2020 Burnet County Transportation Plan

CAMPO

CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION

Contents

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EXECUTIVE SUMMARY

Introduction

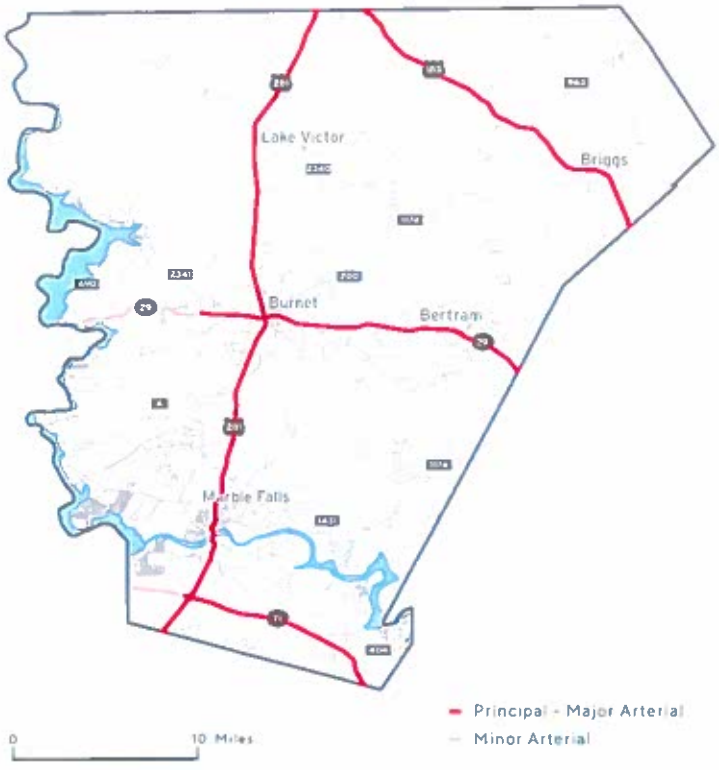
The 2020 Burnet County Transportation Plan was developed by Capital Area Metropolitan Planning Organization (CAMPO) staff at the request of the Burnet County Commissioners Court and as part of the Regional Arterials Concept Inventory (RACI). This plan serves as an update to the 2010 Burnet County Transportation Plan. The primary focus of this effort was to plan for future growth with mobility choices that are safe, convenient, reliable, and efficient. This plan includes a public outreach component, an analysis of the county's existing conditions, and a concept plan process with recommended improvements over the next 25 years.

Plan Approach

Public Outreach

The plan started with public outreach in February 2018 and concluded in June 2019. An overarching goal of the community engagement process was to be inclusive and equitable, reaching the general public to include all people including vulnerable populations. Most responses showed that residents commute primarily to the county's cities and towns and almost all stayed within Burnet County. Prominent themes from the public outreach responses showed that there's a need to improve the existing network's connectivity and to provide additional river crossings and low water crossings.

Existing Arterial Network



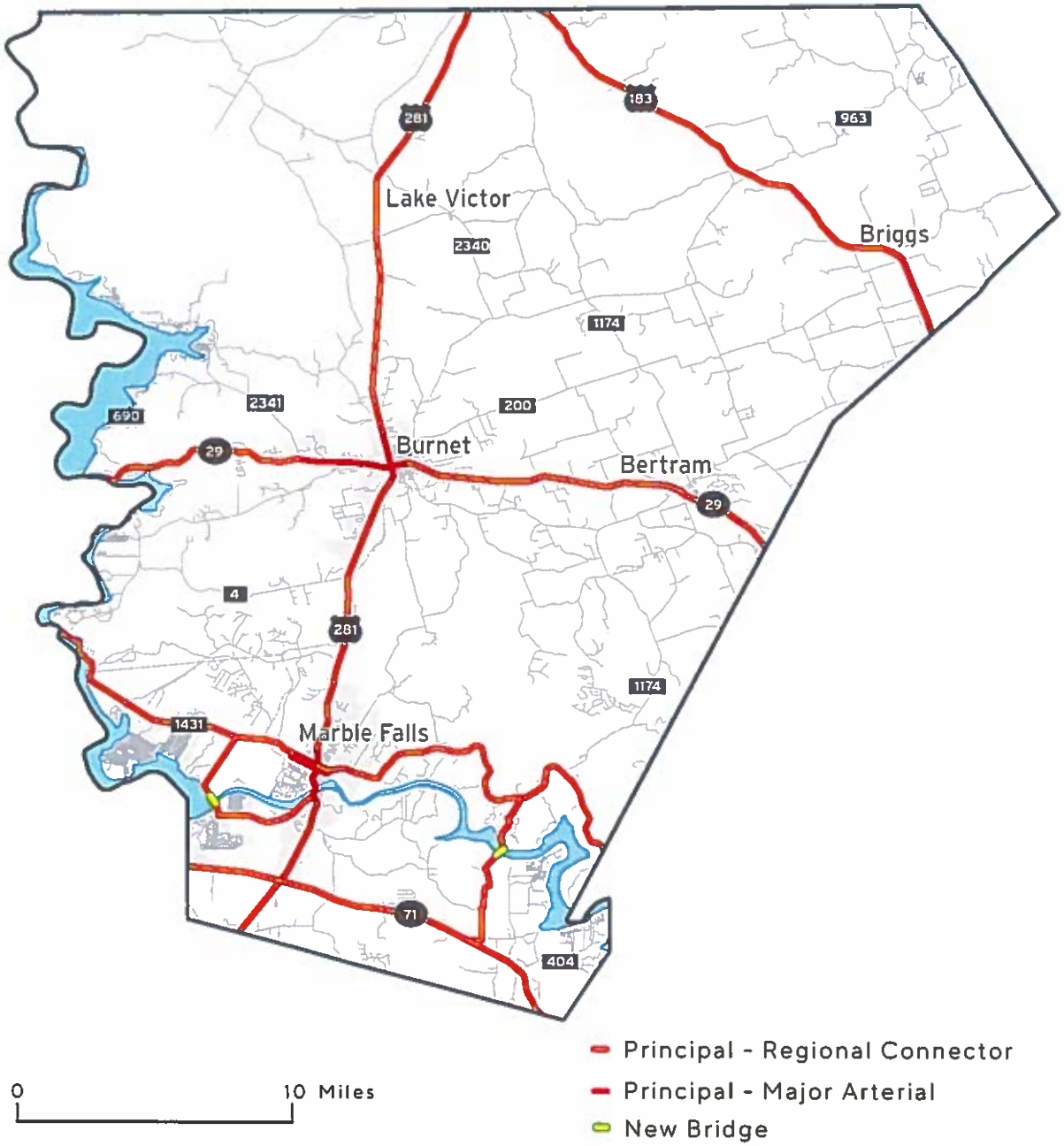
Existing Conditions Analysis

Today, over 2 million vehicle miles are traveled each day in Burnet County and the arterial system is under-performing because it lacks the necessary connectivity and redundancy for efficient transportation. There are also many environmental constraints that make roadway network expansions infeasible or cost-prohibitive. Most importantly, high crash rates were found on many of the primary transportation routes within the county, including significant portions of US 281 and RM 1431. This existing conditions analysis found that focusing on safety improvements for these roadways can provide substantial gains in safety for the county as a whole.

Concept Plan & Recommendations

The Recommended Arterial Network identifies improvements that provide the greatest contribution to the highest functioning roadways. In addition to enhancing these roadways, the Recommended Arterial Network also includes two new bridges over the Colorado River, Wirtz Dam Bridge and The Narrows Bridge. Many of these specific improvements and new facilities were identified in local plans, including the 2010 Burnet County Transportation Plan, and further refined through public involvement and Steering Committee feedback as a part of the RACI. Not only will these recommendations bring benefit to residents and travelers in Burnet County through savings in time and miles traveled, but they will also help to provide a safer and more dependable transportation system.

Recommended Arterial Network



CHAPTER 1
PROCESS

Introduction

This plan is an update to the 2010 Burnet County Transportation Plan. Since the implementation of the 2010 Burnet County Transportation Plan, the Capital Area Metropolitan Planning Organization(CAMPO) created a Regional Arterials Concept Inventory (RACI) that analyzed regional roadway scenarios to help the Capital Area plan for future growth with mobility choices that are safe, convenient, reliable, and efficient. This plan includes recommended improvements and new facilities identified in the RACI for Burnet County.

2010 Burnet County Transportation Plan and RACI

The 2010 Burnet County Transportation Plan, along with the 2016 Marble Falls Comprehensive Plan Update and the City of Granite Shoals Comprehensive Plan, represent the major previous transportation planning efforts for Burnet County. While each of these documents focused on improvements within their own jurisdictions, they each presented a coherent vision of a county that is planning for growth in both residents and businesses and one that will need to make additional investments in a safe, multi-modal, and sustainable transportation network to meet these new demands.

Overall, the considerations of the RACI and the past transportation planning work in Burnet County align. Improved safety, enhanced multi-modal travel, supporting economic development goals, making investments to manage current and future growth trends, and protecting environmental assets are all key goals of all the planning efforts.

Like the RACI, the 2010 Burnet County Transportation Plan focuses on improving the highest performing roadways within the county. These primarily include US 281, US 183, SH 29, SH 71, and RM 1431. Each of these roadways provide for longer distance trips within the county and to destination outside of the county, such as to job centers in Travis and Williamson Counties.

2010 BURNET COUNTY TRANSPORTATION PLAN OBJECTIVES

- Address traffic safety and congestion concerns
- Support economic vitality
- Provide transportation choices to enhance quality of life
- Increase and explore financing options and opportunities

REGIONAL ARTERIALS CONCEPT INVENTORY OBJECTIVES

- Improve safety for all arterial users
- Improve network efficiency and flexibility to reduce travel times and distance
- Plan for growth more effectively
- Design multi-modally to provide more choices to move people and goods
- Protect and preserve the environment
- Foster a system that promotes prosperity and vitality

2020 Burnet County Transportation Plan Update

The 2020 Burnet County Transportation Plan Update is built from the recommendations of the 2010 Burnet County Transportation Plan, other local planning efforts within the county, and the RACI. Although the local plans produced by municipal and county governments exhibit a greater emphasis on local roads, while the RACI prioritized regional mobility, the two plans work together to provide a comprehensive vision for the county's future roadway network. Integrating and building on these differences, this plan serves as a key update to the 2010 planning effort and as a guide to future transportation planning in Burnet County.

Study Process

CAMPO worked closely with the Regional Arterials Steering Committee to guide the study process through regular meetings and presentations using the Platinum Planning Program. Representatives from both Burnet County and the City of Marble Falls served on the Regional Arterials Steering Committee. Extensive outreach was conducted with local government officials and the public through a series of meetings. The study team then conducted comprehensive analyses which ultimately resulted in recommendations to improve the function of the Capital Area's arterial network.

