

MOBILITY 2050

AAMPO



THE ALAMO AREA TODAY

MOVING PEOPLE CONNECTING PLACES



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2. THE ALAMO AREA TODAY

The Alamo Area MPO’s region continues to experience exponential growth. While congestion remains an issue during peak travel times, the existing transportation system does a good job keeping goods and people moving safely, efficiently, and effectively today. To plan for continued and improved system performance, it is necessary to have an understanding of the current network. Planners consider a variety of factors while evaluating the current network and planning for the future. Major planning factors considered by AAMPO and its partners include:

- The pace of population and employment growth
- Land use and area planning efforts
- Performance measures and targets
- Multimodal operations and connections
- Impacts and mitigation efforts related to air quality and the human and natural environment
- Travel behavior and travel patterns
- Network management and planning strategies

This section will explore these factors, highlight existing programs and plans, and list recent mobility developments in the Alamo Area region.

2.1 Growth and Land Use

The Alamo Area region grew by nearly 399,622 people from 2010-2020 and is expected to reach 4,232,264 population by 2050. According to US Census Bureau and the State Demographer’s Office, the four counties in the AAMPO planning area saw the number of jobs increase by 287,581 since 2010.

Table 1: Numeric and Percent Growth from 2010-2020

AAMPO Counties showing Numeric and Percent Growth from 2010-2020 Source: US Census Bureau, Decennial Census of Population and Housing (2010, 2020)				
	2010 Population	2020 Population	Population Change	Percent Population Change
Bexar	1,714,773	2,009,324	+294,551	+17.2%
Comal	108,472	161,501	+53,029	+48.9%
Guadalupe	131,533	172,706	+41,173	+31.3%
Kendall	33,410	44,279	+10,869	+32.5%
Texas	25,145,561	29,145,505	+3,999,944	+15.9%
USA	308,745,538	331,449,281	+22,703,743	+7.4%

Improvements to the Alamo Area’s regional transportation network have done well to keep pace with projected growth. Increased workforce development and a solid transportation system are essential for a healthy, robust, and growing economy. Local governments are continually developing policies and programs to improve workforce development and attract new industries to the area.

These policies and programs facilitate land use decisions that have the most immediate impact toward facilitating infrastructure improvements and advancing regional transportation goals.

Land use is a hugely important planning aspect that deeply impacts the ability to move people and goods. Land use policies that support a multimodal network and advance preservation of public rights of way for transportation infrastructure have multiple benefits. From a transportation professional standpoint, the benefits come in project development time, construction and delivery time, and cost savings. Savings realized when local governments can surpass the sometimes lengthy and typically costly process of acquiring private property for public projects. For private property owners, these benefits prevent the need to sell or donate land, be relocated, subjected to eminent domain, or potential fluctuating property values. Public benefits to preserving rights of ways and dedicating space to public mobility projects is predictable development and overall better use of taxpayer funds. Land use policies that support future transportation needs allow for greater predictability, community stability, economic opportunity, and better use of time and limited funding resources.

A large element of *Mobility 2050*'s vision and goals hinge on land use. This plan seeks to foster appropriate land use patterns, advance alternative modes of transportation, and increase equitable accessibility for all users with a stated goal of investing in the existing transportation system and preserving right of way for future improvements. Several of the plan's additional goals - effectively and efficiently use funding and encourage alternative modes such as transit, context sensitive solutions, fostering the region's competitive advantage by promoting economic development, fostering financial sustainability, and encouraging the highest return on financial investments – can also be advanced with additional proactive land use policies.

AAMPO's planning partners and local governments understand and support proactive land use policies. These policies are the cornerstones to comprehensive planning efforts. Many partners have adopted plans to further specific land use development. These plans promote preservation of public rights of way and consider adjacent land uses as it relates to mobility and infrastructure. The comprehensive and other mobility related plans from transportation partners are listed below.



Figure 10: Alamo Area Planning Partners Efforts

Mobility 2050 and all the plans listed above have a common goal of promoting an enhanced standard of living while accommodating economic, population, and employment growth. These plans are also consistent with the planning objectives outlined in the FAST Act. AAMPO's Board will continue to facilitate conversations and pursue policies that support the integrated development of transportation, land use, and economic development plans. By collaborating with local, regional, and statewide transportation partners, the agency strives to coordinate efforts to maximize opportunities and leverage available resources.

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase the accessibility and mobility of people and for freight.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
- Enhance travel and tourism.

2.2 Performance Measures

AAMPO is a federally-funded agency and regulated by federal laws. When federal infrastructure bills become acts and are financially obligated, the funding that flows from them comes with various requirements, tied to national infrastructure goals. Federal legislation, with the passage of MAP-21 (July 6, 2012), instituted **performance-based programming and management** to help achieve the most **efficient and effective investment** of transportation resources and provide **greater accountability and transparency**. The FAST Act (December 4, 2015) continued system performance management with the establishment of national goals for safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability, and reduced project delivery delays. Together, these laws help create a streamlined, performance-based, multimodal program to address challenges facing the transportation system. Additional or expanded performance measures may be included in the forthcoming IJJA regulations as more guidance is released.

To date, AAMPO has adopted performance measures associated with Safety (PM1), Bridge and Pavement Condition (PM2), Roadway System Performance (PM3), and Transit Asset Management (TAM). Below is a table of the AAMPO board adopted performance measures and the corresponding targets for 2022.

Table 2: AAMPO Performance Measures and Targets

AAMPO ADOPTED PERFORMANCE MEASURES AND TARGETS 2022	
PM 1: Safety - Reviewed every year, based on 2% reduction of five-year average for all public roads (2022)	
Traffic Related Fatalities	3,272
Traffic Fatalities Rate per 100 million vehicle miles traveled (VMT)	1.23
Traffic Related Serious Injuries	19,065
Traffic Related Serious Injuries per 100 million VMT	6.47
Non-motorized Fatalities and Serious Injuries	2,642
PM 2: Bridge and Pavement Condition – Reviewed every two years (2022)	
Interstate Pavements - Good Condition	66.5%
Interstate Pavements - Poor Condition	0.2%
Non-interstate National Highway System (NHS) Pavements – Good Condition	54.1%
Non-interstate NHS Pavements – Poor Condition	14.2%
NHS Bridges – Good Condition	50.4%
NHS Bridges – Poor Condition	1.5%
PM 3: Roadway System Performance – Reviewed every two years (2022)	
Interstate Reliability*	65.0%
Non-interstate NHS Roadways Reliability	45.0%
Freight Truck Travel Time Reliability (TTTR) Index**	2.20%
Transit Asset Management – Reviewed every year (2022)	
Equipment (% non-revenue vehicles that have either met or exceeded useful life benchmark)	
Automobiles	44%
Trucks and Other Rubber Tire Vehicles	36%
Rolling Stock (% revenue generating vehicles that have either met or exceeded useful life benchmark)	
Articulated Bus	0%
Bus	4%
Paratransit Vans/Cutaways	0%
Passenger Rail Infrastructure	N/A
Facilities (% rated below adequate condition on the Transit Economic Requirements Model (TERM) analysis scale)	
Administrative	0%
Maintenance	0%
Passenger/Parking	0%
*Reliability: the predictability and consistency in travel times regardless of congestion. Percent is based on person-miles traveled.	
**TTTR Index: 95th percentile truck travel time/50th percentile truck travel time	

Planners use the historic performance metrics to predict future system performance. The commitment to advancing the achievement of these targets is demonstrated during the development of the Transportation Improvement Program (TIP), AAMPO’s four-year transportation program. Performance areas are part of the criteria decision-makers consider during TIP project selection.

2.3 Recent Achievements

As previously noted, the region (and everyone) suffered severe impacts as a result of the COVID-19 pandemic. The pandemic hit the Alamo Area in mid-March 2020 with many businesses and schools experiencing a complete shut-down. The initial thinking was the pandemic would be short-lived and things would return to normal within a short timeframe. Unfortunately, this was not the case. AAMPO personnel pivoted and worked remotely or from the office observing strict pandemic protocols. Public outreach and community engagement continued with virtual opportunities and limited in-person efforts. The policy board, with support from the AAMPO committees, proceeded with project selection for the 2023-2026 TIP. During the spring of 2022, the pandemic continued to impact the region. However, with the passage of the IIJA, there is much to look forward to in the transportation world. An overview (not comprehensive) of progress made during 2019, 2020, and 2021 is listed below. Despite the challenges brought on by COVID-19, AAMPO and its local partners continued to work together toward a multimodal network that is safe and accessible to all user groups.

While AAMPO is charged with facilitating the distribution of federal transportation funds, not every project and program is funded through the agency. Regional transportation planners and agencies share accomplishments with AAMPO as part of the 3C effort. The information below represents high-profile projects and program that have been completed or implemented over the past three years. The data being shown is sourced from TxDOT's Project Tracker application, AAMPO's Alamo Bike crowdsourcing application, and the various regional transportation partners. The AAMPO Study Area includes Bexar, Comal, Guadalupe, and a portion of Kendall counties and TxDOT's San Antonio District takes in the entirety of the study area plus eight other counties outside of AAMPO's study area. The four major population centers in the study area are Boerne, New Braunfels, San Antonio, and Seguin. Each of these transportation partners, along with other communities such as Leon Valley and Bulverde, have advanced the area's roadway and bicycle network over the past three years with more development and improvements slated for the future.

Multimodal Operations and Planning Considerations

As the region continues to grow, transportation planners continue to explore opportunities for developing regional multimodal connections. In addition to utilizing performance measures to evaluate potential projects for AAMPO funding, analysis also includes how the project or program may be integrated into the regional network. AAMPO, under the direction of the policy board, will continue funding the improvement and addition of new roadways and adding capacity (lanes) to highways. However, AAMPO and other transportation professionals understand it is impossible to build the region out of future congestion. In 2009, AAMPO adopted a Complete Streets Policy, aimed at ensuring people of all ages and abilities are able to use public rights of way and roads safely and comfortably, regardless of mode. The Complete Streets Policy ensures public rights of way can be transformed to accommodate a variety of modes including bikes, pedestrians, micromobility, and transit.

Early coordinated planning allows for a more comprehensive deliberate development approach, especially when there are multiple local, state, and federal agencies involved in multi-year project development. Toward this end, AAMPO has instituted a number of programs and developed studies to encourage planners, partners, stakeholders, and the public to take a more comprehensive look at mobility needs and transportation options. The plans and studies and programs referenced below are centered on planning for safer roadways, improved multimodal connectivity, and promoting better air quality by reducing emissions. They promote increased active transportation (bicycling, walking) and transit as viable options for daily commutes and other mobility needs.

