035 No Build	2035 Trend	2035 Centers	
Mobility	Improve Mobility	1	Average Freeway Speed	0.021	0.034	0.083
		2	Average Network Speed	0.020	0.066	0.083
		3	Percent of roadways experiencing congestion during 24 hours	0.026	0.082	0.083
		4	Vehicle hours of delay per person during 24 hours	0.021	0.068	0.083
	Improve Accessibility	5	Number of roadway system intersections	0.015	0.067	0.050
		6	Number of transit stops	0.019	0.062	0.067
		7	Number of intermodal stations	0.015	0.034	0.067
		8	Percent of fixed guideway and rapid bus miles serving high density areas	0.067	0.027	0.017
		9	Population within 1/2 mile of transit	0.016	0.054	0.067
	Improve System Performance	10	Vehicle hours traveled per person during 24 hours	0.016	0.053	0.067
		11	Percent of all trips that are non-SOV	0.015	0.035	0.067
		12	Total number of transit trips	0.015	0.036	0.067
		13	Average weekday vehicle miles traveled per person	0.022	0.021	0.067
		14	Average home-based work trip time	0.017	0.029	0.067
SUM			0.306	0.668	0.934	
Possible Points			1.000	1.000	1.000	
Consumer Index Value			2	4	5	

	#	Measures	2035 No Build	2035 Trend	2035 Centers	
Economy	Maximize Affordability	15	Average private cost per trip	0.041	0.134	0.167
		16	Average annual maintenance cost	0.167	0.092	0.037
	Support Economic Development	17	Employment within one-half mile of fixed guideway transit, rapid bus, and limited access roadways	0.032	0.103	0.111
		18	Percentage of population in high density traffic analysis zones	0.025	0.075	0.111
		20	Square miles of redevelopable or vacant, low sensitivity land within 1/2 mile of fixed guideway transit	0.025	0.069	0.111
	Support Freight Movement	21	Average travel time to Bergstrom International Airport	0.050	0.167	0.056
		22	Travel time for through freight traffic	0.041	0.167	0.136
	SUM			0.380	0.807	0.730
Possible Points			1.000	1.000	1.000	
Consumer Index Value			2	5	4	

	#	Measures	2035 No Build	2035 Trend	2035 Centers	
Environment	Minimize Air Pollution	23	Total VOC	0.037	0.112	0.167
		24	Total NOx	0.040	0.075	0.167
		25	Total Greenhouse Gas Emissions	0.048	0.059	0.167
	Minimize Resource Use/Impact	26	Miles of new roads and transit intersecting high sensitivity areas	0.250	0.074	0.237
		27	Miles of new roads and fixed guideway transit adjacent to and intersecting vacant land	0.060	0.197	0.250
	SUM			0.436	0.517	0.987
Possible Points			1.000	1.000	1.000	
Consumer Index Value			3	3	5	

	#	Measures	2035 No Build	2035 Trend	2035 Centers	
Social Equity	Maximize Equity	28	% of EJ population within 1/2 mile of transit (stops)	0.048	0.157	0.167
		29	Difference between % of EJ population within 1/2 mile of transit and % of non ej population within 1/2 mile of transit. (stops)	0.167	0.125	0.039
		30	Average travel time for trips originating in EJ TAZs.	0.047	0.167	0.154
	Increase Safety	31	Transit mode share	0.038	0.089	0.167
		32	Miles of improvements to "high crash" corridors	0.037	0.167	0.104
	Increase Security	33	Miles of improvement to hurricane evacuation route (and links to hurricane evacuation route)	0.041	0.167	0.074
	SUM			0.377	0.871	0.704
Possible Points			1.000	1.000	1.000	
Consumer Index Value			2	5	4	