CAMPO's Platinum Planning Program

The RACI and this plan are completed under CAMPO's Platinum Planning Program. The Platinum Planning Program is a comprehensive planning process that examines transportation, land use, and other planning areas. Planning in this way allows for more holistic recommendations to be made, ensuring that transportation planning considers other concerns and needs.

Public Outreach

Public outreach commenced in February 2018 and concluded in June 2019. Early outreach focused on sharing background information on the study and gathering input on existing conditions, needs, and priorities. Later outreach focused on gathering public feedback. An overarching goal of the community engagement process was to be inclusive and equitable, reaching the general public to include vulnerable populations such as low-income, minority, those with limited English proficiency, seniors, zero-car households, and people with disabilities. All meeting materials and input opportunities were available on the project webpage. Those that could not attend meetings in person were also offered the opportunity to view meeting materials through an Online Open House, to take the survey online, or to provide comments via email.

In total, 50 Burnet County responses were collected from residents living in eight of the eleven county zip codes. When asked about their commute destination, most respondents commuted to Marble Falls and Bertram, and almost all stayed within Burnet County. Several respondents from Burnet County noted a need to improve connectivity to the existing network and surrounding areas, as well as a desire for additional river crossings and low water crossings. Many responses discussed the need for improved roadway safety features, including turn lanes, medians, and bicycle and pedestrian facilities.

Public Outreach Responses by Zip Code

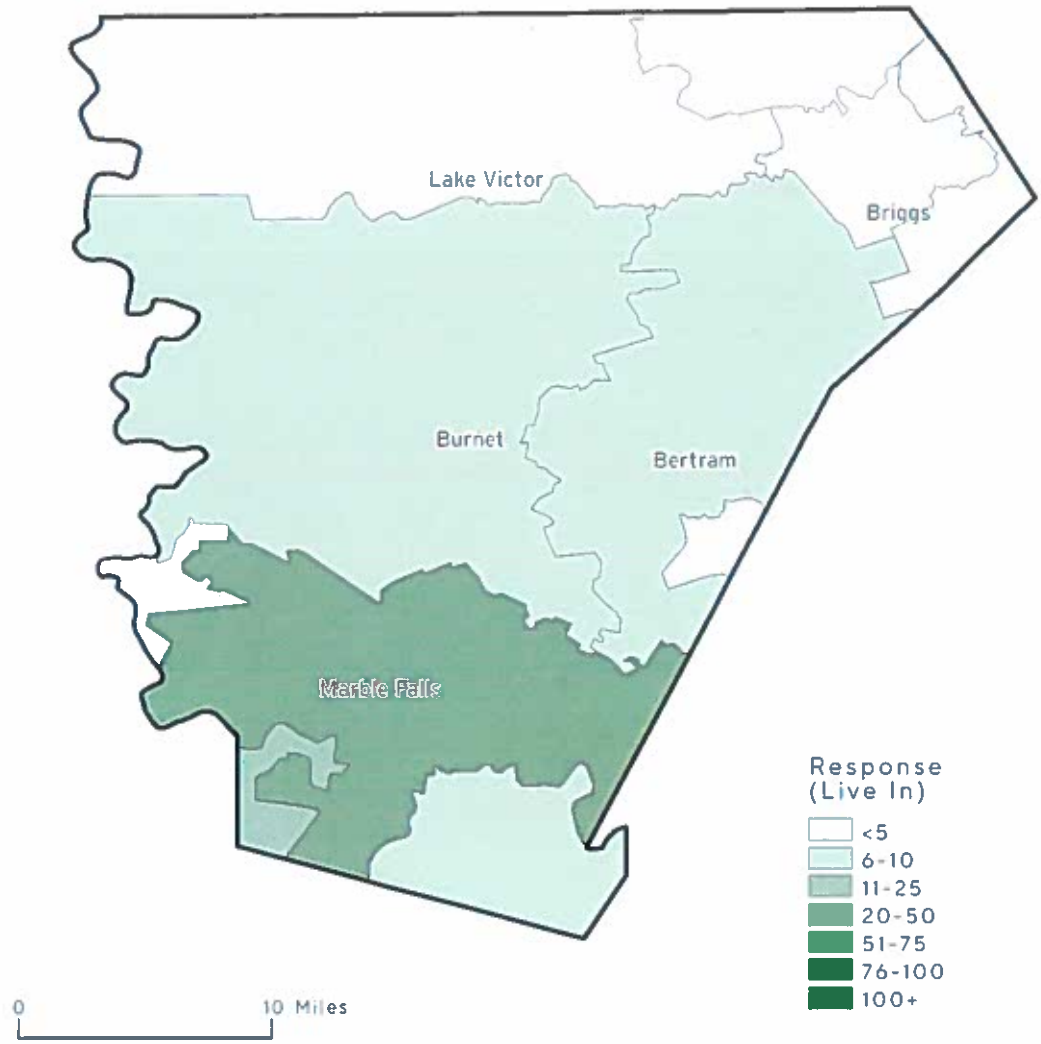


Figure 1.1

Burnet County Public Outreach Key Themes

- Additional river crossings
- Expansion needed on US 281
- Support for commuter and freight traffic
- Connections to existing arterials (SH 71, RM 1431, US 281)
- Limited visibility and lack of shoulders in southeast Burnet County

CHAPTER 2
EXISTING CONDITIONS

Introduction to Existing Conditions

This chapter provides the "big picture" of how the existing arterial roadway network impacts the way Burnet County residents live, work, play, and identifies the county's needs to improve access to desired job markets, services, and recreational opportunities.

What is an Arterial Road?

This study uses Texas Department of Transportation (TxDOT) and Federal Highway Administration (FHWA) definitions of functional roadway classifications as a starting point for further discussions. Figure 2.1 illustrates FHWA's functional classifications. However, the 2010 Burnet County Transportation Plan functional classification system differs from those of TxDOT and FHWA so the roadways were grouped up to be consistent with FHWA's system.

The U.S. Department of Transportation (USDOT) and Federal Highway Administration (FHWA) support state and local governments in the design, construction, and maintenance of the nation's highway system. TxDOT defines Off-System roadways as any roadway not designated on the State Highway System and not maintained by TxDOT. Conversely, On-System roadways are designated on the State Highway System and maintained by TxDOT. Maintenance of off-system roadways is the responsibility of the local jurisdiction in which the road is located. CAMPO may partner to fund improvements to many of the On-System arterials and high functioning off-system roads with local governments. On-System and Off-System roads can be further classified by functional classification which groups roadways into classes based on traffic characteristics and the types of service they provide.

FHWA Classification Table	
Interstate	Interstates are the highest level of roadway and designed for long-distance travel offering limited access.
Freeway	These roads have directional travel lanes and are separated by some type of physical barriers. Access is purely controlled by interchanges and on- and off-ramps to maximize their mobility function.
Tollroad	Roadways (either public or private) where passengers pay a usage fee to use the roadway.
Expressway	Roadways with directional travel lanes that are typically separated with controlled access to maximize mobility.
Principal Arterials	Roads serve major centers and provide a high level of mobility, but abutting land uses can be served directly.
Minor Arterials	Provide service for trips of moderate length and offer connectivity to the higher arterial system.
Collector	Gather traffic from local roads and funnel users to the arterial network.
Local	Classified by default of all used roads other than arterials and collectors. Designed to minimize through traffic and are often used at the very beginning or end of a trip.

Figure 2.1

For the purposes of this study, CAMPO defined an arterial as a road that connects to limited access roadways (freeways), local streets, and destinations. Arterials are smaller than a major access controlled roadway such as IH-35, but larger than a local neighborhood street. Not unlike the rest of the Capital Area, Burnet County arterials are used frequently to commute between home, work, and school. TxDOT and FHWA definitions of functional classifications were used as a baseline for evaluating and redefining these classification using regional context.

Grouping-up process - Deferred to TxDOT Classification Table

2010 Burnet County Transportation Plan	TxDOT	CAMPO Regional Functional Classification
-	Toll	Limited Access (Non-tolled/tolled)
-	Interstate Freeway / Expressway	
Principal Arterial	Principal Arterial	Principal Arterial Major Arterial Regional Connector
Minor Arterial	Minor Arterial	Minor Arterial
Collector	Major collector Minor Collector	Collector
Local	Local	Local

Figure 2.2

Burnet County Existing Arterial Network

The Burnet County existing arterial network map highlights arterials using CAMPO's RACI functional classification system, which include existing major and minor arterials. SH 71 and SH 29 begin as major arterials to the east but become minor arterials once they cross US 281. Major arterials in the county that run north/south are US 281 and US 183.