AAMPO PROGRAMS

Table 3: AAMPO Programs

AAMPO PROGRAMS			
Program	Audience	Description	Mode Promoted
Alamo Commutes	Commuters, small businesses, large employers	Provides commuters and employers with the information, tools, and resources they need to make more sustainable commuting choices. The program goal is to decrease traffic congestion, improve air quality, and create a better quality of life in the Alamo Area.	Carpool, Public Transportation, Car/Bike Share, Bike, Walk, Micromobility
Street Skills Program	Adults and mature teens	Teaches participants the rules of the road including bicycle safety tips and best practices for handling potentially dangerous situations. To further encourage safety while cycling, attendees are given a free helmet and set of bike lights.	Bike
League of American Bicyclists' Bicycle Friendly	Employers and business owners	A nationwide recognition program for employers' efforts to encourage a more welcoming atmosphere for bicycling employees, customers and the community. AAMPO's Alamo Commutes program promotes employer-supported bicycle	Bike

Business Program		commuting to work. AAMPO's Active Transportation Planner works with businesses to make them more bicycle community friendly.	
Community Outreach Events	Residents and the general public	AAMPO staff produce and attend various events to distribute educational materials related to bicycling, walking, safety, and air quality. On average, staff attends over 20 community events annually reaching thousands of Alamo Area residents.	Bike, Walk, Micromobility
Open Streets Events	Residents and the general public	Events that allow people of all ages, abilities, and economic backgrounds to take to the streets using various modes to replace automobiles. AAMPO plays an active role in coordinating, participating, and promoting open streets events in the region, such as Síclovia in San Antonio, CycloViva in New Braunfels, and Movin' on Main in Schertz.	Bike, Walk, Micromobility
Bicycle Rodeos & Safety Talks	School age children, parents, and educators	Provides support for area school's bicycle rodeos by distributing and helping children properly fit helmets, and sharing safety information with parents, teachers, and students. MPO staff also provide bicycle and pedestrian safety talks to schools and other youth groups.	Bike, Walk
Safe Routes to School Program & Walk to School Day	School age children, parents, and educators	AAMPO collaborates with local and regional partners to promote International Walk to School Day each October and to foster more Safe Routes to School programming in the region.	Walk
National Bike Month	Residents, employers, learning institutions, and the general public	National Bike Month is in May and provides a chance to showcase the benefits of bicycling and encourage more people to do it. AAMPO promotes, produces, and participates in annual events like Bike to Work Day, Bike & Roll to School Day, the Bike Beat festival and Street Skills classes.	Bike
Walkable Community Workshop Technical Assistance Program	Neighborhoods, community groups, and residents	A technical assistance program that works with various groups to identify infrastructure improvements to encourage walking and bicycling to restaurants, schools, businesses and parks.	Bike, Walk

The plans listed below were developed and supported by AAMPO. These plans seek to provide a framework by which local transportation partners can advance the program results into projects, programs, with multimodal facilities and safeguards. AAMPO encourages this type of collaboration with various agencies to promote a comprehensive regional network. The Alamo Area MPO promotes coordinated planning that allows for leveraging limited resources and produce a greater return of investment. Various active transportation and alternate modes of travel elements have been advanced by local governments and Alamo Area non-profits. AAMPO will continue to update and synthesize these elements with increased emphasis on safety for the traveling public.

AAMPO PLANS AND STUDIES

Table 4: AAMPO Plans and Studies

AAMPO PLANS AND STUDIES		
Plan (Year Completed)	Purpose and Highlights	Participating Entities
Regional Bicycle and Pedestrian Planning Study (January 2016)	<p>Promote safe, accessible and comprehensive multimodal planning and development.</p> <p>Assess bicycle and pedestrian conditions in the cities of Boerne, New Braunfels, and Seguin, and makes recommendations regarding future facilities necessary to create comprehensive active transportation networks. Work specific to Bexar County and the City of San Antonio includes the development of a Pedestrian Master Plan.</p> <p>More detailed connectivity work has also been conducted within the San Antonio Missions National Historical Park and surrounding neighborhoods.</p> <p>Provide guidance for implementation.</p>	<p>AAMPO</p> <p>City of Boerne</p> <p>City of New Braunfels</p> <p>City of San Antonio</p> <p>City of Seguin</p> <p>San Antonio Missions</p> <p>National Historic Park</p>
Regional Managed/Transit Priority Lanes Feasibility Study (December 2016)	<p>Develop a long-range regional, multimodal system-wide congestion management plan through the use of managed and/or transit priority lanes</p> <p>Reduce congestion and provide more reliable trips.</p> <p>Develop a set of recommended managed lanes treatments for select corridors in the San Antonio metropolitan region.</p>	<p>AAMPO</p> <p>TxDOT</p> <p>VIA</p>
Regional Thoroughfare Plan Study (October 2018)	<p>Review existing major thoroughfare plans for consistency in alignment and functional classification as the roadways cross jurisdictional boundaries.</p> <p>Develop constraints analysis and connectivity/capacity review.</p> <p>Determine and map constraints that impact the constructability of proposed thoroughfares and identify those thoroughfares with limited feasibility.</p> <p>Perform a needs study that uses both capacity and connectivity criteria to identify areas of the region that should be the focus of future planning efforts.</p> <p>Provide tools for AAMPO member agencies to aid them with thoroughfare planning efforts.</p> <p>Identify and discuss best practices</p>	<p>AAMPO</p> <p>Bexar County</p> <p>City of New Braunfels</p> <p>City of San Antonio</p> <p>City of Seguin</p> <p>Comal County</p> <p>VIA Transit</p> <p>TxDOT</p>
Bike Share Master Plan (November 2018)	<p>Seek opportunities to expand the existing system in San Antonio and include Boerne, New Braunfels, and Seguin. The findings of the study are presented in four reports – one for each community.</p> <p>For Bexar County, the report presents a background and history of the existing bike share program, explores the City of San Antonio's new dockless pilot program, and presents the results of an independent analysis that looked at demand, equity, public and stakeholder opinion, and experience from other cities to develop options and recommendations for how San Antonio should move forward and best leverage public and private investment in shared mobility.</p>	<p>AAMPO</p> <p>Bexar County</p> <p>Comal County</p> <p>Guadalupe County</p> <p>Kendall County</p> <p>City of Boerne</p> <p>City of New Braunfels</p> <p>City of San Antonio</p> <p>City of Seguin</p> <p>San Antonio Bike Share (SABS)</p> <p>TxDOT</p> <p>VIA</p>

	In the smaller communities, that do not have bike share or shared mobility, a feasibility assessment process was performed. The study explored opportunities and challenges and reviewed geographic conditions, land use patterns, demographics, population trends, transportation infrastructure, city infrastructure, and local and regional policies.	
Alamo Regional Transportation Attitude Survey (RTAS) III (April 2018)	Gather statistically reliable data to document perceptions of regional transportation needs and issues, and determining preferences and priorities for transportation system enhancements. The survey effort gathered information on the following: How Residents Thought Traffic Congestion Has Changed Compared to Five Years Ago. Satisfaction with Aspects of the Region's Transportation System. Current and Emerging Problems in the Region. Satisfaction with Efforts to Address Long Range Transportation Planning Issues in the Region. Satisfaction with Non-Automobile Transportation in the San Antonio/Alamo Region. Most Residents Believe the Current Level of Funding for Road, Highway, and Public Transportation Improvements Should Increase over the Next Five Years.	Statistical samplings of Alamo Area residents, employers and traditionally underserved populations.
Capital-Alamo Connection Study (February 2019)	Develop a framework of bi-regional strategies to enhance the mobility within the greater Austin-San Antonio region. This study identifies inter-regional travel patterns, assesses current market conditions, and defines future transportation needs to inform the development of strategies that address mobility between regions.	AAMPO CAMPO TxDOT SAT, AUS, ENV, TPP, and other Division District City of San Antonio City of Austin Other local governments Various stakeholders
Fort Worth to Laredo High-Speed Transportation Study (April 2020)	Analyze various high-speed modes and corridors between Fort Worth, Waco, Temple/Killeen, Austin, San Antonio, and Laredo to include in a future Tier 2 Environmental Analysis. The highest-ranking technology/corridor combination utilized hyperloop and a highway/greenfield/utility corridor. Findings suggest that a corridor utilizing hyperloop, maglev, or high-speed rail is feasible and a viable solution for transportation issues throughout the State of Texas and particularly in the rapidly growing I-35 corridor.	AAMPO North Central Texas Council of Governments Waco MPO Killeen-Temple MPO CAMPO Laredo MPO Numerous stakeholders
New Braunfels Transit Study (June 2021)	Study fixed route transit service in the City of New Braunfels. Identify potential routes (including connectivity to San Antonio, Seguin, Schertz/Cibolo,) and current and	AAMPO City of New Braunfels Stakeholders The public

	<p>proposed park and carpool facilities; projected ridership levels; passenger amenity packages; potential street improvements; capital costs; operating costs; funding sources; cost/benefit analyses; and phasing of implementation.</p>	
<p>Subregional Planning Study (March 2022)</p>	<p>Conduct a subregional planning project in the I-35 corridor connecting northeast Bexar County, Comal, and Guadalupe Counties. Implement many strategies recommended by the Capital-Alamo Connection Study. A list of more than 100 potential multimodal projects was developed to help meet the goals and objectives adopted by the project's Study Oversight Committee. The projects were prioritized from 1 to 116 using a performance-based ranking process reflective of the adopted goals and objectives. To help keep the implementation process moving forward, several implementation strategies and checklists were developed to keep the implementation process at the forefront.</p>	<p>AAMPO Alamo Area Council of Governments Bexar County Comal County City of New Braunfels Guadalupe County City of San Antonio City of Seguin Joint Base San Antonio TxDOT VIA</p>

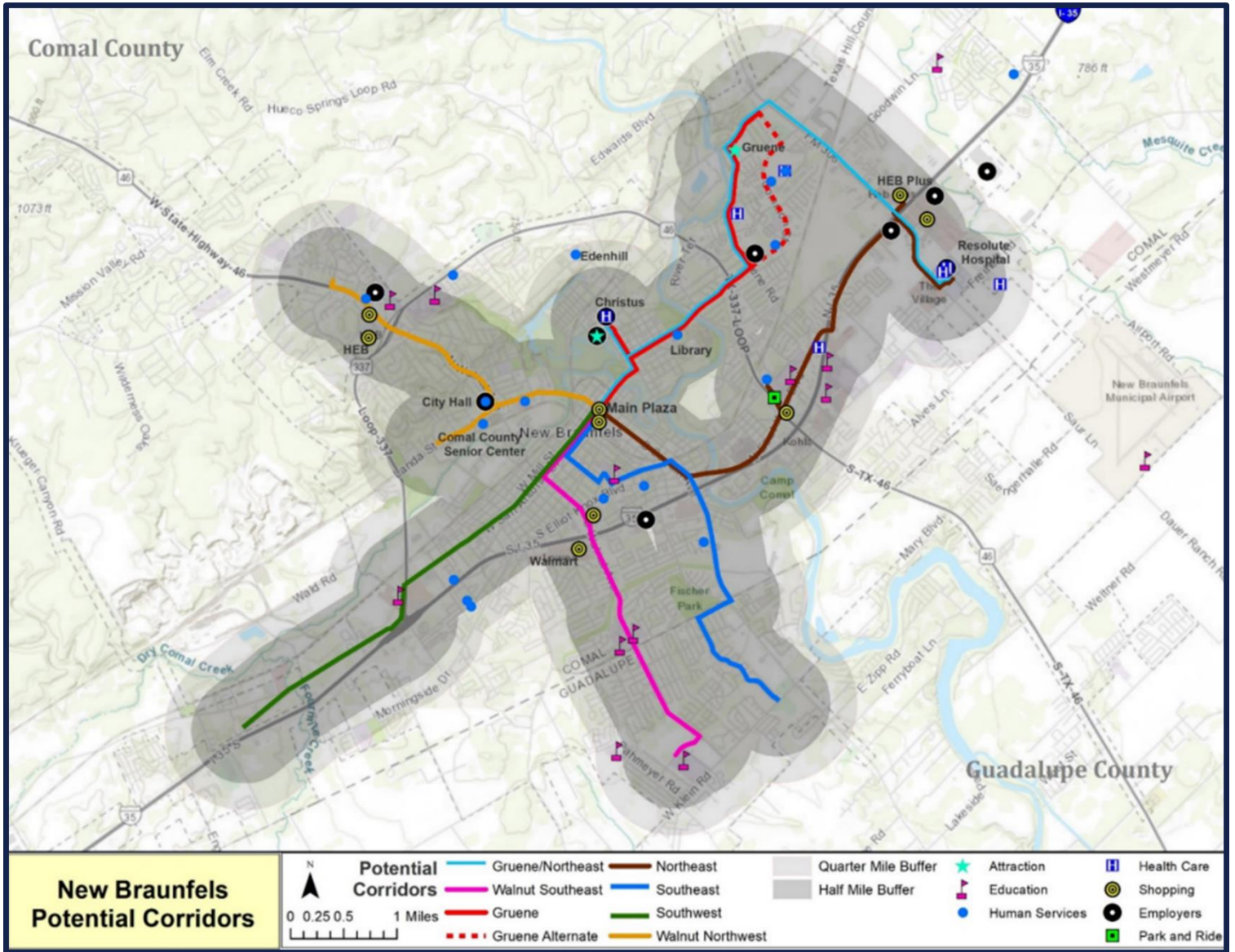


Figure 11: New Braunfels Potential Corridors

Through these plans, studies, and programs, AAMPO has provided and participated in regional technical assistance, community education, safety awareness, and project recommendations to government and municipal partners, neighborhoods, communities, schools, non-profits, small business owners and large employers. Following is a brief update of completed projects and mobility improvements covering 2019-2021.

