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GREENING AMERICA'S COMMUNITIES

BROWNSVILLE, TX

GREENING AMERICA'S COMMUNITIES

Greening America's Communities is an EPA program to help cities and towns develop an implementable vision of environmentally friendly neighborhoods that incorporate innovative green infrastructure and other sustainable design strategies. EPA provides design assistance to help support sustainable communities that protect the environment, economy, and public health and to inspire local and state leaders to expand this work elsewhere.

Greening America's Communities will help communities consider ways to incorporate sustainable design strategies into their planning and development to create and enhance interesting, distinctive neighborhoods that have multiple social, economic, and environmental benefits.

Brownsville, Texas was chosen in 2016 as one of six communities to receive this assistance along with Columbia, South Carolina; Honolulu, Hawaii; Multnomah County, Oregon; Muscatine, Iowa and Oklahoma City, Oklahoma.

More information is available at: https://www.epa.gov/smartgrowth/greening-americas-communities

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1 EXECUTIVE SUMMARY

The city of Brownsville, Texas is in the process of planning and implementing policies and projects that aim to improve stormwater management and improve public space for pedestrians, bicyclists, and drivers. City staff is particularly interested in exploring improvement in their historic downtown and along International Boulevard—an important street in Brownsville connecting the city with Matamoros, Mexico. The boulevard borders the southern edge of Brownsville's historic downtown and is lined by school campuses, small businesses, and working class neighborhoods.

The city requested technical assistance from the U.S. Environmental Protection Agency (EPA) via the Greening America's Communities (GAC) initiative to develop schematic design options for improving stormwater management and public space along and in the vicinity of International Boulevard. The city worked with the EPA and the design team to select five sites to focus on for development of conceptual designs.

The EPA funded a design team to study the five sites, become familiar with other planning and visioning efforts, and develop design options highlighting opportunities for green infrastructure. Green infrastructure strategies recognize that rainwater acts differently in urban areas than it does in natural areas. By incorporating natural stormwater approaches in urban areas, more stormwater can be managed and become an asset rather than simply a nuisance.

The design team began with a site visit and met community leaders and residents to discuss the chosen sites. The team documented existing conditions of the surrounding greater downtown area and the five individual sites, and then created two design options for each site. One design presented a short term feasible option, while the other presented a more ambitious option. During a three day design charrette held June 19, 20, and 21 of 2017, the design team received feedback on the design options at public stakeholder meetings and public events. Additionally, the design options were shared at a workshop in the Buena Vida neighborhood as part of the EPA Building Blocks for Sustainable Communities technical assistance program. The feedback guided the refinement of the final design options.

The refined design options generally focus on improving or enhancing existing public spaces. At streets and sidewalks the design options enhance the pedestrian experience with more shade, wider sidewalks, and vegetation while maintaining vehicular traffic circulation. Many comments made during the charrette related to better connectivity between areas along International Boulevard. The design options suggest using pedestrian improvements to increase connectivity between the boulevard, downtown, and the Buena Vida neighborhood.

Furthermore, stormwater management infrastructure such as stormwater parks, rain gardens, and tree cells are suggested to help not overwhelm existing stormwater infrastructure and help mitigate localized flooding. Additional benefits also include improving water quality and enhancing the public space along International Boulevard. Public comments were in favor of green infrastructure as long as there is a realistic maintenance plan in place that will keep components functional and visually attractive.

There are near-term funding, partnership, and public outreach opportunities the city can take to implement the design options developed through the GAC initiative. This process has reinforced the importance of International Boulevard and the potential this street has to transform the surrounding area by being more walkable, bicycle friendly, visually attractive, and environmentally friendly.

1 RESUMEN EJECUTIVO

La ciudad de Brownsville, Texas, está en el proceso de planificación e implementación de políticas y proyectos que apuntan a mejorar el manejo de aguas pluviales y mejorar el espacio público para peatones, ciclistas y conductores. El personal de la ciudad está particularmente interesado en explorar las mejoras en su centro histórico y en International Boulevard, una importante calle de Brownsville que conecta la ciudad con Matamoros, México. El bulevar bordea el extremo sur del centro histórico de Brownsville y está bordeado por campus escolares, pequeñas empresas y vecindarios de clase obrera.

La ciudad solicitó asistencia técnica de la Agencia de Protección Ambiental de Estados Unidos (EPA) a través de la iniciativa Greening America's Communities (GAC) para desarrollar opciones de diseño esquemático para mejorar el manejo de aguas pluviales y el espacio público a lo largo y en las cercanías de International Boulevard. La ciudad trabajo en conjunto con la EPA y el equipo de diseño para seleccionar cinco sitios en los cuales enfocarse para el desarrollo de diseños conceptuales.