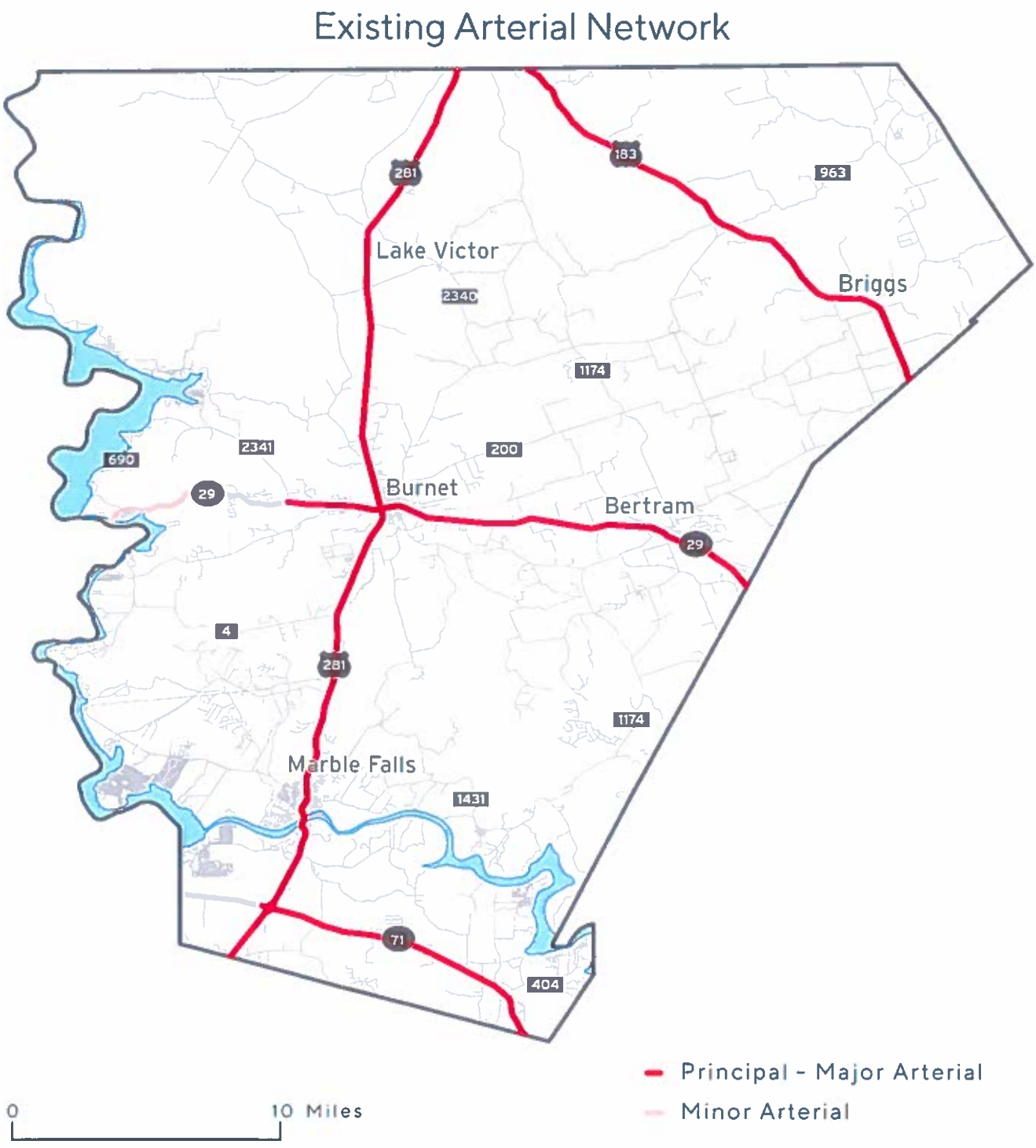


Figure 2.3

Existing Network Performance

Burnet County residents work and play in different cities across the Capital Area and depend heavily on the arterial network during their commutes. The existing network and its performance is directly related to the interaction between the available supply (roadways) and demand from people. Demand can be described as the number of roadway users, their origins and destinations, and how they traverse the roadway (car, bike, transit, etc.). Supply can be described as the amount of roadway and the type of roadway, i.e. miles of bike lanes, lane miles of roadways for automobiles and transit. Performance is a measure of the relationship between supply and demand. Roadway performance can suffer when demand is greater than supply. The root cause is often due to the fact that the supply is not appropriate for the demand, there is a lack of additional choices in the wider network, or the function of the road conflicts with how it has been designed to balance access and mobility concerns.

Travel times of people are impacted by both supply and the access to facilities whether it be roadways, bicycle lanes, or pedestrian facilities. Figure 2.4 summarizes how supply of different facilities impacts overall mobility in the region. The majority of centerline miles in Burnet County are classified as Local Roads (50%).

	Percent of Centerline Miles by CAMPO Regional Classification Type[1]						
Type	Bastrop	Burnet	Caldwell	Hays	Travis	Williamson	CAMPO Region
Limited Access Route	3%	0%	1%	6%	10%	4%	6%
Tolled Limited Access Route	0%	0%	8%	0%	7%	5%	5%
Expressway/Regional Connector	21%	12%	17%	17%	29%	25%	23%
Minor Arterial	20%	8%	26%	25%	17%	29%	21%
Collector	14%	30%	11%	14%	2%	2%	8%
Local	42%	50%	37%	38%	35%	35%	37%
Total Network Miles	497	386	433	649	1,979	1,502	5,446

Figure 2.4

Vehicle miles traveled (VMT) represents the demand on the regional roadway network. Today, over 2 million vehicle miles are traveled each day in Burnet County (approximately 4% of the entire Capital Area).

Vehicle Miles Traveled by County[1]		
County	VMT	% VMT
Bastrop	2,301,000	4%
Burnet	2,258,000	4%
Caldwell	1,676,000	3%
Hays	7,251,000	12%
Travis	30,273,000	53%
Williamson	13,733,000	24%
Total	57,492,000	100%

Figure 2.5

[1] 2020 baseline represents the current transportation network performance

Vehicle Hours Traveled by County[1]		
County	VHT	% VHT
Bastrop	45,000	3%
Burnet	51,000	4%
Caldwell	32,000	2%
Hays	161,000	12%
Travis	796,000	58%
Williamson	296,000	21%
Total	1,381,000	100%

Figure 2.6

Vehicle hours traveled (VHT) represents the time spent on the network each day. Burnet County drivers spend over 51,000 hours a day traveling within the county (approximately 4% of vehicle hours traveled within the entire region).

Vehicle Hours Traveled by Functional Class in Burnet County[1]		
Functional Class	VHT	% VMT
Limited Access	-	-
Regional Arterial	21,000	40%
Minor Arterial	13,000	26%
Other	18,000	34%
Total	52,000	100%

Figure 2.7

40% of the vehicle hours traveled in Burnet County occur on regional arterials, while 60% of vehicle hours traveled are on minor arterials and local roads.

[1] 2020 baseline represents the current transportation network performance

Network Connectivity

The structure of the roadway network plays a significant role in determining the effectiveness of travel, and impacts the form and function of communities. Ideally, and in congruence with the goals and vision of the Study, arterials should contribute to a well-connected, efficient network that provides safe, direct, redundant, and convenient access for multiple modes of transportation (including motorized and non-motorized modes). Arterials can and should provide a wide range of travel opportunities with varying speeds, using a broad set of cross-sections, for different travel purposes and various context zones (urban, suburban, rural). Today the region's arterials are under-performing and lack the necessary connectivity and redundancy for efficient transportation. Due to a variety of constraints, additional demand is put on the limited access roadways. As the arterial network is improved, volume can be shifted to take the load off the limited access corridors.

This plan evaluates the existing arterial network and assesses the existing policies to achieve these goals mentioned above. Building upon a solid understanding of current conditions, the concept plan acts as a guide for future network development and provides tools to reach the vision for the arterial network.

Connectivity is key as no single roadway can provide utility without connecting to other roadways. Today, limited access roadways do not have sufficient arterial support as they carry the brunt of the volume and demand in the Capital Area. A better connected road network can reduce VMT and VHT by providing more direct routes between origins and destinations, while a lack of connectivity often causes circuitous and indirect trips.

A better connected road network improves VMT by providing more direct routes between origins and destinations.

Road networks that lack connectivity often cause circuitous, indirect trips.

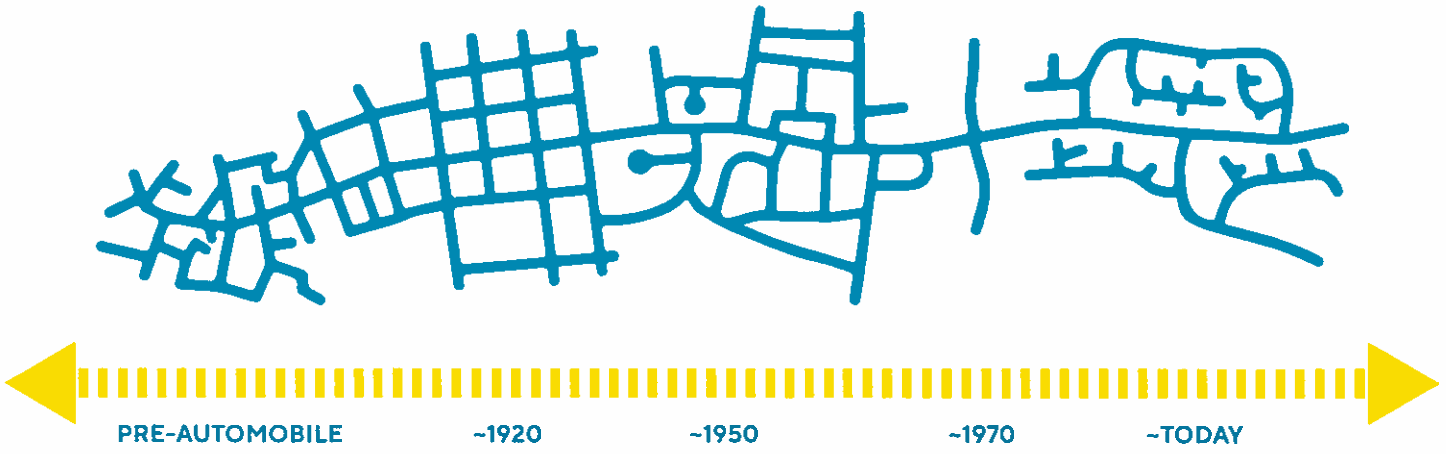


Figure 2.8

Network Redundancy

Redundancy is a key feature of a connected network because it provides alternative routing to destinations that may be due to construction, extreme congestion, or roadway incidents. It is extremely important to emergency response services, but it is often overlooked in network planning and design that tends to focus on corridor improvements. There are very few communities in the Capital Area that specifically reference network redundancy or include alternative routing, except when requiring a minimum of two access points to new subdivisions. This is a holdover of traditional subdivision planning that has occurred in the past 50 years.

Block Dimensions

Block dimensions (block length, face, or size), intersection density, street density, connected node ratios, the connectivity index (CI), grid pattern, and pedestrian route directness provide different ways to measure connectivity and redundancy in a network.[2,3] Further definition and methodology for evaluating these variables are provided in greater detail in the RACI.

Intersection Density

The Burnet County Intersection Density Map illustrates where intersection density is greatest. Generally, intersection density is greatest within urban areas and in the core of the region. Regarding Burnet County specifically, the analysis identifies Granite Shoals as the city with the highest intersection density in the county, due to the community's strict adherence to a gridded street pattern. Block lengths for north-south streets within Granite Shoals are less than 250 feet long with a distribution of approximately 23 intersections per mile.

Factors Limiting Connectivity

Various factors can limit the connectivity of a transportation network, including: geographic barriers (e.g. water features like the Colorado River, Lake Buchanan, and Lake LBJ, or steep topography); man-made barriers (e.g. railroads, roadway viaducts, and other existing infrastructure); ROW constraints in developed or protected areas; and safety hazards (turns or slopes that limit motorists' line of sight). Along these types of corridors, such as SH 71 in southern Burnet County, finding creative ways to provide greater connectivity and redundancy will be key to meeting the growing demand. Enhancing existing roadways and providing new strategically placed river crossings, such as Wirtz Dam Bridge and The Narrows Bridge and extension, helps connect major roadways and distribute trips throughout the connected network.