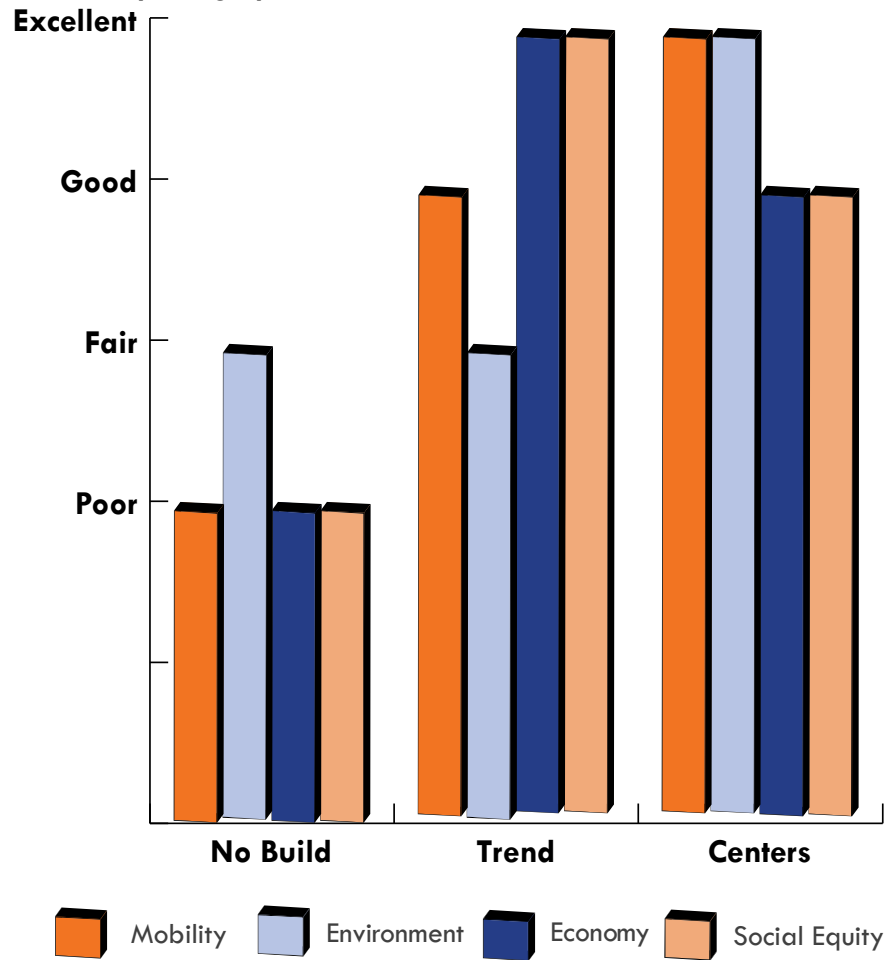
Total Points Possible = 4.000

	2035 No Build	2035 Trend	2035 Alternative
Total points by scenario	1.500	2.862	3.354
	9	17	18

Graphic Display of Indices

Arraying the indices graphically allows for a side by side comparison of how the concepts stack up with respect to mobility measures, economic measures, environmental measures, and social equity/safety and security measures.

Figure 11. Performance by Category



Appendix A—Project Screening

Universe of Projects

As a first step in developing alternative concepts, CAMPO developed a “universe of projects”. The universe of projects reflects the full un-financially constrained list of transportation projects that have been envisioned for development by CAMPO, TxDOT, Capital Metro, local governments and other transportation providers in the 5-county region. Input for this list came from the CAMPO 2030 Plan, Capital Metro All Systems Go Plan, adopted local arterial plans, local plans in progress including the Williamson County Transportation Plan and Bastrop County Transportation Plan, and agency staff. Some additional potential regional transit projects were also included based on input from Capital Metro, CARTS, and the efforts of the CAMPO Transit Working Group.

Project Screen

The universe of projects was initially evaluated and ranked based on a series of quantitative scoring criteria derived from the Vision and Goals for the 2035 Plan. (Based on CAMPO Investment Decision Tree, and SAFETEA-LU Planning Factors). This project screen also factored in input received during Round 1 Public Involvement. Each project received two scores: one score for its evaluation as a project to be included in the trend scenario, the second score for its evaluation as a project to be included in the alternative scenario.

Revenue Screen and Development of Concepts by Network Year

Projects were arrayed on ordered lists by scenario and project sponsor based on score. Project costs were inflated to average “year of expenditure” project cost with an assumption for maintenance cost over the life of the plan. Revenues expected to be available for new projects by 2035 were expended by funding category and sponsor. Each concept was developed based on an assumption that approximately \$9.5 billion would be available to support additional roadway and transit capacity between 2010 and 2035. See Appendix C for a breakdown of revenues and costs by scenario.

Projects that made it above the funding cut off were automatically assigned to the appropriate “robot” scenario. These robot scenarios showed which projects should be funded based on score alone, but had several limitations:

- Did not result in a logical network because each project was judged “on its own”
- Not much difference between the results of the “activity centers” and “trend” scenarios because of the emphasis the scoring placed on existing congestion and project cost
- Did not assume any flexing or innovative pooling of funds (federal and state funding went only to state highway projects, local funding went only to local arterial projects, transit funding went only to transit projects, etc.)

