



# Capital-Alamo Connections Study

---

Transportation Planning & Programming Division, TxDOT

*In partnership with*



February 2019

[Page left intentionally blank]

## Table of Contents

<b>1.</b>	<b>Introduction .....</b>	<b>6</b>
1.1	Study Background.....	6
1.2	Study Area .....	7
1.3	Study Purpose & Goal.....	8
1.4	Study Rationale .....	9
<b>2.</b>	<b>Study Structure.....</b>	<b>12</b>
2.1	Level of Planning.....	12
2.2	Study partners and stakeholders.....	12
2.3	Schedule.....	13
2.4	Methodology .....	14
2.5	Guiding Considerations .....	16
<b>3.</b>	<b>Regional Assessment .....</b>	<b>18</b>
3.1	Population and Economic Growth.....	18
3.2	Land Use and Right-of-Way .....	20
3.3	Environmental Constraints.....	21
3.4	Safety .....	23
3.5	Travel Demand & Congestion .....	24
3.6	Travel Patterns .....	26
3.7	Freight Demand .....	33
3.8	Modal Options .....	35
3.9	Contributing Studies and Plans .....	36
3.10	Key Takeaways.....	39
<b>4.</b>	<b>Stakeholder Engagement.....</b>	<b>40</b>
4.1	Approach and Timeline.....	40
4.2	Individual Stakeholder Outreach .....	41
4.3	Joint Transportation Policy Board (TPB) Workshop 1 .....	42
4.4	CAMPO and AAMPO Technical Advisory Committee Workshops .....	43

4.5	Leadership Workshops .....	43
4.6	Joint TAC Workshop .....	44
4.7	Joint TPB Workshop 2 .....	44
4.8	Summary of Themes .....	45
<b>5.</b>	<b>Regional Strategy Development.....</b>	<b>47</b>
5.1	Strategy Structure .....	47
5.2	Regional Coordination .....	48
5.3	Integrated Corridor Management (ICM) and Intelligent Transportation Systems (ITS) .....	51
5.4	Modal options.....	52
5.5	Priority Transportation Corridors.....	52
5.6	Arterial Improvements .....	54
<b>6.</b>	<b>Regional Strategy .....</b>	<b>57</b>
6.1	Regional Strategic Plan .....	57
6.2	Next Steps .....	74

## **Appendix List**

**Appendix A** - Emerging Technologies Memorandum

**Appendix B** - Regional Transportation Planning Coordination: A primer for the Capital-Alamo Coordination Study

**Appendix C** - Stakeholder Analysis of Findings Report

**Appendix D** - Capital-Alamo Connections Study: Origins, Destination and Travel Patterns

**Appendix E** - Capital-Alamo Connections Study: Freight Analysis

[Page left intentionally blank]

## **1. Introduction**

The Capital Area Metropolitan Planning Organization (CAMPO) and the Alamo Area Metropolitan Planning Organization (AAMPO) in partnership with TxDOT initiated a study to develop bi-regional strategies to enhance mobility within the greater Austin-San Antonio region. These strategies were developed using a two-pronged approach: a comprehensive technical analysis and an extensive stakeholder engagement process which included a series of workshops with MPO's committees and regional leadership as well as interviews with key regional transportation influencers and decision-makers.

The following report describes the study process, technical findings, and stakeholder engagement and input that contributed to the development of short-, mid-, and long-range strategies for enhancing mobility in the region.

### **1.1 Study Background**

The Austin-San Antonio region has experienced exceptional growth in the past 20 years which is projected to continue well into the future. With that exceptional growth come the challenges associated with increased traffic and congestion and quality of life issues. As part of planning to address these challenges, the region undertook studies from 2003 to 2016, in coordination with the Lone Star Rail District, to explore passenger rail that would service Austin, San Antonio and the communities in between. However, changes with potentially available rail right-of-way halted further development of the Lone Star Rail project.

With the ending of the Lone Star Rail project, an opportunity was presented in late 2016 for the region's transportation planning partners to coordinate on other potential solutions to enhance mobility in this developing mega-region. The Capital-Alamo Connections Study was initiated in early 2017, and an Executive Steering Committee was created which was comprised of the two MPO directors and staff, TxDOT directors and staff from Environmental Affairs Division (ENV), Transportation Planning & Programming Division (TPP), as well as Transportation Planning & Development directors and staff from the TxDOT San Antonio and Austin Districts. The Executive Steering Committee provided guidance and input throughout the study. Coordination with other TxDOT division and sections, including Traffic Operations, Freight, and Rail also occurred regularly. During the study, this broad coordination for multi-regional issues allowed for collaboration on transportation options and approaches to enhance mobility and connectivity between the regions.

While this was a concerted effort to develop bi-regional strategies, CAMPO and AAMPO have coordinated with increasing frequency as the two regions have grown closer together. See Section 5, Figure 13 of this report for a list of coordination efforts between the two MPOs.

## 1.2 Study Area

The study area is composed of the 10 counties in the CAMPO and AAMPO planning area and two adjacent counties as depicted in Figure 1. The study area was developed to encompass all major connections between Austin and San Antonio which includes I-35, US 281 and SH 130. See Table 1 for a list of counties by MPO.

Figure 1 Study Area

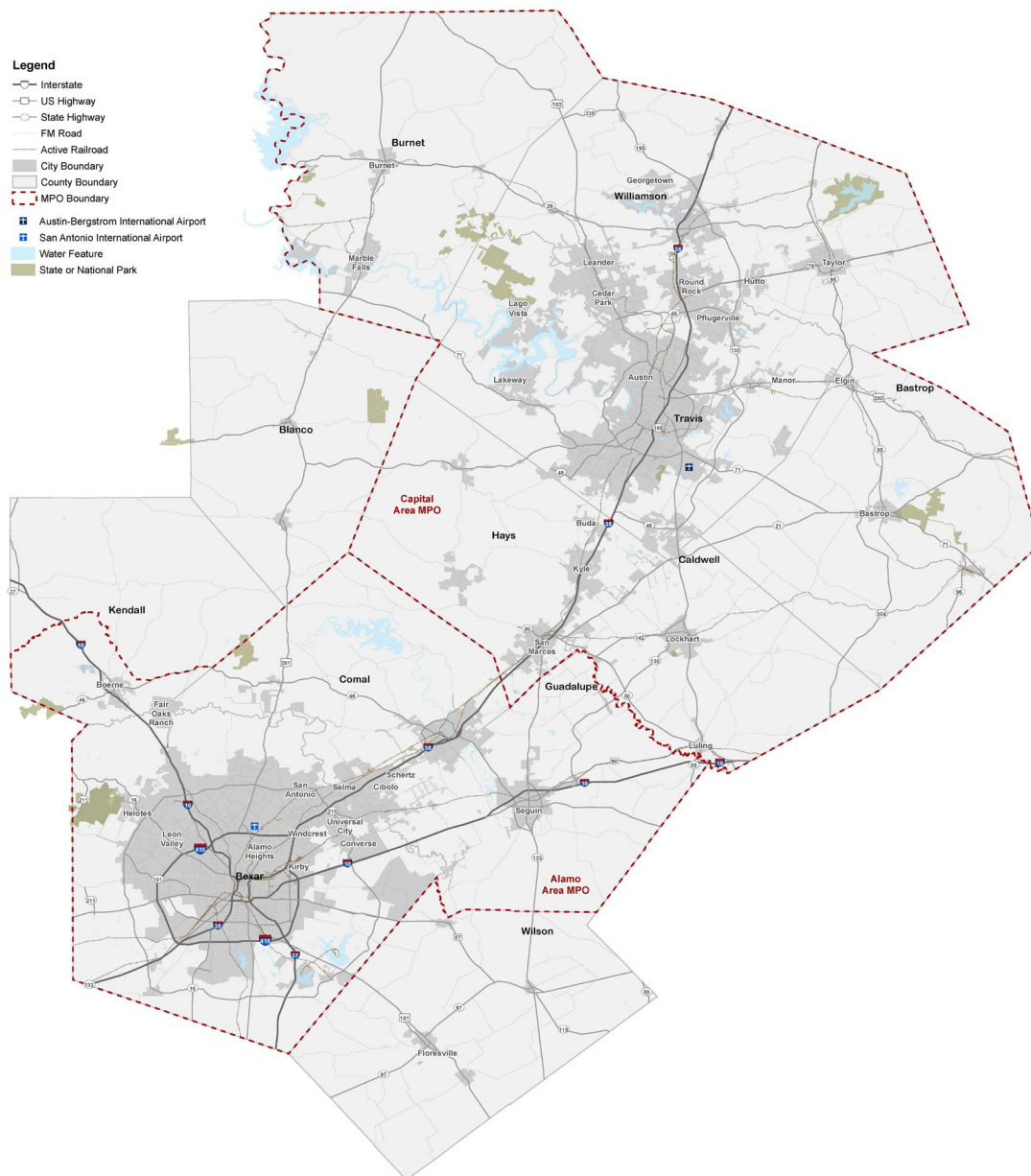




Table 1 - Counties per MPO



Bexar
Comal
Guadalupe
Kendall*
Wilson*
Blanco*



Hays
Travis
Caldwell
Bastrop
Williamson
Burnet

\*Counties partially or not under official MPO jurisdiction.

Although generally acknowledged that most travel between the Austin and San Antonio metropolitan areas occurs along I-35, the study took a broader look of the entire bi-regional area including, but not limited to the Interstate corridor. Even with I-35's role as the primary transportation connection between regions, movement in the area needs to be addressed at a system level. The Executive Steering Committee concluded the analysis of an expanded study area, which includes all areas affected by growth, would be more beneficial for a long-term planning approach.

The expanded regional scope permitted:

- An understanding of growth patterns in the region beyond the areas adjacent to I-35
- The involvement of a wide range of stakeholders with varying transportation perspectives, needs, and concerns
- An assessment of additional regionally significant corridors (e.g. SH 130, US 281)
- Fostering and promoting greater bi-regional coordination and cooperation
- Development of comprehensive recommendations in terms of **infrastructure, policy, and technology.**

As population continues to grow, the geographic distinctions between the Austin and San Antonio metro areas may lessen. There will be a greater need in the future to coordinate planning efforts at the MPO level, particularly regarding transportation facilities and services that link the two regions. By engaging the entire 12-county region, this study effort promoted the importance of bi-regional coordination and acknowledged that mobility management is not limited to just one jurisdiction or agency.

### 1.3 Study Purpose & Goal

With the increase in growth and traffic congestion in the region, cooperation on solutions development and alignment of infrastructure investment has become a focus. The purpose of the Capital-Alamo Connections Study is to develop a shared vision and path forward for addressing increasing growth and traffic congestion in the region.

An initial meeting was held with both MPO Transportation Policy Boards on November 1st, 2017 where transportation needs and challenges were discussed. At this meeting, an overarching study goal along with objectives, was discussed and validated. The study goal is to develop a regional strategy to enhance mobility and identify infrastructure, policy, and technology solutions for the Greater Austin-San Antonio region. Objectives included the following:

- Enhance existing transportation services and facilities.
- Provide additional, reasonable, and economically feasible transportation options.
- Address the diverse needs of the traveling public.
- Enhance multimodal opportunities in the region.
- Address sub-regional travel patterns
- Work with partners throughout the region.
- Use a comprehensive and coordinated improvement approach.
- Address the influence of local travel patterns on regional congestion.

### STUDY GOAL

Develop a regional strategy to enhance mobility and identify infrastructure, policy and technology solutions for the Greater Austin-San Antonio region.



The study goal defines three main areas of action: infrastructure, policy, and technology. The study partners recognized the need to perform coordinated actions in these three areas. Infrastructure improvements are meant to address current and immediate needs - but those to be implemented in the future must have a policy framework today that facilitates their future implementation. As for technology, the rapid changes in the transportation arena both open possibilities to leverage efficiencies and present challenges planning for a future we are currently unable to define.

More broadly, this study is not focused on a single solution, and the outcome is not dependent on a single jurisdiction solving all of the regional needs. Instead, it is intended to be the foundation on which local, regional, and State transportation initiatives can be organized over the coming years to create cooperative solutions.

## 1.4 Study Rationale

The Central Texas region is grappling with the effects of population growth, low density development patterns and the associated increase in traffic/congestion that make coordinated long range planning a necessity to help preserve the economic prosperity and vitality of the region.



Accelerated  
9 Growth

**The accelerated growth of the Central Texas region.** Texas as a whole has experienced tremendous growth over the past decade. Statewide, Texas has added 12.6% more people since the 2010 Census, which is one of the

highest growth rates in the nation.<sup>1</sup> Counties in the study area having been topping national growth listings throughout the past decade, both for population totals and percentage growth. Most recently, San Antonio's Comal and Kendall Counties along with Austin's Hays County were named among the national 10-fastest growing counties in 2017. Williamson County, north of Austin, landed on the same list in past years. Additionally, Bexar County, home of the Alamo, was the 7<sup>th</sup> county in the nation with the most people added in 2017. More details on the current and expected population of these regions can be found later in the regional assessment of this report.

Comal, Kendall and Hays counties were among the 10 fastest-growing counties in the US during 2017

Population growth is classified as an indicator of a healthy local economy, which the state has been recognized for, and Central Texas is a leader in this expansion. It is the role of this study to find transportation strategies that help the region cope with its challenges and develop its possibilities.



Emerging  
Megaregion

**Central Texas constitutes a part of an emerging megaregion. A**

megaregion is a large network of metropolitan regions that share several environmental and infrastructure systems, economic linkages and land use patterns. Several counties in the study area are recognized by the Federal Highway Administration (FHWA) as a branch of the Texas Triangle Megaregion. This southern megaregion envelopes 101 counties in the state and is generally recognized as the area enclosed by the sections of I-

35, I-45 and I-10 connecting Texas' biggest cities: Houston, Dallas-Ft. Worth, San Antonio and Austin. The Texas Triangle is characterized by an extensive established region with development being driven by the explosive growth of smaller communities.<sup>2</sup>

The geographical proximity of the Austin and San Antonio metro areas, coupled with their development patterns and those of intermediate communities make the "merging" development pattern more apparent. In 2017, Texas State Demographer [Lloyd Potter](#) stated the I-35 corridor hints at a future pattern of continuous land use development from

"An apparent merging of population density along I-35 corridor as the metro areas continue to grow".  
-Texas State Demographer

<sup>1</sup> <https://www.forbes.com/sites/chuckdevore/2018/05/22/texas-laps-california-in-job-and-population-growth/#3262e19f73f3>

<sup>2</sup> [http://www.america2050.org/upload/2010/09/2050\\_Defining\\_US\\_Megaregions.pdf](http://www.america2050.org/upload/2010/09/2050_Defining_US_Megaregions.pdf)

the State Capital to the home of the Alamo. This study aims to provide a framework for coordination of regional transportation efforts at a higher planning scale to prepare for this future.



### Urgent Demands

**Growing demands on the extensive transportation network connecting the regions.** A growing population and concentrated development patterns have created increased traffic demands on the regional transportation system. Growth-induced traffic has landed 28 roadway segments in the study area within the TxDOT's 100 Top Most Congested Highways in the State. Seven of these segments are located along I-35, US 281 and SH 130, their main north-south connections. I-35 in Downtown Austin with an average daily traffic of 207,725 vehicles per day<sup>3</sup>, is already congested to the point of being recognized as the 3rd of the Top 100 Most Congested Highways in the state. Other connections, while not on the statewide list, are also nearing capacity or having efficiency challenges. More details on the current and expected traffic conditions in the region can be found later in this report (Chapter 3).

Efforts to reduce pressure in the system include an TxDOT's extensive improvement program for I-35, expansion plans for several major facilities, and technology-based efficiencies. However, the space available for traditional capacity building is finite. Given today's demands, accommodating the expected regional growth within the existing transportation network could represent one of the biggest challenges to the region. It is the role of this study to identify the actions necessary to help address these challenges.

Seven segments on the North-South connections between Austin and San Antonio are in the Top 100 Most Congested Highway Segments

---

<sup>3</sup> Statewide Planning Map. 2017 Data. Accessed. 12/2018

## 2. Study Structure

TxDOT in partnership with AAMPO and CAMPO took a broad view of mobility challenges and potential solutions for the bi-regional area. The population within and between the regions is experiencing accelerated growth; this will lead to demands on current infrastructure in excess of current improvement plans. Without additional investments and solutions, roadway congestion will continue to spread, and the quality of life will be affected. The large, diverse geographic area requires a range of strategies.

### 2.1 Level of Planning

This study includes an over-arching look at the conditions of the region with regard to mobility, and provides a set of high-level but implementable strategies which were categorized and prioritized to span the 25-year planning period.

- **Short-term** recommendations span 0 to 5 years, and include support for many efforts already underway or funded,
- **Mid-term** recommendations span the period from 6 to 15 years, and
- **Long-term** recommendations identify strategies to be implemented from 16 to 25 years in the future.

Recommendation categories contain a range of tactics for implementation, intended to build on each other and complement other transportation improvements. The intent is to provide a broad base of solutions that work together, rather than standalone efforts.

While TxDOT, CAMPO and AAMPO spearheaded this study, implementation of the strategies may fall within the jurisdiction of member agencies. Many recommendations stress the need for greater coordination between agencies. Local partners and involved parties are designated for each strategy, and many require cross-agency planning and execution.

### 2.2 Study partners and stakeholders

As previously discussed, the Capital-Alamo Connections Study is a joint effort between the TxDOT, AAMPO, and CAMPO. As the central authority for overseeing roadways, aviation, rail, and public transportation throughout the state, TxDOT provided management, staff time and funding resources for the development of this study.

MPOs, including AAMPO and CAMPO, are regional agencies tasked with overseeing transportation planning and the allocation of federal transportation funding to areas with populations greater than 50,000. As such they are responsible for all transportation planning and implementation within their jurisdictions. AAMPO and CAMPO provided

leadership, staff time, knowledge repositories and most importantly access to their committee members, which were all crucial to the success of this effort.