[2] Victoria Transportation Institute Online Encyclopedia. Roadway Connectivity, 2010. Accessed at https://bit.ly/23p81Si

[3] Metro (2004), Street Connectivity: An Evaluation of Case Studies in the Portland Region.

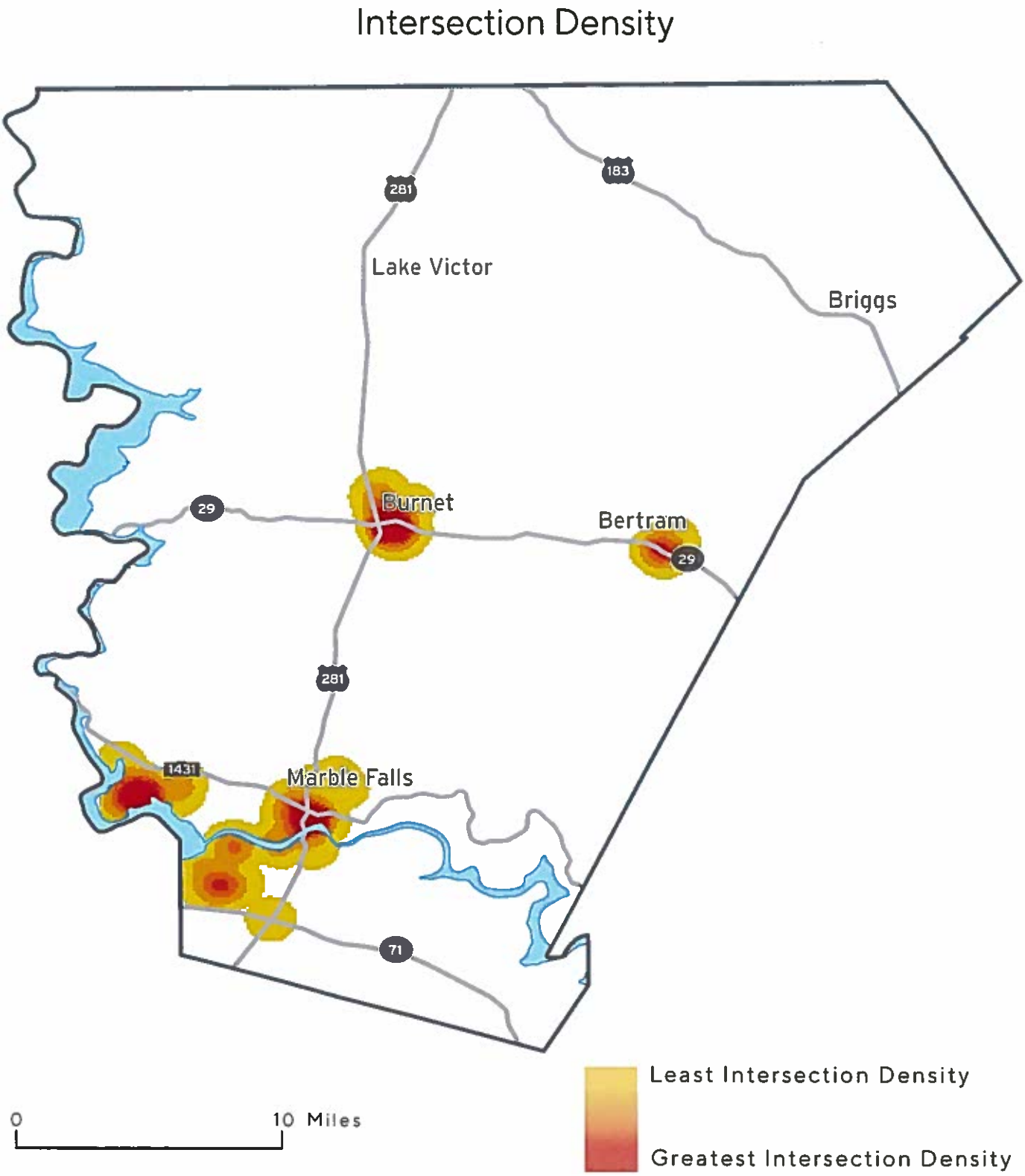

Intersection Density
281
183
Lake Victor
Briggs
29
Burnet
Bertram
29
281
1431
Marble Falls
71
0
10 Miles
Least Intersection Density
Greatest Intersection Density

Figure 2.9

Traffic Generators

Traffic generators like employment centers and commercial districts dictate why and where people travel. In Burnet County, traffic generators are most prominent near the Cities of Burnet and Marble Falls. When prioritizing roadway improvements, an understanding of where traffic generators are and where they may be in the future can help to appropriately accommodate the county's growth and lead to a more efficient use of resources.

Safety Analysis

The Crash Rates and Dangerous Corridors Map, Figure 2.10, identifies roadway segments that experienced more than two times the statewide average crash rate for the same period (years 2014 – 2016) as defined by TxDOT's statewide crash statistics reports.[4] In addition to the crash rate analysis, CAMPO worked with municipalities and residents as part of the outreach process for the CAMPO Regional Active Transportation Plan to identify corridors that are perceived to be dangerous, particularly related to pedestrian and bicycle concerns. Better managing access to driveways, as well as collector and local roads, along these arterials is a key factor to improve safety since many rural areas see faster moving traffic and blind curves. In Burnet County high crash rates were found on the most widely used arterials: SH 29, RM 1431, and US 281, which is of particular concern due to these being the primary transportation routes within the county. Significant portions of US 281 and RM 1431 have higher than average crash rates when compared to the rest of the region. The intersection of these two roadways in Marble Falls is seen as particularly dangerous, which was identified in stakeholder outreach for the RACI. Additionally, the intersection of US 281 and SH 29 in Burnet has a crash rate above the regional median rate. Focusing on safety improvements for these roadways can provide substantial gains in safety.

[4] Texas Motor Vehicle Crash Statistics. TxDOT, 2016. Accessed at https://bit.ly/2YZ6CCj

Crash Rate and Dangerous Corridors

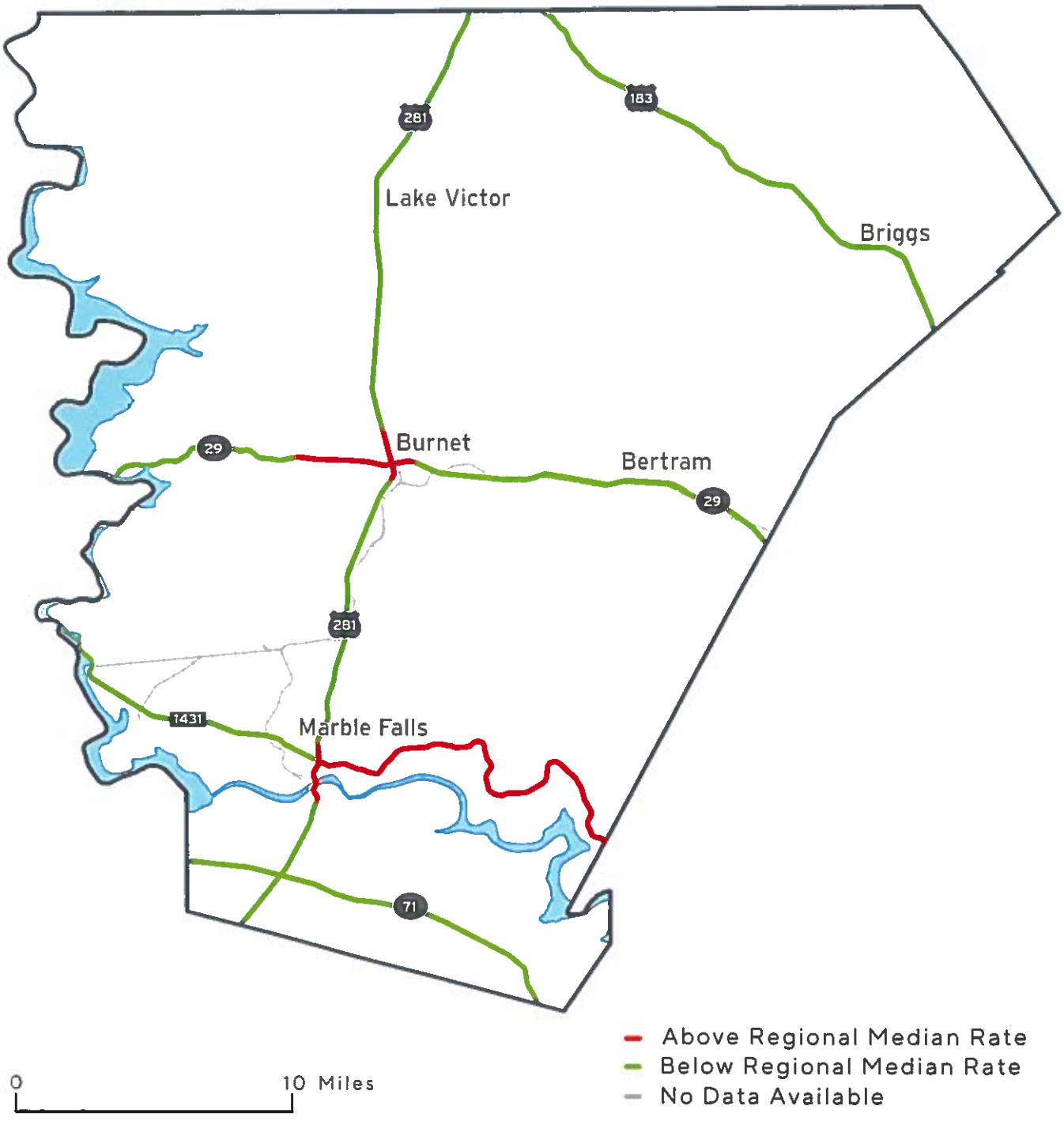


Figure 2.10

Emergency Response

Travel time and network performance are vital to the safety and well-being of residents and they are significant performance indicators for emergency response times. The Burnet County average emergency response time service goal for Emergency Medical Services (EMS) is set at 11 minutes without traffic delays. As indicated in Figure 2.12, there are several areas of Burnet County where response times are greater than the identified goal. These areas have inadequate response times due to poor road connectivity, barriers like the Colorado River, and traffic congestion especially on arterials.

Enhanced network connectivity can improve travel times and reduce the size of the emergency response challenge zones. As shown in the Crash Rate Map, RM 1431 east of Marble Falls has one of the highest crash rates in Burnet County and has an emergency response time greater than 11 minutes. That portion of Burnet County could improve its emergency response time by enhancing the efficiency of RM 1431 and making connections to SH 71 via new river crossings.

New and improved connections can decrease travel times and reduce the size of the emergency response challenge zones. However, new arterials and increased capacity may not always be the most effective ways to serve these areas. Additional emergency response infrastructure could also help close the gaps.

