

**Thriving Transit Corridors:
Driving Transit Oriented Development along Tucson's Broadway Corridor**

University of Arizona
College of Architecture, Planning, and Landscape Architecture
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Disclaimer:

This document is the product of a student service-learning course project completed as a requirement of the Master of Science in Urban Planning program at the University of Arizona. The content in this report does not necessarily reflect the views, policies, or initiatives of the City of Tucson or other community partners.

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Executive Summary

INTRODUCTION

This report aims to grasp, experiment, and envision the potential challenges and opportunities that are directly associated with public transportation along underdeveloped corridors. The objective is to provide useful insight into the impacts of transit investments on people, places, and markets in hopes of inspiring local policy and land use tools that are conducive to urban growth that responds to social needs, prioritizes climate resiliency, and spurs economic prosperity that uplifts local Tucsonans and newcomers alike.

The City of Tucson is the 33rd largest city in the United States and has gained prominence over the last few years. With wins like national recognition by the American Planning Society for the “Best Street in America” in 2017 to UNESCO’s “City of Gastronomy” designation in 2018, followed by the historic local election of Mayor Romero in 2019, to being named one of the “Top 10 US Cities Best Positioned to Recover from Coronavirus” by Forbes in 2020.

While these wins put Tucson on the national map, there are also unintended consequences that followed this prominence such as displacement and homelessness due to rising rents and inflated housing markets. Further, the COVID-19 pandemic left long term impacts on local businesses and communities that require thoughtful policy to mend. Fortunately, the City of Tucson is in a unique position to grow strategically and preserve historic richness, meet housing needs, and maximize economic development opportunities.

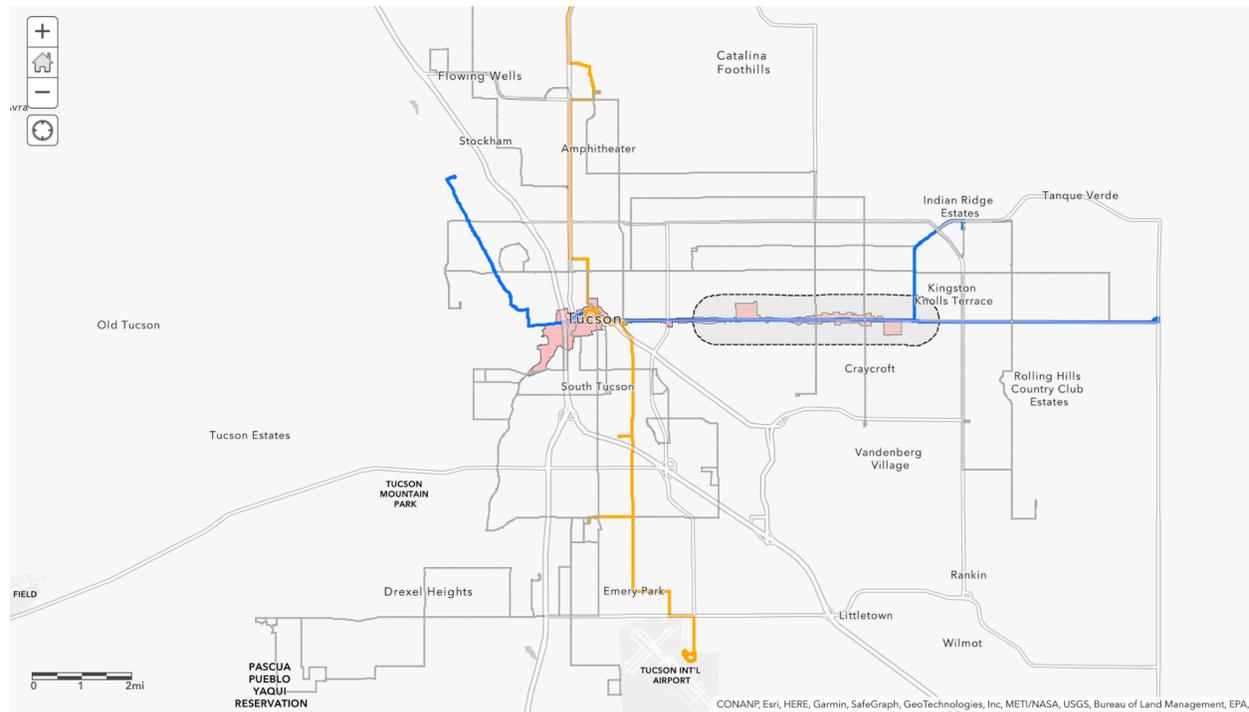
This report uses scenario planning, market-based research, and specific site analyses to imagine how different levels of transit investment can transform a corridor, and how policy and land use tools can steer development patterns towards more equitable and inclusive outcomes.

STUDY AREA

The study area of this report is a 4-mile section of the Broadway Corridor (Country Club to Wilmot). The intention with selecting this section of the corridor was to focus on the area of central Broadway that is not currently covered by the Sunshine Mile Overlay. The objective is to explore transit, policy and infrastructure opportunities to predict how development patterns can equitably increase density and sustainability.

To better understand the context of the study area, it was divided into 4 districts: El Con Williams, Midstar and Park Place. Broadway Blvd is a large arterial that connects the urban area of Downtown to the predominantly residential eastern side of Tucson. The site context includes widened roads with commercial hubs along both sides which strengthen its reputation as an employment hub for the City of Tucson. There are commercial centers like strip malls, plazas, and office buildings. Housing stock in the form of low density complexes and single family homes are also scattered along the corridor. The viewsheds of the Catalina Mountains act as a cultural asset for many residents.

Map 1.1 Study Area Location



PURPOSE + METHODOLOGIES

The three scenarios that were studied in this report were realistic (High-Capacity Transit), optimistic (Bus Rapid Transit) and aspirational (Streetcar Transit). Each transit investment reflected a different need and range of impact on land uses, real estate markets, housing attraction rates and affordability rates among others. This report does not make a recommendation for which type of transit should be pursued, but rather hopes to identify viable and research-based opportunities for the City of Tucson to prepare for roaring markets and the urban growth that follows public transportation and can be applied to various corridors.

Data was sourced from a number of different organizations. The City of Tucson and Pima Association of Governments OpenData portals provided data on crashes, green infrastructure, zoning, districts and jurisdictional boundaries within the City of Tucson. Additionally, 2015-2019 Census Bureau 2015-2019 ACS data on population, race and ethnicity, Median Household Income, Age and Disability, Language, Vehicle Ownership, and Housing Tenure was sourced from the Integrated Public Use Microdata Series (IPUMS) National Historic Geographic Information System (NHGIS) at the Census Block Group level. A field survey was taken that identified broken and missing sidewalks, HAWK crossings and non-HAWK crossings, curb cuts, cultural assets, micro mobility locations and potential locations, and areas that can support large solar installations. Qualitative data was collected through interviews with a small group (9 total) of private sector developers and built environment professionals.

GUIDING PRINCIPLES + VALUES

The work, research and analysis that was carried out in this report was guided by a set of guiding principles that are based on advancing collective community objectives.

There are 5 total guiding principles: Equity, Collaboration, Sustainability, Mobility and Identity.

Figure 1.1 Guiding Principles

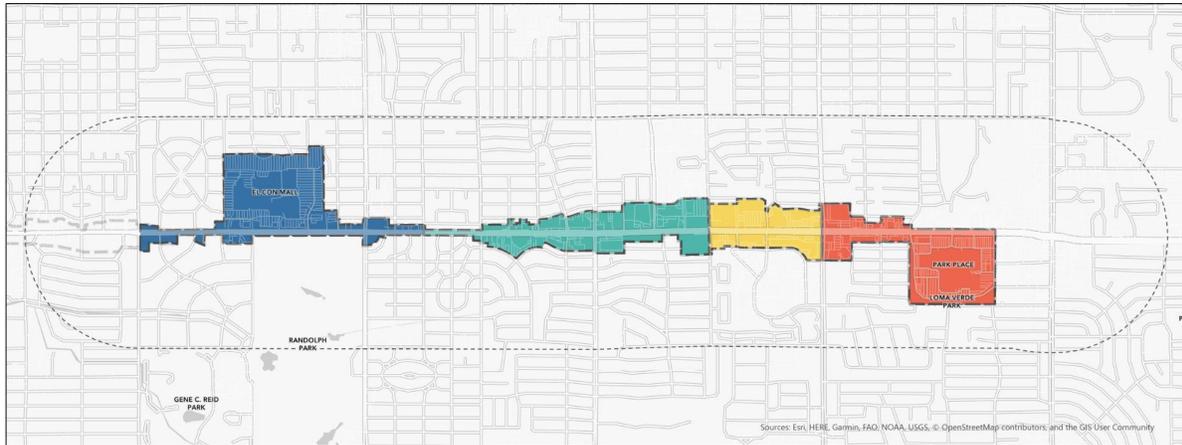
Equity	Collaboration	Sustainability	Mobility	Identity
Affordability Accessibility Quality	Transparency Inclusivity Accountability	Resiliency Connectivity Safety	Multimodal Walkable Active	Culture Authenticity Preservation

Each of these principles encompasses a set of values that informed and inspired the tools and opportunities identified in this research. The focus of these tools and opportunities is to advance the values in hopes of maximizing the built environment and quality of life for all members of the community. The objective with these guiding principles is to steer Tucson towards a socially rich, climate resilient and prosperous future.

PART I: EXISTING CONDITIONS

The first part of this report is an overview of the current conditions of the 4 districts in the study area. The objective of this section of the Broadway Corridor analysis was to understand the social diversity and economic potential of the corridor within a ½ mile **buffer**. The quantitative and qualitative research conducted for this analysis has been organized in the following categories: People, Place and Policy.

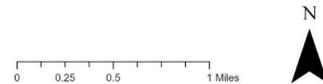
Map 1.2 District Sub-areas



Legend

Study Area (1/2 mile buffer)
Rio Nuevo TIF

El Con District
Midstar District
Park Place District
Williams District



PEOPLE

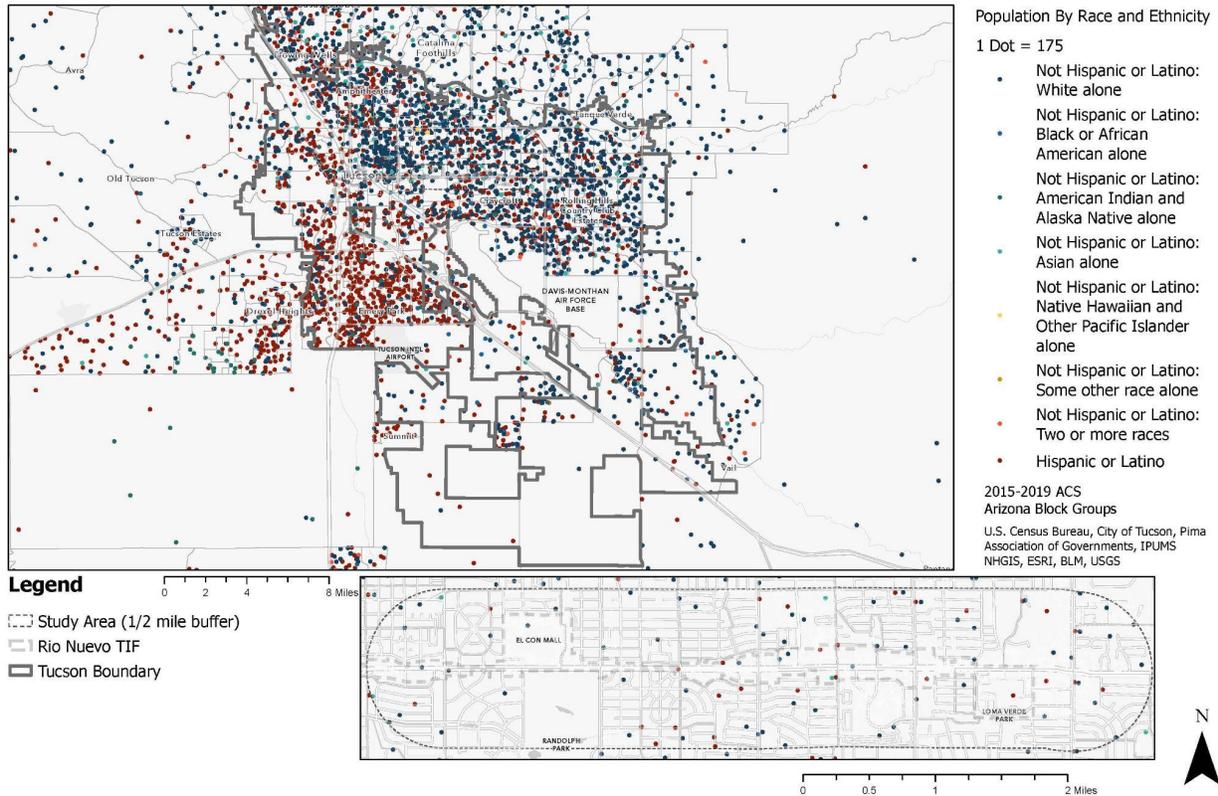
The social fabric of every community is represented by the people who call it their home: those who live, own homes and businesses, contribute to the local economy through labor or production, face transportation challenges of all modes, speak different languages and interact with the built environment daily. To identify opportunities that align with the guiding principles of this report, the diversity, culture and mobility options available along the study area were studied.

Demographics

Population

The population of the Broadway Corridor is predominantly “White Alone” at 81% and 60% “Not Hispanic or Latino: White Alone” which compares to Tucson at 70% and 44%, respectively. Minority population groups are within a percentage point of their Tucson level population. These groups tend to be found in clusters like the neighborhoods just north of El Con Mall. The “Hispanic or Latino” population is found between Columbus Rd and Wilmot Rd. The western portion of the corridor that borders Reid Park has a very low minority population.