Using the “Robot Scenarios” as a foundation, CAMPO staff performed a significant qualitative review and developed alternative concepts by year:

Under the *Trend Concept*, staff assumed that projects identified as priority projects through the CAMPO TIP would move forward to construction by 2015 regardless of scoring. This resulted in a considerable cost impact to the trend concept and significantly reduced the funding available to be expended on projects in 2025 and 2035 under the concept. CAMPO staff included additional projects in this concept based on their rank within the robot trend scenario, with some adjustment to

ensure that the concept included logical future roadway and transit networks that equitably distributed projects throughout the region.

Under the *Centers Concept*, staff assumed that several major projects previously identified as priority projects through the CAMPO TIP would not move forward to construction. This resulted in a lessened cost impact to the Centers Concept and increased the funding remaining to be expended on other projects under the concept. CAMPO staff included projects in this concept based on their ability to efficiently use the existing transportation system and to support the centers concept, in particular, by providing access to a connected network of high capacity transit that would allow movement between centers without negatively impacting the ability of these centers to be oriented to transit and pedestrians. Additional projects were include based on their scores in the robot scenario, with emphasis placed on projects that addressed an existing congestion problem, or provided better connectivity within or between activity centers.

Once all projects were identified for funding by 2035 Concept, projects were further sorted by network year using the following criteria:

- 1) Rough financial constraint by time period
- 2) Indication by sponsors of project readiness
- 3) Logical phasing of the system over time

Scoring Criteria

Trend Score = (Trend Benefit*max capacity*length)/capital cost

Alternative Score = (Alternative Benefit*max capacity*length)/capital cost

General Benefit (Max. 80 points)

- Current Congestion (20 pts) [average within 1 mile buffer]

0-25th percentile (2010 model)	0 pts
26-50th percentile (2010 model)	5 pts
50th-75th percentile (2010 model) or moderate congestion (CMP)	10 pts
75th-100th percentile (2010 model) or severe congestion (CMP)	20 pts

- Local Priority (20 pts)

Identified as a priority by jurisdiction	10 pts
Identified as a need by public during Round 1	10 pts
Identified specifically by public as an undesirable project during Round 1	-5 pts

- System Preservation, Connectivity, Gap Completion, and Safety (20 pts)

Interchange, intermodal facility, or transit project	5 pts
Bottleneck elimination or gap completion	5 pts
Improves structurally deficient/functionally obsolete bridge	5 pts
Reconstruction of a high crash roadway (crash/vmt > 50 th percentile)	5 pts

- Environment, Land Use, and Environmental Justice (20 pts)

<25% of project length in an area of high sensitivity (EPA GISST)	5 pts
0% of project length in an area of high sensitivity (EPA GISST)	10 pts
Transit Project serving EJ Area	5 pts
No additional right of way needed	5 pts

Trend Benefit (Max. 20 points)

- Future Congestion [average within 1 mile buffer]
 - 0-25th percentile (2035 no build model) 0 pts
 - 26-50th percentile (2035 no build model) 5 pts
 - 50th-75th percentile (2035 no build model) 10 pts
 - 75th-100th percentile (2035 no build model) 20 pts

Alternative Benefit (Max. 20 points)

- Support of Growth Concept
 - Transit Project not serving an activity center 5 pts
 - New or expanded roadway connecting activity centers 5 pts
 - New 2 lane minor arterial within an activity center 5 pts
 - Managed lane or new arterial serving an activity center 10 pts
 - Bus or intermodal facility serving an activity center 15 pts
 - Rail Transit or BRT project serving an activity center 20 pts

Screening Data Used

Project Description Data:

- Project Type (Commuter Rail/Bus/Freeway/Tollway/Arterial/Intermodal Station; New vs. Expansion, etc)
- Project Location
- 2010 Estimated Total Project Cost and Maintenance Cost
- Project Length
- Project readiness and priority for sponsor
- Estimated Maximum Capacity

Geographic and Environmental Data:

(All data as presented in Technical Report #1: Needs Assessment)

- Draft Growth Concept
- 2006 CMP: AM and PM Congested Corridors
- 2010 Model Results
- 2035 No Build Model Results
- 2010 Roadway and Transit Network
- Environmental Justice Map
- National Bridge Inventory Data
- Crash location data
- GISST summary data