La EPA financió un equipo de diseño para estudiar los cinco sitios, familiarizarse con otros esfuerzos de planificación y visión, y desarrollar opciones de diseño que destaquen las oportunidades para la infraestructura ecológica. Las estrategias de infraestructura verde reconocen que el agua de lluvia actúa de manera diferente en las áreas urbanas que en las áreas naturales. Al incorporar enfoques naturales de aguas pluviales en las áreas urbanas, se puede administrar más agua pluvial y convertirse en un activo más que una simple molestia.

El equipo de diseño comenzó con una visita al sitio y se reunió con líderes comunitarios y residentes para analizar los sitios elegidos. El equipo documentó las condiciones existentes del área del centro de la ciudad y los cinco sitios individuales, y luego creó dos opciones de diseño para cada sitio. Un diseño presentó una opción factible a corto plazo, mientras que el otro presentó una opción más ambiciosa. Durante una charrette de diseño de tres días celebrada el 19, 20 y 21 de Junio del 2017, el equipo de diseño recibió comentarios sobre las opciones de diseño en las reuniones públicas de partes interesadas y eventos públicos. Además, las opciones de diseño se compartieron en un taller en el vecindario Buena Vida como parte del programa de asistencia técnica de EPA Building Blocks for Sustainable Communities. La retroalimentación guió el refinamiento de las opciones del diseño final.

Las opciones de diseño refinadas generalmente se enfocan en realzar o mejorar los espacios públicos existentes. En las calles y aceras, las opciones de diseño mejoran la experiencia peatonal con más sombra, aceras más anchas y vegetación, a la vez que se mantiene la circulación del tránsito vehicular. Muchos comentarios realizados durante la charrette se relacionaron con una mejor conectividad entre las áreas a lo largo de International Boulevard. Las opciones de diseño sugieren el uso de mejoras peatonales para aumentar la conectividad entre el bulevar, el centro y el vecindario Buena Vida.

Además, se sugiere que la infraestructura de gestión de aguas pluviales, como parques de aguas pluviales, jardines de lluvia y células de árboles, no ayude a abrumar la infraestructura existente de aguas pluviales y ayude a mitigar las inundaciones localizadas. Los beneficios adicionales también incluyen mejorar la calidad del agua y mejorar el espacio público a lo largo de International Boulevard. Los comentarios públicos fueron a favor de la infraestructura verde siempre que exista un plan de mantenimiento realista que mantenga los componentes funcionales y visualmente atractivos.

Hay oportunidades de financiación, asociación y participación pública a corto plazo que la ciudad puede tomar para implementar las opciones de diseño desarrolladas a través de la iniciativa GAC. Este proceso ha reforzado la importancia de International Boulevard y el potencial de esta calle para transformar el área circundante al ser más accesible, apta para ciclistas, visualmente atractiva y respetuosa con el medio ambiente.

FIGURE 1 *Illustrating the project area in relation to a larger context.*

2 INTRODUCTION

International Boulevard is in a crucial location in Brownsville, connecting Matamoros, Mexico with Brownsville and beyond. It is immediately adjacent to historic downtown Brownsville and the two higher education campuses: the University of Texas Rio Grande Valley (UTRGV) and Texas Southmost College (TSC). Momentum to improve the project area and the overall downtown has been building, placing International Boulevard in an important role for the continued development of the city.

In 2015, Brownsville was designated a Main Street City by the Texas Historical Commission, making revitalization resources available to the city and downtown business and property owners. Additionally, the city is currently transforming the historic Market Square area into a pedestrian plaza, and next door the historic Stegman building is under construction, being transformed into a performing arts academy. These and several other exciting developments are working to make downtown more of a destination, and are important factors that framed the context for the downtown sites.

International Boulevard was once an international commercial trucking corridor. Eighteen wheel trucks would travel between U.S. Highway 69/77/83 to the north and Gateway International Bridge to the south. A new international crossing, Veterans Bridge, opened in 1999 becoming the trucking route between Brownsville and Matamoros. Though the truck traffic has moved, International Boulevard remains a road built for truck traffic. The road is oversized for the amount of traffic it carries, having four wide directional lanes, a wide continuous center turning lane, and wide shoulders. The road disconnects the neighborhoods on the east with those on the west and disconnects the downtown area with TSC and UTRGV. There is a sidewalk on both sides of the road but it is intersected by many commercial driveways and parking areas. The wide roadway encourages high speeds, making walking and biking feel unsafe. There are a few crosswalks across International Boulevard but there is only one safe intermediate waiting area in the middle of the street. The existing crosswalk lengths take a long time to cross, but the signaled time to cross is too short to walk at comfortable speeds. Additionally, the time between crossing signals is inconveniently long. There are almost no trees or vegetated areas along the road, creating an unshaded, uncomfortable condition for pedestrians and bicyclists. The region's high temperatures and humidity make unshaded areas very uncomfortable. Stormwater runoff carries contaminants from the large road surface into storm drains that lead directly to resacas or to the Rio Grande. Resacas are a result of the historic annual flooding of the Rio Grande prior to the levees being built that run along the river today. The historic flood waters carved new channels that remained filled with water when the floodwaters receded. Resacas are the water filled remnants of those channels.