Local codes and ordinances can also help create a more connected and redundant network and improve emergency management. Figure 2.11 outlines the share of communities within the region that have enacted specific redundancy or emergency management policies in the Capital Area. Within Burnet County, the cities of Burnet and Marble Falls have emergency management plans in place in addition to the county's.

Redundancy/Emergency Management Policy Summary		
Policy		Number of Communities' Codes/Ordinances with Related Policy
1	Requires More Than One Subdivision Access Point	13 of 24
2	Has Evacuation Route Policy	5 of 24

Figure 2.11

Emergency Response

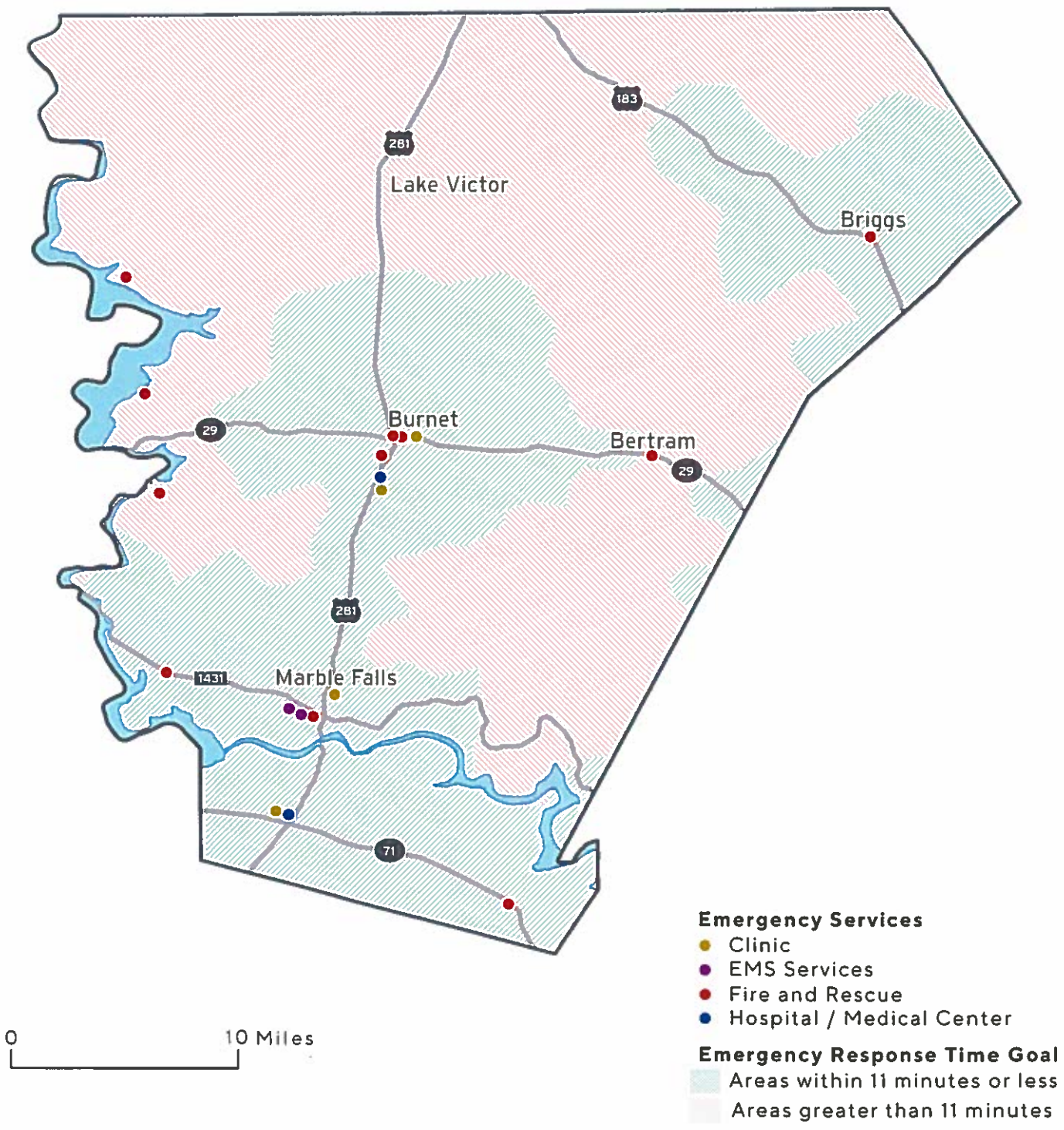


Figure 2.12

Vulnerability

Consideration of vulnerable populations is another significant aspect of CAMPO's work. A portion of the Capital Area's population is considered vulnerable which includes the traditional characteristics from Title VI/ Environmental Justice definitions established by the Federal Highway Administration (FHWA). Title VI of the Civil Rights Act and Executive Order 12898 (Environmental Justice) are laws that forbid discrimination based on race, color, national origin, and minority/low income status. CAMPO expands on these characteristics to include others such as school-aged children, seniors, and persons with disabilities. People considered vulnerable can require special consideration with regards to transportation. Whether it's transportation to and from medical appointments, shopping, work, or emergency evacuations, many of these people rely on public transportation systems, which are less accessible in rural areas. Many may use transportation provided by non-profit organizations, senior services, or city agencies. Seniors with disabilities who have low incomes represent a particularly vulnerable group.

Those who may require transportation assistance include:

- Individuals who cannot independently get to a transit stop,
- Individuals who live independently and require transportation from their location,
- Individuals who live in a group setting (e.g., group home, assisted living center) that require transportation directly from their location,
- Individuals in acute care/in-patient facilities,
- Individuals with disabilities, and
- Individuals with limited English proficiency.

Burnet County has a low to moderate number of vulnerable populations as compared to the rest of the Capital Area. Vulnerable populations tend to be clustered in the more developed areas of the county, as is shown in Figure 2.13. Not all of these groups require the same considerations in the planning process, but a well-connected, multi-modal network that facilitates inter-modal activities can make a significant difference in improving the quality of life for vulnerable populations.

Vulnerability

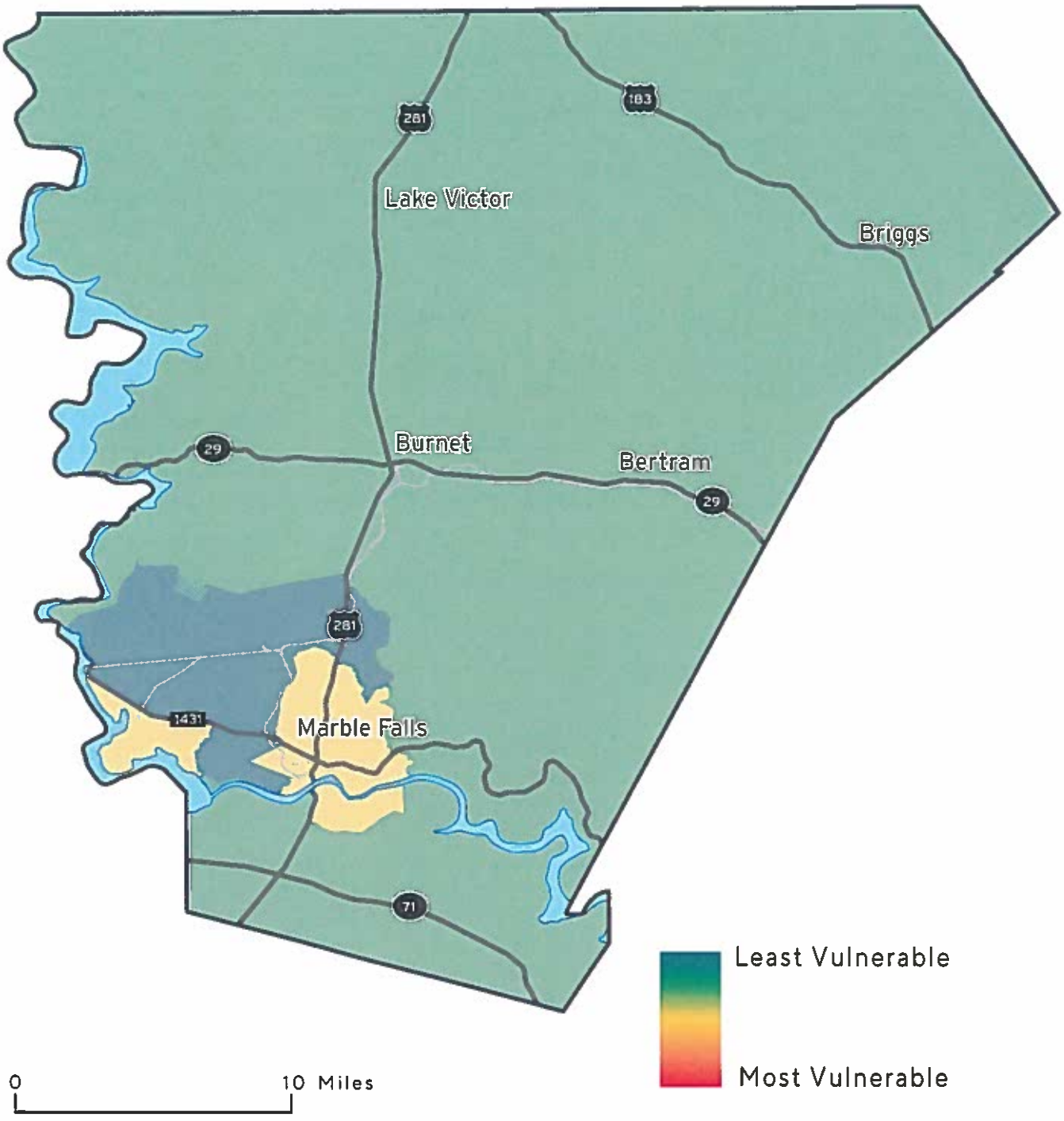


Figure 2.13

Environmental Considerations

Protecting and preserving the environment is one of the six identified goals of the Regional Arterials Concept Inventory and for this 2020 update. Careful and thoughtful consideration should be given to sensitive and/or limited environmental resources within Burnet County. If new or improved roadways are to impact environmentally sensitive areas such as floodplains, karst features, and prime farmland, additional consideration for applying relevant context sensitive solutions will be necessary. The following maps show some of the primary environmental factors mapped across Burnet County that need to be considered when discussing future growth for the county.

The Preserved Lands Map, Figure 2.14, depicts areas that are environmentally significant and need to be considered when planning transportation facilities. These areas include Longhorn Cavern State Park, Inks Lake State Park, Balcones Canyonlands National Wildlife Refuge, and cemeteries. In addition, the Colorado River flows through Burnet County and is broken up into several lakes by dams. Lakes and water sources like Lake Buchanan, the largest lake in Burnet County, need to be considered when discussing future growth patterns as they serve multiple purposes.