Alamo Commutes is AAMPO's flagship program for promoting alternative modes of transportation to address mobility needs and reduce carbon emissions. The program provides commuters and employers with the information, tools, and resources needed to make sustainable and multimodal commuting choices. During the past three years, the program provided incentives and rewards to over 1,000 participants and assisted employers, such as UTSA and Overland Partners, in assessing their employees' commute needs and concerns. Users of Alamo Commutes are incentivized with reward points to track their rideshare, public transit, bike, and/or walk commutes. Through the Alamo Commutes website and associated smart device applications, users are offered access to services like trip planning, carpool matching, and the Emergency Ride Home program. Though COVID-19 had a dramatic impact on participation, The Alamo Commutes challenges kept users engaged and interested in logging their smart commutes.

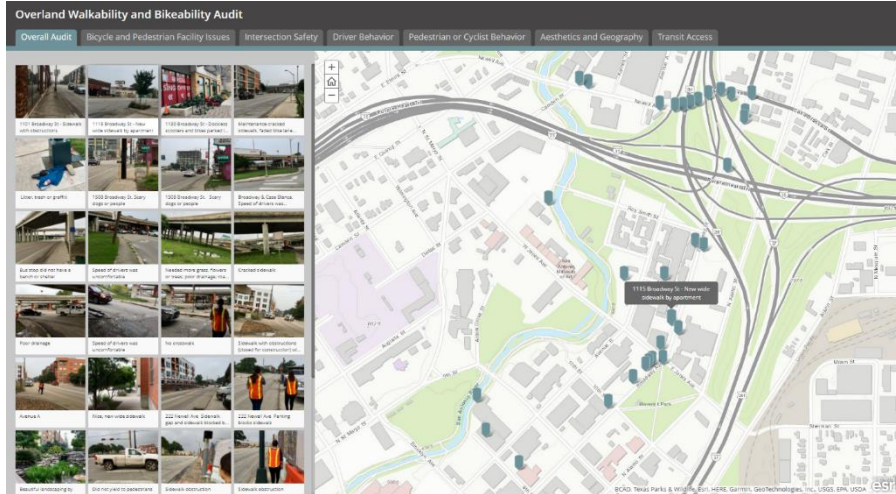


Figure 12: Walkability and Bikeability Audit

Since 2019, Alamo Commutes actively engaged with individuals through quarterly newsletters, the carpool hotline (210-CARPOOL), and a presence at 34 public events. In 2021, Alamo Commutes partnered with VIA Metropolitan Transit to educate commuters about new regional High Occupancy Vehicle (HOV) lanes. HOV lanes are built to encourage and incentivize carpooling, decrease travel times, conserve fuel, and improve air quality. The table below shows the program metrics for participants, reduction in miles traveled, fuel savings, and air quality impacts. As the pandemic begins to subside, AAMPO is gearing up efforts to surpass the 2019 numbers.



Figure 13: Alamo Commutes and VIA Join HOV Campaign

Participation and Impact 2019 - 2021					
Year	Total Alamo Commutes Participants	VMT Reduction (miles)	Gas Saved (gallons)	NO _x Reduction (lbs)	VOC Reduction (lbs)
2019	760	3,158,868	152,868	4,736	4,109
2020	611	2,197,307	103,990	3,294	2,858
2021	358	1,068,834	49,712	1,602	1,390

Table 5: Alamo Commutes Participation and Impact

Alamo Area Roadway and Active Transportation Improvements (2019 to 2021)

Table 6: Roadway and Active Transportation Improvements

Roadway and Active Transportation Improvements (2019-2021)		
Transportation Lead	Projects	Highlights (Projects and programs listed below are representative and not comprehensive.)
TXDOT SAT – Comal County	30 projects with construction underway or beginning soon. [Project Tracker 2019-2021]	Total: \$141 million I-35 access and operational improvements RM 32 intersection improvements: FM 484 and FM 3424 US 281 landscape improvements Safety improvements at Natural Bridge Caverns Road Various maintenance, safety, sidewalk and shoulder, and operational improvements
TxDOT SAT – Bexar County	140 projects with construction underway or beginning soon. [Project Tracker 2019-2021]	Total: \$2.36 billion State Loop 1604 add lanes/widen roadway: I-10 to US 281 State Loop 1604 add lanes: SH 16 (Bandera Rd) to I-10 State Loop 1604 traffic management improvements I-35 highway safety improvements: I-410 to Loop 13 (SW Military) I-410 add lanes: Ingram Road to US 90 FM 471 add lanes: Old FM 471 to Medina County Line SH 16 (Bandera Road) safety improvements from Braun Rd to Mystic Park I-10 add lanes: SL 1604 to Graytown Rd I-35 add lanes: I-410 to Bexar/Guadalupe County Line Various maintenance, safety, sidewalk and shoulder, and operational improvements
TxDOT SAT – Guadalupe County	21 projects construction underway or beginning soon. [Project Tracker 2019-2021]	Total: \$434 million SH 123 widen road/add shoulders: SH 46 to Guadalupe/Wilson County line I-10 add lanes: Guadalupe/Bexar County line to FM 465 FM 1103 add lanes: Guadalupe/Comal County line to Rodeo Way I-35 add lanes: Guadalupe/Bexar County line to FM 3009 FM 725 widen road/add shoulders: Zipp Road to FM 78 FM 20 safety improvements: FM 621 to SH 80 Various maintenance, safety, sidewalk and shoulder, and operational improvements
TxDOT SAT – Kendall County	20 projects construction underway or beginning soon.	Total: \$49.3 million I-10 connectivity improvements: North Creek Road to US 87 RM 1376 frontage roads: Wasp Creek to US 87B

	[Project Tracker 2019-2021]	RM 473 safety improvements: .7 miles west of RM 474 to 1.56 miles east of RM 474 I-10 construct ramps: Cascade Caverns/Scenic Loop to Kendall/Bexar County line Various maintenance, safety, sidewalk and shoulder, and operational improvements
Bexar County		Widening of FM 471 from 2 to 4 lanes from Old FM 471 to FM 1560.
City of Converse		Multi use path construction from Converse North Park to FM 78.
City of Kirby		Binz Engleman Road roadway reconstruction with sidewalks and bike lanes from Springfield to: 0.4 Mi east of Ackerman Road.
City of New Braunfels		Construction of sidewalks, ramps & other pedestrian related infrastructure on San Antonio Street, Walnut Street, McQueeney Street, and near Seele Elementary School. Construction of sidewalk improvements, pedestrian ramps, crossings and signage in various locations in New Braunfels and near Lone Star Elementary School.
City of San Antonio	May 2022: 97% of 2017 Bond Program Projects will either be substantially completed or under construction. Package [2017-2022 Bond Package]	Alazan Creek Greenway Trail extension from Lambrano Street to Laredo Street. San Pedro Avenue construction of sidewalks and pedestrian infrastructure. Judson Road sidewalk construction from Independence to IH 35. 2017 Bond Package: Streets, Bridges & Sidewalks: \$445 Million, 64 Projects Parks, Recreation & Open Space Improvements: \$187 Million, 79 Projects
City of Schertz		Construction of sidewalks, bike lanes and off-road trail construction on Woodland Oaks Dr, Savannah Dr & Live Oak Rd.
City of Seguin		IH35 sidewalk construction along frontage roads from IH 37/US 281 to Walters Street. Walnut Springs multiuse trail extension from Vaughan Bridge to Max Starcke Park East.
Universal City		East Aviation widening to provide operational improvements, bike lanes, sidewalks and drainage from Houston Drive to Aztec Way.

Regional Toll Analysis and HOV Lanes

Previous mobility plans outlined proposed projects for numerous toll facilities within the Alamo Area. This effort would have required AAMPO to conduct a Regional Toll Analysis. However, the majority of these proposed toll facilities have been replaced by “managed” high occupancy vehicle (HOV) lanes. Therefore, the analysis is no longer required. As of Spring of 2022, the only operational toll facility in the Alamo Area is SH 130. Of the entire 90+ mile SH 130 facility, which runs from north of Austin (Georgetown) to IH10, just east of Seguin, only one segment operates within the AAMPO region - Segment 6, the 15-mile

southern portion of toll road. The TxTag company handles all billing, collections and payment processing for SH 130.

The Alamo Region currently has operational HOV lanes along I-10 west, northwest of Loop 1604 and on US281 north of Loop 1604. These lanes are currently restricted to 2+ occupant vehicles (and buses) and prohibit large trucks. The SAMM5 Travel Demand Models have been modified to allow for different occupancy treatments for each of four daily time periods as specified by various congestion levels. Additional proposed HOV lane projects are planned for I-35, Loop 410, and Loop 1604 and are included in the forecast year networks in the travel demand model used for this document.

Public Transportation and Transit

VIA Metropolitan Transit (VIA) and the Alamo Area Council of Governments' (AACOG) Alamo Regional Transit (ART) are the two public transportation service providers in the Alamo Area. AACOG's ART serves 12 rural counties including Comal, Guadalupe, and Kendall in the AAMPO study area. ART provides demand response (passengers call to schedule trips), curbside-to-curb, and door-to-door service. As part of their services, ART has two deviated fixed-routes. With this type of service, a bus or van stops at fixed points and keeps to a timetable but can deviate its course between two stops to go to a specific location for a pre-scheduled request. Connect Seguin was the first of this type of service connecting major destinations in Seguin and Guadalupe County. It is funded with City of Seguin general funds and ART local funds. In October 2020, Cowboy Connect was launched as the second of ART's deviated fixed-route services. It connects the communities of Pleasanton, Jourdan, and Poteet in Atascosa County. Services are available Monday through Friday from 7 a.m. to 6 p.m. Additionally, ART and VIA work together to coordinate transfer opportunities between VIA service and ART's demand-response services to the Cities of New Braunfels, Cibola, Marion, Schertz, Selma, and Garden Ridge as well as the McQueeney community. Services for these areas are funded with VIA urban transit funding and matched by local funds from ART and the areas served. In 2021, ART provided 104,591 one-way trips.

VIA serves the greater Bexar County area including San Antonio, Sandy Oaks, Elmendorf, St. Hedwig, China Grove, Kirby, Terrell Hills, Alamo Heights, Olmos Park, Balcones Heights, Leon Valley, Castle Hills, Converse, and Shavano Park. Services include bus with fixed-route services, paratransit service for riders with disabilities, Primo high frequency service, VIA Link ride-sharing service, vanpool service for commuters, and special event Park & Ride service. VIA operates and maintains 14 transit centers with 10 located in the area's top 10 major activity centers, 6,449 bus stops, 501 buses (approximately 9 out of 10 are fueled by compressed natural gas), and 139 VIATrans vans. VIA's service area is 1,212 square miles, which covers 97% of Bexar County.

Primo is VIA's rapid bus high-capacity service. It is designed to serve fewer stops and, by having traffic signal priority, faster travel speeds. Enhanced stops feature real-time arrival information displays, art panels created by local and national artists, and free Wi-Fi to enhance a rider's experience.

In May 2019, VIA launched its VIA Link program to provide mobility-on-demand transportation. Similar to Uber or Lyft ridesharing services, customers in Sandy Oaks, Northeast, and Northwest VIA Service Zones may use a convenient app or make a phone call to request a VIA Link passenger van to meet them at a "virtual stop" for a shared ride that can begin and end anywhere within the zone. Customers may also connect to VIA bus service to continue their trip to bus stops across the VIA service area.