Map 1.3 Population by Race and Ethnicity



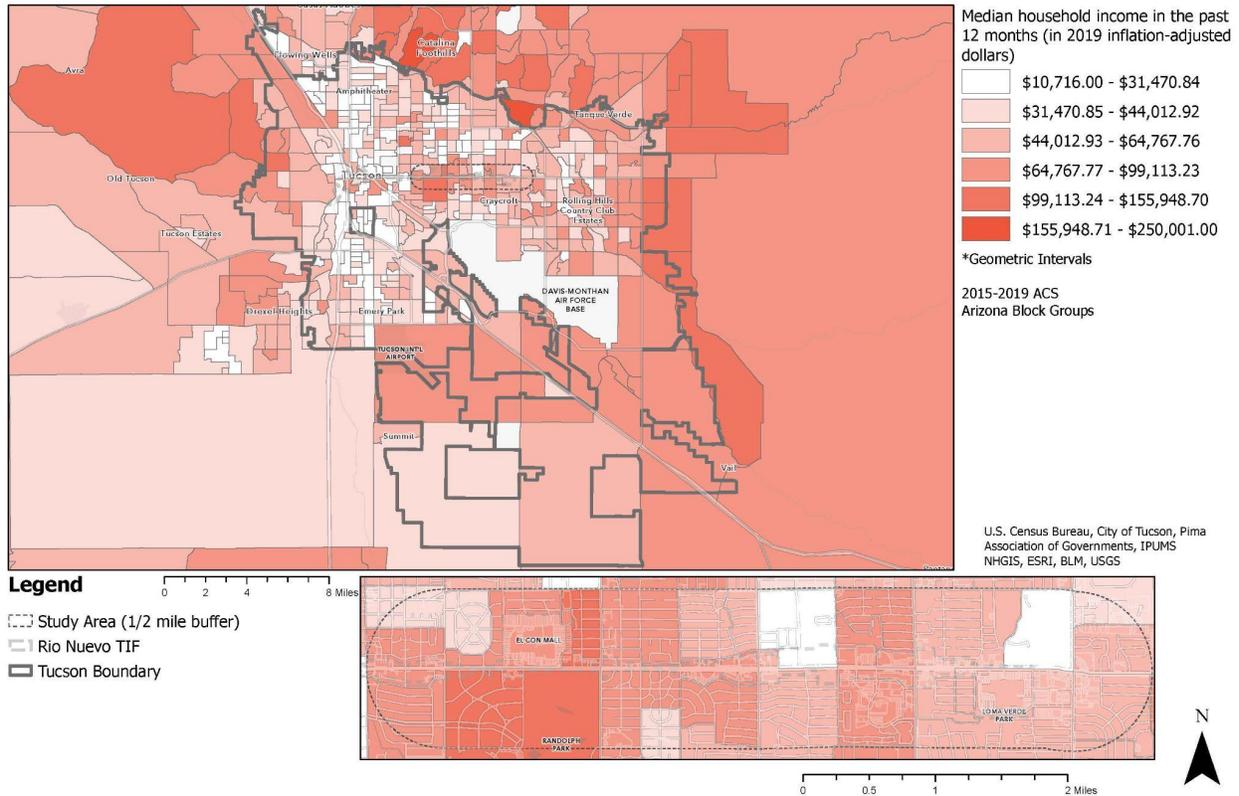
Vehicle Availability

The number of households with No Vehicle Availability is at 13% within the corridor, compared with 12% in the whole city of Tucson. There are three block groups that are intersecting our study area with No Vehicle Availability between 25%-38%. These are found bordering Wilmot Rd and Swan Rd north of Broadway Blvd. People in the corridor also walk to work at a rate of 16%.

Poverty and Income

The median household income of the corridor is \$58,718 while Tucson’s median household income is \$41,677 but the poverty level under .5, which is the poorest of the community, is inline with Tucson’s rate of 10% under .5. The poverty rate at 2 or greater is 60% which suggests most of the corridor makes twice the current poverty level. Tucson currently sits at 53% ratio of income to poverty at 2 or greater.

Map 1.4 Median Household Income



Age and Disability

The corridor's median age is 40.6. The older areas of the corridor are around the two malls at El Con and Park Place. The block groups that encompass both malls and some residential areas have a median age between 49-59. The corridor as a whole has a lower rate of households with at least one person with a disability at 27% while Tucson is at 29%.

Language

The rate of households that are spanish limited english speakers represent only 2% of the corridor compared to 5% of Tucson residents. However, there are concentrations of these speakers in some block groups south of the El Con Mall and north of Park Place with rates between 4% - 10%. These areas coincide with lower incomes and areas of minority populations.

Jobs

Jobs data was collected from the United States Census Bureau's OnTheMap application that allows users to view 2019 Longitudinal Employer Household Dynamics (LEHD) data with a specified geography. A buffer was created along the specified transit corridors that have been identified by PAG in their High Capacity Transit Implementation Plan. To look at Inflow/Outflow of the corridor, an outline of Block Groups intersecting a buffer was created and imported to the U.S. Census Bureau's OnTheMap to extract their data.

The Broadway corridor buffer area currently contains around 8% of Tucson's total jobs. The industries that are overrepresented compared to the Tucson area as whole are retail trade, accommodation and food services, and professional, scientific, and technical services. The entire study area from Ronstadt to Wilmot contains 48,000 jobs which is the most of the measured high-capacity transit corridors (Oracle, 6th Ave, Speedway) that have been proposed by PAG. Inflow/Outflow data found that 95% of those who work in the study area do not reside within it, while 90% of those who do, travel for work to other parts of the city. The wages of jobs in the corridor making \$1,250 per month or less are overrepresented at 26.5% compared to Tucson as a whole at 21.4%. Most jobs in the corridors have wages between \$ 1,251 to \$3,333 a month at 41.3% which is nearly 2% higher than Tucson. The most notable difference is in jobs with wages over \$3,333 a month with the corridor having 32% compared to Tucson 39%.

Table 1.1, 2019 Jobs by Industry Sector

2019 Jobs by Industry Sector	Tucson Share	Broadway Corridor Share	Full Broadway Share	Oracle Share	Speedway Share	6th Avenue Share
Agriculture, Forestry, Fishing and Hunting	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Mining, Quarrying, and Oil and Gas Extraction	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%
Utilities	0.7%	0.0%	2.7%	3.0%	0.0%	3.6%
Construction	4.2%	0.8%	1.1%	3.1%	1.1%	2.5%
Manufacturing	3.3%	0.7%	0.7%	0.7%	0.5%	1.3%
Wholesale Trade	2.1%	1.8%	1.2%	1.1%	0.5%	2.2%
Retail Trade	11.3%	16.4%	7.5%	10.0%	7.2%	2.1%
Transportation and Warehousing	2.5%	0.6%	0.4%	0.2%	0.9%	0.5%
Information	2.1%	2.0%	1.4%	3.3%	0.8%	0.7%
Finance and Insurance	2.9%	8.5%	3.5%	0.4%	1.6%	0.5%
Real Estate and Rental and Leasing	1.7%	2.9%	2.9%	2.6%	1.0%	2.2%
Professional, Scientific, and Technical Services	6.0%	18.9%	9.7%	3.5%	3.6%	3.4%

Management of Companies and Enterprises	0.5%	0.7%	0.9%	0.6%	0.8%	0.4%
Administration & Support, Waste Management and Remediation	9.6%	8.5%	4.8%	2.3%	10.8%	1.3%
Educational Services	13.5%	0.7%	17.8%	24.6%	31.1%	23.8%
Health Care and Social Assistance	19.2%	14.7%	8.9%	8.5%	26.6%	16.5%
Arts, Entertainment, and Recreation	1.0%	0.3%	1.7%	2.3%	0.3%	2.2%
Accommodation and Food Services	10.1%	17.8%	10.3%	7.5%	10.3%	5.8%
Other Services (excluding Public Administration)	2.9%	4.4%	2.8%	2.0%	2.7%	1.5%
Public Administration	6.4%	0.0%	21.6%	24.2%	0.0%	29.5%

Table 1.2, 2019 Jobs by Earnings

2019 Jobs by Earnings	Tucson Share	Broadway Corridor Share	Full Broadway Share	Oracle Share	Speedway Share	6th Avenue Share
\$1,250 per month or less	21.4%	26.5%	21.7%	21.6%	20.0%	17.2%
\$1,251 to \$3,333 per month	39.5%	41.3%	33.7%	33.7%	39.0%	30.6%
More than \$3,333 per month	39.1%	32.1%	44.6%	44.7%	41.0%	52.3%

Table 1.3, 2019 All Jobs Share by Corridor

Tucson		Speedway ½ Mile Buffer		6th Avenue ½ Mile Buffer		Full Broadway ½ Mile Buffer		Oracle ½ Mile Buffer		Broadway Corridor ½ Mile Buffer	
Count	Share	Count	Share	Count	Share	Count	Share	Count	Share	Count	Share
239,827	100.0%	40,362	16.8%	36,146	15.1%	48,941	20.4%	43,663	18.2%	18,615	7.8%

Community Character

In efforts to protect culture and heritage, understanding community character is a vital component of preservation efforts. Dismissing community character can have devastating consequences often as a result of irresponsible development, lacking policy or inflexible zoning regulations. Community character, also known as a “a sense of place”, is an outcome of a community’s identity. Traditionally, community character has been considered the outcome of the physical space, such as landscape features and historic preservation. However, these are a small part of what truly creates community character for people. Cultural Asset Inventories (CAI) have been known to include the social and economic contexts of a community, which has been identified in this report as a necessary component of creating a prosperous Broadway Corridor.

Further, it is important to understand characteristics such as: population, demographics, linguistics, physical and natural resources, climate, food culture, cultural history, art and communal patterns alongside landscape features and architecture (Hodgson, 2011: 1-3). The culmination of these cultural inventories allows municipalities to better understand the fabric of their community.

The study area’s physical characteristics include widened roads, commercial hubs, class B office buildings and single family homes surrounding the corridor. The Catalina Mountains viewsheds are considered wayfinders for the community. There are also a number of federally recognized historic districts, structures and architectural styles that contribute to the sense of place and cultural significance of the area.

Table 1.4: Historic Districts within Study Area

Title of Historic District	Years of Significance	Areas of Significance	Prominent Architectural Styles	Broadway Corridor District Location
El Encanto Estates Historic District	1929-1961	Community Planning & Development; Architecture	Neoclassical, Spanish Colonial, Mission, Pueblo and Sonoran Revival styles	El Con District
Colonia Solana	1928-1964	Community Planning & Development; Architecture	Spanish Colonial Revival to post-WWII Ranch residences	El Con District
El Montevideo Residential Historic District	1930-1961	Community Planning & Development; Architecture	Spanish Colonial, Territorial (Sonoran), Pueblo Revivals, and post-WWII Ranch and Mid-Century Modern (Contemporary) style residences	El Con District
San Clemente Historic District	1923-1959	Community Planning & Development; Architecture	Spanish Colonial Revival, Mission Revival and Classic Ranch residences	El Con District & Midstar District
Indian House Residential	1926-1950	Community Planning & Development; Architecture	Southwestern Revival and Mid-Century Modern (Contemporary) style residences	Park Place District
San Rafael Estates	1954-1956	Community Planning & Development; Architecture	Mid-Century adobe Modern (Contemporary) Ranch residences	Park Place District

Table 1.5, Historic Structures on the National Register within Study Area

Name of Individually Listed Historic Structure	Address	Year(s) of Significance	Areas of Significance	Architectural Style	Broadway Corridor District Location
El Conquistador Water Tower	Near the intersection of Broadway and Randolph Way	1929	Initial water supply to Colonia Solana subdivision and El Conquistador resort hotel	Mission/Spanish Colonial Revival	El Con District
Gist Residence	5626 East Burns Street	1958	Architecture	Mid-Century Modern	Park Place District
Villa Catalina	3000-3034 East 6th Street & 521-525 North Country Club Road	1957-1961	Architecture	Mid-Century Modern	El Con District
El Encanto Apartments	2820 East Sixth Street	1940-1945	Planning and Development	Mission/Spanish Colonial Revival (Monterey style)	El Con District

The study area contains traditional and non-traditional potential cultural assets that contribute to its community character. This corridor is largely commercial with many destinations located within retail centers, including El Con Mall, Midstar Plaza, Plaza at Williams Center, and Park Place Mall. There are many locations that enable people to gather and share experiences, as well as receive services. Most of the uses in the study area consist mostly of restaurants, community spaces, cultural stores, and resource centers. Larger franchise businesses within these shopping centers are also thought of as notable destinations. Though vibrant, the study area could benefit from additional prominent cultural assets, such as places of worship, public art, and grocery stores.

A notable trend about the study area is the distances between destinations and services. Many are sprawled out along the corridor, which decreases access to pedestrians and other mobility modes due to lacking infrastructure or disinvestment. Moreover, it is an autocentric area; Broadway Blvd serves as a major arterial with outdated development patterns, making it rich in parking lots and wide lanes. While these spaces along the corridor provide the community with services and spaces to congregate, there is much room for improvement.