Appendix B—Modeling Outputs

	2005	2010	2015 T	2015 A	2025 T	2025 A	2035 T	2035 A	2035 on 2010
Person Trips	5,660,178	6,352,621	7,363,128	7,382,783	9,496,739	9,514,409	12,236,783	12,246,423	12,236,458
Intrazonal Trips	226,742	267,657	323,263	340,203	442,941	486,842	641,661	672,694	659,695
SOV Auto Trips	2,766,892	3,107,223	3,596,374	3,567,408	4,588,049	4,571,357	5,922,704	5,860,972	5,937,220
HOV Auto Trips	919,197	1,030,291	1,209,189	1,204,627	1,572,854	1,571,507	2,064,107	2,053,196	2,065,453
Truck Trips	375,254	427,196	486,351	486,351	623,622	623,622	797,216	797,216	797,063
Toll VMT	-	584,778	1,224,338	1,273,996	2,466,357	2,787,722	5,348,629	5,738,585	5,780,797
All Vehicle Trips	4,061,343	4,564,710	5,291,914	5,258,386	6,784,525	6,766,486	8,784,027	8,711,384	8,799,736
% vehicle trips non-SOV	22.63	22.57	22.85	22.91	23.18	23.22	23.50	23.57	23.47
Transit Trips	205,631	221,525	254,793	275,725	327,831	343,539	339,717	413,319	290,659
% Transit Trips to Person Trips	3.6%	3.5%	3.5%	3.7%	3.5%	3.6%	2.8%	3.4%	2.4%
HH Size	2.61	2.62	2.62	2.62	2.64	2.64	2.65	2.65	2.65
Population	1,458,641	1,667,544	1,919,968	1,919,968	2,506,834	2,506,834	3,250,531	3,250,531	3,250,531
Auto VMT	30,504,432	33,864,460	38,638,125	38,045,491	47,317,957	46,485,075	60,540,177	58,514,897	60,299,523
Truck VMT	6,007,078	7,033,221	8,257,125	8,264,914	10,753,272	10,931,467	14,506,711	14,548,126	14,713,598
VMT	36,511,511	40,897,681	46,895,249	46,310,405	58,071,229	57,416,542	75,046,888	73,063,023	75,013,121
VMT/person	25.03	24.53	24.43	24.12	23.17	22.90	23.09	22.48	23.08
VHT_Congested	867,011	989,668	1,187,011	1,162,771	1,778,755	1,712,585	2,800,690	2,533,873	3,482,594
VHT/person	0.59	0.59	0.62	0.61	0.71	0.68	0.86	0.78	1.07
VHT_Uncongested	705,844	774,293	874,960	861,951	1,076,155	1,060,771	1,358,492	1,325,664	1,372,662
VHD	161,168	215,375	312,051	300,820	702,600	651,815	1,442,198	1,208,209	2,109,932
VHD/person	0.11	0.13	0.16	0.16	0.28	0.26	0.44	0.37	0.65
Avg System Speed	42.11	41.32	39.51	39.83	32.65	33.53	26.80	28.83	21.54
Avg HBW Trip Length	14.07	14.16	14.13	14.03	14.35	14.15	14.69	14.36	14.80
Private Cost/Person Trip	1.64	1.75	1.89	1.86	2.37	2.28	3.08	2.78	3.94
A Op Cost \$0.1292	1.07	1.06	1.04	1.03	0.99	0.98	0.98	0.96	0.97
T Op Cost \$0.4522	7.24	7.44	7.68	7.68	7.80	7.93	8.23	8.25	8.35
Transit Fare/trip	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Avg toll cost per mile	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Avg cost per delay hour	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47	15.47
Avg Trip to Airport (min)	16.44	16.96	16.22	16.85	16.3	17.02	16.65	17.39	17.43
EJ Average Trip Length	10.133	10.348	10.712	10.747	11.874	11.989	13.606	14.013	17.207
nonEJ Average Trip Length	13.595	13.51	13.616	13.437	14.907	14.765	17.113	16.214	22.076
Difference nonEJ - EJ	3.462	3.162	2.904	2.69	3.033	2.776	3.507	2.201	4.869

Appendix C—Revenues and Costs

Forecasting Revenues

CAMPO developed preliminary revenue forecasts based on various sources, including a revenue forecasting tool being developed at the State Level by the Texas Transportation Institute, input from Capital Metro, cities, counties, and other regional partners, and other sources. *Technical Report #1: Needs Assessment*, provides a more detailed description of the preliminary revenue forecast developed.

CAMPO assumed set-asides for support of the existing system based on funding type (some funding can only be used on preservation activities), historic spending on non-added capacity improvements, and other factors.

Summary of Revenue Available by Source

Source	Total Revenues	Set Aside for Existing System	Available for New Projects
FHWA/TxDOT (Preservation)	\$ 4.49	\$ 4.49	\$ -
FHWA/TxDOT (Capital)	\$ 2.18	\$ -	\$ 2.18
FTA	\$ 1.38	\$ 0.00	\$ 1.38
MTA Sales Tax	\$ 8.71	\$ 6.08	\$ 2.63
Misc. Local Funding	\$ 8.30	\$ 4.89	\$ 3.41
Total Revenue	\$ 25.06	\$ 15.46	\$ 9.60

The remaining \$9.6 billion dollars was assumed to be available to spend on new added capacity projects (including maintenance of those projects.)