In 2020, VIA deployed the Keep SA Moving Plan (www.keepersamoving.com), a produce of the past regional transportation plans such as VIA's Vision 2040. Keep SA Moving went before City of San Antonio voters as an Advanced Transportation District sales tax ballot initiative to fund the projects and services identified in the plan. This includes the Advanced Rapid Transit North/South projects and plans to expand VIA's on-demand rideshare service, VIA Link. This ballot initiative was approved by voters in November 2020.

VIA's services is a cornerstone to mobility in the largest urban area in AAMPO's region. They are constantly seeking ways to assist their users with safer, more convenient, and more comfortable rides. VIA routes connect underserved areas with major education, activity, and employment centers and provide services to accommodate people with disabilities, low-income populations, and senior citizens. They strive to provide last mile needs and connections by adding bike racks on buses and evaluating stops for sidewalk access. The agency continues to be committed to its mission of providing regional multimodal transportation options that connect the community to opportunity, support economic vitality, and enhance quality of life throughout the San Antonio and Bexar County region.

Below are several of VIA's accomplishments from the past three years. Thereafter is the list of public transportation and transit improvements.

Route 103 Primo Zarzamora (Crossroads Park & Ride to Madla Transit Center) – January 7, 2019

- Enhanced stops feature real-time arrival information displays
- Art panels created by local and national artists celebrating love, culture, and community,
- 12-minute frequency on weekdays and 15-minute headways on weekends.

Brooks Transit Center - August 26, 2019

- 4,300 square foot state-of-art facility
- Expanded service with Primo, VIA Link, Express route, and 4 other routes being served
- Amenities include:

air-conditioned	restrooms
customer information center	indoor and outdoor seating
ticket-vending machines	on-site security
real-time/next-bus arrival information	free parking (50 available spaces)
food vending machines	electric car charging stations
device charging outlets	bicycle racks
free wi-fi	public art

Route 102 Primo Military (Kel-Lac Transit Center to Brooks Transit Center) - August 26, 2019

- The third of VIA's Primo service routes.
- 15-minute frequent service on weekdays and 15-min frequent service on weekends.

Stone Oak Park & Ride and HOV Lane Connection (US 281: Loop 1604 to Borgfeld Drive) - August 23, 2021

- Bridge connects directly into VIA's Stone Oak Park and Ride facility allowing buses and commuters access to the Park & Ride facility directly from the HOV lanes

VIA Link Northeast Zone (on-demand service) – May 2019

Serves Northeast San Antonio

- Provides door-to-door rideshare trips to and from any location within the zone boundaries
- Replaced 3 under-performing routes with shorter trip times and shorter wait times.

VIA Link Express Sandy Oaks Pilot (on-demand service to Brooks Transit Center) - September 13, 2021

Serves Southeast Bexar County and San Antonio

- Unlike other VIA Link service, trips within the VIA Link Express Sandy Oaks Zone are not available. The service only takes customers to VIA facilities.
- Pilot program that may be adjusted after the initial service starts.

A snapshot of VIA’s vehicle services and passenger trips is represented below. It is anticipated that as COVID-19 restrictions continue to lift, the community will return to, and with VIA’s improved services and facilities will consider, public transportation and surpass 2019 numbers.

VIA Metropolitan Transit Vehicle Hours and Passenger Trips*			
Timeframe and Metric	Fixed Route	VIA Link	VIAtrans
FY 2019 Total Vehicle Hours	1,877,681	N/A	615,934
FY 2019 Total Passenger Trips	40,962,611	N/A	1,016,450
FY 2021 Total Vehicle Hours	1,595,112	24,136	432,023
FY 2021 Total Passenger Trips	23,032,608	80,539	570,611
*2019 numbers are included for historic reference in light of significant ridership decline during 2020. Ridership continues to increase as the COVID-19 pandemic subsides and the price of gasoline increases.			