Context Sensitive Design

Context Sensitive Design (CSD) incorporates stakeholder input and local environmental characteristics into the design and development of roadway or transit corridors. Given the aforementioned environmental considerations, CAMPO uses CSD tools to help achieve its goal of fostering a system that promotes prosperity and vitality for all communities across the region. CSD goes beyond a traditional "one size fits all" roadway design approach, and instead tailors solutions to meet the needs and desires of affected stakeholders and fit the specific environments in which they are being constructed. CAMPO recognizes that each community is unique and CSD helps align roadway design with evolving road and community characteristics.

Preserved Lands

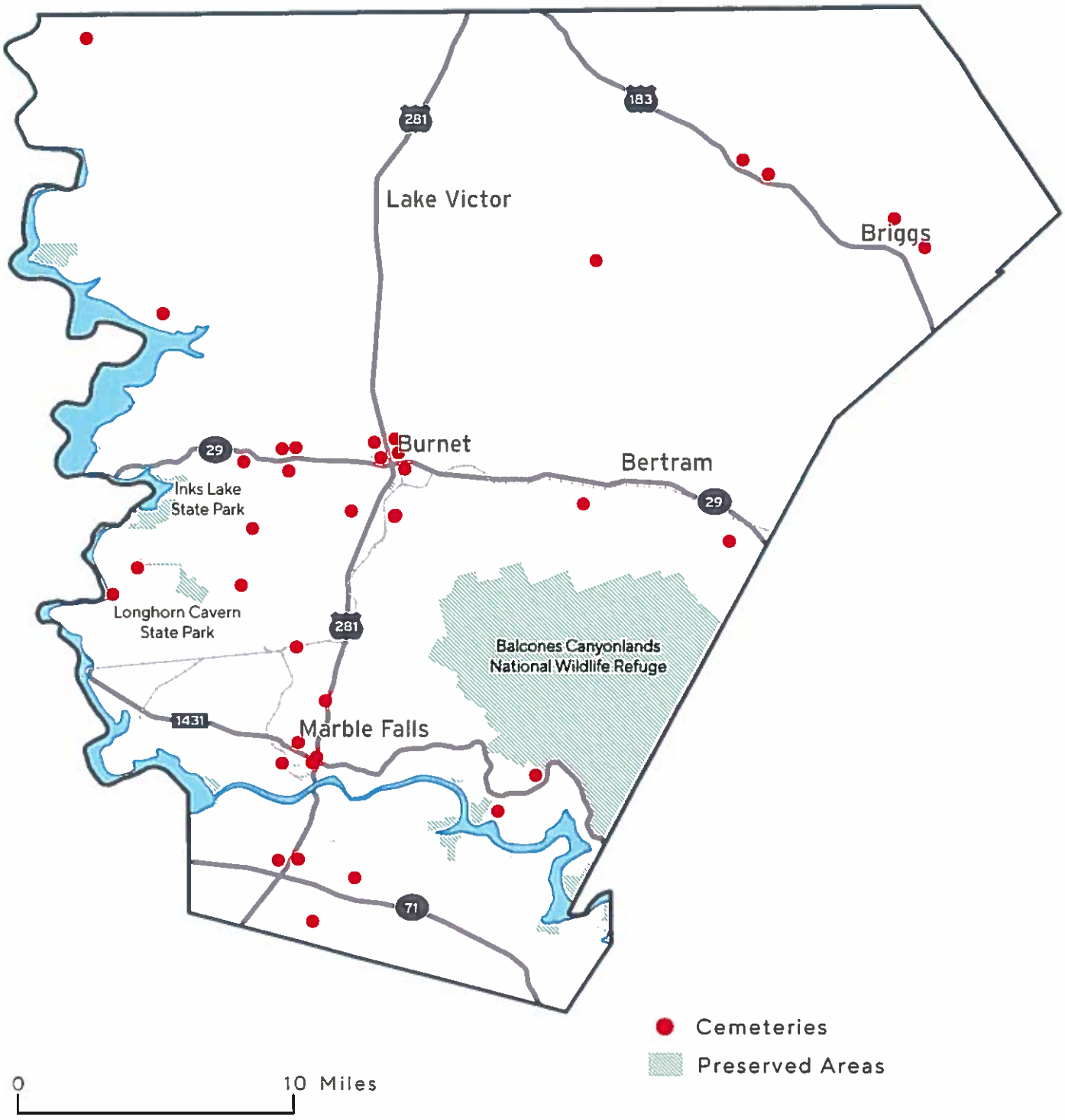


Figure 2.14

Burnet County Growth

Historically, Burnet County's more rural land use pattern has been supported by a network of local, county, ranch-to-market and arterial roadways that have satisfied county residents' transportation needs. As demand from development in both the county's historic developed centers and areas bordering high-growth corridors in neighboring counties grows, there will be increased need for new connections. In 2015, Burnet County had a population of 43,726 and is projected to increase its population by 115% to 94,000 people by 2045. The eastern edge of the county, in particular areas adjacent to the SH 29 and US 183 corridors, are expected to see additional growth as new development flows from neighboring Williamson County. As Burnet County and the Capital Area continue to grow, development codes and subdivision regulations can help the county scale its growth in an efficient and economically productive way. A strong and connected arterial network facilitates local economic development, especially freight transportation, in each of the county's developed areas.

The Marble Falls Comprehensive Plan aims to prepare the city for these growth projections by ensuring that thoroughfare rights-of-way are sufficient and designing a transportation system that can meet the growing demand for alternate, or active, forms of mobility. These objectives are mirrored in the 2010 Burnet County Transportation Plan.

Freight

The Texas Freight Mobility Plan analyzed potential 2045 freight demand and showed overall state-wide tonnage is expected to nearly double between 2016 and 2045. Several roadways in the Capital Area are shown to experience a Level of Service (LOS) F, a standard measurement for peak-period roadway performance, in existing conditions (2016) as well as 2045. This often means that demand is exceeding the ability of the road to serve users without stop-and-go traffic. US 281, US 183, and sections of SH 71, and SH 29, from the Travis County line to US 281, are a part of the Texas Freight Mobility Plan in Burnet County. Freight mobility and connectivity to regional arterials are essential to Burnet County's economic vitality as the mining industry accounts for a large number of jobs in Burnet County. US 281 serves as a key north to south connector, providing greater mobility for travelers and commercial freight in the Texas Hill Country and central portion of the state.

Traffic Counts

Throughout the county, the on-system roadways owned and managed by TxDOT carry the majority of trips. Even though these roadways are designed to handle a large number of trips, peak hour demand can put a strain on the system, especially in areas that lack strong network connectivity. The number of trips on a roadway is a metric that helps provide tangible context to the demand on each roadway segment. The following map,
Figure 2.15, shows the on-system network and the existing daily traffic counts.[5] The arterials east of US 281 have the highest counts with SH 29 and SH 71 getting well over 20,000 trips per day, which is not surprising given that there is greater development intensity west of the county.

[5] CAMPO Travel Demand Model

Traffic Counts

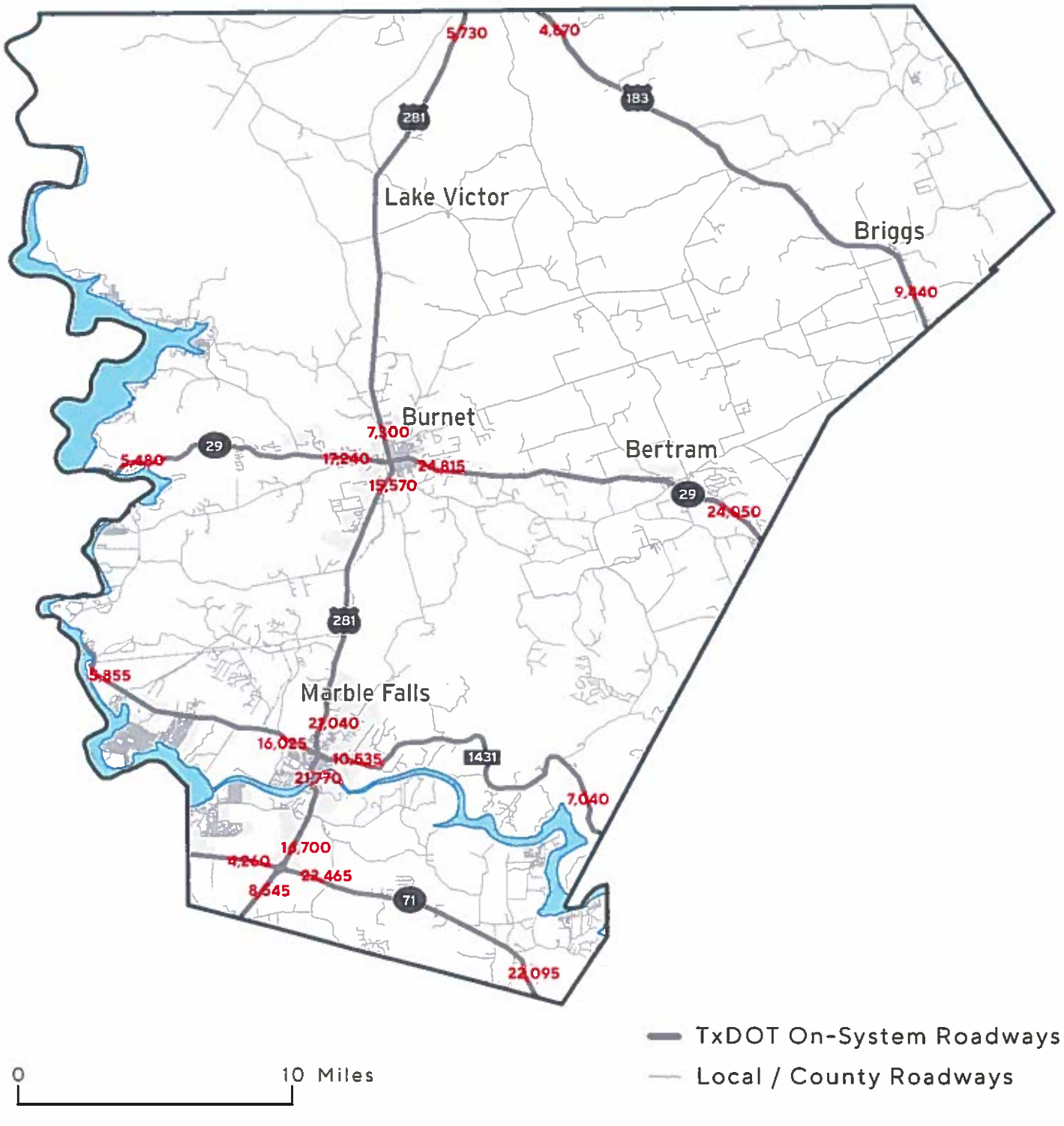


Figure 2.15

CHAPTER 3
CONCEPT PLAN

Scenario Planning

The Burnet County concept plan is a product of the RACI scenario planning methods which used the CAMPO 2040 Regional Travel Demand Model. The scenario planning networks were developed in coordination with the RACI Steering Committee to show how varying improvements to the arterial network would benefit regional connectivity. These networks and the eventual results of the scenario planning exercise were presented to stakeholders throughout the Capital Area. For any given year, the model quantifies the vehicular demand for roadways and provides resulting travel times based on that demand. Specific details related to the development of the Capital Area concept plan can be found in Chapter 4 of the RACI.