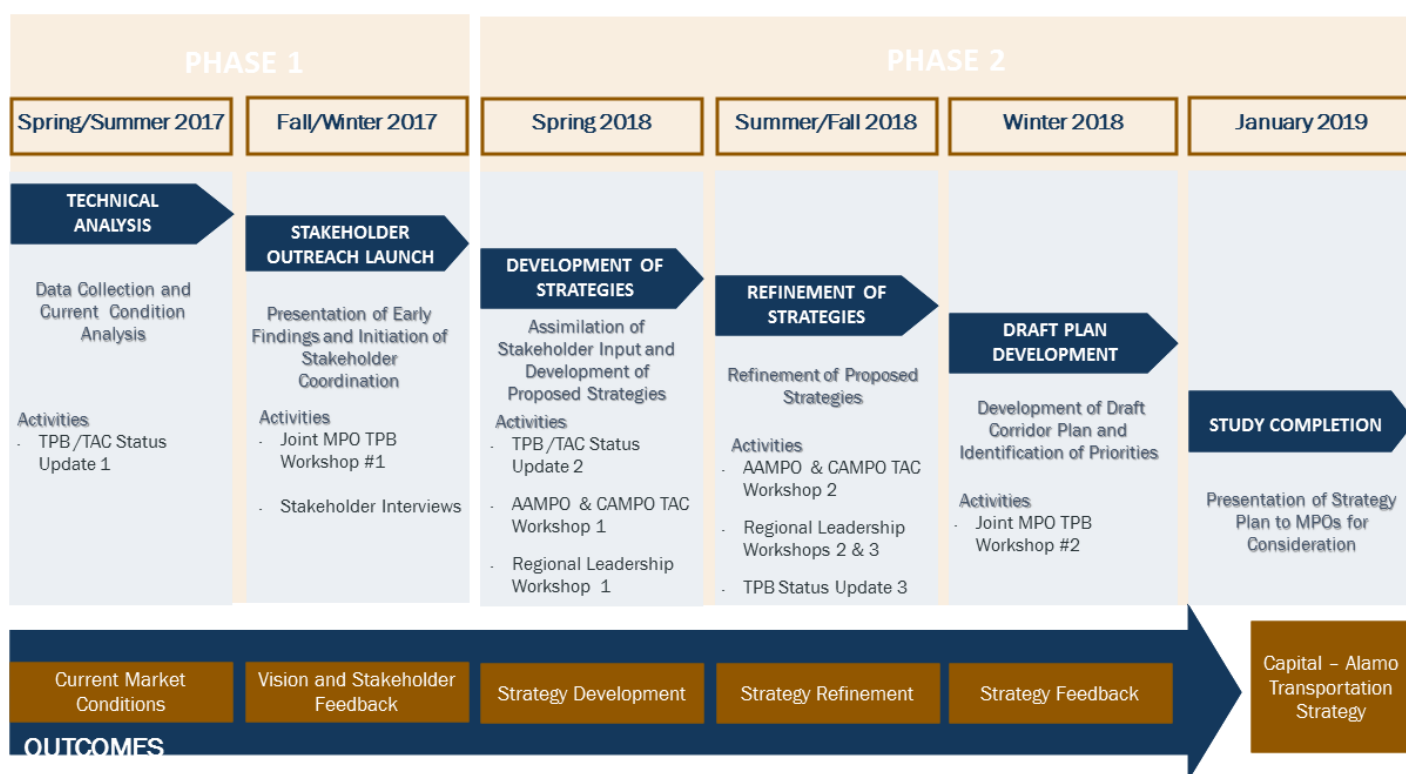
Other stakeholders in the study process included county officials for all counties within MPO jurisdiction, city officials, public transit providers (Capital Metro, VIA, CARTS, and Alamo Regional Transit), Regional Mobility Authorities (Alamo RMA, Central Texas RMA), research agencies (Southwest Research Institute) and transportation technology companies (such as Chariot and Google). For a comprehensive list of stakeholders refer to Appendix C.

The three partner agencies came together to assess the mobility challenges from a broad base of transportation planning and funding. Partnership is necessary to bring together the right combination of municipalities, elected officials, transportation leaders, and funding partners to induce change across the two regions. The study also provided an opportunity to grow and formalize the current communication and coordination efforts between the participating agencies.

## **2.3 Schedule**

The Capital-Alamo Connections Study was initiated in early 2017. The study had an original intended duration of one year, which was later extended to accommodate stakeholder interviews, MPO workshops and other coordination. Data collection and analysis began in Spring 2017 and ran through Fall 2017, with updates as appropriate. Stakeholder outreach and MPO workshops began in Fall 2017, occurring at key points in the study through Winter 2018. Figure 2 depicts an overview of the study schedule along with the activities performed and the outcomes defined during each stage.

Figure 2 - Study Schedule



## 2.4 Methodology

The study methodology was comprised of two main elements:

1. Technical Analysis – Review and analysis of technical information and data to provide an outline of current and expected regional conditions, and
2. Stakeholder Input – Consideration of empirical information sources obtained through a process of stakeholder involvement

Conclusions and insights from both input streams were combined with research into best practices, funding mechanisms, as well as emerging trends and technologies to produce regional transportation strategies to meet the purpose and goal of the study.

The following describes the input and steps involved in developing the strategies.

### (a) REGIONAL EVALUATION

The Executive Steering Committee aided in gathering the latest information regarding their current and long-range estimates for key topics including:

- Population and employment data for diagnosis of the population trends, and geographical and economic implications;



- Land cover, distribution and available right-of-way (ROW) to assess the development patterns of the region;
- Traffic demands from both the travelling public and the freight industry to determine the level of remaining capacity in the existing transportation network;
- Trip origins and destinations to define main movements and by extension potential routing options to differentiate or address them in better ways;
- Travel times, congestion indexes and safety factors to assess bottlenecks and points of major impact;
- Multimodal options and initiatives to create a more balanced, efficient and equitable transportation system;
- Environmental features which must be considered;
- Planned and programmed initiatives and improvements to identify gaps in service and synergies between expected improvements.

The regional evaluation and definition of the study framework were the focus of the first phase of this study. However, individual analyses were carried forward and updated throughout the second phase in response to newly available data or information.

#### **(b) STAKEHOLDER ENGAGEMENT**

The study team led a series of one-on-one interviews with key stakeholders whose input was requested in terms of their personal perception of needs and challenges for the regional well-being of the transportation network. The interviews were complemented by a first series of workshops with the two MPO Transportation Policy Boards (TPB) and Technical Advisory Committees (TAC) members meant to acquaint them with the insights of the ongoing technical effort and solicit validation for the data analysis conclusions. These discussions with stakeholders revealed insights not readily available in databases. Workshops with MPO and TxDOT leadership also occurred, providing further guidance and insight into the data and strategy development. Their work is documented in Chapter 5 - Stakeholder Engagement.

#### **(c) STRATEGY ASSESSMENT**

Based on the technical assessment and input from the stakeholder outreach effort, and MPO and leadership workshops, a set of initial strategies were developed.

AAMPO and CAMPO TPB Chairmen, Commissioner Kevin Wolff and Will Conley along with MPO Directors, Isidro Martinez and Ashby Johnson, led a subsequent assessment of a preliminary strategy universe which provided a primer for MPOs members to consider, modify, and further craft the strategies. A second round of workshops provided the setting for MPOs to collectively refine these regional strategies. MPO TAC members were asked to



create and recommend a final set of strategies for TPB consideration and prioritization based on their appropriateness and feasibility.

#### **(d) REGIONAL STRATEGIC PROGRAM**

The final set of regional transportation strategies, with corresponding implementation timeframes resulting from data and inputs described above, were presented to the MPO TACs and TPBs in January 2018 for acceptance. These strategies are located in Chapter 7. This program is meant as a guide for inclusion in MPO planning efforts.

### **2.5 Guiding Considerations**

While this study took a wide-ranging view of potential mobility improvements by including potential policy, technology and infrastructure solutions, the study team was guided by overarching policies and opportunities which impact the scope of the recommendations, among which include the following:

#### *Tolling*

State-level policies affect transportation planning and funding. Tolling has been an effective way to leverage funding for roadway facilities in recent years, either for new facilities or managed lanes (which use tolling to mitigate congestion and provide a reliable trip option). In 2017, however, the offices of Texas's Governor and Lt. Governor specified that no new toll projects would be planned in the State. Tolling remains an unlikely project delivery option at this time, with state leaders seeking other methods to secure additional transportation funds. For this reason, recommendations related to tolling have not been included in this study, although managed capacity is still an option to manage traffic flow using other methods including but not limited to HOV lanes, dedicated bus lanes, etc.

#### *Land Use Planning Authority*

During the outreach efforts (See *Chapter 5 & Attachment D*), many stakeholders discussed the linkages between land use and transportation, the costs and/or difficulties incurred when development occurs haphazardly, and a desire for greater integration between land-use planning in the counties and State transportation investments. Comments were received regarding the need for land-use planning controls outside the municipal boundaries which would seek to guide development in tandem with regional transportation improvements. Within current Texas law, however, land use authority only can occur within

the municipal boundaries. Similarly, Senate Bill 6<sup>4</sup> requires landowner or voter approval for annexations in the State's largest counties, limiting cities' annexation and growth management authority under specific conditions as outlined in the bill.

It was outside the scope of this effort to address the larger State policy of land-use planning authority, but greater coordination between government agencies is encouraged to bring greater investment efficiencies.

### *Passenger Fixed Guideway (Rail)*

This study included a review of emerging technologies that may one day revolutionize the way that passengers could be transported through the corridor. All of the data from the Lone Star Rail District efforts was reviewed and updated as necessary to assess the current state of rail potentials. However, several factors became clear during these considerations. First, the existing rail infrastructure is owned by Union Pacific, and at this time the private company is not interested in accommodating more passenger services on a profitable freight line that is nearing capacity.

Second, the State of Texas does not have funding available to introduce passenger rail services in this area. While both regional governments are interested in passenger rail as a long-term solution, pressing investments for shorter distance services within both urban areas must be the priority for their limited resources.

Third, a review of existing markets using cell phone data revealed that the existing Austin-San Antonio travel market is extremely limited. There may be latent demand in long distance trips by rail (and as the two regions grow together, this market is likely to expand), but there is not a sustainable market at this time.

---

<sup>4</sup> TX SB 6 | 2017 | 85<sup>th</sup> Legislature 1<sup>st</sup> Special Session - <https://legiscan.com/TX/text/SB6/id/1644616/Texas-2017-SB6-Enrolled.html>

### 3. Regional Assessment

To better understand regional movements, passenger and freight data were obtained from various sources and analyzed in terms of their current as well as future magnitudes. Such data included existing and forecasted population and employment totals and densities, traffic volumes, activity centers, crash histories, transit services and usage information, trip origins and destinations, planned and programmed improvements, environmental features, as well as truck and rail freight movements. A synopsis of the relevant findings for the topics of greater significance is provided in the following chapter along with a brief assessment of the impact each has on the overall mobility in the region. Phase 1 of this effort investigated all aforementioned topics with the appropriate level of detail. In summary, travel demand for the study area is expected to grow, further reducing travel time reliability and adversely affecting system performance.

#### 3.1 Population and Economic Growth

##### (a) POPULATION

The Austin-San Antonio Region is expected to grow to over 3.9 million by 2045, or even as much as 8.4 million when considering the full 12-county study area.<sup>5</sup> Even with development patterns for both cities pointing to north-oriented growth, the continued explosive expansion of the intermediate counties points to the shrinking of the physical separation between the two metro areas.

The suburban and surrounding counties of the region are experiencing growth in numbers that are nationally significant. Medium sized communities with thriving economies, like San Marcos and New Braunfels, are showing signs of higher population densities with forecasts pointing to this trend continuing. The two regions are expected to coalesce into one of the anchors of the Texas Triangle megaregion, potentially attracting more population into the area, which could in turn present an even greater challenge to the efficient movement of people and goods.

---

<sup>5</sup> CAMPO & AAMPO Population Forecasts 2045. Census Bureau Population Estimates 2016

Figure 3 - Population Expected Growth

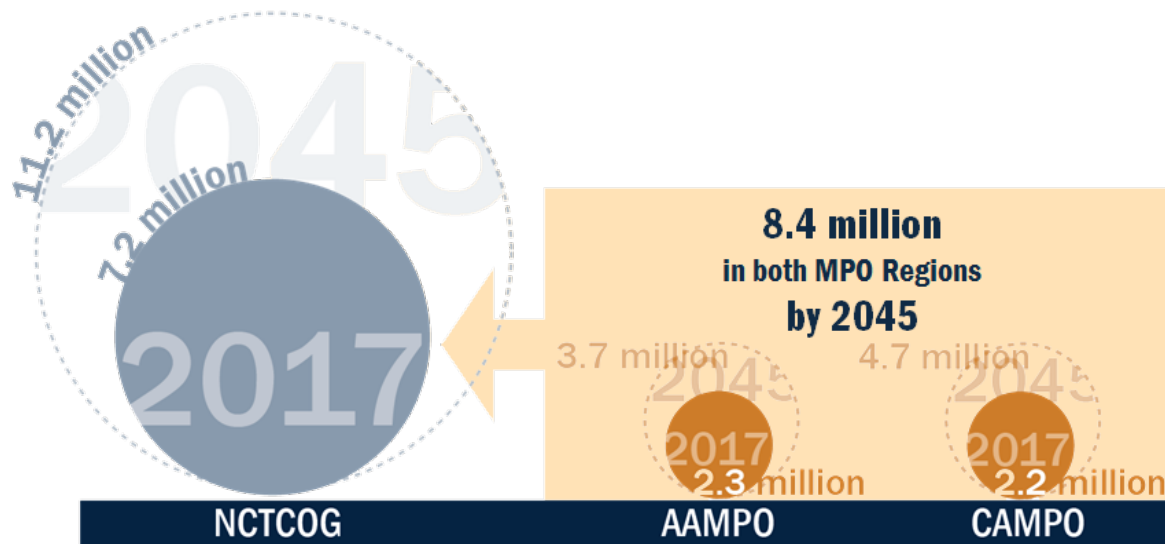


Figure 3 depicts a comparison between the current and expected populations of the Austin-San Antonio Metropolitan areas and that of the Dallas-Fort Worth (DFW) metro. By 2045, the Austin-San Antonio region could be comparable to, or bigger than, the current DFW metropolitan region. However, today's DFW population is served by a highway and rail system that is four times the size of the Capital-Alamo Connections Study area.

While DFW has major transportation deficiencies, the current size of the Capital-Alamo transportation (existing and committed) network suggests that travel deficiencies will be even more serious when Central Texas approaches DFW's size. Growth of this magnitude will require an extensive and proactive transportation improvement program to address its needs.

Land development patterns present other challenges and opportunities. In 2010, according to the Census Bureau, 57% of the population in the study area lived within 5 miles of the I-35 corridor. In 2045, it is estimated the same population will hover at 53%. This explosive localized regional growth combined with a significantly constrained transportation network will create significant stress on regional facilities and on I-35 specifically.

**Over 50% of the population in the study area lives within 5 miles of the I-35 corridor, both today and in the future.**

#### (b) EMPLOYMENT

Employment was used as the main economic indicator for the region's performance. Employment data from the CAMPO and AAMPO demographic databases were used to estimate current and forecasted employment densities within the study area based on data in the MPO traffic models. The information was used in concert with top employer locations to identify potential travel patterns and activity centers. The highest employment densities

are currently located along the I-35 corridor in both MPOs; although Austin houses another high-density employment center along the US 183 corridor. In San Antonio, the highest densities are found west of I-35 as well as along the I-10 and US 281 corridors.

Employment concentrates near I-35 for most communities. Other concentrators include I-10 and US 281 in San Antonio, and US 183 in Austin.

In 2040, forecasts anticipate new significant centers of employment in Round Rock and Cedar Park as well as higher employment densities in San Marcos, New Braunfels and Buda. These findings are consistent with expected expansion of these intermediate communities. Future employment growth in the San Antonio region is expected to increase north and north east of the city. This will undoubtedly add to the pressures on the central aisle of the region.

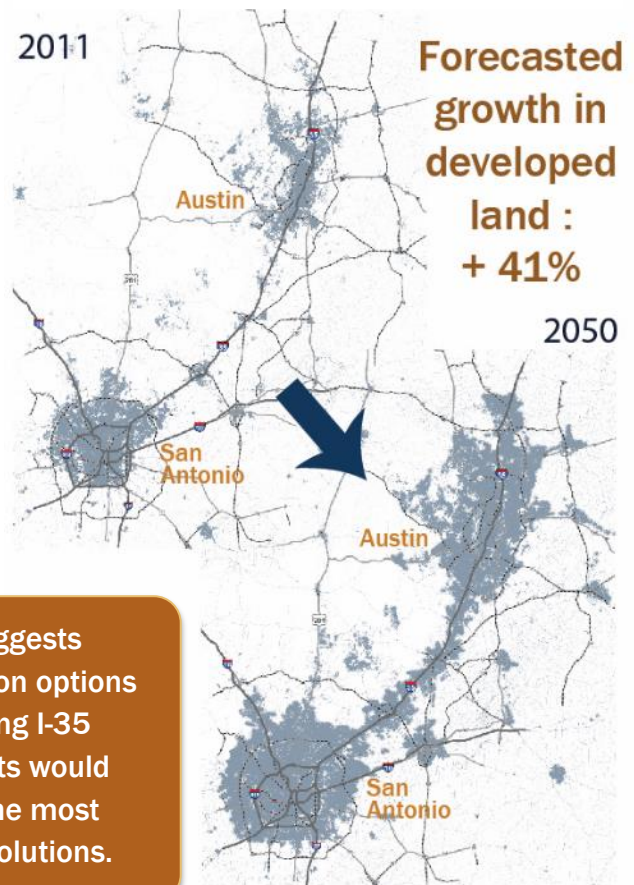
### 3.2 Land Use and Right-of-Way

#### (a) LAND COVER

Land use data<sup>6</sup> was mapped to better understand where developed land and open land are located as well as where potential future development could be anticipated. Developed land in the region is expected to increase by 41% by 2050<sup>7</sup> in keeping with trends established by population and employment forecasts. New developed lands are anticipated to concentrate along the I-35 corridor with notable changes in and around the localities of San Marcos and New Braunfels. Most of the land used for this increase is estimated to come from previously open land.

The prognosis of the regional growth models points to the physical separation between metro areas shrinking as

Figure 4 – Current and Expected Land Cover



<sup>6</sup> Land data was obtained from the National Land Cover Database (NLCD) 2011.

<sup>7</sup> Comparing National Land Cover Database (NLCD) 2011 to the Clark Labs' Predicted NLCD 2050. <http://www.esri.com/about-esri/greeninfrastructure>

depicted by Figure 4. This trend will have an impact in the communities between the two metropolitan areas which are emerging growth poles themselves. The combined impact on the conglomeration of our cities, the demands we will make of them and the demand we put on their transportation systems will drastically reduce the effectiveness and efficiency of the entire system if major improvements are not made.

(b) **RIGHT OF WAY (ROW)**

Assessment of ROW availability in comparison to existing and future population and development densities, points to the need for immediate corridor preservation efforts. TxDOT provided ROW information was evaluated for the main roadways, highways and interstates in the study area as depicted in Figure 5.

Existing ROW for I-35 in urban areas is severely constrained, meaning it is already utilized. However, the corridor maintains some room for expansion (Max. ROW 420 ft) in areas between the major metros. Parallel facilities were also evaluated with the following results: US 281, located 10 to 30 miles west of the central development path, has ROW availability throughout. However, it currently does not have extensive spare roadway capacity and is being encroached or landlocked by land developments. SH 130 has the highest provision of ROW (Av. ROW 470 ft – Max. ROW 700 ft) and a roadway capacity comparable to that of I-35. Nevertheless, it is located 10 to 15 miles east of the central development path and its tolled nature might deter usage. Right-of-Way for east-west connections are similarly constrained especially for those facilities within city limits despite having bigger ROW provisions.

ROW and capacity for other modal options led to consideration of the Union Pacific (UP) rail line paralleling I-35. The UP-Railroad ROW is somewhat constrained and corridor expansion is restricted by adjacent land uses. With a single track available, logistical challenges including scheduling or capacity allocation may become more commonplace. Results from this analysis suggest future system improvements considerations will require proactive corridor preservation efforts along all regional facilities.

### **3.3 Environmental Constraints**

To obtain an overall understanding of environmentally sensitive areas and the potential effect of regional transportation improvement options on them, general environmental information was extracted where available. Major environmental constraints were located and assigned a 500-foot (ft) influence radius. Figure 6 represents the environmental constraints and resource concentrations of greatest concern. As shown, the majority of these environmental features are located to the west of the study area and throughout the Hill Country.



Figure 5 - Right of Way Availability

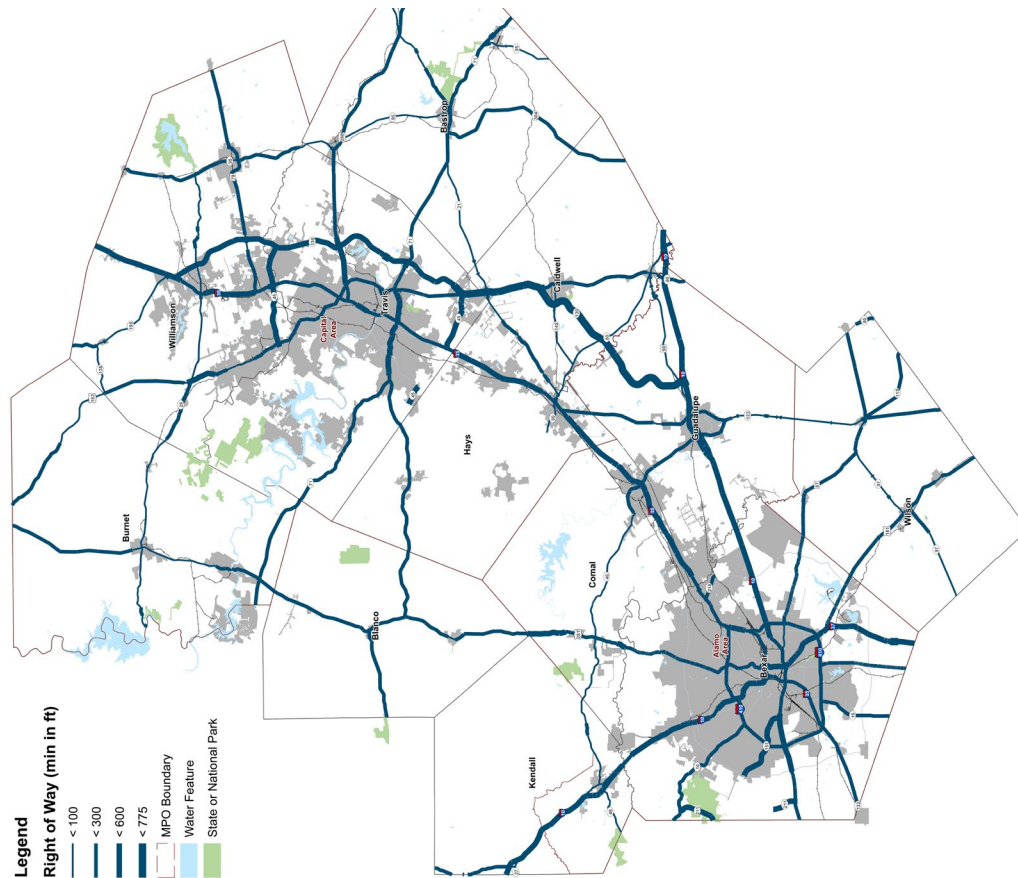
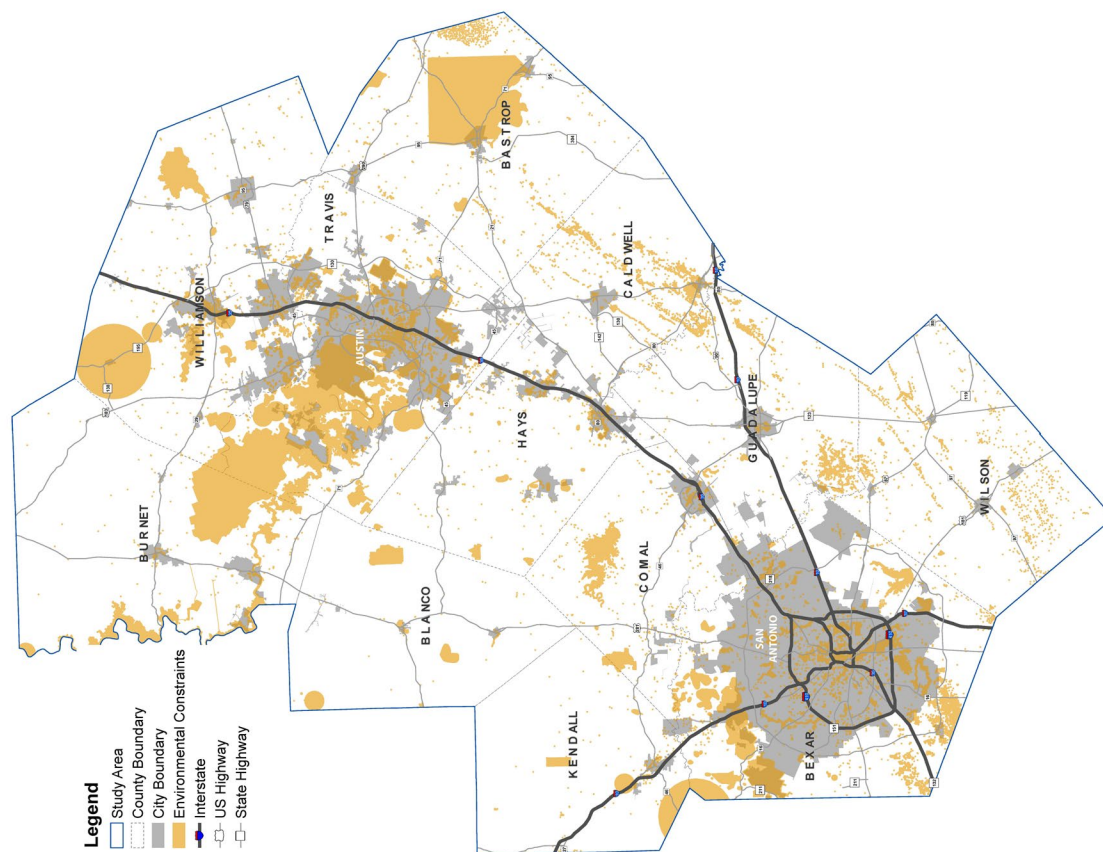


Figure 6 - Environmental Feature Heat Map

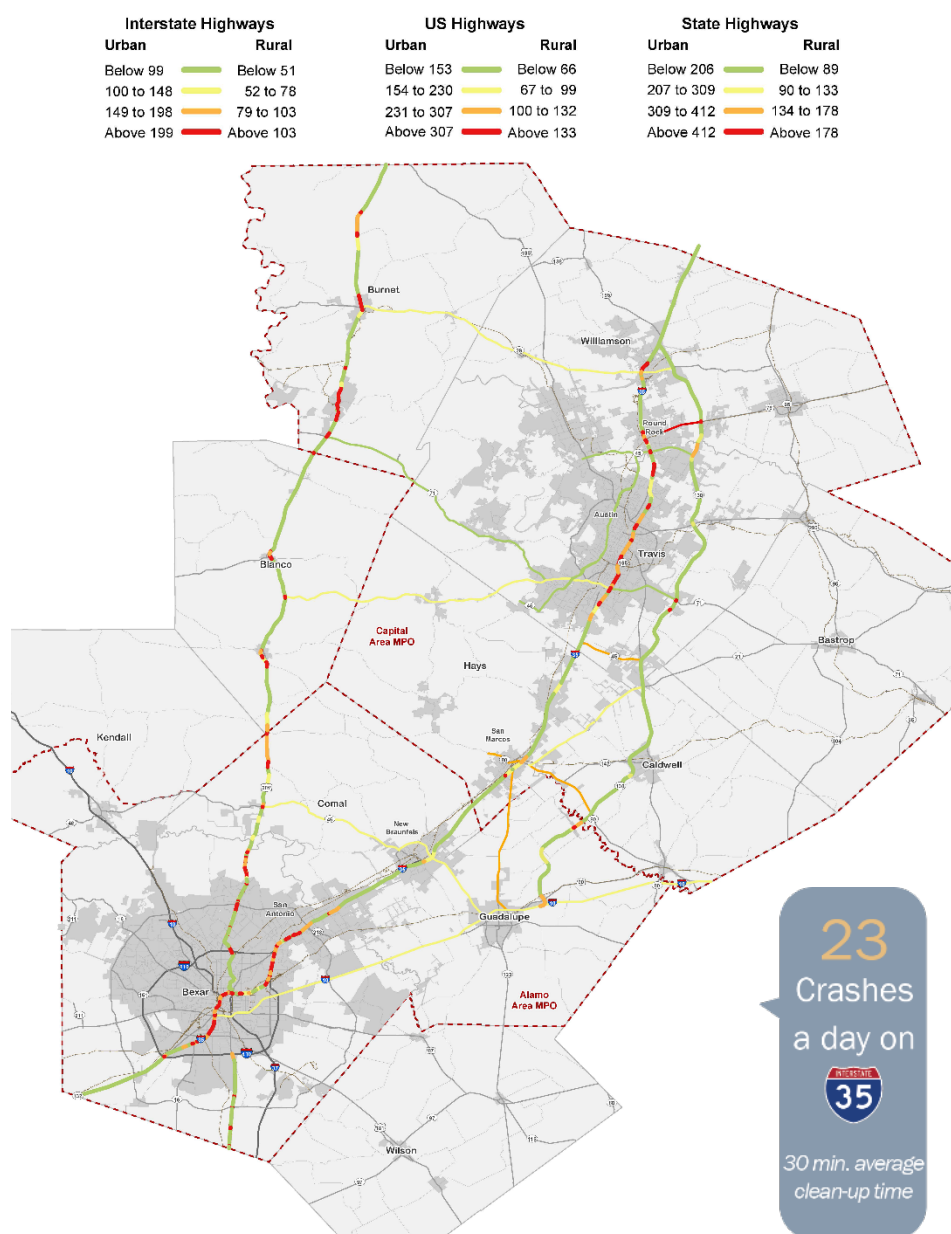


These concentrations could trigger more stringent requirements for implementation of any proposed improvement. As such improvements on the west side of the study area would probably require longer development times than similar improvements to the east. Additionally, environmental features usually pose conservation concerns for surrounding communities.

### 3.4 Safety

Providing a safe and reliable transportation network, which is a principle TxDOT goal, requires the identification of crash concentrations to formulate appropriate solutions. Crash histories within the study area were analyzed based on TxDOT's Crash Records Information System (CRIS) data for the last five years of available data 2012-2016 at the time.

Figure 7 - Crash Rates



#### (a) CRASH FREQUENCIES

The highest concentration of crashes in the region occurred along I-35 (9.5%), reporting an average crash rate 20% higher than the statewide average. However, the majority of these crashes (78%) are Property-Damage-Only crashes. Approximately 1% lead to fatalities or incapacitating injuries. However, an average of 23 crashes per day on I-35 routinely creates delays and further congestion.

Concentrations of crashes on I-35 coincide with segments with the most traffic. As depicted by Figure 7, its rural sections



generally experience lower frequencies of collisions. Findings suggest concentrated efforts to improve designs at particular intersections and urban highway clean-up could be the most efficient strategy for reducing the severity if not number of crashes.

Other major north-south highways, principally SH 130 & US 281, also have localized segments that exceed the statewide average, mostly in relation to busy intersections, but not to the same extent as I-35. However, this suggests that for I-35, SH 130 and US 281 to operate in a safer manner intersection improvements and faster response to incidents should be implemented. Moreover, east-west connections (i.e. US 71, SH 46 & SH 123) potentially serving as collector facilities for county-originated traffic also present elevated crash rates. Specific corridor studies may be needed to address those corridors.

### **3.5 Travel Demand & Congestion**

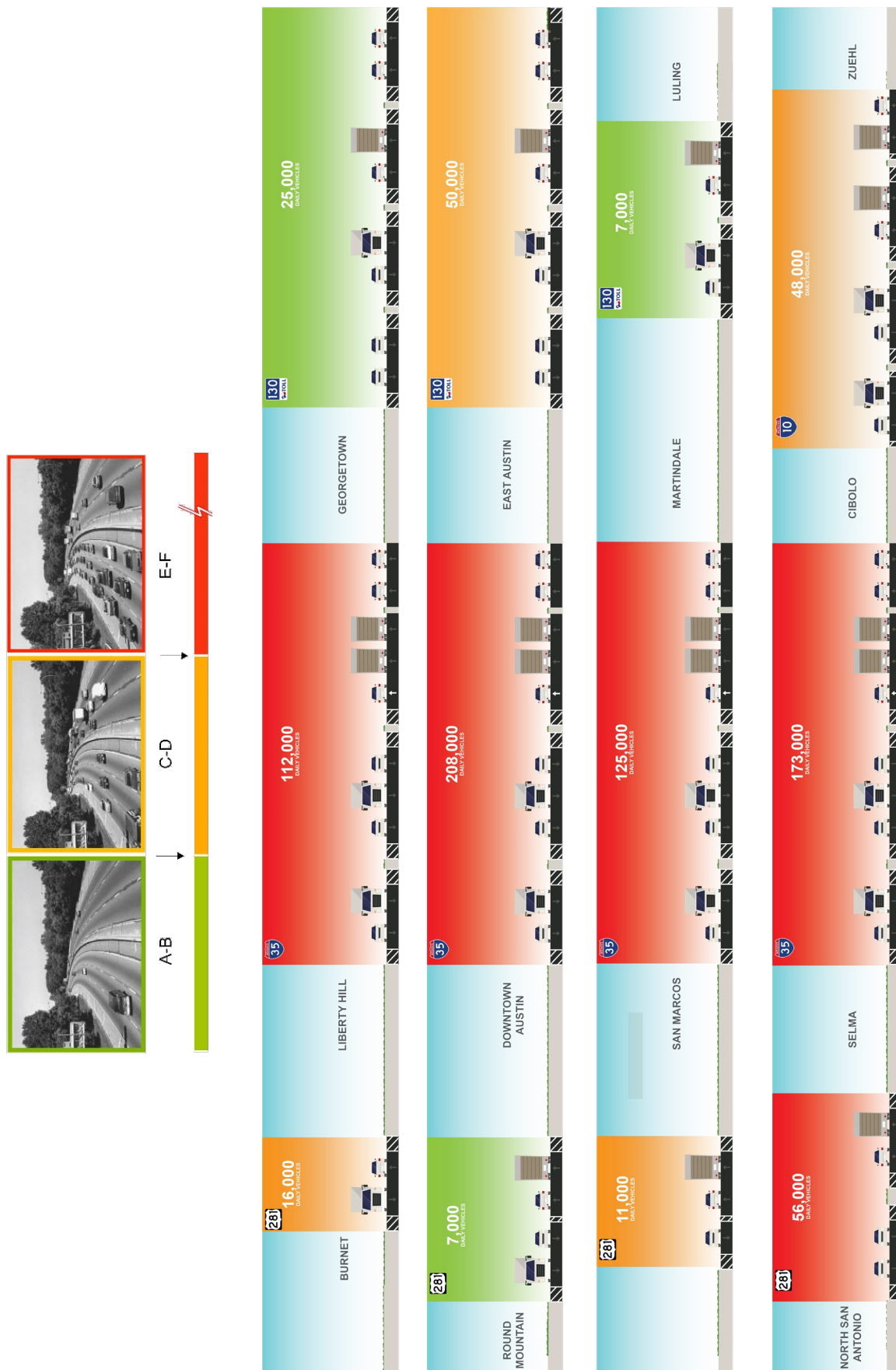
Traffic data and congestion metrics were collected to better understand which facilities are or could face future challenges in providing adequate travel conditions.<sup>8</sup> The capacity of a roadway to handle a certain volume of traffic while maintaining reliable travel times is measured through Level of Service (LOS). Higher traffic volumes usually correspond to a drop in LOS level which in turn signals higher levels of congestion. Figure 8, illustrates average traffic totals for all three major north-south connections in the region in relation to their existing cross sections at selected locations. Color coding indicates which locations are experiencing undesirable levels of congestion.

Average Annual Daily Traffic (AADT), as collected by TxDOT for 2017, reveals I-35 is the most heavily used north-south facility in the region with an average of more than 100,000 daily vehicles. Some urban sections of I-35 for the same year experienced upwards of 200,000 vehicles a day. Parallel facilities to I-35 also experience congestion. Regardless of its lower traffic counts, US 281 experiences congestion through towns, and particularly as it enters the San Antonio metro area. SH 130 is experiencing heavier usage but only experiences congestion through Austin's metropolitan area.

---

<sup>8</sup> AAMPO 2040 Metropolitan Transportation Plan, CAMPO 2040 and 2045 Metropolitan Transportation Plan, TxDOT Roadway Inventory (2016) and National Performance Management Research Data Set (NPMRDS)

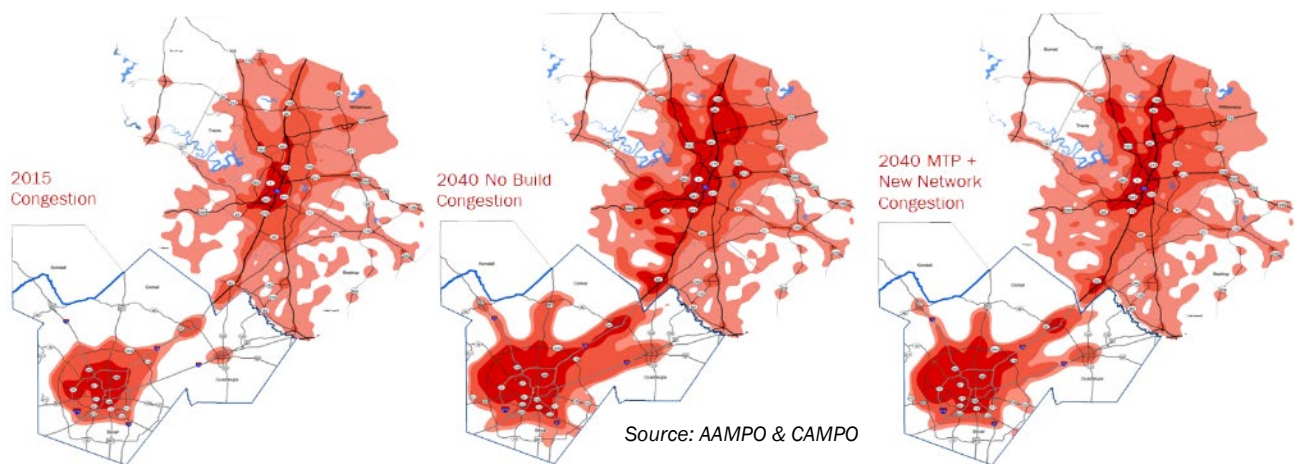
Figure 8 - Level of Service - Samples of Service and Average Daily Traffic (2017) thorough major Facilities in the Region



High traffic volumes have deteriorated the travel experience through parts of the region. Average speeds<sup>9</sup> point to issues with travel time reliability, revealing average peak period operating speeds through urban sections of I-35 and US 281 in Comal and Bexar counties that fall below 55 mph.

In 2015, the MPOs conducted an assessment by forecasting the effects of their respective 2040 Metropolitan Transportation Plans (MTP) on existing levels of congestion. As showcased in Figure 9, congestion levels are expected to rise even if the entire MTP programs of both regions are completed.

**Figure 9 - MPO Congestion Analysis (2015)**



Even with the region's extensive roadway network, its main connections are already burdened with increased traffic, most of which is shouldered by I-35. Given the forecasted demands the regional road system will experience even more difficulties in accommodating the region's future mobility needs.

### 3.6 Travel Patterns

Travel patterns were identified to define the main regional movements as well as those that could benefit the most from targeted transportation improvements. A variety of sources<sup>10</sup> were used to determine micro-regional movements and better identify potential markets. A preliminary analysis using Bluetooth® data collected by sensors deployed throughout I-35,

<sup>9</sup> INRIX 2015, NPMRDS January 2017

<sup>10</sup> Bluetooth TTI data 2016, Streetlight Insight September 2017.

depicted a preponderance of movements within the Greater Austin region. Other regional movements included traffic exchanges between the San Antonio and Austin metro areas, San Marcos to Austin-Georgetown as well as Kyle-Buda to Austin-Georgetown. However, the existing Bluetooth® sensor coverage at the time of this analysis was considered less than ideal. A subsequent analysis using StreetLight® InSight data was performed in order to complement the assessment and better understand travel behaviors from community to community as well as along major corridors. StreetLight InSight® collects locational data from interconnected devices, such as cell phones, which can be combined with census data to describe the origin and destination of traffic, demographics, potential modes, and estimated speeds. This data, recognized for its superior locational accuracy, provides a representative sample so that traveler behaviors can be better understood.

A regional analysis of movements between city limits was performed for morning and afternoon peak traffic periods, producing the following results:

- The majority of trips originating from the Greater Austin and San Antonio regions remain within their respective communities which makes them relatively short in distance.
- Trips originating in intermediate communities along the I-35 corridor (i.e. San Marcos & New Braunfels) tend to travel to nearby communities.
- Weekend trips depict more travel to unincorporated areas in the counties, but percentages remain close to those observed on weekdays.

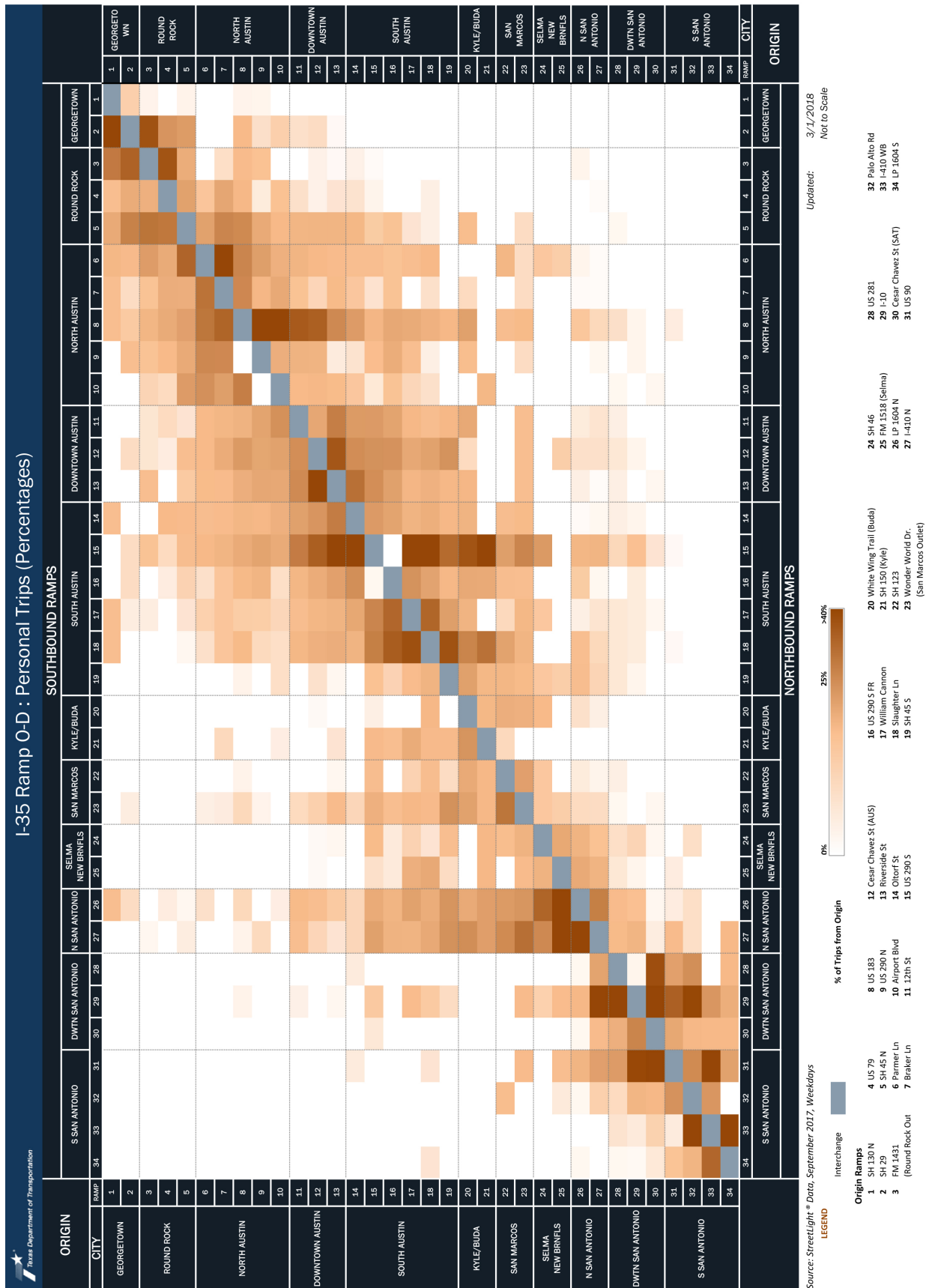
Analysis of this data would suggest that providing more transportation options within MPO boundaries connecting these major movements could mitigate existing congestion along major corridors. For more details on this analysis refer to Appendix D.

#### **(a) MAIN CORRIDORS RAMP TRAVEL PATTERNS**

Travel patterns along main north-south corridors were also investigated using StreetLight® Data. The locational accuracy of the data set allowed for the determination of origins and destinations for travelers based on enter and exit ramps at major intersections used to access I-35, US 281 and SH 130.

Assessing the ramp usage along I-35, analysis found a considerable number of vehicles traveling on the Interstate are only using it for a relatively short distance as depicted by Figure 10. Forty to seventy percent of the traffic in Austin, San Antonio, Round Rock and Georgetown, is only travelling 3 or 4 exits on the Interstate. Furthermore, locations in South Austin (US 290), Downtown San Antonio (I-10) and Round Rock (SH 45 N) produce considerable numbers of trips from one interchange to the next. This would suggest that having more local transportation options or expanding local arterial connections may help alleviate some of the heaviest congestion on I-35.

Figure 10- I-35 Ramp Origin - Destination Results for Personal Trips (Percentages)



Similar analysis along other corridors revealed the US 281 corridor is serving its intended purpose as a long-distance connection, but only once it exits the north end of San Antonio. SH 130, even as a tolled facility, reports heavy usage at its north end which is why this portion is currently being widened. Several other points of interest were highlighted by the analysis as depicted in Table 2 - Corridor Travel Pattern Findings.

**Table 2 - Corridor Travel Pattern Findings.**

Travel Pattern Localized Findings			
Region	Interstate 35	US Highway 281	State Highway 130
North	While experiencing the largest number of short trips, South Austin also attracts or produces some of the longest trips	The facility is heavily used through its dual designation with US 290	SH 71 in South Austin is a major destination to trips from both directions of SH 130
Central	Selma and New Braunfels interacts mainly with San Antonio through the LP 1604 & I-410 N connections	Half of trips entering the corridor at FM 1863 are headed to SH 46	Southbound travel past SH 21 is mostly headed for I-10
South	Almost half of trips Southbound from Downtown San Antonio only go to SH 90	US 281, through San Antonio, is heavily used as a connection to I-410 North	The facility is partially used as a loop around Lockhart.

Travel patterns determination at this level of analysis proved very beneficial in the identification of major movements along principal corridors, however the nature of the data now available for planning purposes can prove even more useful for efforts to address and redirect travelers by local partners.

#### **(b) METROPOLITAN COMMUTING PATTERNS**

The journey to work is one of the most significant in the daily distribution of traffic share. To identify regional needs and potential connectivity opportunities, information on work flows and morning commute travel patterns (6 -10 am) was analyzed.



The Census Bureau provides two different datasets related to worker flows: the Longitudinal Employer-Household Dynamics (LEHD) Origin- Destination Employment Statistics (LODES) and the American Community Survey (ACS) Journey to Work.<sup>11</sup> The source of information for each of these products is different so changes in results are expected, however in coordination, they can be used to define spatial, economic, and demographic conditions as they relate to journey-to-work travel flows. The following describes findings for both sources and strives to explain reasons for their variation.

LODES is based on employment administrative data linked to residence information from annual federal data, to produce labor market statistics. The information, which represents 95% of employment nationwide <sup>12</sup>, can illustrate worker flows at a variety of geographical levels. There is some allegorical information that suggests the use of administrative records may somewhat skew results as some employment records amass multi-location employment (example a chain of convenience stores) in the headquarters location instead of being distributed through the corridor. LODES data estimates the percentage of bi-regional commuters for both MSA between 4 and 5%, as depicted by Table 3.

**Table 3 – LODES Summary of Austin & San Antonio Regional Commuter Flows**

Home Zone	Work Zone				Home Zone	CACS Regional Commuters	
	Austin - Round Rock	San Antonio - New Braunfels	Other locations	Total		Share of workers	Share of Local Employment
Austin - Round Rock	729,840	42,386	139,464	911,690	Austin - Round Rock	4.65%	5.96%
San Antonio - New Braunfels	56,753	793,600	128,300	978,653	San Antonio - New Braunfels	5.8%	4.48%
Other locations	164,946	110,304					
Total	951,539	946,290					

Source: US Census Bureau - Longitudinal Employer-Household Dynamics (LEHD) Origin- Destination Employment Statistics (LODES)

ACS Journey to Work Survey, unlike LODES, is based on a survey distributed to a population sample, who answer the question “*At what location did this person work last week?*” The dataset is released every 5 years detailing worker flows based on the 5-year American Community Survey. The latest available dataset at the time of this study represented the

<sup>11</sup> <https://lehd.ces.census.gov/data/> & <https://www.census.gov/programs-surveys/acs/>

<sup>12</sup> LODES does not cover the self-employed, military employment, the U.S. Postal Service, and informal employment

2009-2013 ACS. As this is a cross-sectional data set, the responses may not represent all typical travel patterns not to mention there are limits to how well the information is represented since it is based on a sample. However, the dataset depicts an even lower percentage of workers commuting between these two metropolitan areas. Table 4 illustrates the results based on ACS estimates.

**Table 4 – ACS Summary of Austin & San Antonio Regional Commuter Flows**

Home Zone	Work Zone				Home Zone	CACS Regional Commuters	
	Austin - Round Rock	San Antonio - New Braunfels	Other locations	Total		Share of workers	Share of Local Employment
Austin - Round Rock	857,132	8,787	24,087	890,006	Austin - Round Rock	0.99%	1.59%
San Antonio - New Braunfels	14,239	949,300	22,442	985,981	San Antonio - New Braunfels	1.44%	0.90%
Other locations	25,029	17,148					
Total	896,400	975,235					

Source: US Census Bureau - 2009-2013 ACS Journey to Work

Given the different measurement techniques, an assumption can be made on the total commuter flows between the two metropolitan areas hovering between 1 – 6% of all work trips according to Census data. Trip purpose studies generally indicate that home-based travel to work usually accounts for approximately 20 percent of all trips on the transportation system. As a result, we would assume long distance commuter traffic in our study area amounts to a range of 0.2 to 1.2% of total traffic. While this falls within the low end of the census estimate, it is consistent with the analysis results.

Additionally, previous findings appear consistent with data reported by StreetLight® on intercity travel for morning peak-period traffic. According to an analysis conducted on morning travel for September 2017, the Austin and San Antonio Metropolitan area exchange around 0.2 percent of all morning traffic.

Other results from the analysis of StreetLight® data on morning commutes indicate large movements between immediately neighboring communities like Georgetown – Austin (22%) Georgetown - Round Rock (17%), Round Rock - Austin (47%), Buda – Austin (52%) and New Braunfels - San Antonio (20%). Communities at the center of the study area present more diversified commuting patterns. Kyle remains a big producer of commuter trips, but its trip distribution is divided between Austin (38%), San Marcos (13%) and Buda (6%). Finally similar to the big metropolitan areas, San Marcos retains the majority of its morning



commuters but has a diversified regional commuter pattern with commuters travelling to Austin (8%), Kyle (6%), New Braunfels (4%) and San Antonio (4%).

All of these data were used to quantify the number of long-range commuters travelling between the MPOs, as the findings indicate their share of the morning commute is not as significant as previously thought. Improvements to the travel time reliability in the region might spark a greater exchange of commuters between major communities, which could be served by transportation alternatives such as improve transit service provision.

### (c) CURRENT MODE SHARE

The Census Bureau also reports the current mode share, or percentage of morning commuter trips taken by each available transportation mode, as a metric for transportation planning considerations.

In 2015, the Census Bureau reported most of the morning commuter trips in the study area being done by driving a personal vehicle alone (79%). Although the trend is consistent with the national average (76.6%), Austin reports only 72% of its population commuting by single personal vehicle.<sup>13</sup>

Figure 11 - Commuter Mode Share

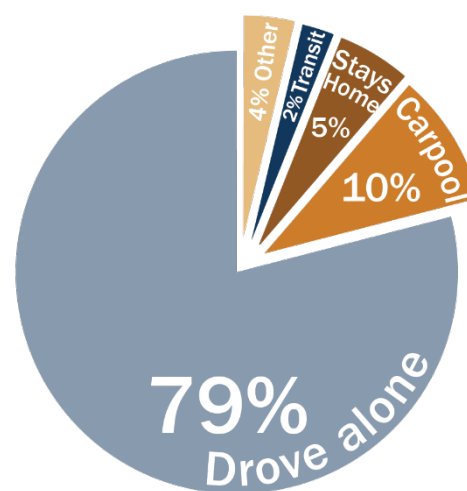


Figure 11 illustrates the average commuter share for different modes in bi-regional the study area. In comparing these percentages with national averages some observations are highlighted.

- Carpooling is reported at higher averages than the national average, especially from the City of Kyle.
- The Capital Area MPO reports considerably higher numbers of telecommuters than both the national average and the Alamo Area MPO.
- Public transit use remains lower than the national average, even scoring below walking and biking as a primary mode.

A shift in mode share within the study area will require initiatives that strengthen options beyond driving alone and trigger efficiencies in the existing transportation network.

---

<sup>13</sup> Census Bureau "Travel to Work" (ACS 1-year estimate).

### 3.7 Freight Demand

Freight data was collected to better understand freight needs and how they affect mobility of people and goods in the region. According to the 2016 Texas Rail Plan Update, “the compound annual growth rate (CAGR) rates suggest a doubling (98.9%) of rail freight tons, and a near tripling (183.7%) of rail car movements before the year 2040”.<sup>14</sup> Analysis was performed separately for rail and highway-based freight for the sake of thoroughness, with findings as follows.

#### (a) TRUCK FREIGHT

Recognizing the importance of freight traffic in the region, especially as it refers to I-35, a StreetLight® GPS-based data analysis of commercial traffic origins and destinations was performed allowing for the identification of truck freight traffic throughout the region.

Findings show more than 8 out of 10 truck movements within the study area use I-35 today and approximately 5% of all trucks traveling through at least part of the I-35 corridor use either I-410 or SH 130 as relief routes through urbanized areas.

Figure 12 illustrates the most significant commercial movements on I-35 in a directional basis. Approximately 22% of commercial traffic entering the I-35 corridor south of San Antonio travels through the entire region with 13% making the same trip in the opposite direction. The aforementioned percentages in association with 2016 traffic counts at the north and south ends of the study area, indicate that approximately 3,000 trucks a day travel the I-35 corridor without stopping. Given the nature of the data collected by StreetLight®, these percentages indicate that a preponderance of commercial trips are making at least one stop in their way through the region, at which point they should be classified as part of local traffic for at least a segment of their trip.<sup>15</sup>

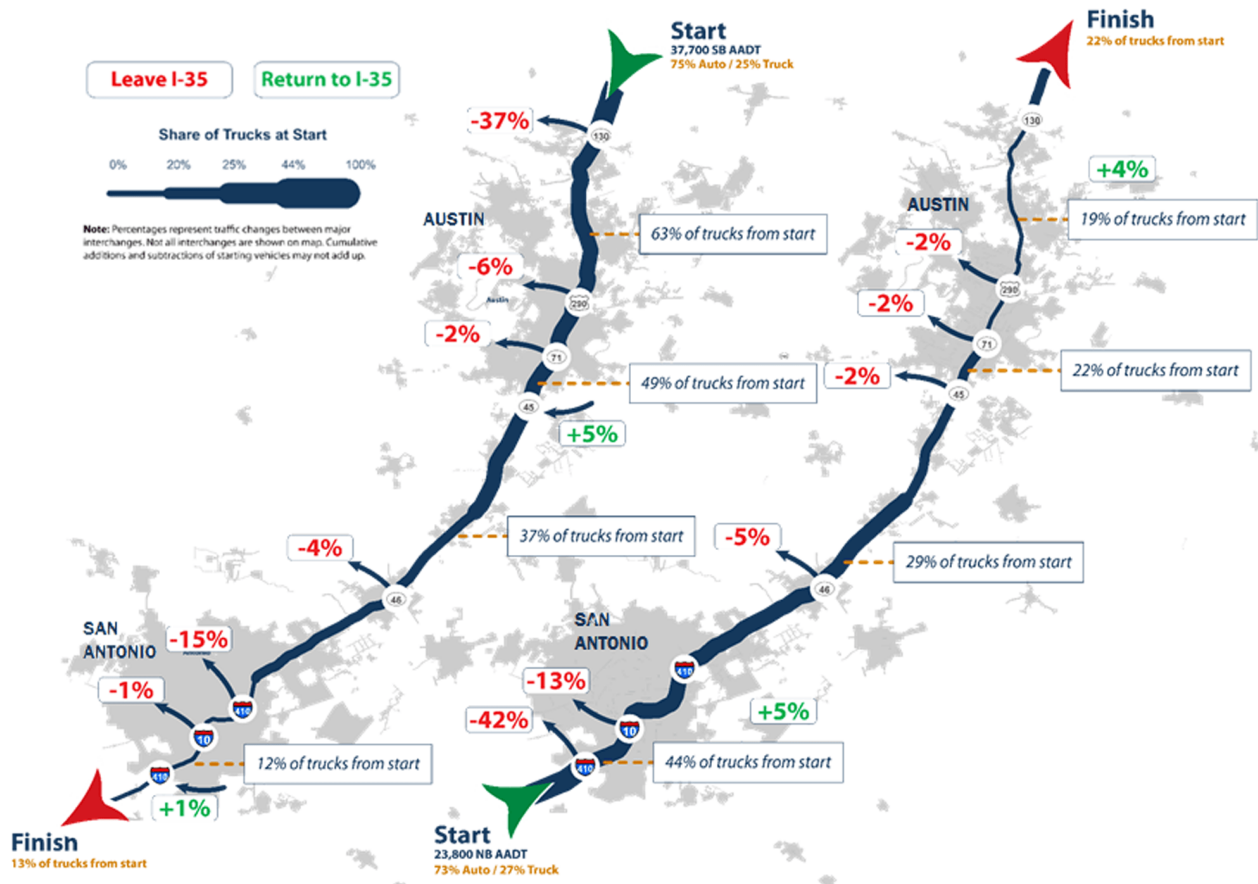
Although the calculated percentages of freight traffic on I-35 are not as high as expected, the annual volume of freight between San Antonio and Georgetown in 2010 according to the Texas Freight Plan was calculated to be between 5 Million to 10 Million tons and it was expected to escalate to between 10 Million and 25 Million tons per year by 2040.

---

<sup>14</sup> 2016 Texas Rail Plan Update, Chapter2, P.104. <http://ftp.dot.state.tx.us/pub/txdot-info/rail/2016-rail-plan/chapter-2.pdf>

<sup>15</sup> StreetLight® considers a new trip has started every time a vehicle has not moved more than 5 meters (16.4 ft) in 5 min.

Figure 12 - Commercial Through Trips on I-35



## (b) RAIL FREIGHT

Currently the Austin – San Antonio region handles an excess of between 5 to 10 million tons of rail freight tonnage through the most significant regional rail line. The UP line connecting the two metros areas is part of the heavily-used rail corridor connecting Laredo and the Upper Midwest. This single-track freight rail line represents the most viable option for rail transportation possibilities for the area. The existing line currently serves AMTRAK passenger traffic in addition to its freight operations, however approximately 2/3 of all passenger service delays on the line are due to prioritized freight operations. This is another indication of the high level of freight activity on the line. <sup>16 17</sup>

<sup>16</sup> 2016 State Rail Plan. Chapter 2. p.59 <http://ftp.dot.state.tx.us/pub/txdot-info/rail/2016-rail-plan/chapter-2.pdf>

<sup>17</sup> Performance or forecasting data for rail lines is proprietary. The data for this rail line is not readily available from UP and maybe differ from other data sources like TRANSEARCH data. However, the 2016 Rail Plan Update suggests that rail operations will be at or over current capacity by 2040.

Improvement strategies could include adding frequent sidings for passing, double-tracking, rail on parallel or new alignments, and even a freight bypass, as a means to expand freight rail operations. However, most possibilities are hindered by the fluctuating existing ROW (60 – 200 ft) and would require extensive coordination and cooperation with the privately-held rail lines. The location of the main line, through heavily-developed and populated areas also adds safety concerns to the daily operations of the system. The rail line features 88 at grade rail crossings and a relatively sharp curve near the Lamar Blvd Bridge in Downtown Austin, which reduces speed significantly.

Currently there are no publicly available plans for a relief route for the region's rail system. The need for such improvement options to remain available at some future date necessitates further studies and the continued cooperation of local authorities and private entities.

### **3.8 Modal Options**

Current transit data was obtained from Capital Metro (CapMetro), VIA Metropolitan Transit (VIA), the Capital Area Rural Transportation System (CARTS), and Alamo Regional Transit (ART) to better understand how those systems work and are intended to expand within the region. Both San Antonio and Austin have large fixed- route public transit services which are equipped to serve the role of local transportation connections. These systems serve movements mainly within the major metros with reduced service in the outlying communities between Austin and San Antonio.

In Austin, CapMetro operates a series of local bus routes (frequent-stop service & express routes) with an average of 100,000 trips per day. This service connects various Park & Ride lots into central and downtown Austin, the UT campus and several other employment centers. In addition, CapMetro operates a commuter rail line between the northwest suburbs and downtown with an average daily ridership of 3,300 people in the first quarter of 2017. For residents outside of the CapMetro service area, CARTS provides regional transportation for a 7,200-square-mile area surrounding Austin. CARTS offers limited traditional bus service, non-emergency medical transportation and other services of varying frequency for an average weekday ridership of 2,300 people in 2017.

In the San Antonio urban area, VIA operates 93 bus routes serving the majority of Bexar County. The Metro, Frequent Service, Skip (limited stop), Express and VIA routes carried an average of 116,000 person trips a day in 2017. Rural on-demand transit service for San Antonio is provided by ART, which serves 12 rural counties - Atascosa, Bandera, Comal, Frio, Gillespie, Guadalupe, Karnes, Kendall, Kerr, Medina, McMullen, and Wilson. ART provides demand response (dispatchers must be called at least 24 hours prior to the desired trip to schedule service on a first-come-first serve basis) transportation as well as connection to the

VIA service network. In the first quarter of 2017, ART provided an average of 4,000 person trips a day.

Ridership for all systems is in line with national averages of transit use but there is a regional desire to better leverage transit provision. Although, there is no national standard for what population densities can support alternative transportation modes, the Federal Transit Agency in their recent New Start program suggested that densities of 8,000 or more people per square mile are more likely to be able to support multimodal investments. Population densities corresponding to these guidelines within the study area are better positioned to be served by modal options. These areas are located within LP 1604 in San Antonio, along both Metro portions of I-35 and north of the US 183 corridor in Austin.<sup>18</sup>

### **3.9 Contributing Studies and Plans**

Agencies throughout the two regions provided data to aid in the understanding of how their near- and long-term plans address existing and future congestion issues. Expected growth and its associated challenges have sparked interest in efforts beyond the region's current solutions, not just more improvements, but on bi-regional cooperation that could create more benefits through coordination of adjoining projects.

#### **(a) PREVIOUS REGIONAL INITIATIVES**

The Lone Star Rail Project (LSTAR), overseen by the Lone Star Rail District, studied the potential development of a passenger rail line between Austin and San Antonio. Environmental studies began in 2009, focusing on a plan to relocate the Union Pacific Railroad, converting the existing rail line to passenger rail. The LSTAR study ended in 2016. Data from this study was collected and evaluated, however most of the information was out of date or was LSTAR specific and not relevant to this study. The remaining data was updated using new census data and new AAMPO and CAMPO Metropolitan Transportation Plans.

#### **(b) COUNTY & CITY PLANS**

Transportation improvement plans for each of the local governments in the study area were collected to better understand how these proposed improvements address the needs of the Austin-San Antonio Region. The Hays County Bond Program (2016), The Hays County Transportation Master Plan (2012), the Travis County Capital Improvement Program and

---

<sup>18</sup> <https://www.planetizen.com/node/77132/its-time-talk-about-national-minimum-urban-density-standards>;  
<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/NewStartsPolicyGuidance.pdf>

Bond Capital Improvement Program (2017), the Comal County Major Thoroughfare Plan (2010), the Williamson County Bond (2016), the Caldwell County Transportation Plan (2013), the San Marcos Transportation Master Plan (2018) as well as the current city thoroughfare plans were collected through this effort. Transportation Improvement Plans for cities in the study area were also collected including the San Antonio Bond and Multimodal Transportation Plan as well as the 2018 Austin Strategic Mobility Plan. The MPO Regional Arterials Plans were under development during this study and are therefore not included as a source.

**(c) METROPOLITAN TRANSPORTATION PLANS (MTP) & UNIFIED TRANSPORTATION PROGRAM (UTP)**

The AAMPO and CAMPO Metropolitan Transportation Plans (2040 and 2045), as well as TxDOT's Statewide Transportation Improvement Program and Unified Transportation Program, were obtained to evaluate the projected improvements in the region. In total, nearly \$6 billion of highway improvements are anticipated on I-35 by the year 2040, funding notwithstanding. Investments in other major north-south corridors (e.g. SH 130 & US 281) and connections are not as sizable, totaling less than \$1 billion.

**(d) INCIDENT MANAGEMENT PLANS & TRANSPORTATION SYSTEM MANAGEMENT AND OPERATIONS (TSMO)**

The goal of Incident Management Plans is to ameliorate congestion exacerbated by traffic incidents such as crashes, load spills, and vehicle breakdowns by expediting the detection, response and clear up time of traffic incidents in the quickest and safest manner. Both MPOs are currently developing and approving new Traffic and Regional Incident Management Plans for their jurisdictions. These plans should be considered at the time of their approval.

In lieu of these documents, the CACS study team collected information on existing and planned localized intervention incident management response initiatives. The Highway Emergency Response Operator (HERO) Roadside Assistance Program in Austin, is a partnership between TxDOT and CAMPO, intended to assist drivers and aid in the cleanup of minor crashes along main metro corridors with a view to reduce delay times and incidence of secondary crashes. It has been met with considerable success and has been recently expanded. A similar initiative, the Work Zone Warning Initiative powered by Austin's Mobility35 data collection program, concentrates on promoting awareness of construction zone activities along I-35.



San Antonio launched the Wrong Way Initiative in 2011 sponsored by TxDOT with cooperation of local public agencies. The initiative, led by a multiagency task force, has generated advances in identification of hotspots, countermeasures and enforcement practices. Pilot projects for sections of US 281 and I-35 have been already implemented with considerable success. Both programs are part of the upcoming incident management plan updates.

Transportation System Management and Operations (TSMO), on the other hand, is a statewide initiative to address current safety and congestion challenges. Through the establishment of the TSMO Strategic Plan, TxDOT aims to improve mobility by creating a system of operating procedures and regional partnerships that prioritize mobility through the application of technology and other innovative techniques.

#### **(e) LONG RANGE PLANS**

Transportation and Thoroughfare plans for the two regions were also collected to understand gaps in the network associated with changes in jurisdiction and opportunities for better network integration. The study team collected the Kyle Transportation Master Plan, the Buda Transportation Master Plan 2013 and the Hays County Thoroughfare Plan 2016 for the Capital Area MPO. Future plans for the Alamo Area Capital Area were collected including the Schertz Thoroughfare Plan 2017, the Guadalupe County Thoroughfare Plan 2017, the San Marcos 2035 Thoroughfare Plan as well as the Seguin Transportation Master Plan 2017.



### 3.10 Key Takeaways

The following includes the key takeaways from the data analysis presented to the stakeholders, which were carried forward into the development of strategies.

---

#### *I-35 is the PRIMARY regional connection*

---

- ✓ It has the highest AADT (4:1), highest truck traffic and worst congestion in the area.
- ✓ Population and Employment concentrations are located in close proximity to I-35.

---

#### *The market is US*

---

- ✓ Local trips and short-range commuters are the main users of regional roadways.
- ✓ Metro-to-metro commuter trips are relatively low, but they may be a latent market.

---

#### *Bet on the central corridor for development*

---

- ✓ Development patterns suggest that the I-35 corridor is the backbone of future growth between the regions.
- ✓ Population distribution and lack of ROW suggest a need for corridor preservation to enhance the support network for the central corridor.

---

#### *Freight traffic on I-35 is generally NOT through traffic*

---

- ✓ Eight out of 10 truck movements within the study area use I-35 today.
- ✓ There is only between 18-22% of trucks travelling all the way through the study area.

---

#### *Local improvements can do much to improve quality of life*

---

- ✓ Operational improvements can help alleviate localized problem spots.
- ✓ Safety and operational improvement of rail crossings, and bottleneck intersection could have regional impact.

---

#### *Communities are invested in MORE collaboration*

---

- ✓ Expansion of coordination efforts through the last decade and increased interest in partnerships by regional agencies points to a recognition of opportunities and benefits to regional cooperation.



## 4. Stakeholder Engagement

Stakeholder engagement was an integral part of the Capital- Alamo Connections Study. Stakeholder outreach occurred throughout the study process. Input provided by stakeholders confirmed and expanded on the needs and challenges within the study area as defined in the technical analysis, ensuring it provided an understanding of the physical, financial, and political feasibility of potential recommendations. For a detailed account of these efforts refer to Appendix C – Stakeholder Engagement Analysis of Findings Report.

### 4.1 Approach and Timeline

The stakeholder involvement effort of the study aimed to communicate the purpose of the study, gather relevant data and information regarding needs and challenges, and create a feedback loop between meetings. Feedback was solicited on the overall study approach, the identification of additional stakeholders, as well as the development and definition of potential strategies to address transportation needs.

Key goals of the stakeholder involvement included:

- Identify stakeholders,
- Establish and maintain interactive communication with stakeholders,
- Provide easily accessible, relevant, and meaningful information to stakeholders,
- Consider all reasonable input from stakeholders, and
- Provide stakeholders with the opportunity to participate in the development of the study and to be fully engaged and informed throughout the study process.

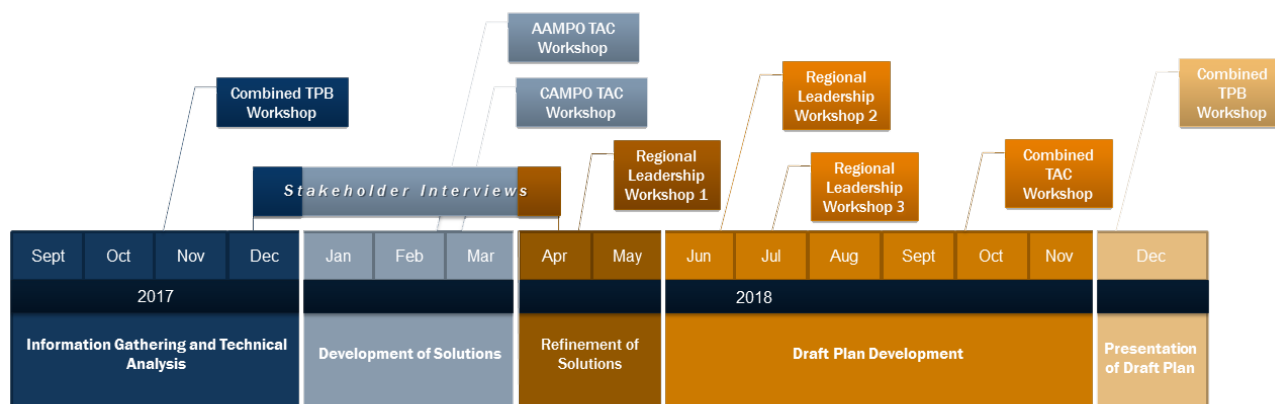
The study team worked closely with organizations and individual stakeholders to incorporate their input into the study recommendations. The study, aimed at providing overarching bi-regional strategies, did not include general public outreach as part of the process given its high-level nature. As solutions continue to be developed, it is anticipated that public input will be sought through the planning processes of the respective agencies involved.

Figure 13 illustrates the overall project timeline and stakeholder outreach process. The stakeholder engagement process utilized various strategies to inform and gather input from stakeholders including:

- i. [Project website](#), including study background, purpose, and schedule
- ii. One-on-one stakeholder meetings/interviews
- iii. Workshops with MPO TAC members
- iv. Workshops with Regional Leadership at TxDOT and MPOs
- v. Workshop with MPO TPB members

- vi. Regular updates at monthly MPO TPB and TAC meetings
- vii. Targeted updates to key stakeholders via email, including study data pamphlets, fact sheets, and maps

Figure 13 Stakeholder Outreach Schedule



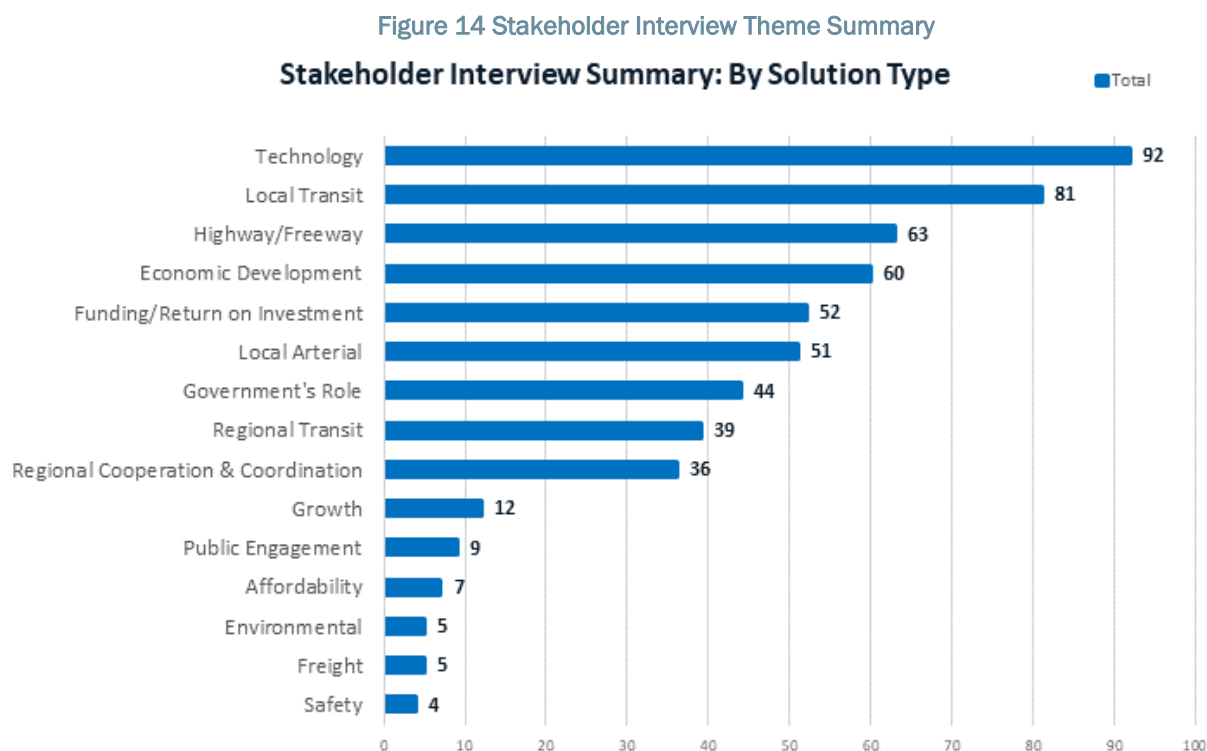
## 4.2 Individual Stakeholder Outreach

The project team conducted individual stakeholder interviews with key transportation influencers and decision makers within the study area: City managers, County commissioners, Transportation Policy Board members, transit agencies, key peer entities, and technology companies. The purpose of the interviews was to understand various perspectives on challenges and opportunities related to infrastructure, policy, and technology improvements.

A list of potential stakeholders was developed and updated throughout the interview process. Twenty-six interviews were held between December 2017 and April 2018. A general list of questions was developed that remained consistent throughout all interviews, although the structure of each discussion was conversational and varied based on stakeholder interests.

The stakeholder interview process was intended to reflect input from decision makers within the two regions and provide insight as to how people in leadership positions think about bi-regional transportation issues. The discussion regarding impacts of increasing transportation challenges and potential solutions gave the project team a sense of the political feasibility of prospective solutions. In total, 560 comments were recorded which were consolidated into a list of key themes.

Figure 14 below depicts the number of comments received related to each topic area. The highest scoring categories were technology and local transit.



### 4.3 Joint Transportation Policy Board (TPB) Workshop 1

On November 1, 2017, an introductory joint workshop was held for Transportation Policy Board members of both CAMPO and AAMPO at the New Braunfels Civic Center. The intent of the workshop was to present an overview of the study; receive input on transportation needs and challenges; and begin a discussion on infrastructure, policy, and technology solutions within the two regions. Attendees participated in two main activities during the workshop:

- Discussion of an overall Long-Range Vision for the bi-regional area. Board members were asked to list top challenges and opportunities both singularly and jointly for their regions.
- Discussion of specific Regional Needs and Challenges. Board members engaged in round-table discussions on infrastructure, policy, and technology needs and challenges.

During the workshop, stakeholders expressed the need for expanded multimodal transportation options, greater coordination between land use and transportation, concern regarding congestion and delay along I-35, lack of funding options for transportation improvements, and the lack of political will to pursue major investments.

#### 4.4 CAMPO and AAMPO Technical Advisory Committee Workshops

Workshops were held for the Technical Advisory Committees (TACs) of both CAMPO and AAMPO on February 23, 2018 and March 5, 2018 respectively. These workshops presented the results and analysis from the first combined TPB workshop. Both committees received the same presentation materials and activities. The workshops were structured to gather detailed input on potential infrastructure, policy, and technology recommendations.

Attendees engaged in three activities during the workshops:

- An **Infrastructure** micro-charrette, where team members discussed existing and planned projects in each region, as well as any gaps/opportunity areas. On infrastructure, both groups recommended improved connectivity between main transportation corridors, and identified a need for long-distance transit using potentially dedicated lanes.
- A **Policy** “circles and soup” exercise encouraged TAC members to consider the level of influence that MPO organizations and the State have on various policy considerations. In this realm, both groups expressed a need to formalize regional coordination and improve regional thoroughfare planning and corridor preservation. They also expressed a desire for broader land-use regulation and planning authority, more flexibility in funding between modes.
- A **Technology** preference survey, which asked attendees to rank their preferences for existing or emerging technologies based on what they believe to be their appropriateness for the study area. In this regard, both TACs generally placed higher importance on Integrated Corridor Management & Information Technology Systems (ICM & ITS) as well as transit-related solutions, and less importance on technologies emerging from the private sector.

#### 4.5 Leadership Workshops

The team hosted three workshops attended by TxDOT, CAMPO and AAMPO leadership. These workshops were intended to provide direction in developing the overall study documentation and finalizing study recommendations.

The first workshop was held on April 30, 2018. It included an overview of progress to date along with input collected from the MPO TAC workshops. Group discussion focused on tolling, rail or other high-capacity transportation modes between the Austin and San Antonio regions, land-use policy, and next steps as these remain at the forefront of the public consciousness.

The second and third workshops were held on June 29 and July 30, 2018 respectively. They included follow-up discussions on the overall plan documentation, presentation, and recommendation categories.

#### 4.6 Joint TAC Workshop

On October 2<sup>nd</sup>, 2018, TACs from both MPOs came together for the first Joint Technical Advisory Committee meeting in the region. The objective of the workshop was to present a shared point of reference for recent study findings as well as to provide a vetting opportunity for proposed strategies. Participants were grouped based on their areas of expertise and interest.

The workshop was hosted by both MPO directors, who emphasized the importance of the input these groups could bring into shaping transportation strategies. The joint TACs analysed and worked on 59 strategies and 117 tactics divided into 5 main topical groups. Each group proceeded to review and modify the draft listing of strategies and their corresponding tactics as assigned to their table.

Modifications and additions to the proposals included more inclusive and specific language changes to make strategies more action oriented and include more local partners. TAC members required a higher level of coordination between the strategy groups themselves and strategies that supported a more formalized bi-regional relationship. Reconfiguration of several tactics in order to fast track some of their elements was also requested. On the topic of technology and intelligent road management the group decided to move away from specific technologies in order to remain flexible to future changes.

#### 4.7 Joint TPB Workshop 2

On December 5, 2018, a second workshop was held for Transportation Policy Board members. The intent of the workshop was to present the full set of proposed strategies as developed by the TAC members and study team for consideration and prioritization by the members of the TPB.

Figure 15 – Welcome address at the Capital-Alamo Joint TAC Workshop



During the workshop, TxDOT representatives presented a review of the study definition and rationale, emphasizing the dimension of the expected regional growth and its potential impacts to the regional transportation network. The workshop also included a brief overview of the study schedule and its progress and findings from the regional movement analysis (refer to Chapter 3 for more details). Attendees were also provided with an update on coordination efforts developed through the series of workshops previously discussed. The presentation concluded with a brief address by the MPO directors who outlined current and recent bi-regional coordination efforts.

Figure 16 – Prioritization Exercise at Joint TPB Workshop 2



The workshop section of the program focused on a prioritization exercise allowing attendees input into the pre-vetted strategies and their prioritization. Results highlighted the desire to advance improvement strategies as soon as possible. Comments by attendees focused on providing new ways to connect SH 130 and I-35 and the need to consider the economic development aspects of such improvements.

#### 4.8 Summary of Themes

Throughout the engagement process, the project team received a wide range of comments with several key themes emerging as top issues for stakeholders. These include the following:

- **Bi-regional coordination.** It discussed large-scale infrastructure improvements, land use and transportation policy, funding, etc. Stakeholders saw benefits in increased and formalized coordination between agencies to implement necessary improvements. These interactions also allowed the opportunity to highlight the work already being done in close coordination with other agencies.
- **ICM & ITS.** A top interest for TAC and TPB members, ICM involves maximizing the use of existing infrastructure through technology and improved coordination between modes, recognizing the importance of utilizing innovative practices.
- **Local transit.** Stakeholders throughout the study area expressed interest in improving transit options, such as line-haul bus service and more options for last-mile connections. While long-distance (regional) transit options were important and desired, stakeholders remain concerned with serving shorter-distance trips.

- **Improvements to I-35.** As the corridor recognized as the central connection between the San Antonio and Austin metro areas, I-35 was discussed in terms of managed capacity, transit options, new connection points, incident response times and general expansion.
- **Funding.** Funding availability was a key concern for many stakeholders, including elected officials and government agencies. Many were seeking greater flexibility in funding across modes, more funding options or expressed interest in innovative funding strategies.

These themes resurfaced throughout the process, in terms of technical analysis and development of recommendations providing overall context and direction for the study.



## 5. Regional Strategy Development

As a wide-ranging bi-regional study, the Capital-Alamo Connections Study identifies high-level recommendations that combine the needs of both CAMPO and AAMPO by aligning with plans that have already been developed to provide a consistent bi-regional strategy and overarching direction.

Recommended strategies from the study have been grouped into categories and are prioritized within the 25-year MPO planning horizon.

- **Short-term** recommendations run from now to 5 years, and include support for many efforts already underway or funded,
- **Mid-term** recommendations span the time period from 6 to 15 years
- **Long-term** recommendations will be implemented between 16 to 25 years.

Although TxDOT, CAMPO and AAMPO guided this study, implementation of the recommended strategies may fall within the jurisdiction of individual MPO member agencies and surrounding communities.

### 5.1 Strategy Structure

The Capital-Alamo Regional Strategy is organized in five thematic groups that address the concerns and aspirations of the partners in this effort: Priority Transportation Corridors, Integrated Corridor Management (ICM) & Intelligent Transportation Systems (ITS), Arterial Improvements, Modal Options and Regional Coordination.

Strategies were developed by reviewing current transportation plans and programs from each MPO and local jurisdiction within the study area, incorporating input from MPO groups, gathering contributions from local stakeholders and integrating further technical analysis. The most notable considerations of current efforts for each strategy group are included below.

Figure 17 - Strategy Inputs



## 5.2 Regional Coordination

Collaboration between MPOs and TxDOT was the backbone of this study but it has not been the first instance of cooperation in the region. MPOs provided a historical record of their coordination efforts, as depicted in Figure 18. This history showcases the need and willingness to work with regional partners. Coordination across transportation planning boundaries is an ongoing concern as expressed by stakeholder outreach results. While these areas have made great strides in this respect, there are still several avenues to regional coordination that could be used moving forward.

Presently in addition to this study, the MPOs are coordinating long-range plans for the arterial networks, bicycle and pedestrian networks as well as safety and incident response improvements.

The FHWA framework for regional models of cooperation recognizes the need for regions to coordinate on asset and congestion management, economic development and most relevant to this effort: transportation planning efforts including freight and transit services. The framework also defines the main elements of a successful regional cooperation structure. CAMPO and AAMPO excel at establishing a culture of collaboration, allowing a diversity of opinions and fostering a bi-regional relationship. However, both agencies have expressed a willingness to allow coordination at all levels of the organization which will require formalization of current efforts and the start of technically based exchanges.

Regional Coordination Strategies were developed based on the federal framework previously discussed as well as research into best national practices as outlined in Appendix B. They aim to move regional coordination efforts from ad-hoc efforts like the present study to a

level of cooperation that can allow the development of joint planning documents. Strategies are meant to build on each other, from formalization and sharing of current practices through information sharing and objective definitions into coordinated committees focusing on specific action topics.

Results of the Strategy Plan as a whole are largely dependent on continued communication and collaboration between regional parties, making the Regional Coordination Strategies the cornerstone of continued success.

**(a) OPPORTUNITIES TO LEVERAGE PARTNERSHIPS, FUNDS AND ASSETS**

The growth of the Austin and San Antonio regions may lead to greater opportunities to leverage funding and partnerships for the benefit of the whole. High-growth regions with low cost of living, high quality of life and an educated workforce are quickly adding population and employment opportunities that can bring considerable influence to decisions related to locating, funding, or financing private or public sector projects such as those listed below.

- Big- scale employment generators (e.g. recruiting corporate headquarters, international businesses),
- Federal funding for transportation and other infrastructure improvements,
- Economic diversification,
- Major airports, and
- National sports teams.

Greater cooperation and partnership between regions could lead to collaboration on major endeavors. The federal funding process for transportation or other infrastructure projects is highly competitive. Authorities look for certain attributes and characteristics as well as a track record of successful partnerships to award competitive grant funding. These attributes include:

- Agreement and participation among all levels of government,
- Local match funds or partnerships between regions leading to expanded local funding opportunities that demonstrate commitment,
- Community support built through coordination in messaging and public involvement, and
- Coordination between entities involved in the planning, implementation, operation, and ongoing maintenance or monitoring of projects.

As congestion increases within these regions, smaller-scale improvements will be unable to mitigate safety and delay concerns. Expanded coordination, collaboration, and funding partnerships will open up greater opportunities for large-scale improvements within the infrastructure, policy, and technology arenas.

Figure 18 - Alamo Area and Capital Area MPO Coordination Timeline



### 5.3 Integrated Corridor Management (ICM) and Intelligent Transportation Systems (ITS)

Stakeholders expressed a desire to increase the efficiency of the existing transportation network as a primary and short-term objective. The implementation of new ICM & ITS systems and the integration of existing ones will provide broader regional benefits. The TxDOT spearheaded the development of a Transportation Systems Management & Operations (TSMO) Statewide Plan, released in late 2017, outlining the state standard for management and operation of ICM systems. The TxDOT Austin District has a recently released TSMO plan. However, development of other TxDOT district specific plans is being developed in a tiered-fashion that is focused on tool and system implementation of most interest to each District.

There are several corridor-based programs for ICM implementation at the statewide level. The Texas Connected Freight Corridors, sponsored by TxDOT, seeks to support the eventual deployment of automated vehicles in Texas by building the first stage of “connected infrastructure along the primary Interstate system”. The vehicle-to-infrastructure (V2I) communication pilot program will allow data collection from 1,000 especially-outfitted commercial vehicles which will be used in the first step towards the creation of in-vehicle warning systems for pedestrian/animal presence, queue, road and weather conditions.

Other ongoing opportunities to further ICM efforts include local ITS systems deployed by the cities of Austin & San Antonio.

Analysis of current efforts and best-practices allow for the identification of six ICM priority areas for the Capital-Alamo study area: ITS capital improvements, ICM systems and emergency response and incident management, active traffic monitoring, traveler information systems and demand management. Even with current local advancements in all these areas, main challenges remain coordination, consistency and continuity of objectives and system integration.

Strategies in this group focused on improving communication and data exchange between jurisdictions for both traffic management and incident response. Short term strategies focus on actions that define and clarify terms and objectives across boundaries as well as joint research into current technological advances. The objective is to create a level playing field of knowledge for the entire region, which can serve as a framework for technological cooperation and future system redundancies.

## 5.4 Modal options

According to technical analysis and stakeholder contributions, currently the main challenges to the movement of goods in the region are the high level of traffic in both the rail network and the highway system, coupled with a lack of alternative routes.

Transit provision and technologies were investigated as part of the development of modal options strategies. Analysis of transit service areas, provision structures, historical ridership totals, and system integration levels pointed to the existence of well-developed urban transit agencies in the metropolitan areas. As a result, strategies were developed focused on continued investments in urban areas. However, based on differences in service provision strategies, strategies for rural transit agencies centered on better coordination.

Regional gains could be achieved by developing opportunities in transit services across regions. Currently intercity options are lacking. The scope of rural transit services linked to each metropolitan area is inconsistent, and there are no agreements in place to allow for system transfer at jurisdictional boundaries. However, travel pattern analysis determined that there is a market of localized trips which could benefit from increased modal options across jurisdictions. Currently such services are not widespread, and they do not exist between the two regions. Information sharing between non-associated transit agencies occurs in an ad-hoc manner and on a case-by-case basis.

Short range strategies for providing modal options were developed to support transit service expansion to immediate suburban communities, with additional recommendations to research technological advancements that can spark system efficiencies. Much like the ICM & ITS strategies, multimodal options require better integrated platforms to allow an efficient exchange between systems. The ultimate objective in the long-term is to provide a pathway towards the potential implementation of integrated megaregion transit service by phasing improvements to regional transit systems and optimizing the points of integration.

## 5.5 Priority Transportation Corridors

Interstate 35, State Highway 130 and US Highway 281 were named as Priority Transportation Corridors by this study based on their capacity, regional reach as well as their role as main north-south connections. Each of these facilities has extensive rural segments and urban portions through major communities in this study area, however they remain entirely under TxDOT jurisdiction.

I-35 is a major national connection as well as the main regional connection in the study area. A statewide effort to identify needs and solutions for the entire corridor was completed in 2011 (I-35 Corridor Advisory Committee 'My35' Plan) which has led to improvements in

many segments of the corridor statewide. The Mobility35 Program in the Austin area and other I-35 projects in the San Antonio area stem from that effort and aim to expand the interstate capacity and improve safety on the corridor as quickly as funding and project development allows.<sup>19</sup> In the study area, the Austin and San Antonio TxDOT Districts are actively working on improvements to relieve congestion along I-35 which are included in the MPO Transportation plans.

SH 130 was built as the regional fast-moving alternative to the I-35 corridor and while it continues to function in this capacity, study findings support the conventional wisdom suggesting it now serves a considerable amount of “local trips” through some of its sections.<sup>20</sup> As a response to increased demand, capacity expansions are underway for the northern segments of SH 130. At the southern end of the region, stakeholders believe that additional links to I-35 could improve the use of SH 130 for regional mobility and improve access to adjacent communities.

US 281 has two main initiatives underway. The first one addresses improvement of various roadway structures and the second defines a long-range improvement program, both of which depend mostly on state allocated funding. The objective of the US 281 improvement program is to increase safety and address several congestion hotspots north of San Antonio, in Blanco and around Marble Falls where the facility is burdened by local trips. However, the analysis of current and forecasted conditions after improvements are completed highlights opportunities to advance improvements with bigger regional benefits.

Development of strategies for this group of priority corridors focused on infrastructure improvements and implementation of supporting policy. As such, short-term strategies focus on basic infrastructure analysis and inventory to prioritize localized improvements at safety deficient intersections and support the completion of the I-35 improvement program in both the San Antonio and Austin Districts. Strategies for the mid- and long-term periods are meant to complement on early improvements and further address capacities.

Strategies dealing with the improvement of any of these corridors will be the responsibility of TxDOT, supported by the MPOs. The local implications of any improvement will require collaboration and buy-in from local governments.

---

<sup>19</sup> <http://www.my35.org/>

<sup>20</sup> <https://www.txdot.gov/inside-txdot/media-center/local-news/austin/039-2018.html>



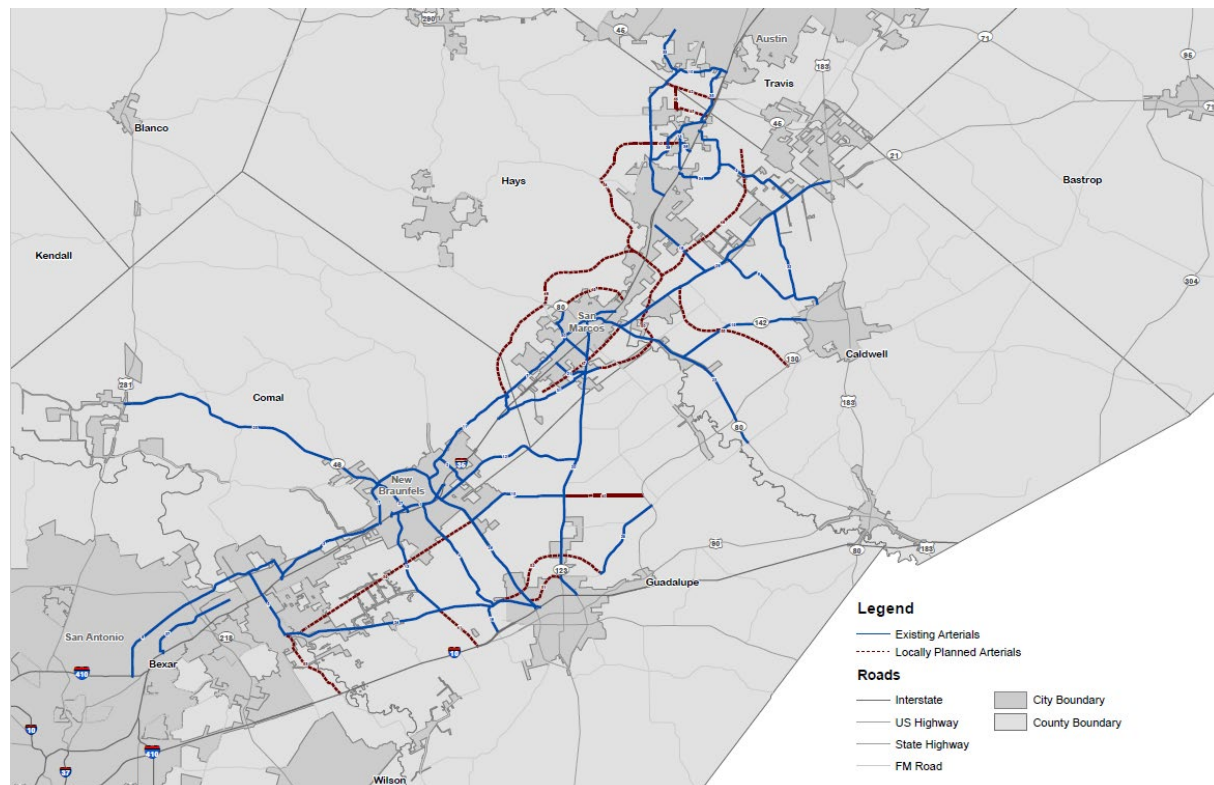
## 5.6 Arterial Improvements

Technical analysis and input from regional stakeholders made evident the need for a more extensive and better-connected transportation network. This is particularly necessary to support movement along priority corridors in case of sudden congestion as well as to address local movements. Efforts were concentrated on the space between the San Antonio and Austin metropolitan areas to facilitate better integration at the jurisdictional boundaries.

The Executive Steering Committee for this study, recommended concentrating on the improvement of arterial options in the “gap” between the two metropolitan area boundaries and MPO TAC members identified a total of 26 local facilities currently providing north-south alternative connections. These facilities include a total of 235 miles that could provide relief to I-35, with local entities planning another potential 30 miles of new construction in facilities considered in the long term. Refer to Figure 19 - Existing and Planned Local Arterials for the existing and planned local arterials between the Austin and San Antonio areas at the time of the analysis.

Improvements to these facilities that increase efficiency and throughput of various modes could face significant environmental and funding challenges if they require ROW expansions or alignment changes, making early identification of strategic local connections a priority to implement a proactive bi-regional arterial strategy.

**Figure 19 - Existing and Planned Local Arterials**



In response to the concern expressed by both MPO's about the potential best use of their arterial network in the development of the region, a need-identification framework was developed to pin point those facilities that would have not only a local access benefit but could alleviate congestion on a larger scale.

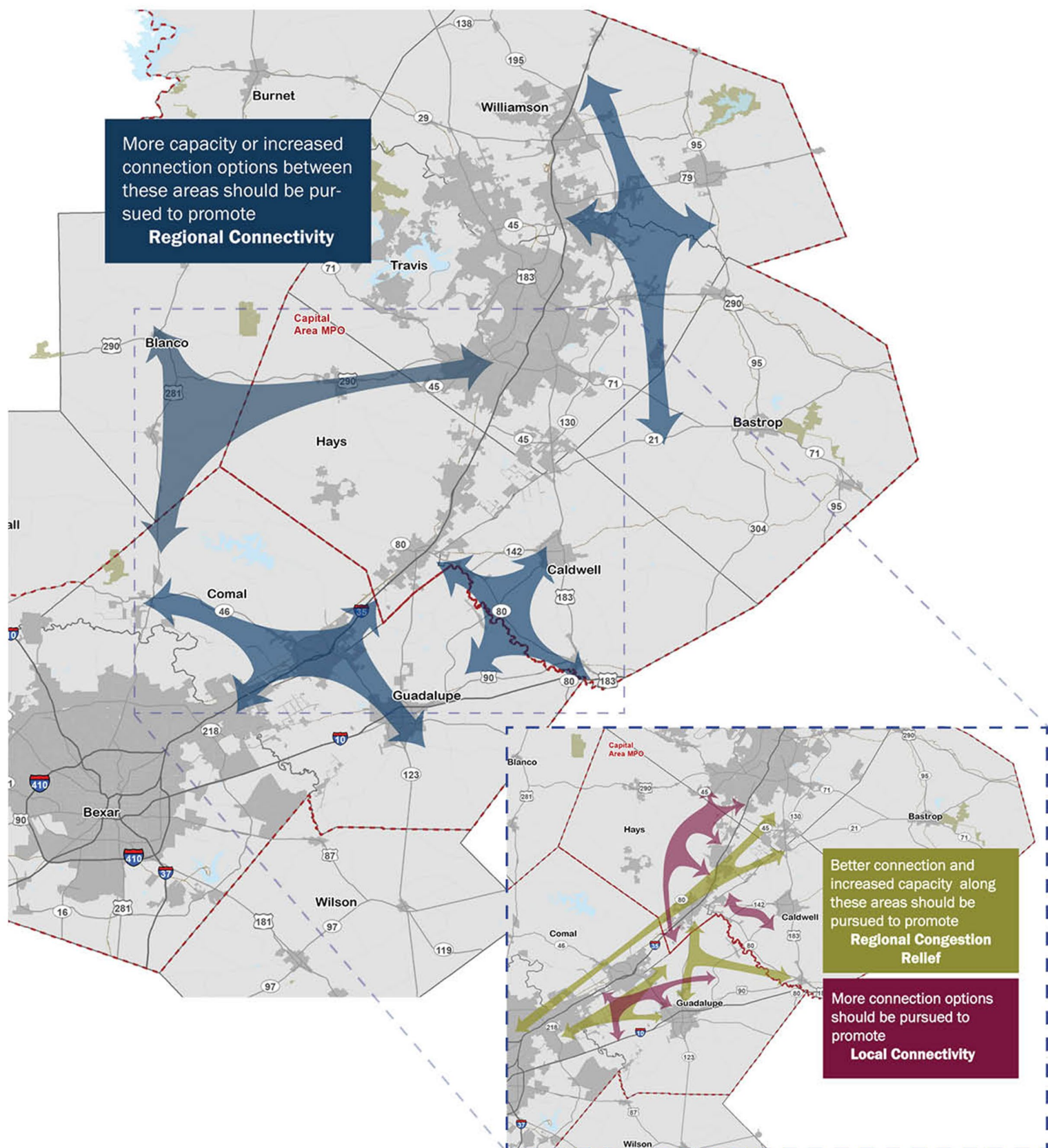
The following factors were used in the technical review of all arterials included in local and county transportation plans, as well as conceptual and generalized alignments of future facilities proposed by MPO TACs:

- Current & Future Travel Volumes
- AADT
- Peak and Directional Factors
- Existing Cross Section & Length
- Crashes Histories (Totals & Rates)
- Environmental Constraints
- Construction Risks
  - o Environmental Risks
  - o Community Support & Impacts

The compiled information for an expanded universe of 55 relevant arterials was weighted and scored based on preferences expressed by the MPOs. These results permitted the crafting of a general regional recommendation for arterial improvements, as depicted in Figure 20, identifying which type of objectives should be applied to arterials groups addressing different types of movements.

The Executive Steering Committee and Regional Leadership contributed to the refinement of these overall recommendations prior to their review and approval by the TACs and TPBs.

Figure 20 - Arterial Improvement Regional Strategies



## 6. Regional Strategy

The Regional Strategic Plan outlines the strategies recommended for enhancing the mobility between the Capital - Alamo area. The following chapter defines these strategies and details the actions and entities involved in their realization.

### 6.1 Regional Strategic Plan

The Capital-Alamo Regional Strategic Plan is arranged by thematic groups and recommended timeframes. The attributes accompanying each of the strategies represent the following:

#### *Timeframe*

Specific timeframe designated for each strategy to program needed improvements through coordinated actions




#### *Strategy*

Definition of the recommended improvement strategy.

#### *Tactics*

Provides an initial guidance on actions to be implemented to achieve the recommended strategies.

#### *Overarching Topics*

Refers to the three main improvement themes as defined by outreach efforts: Technology () , Policy () , and Infrastructure (). These overarching topics provide an additional framework for the implementation of the recommended strategies.

#### *Potential Local Partners*

Identifies the potential agencies and stakeholders expected to coordinate to implement the recommended strategies. Since they may require may cross-agency planning and execution.

#### *Underway* ()

Denotes tactics where progress is already being made through prior or current efforts.






#### *Strategy Coordination*

Denotes tactics which have been identified as requiring coordination with other strategy groups for optimal effectiveness.



## a. Regional Coordination Strategies

Transportation agencies use a range of alternatives to improve coordination while retaining jurisdictional control. The following delineates the Capital- Alamo Connections Study strategies geared towards strengthening and expanding regional cooperation.

Strategy	Tactics	Topics	Potential Partners		Coord.
SHORT TERM (2019-2024)					
Formalize interagency coordination efforts	Continue bi-regional cooperation on matters of common interest, particularly related to longer distance transport needs, by establishing a regular bi-regional update between MPOs		CAMPO, AAMPO, TxDOT, Cities, Counties, Transit Agencies	x	
	Draft a document to establish future shared goals				
	Identify potential “Early Win” projects that can encourage membership participation in additional efforts			x	
	Develop a coordinating body out of initial interagency coordination efforts				
Create a joint website to document coordination efforts	Share information about transportation efforts carried out by each agency		CAMPO, AAMPO, TxDOT	x	
	Publicize past coordination efforts and ongoing success			x	
Formalize an agreement to share planning data and shared performance measures among the two MPOs, local governments and transit agencies	Share current performance data and measurement approaches		CAMPO, AAMPO, TxDOT		ICM & ITS
	Share growth assumptions and regional travel demand model results				
	Define and track performance measures that are relevant to all communities, such as I-35 travel time reliability				
Develop a bi-regional travel	Hold workshops on regional growth assumptions and travel		CAMPO, AAMPO		







Strategy	Tactics	Topics	Potential Partners		Coord.
demand model	impacts				
	Track demographic and travel trends, as well as emerging demands			x	
Define bi-regional objectives for improvement of mobility and connectivity	Share performance measures and objectives		CAMPO, AAMPO		ICM & ITS
Define performance measures dealing with mobility between the regions	Develop combined performance measures that focus attention on cross-jurisdictional travel issues based on current regional performance measures.		TxDOT, CAMPO & AAMPO TACs		
MID TERM (2025-2035)					
Create a policy-level cooperative body between both regions including representatives from all members of the Capital-Alamo Connections Study partnership.	Foster interlocal agreements between neighboring jurisdictions to develop shared transportation policies relevant to specific projects		CAMPO, AAMPO	x	
	Hold regular meetings of decision-makers from both regions to promote project level cooperation			x	
Implement bi-regional solutions to improve mobility and connectivity	Execute coordinated strategies for short- and long-range planning for projects of a bi-regional or bi-jurisdictional basis		CAMPO, AAMPO, Transit Agencies		
	Perform project prioritization process for bi-regional impacts				
Create a bi-regional technical committee focused on topics of shared concern	Focus on areas that affect both regions jointly, such as freight movement, rural transit, passenger rail, and emerging technologies		CAMPO, AAMPO, TxDOT	x	
	Facilitate conversations and agreements with public and private stakeholders to improve mobility in the region			x	










Strategy	Tactics	Topics	Potential Partners		Coord.
	Coordinate studies and shared planning documents related to specific transportation projects of mutual interest				
LONG TERM (2036-2045)					
Develop Combined Planning Documents	Collaborate on the development of a shared long-range transportation plan		CAMPO, AAMPO, Transit Agencies		
	Facilitate continued partnerships with transit agencies across existing service boundaries				Modal Options













## b. Integrated Corridor Management (ICM) & Intelligent Transportation Systems (ITS)

ICM & ITS Strategies provide guidance on how to make a more efficient use of the current transportation infrastructure and make travel more reliable by relying on coordinated, multijurisdictional operations, which will be crucial to adapting to emerging technologies.

Strategy	Tactics	Topics	Potential Partners		Coord.
SHORT TERM (2019-2024)					
Coordinate Emergency Roadside Assistance Programs Throughout Region	Achieve continuous roadside assistance on I-35 corridor between San Antonio and Georgetown		TxDOT, CAMPO & AAMPO TACs		
	Coordinate dispatching between operators in each TxDOT District and local jurisdictions				Regional Coord.
Define regional priorities for corridor management	Establish an ICM and ITS Task Force to coordinate local Traffic Management groups and define regional priorities for emergency response as well as incident and construction management	 	TxDOT, CAMPO & AAMPO TACs		Regional Coord.
	Coordinate and develop interregional efforts related to emergency response and incident management, construction management, and ITS systems				Regional Coord.
	Prioritize areas that would benefit from regional systems coordination				
Map existing and planned ITS systems, owners, and interagency agreements	Review ITS Master Plans for Austin and San Antonio Districts		TxDOT, CAMPO & AAMPO TACs		
	Review local systems maintained by major cities in the region				
	Identify gaps or incompatibilities between the systems				
Coordinate Austin and San Antonio District Transportation	Find opportunities to coordinate plans between areas		TxDOT, CAMPO & AAMPO TACs		Regional Coord.

Strategy	Tactics	Topics	Potential Partners		Coord.
System Management & Operations (TSMO) activities	Where TSMO coordination is required, establish procedures for engaging across jurisdictional boundaries			×	
	Share innovations and project successes between regions				
Identify data sources for operations performance measures dealing with mobility between the regions	Identify new or existing technologies that could enable mobility tracking between regions	 	TxDOT, CAMPO & AAMPO TACs		
	Identify existing road technologies and new technologies that support performance measure tracking				
Implement an Interregional, Integrated Corridor Management System for I-35	Develop corridor management strategies, such as active traffic management, traveler information systems, demand management, and incident management	 	TxDOT, CAMPO & AAMPO TACs		
	Engage stakeholders, including TxDOT Districts, local cities, emergency responders, and transit agencies in regular meetings and workshops			×	Regional Coord.
Coordinate regional travel information systems across jurisdictional boundaries	Provide relevant information for regional through-travel online, through device-based services (Waze, Google Maps, etc.), and on variable messaging signs	  	TxDOT, Working Groups	×	
	Extend the reach of broadcasted travel time comparisons on major facilities, such as I-35, US 281, and SH 130, targeting freight and passenger traffic decision points				
MID TERM (2025-2035)					
Support the pursuit of opportunities to fund or pilot innovative technology	Identify federal & private grant funding opportunities		TxDOT, CAMPO & AAMPO TACs		
	Continue the development industry relationships to pursue public-private partnerships				










Strategy	Tactics	Topics	Potential Partners		Coord.
deployments for interregional mobility	Consider the impacts of emerging technologies, such as freight mobility, passenger information systems, and incident management, and create Working Groups for each.				Regional Coord.
	Support local initiatives to establish pilot technology deployment programs				
Improve use of ICM during early coordination of construction activities and major planned disruptions across region	Alert travelers to disruptions of travel through the regions		TxDOT, Working Groups	×	
	Identify alternative routes and alert passengers of incidents using V2X (Vehicle-to-Everything) technologies				
Develop Regional Incident Management Plan and process for regular updates	Integrate existing plans from Capital and Alamo Area regions		TxDOT, Working Groups		
	Define protocols for coordinated incident response between regions				
	Enable 'Closest to' dispatching across jurisdictional boundaries				
Refine local ITS systems and coordinate operations with Traffic Management Centers	Promote ITS integration in new local roadway construction		TxDOT, Working Groups	×	
	Develop agreements between local system owners and TxDOT			×	Regional Coord.
Support data gathering for early deployment of connected vehicles systems along major travel corridors	Gather information on roadway conditions, vehicle speed, and traveler type in central repositories		TxDOT, Working Groups	×	
Create framework and opportunity to share	Develop data sharing agreements for archived operations data		TxDOT, Working Groups		







Strategy	Tactics	Topics	Potential Partners		Coord.
operations data and coordinate monitoring & performance management targets	Align performance metrics				Regional Coord.
	Make operations data available for short- and long-range planning			x	
LONG TERM (2036-2045)					
Establish redundancy in Regional Traffic Management Centers	Manage and coordinate ITS systems, incident response, integrated corridor management		TxDOT, Working Groups		
	Develop system interoperability and shared management capabilities			x	
Deploy technologies to support connected vehicle systems along major travel corridors	Use ITS systems to facilitate vehicle-to-infrastructure (V2I) and vehicle-to-everything (V2E) communication technologies		TxDOT, Working Groups		
	Provide information to connected vehicle operators on system status, traffic, and disruptions				
Use emerging technology to move people and goods within the regions	Implement pilot programs leading to full deployment of emerging technologies		TxDOT, Working Groups		
	Focus on improving safety and efficiency of travel in the region with connected and autonomous vehicle technology				

## c. Modal Options

The need and desire for improvement of modal options in a regional manner was a consistent message throughout the study process, Participants stressed the importance of advancing local and commuter, and region-wide options for multiple transportation modes.

Strategy	Tactics	Topics	Potential Partners		Coord.
SHORT TERM (2019-2024)					
Consider coordination schemes to enhance freight movements throughout the region	Conduct regular re-evaluation of freight origins and destinations to adjust freight considerations in the mid-term		CAMPO, AAMPO, TxDOT and UP Rail		
	Participate in freight-centric studies on long range freight bypass needs and truck parking facilities				Regional Coord.
Implement Regional Intercity transit services	Broker new or additional intercity service, such as the Buda - Austin Commuter Route or CARTS - Interurban Coach Routes	 	CapMetro, VIA, ART, CARTS, Local Govts., TxDOT	x	
	Implement a New Braunfels - San Antonio Commuter Transit Route			x	
	Conduct summits among transit providers. Identify and eliminate obstacles between urban and rural transit systems				Regional Coord.
Further regular interregional transit cooperation	Annual coordination on intercity markets and service expansion plans		CapMetro, VIA, ART, CARTS		Regional Coord.
	Develop consistent policy goals and needs assessment methods to facilitate easier interagency bi-regional cooperation				Regional Coord.
	Technical knowledge transfer meeting for transit providers			x	Regional Coord.
	Maintain web links between all transit providers				






Strategy	Tactics	Topics	Potential Partners		Coord.
Discuss how the public sector could assist private companies to move freight more safely and efficiently	Discuss operational needs and opportunities		UP Rail, Trucking Companies, Shippers, TxDOT, CAMPO, AAMPO, Local Govts.	×	
	Identify further opportunities to grade separate arterials and rail freight operations				Arterials
MID TERM (2025-2035)					
Establish a Transit Coordination Task Force focusing on service borders	Create rules for the sharing of ridership info and service adjustments		CapMetro, VIA, ART, CARTS		
	Create web-based clearinghouse for long-term plans and services information				
Expand regional commuter transit options	Support the establishment of additional fixed-route flex-schedule regional routes by rural transit providers per Alamo Area and Capital Area Transit Human Service Transportation Plans	 	CAMPO, AAMPO, ART, CARTS	×	
	Develop a funding strategy for megaregion rural transit.				
	Hold a bi-annual interregional discussion on service updates				Regional Coord.
Identify potential interregional joint transit service routes	Study potential end-to-end interregional transit service	 	CapMetro, VIA, ART, CARTS		Priority Corridors & Arterials
	Study potential interregional Park-and-Ride locations				Priority Corridors & Arterials
Promote potential interregional bicycle routes and new long-	Connect regional bicycle networks along highways	 	TxDOT, CAMPO, AAMPO, Local		
	Coordinate regional bicycle routes with transit agencies for				





Strategy	Tactics	Topics	Potential Partners		Coord.
distance bikeways	connectivity		Govts.		
	Use regional technical partnerships to promote, fund, and construct interregional bikeway connections				
	Incorporate permanent bicycle and pedestrian count equipment into new bikeways				
Consider possible rail and trucking enhancements	Create truck parking information systems and develop parking supplies if needed that aligned with statewide plans		UP, TxDOT Districts, National Truck Stop Association, Local Govts.		Priority Corridors
	Support network enhancement for all modes				Priority Corridors & Arterials
	Develop a Regional Rail Strategy for the movement of people and goods				Regional Coord.
	Foster preservation of right-of-way along corridors				Arterials
LONG TERM (2036-2045)					
Establish an interregional Transit Coalition	Extend Rural Transit Coordination into an interregional Transit Coalition		CapMetro, VIA, ART, CARTS, TxDOT		
Participate in interregional coordination for rail freight relief efforts	Provide assistance as requested to private sector with implementation of their freight rail relief strategies	 	UP, Amtrak, TxDOT, AAMPO, CAMPO		
	If surplus rail freight capacity is created, discuss opportunities for alternative uses of increased rail capacity in the region				



## d. Priority Transportation Corridors

Strategies immediately following identify actions to help improve mobility along I-35, US 281 and SH 130; the 3 main corridors connecting north-south through the two regions are included below. Strategies for SH 130 are not recommended at this point in time, given the planned widenings in northern Austin which is expected to provide capacity to accommodate future demands. However, study into additional connections to SH 130 is an area of interest and potential future study.






Strategy	Tactics	Topics	Potential Partners		Coord.
SHORT TERM (2019-2024)					
Enable future technology enhancements	Define minimum ITS requirements for major Priority Transportation Corridors		TxDOT, CAMPO, AAMPO		ICM & ITS, Arterials
	Introduce installation requirements for technology integration in new expansion projects along Priority Transportation Corridors				
	Leverage technology to help travelers effectively plan trips				
Support improvements that address local deficiencies along I-35	Determine I-35 frontage road segments operating deficiently		TxDOT, CAMPO, AAMPO	x	
	Inventory and evaluate I-35 ramps for optimal configuration and move forward with the delivery of an access ramp conversion program				
Complete requirements for expansion of I-35	Develop environmental and Preliminary Engineering for expansion of I-35 between the Austin to San Antonio metro areas		TxDOT, CAMPO, AAMPO	x	
Reduce safety concerns at local intersections with high crash concentrations along US 281	Implement safety improvements at local intersections in Bexar County		TxDOT, CAMPO, AAMPO	x	
	Determine and implement safety improvements at local intersections in Comal, Burnet and Blanco Counties				










Strategy	Tactics	Topics	Potential Partners		Coord.
MID TERM (2025-2035)					
Maximize I-35 frontage road efficiency	Continue the implementation of a frontage road operation and upgrade program		TxDOT, CAMPO, AAMPO	×	
Further the US 281 roadway structure update program	Construct a new Guadalupe River Bridge (SB)		TxDOT, AAMPO	×	
Increase capacity on US 281	Construct a 4-lane divided highway from the Comal County Line to the Burnet County Line.		TxDOT, AAMPO, CAMPO, Local Govts.		
	Support the implementation of the US 281 Improvement Program by ensuring the existing ROW supports ultimate construction needs.				
	Construct a 4-lane freeway in Comal County				
	Study the feasibility of Park and Pool locations along US 281 in Bexar, Comal and Blanco Counties				
Improve regional mobility west of Austin and San Antonio	Reconstruct the US 281 /SH 71 intersection as a free-flowing interchange		TxDOT, CAMPO		
	Reconstruct the US 281 /US 290 S intersection as a free-flowing interchange		TxDOT		
Increase safety on US 281	Develop interchanges at Mustang Vista Rd, Casey Rd, FM 311, Jumbo Evans Blvd, Rebecca Creek Rd and FM 306 in Bexar County	 	TxDOT, AAMPO, CAMPO, Local Govts.		
	Conduct a regional crash hotspot analysis every 5 year to evaluate safety concerns				
	Improve intersections with high crash histories including RM 473 West, RM 473 East, John Price Road, and RM 32				





Strategy	Tactics	Topics	Potential Partners		Coord.
LONG TERM (2036-2045)					
Increase I-35's person and freight throughput	Improve I-35 to accommodate higher demands		TxDOT, CAMPO, AAMPO		
Increase capacity on US 281	Construct a 4-lane freeway from FM 306 (North of Comal County Line) to SH 71 in Burnet County		TxDOT, Local Govts.		
Reorganize long-range traffic through City of Blanco	Develop long term solutions for traffic on US 281 through the City of Blanco		TxDOT, Local Govts.		

## e. Arterial Improvements

Regional stakeholders identified limited availability of alternatives to main transportation corridors, which are imperative given the number of local trips being made in the region. The following Arterial Improvements Strategies work to provide options for local movements and routing alternatives, especially in the event of an incident on I-35.

Strategy	Tactics	Topics	Potential Partners		Coord.
SHORT TERM (2019-2024)					
Designate an interregional relief arterial network	ID network of arterials designated as relief routes for local movements and I-35 relief operations		TxDOT, CAMPO, AAMPO, Local Govts.		
	Begin feasibility studies to assess existing & future needs and conditions on each of the identified relief arterials			x	
Develop an improvement plan for designated relief arterials	Prioritize improvements on existing relief arterials		TxDOT, CAMPO, AAMPO, Local Govts.	x	
	Identify and prioritize potential new arterial connections			x	
Develop a prioritization framework to aid local officials in prioritizing future investments	Develop arterial performance measures and an information exchange protocol for sharing of the resulting measurements		TxDOT, CAMPO, AAMPO, Local Govts.		
	Develop an investment monitoring tool for arterial improvements				
Coordinate connection of planned arterial improvements in regional, local, and county thoroughfare plans	Initiate arterial improvement coordination between MPOs, cities and counties, focusing on cities whose ETJs cross county and MPO boundaries		CAMPO, AAMPO, Local Govts.	x	Regional Coord.
	Support local corridor preservation and corridor management activities for identified routes			x	

Strategy	Tactics	Topics	Potential Partners		Coord.
MID TERM (2025-2035)					
Develop interregional relief arterial network	Construct improvements to existing relief arterials	 	TxDOT, Local Govts, CAMPO, AAMPO	×	
	Conduct planning and engineering for new arterial connections			×	
Coordinate the connection of local arterial ITS systems with regional ITS master plans	Support existing local ITS efforts and traffic management systems on arterials through knowledge and resource sharing	 	CAMPO, AAMPO, Local Govts, TxDOT	×	ITS & ICM
	Integrate local arterial ITS and TxDOT-managed systems				ITS & ICM
	Develop a regional strategy for smart multimodal corridors, including installation of ITS technology and variable message road signs for motorists				ITS & ICM
	Create an interregional arterial rerouting plan for incidents along major regional connections and integrate recommendations into local incident management plans and ITS protocols				ITS & ICM
Prioritize corridor preservation and access management efforts	Integrate planned arterials with local growth plans	 	CAMPO, AAMPO, Local Govts, TxDOT		
	Identify and preserve right-of-way for new arterial connections			×	
	Perform access management along local arterials to ensure adequate mobility and safety			×	
Integrate management and operations of designated arterials into I-35 corridor management strategies	Identify areas of opportunity and overlap between local transportation Incident Management Plans	 	CAMPO, AAMPO, Local Govts, TxDOT	×	

Strategy	Tactics	Topics	Potential Partners		Coord.
LONG TERM (2036-2045)					
Equip arterials with connectivity capabilities to accommodate emerging technologies	Provide ITS connectivity along smart multimodal corridors		TxDOT, CAMPO, AAMPO, Local Govts.		ITS & ICM / Modal Options
	Implement maintenance practices that support smart multimodal corridors				ITS & ICM / Modal Options
Continue to promote use of local arterials to facilitate interregional multimodal connectivity	Coordinate with regional bicycle networks and regional transit service routes to promote use of major arterials as regional multimodal corridors		CAMPO, AAMPO, Local Govts, TxDOT		Modal Options
Nurture the extension of the local and relief arterial networks to enhance mobility and connectivity between growing regions	Reassess the performance of the interregional arterial rerouting plans in a bi-annual basis based on established arterial performance measures		CAMPO, AAMPO, Local Govts, TxDOT		Regional Coord.

## 6.2 Next Steps

This study and its outreach efforts have demonstrated there is a need and desire for the Capital-Alamo region to address mobility challenges collaboratively and in coordination with other planning partners. As population continues to grow and development expands, the geographic distinctions between the Austin and San Antonio metro areas are expected to decrease. There will be a greater need in the future to coordinate planning efforts, particularly regarding transportation facilities and services that link the two regions. A series of well-coordinated strategies for policy, technology and infrastructure solutions will be required to meet the growing demands and enhance the mobility in this emerging megaregion. Such strategies presented in this study, developed and coordinated in partnership with CAMPO and AAMPO, provide a path forward toward addressing those demands. It falls to all the study partners to integrate the strategies from this study into their planning efforts.