Draining stormwater out of the city is a process that requires coordination with other entities. Drainage canals and resacas are maintained by county irrigation districts, drainage districts, and/or by the Brownsville Public Utilities Board. Draining into the Rio Grande requires coordination with irrigation districts and the International Boundary & Water Commission. Green infrastructure strategies that slow down stormwater can assist in successful coordination with other entities. Green infrastructure is a cost-effective approach to improving and increasing the capacity of traditional drainage infrastructure systems that also provides multiple community benefits. These strategies are designed to mimic nature by slowing and filtering stormwater before it reaches either the traditional storm drainage system or a natural body of water.

The design process for the GAC initiative began with a site visit where the design team walked the five individual sites with city staff, and were given a driving tour of the greater downtown area. The five sites were discussed in detail with city staff and other stakeholders to gain comprehensive input on the sites. The design team met many residents and community leaders by attending a Cyclobia; a regular event where downtown streets are temporarily closed to vehicles but open to pedestrians and bicycles.

The major community concerns heard during the site visit focused on getting safely around downtown, improving the appearance of downtown, and improving drainage to minimize flooding. The two biggest pedestrian concerns were the need for safer crossings at the Gateway International Bridge and across International Boulevard. However, there was also the need to avoid delaying vehicular traffic. Enhancing sidewalks, green areas, and other public spaces were suggested for improving the image of downtown.

To help city residents and city staff weigh potential options to addressing their priorities, the design team created two design options for each site, to receive feedback on. One of the designs for each site presented a short term feasible option; while the other presented a more ambitious option. Each design option showcases how green infrastructure can be incorporated in each site to help mitigate flooding and create more pleasant places, and how smart growth ideas can improve pedestrian access and safety.

FIGURE 2 *The Rio Grande River in Brownsville, Texas.*

3 COMMUNITY ENGAGEMENT

WORKSHOP DESCRIPTION

The design team gathered feedback on the design options in two ways: five stakeholder meetings and two public events.

The team held small stakeholder meetings where each meeting focused on a theme: downtown business and arts community, movement, border operations, built environment, and green infrastructure. Each stakeholder meeting focused on different aspects of the design options, in order to gather unique feedback from each stakeholder group.

FIGURE 3 *Community members review multiple design options on site during a charrette.*

The first public event was a walking tour of the five sites where residents experienced the existing benefits and challenges of each area. One of the more memorable experiences was the challenge attendees had crossing International Boulevard on foot. During the walking tour of the five sites, the design team presented the design options and precedent studies with display boards. The second public event was a presentation of the revised design options based on everyone's feedback.

STAKEHOLDER FEEDBACK

The downtown business owners and the art community stakeholder group prioritized better connections, better pedestrian and bicycle infrastructure, parking, and landscaping that is well maintained. They envisioned a better connected historic downtown with the TSC and UTRGV campuses, in order to make downtown more of an experience for students and faculty. Business owners noted that more pedestrians are better for business, and improvements like shaded sidewalks and safe bike areas would create a better walking and biking experience. The art community suggested incorporating artists into revitalization projects, especially projects with highly visual aspects such as creating visually attractive sidewalks.

The movement stakeholders included city traffic department officials, bicycle and pedestrian advisory committee members, a federal transportation official, and city public transportation officials. Their priority issues and goals focused on safe bike and pedestrian infrastructure and avoiding traffic backups. The stakeholders had concerns that a single vehicle lane each way on International Boulevard would back up traffic, but did favor formalizing drop off and pick up areas near the bridge. The group favored bikeways that were separated from roadways and the approach to creating safer pedestrian crossings.

The priority issue of the border operations stakeholder group included concern that public space near the international bridge proposed in the design options should not offer direct views of border operations. They shared the goal of

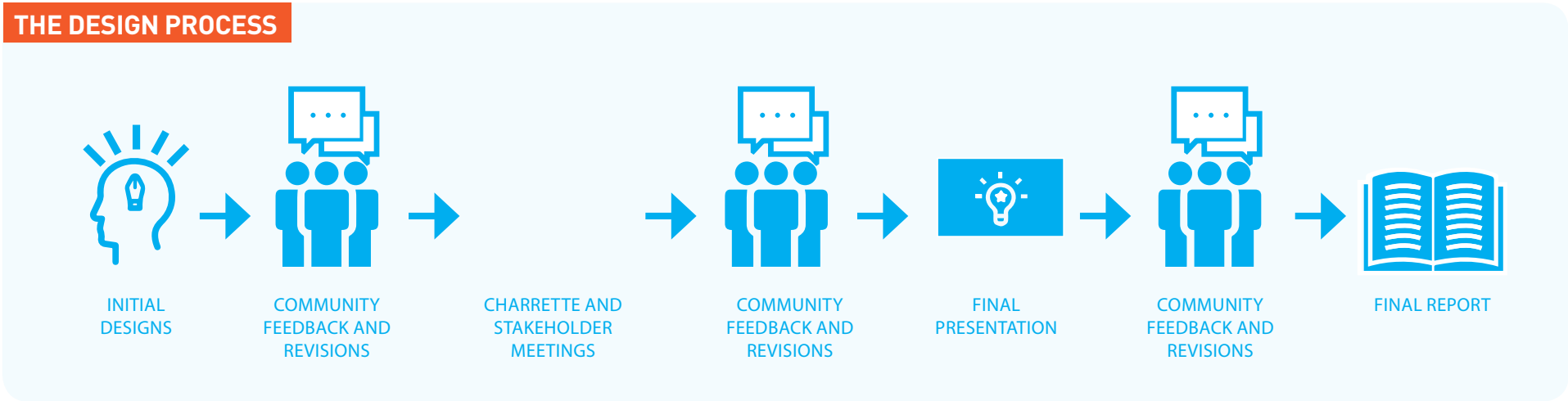


FIGURE 4 *A diagram of the design process.*

improved pedestrian safety near the bridge. A representative from the Customs and Border Protection Services shared that a redesign of the bridge crossing had been developed that included pedestrian safety improvements. No specific details of the plan were mentioned, but plans would be shared, if and when there is funding, so details may be coordinated appropriately.

The built environment stakeholder group included architects and city staff. An architect brought forward the importance of ensuring design cohesion between the five different sites. Stakeholders recognized there is an opportunity to celebrate the history of Alice Wilson Hope Park with park enhancements. The park is the site where ferries transported people and goods across the river before bridges were built. The park is also recognized as one of the starting points for the Chisholm Trail, a historic cattle driving route.

The priority issue of the green infrastructure stakeholder group was ensuring maintenance plans are feasible and followed. Some civil engineers and city staff had concerns that permeable pavers are difficult to keep fully operational. They also pointed out the importance of ensuring irrigation is used for planted areas during dry periods.

PUBLIC MEETING FEEDBACK

The walking tour presented a unique opportunity for residents to think about and offer feedback on downtown, International Boulevard, and the spaces in between. The intrigue of the event was effective in drawing participants with different views and experiences of the five sites.

The feedback on the tour was geared to the pedestrian and biking experience, and to landscape design. Envisioning the pedestrian improvements at the very sites on which they were proposed was useful for seeing the importance of better connections between downtown and TSC/UTRGV, and for seeing the potential of the alleyways.

The second public meeting was a presentation of the revised design options. One design option for each site was presented which included a perspective image of the design option. The feedback was positive and the potential for the alleyways was echoed. The importance of a budget for a landscape maintenance plan was again reinforced.

4 EXISTING CONDITIONS

For each of the five sites, existing vehicular and pedestrian movement, pedestrian and vehicular conflict areas, stormwater infrastructure, cultural and commercial amenities, and open space were assessed.

SITE 1: GATEWAY BRIDGE

Vehicular and pedestrian traffic centers around the international crossing, but the infrastructure for both means of travel is not well defined or responsive to either pedestrian or vehicular needs. In the one block between the border crossing and Washington St. (image 1), there are 13 pedestrian/vehicle conflict possibilities (figure 9). Pedestrians who cross from Matamoros, MX and walk to downtown, have to negotiate five vehicle crossings; only one of these has a crosswalk signal. The intersection of Washington Street and International Boulevard is very large compared to the traffic volume. The large road width creates a difficult situation for pedestrians who wish to cross (image 2).

The site is adjacent to open space located along TSC's campus and a small triangular county park (image 3) between the campus and International Bridge crossing, where people wait in tree shade for rides. Two smaller open spaces are on either side of Elizabeth St. and present potential for better public space development.

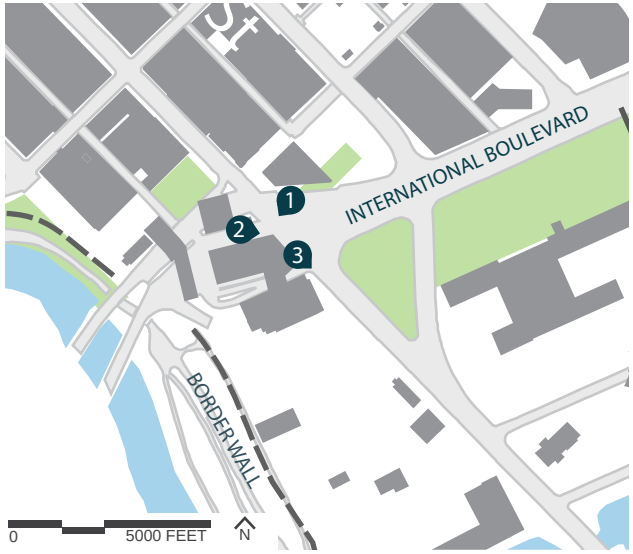
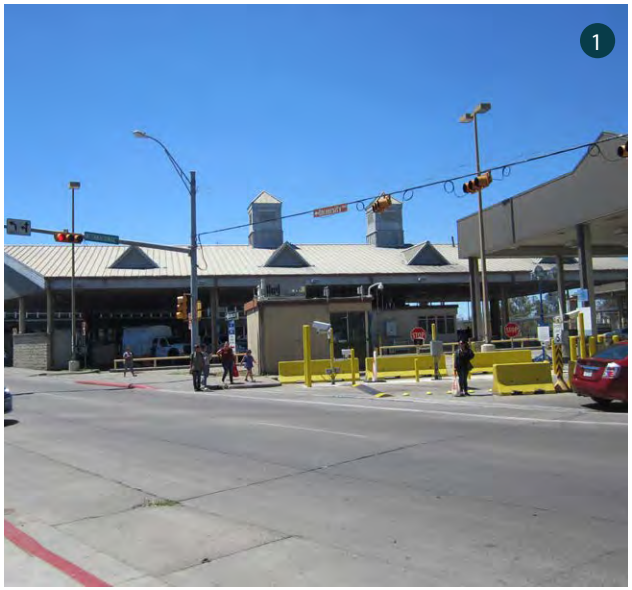
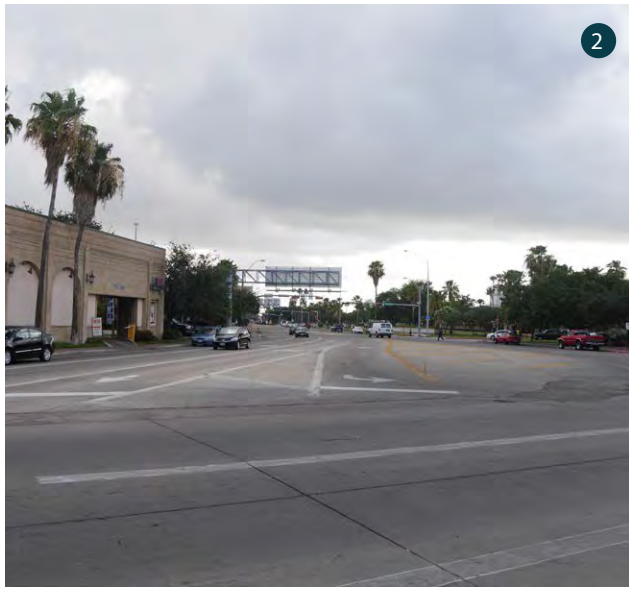


FIGURE 5 *A map of Site 1.*





FIGURES 6-8 *Existing site views (numbers correspond to viewpoints on site map)*

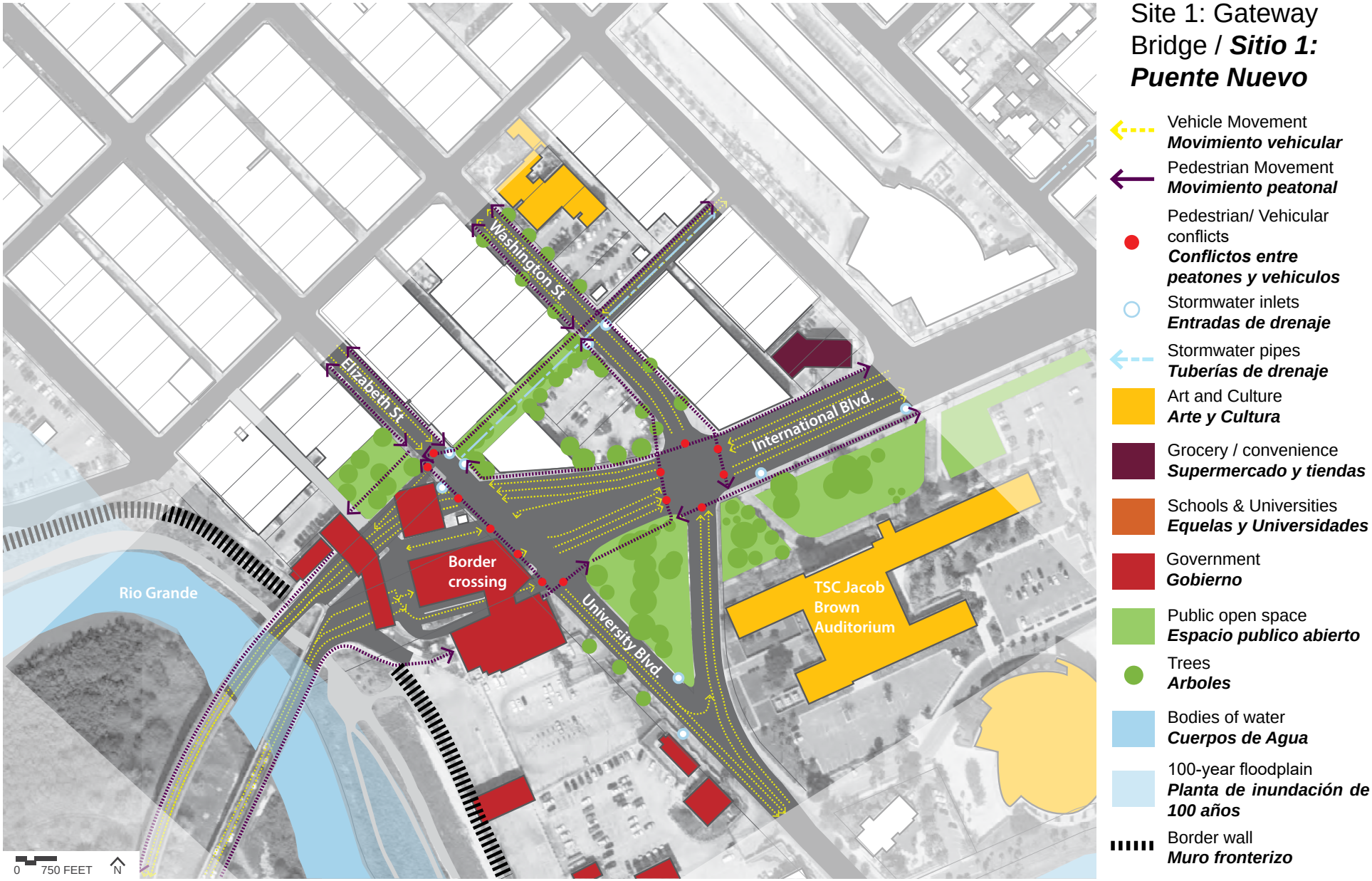


FIGURE 9 *An analysis of Site 1.*

SITE 2: SHORELINE

Alice Wilson Hope Park is the only area of shade on Sam Perl Boulevard for pedestrians who cross the Brownsville and Matamoros International Bridge; which currently is a long unshaded walk to and from downtown.

Alice Wilson Hope Park provides open space for residents to enjoy, but the park is difficult to access due to lack of cross walks, pedestrian crossing signals, and wheel-chair accessible paths (image 1). Both Sam Perl Boulevard and St. Charles/13th Street have wide traffic lanes which encourage drivers to travel at high speeds. The park is further limited by the border fence (image 2) which limits views and access to the river and river bank (image 3).

A portion of stormwater runoff from downtown, is discharged to the Rio Grande at an outfall near Alice Wilson Hope Park. The city of Brownsville has plans to renovate a pump house near the park. These present opportunities for enhancing the park with green infrastructure.

FIGURE 10 *A map of Site 2.*

FIGURES 11-13 *Existing site views (numbers correspond to viewpoints on site map)*

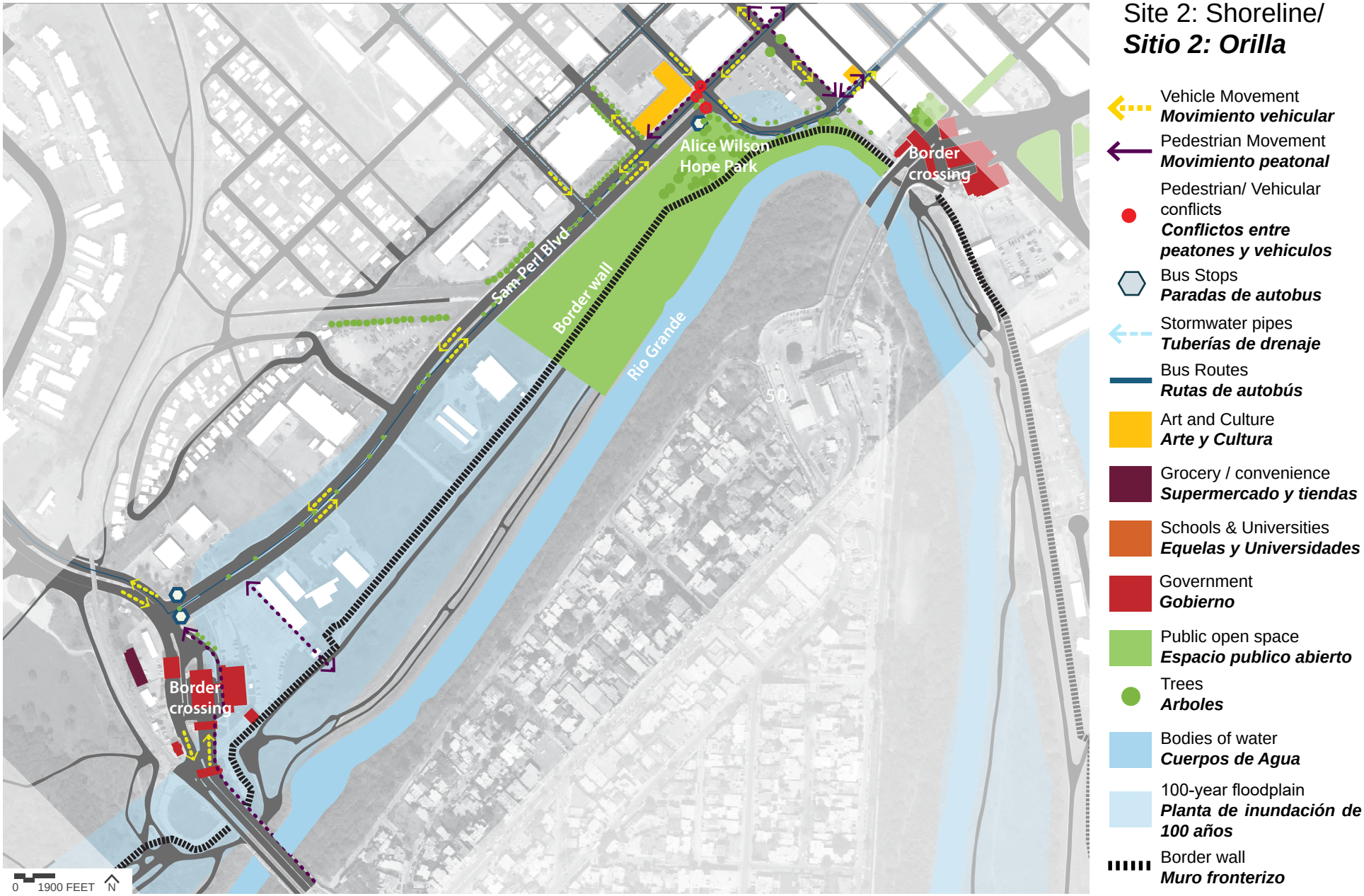


FIGURE 14 *An analysis of vehicular movement at Site 2.*

SITE 3A: INTERNATIONAL BOULEVARD AT CAMPUS

There are many cultural and educational amenities in the vicinity of this site, but there is a lack of connectivity between them. The large width, wide lanes, and turn lanes of International Boulevard make it difficult for pedestrians to cross (image 1-3). Students of TSC and UTRGV who park downtown or use Brownsville Metro and arrive at the main transfer station, experience a difficult street crossing at International Boulevard before arriving on campus.

The current layout of International Boulevard creates a barrier between the two campuses and downtown, but there is potential for a better connection. For example, there is a large area of green space with many trees along the International Boulevard campus frontage that is generally unused.

The large amount of asphalt on this site is due to the width of International Boulevard and the nearby parking areas on campus. Stormwater runoff from these paved areas flows directly into storm drains.

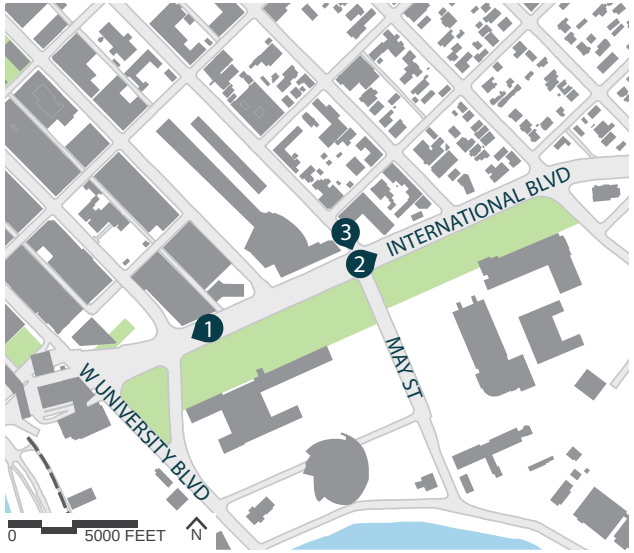
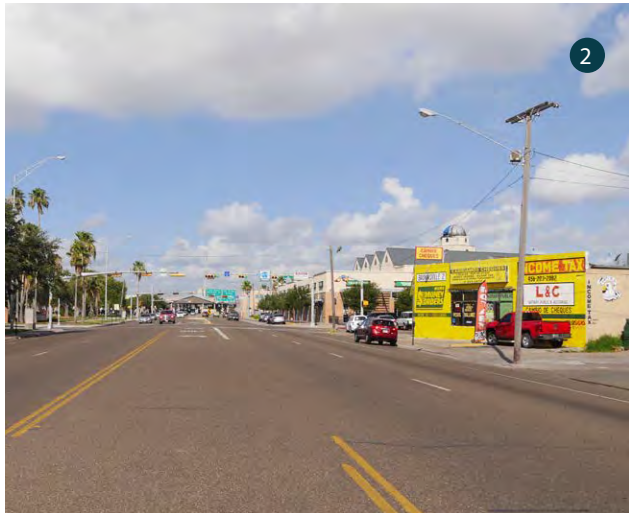


FIGURE 15 *A map of Site 3A.*



FIGURES 16-18 *Existing site views (numbers correspond to viewpoints on site map)*

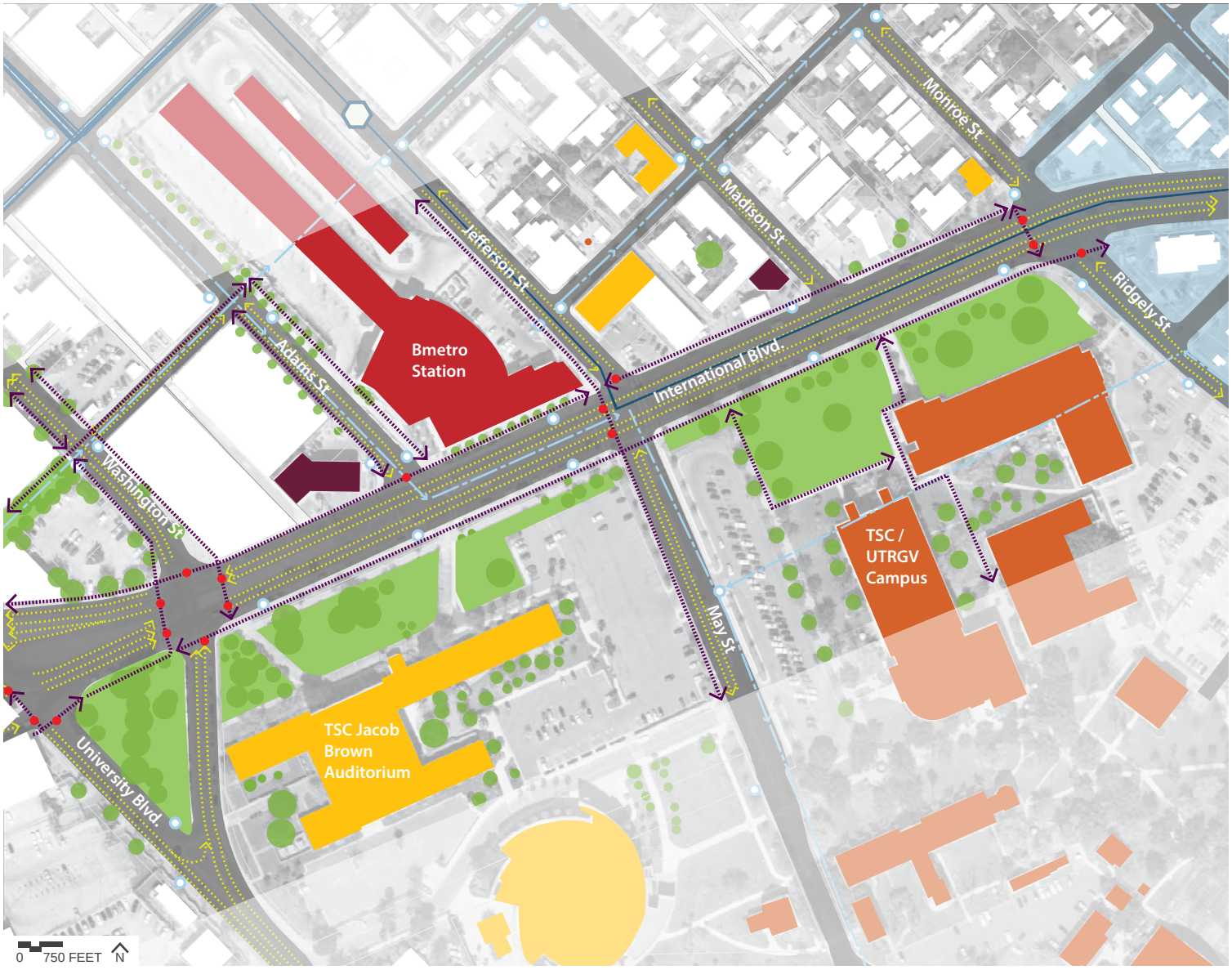
SITE 3B: INTERNATIONAL BOULEVARD BEYOND CAMPUS

The block between Tyler Street and Polk Street (image 1-3) was selected because it is typical of this portion of the boulevard; and it is two blocks away from the Buena Vida housing development.

The large lane widths, central turning lane, and shoulders at campus continue north to this portion of the street. The edge condition varies from campus in that there are many businesses that have curb cuts or parking lots that flank the street frontage. The numerous curb cuts make the pedestrian and bicycling experience difficult, as cars may be coming in and out of businesses.

FIGURE 19 *A map of Site 3B.*

FIGURES 20-22 *Existing site views (numbers correspond to viewpoints on site map)*



Site 3: Campus / *Sitio 3: Campus*

- Vehicle Movement / ***Movimiento vehicular***
- Pedestrian Movement / ***Movimiento peatonal***
- Pedestrian/ Vehicular conflicts / ***Conflictos entre peatones y vehiculos***
- Bus Stops / ***Paradas de autobus***
- Inlets / ***Entradas***
- Stormwater pipes / ***Tuberías de drenaje***
- Bus Routes / ***Rutas de autobús***
- Schools & