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

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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.
POURPOSE + 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. More information
about specific data, assumptions or methodologies can be found in the Appendix Section.

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

<table>
<thead>
<tr>
<th>Equity</th>
<th>Collaboration</th>
<th>Sustainability</th>
<th>Mobility</th>
<th>Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordability</td>
<td>Transparency</td>
<td>Resiliency</td>
<td>Multimodal</td>
<td>Culture</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Inclusivity</td>
<td>Connectivity</td>
<td>Walkable</td>
<td>Authenticity</td>
</tr>
<tr>
<td>Quality</td>
<td>Accountability</td>
<td>Safety</td>
<td>Active</td>
<td>Preservation</td>
</tr>
</tbody>
</table>

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

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.
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 in line 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.
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 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 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%. More information about specific data, assumptions or methodologies can be found in Appendix A.

Table 1.1, 2019 Jobs by Industry Sector

<table>
<thead>
<tr>
<th>2019 Jobs by Industry Sector</th>
<th>Tucson Share</th>
<th>Broadway Corridor Share</th>
<th>Full Broadway Share</th>
<th>Oracle Share</th>
<th>Speedway Share</th>
<th>6th Avenue Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry, Fishing and Hunting</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Mining, Quarrying, and Oil and Gas Extraction</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Utilities</td>
<td>0.7%</td>
<td>0.0%</td>
<td>2.7%</td>
<td>3.0%</td>
<td>0.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Construction</td>
<td>4.2%</td>
<td>0.8%</td>
<td>1.1%</td>
<td>3.1%</td>
<td>1.1%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>3.3%</td>
<td>0.7%</td>
<td>0.7%</td>
<td>0.7%</td>
<td>0.5%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>2.1%</td>
<td>1.8%</td>
<td>1.2%</td>
<td>1.1%</td>
<td>0.5%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>11.3%</td>
<td>16.4%</td>
<td>7.5%</td>
<td>10.0%</td>
<td>7.2%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Transportation and Warehousing</td>
<td>2.5%</td>
<td>0.6%</td>
<td>0.4%</td>
<td>0.2%</td>
<td>0.9%</td>
<td>0.5%</td>
</tr>
<tr>
<td>----------------------------------------------</td>
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<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Information</td>
<td>2.1%</td>
<td>2.0%</td>
<td>1.4%</td>
<td>3.3%</td>
<td>0.8%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>2.9%</td>
<td>8.5%</td>
<td>3.5%</td>
<td>0.4%</td>
<td>1.6%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Real Estate and Rental and Leasing</td>
<td>1.7%</td>
<td>2.9%</td>
<td>2.9%</td>
<td>2.6%</td>
<td>1.0%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Professional, Scientific, and Technical Services</td>
<td>6.0%</td>
<td>18.9%</td>
<td>9.7%</td>
<td>3.5%</td>
<td>3.6%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Management of Companies and Enterprises</td>
<td>0.5%</td>
<td>0.7%</td>
<td>0.9%</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Administration &amp; Support, Waste Management and Remediation</td>
<td>9.6%</td>
<td>8.5%</td>
<td>4.8%</td>
<td>2.3%</td>
<td>10.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Educational Services</td>
<td>13.5%</td>
<td>0.7%</td>
<td>17.8%</td>
<td>24.6%</td>
<td>31.1%</td>
<td>23.8%</td>
</tr>
<tr>
<td>Health Care and Social Assistance</td>
<td>19.2%</td>
<td>14.7%</td>
<td>8.9%</td>
<td>8.5%</td>
<td>26.6%</td>
<td>16.5%</td>
</tr>
<tr>
<td>Arts, Entertainment, and Recreation</td>
<td>1.0%</td>
<td>0.3%</td>
<td>1.7%</td>
<td>2.3%</td>
<td>0.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Accommodation and Food Services</td>
<td>10.1%</td>
<td>17.8%</td>
<td>10.3%</td>
<td>7.5%</td>
<td>10.3%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Other Services (excluding Public Administration)</td>
<td>2.9%</td>
<td>4.4%</td>
<td>2.8%</td>
<td>2.0%</td>
<td>2.7%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Public Administration</td>
<td>6.4%</td>
<td>0.0%</td>
<td>21.6%</td>
<td>24.2%</td>
<td>0.0%</td>
<td>29.5%</td>
</tr>
</tbody>
</table>
Table 1.2, 2019 Jobs by Earnings

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

Table 1.3, 2019 All Jobs Share by Corridor

<table>
<thead>
<tr>
<th>Tucson</th>
<th>Speedway ½ Mile Buffer</th>
<th>6th Avenue ½ Mile Buffer</th>
<th>Full Broadway ½ Mile Buffer</th>
<th>Oracle ½ Mile Buffer</th>
<th>Broadway Corridor ½ Mile Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>Share</td>
<td>Count</td>
<td>Share</td>
<td>Count</td>
<td>Share</td>
</tr>
<tr>
<td>239,827</td>
<td>100.0%</td>
<td>40,362</td>
<td>16.8%</td>
<td>36,146</td>
<td>15.1%</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>
**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 “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 viewshe’s 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

<table>
<thead>
<tr>
<th>Title of Historic District</th>
<th>Years of Significance</th>
<th>Areas of Significance</th>
<th>Prominent Architectural Styles</th>
<th>Broadway Corridor District Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>El Encanto Estates Historic District</td>
<td>1929-1961</td>
<td>Community Planning &amp; Development; Architecture</td>
<td>Neoclassical, Spanish Colonial, Mission, Pueblo and Sonoran Revival styles</td>
<td>El Con District</td>
</tr>
<tr>
<td>Colonia Solana</td>
<td>1928-1964</td>
<td>Community Planning &amp; Development; Architecture</td>
<td>Spanish Colonial Revival to post-WWII Ranch residences</td>
<td>El Con District</td>
</tr>
<tr>
<td>El Montevideo Residential Historic District</td>
<td>1930-1961</td>
<td>Community Planning &amp; Development; Architecture</td>
<td>Spanish Colonial, Territorial (Sonoran), Pueblo Revivals, and post-WWII Ranch and Mid-Century Modern (Contemporary) style residences</td>
<td>El Con District</td>
</tr>
<tr>
<td>San Clemente Historic District</td>
<td>1923-1959</td>
<td>Community Planning &amp; Development; Architecture</td>
<td>Spanish Colonial Revival, Mission Revival and Classic Ranch residences</td>
<td>El Con District &amp; Midstar District</td>
</tr>
</tbody>
</table>
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. A detailed list of destinations and their definitions of each potential cultural asset that is within Map 3 can be found in Appendix B.

Map 1.5 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.
**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.
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.
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

Type of Potential Cultural Asset

- Restaurants: 30
- Cultural Stores: 22
- Community Spaces: 19
- Resource Centers: 10
- Places of Worship: 4
- Entertainment Centers: 4
- Educational Institutions: 3
- Open Spaces / Parks: 2
- Legacy Businesses: 2
- Historic Districts: 2
- Temporary Markets: 1
- National Register Historic Resources: 1
- Adaptive Reuse Buildings: 1

Park Place District Total: 101
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 sidewalks 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.
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). More information about specific data, assumptions or methodologies can be found in Appendix C.
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

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**
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

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 impervious 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 impervious areas, 12% of desert or grassland, 32% of bedrock, and 20% of roads located on Broadway's sidewalks. More information about specific data, assumptions, or methodologies can be found in Appendix D.
Micromobility

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. A detailed analysis of this data can be found in Appendix C.

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 micromobility 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 (see Appendix F).

**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
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. A thorough review of these tools and the development potential they unlock can be found in Appendix F.

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 “tradeoffs” are attempts at steering development outcomes towards meeting social, environmental, and economic goals.
### Table 1.6, Tucson Special Zoning District Development Incentives

<table>
<thead>
<tr>
<th>Policy</th>
<th>Regulatory Incentives</th>
<th>Monetary Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Density Bonus</td>
<td>Reduced Parking</td>
</tr>
<tr>
<td>Sunshine Mile UOD</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Grant Road UOD</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Main Gate UOD</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Infill Incentive District</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rio Nuevo Area TIF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Business District (GBPET)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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. A detailed overview of the research survey and responses are documented in Appendix F.

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

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

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. More information about specific data, assumptions or methodologies can be found in Appendix G.

**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 1.10: Percent of Incentives by Use (City of Tucson)](image)

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

![Figure 1.11: Proportion of Units Built (City of Tucson)](image)
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)
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).
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. This analysis suggests that there are opportunities to increase building energy efficiency, reduce carbon emissions and reduce energy costs (see Appendix H).

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
- ≤10,000 kWh/yr
- ≤50,000 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

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Transit Impact Area</td>
<td>4-25%</td>
<td>5-42%</td>
</tr>
<tr>
<td>Outside Transit Impact Area</td>
<td>2-8%</td>
<td>4-6%</td>
</tr>
</tbody>
</table>
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

<table>
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<tr>
<th></th>
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<tbody>
<tr>
<td>High-Capacity Express Bus</td>
<td>1/4 mile</td>
<td>22,186</td>
<td>23,090</td>
<td>904</td>
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<tr>
<td>BRT (dedicated lane)</td>
<td>1/4 mile</td>
<td>22,186</td>
<td>23,817</td>
<td>1,631</td>
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<tr>
<td>Fixed Rail (streetcar)</td>
<td>1/2 mile</td>
<td>33,992</td>
<td>46,722</td>
<td>12,730</td>
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Table 2.3, Scenario Table Housing

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<tr>
<th>Total Housing Units Retained in 2032</th>
<th>Estimated Total Housing Units Needed to Broadway Corridor</th>
<th>% Increase in Residential Property Values</th>
<th>% Increase in Office Property Values</th>
<th>Affordability Rate Required for EDIs</th>
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</thead>
<tbody>
<tr>
<td>8,511</td>
<td>1,462</td>
<td>2%</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>8,534</td>
<td>1,776</td>
<td>10%</td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td>15,399</td>
<td>4,828</td>
<td>20%</td>
<td>15%</td>
<td>20%</td>
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Table 2.4, Scenario Table Jobs

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

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

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

This plan has a public inclusion approach to community outreach. It encourages the city to build off 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 pro formas 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.
Appendix

A. Demographics and Jobs

Methodology

The demographics data was collected from the Census Bureau’s 2015-2019 ACS Data and 2010 Census Block Groups. To compare the population of the corridor with the rest of Tucson, block groups that intersected the ½ mile Study Area of the corridor were selected. Block groups that had their centers located within the Tucson Jurisdictional Boundary were used for the City of Tucson demographic datasets. The different topics for all block groups were summed and then divided by the summed total of the total column.

Population

The total population of the area is around 34,000 people based on the ACS 2015-2019 5-Year Estimates. The census designation “White alone” is the most prominent race along our corridor and more than Tucson’s 72 percent White Alone by 10 percentage points. This population is located closest to Broadway Blvd although there are a few minority populations, located within our .5-mile buffer area. Many of those are “African-American or Black alone” and “Hispanic or Latino”. One particular neighborhood north of El Con Mall sees a high population of African American or Black alone. Within the buffer there is a mix of Asian alone, African American or Black alone, and Hispanic or Latino populations. The Hispanic or Latino population is 15% lower in this area than the Tucson population.

Vehicle Availability

Using the vehicle availability data, a summation of the owner and renter occupied units with no vehicle availability was divided against the Total Occupied units in the City of Tucson. This revealed that about 12% of Tucson occupied housing units do not have vehicle accessibility. Our corridor has 13% no vehicle availability but they appear to be concentrated in two different block groups. The neighborhoods between Rosemont Blvd to Swan Rd and Wilmot Rd to Indian House Rd have high density of owner and renter occupied units with no vehicles available. The neighborhood south of Speedway Blvd between Richey Blvd to Alvernon Way also has a higher number of no vehicles available and is within our buffer zones. Most households in our corridor have access to at least 1 vehicle. Compared to other areas of Tucson, most of the corridor has vehicle access.

Poverty and Income.

A ratio of Income level less than 1 means the Poverty level is higher than the income of the family. Under .5 are those with the highest level of poverty. The block groups bordering the Midstar District and the El Con district have the highest levels of poverty. A block group that contains part of the Park Place District also has a high poverty level. The Williams District and the El Con District see the highest income block groups surrounding them but many of the other Block Groups are at or below the median income for Arizona. The further from the corridor one goes, the income continues to decrease. Other areas of Tucson, especially those around Oracle north of Downtown experience higher levels of poverty than the Broadway Corridor.

Age and Disability

The population around our corridor is mostly early 30’s to middle 50’s. Tucson’s median age is 36 years old while the median age of the block groups touching our corridor is 40. This does make our corridor a bit of an older corridor with major implications for aging in place. An exception to this is the neighborhood between Alvernon Way and Swan Rd south of Broadway.
which is mostly those in their 20’s. There are few block groups that contain Broadway Blvd and have many households with 1 or more persons with a disability, but the corridor does not appear to be an area that contains more than other Tucson corridors. The disability rate in the corridor is slightly less than the Tucson rate of 29%.

Language

There are two areas with a denser number of Spanish Limited English-Speaking Households. Compared to Tucson’s Spanish Limited English-Speaking Rate of 5% our corridor is 3% but it appears the location is concentrated. These neighborhoods are north of Broadway Blvd between Swan Rd and Rosemont Blvd and between Wilmot Rd and Indian House Rd. The Wilmot Rd and Indian House Rd neighborhood also has several Asian and Pacific Island limited English Households. Another API limited English household population is between Tucson Blvd and N Camino Miramonte, just east of Country Club Rd.

Jobs

Jobs data was collected from the United States Census Bureau’s OnTheMap application that allows users to view Longitudinal Employer Household Dynamics Data with a specified geography. A half mile 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 the ½ mile 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 Broadway corridor half mile buffer 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 corridor do not live inside of it while 90% of those who live in the corridor work outside of the corridor.

References


Table 1. Scenario Table for Population

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<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>THigh-Capacity Express Bus</td>
<td>1/4 mile</td>
<td>22,186</td>
<td>23,090</td>
<td>904</td>
</tr>
<tr>
<td>BRT (dedicated lane)</td>
<td>1/4 mile</td>
<td>22,186</td>
<td>23,817</td>
<td>1,631</td>
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<tr>
<td>Fixed Rail (streetcar)</td>
<td>1/2 mile</td>
<td>33,992</td>
<td>46,722</td>
<td>12,730</td>
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</table>

Table 2. Scenario Table for Housing

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<thead>
<tr>
<th>Transit Mode Scenario</th>
<th>Impact Area</th>
<th>Total Housing Units Retained in 2032</th>
<th>Estimated Total Housing Units Needed to Broadway Corridor</th>
<th>% Increase in Residential Property Values</th>
<th>% Increase in Office Property Values</th>
<th>Affordability Rate Required for EDIs</th>
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<tbody>
<tr>
<td>High-Capacity Express Bus</td>
<td>1/4 mile</td>
<td>8,511</td>
<td>1,462</td>
<td>2%</td>
<td>5%</td>
<td>10%</td>
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<td>BRT (dedicated lane)</td>
<td>1/4 mile</td>
<td>8,534</td>
<td>1,776</td>
<td>10%</td>
<td>10%</td>
<td>15%</td>
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<td>Fixed Rail (streetcar)</td>
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<td>15,399</td>
<td>4,828</td>
<td>20%</td>
<td>15%</td>
<td>20%</td>
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Table 3. Scenario Table for Jobs

<table>
<thead>
<tr>
<th>Transit Mode Scenario</th>
<th>Impact Area</th>
<th>New Jobs to Corridor in 2032</th>
<th>Total Jobs in Corridor 2032</th>
<th>Retail and Food Growth in Corridor</th>
<th>Total Retail and Accommodation and Food Jobs in Corridor in 2032</th>
<th>Office Growth in Corridor</th>
<th>Total Office Jobs in Corridor 2032</th>
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</thead>
<tbody>
<tr>
<td>High-Capacity Express Bus</td>
<td>1/4 mile</td>
<td>566</td>
<td>14,347</td>
<td>229</td>
<td>5,810</td>
<td>218</td>
<td>5,523</td>
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<tr>
<td>BRT (dedicated lane)</td>
<td>1/4 mile</td>
<td>1,152</td>
<td>14,933</td>
<td>466</td>
<td>6,047</td>
<td>443</td>
<td>5,748</td>
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<tr>
<td>Fixed Rail (streetcar)</td>
<td>1/2 mile</td>
<td>2,594</td>
<td>21,209</td>
<td>887</td>
<td>7,254</td>
<td>1,162</td>
<td>9,500</td>
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### Table 4. Demographic Comparisons

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<tr>
<th>Topic</th>
<th>Tucson</th>
<th>Broadway Corridor</th>
</tr>
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<tbody>
<tr>
<td>No Vehicle Availability</td>
<td>12%</td>
<td>13%</td>
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<tr>
<td>Median Age</td>
<td>35.65</td>
<td>40.6</td>
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<tr>
<td>Median Household Income</td>
<td>$41,677.00</td>
<td>$58,718.00</td>
</tr>
<tr>
<td>Households w/ at least 1 person w/ a disability</td>
<td>29%</td>
<td>27%</td>
</tr>
<tr>
<td>Ratio of Income to Poverty below .5</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Spanish Limited English Speaking Household</td>
<td>5%</td>
<td>2%</td>
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</table>