Table 7: VIA Metropolitan Vehicle Hours and Passenger Trips

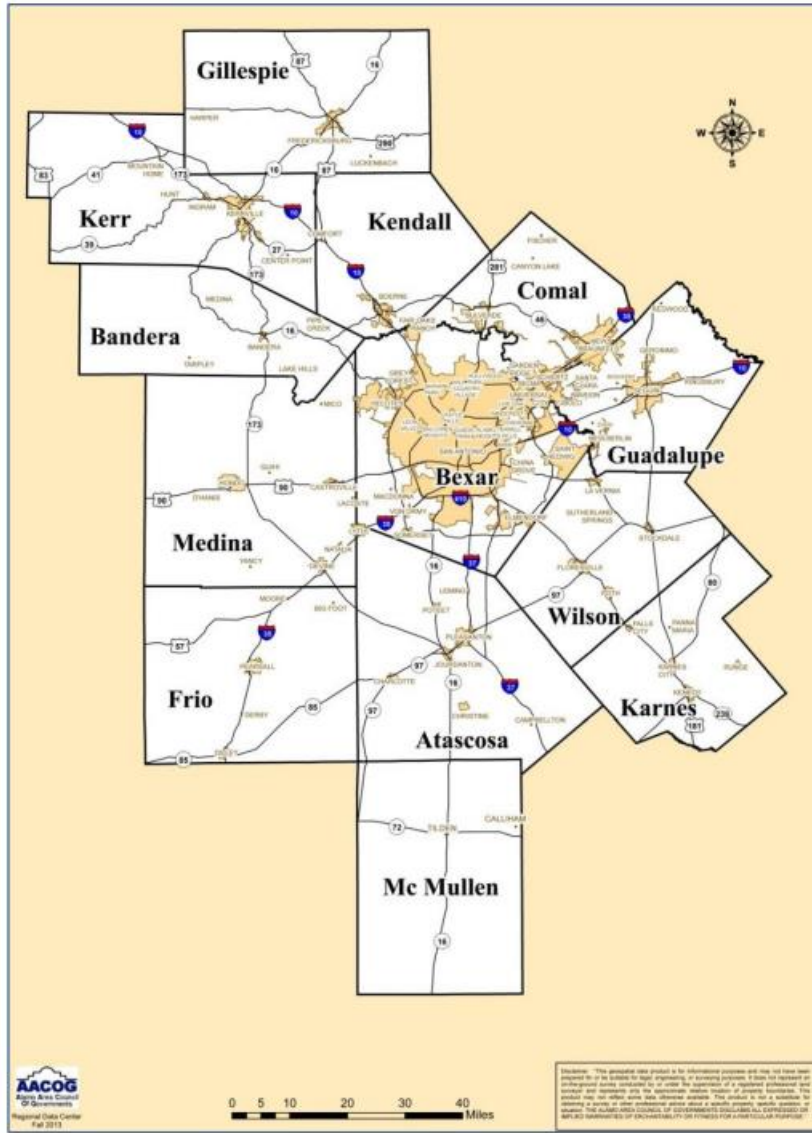


Figure 14: AACOG Area

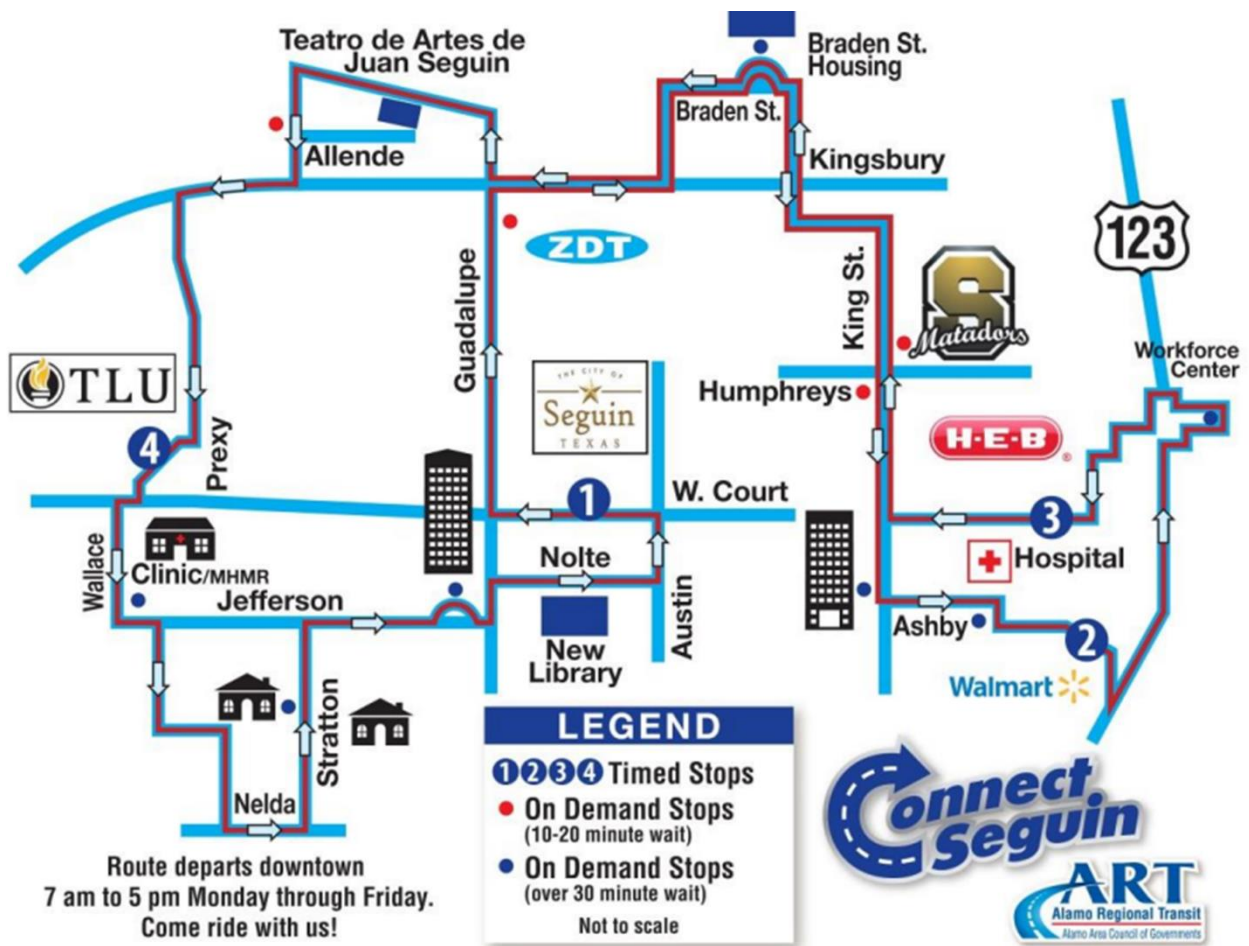


Figure 15: Alamo Regional Transit – Connect Seguin

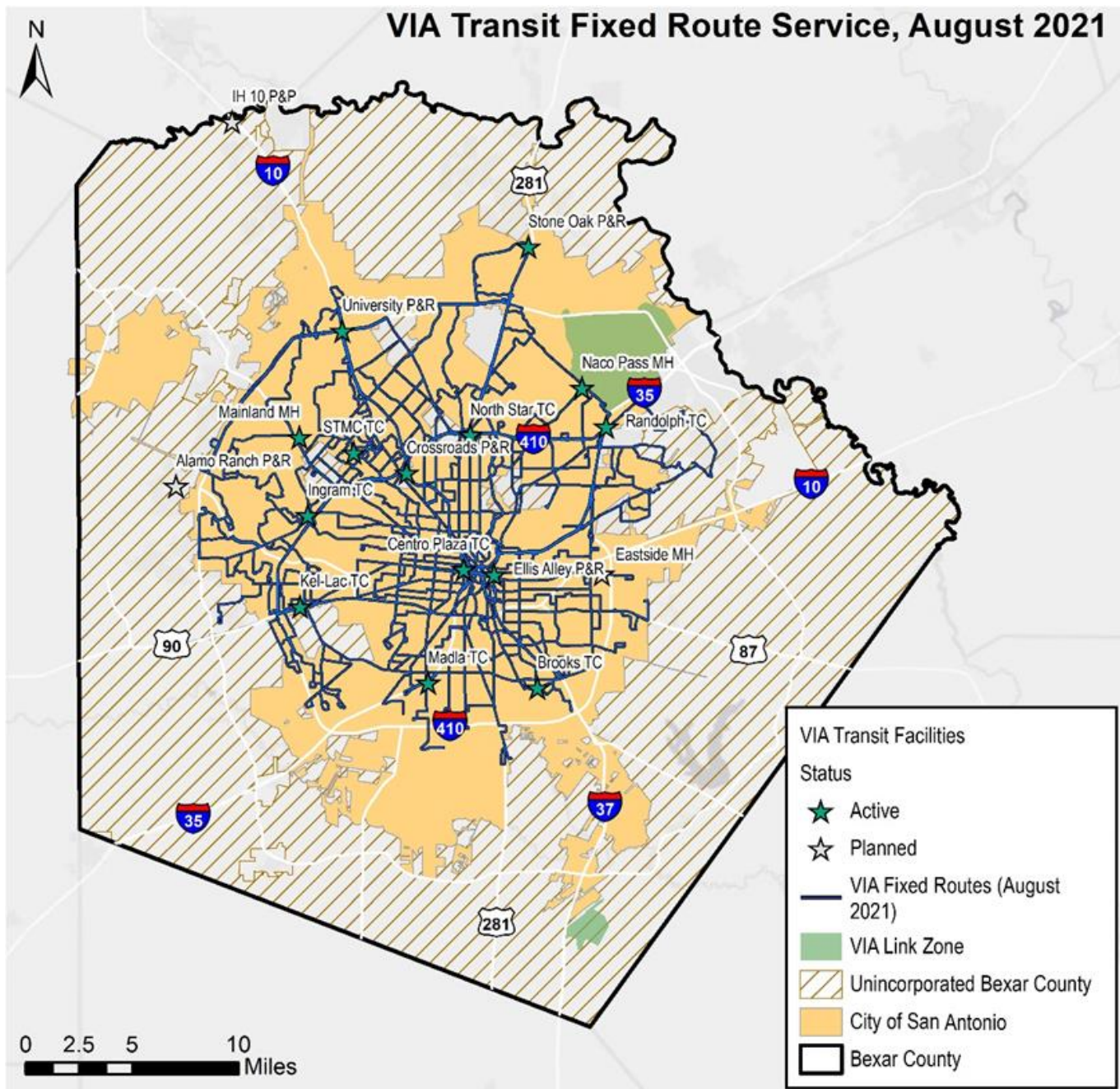


Figure 16: VIA Fixed Route Service

Alamo Area Public Transportation Improvements – 2019-2021

Table 8: Public Transportation Improvements

Alamo Area Public Transportation Improvements (2019-2021)		
Transportation Lead	Projects	Highlights (Projects and programs listed below are representative and not comprehensive.)
AACOG – ART	Cowboy Connect (October 2020)	<ul style="list-style-type: none"> ○ ART's second deviated fixed-route services ○ Connects Pleasanton, Jourdanton, and Poteet in Atascosa County
AACOG – ART	General services: demand response (passengers call to schedule trips), curb-to-curb, and door-to-door.	<ul style="list-style-type: none"> ○ In 2021, ART provided 104, 591 one-way trips including Cowboy Connect and Connect Seguin.
VIA Metropolitan Transit	Fixed Route Bus and Primo Services	<ul style="list-style-type: none"> ○ Passenger trips in 2021 totaled 23,032,608 ○ Route 102 Primo Military ○ Route 103 Primo Zarzamora
VIA Metropolitan Transit	VIALink On Demand	<ul style="list-style-type: none"> ○ Passenger trips in 2021 totaled 80,539 ○ Express Sandy Oaks Pilot ○ Northeast San Antonio Zone
VIA Metropolitan Transit	VIATrans Paratransit Service	<ul style="list-style-type: none"> ○ Passenger trips in 2021 totaled 570,611
VIA Metropolitan Transit	Facility Improvements	<ul style="list-style-type: none"> ○ Brooks Transit Center ○ Stone Oak Park & Ride and HOV connection ○ Bus shelter improvements: 393 (142 provided by COSA, TxDOT, Bexar County, Suburban Cities, and other private entities) ○ Accessibility improvements: 41 (35 provided by COSA, TxDOT, Bexar County, Suburban Cities, and other private entities)

Freight

As previously noted, one of the federal performance measures specifically addresses travel time reliability for highway freight. Further, the FAST Act established a national policy of maintaining and improving the condition and performance of a National Multimodal Freight Network (NMFN). Goals related to the policy include network condition, safety, security, efficiency, productivity, resiliency, and reliability as well as reducing the adverse environmental impacts of freight movement. Federal freight funding opportunities are tied directly to states developing a state freight plan that meets these goals. Therefore, TxDOT leads the effort for improved highway freight mobility in the Alamo Area with participation from AAMPO and other local transportation agencies and freight service providers. The Texas Freight Mobility Plan (TFMP) was adopted in 2018. The TFMP goal areas, which align with the NMFN goals, are the basis for additional efforts and include:

- Safety
- Asset preservation
- Mobility and Reliability
- Multimodal Connectivity
- Stewardship
- Customer Service
- Sustainable Funding
- Economic Competitiveness

According to the TFMP, The Texas Multimodal Freight Network (highway, rail, water, and air cargo) is forecasted to increase to 4.0 billion tons with a value of \$7.5 trillion by 2045. The change represents 79%

growth in tonnage over time with an annual growth rate of 2% and 159% increase in value over the next two decades with an annual increase in value of 3.3%.

Rittiman Road and Walzem Road Bexar County Grade Separation Feasibility Study

In further of the national and statewide goals of safety, efficiency, reliability, and reducing environmental impacts, the Central Texas Grade Crossing Study was completed in 2018. As a direct outcome and next steps, in 2019, TxDOT, AAMPO and other transportation agencies began conversations with Union Pacific to explore concepts to eliminate at-grade crossings (railroad and roadway are at same level). By replacing at-grade crossings with grade separated crossings, these goals may be more easily achieved. In October 2021, specific to the Alamo Area, TxDOT's Rail Division concluded the Rittiman Road and Walzem Road Bexar County Grade Separation Feasibility Study. This study sought to develop and evaluate grade separation concepts where these roads cross Union Pacific Railroad lines.



Figure 17: Rittman Road and Walzem Road Grade Separation Feasibility Study

The Rittiman Road and Walzem Road Grade Separation Feasibility Study resulted in two preferred alternatives. The first one for the Rittiman Road crossing involves constructing an elevated intersection at Gibbs Sprawl Road to remove delays. The Walzem Road preferred alternative is an offset alignment (bridge structure) based on the greatest benefit for the design year (2045). Next steps, once additional funding is identified, could include additional stakeholder coordination and public engagement, survey and

preliminary design, environmental review, and final design and right-of-way acquisition. AAMPO will continue to monitor the progress of these concepts and participate in the planning and outreach efforts.

TxDOT Statewide Truck Parking Study

In April 2020, TxDOT completed the Statewide Truck Parking Study. The purpose of the study was to assess and address Texas’ existing and future truck parking needs with practical, innovative and cost-effective strategies. Study goals included: 1) improve safety, reduce congestion and enhance economic competitiveness of the Texas Multimodal Freight Network and 2) develop actionable strategies to meet truck parking needs across the state by partnering with the private sector (see figure below). The study objectives included the following:



Figure 18: TxDOT Truck Parking Study

- 1) improve safety on the roadways and mitigate community impacts associated with truck parking;
- 2) identify specific needs for truck parking in Texas;
- 3) identify strategies to address truck parking needs; and
- 4) develop an action plan for truck parking recommendations.

Study recommendations include

- 1) policy and program development tied to short-term and mid-term actions;
- 2) investing in high need areas for near-term facility expansion and upgrades;
- 3) investing in and advancing low and medium needs through additional studies, monitoring, project selection considerations, project development, implementation and identifying funding sources; and
- 4) focusing efforts on border crossings, energy production regions, TxDOT Districts, and at the MPO level.

Next steps include continued coordination and collaboration with transportation system users and owners, both private and public, to implement the study recommendations. For more information on this study, please visit www.TxDOT.gov and keyword search “Statewide Truck Parking Study”.

Texas Freight Network Technology and Operations Plan

Another TxDOT-led freight effort included the Texas Freight Network Technology and Operations Plan (FNTOP), published in December 2020. This Plan is a direct result of the recommendations included in the 2018 Texas Freight Mobility Plan (TFMP). Specifically, the recommendation was to develop and implement a statewide, technology-based freight safety

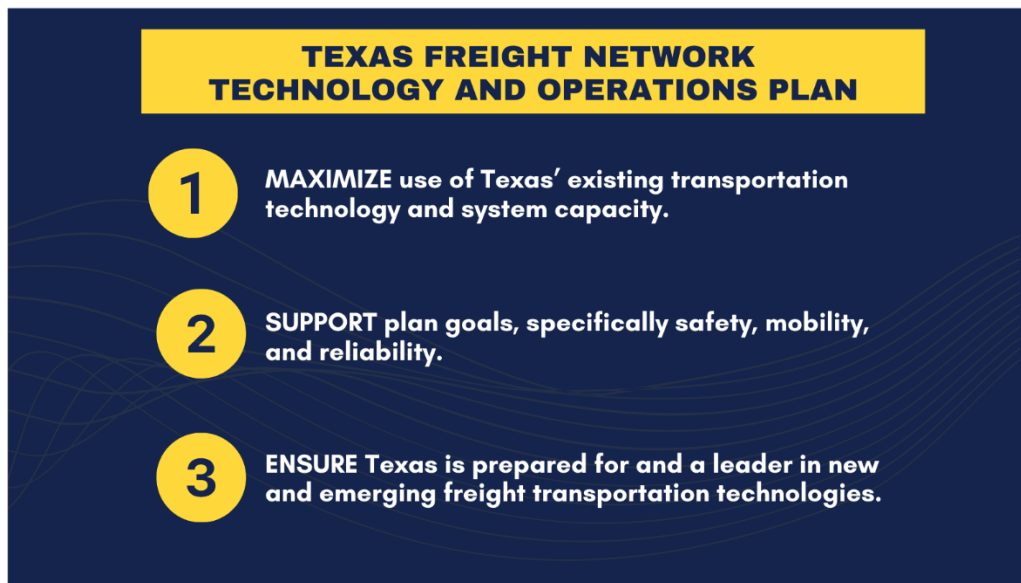


Figure 19: Texas Freight Network Technology and Operation Plan

and operations program. The goals of the FNTOP are adopted from the TFMP and include improving safety, improving the system to remain economically competitive, using cost-benefit treatments to optimize asset utilization and preservation, improving system efficiency and performance, and improving system connectivity for all freight modes. The plan consists of three sections, beginning with a comparison of Texas freight technology deployments with those of the nation and the world, followed by a needs and gap assessment and implementation plan for recommended strategies. Implementation strategies include both near-term and medium and long-term actions. Recommended **near-term actions** are related to FNTOP strategies and include concept of operations development for advancing:

- Safety Warning Detection System;
- Statewide Traffic Operations Center;
- Smart Freight Connector;
- Blocked Rail Crossing Traffic Management System;
- Automated Vehicle Infrastructure, Connected Signing, and Data; and
- a High-Resolution Freight Traveler Information System.

Medium-term actions include:

- procurement and
- implementation.

Long-term actions involve:

- ongoing operations and maintenance,
- identifying sustainable program funding,
- documenting lessons learned, and
- updating the plan periodically.

For more information on this study, please visit www.TxDOT.gov and keyword search “FNTOP”.

Another initiative related to freight mobility is the TxDOT’s Texas Clear Lanes program. This program targets congestion and freight bottlenecks in the state’s major metro areas. Two Alamo Area projects funded through the TxDOT program are Loop 410 improvements from US 90 to Ingram Road and US 281 expansion from Stone Oak Parkway to the Bexar County/Comal County line. These projects are currently under construction with completion dates expected in late 2022.

AAMPO Critical Urban Freight Corridors

AAMPO takes the lead to further develop additional regionally-focused freight plans and improvements. Since the FAST Act established the need for the first National Freight Network, MPOs across the nation were charged with developing Critical Urban Freight Corridors. These corridors must connect intermodal facilities to the Interstate System or serve a major freight traffic generator. Once the corridors are designated as critical, they become part of the National Multimodal Freight Network and eligible for National Highway Freight Program funding.