Model networks were analyzed in the RACI to evaluate varying suites of transportation improvement packages for Burnet County. The first network, Future No-Build, represents the region's current roadways with the projected 2040 population. This "Future No-Build" network provides a look into the future performance of roadways if no improvements are made to the network despite population growth over the next 20 years. Network A, as it was identified in the RACI, is a network where only the region's most significant arterials are improved, and new major arterials are added to eliminate gaps within the regional connections. Network B was developed to qualitatively illustrate how facilities could increase person throughput by utilizing lane management techniques like high-occupancy vehicle (HOV) lanes. The Combined Concept Network, Network C, builds upon the arterial network developed in Network A with more emphasis placed on increasing the number and connectivity of minor arterials throughout the region. Network D, also known as the Regional and Supporting Connections Network, added supporting minor arterial improvements that provide the greatest contribution to the top tier roadways in Burnet County. The overall results of the RACI model network analysis illustrate how network performance will worsen as Burnet County grows if no network changes are made. However, the results show that strategic investments can have a substantial positive impact to the regional network. The network results can be found in Chapter 4 of the RACI.

The results of this scenario planning exercise specific to Burnet County can be found in Figure 3.1, including the Regional Connector Network, which forms this plan's Recommended Arterial Network for Burnet County.

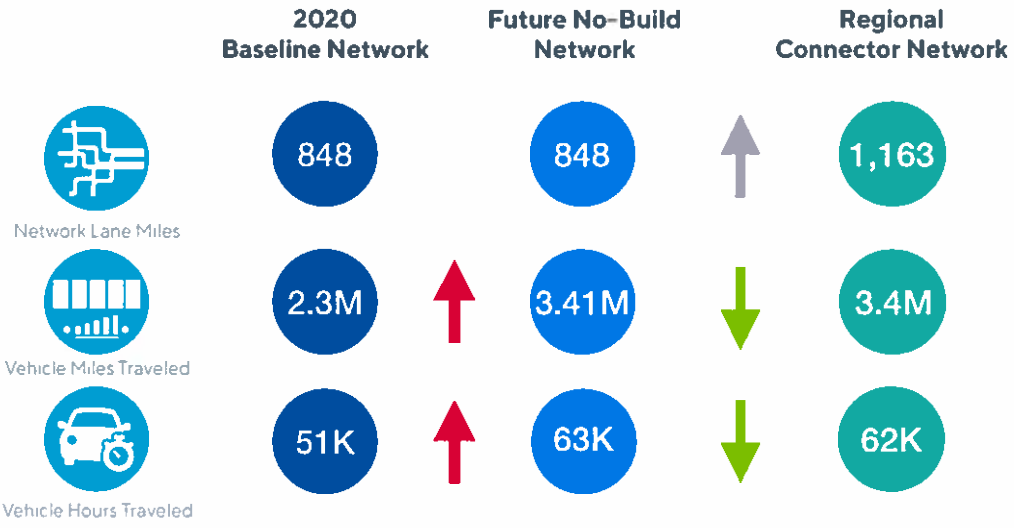


Figure 3.1

Performance Measures

Coding improvements include digitizing the existing, planned, and desired roadway connections into the regional model network and assigning attributes such as number of lanes and functional class based on the proposed improvement. The Travel Demand Model provides performance metrics which are used to evaluate and compare scenarios. The performance metrics are described below:

Centerline Mileage – the sum of the length of each roadway in the region. Increasing centerline mileage is equivalent to adding new roadways to the region's current network.

Network Lane Mileage – the sum of the length of each roadway multiplied by the number of lanes within each segment of roadway. Increasing lane mileage is equivalent to adding new roadways and/or widening existing roadways. Adding lane mileage increases roadway capacity.

Vehicle to Capacity Ratio (V/C) – represents how "full" a roadway is. By dividing demand (VMT) by the capacity (lane miles) the result is the V/C ratio. A V/C under .85 means the roadway is operating at or near free-flow conditions. A V/C ratio of .85 to 1 means that a roadway segment is operating near or at full capacity. A V/C ratio above 1 means the roadway segment is operating over capacity.

Vehicle Miles of Travel (VMT) – represents vehicular demand. VMT is calculated by multiplying the number of vehicles on a roadway segment by the length of that segment. VMT can be calculated for individual roadways or for the entire regional roadway network.

Vehicle Hours of Travel (VHT) – the amount of time vehicles are on the roadways. VHT is calculated by multiplying the number of vehicles on a roadway by the travel time of the roadway. VHT typically decreases when improvements are made. When VHT is decreased, network speed is increased.

AM and PM Peak – time period during the morning (6:00am - 9:00am) and afternoon (3:30pm - 6:30pm) commute to and from work. The AM and PM peak are periods of the day where traffic demand is at its highest point.

V/C ratio Ranges	
V/C Ratio	Description
0.0 - 0.85	Roadway operating at 85% of its capacity or less; free-flow traffic to slow traffic
0.85 - 1.0	Roadway operating between 85% and 100% of its capacity; stop and go
1.0 - 1.5	Roadway operating between 100% and 150% over capacity; congested
1.5 - >1.5	Roadway operating at over 150% of its capacity; "parking-lot" traffic

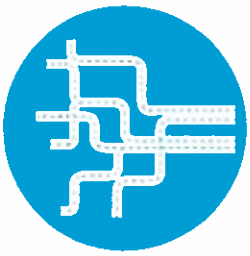
Figure 3.2

2020 Baseline Network

The Baseline Network includes the current roadway network and roadway improvements contained in the Transportation Improvement Program (TIP). Roadway improvements within the TIP are funded for construction and will be completed in the next 3-5 years.

Burnet County contains approximately 9% of the total lane mileage within the Capital Area and serves approximately 4% of the total demand, accounting for 3% of the total VHT within the region. The Baseline Network model results are shown below.

2020 Baseline Network performance measures



Network Lane Mileage 848

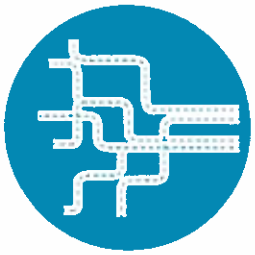
VMT 2,258,000

VHT 51,000

Future No-Build Network

The Future No-Build Network differs from the Baseline Network in that the population and employment are based on the 2040 adopted demographic forecast found in CAMPO's 2040 Transportation Demand Model. This network assumes a doubling of the region's current population and no additional roadway improvements. This type of scenario is often referred to as a "Do-nothing" scenario and is used to compare the impacts of improvements made in other scenarios. The key takeaway for this network's analysis is that as lane miles remain constant, roadway demand is expected to increase by 51% by 2045. The Future No-Build Network model results are shown below.

Future No-Build Network performance measures



Network Lane Mileage 848

VMT 3,405,000

VHT 63,000

Recommended Arterial Network

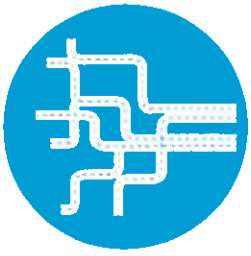
The Recommended Arterial Network identifies improvements that provide the greatest contribution to the highest functioning roadways in Burnet County. As anticipated, US 281, SH 29, SH 71, and RM 1431 are the most congested corridors in the county, which is sensible given that they serve as connectors between Burnet County, the Capital Area, and the Texas Hill Country. In addition to enhancing these roadways, the Recommended Arterial Network also includes two new bridges over the Colorado River (shown in yellow in Figure 3.3):

- Wirtz Dam Bridge
- The Narrows Bridge

Analysis from the RACI indicates that Burnet County would benefit from new connections across the Colorado River. The Recommended Arterial Network includes a new, high functioning arterial roadway extending north from the intersection of CR 406 and SH 71, as an alternative to US 281 in the southeastern part of the county. This new roadway, called The Narrows extension, is planned to run east of US 281, cross the Colorado River, and make a connection from SH 71 to RM 1431. Additionally, the Wirtz Dam Bridge is planned to connect the Cities of Horseshoe Bay and Cottonwood Shores to RM 1431 via South Wirtz Dam Road (Spur 2147) and North Wirtz Dam Road (CR 426). Figure 3.5 details the improvements that form the Recommended Arterial Network.

The Recommended Arterial Network model results are shown below. When compared to the Future No-Build Network, the improvements from this scenario result in a reduction of approximately 5,000 VMT and roughly 900 VHT.