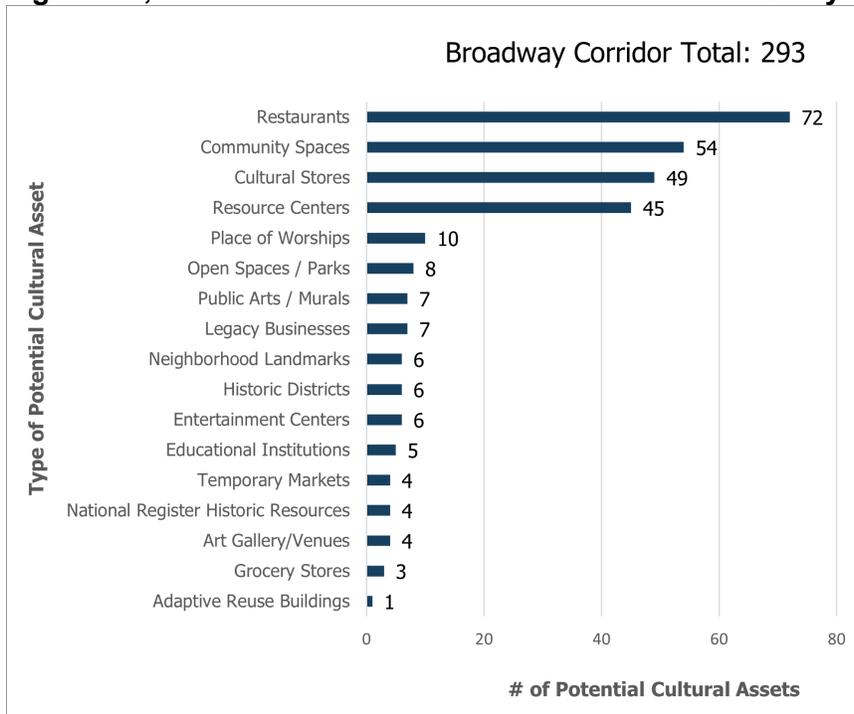
A key component in gaining better insight into the community character of the study area was mapping potential cultural assets based on popular destinations, online community groups and Tucson GIS data. Due to pandemic complications and scope limitations for this research, public community outreach was not conducted in this analysis but should be noted to be a vital part of authentic culture asset mapping

processes. Potential cultural assets were then identified for this report using predetermined categories inspired by a community survey document from the American Planning Association.

Map 1.5 Potential Cultural Assets within Study Area



Figure 1.2, Number of Potential Cultural Assets within Study Area

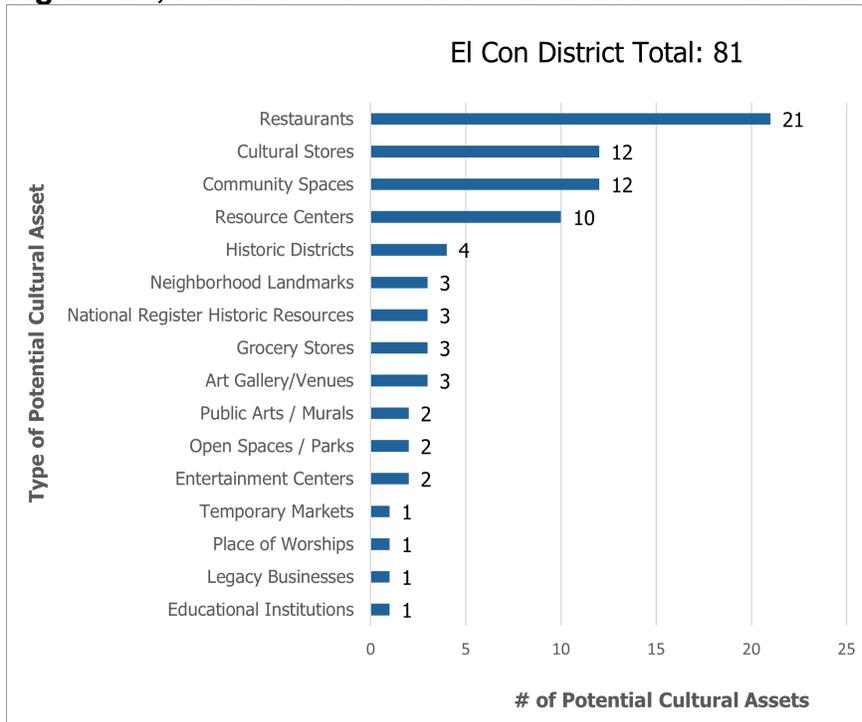


El Con District (Country Club - Alvernon)

El Con District is located on the farthest west end of the Broadway Corridor. It is the oldest section of the corridor as it was once home to the original El Conquistador Hotel that was the heart of this community during the late 1920s until it was demolished in the late 1960s. However, the El Conquistador Water Tower remains as a National Register Historic Resource and a cultural footprint for the community. The hotel was demolished for the expansion of Tucson’s first mall, El Con Mall (Larson, 2017). Eventually, the El Con Mall was completely demolished in the mid 2000s for what exists today as the El Con Center, which is an open air shopping center. Four historic districts and Reid Park are located in this district.

There are a total of 81 potential cultural assets that have been identified. It has a well-rounded mix of uses that include art galleries, grocery stores, and open spaces. While there is a prominent presence of restaurants, they are complimented by cultural stores and community spaces. Some of these spaces include salons, cafes, and restaurants (local, corporate and franchises). There are valuable resources, such as recreational nonprofits and social welfare organizations, such as The Consulate of Mexico. Public parks include San Clemente Park and Reid Park which offer opportunities for recreational activities and play. There is one place of worship, a Jewish Synagogue known as Temple Emanu-El. These destinations bring community members together and help shape the cultural identity of the El Con District.

Figure 1.3, Number of Potential Cultural Assets within the El Con District

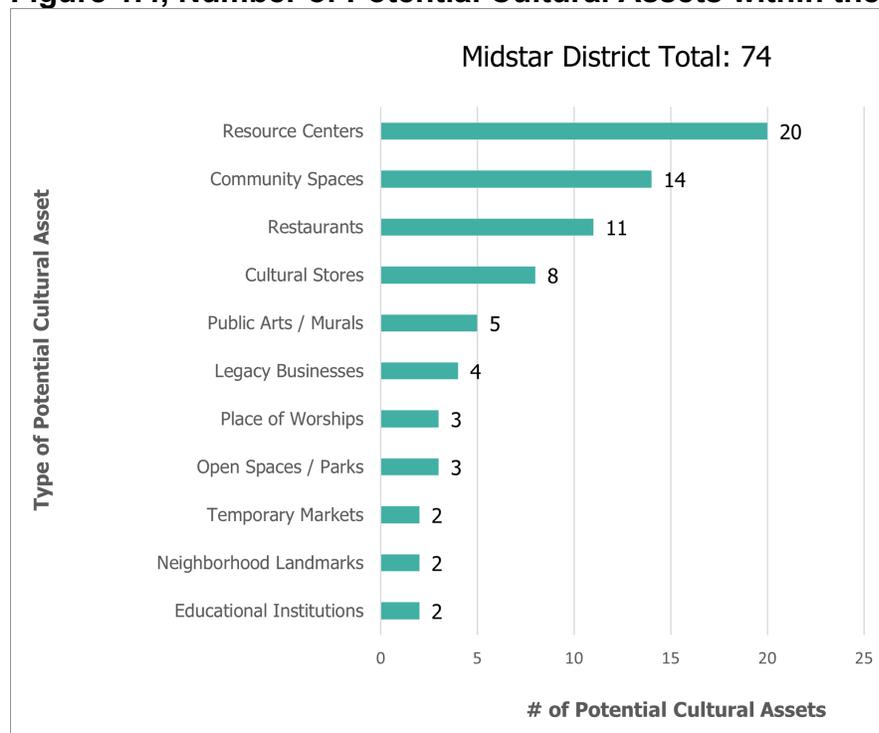


Midstar District (Alvernon - Rosemont)

The Midstar District centers around Midstar Plaza, which is a single-story 50,000 sqft strip shopping center that was developed in the early 2000s. It replaced the Midtown Plaza that was built in the early 1960s. The Midstar Plaza is a contemporary retail center that includes restaurants, stores, and small office spaces (Juarez, 2001). There are a total of 71 potential cultural assets in the Midstar District, mainly consisting of resource centers that occupy many of the office spaces. Nonprofit organizations that provide support to veterans, marginalized groups, and children are also part of the Midstar District community.

Community spaces consist of musical learning centers, salons, and barber shops. Additionally, the cultural stores center around ethnic and niche-based communities. There are some legacy businesses that anchor the neighborhoods, including notable destinations such as Nadine's Pastry & Ice Cream Shop, The Hungry Fox Restaurant and Country Store as well as Kon Tiki Restaurant & Lounge. This district also features 3 public parks and restaurants that pertain to particular cultures like polish, greek, asian, and hispanic. There are also observed “pop up” markets that utilize the empty lots, such as Brian and Kelly’s Pumpkins and Trees, to meet the seasonal shopping needs of nearby residents. These temporary market spaces where small and local businesses can contribute to the local economy demonstrate untapped economic potential in the Midstar District.

Figure 1.4, Number of Potential Cultural Assets within the Midstar District

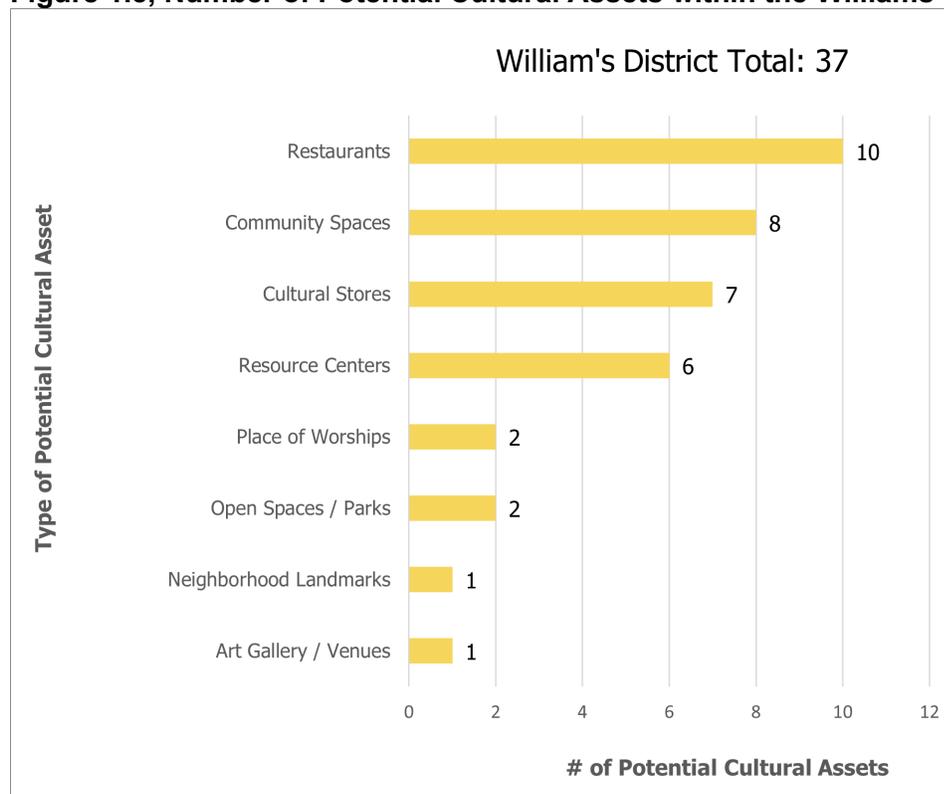


Williams District (Rosemont - Craycroft)

The Williams District revolves around the Plaza at William’s Center and the Williams Centre. The Plaza at William’s Center retail strip mall was built in 1988 and is adjacent to the Williams Centre to the east (Allen, 1990). This is the smallest of the districts with a total of 37 potential cultural assets.

Given Broadway’s commercial nature, it is not surprising that many of the main potential assets consist of restaurants, such as Sauce Pizza & Wine and Trident Grill III. Some other popular destinations include self-care services (salons, spas) and retail stores that cater to gender specific clientele, i.e. lingerie and menswear. There is access to 2 public parks and 2 places of worship of Christian and Jewish descent.

Figure 1.5, Number of Potential Cultural Assets within the Williams District



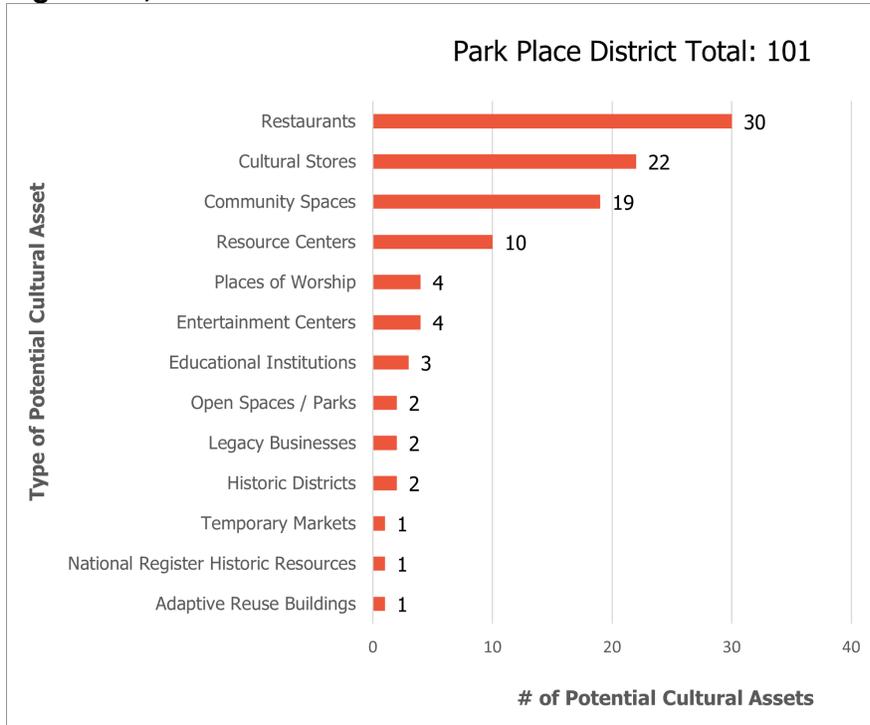
Park Place District (Craycroft - Wilmot)

The main anchor in the Park Place District is the Park Place Mall that was built in the early 1980s. It has the most potential cultural assets known, with a total of 101 in its boundary.

There is an abundant presence of chain restaurants like BJ’s Restaurant and Brewhouse, Red Lobster, and Chipotle Mexican Grill. It has cultural stores that are also mostly larger chain stores aside from some smaller businesses that are located within the Park Place Mall. Community spaces include self-care services and entertainment spaces. The Park Place District has the most entertainment locations and also includes

two historic districts: Indian House Residential and San Rafael Estates which are home to the Gist residence, which is a National Register Historic Resource.

Figure 1.6, Number of Potential Cultural Assets within the Park Place District



PLACE

Another important component of understanding the context of the study area is assessing the current conditions of public spaces and allowable uses. This allows municipalities to work within the reality (and limitations) of the built environment and provides them with the necessary knowledge to think outside of it. This section includes an overview of the public spaces that affect how people move, travel and recreate.

Pedestrian Infrastructure

Image 1. Pedestrian Conditions



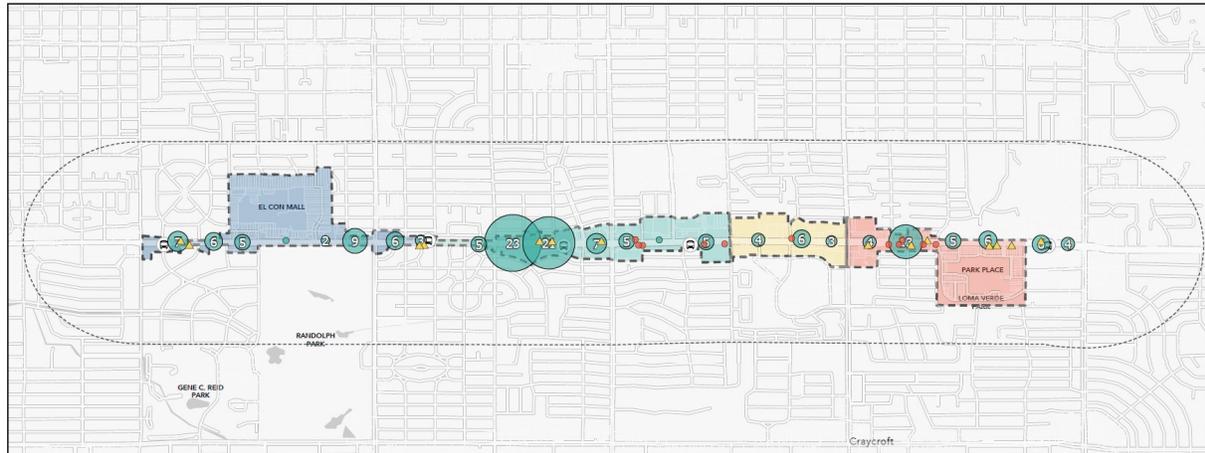
The pedestrian infrastructure in the study area has many highlights, but just as many challenges. While the conditions of the sidewalks vary by district, the overall sidewalks in the study area are good quality. More specifically, higher quality sidewalks and pedestrian connections exist near recently developed commercial areas, such as El Con, Park Place, and

Williams Center. El Con and Park Place enjoy wider sidewalks than the average width of 4 feet, while areas like the businesses between S Columbus Blvd and Swan Rd on the northside of Broadway Blvd have sidewalks that are deteriorating.

The Midstar District contains the most pedestrian infrastructure challenges. Currently, there are over 40 curb cuts between Columbus Rd and Swan Rd, which make for a continuously uneven path for pedestrians. Further, the poor quality side walks observed in this district are often filled with dirt and gravel from the roadway. This affects people that travel using all modes, such as people with disabilities who rely on wheelchairs to travel to and from destinations.

Midstar is another area with pedestrian challenges. An example of this is the access lane between Rosemont Blvd and Mountain View Ave on the South Side of Broadway. This sidewalk is located between parking and an access lane with no grade separation, inviting many chances for conflicts with vehicles. Another big challenge for the study area is maintenance, which results in disinvested public spaces many pedestrians and non-vehicle owners rely on. One portion missing functional sidewalks is the area in front of the church at Mountain View Ave and Broadway Blvd on the northside of Broadway Blvd in the Midstar District. These two locations are the greatest disconnects in the pedestrian facilities that were found throughout the study area.

Map 1.6, Pedestrian Infrastructure Deficiencies



Legend

Study Area (1/2 mile buffer)
Rio Nuevo TIF

Missing Sidewalks
Broken Sidewalks
Unsheltered Bus Stops

Curb Cuts Aggregation
Point Count
Low
High

El Con District
Midstar District
Park Place District
Williams District

0 0.25 0.5 1 Miles

N

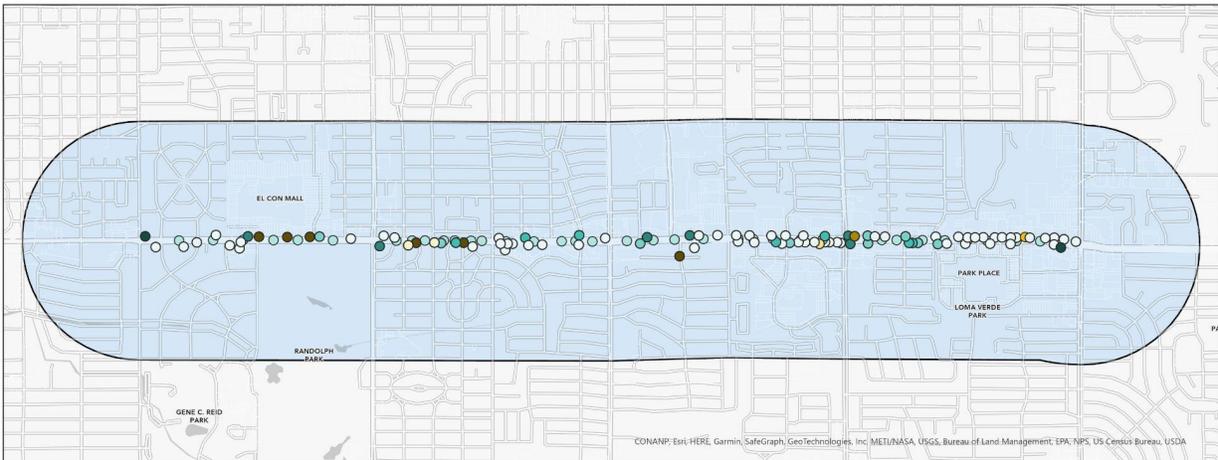
Pima Association of Governments, SafeGraph, ESRI, Garmin, BLM, US Census Bureau, USDA, Broadway Field Survey

The Midstar District has one of the highest levels of no vehicle availability currently between 25%-38%. This is 2 to 3 times the current City of Tucson average of 12%. Most bus stops along the corridor currently have shelters, and in some cases, additional tree shade coverage. There are five bus stops without shelters and only one of those stops is a temporary stop. This suggests a high need for shade and connection improvements as a significant part of the district walk to work (16%) or rely on public transportation (Route 8).

Green Stormwater Infrastructure

The existing environmental conditions of the study area demand a focus on the current distribution of small-scale green infrastructure, urban heat island severity, land coverage, flood zones, and storm drains.

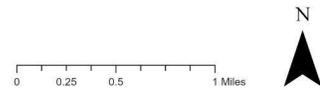
Map 1.7, Small Scale GSI along Broadway Corridor



Legend

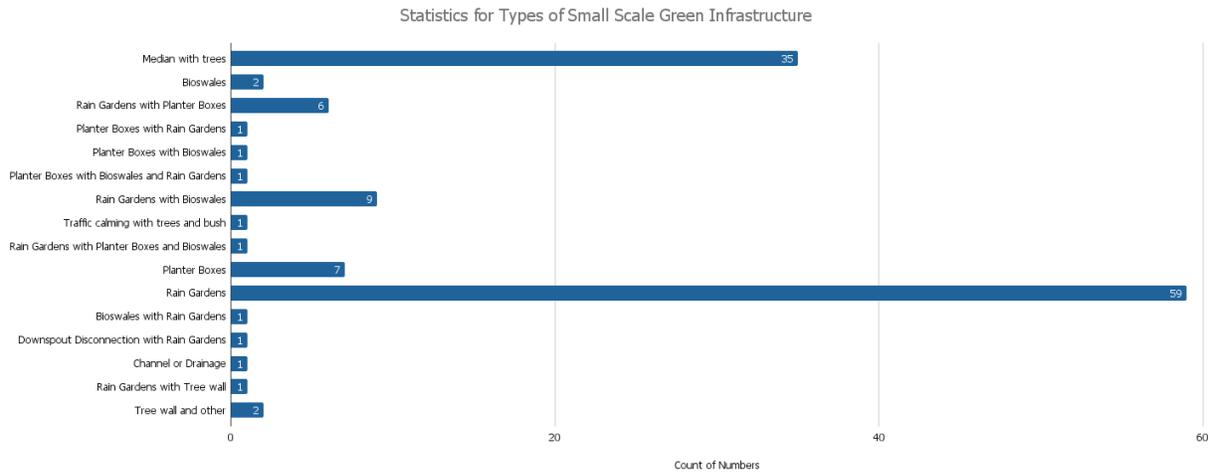
Types of Small Scale Green Infrastructures

- Rain Gardens
- Median with trees
- Rain Gardens with Bioswales
- Planter Boxes
- Rain Gardens with Planter Boxes
- Bioswales
- Tree wall
- Bioswales
- Channel or Drainage
- Downspout Disconnection
- Other
- Study Area 0.5 mile Buffer



Map 1.7 shows the distribution and location of the different types of small-scale green infrastructures on the Broadway Corridor. The data was collected by using an online designed survey from Survey 123. Each spot represents one small-scale GI.

Figure 1.7, Small Scale GSI Statistics



Based on the data collection statistics from the online survey, there are 129 small-scale green storm infrastructures on the Broadway Corridor, including 35 medians with trees, 59 rain gardens, and other types of GIs. For this research, small-scale green infrastructure is defined as stormwater improvements that exist on smaller sites. Some examples can be seen in Images 1-10.

Images 2 & 3: Medians with Curb Cuts



Images 4 & 5: Planter Boxes



Images 6 & 7: Rain Gardens with Bioswales



Images 8 & 9: Rain Gardens

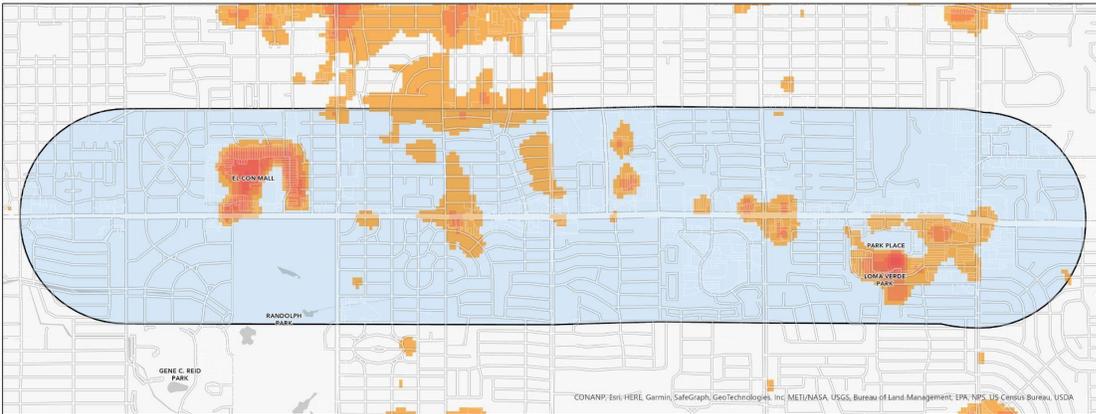


Images 10 & 11: Drainage and Traffic Calming with Bushes



For many cities in the Southwest, heat is a growing threat. To better understand how to mitigate the effects of the Urban Heat Island, learning which portions of the study area are most affected is an invaluable part of equitable policy. Map 1.8 tells the current urban heat island severity on the Broadway Corridor from highest level to lowest level. As seen on the map, the El Con Mall in El Con District and Loma Verde Park in Park Place District have the highest heat severity.

Map 1.8, Urban Heat Island along Broadway Corridor

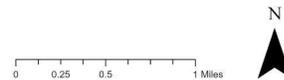


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Urban Heat Island Severity for U.S. cities - 2019

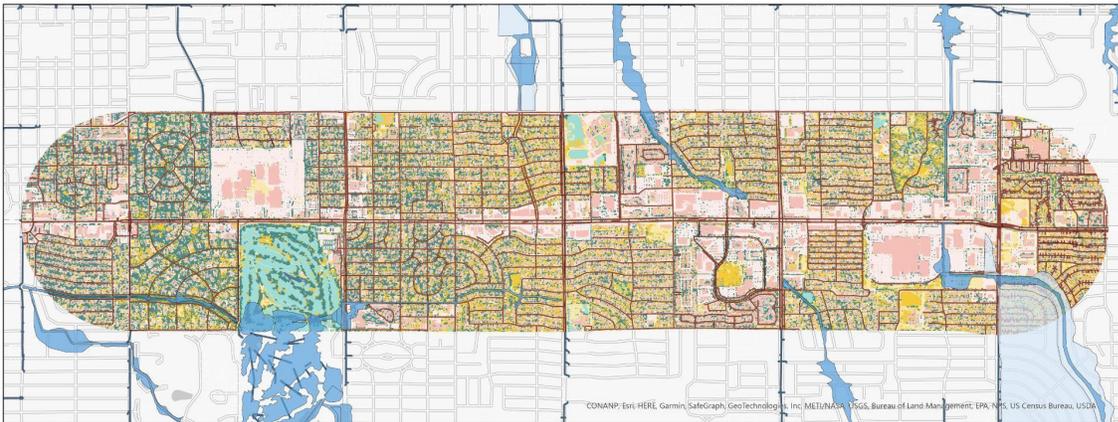
Heat Severity Level

- Highest Level
- Middle Level
- Lowest Level
- Study Area 0.5 mile Buffer

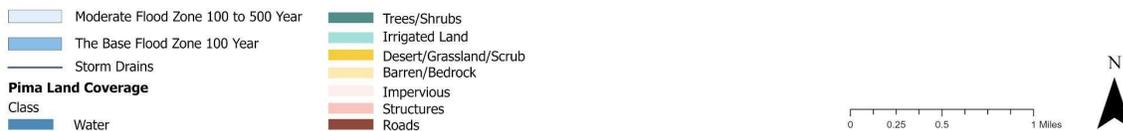


Map 1.9 shows the land coverage, flood zone, and storm drains of the Broadway Corridor. There are some overlaps between impermeable areas and flood zones that have been observed. Based on the analysis from Maps 2 and 3, the El Con Mall in El Con District and Loma Verde Park in Park Place District have impermeable areas without vegetation coverage, which heightens Urban Heat Island severity for the corridor. Also, due to the GIS analysis of the overlapping between Pima Land Cover and Tucson sidewalks, about 16% of tree canopy cover, 20% of impermeable areas, 12% of desert or grassland, 32% of bedrock, and 20% of roads located on Broadway's sidewalks.

Map 1.9, Land Coverage, Flood Zones and Storm Drains along Broadway



Legend



Micromobility

In order to accurately assess the potential of mobility opportunities in the study area, data on the present condition of the public infrastructure was collected both virtually and in person. This data collection allowed for a detailed understanding of where investments can be made to improve the conditions for multimodal transportation and connections in the corridor.

The data collected suggests that the existing conditions of micro mobility options and green spaces in the study area are insufficient. In terms of usability, a notable concern was the lack of safety due to infrastructure disinvestment. Further, there are only 2 hawk crossings in the entire corridor located in the Park Place District and S. Niven Avenue (located in the The Midstar District). Having a crosswalk or hawk crossing at every intersection isn't the solution. But for there to be efficient development and increase in density these issues need to be addressed sooner rather than later before the corridor continues to see an increase in serious fatalities. With the lack of safe crossings and hawk crossings, there have been 35 crashes involving bicyclists and 15 involving pedestrians. The field study also observed a lack of dedicated bike lanes and safe crossing options. While crosswalks do exist at many of the intersections near traffic signals, the distance between each one is further than the recommended and or desired distance of ½ mile. This results in pedestrians unsafely crossing the street to reach their desired destinations. The lack of dedicated bike lanes forces bicyclists to share a lane with traffic or ride in the narrow area of the shoulder, potentially putting both drivers and bicyclists at risk of fatal accidents.

In addition to studying the safety of the study area, micro mobility options (including public bike stations like TuGo, Razor Scooters & Spin Scooters) were analyzed. This research showed that the study area is largely autocentric and has not attempted to change since its inception. There are currently no bike stations along the corridor and micromobility operators such as Razor Scooters and Spin have limited or area restricted access. The availability of greenspaces and shade play a large role in the success of micro mobility, and has also been found to be lacking along the study area.

Images 12 & 13: Crossings



POLICY

Part of the existing conditions of the Broadway Corridor depend largely upon the policy and development landscape that new growth must navigate. To better understand these conditions, the market section of this phase includes research on current development incentives, zoning policies, public subsidy performance, and preferences of the private sector in forms of qualitative research.

Policy Landscape

In the state of Arizona, the built environment responds to legislative policy opportunities and challenges. A thorough grasp of the state and local policy landscape are crucial to developing policy tools to address housing, climate, transportation and access issues proactively.

Statewide

The City of Tucson is in a unique position, as it exists in a state with Private Property Protection laws, which preempt local municipalities from inclusionary zoning requirements and pose a barrier to creating more affordable housing stock. A notorious 2006 ballot measure known as “The Private Property Rights Protection Act”, or

Proposition 207, hinders municipalities from pursuing inclusionary housing policies for new and existing development. This law indicates that no governmental entity can regulate land uses that could devalue a property. If this happens, the municipal agency is legally required to compensate the owner for the difference in maximum value. Other statewide development tools include Impact Fee Restrictions, Gift Clauses, Tax Increment Financing (TIF) and the Housing Trust Fund Cap.

Local

At the city level, Tucson has explored many types of policy and land use tools to attract economic development. These tools have proved successful in some geographic areas, and lacking in others. For example, the Central Business District allows the City of Tucson to subsidize private development through the GPLET (Government Property Lease Excise Tax), a mechanism that provides for government property ownership with private development on site and defers property taxes for up to 8 years. This is a widely used tool among the private sector as the financial support moves the needle between infeasible and feasible projects.

Similarly, the Rio Nuevo TIF (Tax Increment District) is a tax increment finance district that was approved by Tucson voters in 1999. This TIF area was designated as the area around downtown, the Tucson Convention Center, and east along Broadway Blvd, encompassing both the El Con and Park Place malls. The purpose of the TIF is to reinvest a part of the sales tax generated in the district to incentivize new growth and development into the investment area. The goal of this reinvestment has been to revitalize Tucson's downtown area by providing financial incentives to subsidize more private development.

Image 14: CBD District Boundary

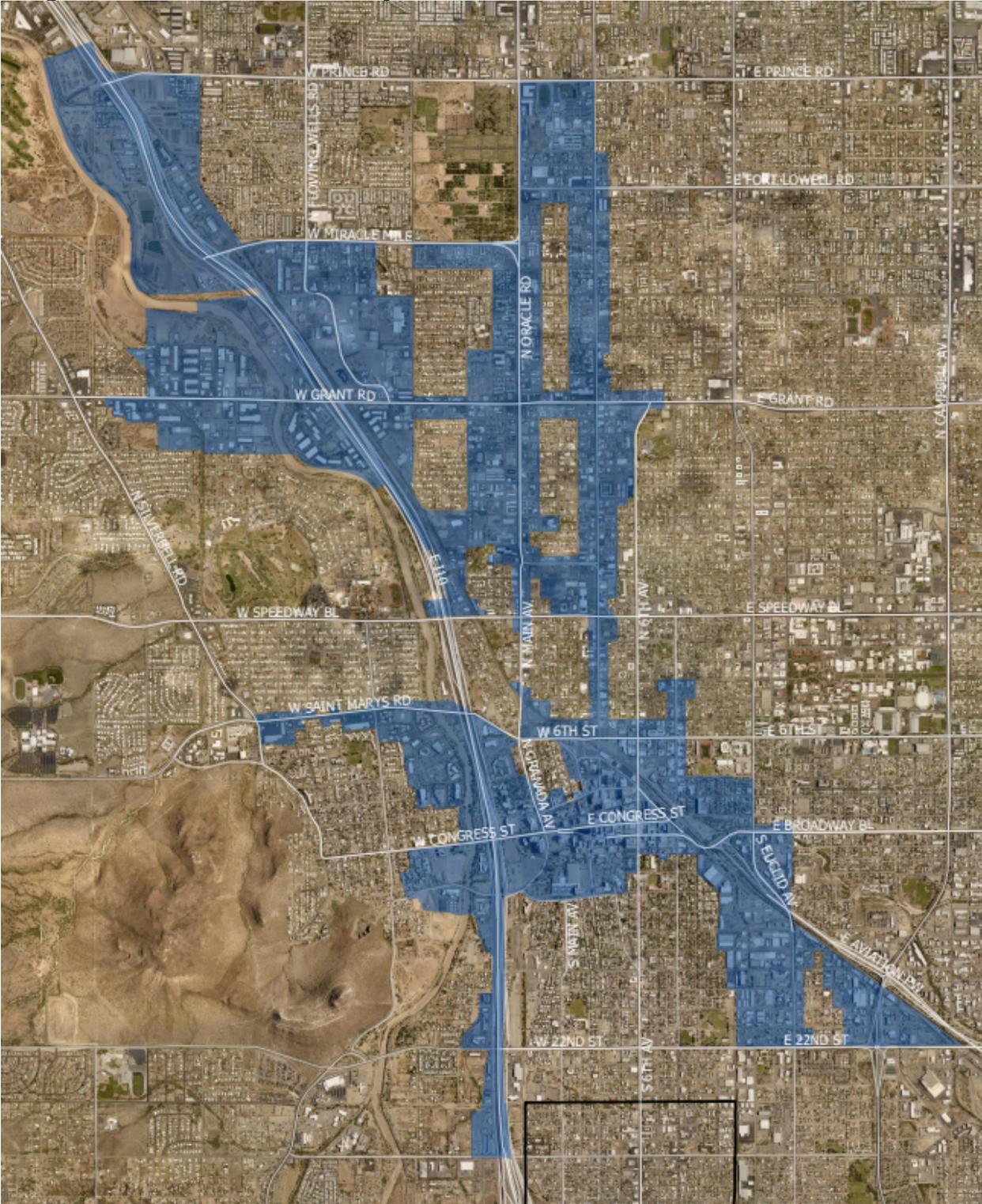


Image 15: TIF District Boundary



Broadway Corridor

The Sunshine Mile Urban Overlay District (SMUOD) covers an approximately 2 mile stretch of the Broadway corridor from Euclid Ave at the West to Country club Blvd at its eastern boundary. The SMUOD was imagined as a tool to revitalize a very distinct corridor that connects downtown Tucson to the east side as a major arterial street. Stated goals of the SMUOD are to support infill development, encourage mixed use, and to enhance the character of the area while retaining and celebrating the historic properties and character of the corridor.

Much like other overlays in Tucson the SMUOD allows for relief from some of the restrictions of the underlying zoning. Developers who opt-in to the SMUOD process will be able to take advantage of a density bonus, parking relief, and lessened setbacks and lot coverage requirements. SMUOD incentives are coupled with features that are deemed to be beneficial for the public and adjacent neighborhoods. The SMUOD provides incentives for affordable housing, mobility hubs, historic preservation, and design best practices. The SMUOD was the first zoning initiative in the City of Tucson to incentivize the development of affordable housing. Other land use tools existing in the city of Tucson include the Infill Incentive District (IID), Grant Road Investment District (GRIT), and the Main Gate Overlay District among others.

Tucson's multiple zoning tools have successfully encouraged development in specific areas of the city. The incentives used by the city in these zoning documents include tax abatement (GPLET), density bonuses, flexible design (reduced setback, lot coverage relief, etc.), and reduced parking, as seen in Table 1.6. These "trade offs" are attempts at steering development outcomes towards meeting social, environmental and economic goals.

Table 1.6, Tucson Special Zoning District Development Incentives

Tucson Special Zoning District Development Incentives										
Policy	Regulatory Incentives					Monetary Incentives				
	Density Bonus	Flexible Design (Reduced setbacks, lot coverage relief, etc.)	Reduced Parking	Accelerated Approval	By-right	Fee Reduction	Fee Waiver	Public Land	Public Funding	Tax Abatement
Sunshine Mile UOD	X	X	X			X ²				If In CBD (GPLET)
Grant Road UOD		X	X			X ²				If In CBD (GPLET)
Main Gate UOD		X	X			X ²				
Infill Incentive District	X ¹	X	X							If In CBD (GPLET)
Rio Nuevo Area TIF									X	If In CBD (GPLET)
Central Business District (GPLET)										X
Notes:										
1-greater allowed density than underlying zoning, no conditions must be met										
2- development review fees shall be reduced by fifty (50) percent for the Adaptive Reuse of an existing building										

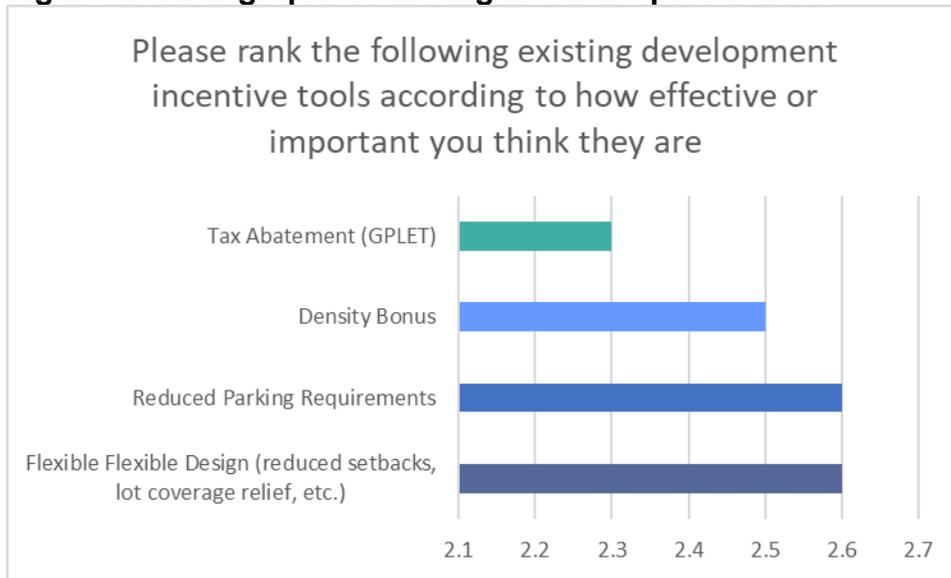
Private Sector

Given the Broadway Corridor’s immense potential for redevelopment and the various policy tools available to the private sector, a qualitative analysis was conducted through 9 anonymous interviews with local developers. The intention with this research was to gather information about the effectiveness of development incentives, understand the level of awareness around existing development incentives, and the perceived value of these benefits offered by the City of Tucson. Interviewees were asked to rank existing incentives based on their opinion of the value of individual incentives. Additionally, they were also asked about incentives that are *not* currently utilized in Tucson but are in effect in other municipalities around the US. Their answers were then assigned a value and scored by highest rank.

Which existing development tools in Tucson are the most effective?

Out of existing incentives in Tucson, interviewees favored flexible design and reduced parking requirements equally, then the density bonus and lastly tax abatement in the CBD.

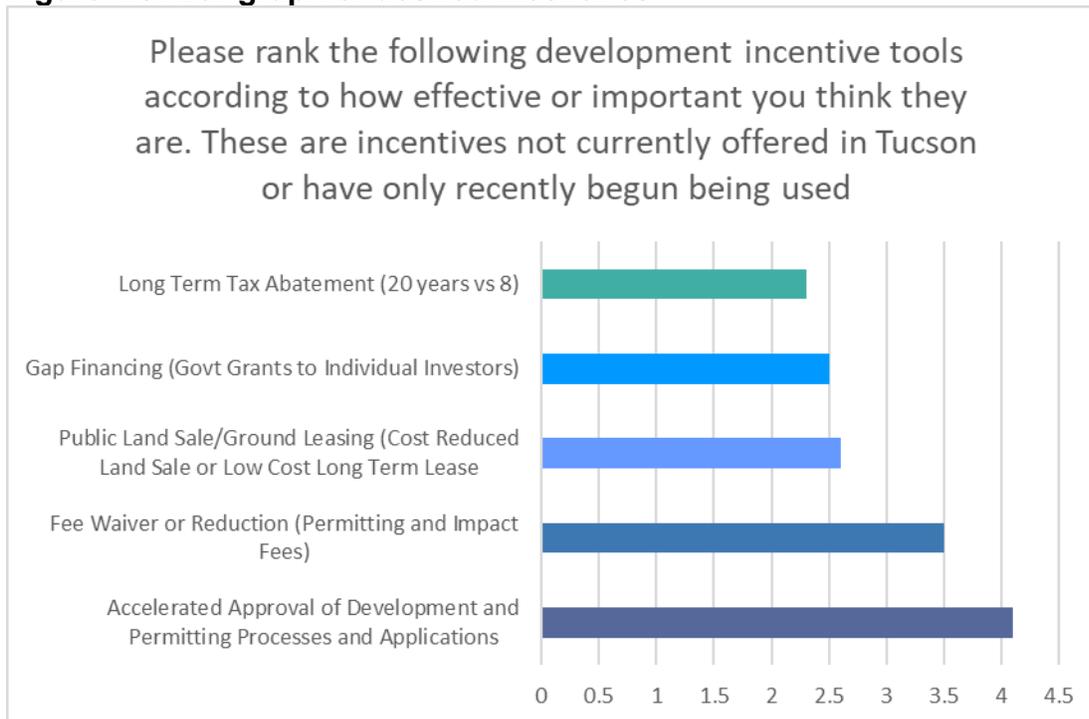
Figure 1.8: Bar graph of existing incentive preferences



Which incentives that do not exist in Tucson are most highly desirable?

Respondents ranked accelerated approval of development permitting and application processes at number 1. Roughly 60% of respondents said this was the most important incentive not currently being offered. The second highest response was waiving or reducing permitting and impact fees, followed by public land sale and ground leasing, gap financing, and more robust tax abatement structures.

Figure 1.9: Bar graph of desired incentives



What type of transportation option yields the most economic value?

Data showed 90% of interviewees believed a fixed rail transit system (light rail or an extension of the streetcar) would yield the largest amount of economic value. Dedicated lane Bus Rapid Transit came in a distant second among respondents.

Market

The Broadway Corridor is seeping with potential for new and innovative development. It is a unique corridor, as it is part of the Rio Nuevo TIF District. Due to the potential sales tax revenues that come from economic activity in the district, public entities like the City of Tucson and Rio Nuevo must focus on maximizing its potential.

A Current Performance Analysis (CPA) was conducted to gain a better understanding of the allocation and local tax dollar expenditures that are invaluable to a transparent development process. One economic incentive offered by the city of Tucson and Rio Nuevo that has been widely used is the GPLET. The CPA of past GPLET projects (2013-present) shines a light on valuable trends seen in the previous allocations of these sales tax revenues. This research compared GPLET agreements entered by the City of Tucson and Rio Nuevo by analyzing the following: type of use (seen in table 1.7), affordable units built, and the proportion of dollars invested by use.

Table 1.7: Type of Use Breakdown

Type of uses	Details
Mixed-use	Mix of office, commercial and residential
Market Rate Residential	Includes student housing
Section 8 Affordable Residential	As determined by HUD
Commercial	Includes hospitality, grocery, retail
Office	Includes coworking spaces
Public	Public assets, streetscapes
Other	Projects led by public entity

The City of Tucson has entered 24 GPLET agreements and subsidized over \$50 million in private development. In contrast, Rio Nuevo has entered 21 GPLET agreements and provided financial support for a total of 32 projects. In total, Rio Nuevo has invested nearly \$142 million into economic development in the TIF district. Combined, these two public entities are managing nearly \$200 million public dollars that come directly from sales tax revenues.

City of Tucson

The City of Tucson's GPLET agreements were divided among 4 major uses: commercial, mixed use, office, and market price residential. Among these uses, 42% of public subsidies went to mixed-use projects, including projects such as 1 E. Broadway, the Union on 6th, The Rendezvous and more. Almost all mixed-use projects were majority residential rental units and incorporated commercial, retail and hospitality uses on bottom or ground floors.

Collectively, the City of Tucson has subsidized 1,467 new residential units with the GPLET tool. It is important to note for this analysis that hotel rooms were not considered in this calculation since they do not offer long-term living opportunities. Out of the 1,467 residential units, 0 of them were affordable for voucher holders or the majority of Tucsonans. This trend is unnerving for housing justice advocates and elected officials who must mitigate the effects of rising housing prices, such as bankruptcy and homelessness.

Figure 1.10: Percent of Incentives by Use (City of Tucson)

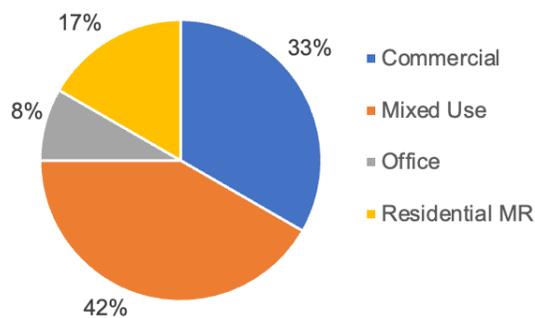
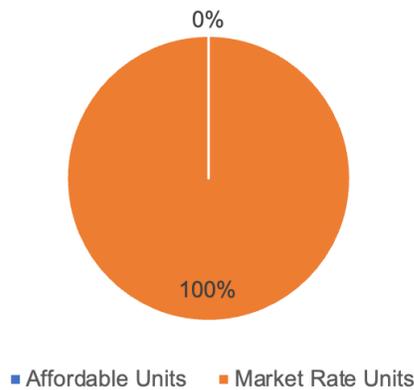


Figure 1.11: Proportion of Units Built (City of Tucson)



Rio Nuevo

Similarly, Rio Nuevo manages a TIF district with the mission to invest in and facilitate economic development within the district boundary. In total, Rio Nuevo has subsidized 32 projects. From these projects, almost half of them (47%) were commercial uses for a total of 15 developments, including the AC Marriott, the MSA Annex and Hotel Congress.

Rio Nuevo has also demonstrated an interest in preservation and public assets that help increase the value of developments in the TIF. It has provided funding for 5 public projects, or 16% of their total investments, including the Greyhound Station, the Scott Avenue streetscape, Mission Gardens, and the Sunshine Mile. These projects were all about improving access or walkability among the district, helping steward a pedestrian friendly and cool Downtown.

Figure 1.12: Percent of Incentives by Use (Rio Nuevo)

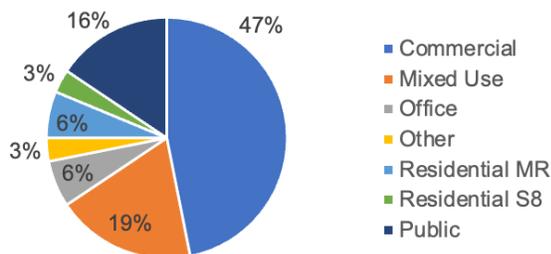
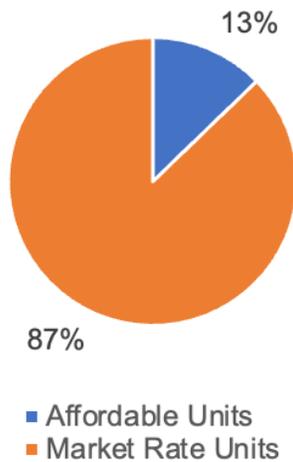


Figure 1.13: Proportion of Units Built (Rio Nuevo)



A large part of steering responsible development with innovative policy tools is creating a pathway for accountability. By analyzing the current expenditures of public tax dollars, the public can understand which uses are most successful and which projects have outcomes that align with community values. Notable trends can be deduced from an audit of GPLET and other public funding sources that have the potential to start productive conversations among all stakeholders.

Building Energy Consumption

To better integrate climate resiliency into the built environment, understanding the energy consumption in the study area sets a foundation for progressive policy. This allows opportunities to be identified for decreasing greenhouse gas emissions and green redevelopment of the corridor.

As a major employment hub and located on a major east-west transit corridor, the study area has the potential to attract between 1,462 and 4,828 new housing units by 2032. There is an opportunity for the City of Tucson to pilot an aggressive energy-efficient retrofit program and building code as part of a smart growth zoning overlay to incentivize smart, sustainable, infill Transit-Oriented-Development in the Broadway Corridor.

Building energy consumption in the study area is modeled by applying the Energy Use Intensity of each land use category (adapted from California's emissions estimator model, CalEEMod) to its total building square footage using ArcGIS. The estimated sum of all building energy consumption within this district is 443,085,935 kilowatt-hours per year - the equivalent of CO₂ emissions generated from 38, 825 passenger vehicles per year (US EPA, 2016).

Figure 1.14. Building Energy Use Intensity by Land Use

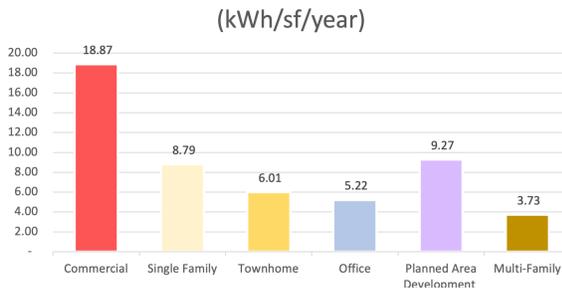
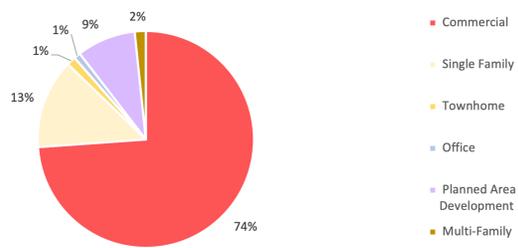


Figure 1.15. District Total Energy Consumption



Commercial land uses demand nearly three times that of residential uses, making them prime targets for mitigation strategies. In fact, commercial buildings within the district consume 74% of all the district’s total energy, at 327.3 million kWh per year. This represents \$40.6 million dollars, or 28,680 passenger vehicles per year. However, targeting multi-family and missing middle housing presents an opportunity to address social equity by reducing household energy costs.

There are approximately 2,572 multi-family housing units within the district (assuming these are typical one-bedroom units at 765 SF). Although multi-family housing has a lower energy use intensity than single-family land use (according to CalEeMod) and accounts for only 1% of the total district energy consumption, this equates to approximately 2,853 kWh of energy per unit, or \$353.72 per year in spending.

Map 1.10 Total Building Energy Consumption

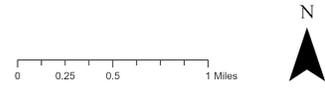


Legend

- Rio Nuevo TIF
- Study Area (1/2 mile buffer)

Total Energy Consumption (kWh/yr)

- ≤5000 kWh/yr
- ≤10000 kWh/yr
- ≤50000 kWh/yr
- ≤100,000 kWh/yr
- ≤100,000 - 24,057,273 kWh/yr



PART II: TRANSIT IMPACTS

The second part of the report includes the framework that was developed to estimate transit investment impacts along a series of different variables that shape the urban fabric of the study area. This research sets the foundation for analyzing the opportunities present in the corridor that have potential to inform policy tools and meet the guiding principles of this analysis.

Real Estate Value Added

There have been numerous studies conducted in the last 10 years studying the relationship between public transit and property values. The most recent joint report by the National Association of Realtors and the American Public Transportation Association analyzes the value added for real estate within transit shed areas (typically defined as a ¼ or ½ mile distance from a public transit stop). The intention of the study is to “compare the performance of residential and commercial property sales near fixed-guideway stations with areas without public transit in 7 regions...served by public transit including rapid rail, commuter rail and bus rapid transit” (NAR, 2019).

The results of the analysis made a compelling discovery about the relationship between real estate and transit: on average, transit increases property values between 4-25% overall, with the highest growth observed in residential uses and modest growth observed for commercial and office uses (NAR, 2019). One possible reason for this correlation is that “transit-oriented developments within urban areas have become more desirable due to their accessibility to job centers, valued amenities and cost-of-living reductions” (NAR, 2019). As a result, neighborhoods within transit shed areas “are often more walkable, with more retail density and other amenities, and include a higher percentage of households with less reliance on vehicles” (NAR, 2019). These factors often drive demand for housing or commercial options within these transit sheds, which directly results in increased property values for properties with proximity to public transit. This value-add demands the highest and best use of real estate in these locations, setting the stage for mixed use development that attracts both consumers and tenants.

Table 2.1, Average Percent Increase in Property Values

Average Percent Increase in Property Values		
	Residential	Office
Within Transit Impact Area	4-25%	5-42%
Outside Transit Impact Area	2-8%	4-6%

Moreover, higher demands for real estate in transit shed areas suggest occupancy remains steady if it does not increase annually. The NAR report mentioned a study done by the Metropolitan Planning Council of Chicago which found vacancy rates were an average of 2% lower than the regional average in locations within the transit shed (NAR, 2019). This value added is a direct impact of transit corridors as both people and cities begin to observe the reduced financial burdens of lessened vehicle dependency and economic development spurred through increased employment hubs and sales tax revenues. With support from the private sector through PPPs, public spaces and streetscapes along transit corridors help create a sense of place that promotes access and identity, factors that also contribute to added value for real estate.

However, this value added does not come free of cost. The study also found more increases in rents (2-14%) along transit shed areas than in neighborhoods away from public transit (NAR, 2019). This suggests cities and public officials “will need to keep working on housing affordability and land use policies to mitigate displacement from high-value public transit” (NAR, 2019). As transit continues to become a magnet for economic development, cities must respond with appropriate policy and land use tools to mitigate the negative impacts (i.e., displacement, class segregation) and protect access and affordability along transit corridors.

To assess the impact of different transit investments (HCT, BRT and SCT) on property values, an average increase for both residential and office uses within the transit shed (½ mile) were estimated for the study area.

Predicting Jobs, Housing Units and Population Growth

The actual population of Tucson and other cities in Pima county for the years 2010, 2015, and 2020 were compared with the Pima Association of Governments Regional Mobility Action Plan 2016 population growth projections. The Urban/Suburban scenario was chosen as the comparison table because the table was identified as the population projection to use for planning in the county by PAG. In reality, Tucson underperformed this projection while the suburban areas of Pima county saw more growth than the projection expected. The Mostly Suburban scenario more accurately portrayed reality but expects a negative Tucson population growth in the future and Marana expecting over 20% growth every 5 years until 2040. The projection numbers from the Arizona Office of Economic Opportunity provided a middle ground between the mostly suburban and urban/suburban projections with Tucson growing 2% every 5 years after 2025 and the suburban areas receiving roughly the same as projected in the urban/suburban scenario.

This analysis selected cities to compare to Tucson based on population size and used county population growth and transit shed population growth (based on pre-selected distances) between 2013-2019 to determine an average rate of growth in the impact areas. The AOEO’s projected population of Pima County in 2032 was used with the 2020 population to create the annual growth rate of the county over 12 years. This rate of growth in the impact of the comparison cities is multiplied by the Pima County annual growth rate and the population of the 2015-2019 ACS block groups intersecting the two different impact areas. This created the projected corridor population in 2032 with the different transit scenarios.

The projected population for the corridor was used with a housing unit need analysis from (Jepson and Weiss?) that used the number of owner occupied and renter occupied units in block groups intersecting the impact areas to create an estimated retained and need of housing units in the corridor in 2032 around the three different transit scenarios. To create the potential in job growth along the corridor, Dr. Chris Nelson’s data on jobs around transit infrastructure was used to create a job growth rate around transit. This number was multiplied by the Pima County job growth rate from the Arizona Office of Economic Opportunity. The total jobs in 2019 in the quarter and half mile buffer area were taken from the Work Area Report from the US Census Bureau’s OnTheMap application. For Office jobs, the sectors Information, Finance and Insurance, Professional, Scientific, and Technical Services, Management of Companies and Enterprises, Health Care and Social Assistance, and Public Administration were added together. Retail was created with the Retail Trade and Accommodation And Food sectors. The current jobs number was multiplied by our created growth in jobs in transit corridors in the City of Tucson rate and taken out 10 years to 2032.

Table 2.2, Scenario Table Population

Transit Mode Scenario	Impact Area	Population Today (Block Groups Intersecting Impact Area)	Population 2032	Population Growth in Corridor by 2032
High-Capacity Express Bus	1/4 mile	22,186	23,090	904
BRT (dedicated lane)	1/4 mile	22,186	23,817	1,631
Fixed Rail (streetcar)	1/2 mile	33,992	46,722	12,730

Table 2.3, Scenario Table Housing

Total Housing Units Retained in 2032	Estimated Total Housing Units Needed to Broadway Corridor	% Increase in Residential Property Values	% Increase in Office Property Values	Affordability Rate Required for EDIs
8,511	1,462	2%	5%	10%
8,534	1,776	10%	10%	15%
15,399	4,828	20%	15%	20%

Table 2.4, Scenario Table Jobs

New Jobs to Corridor in 2032	Total Jobs in Corridor 2032	Retail and Food Growth in Corridor	Total Retail and Accommodation and Food Jobs in Corridor in 2032	Office Growth in Corridor	Total Office Jobs in Corridor 2032
566	14,347	229	5,810	218	5,523
1,152	14,933	466	6,047	443	5,748
2,594	21,209	887	7,254	1,162	9,500

What Variables Were Impacted?

Affordability

The current Sunshine Mile overlay provides developers an opportunity to build affordability into their projects in exchange for a density bonus. According to a study on nationwide Inclusionary Housing policies by Grounded Solutions Network, this is a common practice among cities across the country. Since property values have been proven to increase along transit corridors, development projects within the transit shed are estimated to have higher gains in value compared to other properties in the same region. These higher value benefits are significant for real estate development, as they increase the total value of a sale or rental potential for residential and business tenants within studied distances.

The study also revealed that the majority of inclusionary housing programs in the U.S. have a minimum set-aside proportion for affordable units of 10% (IH, 2019). Further, approximately 29% of existing programs have a minimum set-aside 20% of units or more (IH, 2019). While the requirements vary in different metropolitan areas, research shows there is a case to be made for increasing inclusionary housing requirements. With adequate market support often stimulated by transit, cities have an opportunity to demand more affordable units from developers who wish to build within transit sheds.

This research set the Affordability Rate (AR) for the different scenarios along the Broadway Corridor. Assuming demanding 10% affordable units is the most common reliable inclusionary policy practice among residential and mixed-use development, a 10% AR was used to estimate the potential of HCT and then assumed to rise according to other variables (population, jobs) for BRT and SCT. The intention with raising the AR according to transit investment is to display the potential for new policy or zoning tools (overlay districts) to meet market demands, respond to social needs, and align development and policy to facilitate equitable outcomes.

There is another important distinction to be made when discussing affordability. For many, the term “affordable housing” implies HUD subsidized tenants, earning a varying percent of AMI (Area Median Income). While this term is correct, there is also a large

market of workforce and missing middle tenants that are not always included. One way to think of this distinction is affordability with a “big A” vs. a “little A”.

The “**big A**” is usually associated with HUD subsidized tenants and people with fixed incomes who rely on government assistance to meet everyday needs.

The “**little a**” implies people who are not necessarily covered by or eligible for HUD assistance but are still not making enough income to meet market priced living costs.

Both groups are typically missed when cities pass economic development policies in business districts or through economic development incentives. There is substantial research to support the rise in property values of real estate within a transit shed, suggesting that cities could implement intentional economic incentives along viable areas to steer the private sector to produce projects that align with city and community goals. By demanding more affordability from developers, publicly subsidized economic incentive policies can yield more inclusive outcomes. Using the right policy tools, municipalities can leverage their public transit investments in exchange for inclusive, responsible development.

Pedestrian Comfort and Sustainability

Green Stormwater Infrastructure (GSI)

In order to reduce the urban heat island and urban flooding effect, the future GSI scenario plan will focus on the overlapping areas between impervious areas, urban heat islands, and flood zones. The intersection between the sidewalk and storm drains could also add more GSI constructions.

Based on the City of Tucson data, the average monthly water consumption for each housing unit is 8 ccf. And GSI fees are 13 cents per ccf; therefore, the average monthly GSI fee for each housing unit is \$1.04. Use Current housing units occupied on Broadway in 2020 x (8 ccf) = Estimated monthly water consumption. And Estimated monthly water consumption x (13 cents) = Estimated monthly GSI fees in 2020. Then Estimated monthly GSI fees in 2020 x 12 months = Estimated annual GSI fees in 2020. And the data from the City of Tucson tells Cost-effectiveness of GSI = \$5 per sqft. So the Estimated GSI can be built (Sqft) in 2020 = Estimated annual GSI fees in 2020 divided by \$5. Since the Estimated housing units on Broadway in 2032 will increase, then use the updated housing unit number in 2032 to do the same calculation to get the Estimated GSI that can be built (Sqft) on Broadway for that year.

Table 2.5, GSI Fund Assumption

	A) High Capacity Express Bus	B) BRT (dedicated lane)	C) Fixed Rail (street car)
Current housing units occupied on Broadway in 2020	8,511	8,534	15,399
Estimated housing units on Broadway in 2032	9,973	10,310	20,227
Average monthly water consumption in Tucson per household or housing unit (ccf)	8	8	8
GSI Fees	13 cents/ccf	13 cents/ccf	13 cents/ccf
Monthly GSI fees for each housing unit (USD)	1.04	1.04	1.04
Estimated monthly water consumption on Broadway in 2020 (ccf)	68088	68272	123192
Estimated monthly GSI fees on Broadway in 2020 (USD)	8851.44	8875.36	16014.96
Estimated annual GSI fees on Broadway in 2020 (USD)	106217.28	106504.32	192179.52
Estimated annual GSI fees on Broadway in 2032 (USD)	124463.04	128668.8	252432.96
Cost effectiveness	\$5/sqft	\$5/sqft	\$5/sqft
Estimated GSI can be built (Sqft) on Broadway in 2020	21243	21301	38436
Estimated GSI can be built (Sqft) on Broadway in 2032	24893	25734	50487

Energy Consumption

Existing building energy consumption was studied to identify opportunities for cost and CO2 emissions reductions through energy conservation. While buildings themselves are not directly impacted by various levels of transit improvements, the ability of the district to attract new housing will impact the district's future carbon emissions. Higher levels of investment in transportation infrastructure will attract higher amounts of infill development. Under current levels of transit infrastructure along Broadway, it is unlikely that transit will drive a market for new housing. According to the market study in this report, it is feasible to attract around 1,776 new housing units to the Broadway Corridor with dedicated lane Bus Rapid Transit infrastructure in place, or 4,828 with a fixed rail Street Car. This could significantly drive infill development, resulting in higher carbon emissions from buildings. However, the potential expansion of an overlay zoning district would enable the City to apply stricter building standards for energy efficiency.

Solar

When it comes to the solar canopies, there were only a few variables considered, including understanding the effectiveness and plausibility of implementation. The variables considered included the amount of impermeable surfaces, to what level solar would be accepted and or implemented. Park Place Mall already has some solar installed on the roof of the building making it one of the more favorable locations. Such considerations are vital for a corridor like this that gets an abundance of solar. Park Place Mall has the potential to generate 291.97 KW/Acre & 2.13 KW/Parking spot (34.25 Acres total & ~137 Parking Spots/acre) if left as is and 50% of the spots were covered.

Displacement of Cultural Assets

Typically with transit-oriented development, property values in the area can increase depending on the type of transit applied. When considering commercial and cultural asset displacement we look to form-based code to alleviate pressures to provide more dense and compact development that will likely be acceptable among the community. Character defining compact infill development can enhance the sense of place by providing enough space for new businesses and cultural opportunities while leaving space for existing businesses and cultural assets.

Micro Mobility and Pedestrian Infrastructure

Pedestrian infrastructure has the potential to be influenced by the different transit scenarios. With an express bus system, the increase in property values is not significant enough to influence private development. Because sidewalks are a property owner responsibility, the sidewalks' amenities depend on the development in the area. Fortunately, a BRT system might be able to spur development in areas where there are few barriers, like the lot at Rosemont Blvd and Broadway Blvd. The increased collection in GSI fees for these new properties can be used in a GSI installation grant to help improve areas through stormwater management and new sidewalks. A streetcar system provides the most opportunity for pedestrian infrastructure improvements because the

the roadway alterations will impact the pedestrian sphere which will improve the quality and

Over the semester, various field work trips and the use of respective company apps and websites provided insight to the lack of infrastructure in the corridor. Razor & Spin E Scooters were the only real form of micro mobility available in the corridor but only Spin was able to travel the full length of the corridor. Additionally, both do not provide an abundance of scooters where they are located. There is a TuGo Bike station located near Hi Corbett Field, a ½ mile outside the corridor, but the lack of infrastructure elsewhere in the corridor does not provide the full benefit it should. In part to the corridor being heavily developed for motor vehicles right now, going forward, the corridor needs to provide more resources towards micro mobility to provide more availability in distance and scooters.

Transit as a whole will not impact the variables of micro mobility all that heavily. The only impact HCT BRT & SCT could potentially have on micro mobility is by increasing the number of bikes, docking stations, and all other forms of micro mobility, car share, and rideshare in the corridors entirety to meet the increasing demand. Three or four bike stations might be suitable for any one of the levels of transit but a detailed analysis or understanding of the interest would have to be conducted, but is likely suitable for SCT.

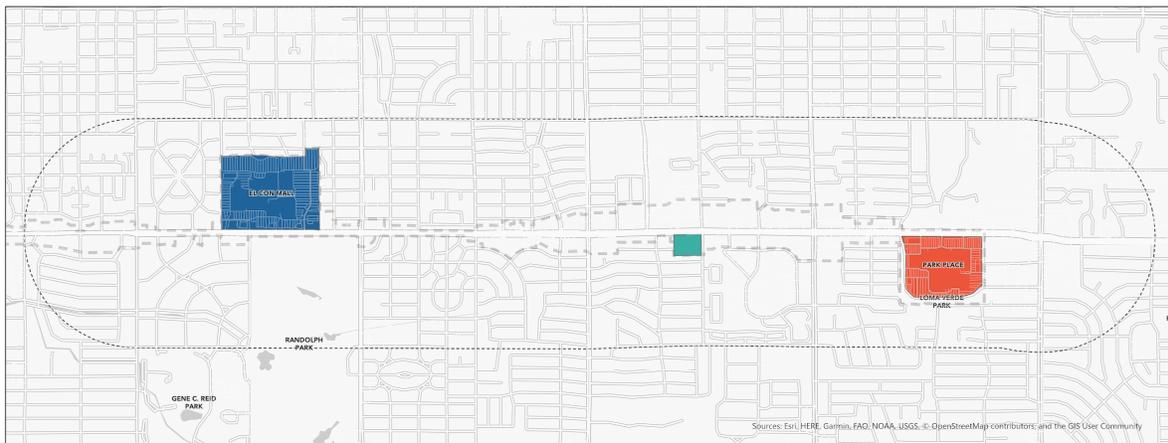
PART III: OPPORTUNITIES & GOALS

Infill Opportunity Sites

As a major employment hub located on a major east-west transit corridor, the study area has the potential to attract between 1,462 and 4,828 new housing units by 2032 (see Table 2.3 above). While this growth is promising, it can also have detrimental consequences on local communities, such as displacement and homelessness, if it is not managed properly. Due to the Broadway Corridor's abundant low density, empty parking lots and large lot sizes, there are numerous infill development opportunities within the study area.

Although there are very few City-owned parcels suitable for redevelopment, El Con Mall, Park Place Mall, and a large vacant lot at the corner of Rosemont and Broadway contain large quantities of underutilized land (surface parking). All three sites are located within a 10 minute walking distance to the #8 SunTran Bus Line, and have access to grocery stores, shopping, social services, parks, and other amenities. Their position on a frequent transit line provides ready access to Downtown Tucson and the Ronstadt Transit Center. Also, the concentration of potential cultural assets located within or near these three sites justify accommodating more dense residential redevelopment to increase access to these special destinations and the employment opportunities they offer.

Map 2.1 Infill Opportunity Sites in the Study Area



Legend

- Park Place Mall
- Empty Lot at Rosemont
- El Con Mall
- - - Study Area (1/2 mile buffer)
- Rio Nuevo TIF

0 0.25 0.5 1 Miles



While the sidewalks in the areas of the two malls are of greater width than most of the corridor there are still opportunities for improving pedestrian comfort and sustainability through sidewalk repair, increased tree canopy, and decreased urban heat island through green stormwater infrastructure with diverse native plants (GSI). And the GSI construction will mainly focus on the impervious areas, desert or grassland on the sidewalks and parking lots. Green infrastructure and sidewalks improvements can be implemented together through incentives that provide installation grants to private property owners for GSI like rain gardens.

There is potential for parking areas to be covered with solar pv shade canopies, equipped with EV charging stations. Because commercial buildings consume the greatest amount of energy per square foot, there is an opportunity for the City to pilot an aggressive energy-efficient commercial retrofit program at the mall sites and apply passive survivability building codes to all new infill development.

Station Location Suitability Analysis

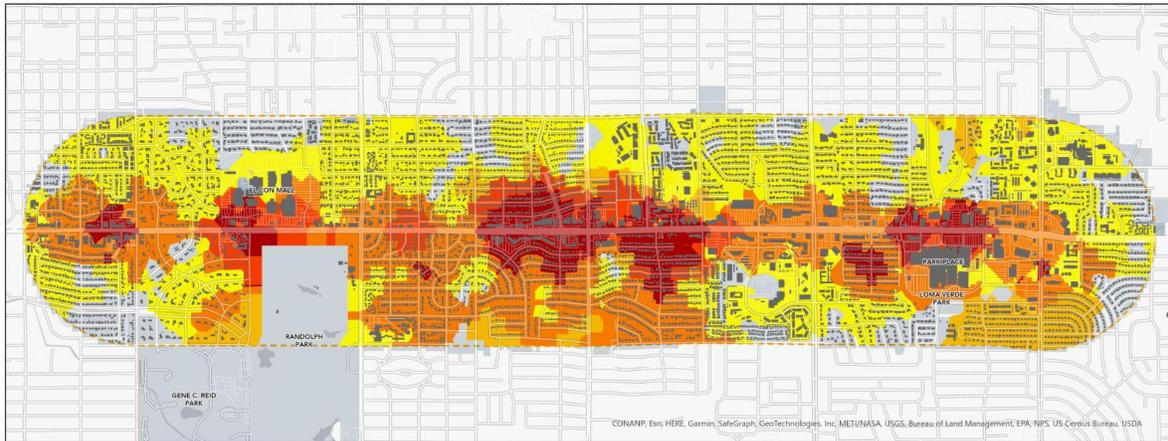
The purpose of this analysis is to pinpoint station locations along the corridor that are best suited for future equitable transit-oriented development by promoting affordability, walkability, density (in relation to missing middle housing), and mixed uses on adjacent parcels. A half-mile of separation between stations was used as the standard across all three transit scenarios.

The analysis combined five criteria to justify the station locations:

1. Parcels with Infill or Redevelopment Potential
2. Bike and Pedestrian Infrastructure
3. Cultural Assets
4. City-owned Parcels
5. Small-scale Green Infrastructure

The results indicate that transit locations should be placed at Treat, the entrance of El Con, Niven (or Rosemont), Craycroft, and the entrance of Park Place mall. Other stations will be placed according to the half-mile standard.

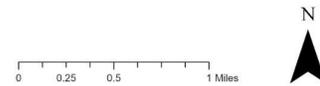
Map 2.2, Station Location Suitability Analysis



Criteria Score
Score

1
2
3
4
5

Buildings
Parcels



Infill Capacity Study

This study evaluates the potential for residential development at the El Con Mall site on the Broadway corridor in central Tucson. This area was targeted for the significant amount of underutilized land and high potential for infill redevelopment. The attractiveness of the site is bolstered by its accessibility to grocery, shopping, and other existing retail and cultural amenities. It is also situated on a frequent transit line providing ready access to downtown Tucson and the Ronstadt Transit Center.

Mid-Century sub-area standards from the Sunshine Mile UOD were applied to the study to visualize potential development. Parking requirements, residences per acre, and open space requirements were accounted for.

Map 2.3, El Con Infill Development Potential Site Plan



Legend

- 1,547 apartment units (900sf, 3 stories, 32 units per block, 16 blocks)
- 193 townhome units (1,200sf, 2 stories, 6 units per block, 32 blocks)
- 28 duplex units (1,500sf, 1 story, 2 units per block, 14 blocks)

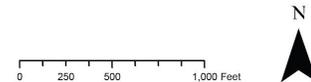


Table 2.6, Development Potential Assumptions and Outcomes

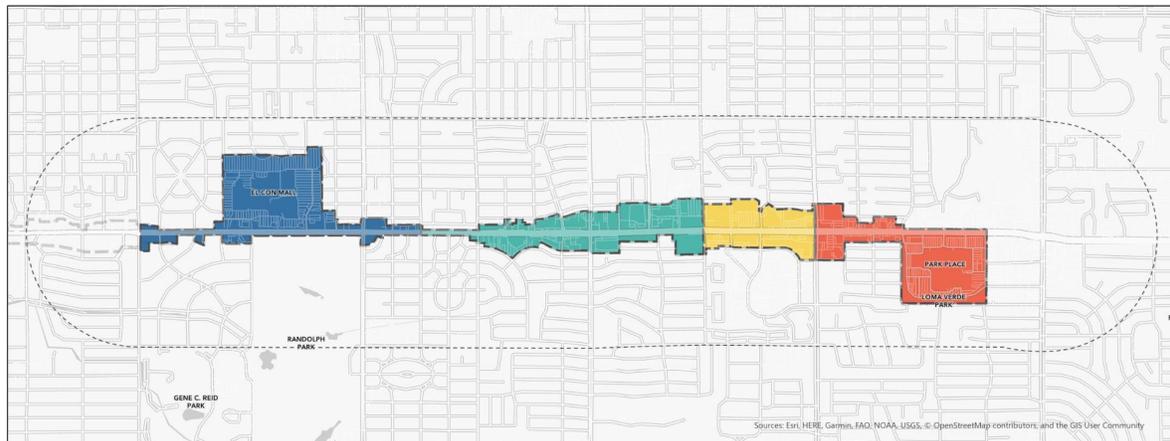
Development Potential Assumptions		
Zoning rules used are taken from the Mid-Century subarea of the Sunshine Mile Urban Overlay District	Total Units	Affordable Units Created at 30% Inclusion
-Residential Units/acre=40 Dwelling Units (DU)		
-30% Open Space Requirement		
- All apartment buildings three stories, 900 sq ft ea	1547	464
-Townhomes two stories, 1200' sq ft	193	58
-Duplex one story, 1500' sq ft x 2 units	28	8
Parking required is one space/DU or 1/500 sq ft of comm		

Overlay Policies

The potential opportunities referred to in this report are currently not feasible with the existing zoning on the Broadway corridor. In order to realize these opportunities some type of rezoning must occur. This rezoning could come in the form of an optional urban overlay district like others that the City of Tucson has created to encourage development. The infill capacity study used the Sunshine Mile UOD Mid-century subarea standards to illustrate what could be possible with a rezoning of the El Con district area. A new overlay could incorporate all of the tools currently in the SMUOD but also include additional incentives. The inclusion of additional policy incentives in a new

or extended overlay could potentially spur more rapid development in the corridor. Some possibilities gleaned from the national policy review and interviews include accelerated approval of permitting and development review, and impact and development fee reduction or waiver. Also, form-based code was applied to a general SmartCode overlay that provided images of feasible designs that could inform developers of preferred architectural styles and streetscape designs for an expedited approval process. The inclusion of these policies could be a powerful tool in the incentivization of affordable housing and compact mixed-use development in the study area.

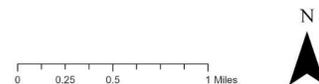
Map 2.4, District Sub-areas



Legend

Study Area (1/2 mile buffer)
Rio Nuevo TIF

- El Con District
- Midstar District
- Park Place District
- Williams District



PART IV: CONCLUSIONS

Broadway eTOD Community Outreach Plan Summary

Due to the limited time for our evaluation of the eastern section of the Broadway Corridor and COVID-19, we were unable to do any community outreach with residents. However, we were able to better understand the corridor by meeting with a few employees from the City of Tucson, local real estate developers, and conducting field surveys of the commercial corridor between Country Club Road and Wilmot Road along Broadway Boulevard. Therefore, this community outreach plan is intended for the City of Tucson to move forward to better understand the needs of the residents who utilize these spaces and infrastructure on a daily basis.

This plan has a public inclusion approach to community outreach. It encourages the city to build off of their existing Tucson eTOD Strategic Plan for a different transit corridor in the city. It has traditional methods of communicating with the public, like public meetings and workshops, as well as types of outreach methods that draw people to events and provide information, like surveys and developing a project-specific website. Also, they have outreach methods that reach people and meet them where they are. This includes partnering with community leaders, establishing focus groups, and planning community outreach events, just to name a few. These existing methods can be built on to provide more inclusive outreach methods that reach more residents who are typically disadvantaged during the planning process like: ethnic groups, youth, disabled people, and lower income residents. These recommendations can include but are not limited to: hiring professional community service staff and facilitators, establishing a lottery-selected and equity-focused panel who would be compensated for their time, youth outreach initiatives, and resident cultural asset and pedestrian mapping. These methods look to build trust and empower a variety of community members by incorporating them in the decision making process in planning.

Areas for Future Study

This report captures the potential opportunities that can be maximized along the Broadway Corridor and in the study area. It would be remiss not to acknowledge the potential policy and place recommendations that could be drawn if this research were ongoing. Some areas that could be explored include:

- Specific site planning: improving public places through design and landscape recommendations
- Transit and streetscapes: exploring streetscape transformations with dedicated or fixed lanes
- Tackling homelessness: specific demographic research to understand the risk and rate at which people are displaced
- Financial Analysis: sample proformas for market priced development to assess the amount per project to subsidize for affordable housing
- Overall recommendations encompassing specific actions to bring identified opportunities to fruition

While the analysis presented in this report is only a small sample of how transit can transform underdeveloped corridors, the potential to use market based research to strategically incentivize urban growth through policy is endless.

Closing Thoughts

The analysis conducted in this report was led by a set of guiding principles that align with AICP ethics and capture shared community goals. It does not aim to make a recommendation about which type of transit system should be pursued, but rather hopes to inspire municipalities with the immense potential that is directly associated with investing in public transportation.

These benefits, while plentiful, should be managed by policymakers and public officials to ensure a prosperous future for every member of the community. There is power in people-centered policy, climate resilient practices and responsible real estate development.