During fall 2016 and winter 2017, AAMPO’s TAC participated in a series of work sessions to address the freight requirements associated with the FAST Act. During this same timeframe, AAMPO hosted regional freight stakeholder workshops to present the findings of the TAC efforts, collect comments, and ultimately develop a list of recommended Alamo Area Critical Urban Freight Corridors (CUFC). These efforts culminated into AAMPO’s policy board accepting the recommendation. The table below shows the CUFCs in the AAMPO study area. For more information on the process and related corridor selection, visit www.alamoareampo.org/Freight/docs/AAMPO_CUFCProcessCertificationLetter.pdf

Critical Urban Freight Corridors in the AAMPO Study Area			
Route	From	To	Centerline Miles
Loop 1604 North	IH 10 West	IH 10 East	25.69
Loop 410 North	IH 35 North	Loop 410 NE	1.83
Rittiman Road	Loop 410 North	FM 78	2.58
Foster Road	FM 78	IH 10 East	2.46
Frio City Road	General Hudnell Dr.	Brazos Street	2.40
SH 46	IH 35 North	IH 10 East	10.20
Total Centerline Miles			45.16

Table 9: Critical Urban Freight Corridors

AAMPO planners will continue to participate in the various TxDOT statewide-supported committees and work groups, as well as with the Texas Innovation Alliance's Freight and Logistics Community of Practice, exploring multimodal improvements and identifying potential projects. Moving forward, AAMPO will be conducting a regional freight planning study as described in the Future of Transportation section of this plan.

2.4 Bexar County Air Quality and Nonattainment

As the AAMPO urban areas continue to grow, mitigating (reducing the severity) the potential harmful environmental effects of constructing and operating transportation improvements are of utmost importance. The Safe, Accountable, Flexible, Efficient, Transportation Equity Act - A Legacy for Users (SAFETEA-LU) and subsequent Moving Ahead for Progress in the 21st Century (MAP-21) acts have better defined environmental goals that include more integration of metropolitan and statewide planning with the National Environmental Policy Act (NEPA) activities. The Alamo Area currently faces air quality challenges as well as threats to the water supply. Detrimental impacts resulting from population growth, inappropriate land use, and added capacity for automobiles must be avoided. Over the years, AAMPO and its partners have implemented a variety of plans, programs and projects that avoid and minimize environmental impacts to the greatest extent practicable for a more sustainable future.

Linking Planning and NEPA

Planning and Environment Linkages (PEL) is an umbrella term for the many environmental issues that should be considered and used in the planning process to mitigate or avoid significant environmental impacts. PEL addresses many of the concerns addressed under NEPA, such as environmental effects, endangered species, wetlands, cultural preservation, and impacts to historically underserved areas or environmental justice populations. The process includes various tasks and the development of preliminary concepts. This information and associated efforts are then considered during the subsequent process required by NEPA. PEL pertains to a wider array of issues and topics, including early interagency consultation and coordination and public involvement activities.

AAMPO encourages PEL as an approach to transportation decision-making because it considers environmental, community, and economic goals early in the planning stage, and carries them through project development, design, and construction. AAMPO also strives for a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays in project implementation. Ultimately, the project sponsor is responsible for the relevant environmental clearance documentation to comply with NEPA or appropriate state level environmental clearance, where applicable. However, AAMPO has developed tools to assist project sponsors with technical information to make informed decisions. Two of these tools are iMAP, that uses geographical information system (GIS) mapping, and travel demand modeling (TDM) which uses current travel behavior to predict future travel patterns based on population and employment growth.

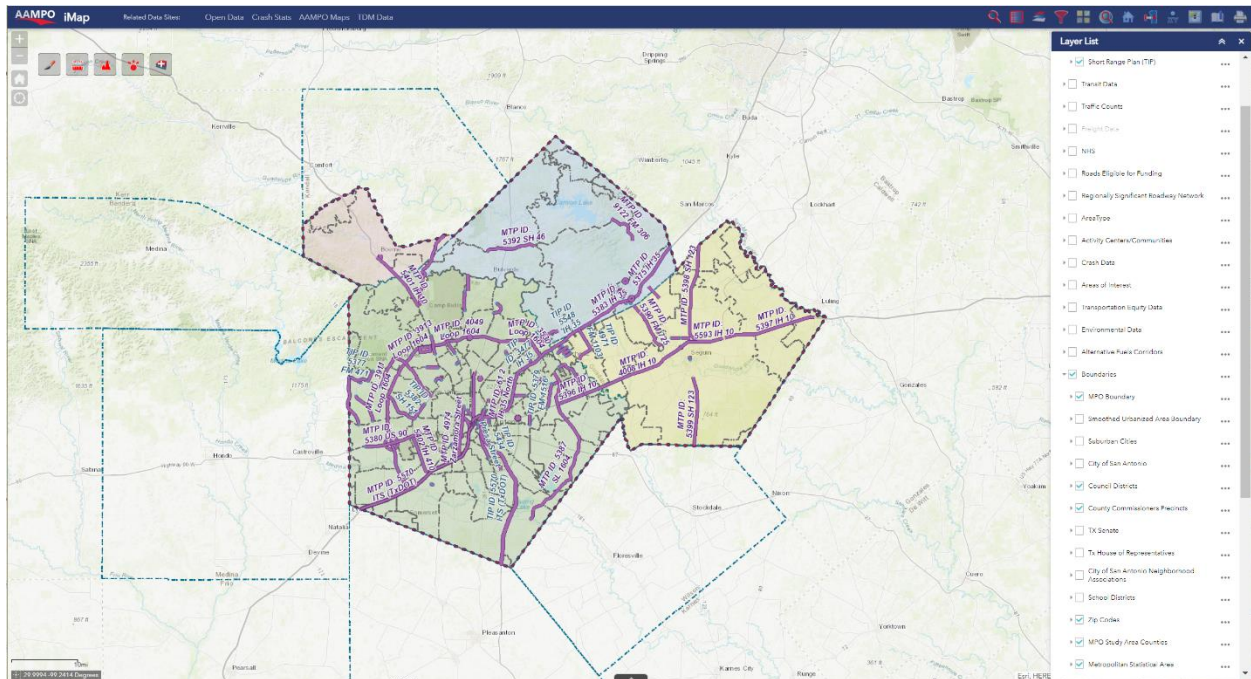


Figure 20: AAMPO iMap Tool

AAMPO's GIS and TDM professionals work together to catalog existing conditions and predict future environmental impacts. The GIS developed iMAP tool can be utilized to analyze data, on a travel corridor or more regionally, specific to various environmental factors. iMAP datasets include information on environmental justice populations, impacts to the Edwards Aquifer, floodplains, and watershed areas. It also provides information on places of community interest that may need to be avoided due to archeological or historic significance. Travel modeling information is used to predict the air quality impacts associated the number of vehicles forecasted to use a particular proposed transportation facility (see Transportation Conformity section below). Additionally, AAMPO maps both short and long-range mobility projects to illustrate proximity to the areas of environmental concern.

Water Resources

Water is life. It is the most important natural resource for living organisms to survive. The availability of clean and abundant water is also important to a maintain a thriving economy and quality of life. The Edwards Aquifer is one of the major groundwater aquifer systems in Texas. Aquifers are underground formations of permeable rock. After entering an aquifer, ideally from rain events, water moves downward and is discharged via natural springs or is pumped using modern technology. The Edwards has been a source of water for people in south central Texas for more than 12,000 years. Geographically, the Aquifer extends through parts of Kinney, Uvalde, Zavala, Medina, Frio, Atascosa, Bexar, Comal, Guadalupe, and Hays counties and covers an area approximately 180 miles long and from five to 40 miles wide. The total surface area overlying the Aquifer is approximately 3,600 square miles. Today, it is the primary source of water for approximately 2 million people, thousands of agricultural professionals and industrial services, and a variety of unique habitat, some of which are endangered. The Edwards also feeds the Comal and San Marcos springs as well as the Nueces, San Antonio, Guadalupe, and San Marcos River basins providing water for recreational and other downstream uses.

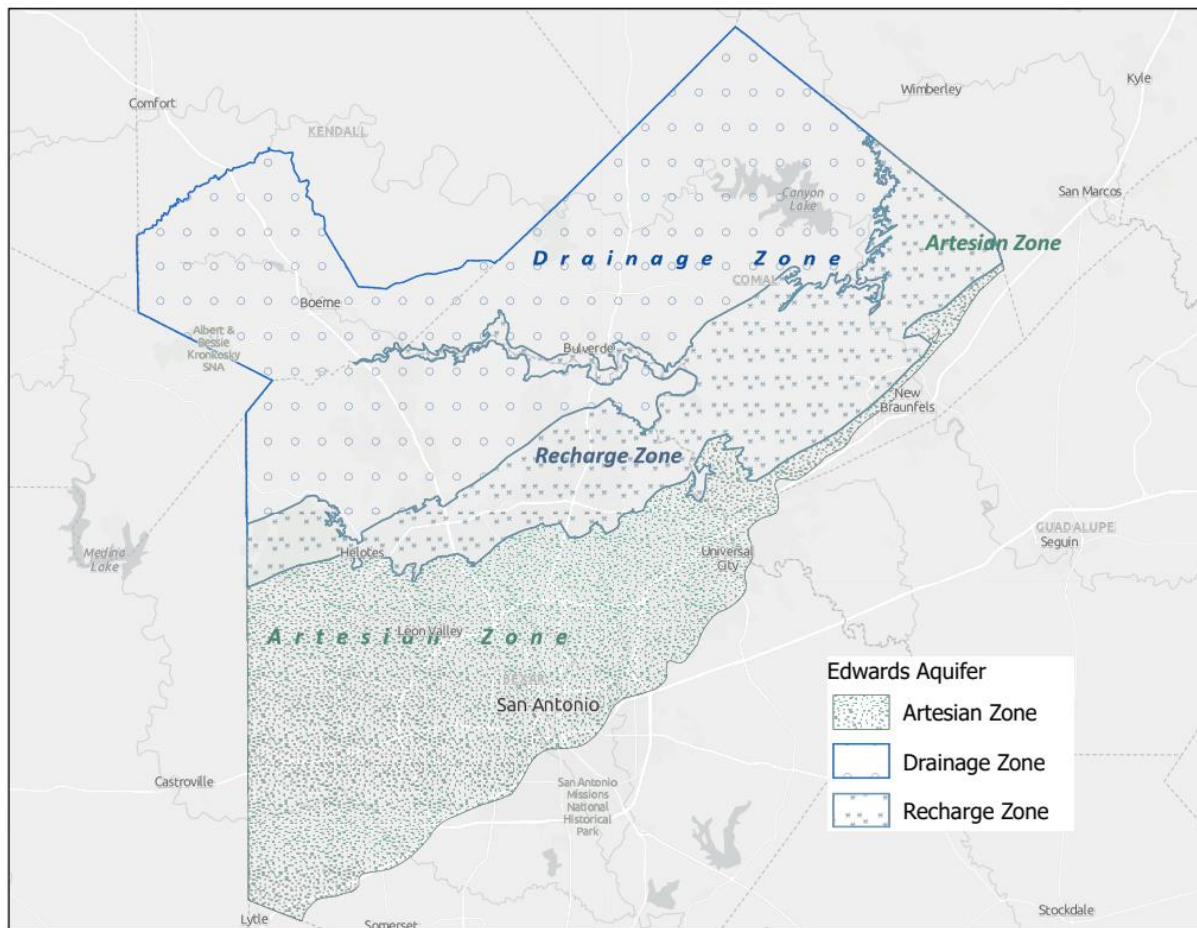


Figure 21: Edwards Aquifer

The aquifer is divided into three main zones: the contributing zone, the recharge zone, and the artesian zone. The contributing zone is also called the drainage area or the catchment area. In this zone, the land surface "catches" water from rainfall and water runs off into streams or infiltrates into the water table below the surface. Stormwater runoff (or worse case, runoff of contaminated liquids) and the water table springs then feed streams that flow over relatively impermeable limestone until they reach the recharge zone. Because transportation facilities generally cause an increase in the impermeable surface area, roadways can result in increasing local surface runoff and reducing water infiltration into the water table. Roadway construction projects can also cause the altering of drainage patterns at stream crossings, by changing the speed, direction and amount of storm water flow. Due to the development and expansion in the Edwards Aquifer recharge zone and recent and recurring drought, concerns regarding the importance of maintaining a healthy aquifer continues. It is important for governmental entities, private corporations, and the community to work together to address urban development that impacts this vital water resource. The Edwards Aquifer Sustainability Initiative specifies and encourages limits on impervious cover percentages, or the amount of non-porous groundcover, to sustain existing water quality and supply.