### Table 5. Trip to Work Comparisons

<table>
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<th>Trip to Work</th>
<th>Tucson</th>
<th>Broadway Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car, Truck, Or Van</td>
<td>85.02%</td>
<td>61.27%</td>
</tr>
<tr>
<td>Car, Truck, or Van: Drove Alone</td>
<td>74.34%</td>
<td>53.01%</td>
</tr>
<tr>
<td>Car, Truck, or Van: Carpoled</td>
<td>10.69%</td>
<td>8.25%</td>
</tr>
<tr>
<td>Public Transit</td>
<td>3.46%</td>
<td>4.76%</td>
</tr>
<tr>
<td>Public Transit: Bus</td>
<td>3.31%</td>
<td>3.06%</td>
</tr>
<tr>
<td>Light Rail</td>
<td>0.14%</td>
<td>1.70%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>2.38%</td>
<td>8.90%</td>
</tr>
<tr>
<td>Walk</td>
<td>3.20%</td>
<td>16.37%</td>
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### Table 6. Race and Ethnicity

<table>
<thead>
<tr>
<th>Race and Ethnicity</th>
<th>Tucson</th>
<th>Broadway Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Hispanic: White Alone</td>
<td>43.9%</td>
<td>60.2%</td>
</tr>
<tr>
<td>Not Hispanic: Black or African American Alone</td>
<td>4.6%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Not Hispanic: American Indian or Native Alaskan Alone</td>
<td>1.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Not Hispanic: Asian Alone</td>
<td>3.0%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Not Hispanic: Native Hawaiian and other Pacific Islander alone</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Not Hispanic: Some other race alone</td>
<td>0.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Not Hispanic: Two or more races</td>
<td>2.4%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>44.0%</td>
<td>28.8%</td>
</tr>
</tbody>
</table>
### Table 7. Race

<table>
<thead>
<tr>
<th>Race</th>
<th>Tucson</th>
<th>Broadway Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Alone</td>
<td>72.2%</td>
<td>81.1%</td>
</tr>
<tr>
<td>Black or African American Alone</td>
<td>5.0%</td>
<td>3.7%</td>
</tr>
<tr>
<td>American Indian or Native Alaskan Alone</td>
<td>3.8%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Asian Alone</td>
<td>3.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Native Hawaiian and other Pacific Islander alone</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Some other race alone</td>
<td>10.4%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>5.3%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

### Table 8. Percent Growth 2010-2020/ AOEO Projection 2021-2045

<table>
<thead>
<tr>
<th>Jurisdiction Actual</th>
<th>Actual Percent Growth to 2020/AOEO Projection Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>Marana</td>
<td>9.5%</td>
</tr>
<tr>
<td>Oro Valley</td>
<td>2.3%</td>
</tr>
<tr>
<td>Sahuarita</td>
<td>0.7%</td>
</tr>
<tr>
<td>South Tucson</td>
<td>0.6%</td>
</tr>
<tr>
<td>Tucson</td>
<td>1.6%</td>
</tr>
<tr>
<td>Pima County</td>
<td>4.7%</td>
</tr>
</tbody>
</table>
Table 9. Pima Association of Governments, RMAP 201-2045 2016 Addendum
Population Projections

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Mostly Suburban Projection Percent Growth</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
<td>2020</td>
<td>2025</td>
<td>2030</td>
<td>2035</td>
<td>2040</td>
<td>2045</td>
</tr>
<tr>
<td>Marana</td>
<td>17.3%</td>
<td>36.8%</td>
<td>29.1%</td>
<td>37.0%</td>
<td>22.4%</td>
<td>11.5%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Oro Valley</td>
<td>3.0%</td>
<td>13.7%</td>
<td>6.6%</td>
<td>8.6%</td>
<td>5.0%</td>
<td>2.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Sahuarita</td>
<td>12.8%</td>
<td>27.0%</td>
<td>20.4%</td>
<td>12.5%</td>
<td>7.0%</td>
<td>6.0%</td>
<td>2.9%</td>
</tr>
<tr>
<td>South Tucson</td>
<td>0.3%</td>
<td>4.4%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Tucson</td>
<td>3.3%</td>
<td>3.7%</td>
<td>4.6%</td>
<td>-0.1%</td>
<td>-0.1%</td>
<td>-0.1%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Pima County</td>
<td>4.0%</td>
<td>8.2%</td>
<td>5.2%</td>
<td>8.6%</td>
<td>9.0%</td>
<td>10.2%</td>
<td>11.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jurisdiction Actual</th>
<th>Mixed Urban/Suburban Percent Growth</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
<td>2020</td>
<td>2025</td>
<td>2030</td>
<td>2035</td>
<td>2040</td>
<td>2045</td>
</tr>
<tr>
<td>Marana</td>
<td>17.3%</td>
<td>17.8%</td>
<td>14.4%</td>
<td>12.1%</td>
<td>11.1%</td>
<td>10.0%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Oro Valley</td>
<td>3.0%</td>
<td>6.0%</td>
<td>5.8%</td>
<td>5.0%</td>
<td>4.6%</td>
<td>4.2%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Sahuarita</td>
<td>12.8%</td>
<td>21.2%</td>
<td>19.5%</td>
<td>10.0%</td>
<td>6.9%</td>
<td>6.4%</td>
<td>6.0%</td>
</tr>
<tr>
<td>South Tucson</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Tucson</td>
<td>3.3%</td>
<td>6.6%</td>
<td>6.6%</td>
<td>6.0%</td>
<td>5.6%</td>
<td>5.1%</td>
<td>4.9%</td>
</tr>
<tr>
<td>Pima County</td>
<td>4.0%</td>
<td>7.2%</td>
<td>4.7%</td>
<td>5.0%</td>
<td>4.8%</td>
<td>4.4%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>
B. Community Character

Embracing and Expanding Community Character

Heritage Conservation

Map 1: Historic Resources within the Broadway Corridor

Table 1: Historic Districts Completely within 1/2 Mile Buffer of Broadway Corridor

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

Table 2: Prominent Architectural Styles in the Historic Districts Completely Within the Broadway Corridor

<table>
<thead>
<tr>
<th>Mission Revival</th>
<th>Neoclassic</th>
<th>Pueblo Revival</th>
<th>Ranch</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="Image" alt="Mission Revival Image" /></td>
<td><img src="Image" alt="Neoclassic Image" /></td>
<td><img src="Image" alt="Pueblo Revival Image" /></td>
<td><img src="Image" alt="Ranch Image" /></td>
</tr>
<tr>
<td>Spanish Revival</td>
<td>Spanish Colonial Revival</td>
<td>Southwestern</td>
<td>Sonoran Revival</td>
</tr>
</tbody>
</table>
Table 3: Historic Structures on the National Register within 1/2 Mile Buffer of Broadway Corridor

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

Community Character
Defining Community Character

Community character, also considered a sense of place, is an outcome of a community’s identity. Traditionally, community character has been considered the outcome of the physical space like landscape features and historic preservation. However, these are only components of what provides community character because cultural asset inventories can also include the social and economic contexts of a community. It is important to understand characteristics such as: population, demographics, linguistic characteristics, 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 allow municipalities to better understand the fabric of their community.

Methodology

To better understand the identity of the Broadway Corridor between Country Club Road and Wilmot Road, a Potential Cultural Asset Map was developed. A half mile buffer was used to incorporate the increased access from modes of transportation. Community outreach was not a component of this project due to COVID-19 and the time and scope of this project. This is why “potential” in cultural asset mapping is to be emphasized. The destinations on Map 1 were identified by searching for predetermined categories on Google Maps, Tucson community-based Facebook groups, and City of Tucson GIS data. It should be noted that this is not a comprehensive list of all the possible destinations in the corridor. This list can be expanded and should include community outreach if this model were to be used in the future to gauge actual cultural assets in the area that serve the community.

The predetermined categories within this project include all business types including: local and family-owned as well as corporate and franchised companies that may be important to the community. There are also destinations that may fall under more than one category. These were attempts to remove biases from this pilot cultural asset map. There are some predetermined categories that may need to be defined (Table 3), has a detailed list of names of destinations and their definitions of each potential cultural asset that is within Map 1.

Table 3: Definitions of Predetermined Categories for Potential Cultural Asset Map (Map 1)

<table>
<thead>
<tr>
<th>Name of Predetermined Category</th>
<th>Definition</th>
<th>Type of Asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Spaces</td>
<td>Destinations where people gather for social and cultural activities</td>
<td>Dance schools/clubs, yoga studios, martial arts studios, coffee shops/cafes, bars/nightclubs, comedy clubs, gyms, tattoo and piercing shops, bicycle shops, Smoke/vaporizer shops,</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
<td>Examples</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cultural Stores</td>
<td>Destinations where people can purchase books, food, clothes, or music related to ethnicity, gender or a niche cultural community</td>
<td>Cultural specific shops, specialty stores, gift shops, antique shops, sports shops, and hobby stores</td>
</tr>
<tr>
<td>Entertainment Locations</td>
<td>Destinations people go to for entertainment purposes</td>
<td>Movie theaters, museums and themed-entertainment locations</td>
</tr>
<tr>
<td>Legacy Businesses</td>
<td>Local businesses that have been in Tucson for 20+ years, typically at the same location (Unofficial legacy businesses included)</td>
<td>N/A</td>
</tr>
<tr>
<td>Neighborhood Landmarks</td>
<td>Specific destinations mentioned by officials from the City of Tucson during interviews and meetings</td>
<td>N/A</td>
</tr>
<tr>
<td>Resource Centers</td>
<td>Destinations the community relies on for social welfare services and basic amenities</td>
<td>Government amenities and services, nonprofit organizations, food banks, shelters, etc</td>
</tr>
<tr>
<td>Temporary Markets</td>
<td>Destinations businesses occupy temporarily</td>
<td>Farmer’s Markets, seasonal markets, and food trucks</td>
</tr>
</tbody>
</table>

These predetermined categories were inspired by the American Planning Association’s *Community Character* document that designed a survey for community outreach. Their example included the development of a survey for the Boston Indicators Project, which was a private-public partnership between the City of Boston, Metropolitan Area Planning Council, and the Boston Foundation. They wanted to evaluate the city as a whole as well as be able to qualify and quantify and measure the survey’s outcomes to identify valuable resources and assets among the community. This document emphasizes the importance between “the interaction and participation of a broad range of stakeholders (from schoolchildren and engaged residents to academic and community-based experts to public officials and policy makers) to achieve its goals and objectives (Hodgson, 2011:4). Despite not being able to perform community outreach, the goal to attempt to
identify and evaluate a generalized cultural asset map was to understand the likely cultural centers and primary destinations along the Broadway Corridor to recognize the potential impacts of development and varied transit scenarios.

Existing Conditions

The site context of this section of the Broadway Corridor is a four-mile stretch that connects the urban area of Downtown Tucson to the predominantly residential eastern side of Tucson. It has widened roads that have commercial hubs along both sides that strengthen its reputation as an employment hotspot for the City of Tucson. There are commercial centers like strip malls, plazas, and office buildings. Residential units and single-family homes are sprinkled along the commercial corridor. However, mostly single-family homes are located north and south of the corridor. Also, there are viewsheds of the Catalina Mountains that are considered wayfinders for the community.

Map 2: Potential Cultural Assets within the Broadway Corridor

Broadway Corridor with Half Mile Buffer (Country Club Road to Wilmot Road)

The Broadway Corridor between Country Club Road and Wilmot Road was evaluated with a half mile buffer (north/south and east/west), which contains traditional and non-traditional potential cultural assets that contribute to its community character. This corridor is largely commercial with many destinations located within its retail centers like: 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. This corridor is mostly made up of restaurants, community spaces, cultural stores, and resource centers. Many of its destinations are larger franchise businesses within these shopping centers. The corridor lacks other prominent cultural assets like places of worship, public art, and grocery stores. Also, many of these destinations and services are sprawled out along the corridor which decreases access to pedestrians. It is very autocentric with its main Broadway Blvd itself being wide and the properties containing many large parking lots. While these spaces along the corridor provide the community with services and spaces to congregate, there is much room for improvement.

Graph 1: Number of Potential Cultural Assets within the Broadway Corridor

El Con District with Half Mile Buffer (North Country Club Road to South Alvernon Way)

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 and is a National Register Historic Resource and a cultural asset to 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 eighty-one potential cultural assets that have been identified. This district is the most diverse in potential cultural assets. It is the most well-rounded district with art galleries, grocery store access, and open spaces. However, it consists mostly of restaurants by far, but is followed by cultural stores and community spaces. This district’s community spaces are predominantly salons and cafes. Its cultural stores are
focused on clothing stores, specialty bakeries, and gift shops. There is a blend of chain restaurants and more local-based restaurants. Its resource centers range from recreational nonprofits to social welfare organizations. The Consulate of Mexico is within its boundaries. It has two public parks: San Clemente Park and Randolph Park. There is one place of worship which is a Jewish Synagogue, the Temple Emanu-El. These potential cultural assets act as destinations that bring community members together that are mostly recreational and historic.

Graph 2: Number of Potential Cultural Assets within the El Con District

Midstar District with Half Mile Buffer (South Alvernon Way to South Rosemont Blvd)
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). The overall Midstar District mostly consists of resource centers that occupy many of the office spaces. There are many nonprofits within this district that provide community support to veterans, marginalized groups, and children. Its community spaces consist of musical learning centers, salons, and barber shops. Its cultural stores center around ethnic and niche-based communities. Its legacy businesses include notable destinations such as Nadine’s Pastry & Ice Cream Shop, The Hungry Fox Restaurant and Country Store as well as Kon Tiki Restaurant & Lounge. There are three public parks in the area providing places for people to gather outdoors. There are also restaurants that pertain to particular cultures like polish, greek, asian, and hispanic. The temporary market space where Brian and Kelly’s Pumpkins and Trees is an empty lot that has space for opportunities within this district.

Graph 3: Number of Potential Cultural Assets within the Midstar District
Williams District with Half Mile Buffer (Rosemont to Craycroft)

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 neighbors the Williams Centre to the east (Allen, 1990). This district is the smallest of the districts. The potential cultural assets mostly consist of restaurants and community spaces. Its restaurants are mostly local chains like Sauce Pizza & Wine and Trident Grill III. The community spaces pertain to destinations for self-care like salons and spas. There are cultural stores that are mostly gender specific with lingerie stores and menswear. There are two recreational parks and two places of worship that are Christian and Jewish.

Graph 4: Number of Potential Cultural Assets within the Williams District
Park Place District with Half Mile Buffer (North Craycroft Road to North Wilmot Road)

The Park Place District is centered around the Park Place Mall that was built in the early 1980s. It has the most potential cultural assets known with one hundred and one located within its boundaries. It mostly consists of restaurants that are mostly larger chains like BJ’s Restaurant and Brewhouse, Red Lobster and Chipotle Mexican Grill, just to name a few. 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. This district has the most entertainment locations. There are two historic districts: Indian House Residential and San Rafael Estates. The Gist residence is a National Register Historic Resource.

Graph 5: Number of Potential Cultural Assets within the Park Place District

Scenario Planning Trends - Form-Based Code & Community Outreach

Impacts of Transit-Oriented Development

Transit-oriented development has a great potential to benefit communities. It is environmentally friendly, it centralizes pedestrian activity, and it provides better access to public transportation to popular destinations, such as recreation, work and residence. However, this can also lead to an increased desire for development and redevelopment to improve access between residential and commercial areas. Transit-oriented development can lead to gentrification and the displacement of long-standing community members, businesses, and regional cultural activities by increasing the value of its neighborhood. This is the result of improved infrastructure attracting specific demographics, like young professionals, and real estate developers who are investing in these areas for profit (Turrentine, 2018). While transit-oriented development is desirable due to its community benefits, it is imperative to involve its current residents in the decision making process and encourage appropriate development like a form-based...
code when considering improving transportation options to maintain and strengthen the community’s identity.

Form-Based Code
To best encourage appropriate transit-oriented development that brings people and cultural activities together rather than displacing them, as of now, the City of Tucson depends on a Euclidean Zoning Code that includes complicated and strict design standards and guidelines that are supposed to encourage desired development in a given area. The design guidelines not only make it difficult for developers to engage creatively with properties, but it is also costly and time consuming for municipalities throughout the design review and approval process. Developing an aesthetic based code overlay that could be based on community character components, like prominent architectural and favorable streetscape styles in the area, could revitalize and diversify the existence of cultural assets, like small businesses and recreational opportunities, in the community as well as encourage affordability (Herriges, 2020). However, to determine a form-based code that works for the Broadway Corridor, community outreach is essential.

Preliminary Inclusive Community Outreach
For preliminary community outreach for eTOD for the Broadway Corridor to ensure community character is addressed, the City of Tucson should have two goals: collaborate with stakeholders and identify cultural assets, and build support for form-based code among the community. Developing and providing access to a diversity of residents to contribute to a cultural asset map could be beneficial to the City of Tucson. It would inform them of tangible and intangible destinations that are important to the community. Please refer to the Broadway eTOD Community Outreach Plan for more details on page.