Estimating Costs

The cost of each concept was calculated based on the following:

$$\text{Total Project Cost} * \text{Inflation Factor} + \text{Maintenance Cost} - \text{Project Specific Revenue}$$

Total Project Cost

Total Project Cost was calculated based on the following: construction cost + right of way cost + design, engineering and contingency. Construction cost and right of way costs were calculated by multiplying element and mile based unit values by total numbers of miles or units. Design, engineering, and contingency were assumed to add a total of 20% to the cost of the project. All unit values were developed based on state and national studies of average construction and right of way costs by project type.

Inflation Factor

A 4% per year annual inflation rate was applied on a per year basis between 2010 and the anticipated letting period for the project. 4% reflects a fairly robust long term inflation assumption and is consistent with the inflation rate currently being used by the Texas Department of Transportation to track project costs.

Maintenance Cost

An annual maintenance cost was calculated based on multiplying an element and mile based unit value by total numbers of miles or units. Unit values were developed based on studies of

average maintenance costs by project type. This cost was multiplied by the number of years the project would be open and operational between letting date and 2035.

Project Specific Revenue

Potential project specific revenue was calculated by project type and deducted from the cost of the project. Potential project specific revenues include the following: an assumption that the private sector would contribute right of way for non-state system arterial projects, an assumption that rail projects could qualify for up to 50% New Starts Funding, an assumption that 50% of the cost of constructing and 100% of the cost of operating toll projects could be covered by tolling.

Applying Revenues to Cover Costs

Both build concepts assume flexing of revenues between local, highway, and transit sources. In particular, the concepts assume that local funding will be required to improve the state system over the years ahead. Based on the revenue forecasts used, the trend concept would require the greatest amount of revenue flexing.

Trend:

\$2.9 billion in local revenue flexed to state system projects.
 \$2.26 billion in transit revenue flexed to state system projects.

Centers:

\$1.62 billion in local revenue flexed to state system projects.
 \$0.5 billion in local revenue flexed to transit projects.

Revenue forecasts are preliminary, and the actual funding breakdown could be considerably different. The concepts were not developed with an assumption of particular funding going to particular projects, and the final plan will not assign specific funding to specific projects.

"Trend"

	Total Cost	Project Specific Revenues	Net Cost	TXDOT Revenues	Local Revenues	MTA/FTA Revenues
State System Projects	\$ 11.04	\$ 3.70	\$ 7.34	\$ 2.18	\$ 2.90	\$ 2.15
Transit Projects	\$ 2.49	\$ 0.63	\$ 1.86	\$ -	\$ -	\$ 1.86
Local Projects	\$ 0.67	\$ 0.16	\$ 0.51	\$ -	\$ 0.51	\$ -
	\$ 14.20		\$ 9.71			

"Centers"

	Total Cost	Project Specific Revenues	Net Cost	TXDOT Revenues	Local Revenues	MTA/FTA Revenues
State System Projects	\$ 3.80	\$ -	\$ 3.80	\$ 2.18	\$ 1.62	\$ -
Transit Projects	\$ 5.20	\$ 0.63	\$ 4.57	\$ -	\$ 0.50	\$ 4.01
Local Projects	\$ 1.50	\$ 0.21	\$ 1.29	\$ -	\$ 1.29	\$ -
	\$ 10.50		\$ 9.66			

Assumptions

- Costs reflect estimated total project cost inflated to anticipated average year of expenditure, and include an assumed annual cost for maintaining and operating the projects included in the scenario.
- Project specific revenues include assumptions for the following: tolling, new starts revenues, developer right of way contributions.
- "State System Projects" include all added capacity projects on the state system including freeways, arterials, and HOT lanes/bus only shoulders on the state system.
- "Transit Projects" include rail construction, purchase of rolling stock, construction of intermodal facilities and stations, improvements associated with creation of bus only lanes on arterials, and the cost of operating and maintaining new service.
- "Local Projects" include added capacity projects to non-state system arterials.
- All revenue amounts reflect revenue expected to be available after set asides for operating and maintaining the existing system and making non-added capacity improvements to the existing system (TDM, TSM, Bike-Ped, etc)
- "TXDOT Revenues" includes FHWA and TXDOT Funding expected to be available for added capacity projects.
- "Local Revenues" includes local and private revenues forecast by local jurisdictions to be available for new regional capacity.
- "MTA/FTA Revenues" includes all revenues projected to be available from the Federal Transit Administration and the Capital Metro Sales Tax for new regional capacity.