Mitigation strategies could be used to reduce storm water runoff and degradation of the Edwards Aquifer, as part of the transportation planning effort. Most of these strategies can be directly incorporated into the project design. Engineering on new projects, and redesign and retrofit of existing facilities could include:

- Erosion control measures and runoff management techniques used to prevent pollution of adjacent waterways and the Edwards Aquifer;
- Transportation facility alignment adjustments to avoid flood hazards;
- Greater use of permeable (porous) surfaces to reduce impacts on ground water recharge;
- Cost/pricing strategies to reduce demand for paved, impermeable parking; and
- Increasing fines for intentional discharge of contaminated liquids or other substances.

Other mitigation strategies include compliance and enforcement of federal, state and local policies, standards and land use strategies that seek to preserve water quality and supply.

Other Environmental Considerations

Another environmental consideration unique to the Alamo Area includes the presence of endangered Karst invertebrates. Nine karst invertebrates (various beetles and spiders) are listed as endangered species in the Bexar County area (Federal Regulation 65 FR 81419 81433). These species inhabit caves and mesocaverns (humanly impassable voids in karst limestone). Five karst zones have been defined within Bexar County and are defined as follows:

- Zone 1. Areas known to contain listed karst invertebrate species.
- Zone 2. Areas having a high probability of containing habitat suitable for listed karst invertebrate species.
- Zone 3. Areas that probably do not contain listed karst invertebrate species.
- Zone 4. Areas that require further research but are generally equivalent to Zone 3, although they may include sections that could be classified as Zone 2 or Zone 5 as more information becomes available.
- Zone 5. Areas that do not contain listed karst invertebrate species

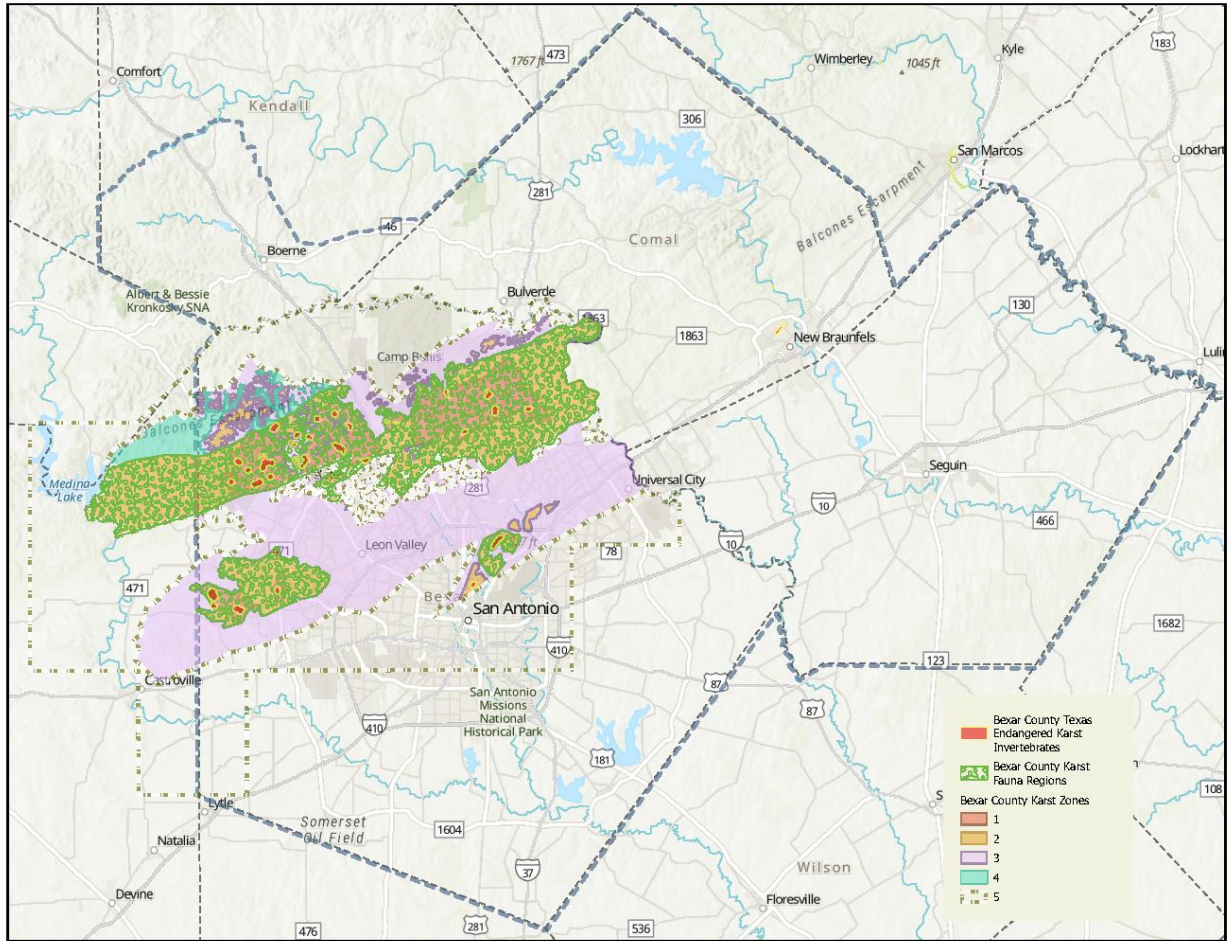


Figure 22: Endangered Karst Invertebrates

The Texas Hill Country is a notable region that contains karst topography and each of the counties within the AAMPO study area contain a portion of it. The Texas Hill Country is home to a number of caverns, three of which are in the Alamo Area – Natural Bridge Caverns, Bracken Cave, and Cascade Caverns. The Hill Country is also known for its unique ecosystems supporting endangered species including invertebrates and salamanders, birds, and plant life.

TxDOT and engineering consultants use borehole data, trenching, electrical resistivity surveys to test karst voids with a high likelihood of being inhabited. This is a significant construction consideration for roadway work in Bexar County. These measures help to prevent project delivery delays, potential redesign, and cost overruns, when proactively conducted. An iMAP layer containing the five karst zones can be found on AAMPO’s online iMap tool at <http://www.alamoareampo.org/imap/>.

Air Quality

The ratification of the Clean Air Act of 1970 authorized the development of comprehensive federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources. Four major regulatory programs were initiated: the National Ambient Air Quality Standards (NAAQS), State Implementation Plans (SIPs), New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAPs). The Clean Air Act required areas to create plans to meet the air quality standards and set deadlines for achieving those standards. Thereafter, the Environmental Protection Agency (EPA) was created to implement the various requirements included in the Clean Air Act.

Using this authority, the EPA set air quality standards for six air pollutants: sulfur dioxide (SO₂), particulate matter (PM_{2.5} and PM₁₀), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone (O₃), and lead (Pb). The Act requires the EPA to review the scientific data upon which the standards are based every five years. The EPA may revise the standards, if necessary to protect public health with “an adequate margin of safety”. The 1990 Clean Air Act Amendments lists nonattainment areas into classifications based on the severity of exceedance and establish specific pollution controls and attainment dates for each classification: Marginal, Moderate, Serious, Severe, and Extreme. Areas with more severe air pollution problems have a longer time to meet the standards, but also have more stringent control requirements placed on them.

Unlike the other pollutants, ozone is not directly emitted from any source. Instead, it is formed when volatile organic compounds (VOCs) and nitrogen oxides (NO_x) react in the presence of sunlight. The criteria pollutants image illustrates examples of on-road mobile, non-road mobile, point and area sources of VOCs and NO_x. Control of ozone is based on decreasing emissions from these sources. Ozone standards aim to protect public health, particularly for at-risk groups including children, older adults, people of all ages who have lung diseases such as asthma, and people who are active outdoors.

In 2018, the EPA designated Bexar County’s air quality as marginal nonattainment in violation of federal ozone standards. The EPA allow areas with marginal nonattainment three years to comply with the standard; the average of the three totals is the measure by which the status is deemed. Bexar County had until September 24, 2021 to meet the ozone standard of 70 parts per billion (ppb). Unfortunately, this standard was not met and Bexar County now faces being deemed moderate nonattainment in violation of the required ozone standards.

Over the years, the region has been actively implementing measures to mitigate for ozone pollutants. Some examples include implementing intersection improvements and improved signal re-timings, implementing vehicle idling restrictions, conducting educational and public outreach campaigns, improving

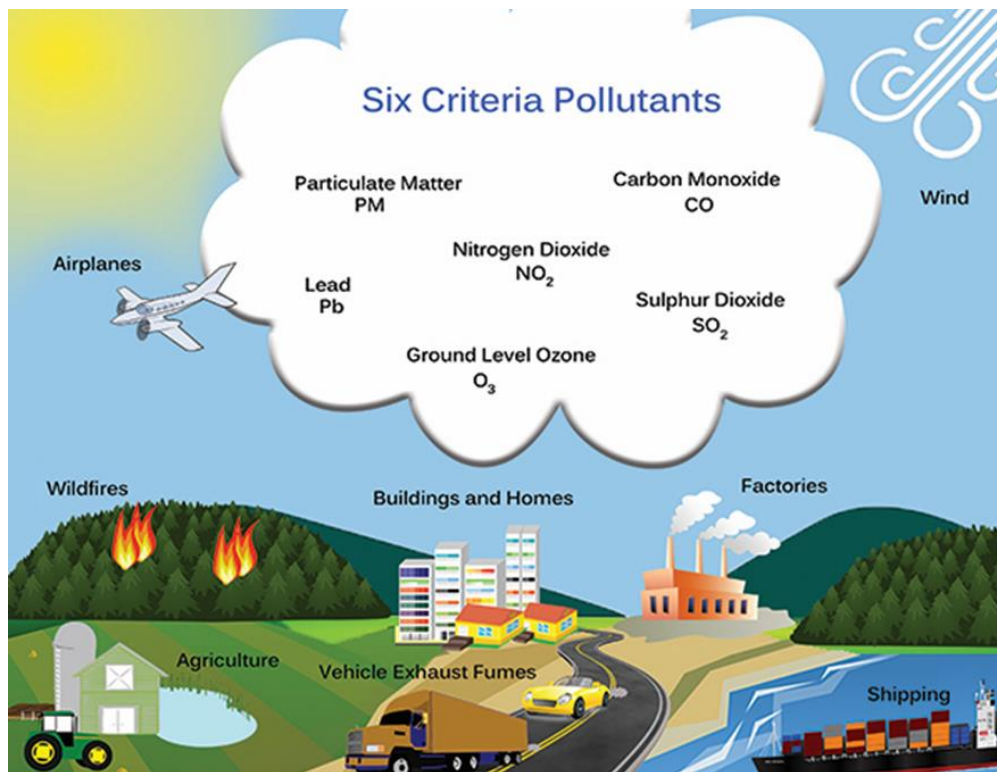


Figure 23: Six Criteria Pollutants

transit service coverage and frequency, purchasing alternatively fueled fleets, expanding the scope of the Alamo Area Commute Solutions Program, increasing the coverage of bicycle and pedestrian facilities and amenities, and adding vehicle travel lanes to reduce delay.

Current Air Quality Conditions

AAMPO and the Alamo Area Council of Governments (AACOG) work together to fund and track air quality in Bexar County. AACOG records and analyzes the air quality data generated from Continuous Air Quality Monitoring Systems (CAMS). These CAMS record ozone levels daily. The regulatory ozone CAMS include the San Antonio Northwest (C23), Camp Bullis (C58), and Calaveras Lake (C59). In addition, AACOG operates non-regulatory ozone monitoring sites across the region during the ozone season (March – November).

As of June 17, 2021 Bexar County had four Ozone Action Days when air quality was predicted to exceed healthy levels. Two of these four days recorded ozone levels exceeding the 70ppb standard. Ozone Action Days strongly encourage residents and businesses to voluntarily practice certain pollution-reducing activities. Figure 24 highlights specific actions to consider on Ozone Action Days.

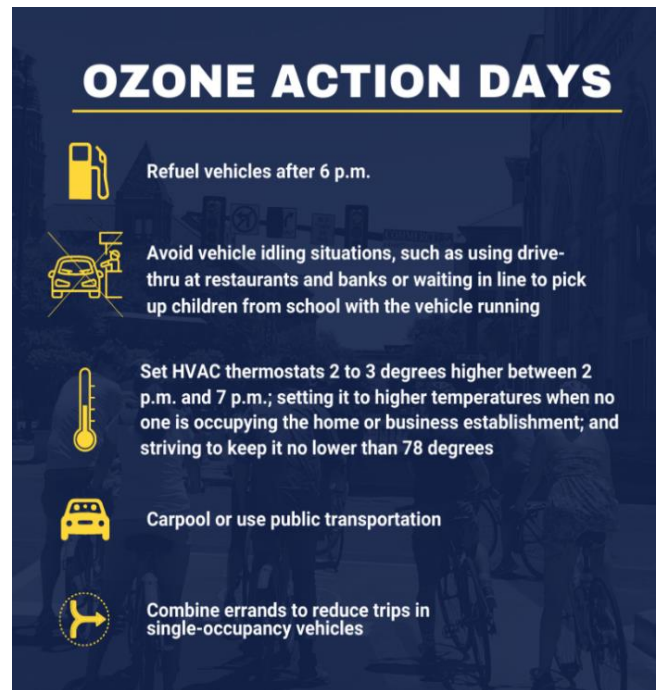


Figure 24: Ozone Action Days

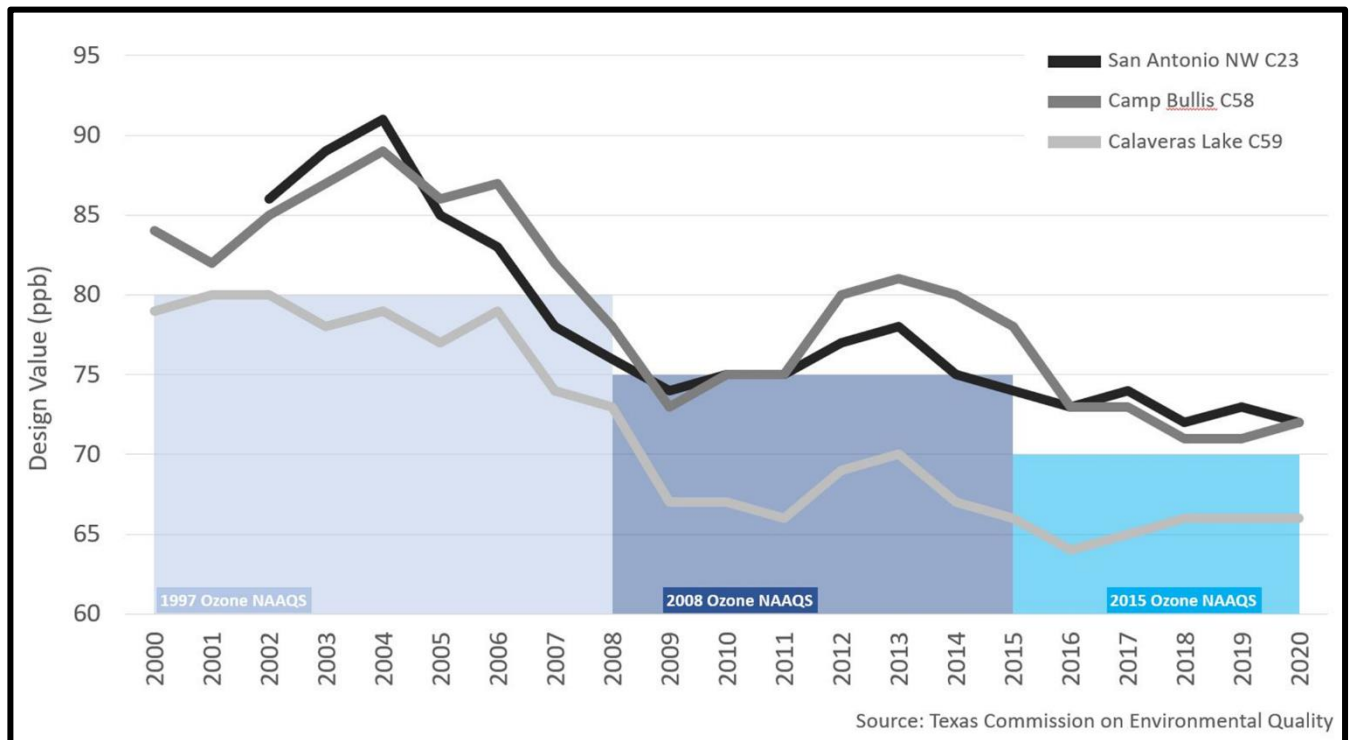


Figure 25: Bexar County Ozone Trend Line 2000-2020

As previously stated, and demonstrated by Figure 25 Bexar County was unable to meet the 70 ppb requirements to meet attainment status by the EPA deadline. Specifically, the Camp Bullis CAMS three-year average exceeded the standard. It is expected that the EPA will soon verify the data and reclassify Bexar County air quality as moderate nonattainment. With this new status, it is very likely Bexar County vehicle owners will have to observe more Ozone Action Days and mandates such as mandatory vehicle emissions testing.

On another related note, as shown in Table 10 according to the AACOG Emissions Trend Analysis for the San Antonio-New Braunfels Metropolitan Statistical Area (MSA), vehicles are not the only source of ozone forming pollutants. As the table shows, there were 191.6 tons of VOCs and 122,8 tons of NOx emitted daily from all man-made sources (power generation, vehicles, aircraft, etc.) in 2020.

2020 Ozone Season Weekday Anthropogenic VOC and NOx Emissions for the San Antonio-New Braunfels MSA				
Source Type	VOC (tons/weekday)		Nox(tons/weekday)	
	Tons/Weekday	Percentage	Tons/Weekday	Percentage
On-Road	20.9	10.9%	33.4	27.2%
Point	9.9	5.2%	51.7	42.1%
Area	109.1	56.9%	7.2	5.9%
Non-Road	15.7	8.2%	19.8	16.1%
Other (Oil & Gas; Off-Road)	36	18.8%	10.7	8.7%
Total	191.6	100.0%	122.8	100.0%

Table 10: 2020 Ozone Season Weekday Anthropogenic VOC and NOx Emissions

Another related air quality concern is particulate matter (PM). While the AAMPO region is currently in attainment for PM, health effects from exposure could include coughing, shortness of breath, tightness in the chest and irritation of the eyes from short-term exposure. Long-term exposure can result in reduced lung function, and respiratory diseases such as asthma, chronic obstructive pulmonary disease, autoimmune disease, and mortality. Currently, the Hill Country is the source of 80% of all limestone quarried in Texas. There is a stretch of operations along the I-35 corridor in Comal County that has approximately 40,000 acres of aggregate operations, referred to locally as “Quarry Row”. Limestone quarrying, crushing, and cement manufacturing creates air pollution in the form of particulate matter. It will be important to continue to monitor and work to mitigate area quarries (not just in Comal County) and other industrial operations that emit PMs and reduce air quality.

Transportation Conformity

As soon as Bexar County was designated nonattainment in 2018, AAMPO became responsible for analyzing expected emissions from on-road mobile sources. This analysis is termed transportation conformity. The transportation conformity requirements ensure transportation projects and plans outlined in AAMPO’s long- and short-range plans (*Mobility 2050* and the 2023-2026 Transportation Improvement Program) do not cause new air quality violations, exacerbate existing ones, or further hinder the area’s air quality designation.

Transportation conformity is a two-step process that begins with a local finding of conformity by AAMPO’s Transportation Policy Board and a final determination of conformity made by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The 2023 Transportation Conformity document describes the transportation conformity process in greater detail and provides local findings on VOC and NOx emissions. It can be found online at www.alamoareampo.org/airquality/conformity. When AACOG receives notice of the new designation of moderate nonattainment, AAMPO has one year from the effective designation to complete the transportation conformity process and deliver an updated document for federal review. A conformity determination is required, at a minimum, every time a new or amended long-range plan (MTP) or short-range program (TIP) is adopted, unless the projects being added are considered exempt. Exempt projects include certain roadway safety improvements, mass transit projects, certain planning and engineering activities, noise attenuation, plantings and landscaping, sign removal, certain repair of damage caused by natural disasters, civil unrest, or terrorists acts, and more (EPA Transportation Conformity Regulations, Section 93.126).

Air Quality Mitigation Efforts

In the Alamo Area, on-road vehicles have historically been the most significant source of NOx and the third largest source of VOCs. Fortunately, improvements in technology have had a considerable effect on the reduction of air pollution (emissions from new vehicles have declined over time as emission controls and fuel efficiency have improved). Even though cleaner vehicles are in operation, reducing vehicle miles of travel is another way to reduce emissions and improve air quality. Reduction in the growth of vehicle miles of travel requires behavioral changes rather than solely relying on improvements in technology. A downward trend in VMT brings significant benefits in reducing mobile source emissions. The challenge is to reduce the length of most trips and to identify and implement strategies to encourage walking, bicycling and transit use. Clearing bottlenecks, and other methods for reducing engine idling, is another major means of reducing vehicle emissions. AAMPO, TxDOT, and the City of San Antonio use their communication channels to inform the public of Ozone Action Days and promote methods for improving air quality as it relates to vehicular travel.

While AACOG is AAMPO’s partner in tracking and analyzing Bexar County’s air quality, AAMPO and VIA are taking the lead to influence behavior and provide viable alternatives to single-occupancy vehicle travel and reducing the number of miles traveled. AAMPO’s Commute Solutions program encourages and

rewards commuters for using transit, vanpooling, carpooling, biking, walking, or using any other type of non-vehicular method of transport. It also works with area businesses (small and large) and schools and universities to implement accommodations for employees, faculty, and students who choose alternatives to single-occupancy vehicle travel as their commuting choice. Members of the program are also eligible to receive emergency rides home. Participation in the program waned during 2020 and as the area begins to recover, Alamo Commutes member numbers are increasing and businesses and schools are getting on board to participate.

VIA is leading the way to improve transit travel and protect the environment in the areas of operations and maintenance. VIA environmental compliance successes and advancements over the past three years include:

- ISO environmental management recertification is in process;
- Solar panels, electric vehicle charging at Park & Rides, and LID and native plant landscaping features are part of shelter and facilities design;
- Renewable natural gas (RNG) partnership with CPS Energy is in the works;
- Emission reduction resulted in a 2-ton VOC reduction at VIA maintenance facility (stationary emissions);
- Installation of active air purifiers in our bus and van fleet is ongoing
- VIA has not received any Notices of Violation or Notices of Enforcement for past 24 months from TCEQ regarding waste water quality; and
- Currently certified as a Gold Business by Reworks SA and primed to receive the next level recognition of “Pinnacle” certification for sustainability and recycling efforts.

With increased population and vehicle miles traveled projected, it is important the region be proactive on regulations concerning water quality and air quality. The area will need to be proactive in its protective measures and getting information out to the general public in order to help reduce potential negative environmental impacts. AAMPO will continue to apply the 3C approach to furthering these objectives.