Transit-Oriented Development Scenarios
Transit has an impact on property value, but the mode of transit will indicate the increased amount on property values. Transit not only impacts residential property values, but also commercial property values that may relate to existing cultural assets in the area (Zuk, 2015: 18-19). The following scenario planning analysis will examine three modes of transit: High-Capacity Express Bus, Bus Rapid Transit, and Streetcar, and determine appropriate collaborations between form-based code recommendations and community outreach methods in relation to improving access to cultural assets in the Broadway Corridor.

High-Capacity Express Bus
While some modes of transit can increase property values causing gentrification, other modes, like High-Capacity Express Buses, need direction on station location and frequency to ensure effectiveness. Typically property values near bus routes have modest gains because “most bus routes lack the permanence of fixed infrastructure” (Zuk, 2015: 20). Nonetheless, improving infrastructure that will impact the community
should not only require community outreach for displacement, but also to ensure public funds are distributed wisely for overall effectiveness and efficiency.

Despite High-Capacity Express Buses not applying much pressure to displacing existing cultural assets, it can be a tool the City of Tucson uses to improve access in the Broadway Corridor to desirable destinations, such as community spaces, cultural stores, and resource centers, just to name a few. Form-based code could assist in improving access to cultural assets by encouraging infill opportunities near desired station locations. For example, Station Area Planning encourages transit-oriented development where there are significant development opportunities near single-family housing. It ensures an expedited process for development application with less pushback from the neighborhood. Also, it can provide necessary buffers between dense development and single-family neighborhoods. While typically with Euclidean Zoning each station area would need a community outreach visioning process, with a form-based code these design guidelines would already be established through an extensive preliminary community outreach project.

Bus Rapid Transit

Similar to High-Capacity Express Buses, Bus Rapid Transit (BRT) does not significantly increase property values despite having a designated infrastructure to expedite travel. The goal of BRT is to provide fast, comfortable, and cost-effective services throughout a municipality with designated lanes and transit signal priority to ensure travelers are able to get to their desired destinations efficiently (What Is BRT?). As of now, the Broadway Corridor does include commercial clusters throughout, however, the pedestrian experience and current streetscape may not encourage enough ridership to support a proper BRT since even the commercial clusters are largely sprawled with large, unshaded parking lots in between their storefronts and the sidewalks. A potential solution would be to encourage compact and mixed-use infill development to increase the number of destinations at a BRT stop as well as provide a comfortable experience for pedestrians.

Streetcar

Streetcars as public transit systems require permanent infrastructure such as fixed rail installation and committed stations. Typically, they are viewed as positive additions to a community because they attract mixed-uses and commercial opportunities. However, they can also lead to gentrification of neighborhoods and displacement of existing retail spaces. There is “a positive association between rail proximity and both property values and building permit activity, which suggests a possibility of a positive association with retail gentrification.” In these situations locally-serving businesses can have higher rates of closure. Despite these negative impacts, transit-oriented development does improve access to retail and can uplift lower-income communities by providing a “diverse retail composition” (Chapple, et al, 2017: 16-17). With careful consideration and applying certain conditions, for example, incentivizing affordable housing and inclusion of cultural assets identified by the community, then the addition of the streetcar would have less severe negative impacts on the existing community. To best accommodate the potential
influx of new commercial, cultural, and community spaces into the corridor alongside existing space, form-based code could be utilized to encourage and streamline the application process for approval, meanwhile incorporating community-based architectural styles.

Next Steps

Continuing Research

- Evaluating the number of potential cultural assets in an existing TOD neighborhood to compare to existing conditions of the Broadway Corridor with how many potential cultural assets are present within walking distance.
- Developing survey components for resident cultural asset maps for empowered community input.
- Developing educational materials for community events to promote form-based code amongst the community.
- Compare location of potential cultural assets with demographics like population density, ethnicities, and income levels.

References


C. Pedestrian Infrastructure

**Scenario #1:**
After reviewing the existing conditions and coming to an understanding of what the corridor needs, it is quite clear what that is. While Scenario #1 is more focused on the do-nothing approach, adding some micro mobility along the corridor and or do additional research for more in-depth scenarios where things are done in full. That included some type of micro – transit options (ride-share, car-share, e-scooters, public bikes, etc.), the potential for solar coverings over certain parking lots & some form of energy storage. The overall safety of the corridor and those that use it are being heavily looked at and hopefully in Scenario #1 some of these concerns would be addressed. There won’t be any serious or positive gain to any improvement made if the infrastructure added isn’t safe to use. That is why adding more hawk crossings at places like N Belvedere Avenue where the distance between crossings is further than the recommended or desired distance either by the city or the user. With the potential changes and suggestions made in each scenario, hopefully the overall safety and usability of the corridor will greatly improve.

Here in the first scenario, leaving the corridor as is, is the primary objective, but doing nothing in the micro mobility aspect may still not be the right answer. That is why it is recommended for the first scenario that the e – scooter restriction for Razor Scooters is lifted, with public approval of course, and the potential for at least one bike docking station at the largest employment center in the corridor. By doing this, those who are employed in the area or use the transit system to get across town and do not have access to a motor vehicle might be able to reach their final destinations, or reach the first and or last miles, better. The more ideal location for a minimal scenario such as this would be located closer to the Park Place Mall as there is a higher disparity or lack of motor vehicles in households which has its own negative impacts on the community. While this might not always be the case, the area near the Park Place Mall in the Park Place district of the corridor where motor vehicles are not accessible when compared to the rest of the corridor does make a good case for such tools or amenities in micro mobility.

**Scenario #2:**
Scenario #2 is a little more aggressive at addressing the research question in consideration, when compared to Scenario #1, at least when it comes to the solar implementation and car – share, rideshare and other forms of micro mobility along the corridor. This goes for both pedestrians and bicyclist infrastructure as they are lacking more than they should in such a corridor. The best solution to the current problems with the implementation of a B.R.T. line would have Park Place Mall install solar coverings that span up to 50% of the parking lot. Park Place Mall is the best spot for this in terms of acceptance because of some solar panels already being installed. This is also a “decent” location because most of the people in the corridor do not have access to a motor vehicle and with this solar installation there could be a higher acceptance or installation of rideshare or car share that has a more sustainable approach. Installing solar into the parking lots could help in providing charging stations for the ride share and car share programs while also reducing the urban heat island effect in such a parking lot which will have its own benefits.

With a B.R.T. line, which will undoubtedly increase demand across the board, there must be something that “deals” with it or is able to negate the negative impacts. And while the overall goal is to reduce the reliance on motor vehicles, the implementation of a car share program could truly help, especially with more of the utility aspect of the corridor and supplementing transit where the
B.R.T. might not suffice. It is envisioned that the car share program would help people in the more intensive situations when they need the extra space for various circumstances which may include going to the market, moving and much more. It was made clear that for a car share program to be effective and have at least 3 cars with 10 users or members each, there would have to be at least 30 households or members that would take part in the program (Litman, pg. 4). At the same time, a carshare program is exponentially higher in cost than public transit but the overall idea is to fill in for gaps in public transit. While the density for such a program may currently exist, with the correct development and attraction of new residents in the corridor a car share program could thrive, and the installation of a B.R.T. line may provide that. The same goes for rideshare but that already exists to some degree along the corridor. The only idea would be to implement it at a higher level and or consistency. This will in hopes connect the gaps for those who live within the 0.75-mile buffer and might not be able to or feel comfortable getting to the closest bus stop or transit center on their own. In some regard, scenario 2 would treat Park Place Mall as a transit center in some regard where more people have access to transit opportunities in and around the corridor. In some of the readings, it was made clear that Lyft, Uber, and companies of similarity are not considered rideshare and that rideshare was like a bus on demand that helps fill that first and or last mile of transit.

Placing a form of micro mobility in scenario #2 is also under consideration. Getting to and from work or even a local store might be more difficult for those without a car. In scenario #2 it is recommended installing at least two bike stations like the GoBike system utilized in San Francisco or the TuGo bike system here in Tucson. The GoBike system in San Francisco has a low density of racks or docks per square mile (289 racks and 42.3 bikes per square miles). This is low when compared to the alternative in San Francisco, JUMP which has 1013 racks and 80 bikes per square mile. This type of system can be highly beneficial to the city of Tucson as it would expand the existing network that Tucson has, it would bring in more people to the corridor which would help business to some degree, and the people that call this corridor home would have an efficient mode of transit. The average population density in San Francisco where these racks, or docks, are located is about 35,000 per square mile which is obviously more than in most of Tucson and certainly this corridor. The respective systems usually charge an annual membership and charge a per trip cost that is primarily based on how often they utilize the system. Scenario #2 is the best option as of right now to implement a bike network through the corridor to test the waters but in scenario #3, or other scenarios not considered, it is likely that further implementation could occur. The ideal location would preferably be at either mall and or the vacant lot located at Broadway & Rosemont. The maps below present important data on how long people tend to use the various micro mobility options in San Francisco and how far they usually travel. Tucson is not San Francisco but in terms of understanding how other cities are implementing such micro mobility is vastly important to calculating how many stations are needed, if at all, (docked bikes or free standing) and where to place them. But none of this is possible without the
additional infrastructure such as bike lanes making it safe for cyclists and other users of micro mobility.

**Scenario #3:**
Scenario #3 is primarily a continuation of scenario #2 but “in full effect” or where everything is on the table and is usually an all-out approach. The overall scenario #3 “vision” has a hope of implementing solar coverings on up to 100% of the Park Place Mall parking lot and the El Con Parking lot with enough energy storage technology to provide clean energy for all the stores at each location and then some. Based on calculations when comparing the average energy production of solar & energy storage systems Park Place Mall can produce 0.02 Gigawatts or about 20 Megawatts of energy on 34.25 acres and El Con has the potential to generate 0.03 Gigawatts or 26 – 27 Megawatts of energy on 43.124 acres. Both calculations are done in consideration to 100% coverage of the asphalt/parking spots. This data or energy production assumptions was made possible by Tesla Solar’s website as they say that the typical Target consumes roughly 1.6 MW of energy daily. There was an article posted by Yale recently that heavily discusses both the communal and environmental benefits of solar awnings. It goes on to mention how the parking lots of all the Walmart’s within the United States could produce 11 gigawatts of energy which would provide more than enough energy than they could replace up to 12 coal fired plants (Comiff, 2021). And the average Walmart parking lot is 5 acres in size. This parking lot size was used to help calculate the potential solar generation. But on top of that, if such was implemented across all large parking lots, the potential for reducing carbon emissions and the urban heat island effect could be quite great. With the energy production of the intended systems there would clearly be an overflow of energy. In scenario #3, this solar installation is fit to provide that energy to TEP in some regard & the carshare programs and or Public EV charging stations at each site.

In scenario #3, the implementation of rideshare and carshare programs to promote accessibility in addition to other forms of micro mobility comes to fruition. Even though Park Place Mall is the ideal location for a solar panel or “awning” installation, El Con Mall can be a reasonable, but smaller alternative or addition in scenario #3. But regarding the rideshare and carshare programs, the El Con Mall location does have the potential as a tentative location but given the car ownership is higher at this location, the importance is not as high. El con Can also be considered a site for micro mobility as well as it is currently at the border for the Razor E – Scooters and could provide some form of additional aid to those without motor vehicles and those who desire to travel by other modes of transportation besides car to get around the rest of the corridor. Having some form of car share at both Park Place & El Con Malls might not be feasible, even under the all-out scenario #3 due to the relative distance but having both provide some form of micro mobility and act as
destinations in that regard can truly benefit the corridor. Providing some form of rideshare, carshare, and micro mobility will certainly have an overall benefit and individual benefits. But it is without a doubt, that the corridor is greatly underserved in those regards and any improvement or addition in these areas would benefit current and future development greatly along with the people that utilize the corridor daily.

The overall suggestions for scenario #3 address the potential for solar generation, EV charging, tree canopy, and the increase in micro mobility. Solar generation at least in scenario #3, would be to install solar over every parking spot which is about 4,692 at Park Place Mall and about 7,267 at El Con Mall. These numbers might be higher than they are but, the overall suggestion would be to cover the spots 100% to achieve maximum energy generation. The second suggestion would be to use up to 10 parking spots for electric vehicle charging for the public. The available charging does not have to be at the level of Tesla Superchargers, but ChargePoint chargers are a decent equivalent. There has been concern over the implementation of these chargers as of recently but with the growing number of electric vehicles on the market and the lack of public chargers along the corridor it is recommended that these chargers get installed sooner rather than later. For reference there are only 2 public chargers in the corridor, excluding the charge at the TownePlace Suites by Marriot close to the Park Place Mall as that is not necessarily public (Plugshare App). While most people can either charge at home or at charging stations elsewhere in Tucson, it would be nice not to have to travel all that far, especially if all the public chargers close by are being used. The third recommendation would be to implement more tree canopy. This is its own topic or issue, but it is related to micro mobility and transit as it impacts the overall usability of the corridor, especially in the hot summer months. The 4th and final issue addressed in scenario #3 would be to increase the overall micro mobility availability. Like scenario #2, it is recommended that there be an increase in bike docking stations and bikes per square mile and people, of course the ratio doesn’t have to be identical to the San Francisco study. While there wasn't time to do public outreach, it was inferred, in part, that the lack of ridership or use of a carshare or rideshare of sorts both lacked due to the current infrastructure.

There is also Fargo, a college town in North Dakota that is implementing a similar plan but is focused heavily on the local college’s student body. They pay a small fee as part of their tuition and then can utilize the 101 bikes at 11 total stations across the city. Certainly, the corridor or even Tucson isn’t this size, but it is a good example to compare it to (Mattson, pg. 2). This is something that is largely recommended for the City of Tucson and more specifically, the corridor in question. This article addresses a payment-like plan that may help people afford or even subscribe to a bicycle service, something that may also be beneficial to the residents of this corridor and the rest of Tucson rather than a pay – per – use type plan. The students and or users pay into the program but the sponsors that did help set up the 11 stations paid roughly $30,000 per station (Mattson, pg. 3). If this is within the city’s budget, it is highly suggested to add at least 3 stations along the corridor to provide accessibility at the beginning, middle and end of the corridor. While this case study was focused on a college area it did have a positive impact on the businesses nearby as it brought business away from the university, something that could and should happen here in Tucson. But again, and as the article argues, the infrastructure needs to be there to make all this possible and the needed infrastructure is not currently in the corridor. (Mattson, pg. 2).
**Resources:**


PEDESTRIAN DESIGN

Understanding why people may choose to walk and how the built environment influences that as applied to Broadway Blvd was the main goal of this paper. To understand the motivations and influences on walking, a short literature review was conducted to understand why people may walk more in a certain corridor and the groups most at risk and from what. Understanding the facilities that influence walking behavior was applied to the current Broadway Corridor through the City of Tucson’s Guides about pedestrian facilities. As part of research into the Broadway Corridor, a small team walked the length of the corridor on both sides of the street. During the walk, Survey123 was used to collect location points of curb cuts, missing or broken sidewalks, unsheltered bus stops, and crossings with and without HAWK signals. For this collection, asphalt to the curb was not considered a sidewalk. This information was used in ArcGIS to find locations for targeted pedestrian facility upgrades. The findings could be incorporated into other areas throughout Tucson with a high number of negative pedestrian street design elements. These findings are compared with demographic data at the Census Block Group Level from the 2015-2019 ACS 5-Year Estimate data provided by IPUMS NHGIS with a GIS file for analysis.

PEDESTRIAN SAFETY, COMFORT, AND WALKABILITY

A study by Stoker, Ewing et al. reviewed risk factors for pedestrians in the built environment. They found that children and elderly pedestrians have a “very high” risk factor for pedestrian traffic crashes (Stoker et al, 2015). Other at-risk pedestrian types were those of lower socio-economic status and disabled pedestrians (Stoker et al., 2015). Urban sprawl was also a determinant of the number of fatal crashes with the number increasing with more sprawl. A reduction of vehicle speeds through decreasing the width of vehicle lanes is a good way to increase pedestrian safety. Both Saelens and Handy and Stoker concluded that pedestrian traffic increases with density (Saelens and Handy, 2010; Stoker et al., 2015). Stoker concluded that this also increases crashes between pedestrians and vehicles. Causes of those crashes tend to come from the increasing conflicts between pedestrians and vehicles. The Transportation Research Board’s 2003 Access Management Manual found that the number of crashes per mile increases with the density of access points (Federal Highway Administration, 2006).