Recommended Arterial Network performance measures



Network Lane Mileage 1,163

VMT 3,400,000

VHT 62,000

Recommended Arterial Network

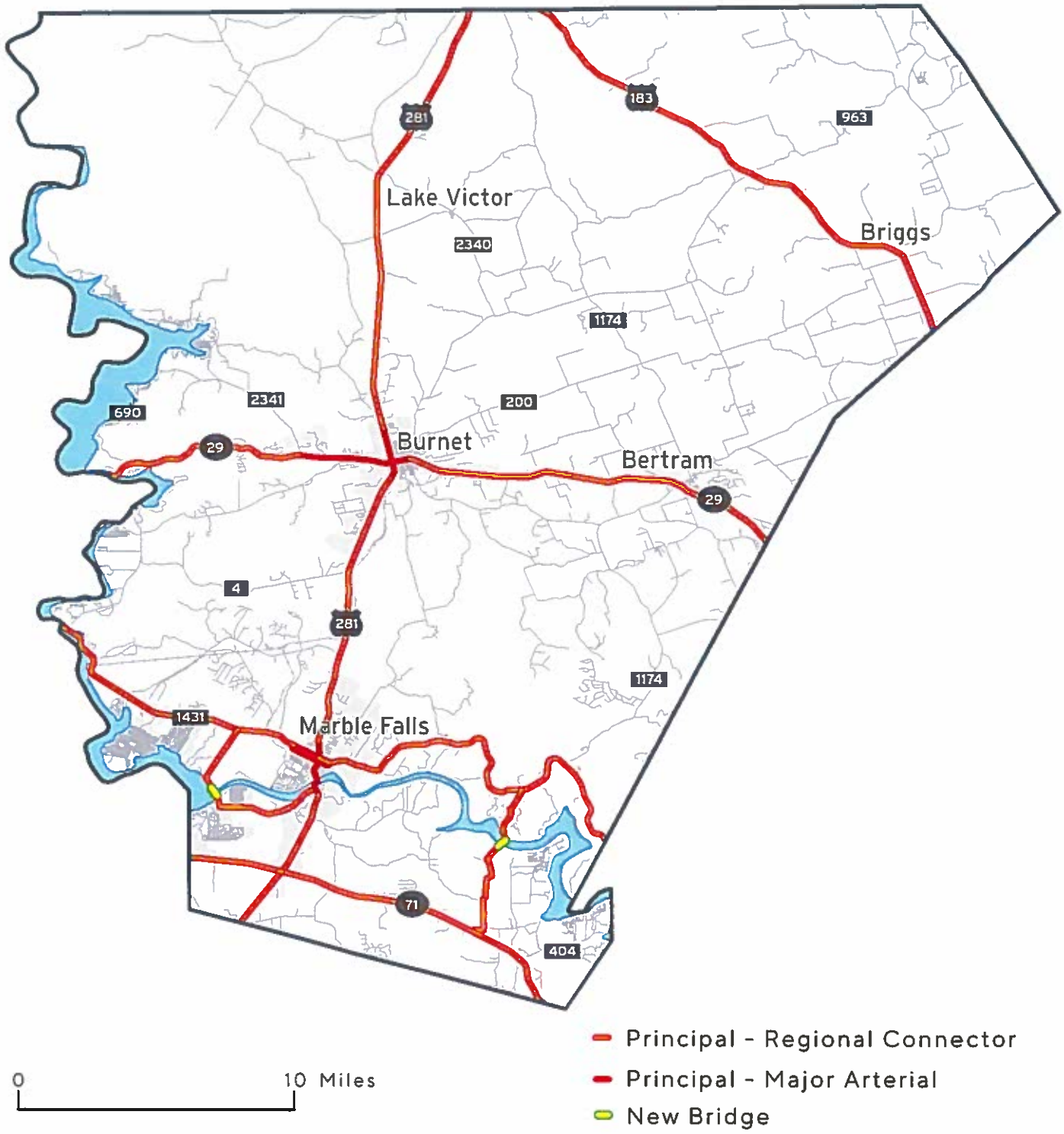


Figure 3.3

The Recommended Arterial Network presents a comprehensive long-range vision for Burnet County's future roadway network. Many of these specific improvements and new facilities were identified in local plans, including the 2010 Burnet County Transportation Plan, and further refined through public involvement and Steering Committee feedback as a part of the RACI. As a part of that same planning process, these concepts were vetted through multiple rounds of engagement by local elected officials. As detailed in the RACI report, once a network of locally planned and desired arterials was produced, CAMPO staff performed "a regional 'gap' analysis to determine where missing connections between planned and existing facilities may be or where demographic forecasts show a lack in the supply of arterial roadways."[6]

Given the population and employment projections of Burnet County within the plan horizon, the county will have need for the improvements identified in the Regional Connectors Network as described in the RACI. Regional connectors provide for longer distance travel across the county and the broader region, providing greater and dependable access to employment centers for the county's residents. In addition, the improvements to the network can contribute to safer travel for all users. Thus, this network is recommended in an effort to meet those demands and the goals for the future of Burnet County.

The improvements will bring benefit to residents and travelers in Burnet County through savings in time and miles traveled. These transportation improvements can help provide greater and more efficient connections for communities to key service providers and essential retailers, such as grocery stores and health clinics. Perhaps most importantly, these improvements will also enhance the safety of the roadway network and better facilitate emergency response. These roadway recommendations help advance the goals of this plan by supporting mobility, quality of life, and the economic success of Burnet County.

[6] CAMPO RACI, pg. ix.

Projected Traffic Counts

The following map, Figure 3.4, shows the on-system network and the existing daily traffic counts, in addition to the projected future daily traffic counts.[5] Even though the number of future trips is projected to increase significantly, the improvements outlined in this Recommended Arterial Network will improve the ability of the network to handle the additional trips efficiently.

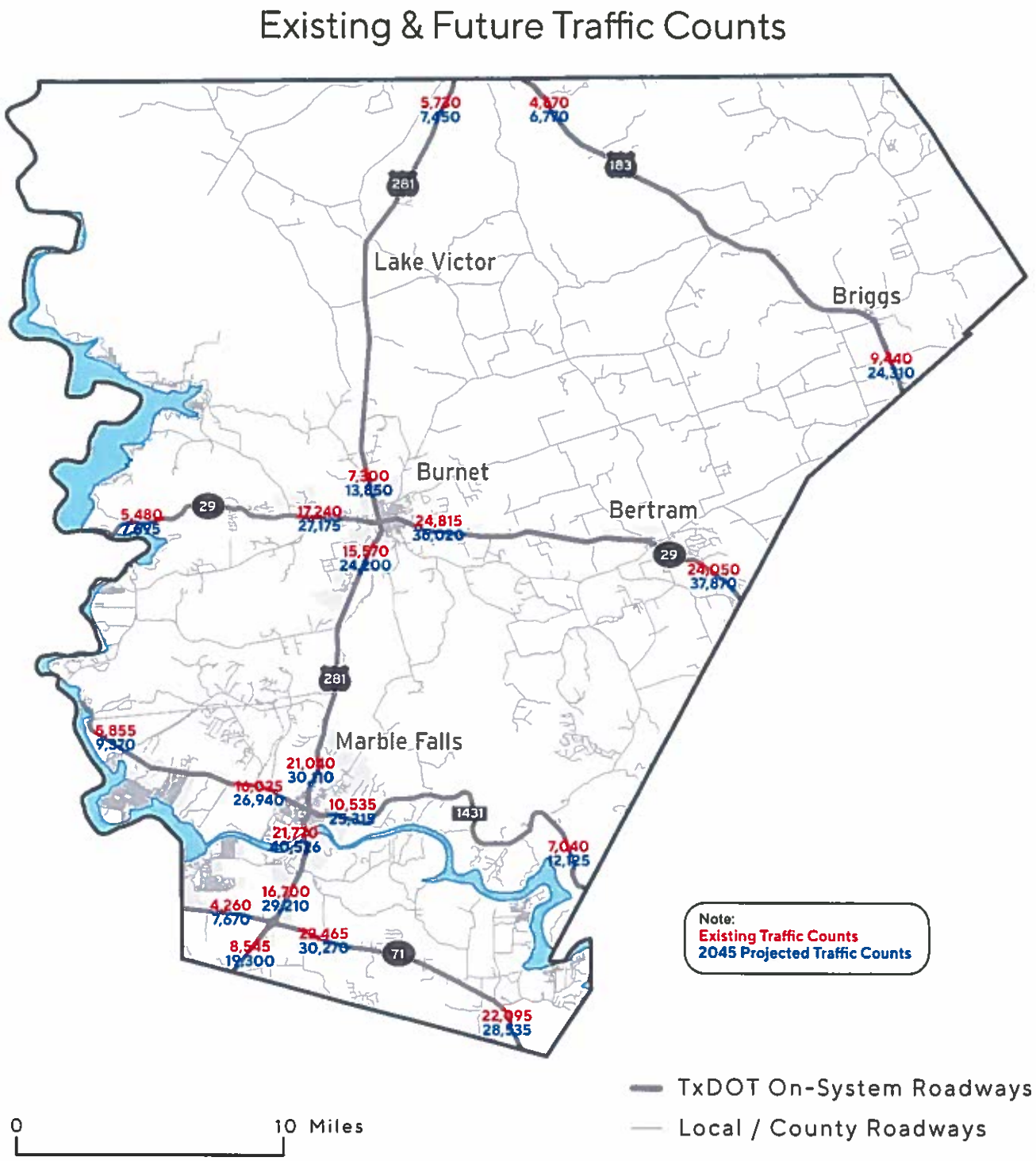


Figure 3.4

[5] CAMPO Travel Demand Model

Recommended Arterial Network Improvements

			Current - 2018			Future - 2045		
Facility	From	To	Current Functional Class	Design Type	Number of Lanes	Proposed Functional Class	Design Type	Number of Lanes
US 281	Blanco County Line	RM 2147	Principal (Major Arterial)	Undivided	4	Principal (Regional Connector)	Divided	6
	RM 2147	Mission Hills	Principal (Major Arterial)	Undivided	4	Principal (Major Arterial)	Divided	4
	Mission Hills	CR 340 Extension	Principal (Major Arterial)	Undivided	4	Principal (Regional Connector)	Divided	6
	CR 340 Extension	Old San Saba/Green Mile	Principal (Major Arterial)	Undivided	2 - 4	Principal (Major Arterial)	Divided	4
	Old San Saba/ Green Mile	Lampasas County Line	Principal (Major Arterial)	Undivided	4	Principal (Regional Connector)	Divided	4
US 183	Williamson County Line	Lampasas County Line	Principal (Major Arterial)	Undivided	2	Principal (Regional Connector)	Divided	4
SH 71	Llano County Line	US 281	Minor Arterial	Undivided	2	Principal (Regional Connector)	Divided	4
	US 281	Travis County Line	Principal (Major Arterial)	Undivided	4	Principal (Regional Connector)	Divided	6
SH 29	Llano County Line	RM 2341	Minor Arterial	Undivided	4	Principal (Regional Connector)	Divided	4
	RM 2341	Hill Street	Minor Arterial	Undivided	4	Principal (Regional Connector)	Divided	4
	Hill Street	Williamson County Line	Principal (Major Arterial)	Undivided	4	Principal (Regional Connector)	Divided	6
RM 1431	Llano County Line	US 281	Major Collector	Undivided	4	Principal (Regional Connector)	Divided	4
	US 281	Travis County Line	Major Collector	Undivided	2 - 4	Principal (Regional Connector)	Divided	6
The Narrows Ext.	SH 71 / CR 406	RM 1431 / CR 344	Local	Undivided	2 / New Facility	Principal (Regional Connector)	Divided	2 - 4
Wirtz Dam Road	RM 2147 / S Wirtz Dam Road	RM 1431 / N Wirtz Dam Road	Local	Undivided	2 / New Facility	Principal (Regional Connector)	Divided	2 - 4

Figure 3 5

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