Saelens and Handy found through their review that pedestrian infrastructure influenced recreational walking with less evidence of its effect on transportation walkers (Saelens and Handy, 2010). Overall, they could not conclude the built environment increases walking but that available evidence backs planning policies that look to expand walking, through safer and more attractive streets and shopping districts near residential areas (Saelens and Handy, 2010). As far as funding goes for pedestrian infrastructure, Makarewicz found that transportation funding across the board has a shortfall but pedestrian infrastructure faces additional funding problems and that the legacy of sidewalks as a private matter contribute to issues in sidewalk connectivity (Makarewicz, 2018)

CITY OF TUCSON REGULATIONS AND GUIDELINES FROM REFERENCE ORGANIZATIONS

Tucson, AZ Code of Ordinances, Chapter 25 Streets and Sidewalks

Current City Code allows for a minimum of four feet for sidewalks (City of Tucson, 2021). Additionally, this chapter defines “driveway” as a portion of the public right-of-way from the
private property line to the improved or traveled part of the roadway, for vehicular access (City of Tucson, 2021). The city has a right to deny driveways, but property owners cannot be denied a “reasonable driveway access” to their property (City of Tucson, 2021). Curb cut replacements can be ordered to be replaced by the traffic engineer if “the private property use has been modified so that an existing curb cut is no longer needed” although this can be protested by the property owner and revoked by the public works director and city manager (City of Tucson, 2021).

**Tucson Unified Development Code, Technical Standards Manual**

**Pedestrian Access**

The Tucson UDC states the four-foot minimum once again but also adds that it should be installed in a way that prevents obstructions from decreasing the width (City of Tucson, 2021). The Location Standards states in 7-01.4.1A that “the sidewalk should be located to minimize any conflict with vehicular access to the project” and that sidewalks cannot be between parking spaces and the access lane for those spaces (City of Tucson, 2021). Sidewalks also must have physical separation from the access lane through several options like curbs, barriers, and grade separation.

**Transportation, Street Technical Standard**

**Construction Standards** - Projects along Broadway Blvd that require new sidewalks will require a minimum width of six feet (City of Tucson, 2021). An additional four foot of sidewalk is required behind existing driveway aprons. The standard driveway apron should be a total of eight from back of the apron to the front curb (City of Tucson, 2021). Curb returns can be substituted for curb cuts for a few different reasons like the ADT exceeding 100, limiting access for traffic control, local conditions approved by TDOT, and when intersections a collector or arterial (City of Tucson, 2021).

**Street Design Criteria** – Under 6.1 Street Layout subsection H, it states that once vehicular access is prohibited at a location in the interest of the public, the City of Tucson is granted a one-foot wide no vehicular access easement (City of Tucson, 2021). Front facing homes on arterials and collectors are afforded two driveways for a circular driveway (City of Tucson, 2021).

**American Association of State Highway and Transportation Officials Green Book 7th Edition**

Under 2.6 Pedestrians of the Green Book, AASHTO states that the most successful retail areas are those that provide the most comfort and pleasure to pedestrians (AASHTO, 2018). Pedestrians resist changes in elevation when crossing and underpasses provide areas for crime (AASHTO, 2018). For crossings, it is best to assume slower walking speeds to help reduce vehicle and pedestrian interactions (AASHTO, 2018). Multiple pedestrian warning and signs and lighted pedestrian crossings are the preferred crossing style (AASHTO, 2018). Pedestrian facilities that are simple and consistent provide greatest accessibility for all users (AASHTO, 2018).
**EXISTING CONDITIONS**

The Broadway Corridor’s pedestrian infrastructure has many great highlights but just as many concerns. The condition of sidewalks varies by district but for most of the length of Broadway Blvd they are of good quality. The most recently developed areas of the corridor around El Con, Park Place, and Williams Center have decent pedestrian connections through sidewalks. El Con and Park Place also enjoy wider sidewalks than the typical 4 foot width that is found along the corridor while areas like the businesses between S Columbus Blvd and Swan Rd on the northside of Broadway Blvd have deteriorating sidewalks. The midstar district contains the most area of concern. Currently, there are over 40 curb cuts between Columbus Rd and Swan Rd. This location also has poor quality sidewalks that are often filled with dirt and gravel from the roadway. The numerous curb cuts add a continuously uneven path for pedestrians.

Another area with concerning sidewalks was the access lane between Rosemont Blvd and Mountain View Ave on the South Side of Broadway. The sidewalk is situated between parking spaces and the access lane with no grade separation, inviting many chances for conflicts with vehicles. Certain areas of the sidewalk are also poorly maintained. An area missing a sidewalk currently is the area in front of the church at Mountain View Ave and Broadway Blvd on the northside of Broadway Blvd. These last two locations are the greatest disconnects in the pedestrian facilities that were found throughout Broadway Blvd.

A block group in the Midstar District has one of the highest levels of no vehicle availability currently between 25%-38%. This is two to three times the current City of Tucson level 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.

**BROADWAY OPPORTUNITIES**

*Using the City Code for Improvements* - Currently Broadway Blvd has several areas with different character and the need for different design considerations. Areas with private residences bordering Broadway should be evaluated to determine whether the curb cuts can be eliminated. Based on the Tucson Code of Ordinances this can be ordered by the Traffic Engineer. One such
home that was made note of in the Broadway Blvd field study is a home with a curb cut and what appears to be a roofed back patio. This home has access from S Irving Ave with available private driveway space. Another home in the El Con District is at 4002 E Broadway. It is accessible through S Longfellow Avenue which makes removal of the curb cut from Broadway possible and also provides an opportunity for an extension of the art currently at the corner of this home. The art appears to stop because of the wood fence but if the fence is replaced with cinder blocks it would provide an extended canvas. Many of the other driveways are front facing but some share a corner with a residential street and Broadway Blvd. An example home has access from N Camino Espanol and Broadway Blvd. This home has two circular driveways with the current curb cuts from Broadway. This portion of the yard is accessible from the front facing driveway and has space to maneuver a vehicle without the need of curb cuts.

With a new overlay, the city should explore new access management incentives for commercial property owners. The city can also create a new access management plan that looks to audit private lot access along major corridors. This would not solve the entirety of the problem but provides the best option for reducing curb cuts and providing better sidewalk conditions for pedestrians.

City of Tucson Sidewalk Rebate Program - The City of Tucson should explore funding options for a sidewalk rebate program along Broadway Blvd. Being able to repair and add sidewalk connections has proven to be an issue for many cities. The City of San Antonio currently has a rebate program that shares between 50% and 75% of the cost of sidewalk repair with residential owners. The San Antonio Rebate program offers additional reimbursement if the City later does improvements along the street (City of San Antonio, 2021). The City of Los Angeles has also implemented a sidewalk cost-share program but it is also limited to certain commercial properties not part of a development within the time span before the sidewalk cost is reverted to the owner. If the goal is creating a network that is equitable and accessible, sharing the cost now and reimbursing residential owners later as part of HCT improvements could help but the areas with the worst sidewalks are commercial properties along Broadway Blvd.
Green Infrastructure and Sidewalks - Providing grants for installation of green infrastructure is one way that the Environmental Protection Agency has suggested cities handle their need to provide GI. Green Infrastructure is helpful for stormwater drainage system but it can provide tree canopy and a barrier to the street. Positive impacts for pedestrians from GI (EPA Municipal Handbook). Montgomery County Maryland currently offers up to 5,000 dollars for installation of permeable pavement, shade trees, rain gardens, and cisterns.

Scenario 1 - With sidewalks being a private property owner responsibility, the city should use their powers to mandate sidewalk repairs and remove unnecessary curb cuts from private residences along the Broadway Corridor. With an express bus system, development and ridership would be expected at its lowest of the three scenarios and limit new sidewalk development. This increases the importance of connections to stops because interruptions that increase difficulty of a walking trip will limit the people who choose to walk and catch a bus (Illinois Center for Transportation, Construction of Pedestrian Infrastructure along Transit Corridors, 2021). Doing what is in the city’s power is what is most realistic in an express bus transit scenario.

Scenario 2 - A BRT would attract more people, housing, and jobs to the corridor and provide an opportunity for new development in a few places with few barriers and cost to begin. The lot at Rosemont and Broadway Blvd is a good example of a potential location. The new developments would be mandated to add a 6 foot width sidewalk by an extended overlay district. Other areas like the commercial properties between Columbus Rd and Swan Rd contain numerous curb cuts. To decrease the number of curb cuts the city should advertise and promote shared access to property owners in the area. As part of a Gold Standard BRT, station locations can serve as a way for the Additionally, the area is devoid of a planting strip and trees.

Scenario 3 - A streetcar system would require the most money but also provide the most return in development. Pedestrian infrastructure funding should match the transit funding in intensity to provide safer and more direct access to public transit.
REFERENCES


D. Green Infrastructure

Green Infrastructure Existing Condition and Scenario on Broadway

Existing Condition on the Broadway Corridor

This existing environmental condition will focus on the current distribution of small-scale green infrastructure, urban heat island severity, land coverage, flood zones, and storm drains.

Map One

The first map 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.
Based on the data collection statistics from the online survey, there are 129 small-scale green infrastructures on the Broadway Corridor, including 35 medians with trees, 59 rain gardens, and other types of GIs. Here are some images of these small-scale green infrastructures.

Medians with Curb Cuts
Map Two

The second map tells the current urban heat island severity on the Broadway Corridor from highest level to lowest level. As people can see on the map, the El Con Mall and Loma Verde Park have the highest heat severity.
The third map shows the land coverage, flood zone, and storm drains of the Broadway Corridor. And there are some overlaps between impermeable areas and flood zones. Based on the mapping analysis from Map Two and Map Three, the El Con Mall and Loma Verde Park have impervious areas without vegetation coverage, which caused urban heat island severity for the corridor.

**GSI Scenario and Fund Assumption**

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 GIS analysis of the overlapping between Pima Land Cover and Tucson sidewalks, about 16% of tree canopy cover, 20% of impervious areas, 12% of desert or grassland, 32% of bedrock, and 20% of roads. Therefore, 20% of the impermeable areas on the sidewalk and 12% of desert or grassland could consider adding more small-scale green infrastructures. This GSI scenario plan will also bring benefits to **pedestrian safety** and **public health**. It is because green infrastructure with tree canopies can provide more shade and cooling benefits for the sidewalk. Besides, green infrastructure with traffic calming systems can provide safety for pedestrians (EPA, 2016).

Our team came up with three scenarios for the transportation development on the Broadway Corridor, which includes high capacity express buses, BRT, and streetcar.
Each scenario has different housing assumptions. The estimated housing development on Broadway in 2020 will be 8,508 units for high capacity express bus and BRT scenarios, and 15,317 units for streetcars.

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 (City of Tucson, 2021).

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 increased number to do the same calculation to get the Estimated GSI that can be built (Sqft) on Broadway in 2032.

<table>
<thead>
<tr>
<th></th>
<th>A) High Capacity Express Bus</th>
<th>B) BRT (dedicated lane)</th>
<th>C) Fixed Rail (street car)</th>
</tr>
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<tbody>
<tr>
<td>Current housing units occupied on Broadway in 2020</td>
<td>8,511</td>
<td>8,534</td>
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<td>Estimated housing units on Broadway in 2032</td>
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<td>Average monthly water consumption in Tucson per household or housing unit (ccf)</td>
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<td>GSI Fees</td>
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<td>8875.36</td>
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</table>
Appendix

**GSI Examples (GSI Fund Proposal, 2019)**

**Bike Boulevard GSI project on Calle Marte between Wilmot and Kolb**
- Cost: $357,000
- GSI Basin area: 71,500 square feet
- Cost effectiveness: $5 per square foot GSI
- TSMS Watershed: Alamo Wash
- Vulnerable Population: Upper-Moderate
- Canopy Data: 5-10%
- Length: 1.8 miles

**Lincoln Park Parking Lot + Rain Garden Retrofits**
- Cost: $900,000
- GSI Basin area: 300,000 square feet
- Cost effectiveness: $3 per square foot GSI
- Adjacent area canopy: 1-5%
- Watershed: Atterbury Wash

**CAPLA Design Project - Drexel at South Country Club – City Owned Parcel (Conceptual Design)**
- Cost: $216,000
- GSI Basin area: 145,000 square feet
- Cost effectiveness: $1.5/sq. ft. GSI
- TSMS Watershed: Rodeo Wash
- Vulnerable Population: Upper-Moderate
- Canopy Data: 1-5%

**Current Green Infrastructure Policy in Tucson (Watershed Management Group, 2015)**

**Green Street - Active Practice Guidelines (Approved Aug 6th, 2013, Department of Transportation, City of Tucson)**

**Intend:**
- Incorporate green infrastructure functions into Tucson streets. All new developments shall assess the costs and benefits of green infrastructure, which must be added to the project budget.

### Table One

| 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 |
Applicability:
Guidelines for green infrastructure apply to the construction of public roads or drainage projects within the City of Tucson. These construction projects involve community roads, drainage, and stormwater management projects, including some landscaping elements.

Green Street Performance Goals:
1. Stormwater runoff on the streets should be directed through green infrastructures before entering drainage.
2. The designed landscape areas should preserve at least half an inch of rainfall.
3. The designed basins of green infrastructure should accept a maximum of eight inches of stormwater.
4. All green infrastructure must drain the water after the most recent rainfall in 24 hours.
5. Providing additional irrigation to the landscape by directing stormwater runoff.
6. Landscape planting criteria shall be considered.
   a. The bottom of green infrastructure basins shall be covered with a minimum of 25% of groundcovers, grasses, and shrubs lower than 3 feet.
   b. Trees and tree canopies shall provide shade and covers.
   c. The use of harvested rainwater shall keep the vegetation alive within five years.
   d. All green infrastructure basins shall be kept at a minimum depth of 12 inches.

Requirement:
Green Street projects require all projects to meet the Applicability. Completing the Performance Goals needs reasonable efforts. The Tucson Department of Transportation (TDOT) should develop a permanent project review team. The team should include planners, engineers, landscape architects, and project managers.

Principles:
Green infrastructure’s design concept and purpose are to reserve, infiltrate, and filter stormwater runoff from streets and sidewalks. Water is usually retained in the basin. The retained rainwater will be used to irrigate plants near public roads. When stormwater runoff exceeds green infrastructure soils’ retention and infiltration capacity, the excess water is filtered and returned to natural waterways. Civil engineers and landscape architects should meet the intent of green infrastructure.

Green Infrastructure Planning:
The purpose of the Tucson Green Street Policy shall be achieved by implementing green infrastructure planning for eligible roads. And follow the process of green infrastructure planning.

Considering Arizona Landscape Ordinances for Green Infrastructure and Green Street (American Legal Publishing Corporation, n.d.).
1) Pima County, Arizona Code - Landscaping, Buffering and Screening Standards
   Key Points:
   18.73.010 Purpose and scope.
   A. landscaping requirements and performance standards
      1. Improve the desert environment of the community.
      2. Preserve groundwater resources based on Arizona Groundwater Code in Title 45, Chapter 2.
      3. Preserving public health, safety, and welfare.
   B. Improve adverse impacts
   C. Scope
1. All development shall meet the code of this chapter.
2. New development.
3. Changes of existing uses.

18.73.020 Definitions.
A. Certain terms
1. Amenity landscaping.
2. Buffer yard.
3. Effluent. - Reuse of greywater
4. Environmental zone design principle.
5. Gross parking area.
7. Mini-oasis design concept.
8. Plant size.
10. Walls or fences.
11. Decorative masonry wall.

18.73.030 Performance standards.
A. Scope.
Common standards for buffer yards, landscape designs, and landscape planning.
B. General Standards.
1. Staying in harmony with the environment of the development site.
2. Using local desert and container plants with inorganic groundcovers.
3. All proposals need to consider the environmental zone design principle.
4. Turf should be irrigated with recycled greywater.
5. Selecting plants from the approved plant lists.
6. Considering the size of trees and shrubs.
7. Take advantage of groundcovers.
8. Considering irrigation and water features' standards and codes.
9. Natural features-Earth berms shall be changed to existing grades, kept a slope of 2:1, and covered with plant material to control soil erosion. The use of natural drainage ways and vegetation shall follow the county floodplain management ordinance.
10. Streetscape sculpture and furniture shall meet the standards from the landscape design manual.
11. Safety design standards shall be considered. (Section 18.77.020)
12. Public right-of-way standards
Landscapes owned or controlled by public areas shall follow the purpose and requirements of this chapter.
13. Plant materials spacing - grouped, clustered, or unevenly spaced shall comply with the Landscape Manual.

C. Stormwater Harvesting Option.
Stormwater harvesting in buffer yards shall meet requirements in Section 18.07.030. And the height of walls can be reduced to three and a half feet. Also, the density of trees' canopy may be reduced by fifty percent.

18.73.040 Screening and buffer yard requirements.
A. Scope
B. Buffer Yards
C. Location of buffer yards
D. Determination of buffer yard requirements
E. Use of buffer yards
F. Buffer yard options

18.73.050 Amenity landscaping requirements.
A. Scope.
B. Parking Area Amenity Landscape Requirements.
C. Stormwater Harvesting Option.

18.73.060 Landscape plan requirements.

18.73.070 Landscape plan review and appeal.
A. Submittal.
B. Landscape Plan Review.
C. All landscaping projects shall be finished before the certificate of occupancy is released.
D. Appeals.

18.73.080 Maintenance provisions.
A. Maintenance of approved landscaping.
B. Maintenance Assurances.
C. Compliance.

2) Tucson, AZ Unified Development Code - 7.6.4. Landscape Standards

Key Points:
A. Use of Drought-Tolerant Plants
B. Vehicular Use Areas
   1. Canopy Trees in Vehicular Use Area
      a. General Standards
      b. Alternative Standard
      c. Exemptions
   2. Plant Protection
   3. Planter Area
C. Landscape Borders
   1. All Landscape Borders
   2. Street Landscape Border
      a. Minimum Width
      b. Residential Subdivision
      c. Located on Site
      d. Inorganic Ground Cover
      e. Vegetative Ground Cover
      f. Scenic Route
      g. Landscaping on Adjacent Sites
      h. Structural Overhangs
   3. Interior Landscape Borders
   4. Exceptions to Standards of Landscape Border
      a. Parking District in Downtown
      b. Expansions
c. Interior Landscape Border
d. Street Landscape Border
f. Planned Area Development
g. Community Garden and Urban Farm Uses

D. **Use of Turf**

E. **Plant Cover/Dust Control**

F. **Use of the Public Right of Way**

**References**


E. Market

Part I: Existing Conditions - Market + 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.

Market Analysis: Current Performance Analysis (Rio Nuevo, COT)
In addition to understanding the policy landscape, details about the allocation and local tax dollar expenditures are invaluable to a transparent development process. This means unpacking the history of economic development incentives rooted in subsidies for the private sector is an inherent component. The city of Tucson has explored policy tools to help steer development outcomes that benefit the community, as discussed in the previous sections. One incentive that has gained popularity among the private sector is the GPLET (Government Property Lease Excise Tax). With the power to delay property taxes, development spurred in the Downtown and 4th Avenue areas in Tucson.

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 (Tax Increment Finance) 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. An analysis of past GPLET projects (2013-present) shines a light on valuable trends seen in the previous allocations of these sales tax revenues and highlights the potential for responsible real estate development with the proper policy and place stewardship.

First, an analysis was conducted on past projects which received public subsidies in the form of a GPLET (seen in Appendix A). The two eligible awarding entities are the City of Tucson and Rio Nuevo. The City of Tucson has entered 24 GPLET agreements and subsidized over $50 million in private development. This section of the existing conditions research focused on analyzing the following: type of use (seen in table A), affordable units built, and the proportion of dollars invested by use.

<table>
<thead>
<tr>
<th>Type of uses</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed-use</td>
<td>Mix of office, commercial and residential</td>
</tr>
<tr>
<td>Market Rate Residential</td>
<td>Includes student housing</td>
</tr>
<tr>
<td>Section 8 Affordable Residential</td>
<td>As determined by HUD</td>
</tr>
<tr>
<td>Commercial</td>
<td>Includes hospitality, grocery, retail</td>
</tr>
<tr>
<td>Office</td>
<td>Includes coworking spaces</td>
</tr>
<tr>
<td>Public</td>
<td>Public assets, streetscapes</td>
</tr>
</tbody>
</table>
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 of public dollars that directly come from sales tax revenues.

The trends and patterns seen in how public entities spend these dollars plays a vital role in understanding the existing conditions for development along the eastern TIF district on the Broadway Corridor. They demonstrate political will, collective interest, and a desire to form public-private partnerships that are aligned with a prosperous future.

The City of Tucson’s GPLET agreements were divided among 4 major uses: commercial, mixed use, office, and market price residential, as seen in Table B. 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. It is important to note that almost all mixed-use projects were comprised of majority residential rental units and incorporated commercial, retail and hospitality uses on bottom or ground floors. The next highest use funded by the GPLET was commercial, including projects such as Johnny Gibson’s Downtown Market, Brother John’s, and the AC Marriott Hotel. The next 17% of GPLET subsidies went to market price residential, which included projects such as The Herbert, The Cadence, and The Gallery on 5th. The lowest funded use was office with the remaining 8% allocated to Mister Car Wash (I and II) Headquarters on 6th Avenue.

Table B: Proportion of GPLET dollars by use (City of Tucson)

<table>
<thead>
<tr>
<th>Use</th>
<th>Proportion</th>
<th>Total Investment</th>
<th>Number of Projects</th>
<th>Sum of # of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>33%</td>
<td>$14,860,694</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>42%</td>
<td>$25,861,445</td>
<td>10</td>
<td>1006</td>
</tr>
<tr>
<td>Office</td>
<td>8%</td>
<td>$1,903,882</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td>$7,878,887</td>
<td>4</td>
<td>461</td>
</tr>
<tr>
<td>Grand Total</td>
<td>100%</td>
<td>$50,504,908</td>
<td>24</td>
<td>1467</td>
</tr>
</tbody>
</table>

Chart A: Proportion of uses (City of Tucson)
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 majority of Tucsonans (see Chart B). 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.

Chart B: Proportion of Units built (City of Tucson)

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, as seen in Table C. From these projects, almost half of them (47%) were commercial uses for a total of 15 developments, including the AC Marriot, the MSA Annex and Hotel Congress. The next highest use category is mixed use at 19% for projects including 44. E Broadway, the Bautista, and City Park.

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.

Table C: Proportion of Rio Nuevo investments by use

<table>
<thead>
<tr>
<th>Use</th>
<th>Proportion</th>
<th>Number of Projects</th>
<th>Total Investment</th>
<th>Sum of # of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>47%</td>
<td>15</td>
<td>$94,030,000</td>
<td>0</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>19%</td>
<td>6</td>
<td>$18,800,000</td>
<td>403</td>
</tr>
<tr>
<td>Office</td>
<td>6%</td>
<td>2</td>
<td>$5,750,000</td>
<td>0</td>
</tr>
<tr>
<td>Other Residential</td>
<td>3%</td>
<td>1</td>
<td>$11,200,000</td>
<td>0</td>
</tr>
<tr>
<td>Residential MR</td>
<td>6%</td>
<td>2</td>
<td>$4,150,000</td>
<td>166</td>
</tr>
<tr>
<td>Residential S8</td>
<td>3%</td>
<td>1</td>
<td>$350,000</td>
<td>83</td>
</tr>
<tr>
<td>Public</td>
<td>16%</td>
<td>5</td>
<td>$7,725,000</td>
<td>0</td>
</tr>
<tr>
<td>Grand Total</td>
<td>100%</td>
<td>32</td>
<td>$142,005,000</td>
<td>652</td>
</tr>
</tbody>
</table>

The remaining uses that received financial support from Rio Nuevo include Section 8 Residential (The Marist), Market Price Residential (Julian Andrew Lofts), office (Common Workspace) and others (TCC Arena). Collectively, Rio Nuevo’s investments have resulted in additional housing units composed of market rate and affordable housing, totaling 652 (seen in Chart C). Of these units, only 13% have resulted in affordable housing. While this is a step in the right direction, it is also worth noting that the Section 8 Residential financial contribution was among the top 5 lowest contributions made by the board, suggesting a low priority for this use.

Chart C: 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 deducted from an audit of GPLET and other public funding sources that have the potential to start productive conversations among all stakeholders.

Some key takeaways from the current performance analysis include an interest and commitment to mixed use projects from both the City of Tucson and Rio Nuevo. This is a promising trend that paves the way for more potential projects that create business and job hubs as well as provide additional housing units for residents. This trend, however, suggests a limit of mixed uses towards retail or hospitality. Despite the clear economic benefits that come from these uses, there is room to grow this category to include different types of uses that serve local Tucsonans, such as artist or maker spaces, recreation or resource hubs and gathering spaces to foster education and community.

Rio Nuevo also has some promising trends that could be explored: they are not limited to GPLETs as their main funding source and have a record of investing in public spaces and community assets that increase development value for the TIF. While they must stay focused on economic development that yields sales tax revenues, a case can be made for the value of walkable urban spaces and cultural assets that bring prominence to an area, thus increasing the total number of people willing to spend.

As a result of this sales tax revenue focus, the analysis also shows that Rio Nuevo invests most of its funds in commercial projects. This suggests that both the city and Rio Nuevo have limitations and opportunities to support project feasibility. Exploring this dichotomy may result in beneficial and effective partnerships between these two public entities, where projects can be curated with secured funding from different sources. This opens a world of innovative financing options for developers who are interested in exploring different types of uses or affordability access.

Lastly, post-pandemic markets are still on route to recovery, suggesting a need for rent affordability to sustain individuals and businesses alike until they can stabilize and prosper. The trends in public expenditures imply that market rate projects are accessing a majority of available funding (including commercial, mixed use and market rate residential, a total of 86%). As a result, majority of these dollars are being used to subsidize private development that is not accessible to a large portion of Tucsonans. This discrepancy damages trust in government and fuels the tension between community members and the private sector.

Further, the Marist is an example of affordable senior housing built with gap financing in form a loan. Despite the low amount of the financial contribution ($350,000), it is an example of a potential partnership for a project that serves members of the community, preserves access to downtown and demonstrates the benefits of a diverse downtown. While this may be the only project to achieve this financing structure, it displays the potential for creative partnerships and development that is conducive to city and community goals for Tucson’s future.
**Part II: Market Scenarios**

To accurately envision the potential for the Broadway Corridor, scenario planning was used to assess and analyze development outcomes based on different types of transit infrastructure and policy tools. Three different scenarios were explored: realistic, optimistic, and aspirational.

Each of these scenarios focused on different levels of transit infrastructure and measured certain indicators to inform development outcomes possible under each scenario. These scenarios were carefully crafted using current existing transit data and educated assumptions. Additionally, they aim to reflect the goals and guiding principles mentioned in the introductory materials. These goals include but are not limited to preservation, mixed-use, affordability and mixed-income development.

For the market analysis portion of each transit scenario, three main indicators were used: value added, affordability potential, and job creation. These indicators were selected out of many to demonstrate the potential economic development that is directly associated with transit infrastructure and the opportunity for policy tools to steer development patterns to align with equitable outcomes for locals Tucsonans and out of state transplants.

**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 this report 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.
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 promote 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.

For the Scenarios in this report, average property value increases within the transit shed areas was used to estimate the potential value increases for both residential and office uses with proximity to different transit investments (HCT, BRT and SCT) along Broadway. This value added was derived from the data observed in the NAR study and estimated for each scenario to demonstrate how transit could impact the real estate market in Tucson. Furthermore, these estimates help inform how policy and land use tools can be proactively advocating for inclusive growth along transit corridors.

Housing Attraction Rate
The Housing Attraction Rate (HAR) can be defined as the percent of new population that is intentionally seeking housing options located near transit. To calculate the HAR for the transit scenarios in this analysis, population growth over six years (2013-2019) was used to find an average attraction rate from comparable cities for different distance proximities to transit infrastructure. This analysis selected cities to compare to Tucson from Dr. Nelson’s research of 40 different transit systems in 35 metropolitan areas in the country. Cities were selected based on population size comparable to Tucson and used county population growth and transit shed population growth (based on preselected distances) to determine the attraction rates used to calculate the average HAR applied in this report, as seen in Table O (Appendix D).
Table O: Proportion of Population Growth to BRT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>2013</th>
<th>2019</th>
<th>Proportion to BRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque</td>
<td>Bernalillo</td>
<td>667,092</td>
<td>677,858</td>
<td>129,193</td>
<td>129,010</td>
<td>19%</td>
</tr>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>675,641</td>
<td>696,216</td>
<td>95,463</td>
<td>102,373</td>
<td>15%</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>1,048,314</td>
<td>1,133,646</td>
<td>85,152</td>
<td>87,261</td>
<td>8%</td>
</tr>
<tr>
<td>Nashville</td>
<td>Davidson</td>
<td>638,395</td>
<td>687,488</td>
<td>175,070</td>
<td>189,284</td>
<td>28%</td>
</tr>
<tr>
<td>Stockton</td>
<td>San Joaquin</td>
<td>693,177</td>
<td>742,603</td>
<td>145,659</td>
<td>154,073</td>
<td>21%</td>
</tr>
</tbody>
</table>

|          |              |        |        |       |        | AVERAGE 18%       |

This average HAR was then applied to BRT and estimated for HCT and SCT due to changing transit shed distances and demand for different transit investments.

To adequately estimate the demand for new housing units predicted to the Broadway Corridor in the Transit Scenarios, total units in 2020 were estimated for the next 10 years using Pima County population growth data then converted to new citywide total units for 2032. From those total new units, each scenario used the estimated HARs to calculate total units expected to the Broadway Corridor using the following formula:

\[
\text{Total Units to Broadway} = x \times \text{HAR}
\]

\[
X = \text{Total Units in 2032} \times \text{BCAR (25%)}
\]

Assumption: Not all new population growth or unit demand is expected to locate only near transit. For that reason, specific buffers were applied when estimating the numbers used in this report, relating to proximity of census blocks to the study area and attraction rates to the Broadway Corridor specifically.

In this report, the Broadway Corridor Attraction Rate is estimated to be 25%. This proportion was applied in efforts of realistic population and unit estimates for accurate scenario planning. Further, Broadway is one of four major transit corridor contenders for future investment and transit-oriented development. Each corridor was given a proportion of attraction due to the high demand of transit options (see Assumptions). This proportion is expected to remain constant in each scenario.

Tucson’s Four Transit Corridors

- Speedway – 15%
- Broadway – 25%
- North Stone – 30%
- South 6th – 30%

Assumption: Proportion of total population and units locating to the Broadway Corridor were estimated based on present FTA awarded funds to the City of Tucson for TOD planning along a 15-mile corridor, as well as the project focus being on Broadway and
assumption that it is not financially or physically feasible to invest in two adjacent corridors in the same 10-year period.

Potential for affordability
The current Sunshine Mile overlay is the most progressive development policy the city of Tucson has explored thus far. Under the Sunshine Mile, developers have an opportunity to build affordability into their projects in exchange for a density bonus (Sunshine Mile). According to a study on nationwide Inclusionary Housing policies by Grounded Solutions Network, 57% “use density bonus as an incentive to offset the cost of providing affordable housing units” (IH). 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 majority of inclusionary housing programs in the U.S. have a minimum set-aside proportion for affordable units of 10% (IH). Further, approximately 29% of existing programs have a minimum set-aside 20% of units or more (Inclusionary Housing). The requirements vary in different metropolitan areas depending on “geographic location, targeted population, tenure, percentage of open space and case-by-case negotiations with the developer” (Inclusionary Housing). This research shows there is a case to be made for increasing inclusionary housing requirements, and with the adequate market support, municipalities have an opportunity to demand more affordable units from developers.

This research set the Affordability Rate 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% Affordability Rate was selected 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 case to be made for workforce and missing middle tenants that are not always considered. 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 be yield more inclusive outcomes. Using the right policy tools, municipalities can leverage their public transit investments in exchange for inclusive, responsible development.

**Impact on Jobs**

The Broadway Corridor is home to one of the biggest employment hubs in the city of Tucson. As a result, moving both workers and consumers efficiently along the corridor can unlock potential for job creation as well as reducing vehicle dependency and improving commute times. The research used to estimate the impact of transit investments in this report found significant correlations between proximity of transit to increased housing and jobs within a ¼ and ½ mile, among other variables such as tenancy and income.

To estimate the impact of transit on jobs in Tucson, data from comparable cities was used to estimate job attraction rates within a ¼ and ½ mile distance of different transit options. Collectively, research showed a positive attraction rate for overall total jobs and retail/food/hospitality jobs, and a slight decline in office jobs.

For the transit scenarios, a rate of growth multiplier was estimated by averaging each selected city’s own rate of growth. This multiplier was then applied to a scenario analysis for the city of Tucson to deduct potential job growth rate along a ¼ transit shed from different transit options. The multipliers for each city were deducted through the following formula:

\[
\text{BRT Area Annual Area Rate} / \text{County Annual Rate} = \text{Multiplier Rate of Growth for BRT compared to County}
\]

The detailed calculations for these numbers can be found in Appendix A in the “Jobs” tab. By averaging each city’s rate of growth, a multiplier rate of growth that was appropriate and comparable to Tucson was applied to calculate the impact of different types of transit on different types of jobs along the Broadway Corridor. A summary of the annual job growth rates for each city studied for BRT can be seen in the Tables C, D and E.

It is important to note that jobs were not estimated to the Broadway Corridor level, as this report looked specifically at jobs that were related to development and destinations along transit corridors, which could vary due to many conditions (see Assumptions). As such, the job sections of the transit scenarios are estimated using 2022 data for job type and growth rate in Pima County.
### Table C: Total Jobs within ¼ mile of BRT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>Annual Growth Rate</th>
<th>Multiplier Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque</td>
<td>Bernalillo</td>
<td>116,991</td>
<td>117,658</td>
<td>0.10%</td>
<td>0.09</td>
</tr>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>146,089</td>
<td>153,327</td>
<td>0.83%</td>
<td>0.62</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>47,495</td>
<td>53,355</td>
<td>2.06%</td>
<td>0.65</td>
</tr>
<tr>
<td>Nashville</td>
<td>Davidson</td>
<td>228,017</td>
<td>278,695</td>
<td>3.70%</td>
<td>1.23</td>
</tr>
<tr>
<td>Stockton</td>
<td>San Joaquin</td>
<td>69,041</td>
<td>75,612</td>
<td>1.59%</td>
<td>0.48</td>
</tr>
</tbody>
</table>

**AVERAGE** 0.62

### Table D: Retail/Food/Hospitality Jobs within ¼ mile of BRT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>Annual Growth Rate</th>
<th>Multiplier Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque</td>
<td>Bernalillo</td>
<td>28,110</td>
<td>28,722</td>
<td>0.36%</td>
<td>0.47</td>
</tr>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>19,395</td>
<td>21,162</td>
<td>1.52%</td>
<td>0.78</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>10,681</td>
<td>11,875</td>
<td>1.86%</td>
<td>0.84</td>
</tr>
<tr>
<td>Nashville</td>
<td>Davidson</td>
<td>39,606</td>
<td>49,862</td>
<td>4.32%</td>
<td>1.79</td>
</tr>
<tr>
<td>Stockton</td>
<td>San Joaquin</td>
<td>13,796</td>
<td>13,420</td>
<td>-0.45%</td>
<td>-0.23</td>
</tr>
</tbody>
</table>

**AVERAGE** 0.73

### Table E: Office Jobs within ¼ mile of BRT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>Annual Growth Rate</th>
<th>Multiplier rate of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuquerque</td>
<td>Bernalillo</td>
<td>25,761</td>
<td>26,569</td>
<td>0.52%</td>
<td>0.66</td>
</tr>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>51,468</td>
<td>48,543</td>
<td>-0.95%</td>
<td>-4.45</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>11,226</td>
<td>11,314</td>
<td>0.13%</td>
<td>1.00</td>
</tr>
<tr>
<td>Nashville</td>
<td>Davidson</td>
<td>84,000</td>
<td>93,057</td>
<td>1.80%</td>
<td>0.91</td>
</tr>
<tr>
<td>Stockton</td>
<td>San Joaquin</td>
<td>16,380</td>
<td>18,195</td>
<td>1.85%</td>
<td>0.87</td>
</tr>
</tbody>
</table>

**AVERAGE** -0.20

The same dataset was used to analyze the impact of Streetcar transit (SCT) on different types of jobs. For this analysis, a total of 4 comparable cities were selected based on population size. It is important to note that the measured impact distance for both the dataset and this analysis was ½ mile (~800 meters) as opposed to ¼ mile. The reason for this is that research shows fixed rail transit tends to have a wider geographical impact on neighborhoods and property values than BRT (source). This could be for several reasons, including convenience, reliability, and attractiveness (source).

To analyze the impact of streetcar transit on different types of jobs, the same analysis was conducted to estimate a rate of growth multiplier to apply to Tucson. For this part of...
the analysis, distance was adjusted to ½ mile for the 4 selected cities. A rate of growth multiplier was applied to the Broadway Corridor scenarios by calculating the average of each city’s job growth rate, as seen in Tables F, G and H.

Table F: Total Jobs within ½ mile of SCT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>Annual Growth Rate</th>
<th>Multiplier Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>63,477</td>
<td>61,084</td>
<td>-0.63%</td>
<td>-0.47</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>32,771</td>
<td>34,576</td>
<td>0.92%</td>
<td>0.29</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Hamilton</td>
<td>69,502</td>
<td>73,083</td>
<td>0.86%</td>
<td>1.01</td>
</tr>
<tr>
<td>Tacoma</td>
<td>Pierce</td>
<td>42,083</td>
<td>47,720</td>
<td>2.23%</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td></td>
<td></td>
<td>1.01</td>
<td></td>
</tr>
</tbody>
</table>

Table G: Retail/Food/Hospitality Jobs within ½ mile of SCT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>Annual Growth Rate</th>
<th>Multiplier Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>6,138</td>
<td>7,450</td>
<td>3.56%</td>
<td>1.82</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>6,450</td>
<td>7,828</td>
<td>3.56%</td>
<td>1.60</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Hamilton</td>
<td>6,934</td>
<td>8,738</td>
<td>4.34%</td>
<td>22.12</td>
</tr>
<tr>
<td>Tacoma</td>
<td>Pierce</td>
<td>2,622</td>
<td>3,188</td>
<td>3.60%</td>
<td>1.07</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td></td>
<td></td>
<td>5.26</td>
<td></td>
</tr>
</tbody>
</table>

Table H: Office Jobs within ½ mile of SCT

<table>
<thead>
<tr>
<th>City</th>
<th>County</th>
<th>2013</th>
<th>2019</th>
<th>Annual Growth Rate</th>
<th>Multiplier Rate of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kansas City</td>
<td>Jackson</td>
<td>27,933</td>
<td>25,353</td>
<td>-1.54%</td>
<td>-7.23</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>Salt Lake</td>
<td>12,282</td>
<td>11,312</td>
<td>-1.32%</td>
<td>-0.51</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Hamilton</td>
<td>33,183</td>
<td>31,829</td>
<td>-0.68%</td>
<td>-1.90</td>
</tr>
<tr>
<td>Tacoma</td>
<td>Pierce</td>
<td>13,694</td>
<td>15,186</td>
<td>1.82%</td>
<td>0.78</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.35</td>
<td></td>
</tr>
</tbody>
</table>

This analysis provided the appropriate data to estimate the impact of both BRT and SCT on different types of jobs for the Broadway Corridor. These rates can be seen in detail in the Scenario Assumptions of the full report. To calculate the impact of High-Capacity Transit (HCT), which is the current largest transit option for most Tucsonans, ½ of the BRT growth rate was applied. The research in this report used the most recent population and job data available to project potential job growth over the next 10 years. A detailed impact analysis on different types of jobs can be found in the scenario breakdowns.
Part III Developer Interviews

Purpose
To gather information about the effectiveness of development incentives offered by the City of Tucson a series of interviews were conducted to provide feedback to city staff. Interviews with local Tucson developers were conducted for this report to understand the level of awareness around existing development incentives, and the perceived value of these benefits. Ten people who are currently involved in local real estate development were interviewed and asked to rank existing incentives based on their opinion of the value of individual incentives. 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 based upon importance.

Methods
Interviews were conducted in various locations around the city at the convenience of the interviewees. All interviewees personal information is protected and is not referenced anywhere in this report. All interviewees were asked the same questions to maintain consistency in results. Interviewees were asked to rank in order of preference the existing incentives offered by the City of Tucson. They were also asked to rank incentives not offered in Tucson but are offered in other municipalities around the United States. The questions asked throughout the interview process are listed below.

1. How familiar are you with local incentives? How effective are the existing economic development options in Tucson? Why? (Rate 1-4)
   a. Density Bonus
   b. Flexible Design
   c. Tax Abatements (GPLET)
   d. Reduced Parking requirements

2. Which type of economic development support options that do not currently exist in Tucson are most desired among RED? Why? (Rate 1-6)
   a. Accelerated Approval (of development and permitting processes/applications)
   b. Gap Financing (defined as government grants given to individual developers to finance a certain project)
   c. Fee reduction (permitting, impact fees)
   d. Public land sales/ground leasing (cost reduced land sales or cheap long term leases)
   e. Longer term tax abatement (20 year instead of 8)

3. What type of transportation option is the best fit for the Broadway Corridor and will yield the most economic development value for the private sector? Why? (Pick best answer)
   a. BRT (no fixed lane, freeflow traffic, 1-mile stops)
   b. Dedicated Lane BRT (fixed bus lane, 1-mile stops)
   c. Fixed rail transit (streetcar with own fixed lane)

4. Bonus Question: What do you think is the reason that most private sector developers do not build affordable housing?
   a. This answer will not be quantified for the project, it is more for us to gauge the political will of some important players.
The answers to these questions were documented and assigned a value to assess which incentives are currently the most desirable to the private development company in Tucson.

**Results**

The results of interviewing people working in private real estate development yielded data about the kinds of incentives they think are most effective and useful. In the first question interviewees were asked to rank the effectiveness of existing incentives in the city of Tucson. The results of the first question are shown in the table below. Interviewees favored flexible design and reduced parking requirements equally, then the density bonus and lastly tax abatement in the CBD.

In question two interviewees were asked to rank a set of incentives that are not currently offered in Tucson, but are being utilized in other municipalities across the United States. In response to this question respondents stated that the number one incentive of this survey was accelerated approval of development permitting and application processes. 60% of respondents said this was the most important incentive

<table>
<thead>
<tr>
<th>Rank</th>
<th>Answers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flexible Design</td>
<td>40%</td>
<td>20%</td>
<td>0%</td>
<td>40%</td>
<td>2.60</td>
</tr>
<tr>
<td></td>
<td>(reduced setbacks, lot coverage relief, etc.)</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Reduced Parking Requirements</td>
<td>30%</td>
<td>30%</td>
<td>10%</td>
<td>30%</td>
<td>2.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Density Bonus</td>
<td>10%</td>
<td>50%</td>
<td>20%</td>
<td>20%</td>
<td>2.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tax Abatement (GPLET)</td>
<td>20%</td>
<td>0%</td>
<td>70%</td>
<td>10%</td>
<td>2.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
not currently being offered, making it the number one response by far. 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.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Answers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Accelerated Approval of Development and</td>
<td>60%</td>
<td>20%</td>
<td>0%</td>
<td>10%</td>
<td>10%</td>
<td>4.10</td>
</tr>
<tr>
<td></td>
<td>Permitting Processes and Applications</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Fee Waiver or Reduction</td>
<td>20%</td>
<td>40%</td>
<td>20%</td>
<td>10%</td>
<td>10%</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>(Permitting and Impact Fees)</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Public Land Sale/Ground Leasing (Cost Reduced</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>30%</td>
<td>2.60</td>
</tr>
<tr>
<td></td>
<td>Land Sale or Low Cost</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Long Term Lease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Gap Financing (Govt Grants to Individual</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
<td>40%</td>
<td>20%</td>
<td>2.50</td>
</tr>
<tr>
<td></td>
<td>Investors)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Please rank the following development incentive tools according to how effective or important you think they are...
F. Zoning Policy

Tucson Policy and Development Incentives

State level legislative barriers

Private Property Rights Protection Act or Prop 207

Arizona policy is unique among states in the United State when it comes to real estate development and housing creation. Due to state level legislation, it is not possible to mandate the creation of affordable housing because of a 2006 ballot measure named The Private Property Rights Protection Act, or proposition 207. The Act provides that “[i]f the existing rights to use, divide, sell or possess private real property are reduced by...any land use law enacted after the date the property is transferred to the owner and such action reduces the fair market value of the property the owner is entitled to just compensation[.] (AZSoS, 2006)”. The basic reading of this law is that no governmental entity can regulate land uses that could devalue a property, and if they do, they are legally required to compensate the owner for the difference in cost.

Impact Fee Restrictions

In addition to prop 207 Arizona also has multiple statutes that constitute barriers to affordable housing development for local municipalities in the state. Arizona Revised Statute (ARS) ARS, Title 9, Ch 4, Article 6.2.1 states that “Development fees may not be used for any of the following: (a) Construction, acquisition or expansion of public facilities or assets other than necessary public services or facility expansions identified in the infrastructure improvements plan. (b) Repair, operation or maintenance of existing or new necessary public services or facility expansions” (AZ leg, 2022). This means that no development related fees, e.g. impact fees, or permitting fees, may be used for the development of affordable housing in any municipality. In addition, development fees collected may not be used to create a trust or fund to support affordable housing development.

Gift Clause

The state of Arizona currently has legislation that states “The Gift Clause prohibits public funding going to non-public enterprises. To comply with the Gift Clause, a government expenditure must serve a public purpose, and the consideration the public paid must not far exceed the value received.” (Davis, 2021). This language presents some ambiguity when it comes to a municipalities ability to engage with private developers in the pursuit of creation of public housing. In the past it has made Arizona cities wary of gifting or selling publicly owned parcels of land at a discount to developers who would create affordable housing on them. In recent court challenges to the Gift Clause Arizona judges have signaled a willingness to consider affordable housing a public purpose. In the Goldwater Institute vs. the City of Phoenix case a judge ruled for
the city when it was challenged for selling land at a 92% discount for affordable housing development. (Carr, 2020).

Tax Increment Financing (TIF)

Many cities in the United States use tax increment financing districts to collect tax revenue from high performing areas to be used in the creation of affordable housing. TIF revenue is most often used to spur economic development in areas that a municipality wants to uplift or redevelop. This often happens around blighted areas and central cities in an attempt at revitalization. Many cities use the tax revenue generated from this redevelopment and revitalization to create local housing trust funds that can be used to supplement affordable housing development. Arizona is the only state in the US that expressly prohibits the establishment of TIF by municipalities in the state. In 1999 the state legislature repealed the law on the books allowing TIF in Arizona.

Housing Trust Fund Cap

Arizona operates a State Housing Trust Fund that is the state’s primary vehicle for the creation of affordable housing. This fund was created in 1988 with the goal of fighting homelessness, housing families, and creating safe, dignified living space for vulnerable populations. Prior to the Great Recession the fund “was generating approximately $40 million per year.” (Carr, 2020) The main source of revenue for this fund is the private sale of unclaimed property to private parties. During the recession the state became very concerned about budget shortfalls and decided to cap the amount of money from unclaimed land sale be capped at $2.5M. This act decimated the fund and its cash reserves plummeted in the years that followed. In response to the current housing crises in Arizona the legislature recently authorized a one-time allocation of $15M to the Housing Trust Fund. The $2.5M cap on unclaimed property revenue transfer to the Housing Trust Fund remains in effect and is the law today.

![Arizona Housing Trust Fund Revenues](image)

Figure 1 AZ HTF Revenues (ADOH, 2019)

Short-term Rentals or SB 350
In 2016 the Arizona state legislature enacted legislation under senate bill 1350 to prohibit local municipalities from restricting private property owners from engaging in the practice of short-term rental. Short term rental of housing units can be attractive to property owners in certain locations because it has the potential to bring a greater return than long-term renting of property. This is especially profitable in areas where the economy is tourist driven, or areas with high rates of business travel. Short term rental of property that is suitable for long term inhabitants can detrimental to an areas overall housing stock by removing a source of potentially naturally occurring affordable housing.
Arizona state law carries a provision for the creation of a Central Business District in its cities’ where they can choose to incentivize development. This statute gives the City of Tucson the authority to provide property tax abatement in the CBD as an incentive to spur economic development. The tool that the city uses to provide this abatement is the Government Property Lease Excise Tax, or GPLET. “The
GPLET can provide up to eight (8) years of property tax abatement” for developments that are in the CBD and conform to city requirements. (CoT, 2017) The GPLET is a mechanism that provides for government property ownership with private development on the site, allowing for the creation of projects that may have otherwise not been possible without the GPLET incentive. It was passed in 1996 and was intended to be an excise tax in-lieu of a property tax scheme that would be applied by building type and square footage. This tax structure lowers taxes paid because it does not collect taxes based on value like most property taxes. In Tucson the Central Business District encompasses downtown and areas adjacent, see Fig. 2 (GPLET Map). To date, the city has entered into 24 GPLET projects, investing nearly $412M into local development.

Rio Nuevo Area

The Rio Nuevo Multipurpose Facilities 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 and “create a vibrant, urban environment where residents and visitors can live, stay, work, and play, allowing us to compete with cities like Austin, Portland, and San Diego for citizens and tourists seeking an urban destination: safe, walkable, artistic and fun, complete with great food and music.” (Rio Nuevo, 2018).

The board of Rio Nuevo is composed of seven people who are all appointed by different levels of the Arizona state government. Three members are appointed by the state governor, two members are appointed by the state Speaker of the House of Representatives, and two members (including the chairman) are appointed by the President of the state Senate. All members must be residents of the county where the TIF exists, and at least four must be residents of the municipality.

Main Gate Urban Overlay District
The City of Tucson’s first urban overlay zoning effort was the Main Gate UOD. The Main Gate UOD was designed to create an area close to the University of Arizona that would incorporate mixed-use properties with enough height and density to accommodate student group housing. This overlay provides relief from lot coverage requirements, setbacks, and other previous restrictions as long as certain provisions are met. The overlay offers these incentives to encourage commercial/retail street level uses in an effort to activate the streetscape and engage pedestrians. The overlay also has a number of design guidelines that developers must adhere to if they use the optional overlay zoning. These requirements include lighting strategies, building materials and colors, architectural elements, doors, windows, building facades, and streetscape design. The overlay also establishes maximum heights by subarea, and identifies height by parcel in specific cases.
The IID is a zoning overlay that is an optional tool that provides some relief from the underlying zoning regulations. The purpose of the overlay is to be more flexible than existing zoning and is designed to incentivize development in certain areas of the city. The goals of the IID are to “promote sustainable infill development, support pedestrian-friendly and transit-oriented neighborhoods, protect historic structures and neighborhoods, offer development incentives through modification of development standards, and provide design standards for sensitive transition between development and existing family residences.” (CoT, 2019) The incentives provided by the IID include an unqualified density bonus, flexible design and reduced parking. The density bonus
allows for additional height of key structures and thereby a greater number of total units that may be included. The flexible design incentive allows for reduced setbacks, relief from lot coverage maximums, and other relief from more restrictive underlying zoning. In addition, there is a provision in every sub area for decreasing parking requirements when certain conditions are met.

Grant Road Urban Overlay District or Grant Road Investment District (GRID)

The Grant Road Investment District Urban Overlay district is a rezoning along Grant Road from just west of Oracle to Park Ave. The overlay covers much of the commercial and retail parcels along this approximately one-and-a-half-mile corridor. The intent of this rezoning was to encourage transit-oriented development, and multi-modal transportation options in the area it covers. This rezoning was implemented in conjunction with the Regional Transportation Authorities road widening project along Grant. It allows a property owner an optional path to gain flexible development requirements in exchange for transit-oriented design in their site or buildings. Goals of the GRID UOD include: balance of uses in the corridor, guiding future development, recognize character of neighborhoods, protect historical assets, and identify areas for new development. The GRID UOD provides relief from underlying zoning requirements such as lot coverage restriction, parking requirements, height restriction, etc. in exchange for meeting certain design criteria set forth by the city. These include public
amenities such as bicycle and car share facilities, and design elements. Desired development outcomes will include pedestrian oriented areas, shaded sidewalks, and incorporate design best practices from the city’s design guidelines handbook.

**Sunshine Mile Urban Overlay District**

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.

Conclusion

Tucson has multiple different zoning tools in place to encourage development in specific areas of the city. This began as an effort to revitalize downtown and centered around the CBD and the Rio Nuevo TIF. Since then the city’s planning department has engaged in many efforts to create overlay zones for key areas of the city targeted for growth. The incentives used by the city in these zoning documents are tax abatement (GPLET), density bonuses, flexible design (reduced setback, lot coverage relief, etc.),

<table>
<thead>
<tr>
<th>Policy</th>
<th>Density Bonus</th>
<th>Flexible Design (Reduced setbacks, lot coverage relief, etc.)</th>
<th>Reduced Parking</th>
<th>Accelerated Approval</th>
<th>By-right</th>
<th>Fee Reduction</th>
<th>Fee Waiver</th>
<th>Public Land</th>
<th>Public Funding</th>
<th>Tax Abatement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunshine Mile UOD</td>
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<tr>
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<td>Central Business District</td>
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</tbody>
</table>

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

and reduced parking. These incentives are linked to individual policy items in the table below.

Arizona State Examples of Development Incentive Policies - Framework

There are many strategies to incentivize different types of development in use around the US, which vary widely based on the legislative climate of the state. This review will look at two municipal examples within Arizona, two examples from Texas, and two aspirational cases from non-property rights states.

Tempe

The City of Tempe adopted a new Affordable Housing Strategy in 2019. This policy was initiated in response to a growing lack of housing affordability in the city, and the
realization that nearly 37% of all Tempe households are housing cost burdened. The City of Tempe is a comparable analog to Tucson as it must deal with the same complicated state legislative framework. Tempe has instituted a robust incentive plan, including many tools that the City of Tucson does not utilize. These include accelerated approval and fast-tracking of development review/permitting, and fee waiver/reduction policy framework. Incentives active in Tempe can be seen in the table at the end of this section. Tucson may consider the adoption of some of these strategies in the future.

Flagstaff
Flagstaff is a city that has been under considerable housing pressures for quite some time. It has experienced sharp increases in rents while wages have failed to keep up with cost of living. In response to this pressure the Flagstaff City Council directed staff to investigate incentives structures that could assist in the construction of affordable housing. Since then, Flagstaff has put into practice a number of tools to encourage the inclusion of affordable housing in development. Some of the incentives are reduced and waived planning and development fees, expedited review, density bonus and flexible
design, as well as land donation, and in-lieu fees. Current incentives offered in Flagstaff can be found in the table at the end of this section.

National Examples of Development Incentive Policies

Austin

The city of Austin, Texas is a useful case study to review as Texas is a state that has private property laws similar to Arizona. This means that Austin municipal leadership has been investigating development incentives under this restrictive legislative landscape for longer than most cities. The result of this is that Austin has a robust suite of tools and incentives to promote density and affordability in new development. Austin has a long history of dealing with housing affordability issues, rising housing prices, sprawl, and growth outstripping infrastructure. Major programs include zoning overlays with incentives that provide density bonuses, affordability, fee waiver, flexible design, and parking. Incentives offered can be seen in the table below.

In response to what has been called a housing crisis in Austin, city leaders have embarked upon an aggressive campaign called the “Affordability Unlocked” program. The Affordability Unlocked Development Bonus Program seeks to incentivize affordable housing by waiving fees and modifying development restrictions in exchange for providing low and moderate-income housing. The program leverages $250M realized from a voter approved municipal affordable housing bond from 2018. This program was designed to help the city reach its goal of 60K affordable units created by 2027. This innovative program leverages many tools and incentives to create affordable housing, and could be emulated in the City of Tucson.

San Antonio

The City of San Antonio utilizes many of the same incentives as other cities that have state level property rights laws that restrict certain municipal mandates. The city uses density bonuses, tax abatement, and fee waivers to incentivize development much like the City of Tucson. San Antonio also uses incentives not currently utilized in Tucson such as public funding, gap financing and bond initiatives for affordable housing. See table below for the incentive table for San Antonio.

In response to increased permitting demand San Antonio Development Services has initiated a “Single Point of Contact” for development needs. This single point of contact is available to answer questions and refer issues that involve development, public works/utilities, water, police, fire, and health services.

National Examples of Aspirational Policy

With changes to the Arizona state legislative landscape possible in the future the City of Tucson could look to other states for new strategies to incorporate affordable housing in new development. If Arizona were to repeal the Private Property Rights Protection Act
municipalities in the state would potentially use a larger range of tools, ordinances, and mandates to incentivize development. Some of the most effective tools to increase affordable housing stock in the United States have been inclusionary zoning and housing ordinances and zoning changes.

**Boston**

The city of Boston Massachusetts first created its Inclusionary Development Policy in 2000. This policy mandates that a developer building any structure containing more than ten housing units that requires zoning relief must include income restricted housing in their development. Since the inception of this program developers in Boston have contributed to the creation of over 2,600 affordable housing units in the city. Because of Boston’s very strong real estate market it has been able to leverage many policy instruments to affect affordable housing development. In 2019 the city updated the Inclusionary Development Policy to include projects that do not require zoning relief and are built under by-right rules. This change required a state law to be passed, after which the city of Boston could collect fees to boost its IDP fund from all large-scale projects in the city.

**Minneapolis**

In 2019 the Minneapolis city council voted to abolish single family housing city-wide in a dramatic and sweeping effort to fight exclusionary zoning practices. Prior to this legislation the City of Minneapolis’s single-family zoned land coverage area was approximately 70% of municipalities land use. In this effort the council effectively up-zoned the entire city of 425,000 residents. This change made it possible to build duplexes and triplexes on land parcels that were previously restricted to single family detached dwellings. As part of the same legislation the city reduced height restrictions, boosted inclusionary zoning policy, and abolished parking minimums. This suite of policy items have enabled the creation of additional housing units in critical areas to address the housing shortage experienced by many US cities today. The recency of the change makes it difficult to estimate the efficacy of the policies, but future evaluation is necessary to understand the impacts of this legislation.

**Regulatory Incentives**
## Monetary Incentives

<table>
<thead>
<tr>
<th>Example</th>
<th>Density, FAR, and height bonus</th>
<th>Flexible Design (Reduced setbacks, lot coverage relief, etc.)</th>
<th>Reduced and Shared Parking</th>
<th>Accelerated Approval/Fast Track Development Review</th>
<th>By-right</th>
</tr>
</thead>
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<td>Austin, TX</td>
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<td>San Antonio, TX.</td>
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<td>Flagstaff, AZ.</td>
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<td>Tempe, AZ.</td>
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<tr>
<td>Boston, MA.</td>
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<tr>
<td>Minneapolis, MN.</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
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</tbody>
</table>
National multi-family housing council, 2020
REFERENCES


G. Building Energy Analysis

Introduction:
Climate change is perhaps the greatest threat facing human civilization today. The impacts of climate change will affect local communities in the form of rising temperatures, increase in extreme heat events, drought, wildfires, floods, hurricanes, tornados, sea level rise, and increased spread of vector born illnesses. These hazards threaten public health as well as public and private property.

As hubs of economic productivity, cities are both a part of the problem and solution. Buildings and transportation make up over 55% of U.S. carbon emissions, according to the American Planning Association (Williams, 2022). And with the majority of U.S. population residing in cities and population growth expected to rise, cities are key leverage points for curbing greenhouse gas emissions (GHG) emissions and ensuring resiliency to climate change impacts. This presents an opportunity for local governments to mitigate climate forcing GHG’s and increase adaptive capacity by adopting laws, policies, and programs that support energy efficient buildings, renewable energy, green infrastructure, and smart growth patterns. A suite of strategies will be necessary to significantly curb GHG emissions, including working with local utilities and state legislators to increase renewable energy through renewable portfolio standards (RPS’s); local energy production laws (distributed energy); and local purchase agreements (CSA’s), however, this study focuses on land-use policies for increased building energy efficiency. Regardless of the approach taken, climate action must simultaneously address issues of distributional and representative equity when prioritizing public spending.

Cities are enabled to use land-use regulations to mitigate climate change through the standard zoning enabling act (Williams, 2022). These strategies include zoning code revisions and overlays that apply smart growth standards, subdivision regulations that require green infrastructure, and energy efficient and zero-energy building codes. Despite the cooling effect Proposition 207 has had on local governments applying land-use regulation, there is adequate rational for leveraging land-use mechanisms to protect public health, safety, and welfare – as well as private property values – against the impacts of climate change (Williams, 2022). Arizona is considered a “home rule state” and does not enforce a state-wide energy code. However, state statute enables local jurisdictions to adopt energy efficient building codes and standards (State Code Status, 2016). In 2011, the City of Tucson and Pima County adopted an ambitious voluntary Net-Zero Energy Building Standard, but according to local architects this standard is outdated and unused. Otherwise, new buildings must meet the International Code Council’s 2018 International Energy Conservation Code, which the City of Tucson adopted in 2018.

This study analyzes building energy consumption within the Broadway Corridor from Country Club Road to Willmott Avenue to understand opportunities for decreasing greenhouse gas emissions. The segment of the corridor employs nearly 240,000 people, representing 8% of city-wide employment, according to this study’s demographic analysis. It is also a major east-west transportation corridor, with Sun Tran bus line #8 prioritized for high-capacity transit in a 2009
study (Bentley, 2009). It has the potential to attract between 1,462 and 4,828 new housing units by 2032, according to this team’s scenario analysis. 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 Analysis:**
Not surprisingly, Energy Use Intensity (EUI) - measured in kilowatt hours per square foot, per year - varies by land use type. Figure 1 shows the EUI of different land use types in the study area, adapted from California’s emissions estimator model, CalEEMod. Building energy consumption in the study area is modeled by applying the EUI of each land use category to its total building square footage using ArcGIS. Building height is accounted for by dividing building height by 12 feet then multiplying by the building footprint resulting in a total building square footage.

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). 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.

![Figure 1. Energy Use Intensity of Land Use (kWh/sf/year) applying CalEEMod standards, Appendix D., Table 8.1 Assumptions: Climate Zone 15, FALSE, T24. Source:(California Pollution Control Officers Association, 2021)](image)

![Figure 2. Total Energy Consumption of Buildings in the District by Land Use (kWh/year)](image)
Case Study:

From 2011 to 2013, a three-year energy efficiency pilot project in Phoenix, Arizona applied energy efficient building standards to ten-square-mile urban corridor along the Valley Metro light rail line. *Energize Phoenix* – a joint collaborative between the City of Phoenix, Arizona State University, and Arizona Public Service – sought to improve the efficiency and cut carbon emissions of existing residential, industrial, office, and commercial buildings through renovations and upgrades. Project closeout reports found that of 38 commercial projects, an actual energy savings of 10% was yielded (Arizona State University Global Institute for Sustainability, 2012).
Opportunity A. Multi-family and Commercial Retrofit Program
Under current levels of transit infrastructure along Broadway, it is unlikely that transit will drive a market for new housing. Under this assumption, one approach the City could take to address energy consumption is to pilot an aggressive retrofit program targeting the biggest energy users in the district. If all commercial buildings in the Broadway Corridor from Country Club Road to Willmott Ave received a retrofit and upgrade package achieving 10% efficiency savings, they could avoid 32,730,998 kWh, or the CO2 equivalent of 2,868 passenger vehicles per year. The two malls in the district, Park Place and El Conquistador, consume over 30 million kWh alone (6% of the district total) – the CO2 equivalent of 2,675 passenger vehicles per year.

On the other hand, there are approximately 2,572 multi-family housing units within the district (assuming these are typical one-bedroom units at 765sf). Multifamily housing tends to be renter occupied, providing critical housing for low-income and fixed-income individuals – those who have historically had less access or capital for private home ownership in single-family detached neighborhoods. Household spending on energy impacts low-income households disproportionately compared to higher-income families. According to the American Council for an Energy Efficient Economy (ACEEE), “low-income multifamily, non-white, and Hispanic households experience high energy burdens, using a large share of their income to pay for energy bills. Nearly half of low-income multifamily households experience an energy burden greater than 6% (American Council for an Energy-Efficient Economy, 2020).” 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.

In Arizona, 25% of household energy use is spent on air conditioning, according to the Energy Information Administration (Energy Information Administration, n.d.). A 2019 Climate Central study showed Tucson as third fastest warming city in the nation, with 18 more days over 105 than in 1970 (Climate Central, n.d.). In Pima County, 39 people die of heat related illness per year, according to the Arizona Department of Health Services (Arizona Department of Health Services, n.d.). When the choice is between food and eviction, low-income households are more likely to avoid the cost of energy bills by enduring higher temperatures or waiting longer to turn on air conditioning (Cong et al., 2021). This significantly increases exposure to heat-related illness, where ambient air temperatures and extreme heat events are projected to increase due to climate change.

This energy burden and climate injustice could be rectified through weatherization retrofits and appliance upgrades that make buildings more resilient and rent more affordable. According to the ACEEE, multifamily retrofits can expect an energy savings of 17% on average. A NYC program, the HUD Green Retrofit program, and a California program saw an energy savings of 22%, 24% and 38% respectively (American Council for an Energy-Efficient Economy, 2020). If all 2,572 multifamily units in the Broadway Corridor from Country Club Road to Willmott Ave received a retrofit and upgrade package achieving 20% energy savings, they could save $70.74
per unit, per year (571 kWh), or $182,721 total - the CO2 equivalent of 129 passenger vehicles per year.

**Opportunity B. Incentivize passive survivability standards for all new multi-family housing**
Tucson is dominated by low-density single-family housing. With only 20% of the housing stock comprised of multi-family units, it is missing middle housing types such as courtyard apartments, townhomes, and low-rise apartments (*Housing Type | MAP AZ Dashboard*, n.d.). According to this team’s market study, it is feasible to attract between around 1,776 new housing units to the Broadway Corridor with dedicated lane Bus Rapid Transit infrastructure in place. This presents an opportunity to increase the housing stock, particularly for multifamily rental units and townhomes. It also presents an opportunity to avoid future carbon emissions from building energy consumption through energy efficient building codes and standards.

The PHIUS+2015 Passive Building Standard is a passive building standard created by Passive House Institute US. Adhering to this standard can decrease building energy demand by between 60 and 85% over typical code-compliant multifamily buildings (*Multifamily | PHIUS*, n.d.). This passive survivability standard also means that interior temperatures remain safe even during power outages, increasing resilience against extreme heat and power grid vulnerabilities. While Tucon’s adoption of the 2018 IECC is a step in the right direction, if all 1,776 new multifamily units within the Broadway Corridor were required to meet the PHIUS standard, they could expect to achieve 70% energy savings over the typical unit. A typical unit consumes about 2,853 kwh per year. Thus, the energy savings per unit would be 1,997 kWh per year and pencils out to $248 in energy cost savings per unit, per year. If applied to all 1,776 units this equates to 3,547,000 kWh or the CO2 equivalent of 311 passenger vehicles per year. However, these cost savings and resilience benefits come at a greater construction cost. Thus, incentives would need to be in place to both encourage its application and to maintain housing affordability.

**Opportunity C. Retrofit El Con Mall and require passive survivability standard for all new multifamily housing**
Among other rationales, the City could pursue a strategy to purchase and redevelop one of the malls in the district and pilot strategies around energy efficiency, renewable energy, and green infrastructure to create a model sustainable, livable, and equitable mixed-use district. El Con Mall consumes approximately 13,133,279 kWh per year. A retrofit achieving 10% energy savings could save $162,853 dollars in annual energy spending, or avoid the CO2 equivalent of 115 passenger vehicles per year.

Higher levels of infrastructure investment, paired with developer incentives, could generate a market for infill development around El Con Mall. According to this team’s market study, it is feasible to attract around 4,828 new housing units to the Broadway Corridor with fixed rail Street Car infrastructure in place. If all 4,828 new units were built to the PHIUS standard, achieving a 70% savings over conventional building standards, this would avoid 9,642,000 kWh of energy consumption per year, or the CO2 equivalent of 845 passenger vehicles per year.
Table 1.1 Energy conservation strategies

<table>
<thead>
<tr>
<th></th>
<th>Scenario A.</th>
<th>Scenario B.</th>
<th>Scenario C.</th>
<th>Retrofit El Con Mall</th>
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<td><strong>Multifamily retrofit program</strong></td>
<td>20% savings rate</td>
<td>20% savings rate</td>
<td>20% savings rate</td>
<td>70% savings rate</td>
</tr>
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<td>1 all existing buildings</td>
<td>1 all new units (1)</td>
<td>1 all new units (1)</td>
<td>1 all existing mall buildings</td>
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<tr>
<td><strong>Commercial retrofit program</strong></td>
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<td>30% savings rate</td>
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<td># existing units (1)</td>
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<tr>
<td><strong>Incentivize PHIUS standard for new multifamily infill</strong></td>
<td>70%</td>
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<tr>
<td>Require PHIUS standard for new multifamily infill at El Con Mall</td>
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<tr>
<td><strong>Total energy per unit (kWh)</strong></td>
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<td><strong>Savings per unit (kWh)</strong></td>
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<td><strong>CO2 avoided per unit</strong></td>
<td>485</td>
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<td><strong>CO2 avoided per unit</strong></td>
<td>27,821,588</td>
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<td><strong>Total existing units</strong></td>
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<td><strong>New MF at El Con</strong></td>
<td>1,467,883</td>
<td>1,467,883</td>
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<tr>
<td><strong>Total savings across units</strong></td>
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<td><strong>Total CO2 avoided</strong></td>
<td>188,980</td>
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<td><strong>Total CO2 avoided</strong></td>
<td>325</td>
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Conclusions:
The city has the opportunity to decrease energy, housing, and transportation burden for its most vulnerable population by investing in energy-efficient retrofits and highly energy-efficient building standards for new multi-family infill within the Broadway Corridor. There are many strategies the City could pursue, including targeting the greatest energy user - commercial sector redevelopment and adaptive reuse, or increasing on-site renewable energy and green infrastructure. Addressing permanent multifamily affordability and energy burden through retrofitting and adopting aggressive energy-efficient building codes such as the PHIUS standard for passive survivability would yield greater social benefit for individuals historically disadvantaged and disproportionately burdened by environmental health hazards. Multiple planning best practices could be achieved through the redevelopment of the El Con Mall, including increased energy efficiency and energy affordability for multi-family infill housing.

Next steps:
This study is limited to building energy efficiency. Further studies to identify opportunities and constraints for creating low-carbon buildings and districts include potential energy generation capacity for on-site renewable infrastructure, plus storage; green infrastructure capacity to reduce urban heat island; district-scale energy and waste systems; and quantifying the energy and emissions from a reduction in vehicle miles traveled through increased transit ridership and mode shift.

References:


Housing Type | MAP AZ Dashboard. (n.d.). Retrieved May 7, 2022, from https://mapazdashboard.arizona.edu/housing-type


I. Infill Capacity Study: A Look at three Sites on the Broadway Corridor

Overview

This study evaluates the potential for missing-middle residential development along the Broadway corridor from Country Club Road East to Wilmot Road. The primary areas targeted are the El Con Mall complex, a vacant parcel on the SW corner of Broadway and Rosemont, and the Park Place Mall at the eastern edge of the corridor. These sites were chosen because of the large amounts of unused, vacant or underutilized land that currently exists. They also all have good access to amenities, employment opportunities, and transit. This proximity to amenities makes these sites well positioned for medium density, missing middle residential development opportunities.

Methodology/Assumptions

To understand each site’s capacity for residential infill, standards from the Sunshine Mile Urban Overlay District (SMUOD) were applied. The Mid-Century subarea standards were utilized as they are most characteristic of the existing density and urban form of the study area. Each site’s overall area, in acres, was calculated using ArcGIS Pro and Google Earth. The square footage of existing commercial buildings was deducted from the overall site area and used to calculate the number of required parking spaces at 1 space per 500 square feet ground floor area, in accordance with the SMD. The remaining net site area available for development was equal to the overall site area, minus existing building square footage and associated parking. Thirty percent of the remaining net site area was set aside for open space, as required by the SMUOD, leaving a net buildable area. The net buildable area must accommodate both the building ground floor footprint and required parking at 1 space per dwelling unit, in accordance with the SMUOD. For comparison across sites, a standard dwelling unit and parking space assumption was applied to the net buildable area at 1,800 square feet per unit (900sf ground floor dwelling, three stories tall, with 300sf of parking per unit). This parking space assumes a 10’ x 18’ space, plus half the width of a 24’ wide drive lane. Net buildable area was then divided by 1,800sf, resulting in a maximum number of dwelling units. This yield was compared to the maximum allowable density of 40 dwelling units per acre, as designated by the SMUOD.
Results

The results of the study show the potential for the inclusion of residential housing units on each of the three respective sites. Table 1. shows the maximum capacity of each of the three sites for accommodating infill housing. After applying this methodology across all three sites, identified El Con as having the greatest infill development potential in terms of underutilized space.

<table>
<thead>
<tr>
<th>Table 1. Maximum Infill Capacity</th>
</tr>
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<tbody>
<tr>
<td><strong>El Con</strong></td>
</tr>
<tr>
<td>Net Site Area</td>
</tr>
<tr>
<td>Net Buildable Area</td>
</tr>
<tr>
<td>number of units at 3 stories</td>
</tr>
<tr>
<td>density</td>
</tr>
<tr>
<td>Max. Capacity</td>
</tr>
<tr>
<td>860</td>
</tr>
</tbody>
</table>

| **Park Place**                  |
| Net Site Area                   | 926,780  |
| Net Buildable Area              | 648,746  |
| number of units at 3 stories    | 1,081    |
| density                         | 51       |
| Max. Capacity                   | Max. Allowable |
| 360                             | 851       |

| **Broadway + Rosemot**          |
| Net Site Area                   | 318,859  |
| Net Buildable Area              | 223,201  |
| number of units at 3 stories    | 372      |
| density                         | 51       |
| Max. Capacity                   | Max. Allowable |
| 124                             | 293       |

The primary focus area of the methodology was the El Con Mall because of the intensive access to amenities and potential for residential development based on the large amount of unused parking. Using the overall available area this feasibility study determined that the El Con Mall area could potentially accommodate up to approximately 2,500 units of housing configured in three story apartment buildings. If the area was developed with a mix of housing types the result may be fewer total units but may be more palatable to the broader community. A mix of housing types at 60% apartments, 30% townhomes, and 10% duplexes would yield approximately 1,800 housing units spread across the net buildable area. It should be noted that this is just one configuration at approximately 35 DU/Ac. Future studies could apply a lower density and involve the public in creating a site plan to increase community receptivity and ownership.

If an overlay zoning tool could be leveraged to incentivize the inclusion of affordable units in the development, many affordable units could be created. At 15% inclusion 376 affordable units would be created, at 20% 500 units, at 25% 625, and at 30% 752 units would be created.
Map 1. El Con Infill Development Potential Site Plan

Table 2. Development Potential Assumptions and Outcomes

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

Future Opportunities

This development potential study of the El Con Mall site is limited by scope and time and could be expanded upon. The proposed development structure serves to show potential land use based upon a limited set of variables and does not incorporate community input, site planning, feasibility and market studies, as well as many other
factors. It does show that there is a large amount of land in central Tucson that could be redeveloped significantly to provide infill semi-urban housing with fantastic access to opportunity.

The level of transit investment could have a significant effect on development at the El Con Mall site. The site can potentially accommodate 200,000,000 sq ft apts at approximately 30 DU/Ac. Which would be in the SMUOD zoning limit of 40 DU per acre. This site could become a major hub of transit-oriented development for Tucson. The most significant transit investment that would spur this development is the extension of a fixed rail system east along Broadway. Fixed rail transit has been correlated to market strength and could provide the right conditions to create the kind of increased density proposed by this study.
J. Community Outreach Plan

Acknowledgments
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 would be 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.

The recommendations within Table 2. Potential Methods of Communicating with the Public in the Broadway Corridor is not a perfect nor an exhaustive list of community outreach methods to improve equitable community outreach in the Broadway Corridor. These are inspiring lessons learned from the College of Architecture, Planning and Landscape Architecture at the University of Arizona, as well as community outreach methods recently conducted in Salem and Eugene, Oregon that were presented at the 2022 National American Planning Conference (Harding, et al, 2022). Further research within the Broadway Corridor should be conducted by community service specialists to select which community outreach methods may be best applicable.

Public Inclusion Approach
Community outreach is essential to urban planning processes because it provides government agencies with internal knowledge of what communities need in terms of infrastructure and reassurance in the present and future. Different levels of public engagement will connect with different types of stakeholders. It is essential when considering the future of communities to have a shared learning experience with who will be impacted by governmental decisions such as the encouragement of transit-oriented development (TOD) (Iroz, et al, 2021: 3). When conducting community engagement, government entities need to consider equitable outreach strategies which includes targeting underrepresented populations like minority groups and young people alongside currently vocal residents and stakeholders from the community.

When considering drastic changes to a community, such TOD, collaboration over consultation is necessary to build trust through holistic and circular processes that not only extracts necessary information from targeted community members to move forward with plans, but rather to incorporate the community throughout the decision making processes to enforce transparency and accountability (Pollock-Ellwand, et al, 2022).
These aspirational goals for circular community engagement would consider diverse community stakeholders as partners during TOD decision making processes. This approach could potentially increase support for policies and methods of TOD rather than opposition because it would provide context, genuine deliberation and incorporation of the diverse community of Broadway as a whole.

**Existing Tucson eTOD Strategic Plan**

Tucson’s Equitable Transit-Oriented Development Strategic Plan was recently implemented using an FTA grant awarded in June 2020. This eTOD Strategic Plan refers to the North-South transit corridor that expands 15 miles from the Tohono Regional Transit Center on the north end to the Tucson International Airport on the south end along Oracle and 6th Ave, which includes a ¾ Mile buffer. This plan defines the project, its intentions, and has diverse methods of community engagement proposed. It incorporates traditional and more equitable methods to better ensure more community members are incorporated in the decision making process. More traditional methods include public meetings and drawing people to events and providing information, while more equitable outreach methods include reaching people and meeting them where they are. Examples provided by this strategic plan of improved methods of communicating with the public are shown in Table 1 (City of Tucson and South Tucson, 2021: 18-21). This is affirmed by their three phases of community engagement which include: Phase I: Kickoff and Initial Listening, Phase II: Sharing and Findings and Consultation, and Phase III: Development of Draft and Final eTOD Plan (23). Overall, it is a more collaborative process that will enable the City of Tucson to better reach populations of people who are typically disadvantaged or underrepresented in more traditional community engagement processes. However, despite the major improvements this plan reflects in community engagement, there is still room for improvement.
<table>
<thead>
<tr>
<th>Method for Communicating with the Public</th>
<th>Type of Outreach Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Open Houses</td>
<td>Public Meeting</td>
</tr>
<tr>
<td>Workshops</td>
<td>Public Meeting</td>
</tr>
<tr>
<td>Popups and Demonstration Projects</td>
<td>Public Meeting</td>
</tr>
<tr>
<td>Project Website</td>
<td>Drawing People to Events and Providing Information</td>
</tr>
<tr>
<td>E-Notifications and Social Media</td>
<td>Drawing People to Events and Providing Information</td>
</tr>
<tr>
<td>Surveys and Polls</td>
<td>Drawing People to Events and Providing Information</td>
</tr>
<tr>
<td>Visualization Techniques</td>
<td>Drawing People to Events and Providing Information</td>
</tr>
<tr>
<td>Neighborhood-Based Ambassadors</td>
<td>Reaching People and Meeting Them Where They Are</td>
</tr>
<tr>
<td>Partnering to Expand Engagement</td>
<td>Reaching People and Meeting Them Where They Are</td>
</tr>
<tr>
<td>Community Dialogue and Storytelling</td>
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</tr>
<tr>
<td>Focus Groups</td>
<td>Reaching People and Meeting Them Where They Are</td>
</tr>
<tr>
<td>Corridor and Land-Use Assessments</td>
<td>Reaching People and Meeting Them Where They Are</td>
</tr>
<tr>
<td>User Group Surveys</td>
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</tr>
<tr>
<td>Community Outreach Events</td>
<td>Reaching People and Meeting Them Where They Are</td>
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Building on the Existing Tucson’s eTOD Strategic Plan for the Broadway Corridor

While Tucson’s Equitable Transit-Oriented Development Strategic Plan is a step forward in the right direction, it can still be improved to encourage a more equitable community outreach strategy. Rather than starting over the strategic plan, it is more efficient to add to the methods of communicating to reach more historically disadvantaged communities in the planning like ethnic groups, youth and young adults, disabled people, and lower income residents to name a few (Harding, et al, 2022). To best reach these historically disadvantaged communities, the City of Tucson needs to go further with their strategies to reach people and meet them where they are by developing better relationships with these communities by hiring more community service/organizing specialists, paying people for their time and input on community experiences, directly engaging with younger populations, and resident cultural asset and pedestrian mapping to continue ongoing communication and engagement despite the completion of projects.

Hiring Professional Community Service Staff and Facilitators

According to Tucson’s Equitable Transit-Oriented Development Strategic Plan, the Department of Transportation and Mobility (DTM) will be utilizing the existing methods for communicating with the public in Table 1 (2021, 19). However, no current community service/organizing managers were found within the department. Hiring In-house Community Service/Organizing Managers and staff, who have the professional expertise on how best to reach targeted communities, develop a long-lasting relationship, as well as analyze data to determine the effectiveness of community outreach programs are necessary to develop efficient and improved programs, services and outreach activities (U.S. Bureau of Labor Statistics, 2022). This division of the department could contribute to ongoing communication and engagement that would increase trust and engagement with underrepresented communities through holistic and circular processes of community engagement over time, and determine which locations within these communities are best to reach and meet them where they are primarily located. Also, partnering with organizations that specialize in facilitation and community service would be a step in the right direction for certain outreach intentions to build trust between communities and the city.

Compensated Lottery-Selected & Equity-Focused Panels

In community engagement, typically hard to reach underrepresented populations can include ethnic groups, low income, youth, and disabled populations. A couple of ways to diversify community outreach regarding TOD could be to develop a “Public Involvement Plan” to intentionally attract and reach people where they are located by developing a
lottery-selected panel using random sampling with GIS and demographic census data, an equity panel, and locations where the youth are prominent like youth centers, schools, and online tools. With all these methods of engagement, it is also important to consider monetary compensation for adults or raffle opportunities for youth as incentives for participation to widen the net on who would participate. These panels should be independently facilitated to receive honest feedback and input from community members. Panel demographics could include but would not be limited to age, council wards, disability, renter/homeowner, gender, race/ethnicity, and levels of education (Harding, et al, 2022). For example, the City of Eugene, Oregon partnered with the nonpartisan nonprofit Healthy Democracy to develop their 2020 Eugene Review Panel on Middle Housing. It cost around $60,000, which consisted of a diversity of 29 Eugene residents who were respondents of randomly selected 7,500 residents within the city’s jurisdiction. These panels occurred online, were led by professional facilitators, open to public observers via YouTube live stream, and a stipend of $560 for about 35 hours of their time. People without access to computers were loaned a laptop and personal technical assistance. This was followed by the development and review of the Panel’s four interactions of their report and future public engagement recommendations to assess the city’s work (2020 Eugene Review Panel On Housing). Partnerships with professional community engagement organizations and the development of intentional and diverse panels can increase the city’s knowledge on which areas and destinations of the Broadway Corridor are important to the community, what the community overall needs in terms of access to infrastructure and amenities, and how best these underrepresented groups can be reached in the future.

**Youth Outreach Initiatives**

When considering the future of the Broadway Corridor it should also include who the potential future users of these spaces will be, which is the youth of the current community. Typically, youth are underrepresented in the community outreach process. However, some methods to reach these groups could be to collaborate with the city’s youth programs, schools, teachers, and advisors, as well as holding forums online with interactive polls and raffle prizes as compensation incentives to encourage attendance and feedback (Harding, et al, 2022). By engaging with young people early on in the community outreach process at their locations of comfortability and access, the City of Tucson can better understand their needs in terms of accessibility, mobility, and identity as well as how to improve their outreach methods for the future.

**Resident Cultural Asset and Pedestrian Mapping**

When considering redevelopment opportunities that typically come along with TOD, the City of Tucson needs to consider cultural assets and the pedestrian experience of the Broadway Corridor. Cultural Asset and Pedestrian Mapping techniques could be better
used if the residents within the communities were able to identify tangible and intangible resources as well as pedestrian infrastructure that needed improvement. This collaborative process usually uses ArcGIS mapping surveys, but Google Maps could be a more accessible mapping tool for the general public. This concept is inspired by Professor Helen Erickson, who realized Greg Baeker’s 2005 model for cultural asset mapping within communities in Tucson titled in which she referred to them as “Tucson Community Treasures” (Erickson, et al, 2020: 3-4). This is a community engagement tool that would rely on the City of Tucson to develop the survey, introduce the concept to the public and ensure underrepresented communities had access to the survey. This would provide the city with a better understanding of which parts of the Broadway Corridor contribute to its cultural identity as well as which areas need improvement.

Table 2. Potential Methods of Communicating with the Public in the Broadway Corridor

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References


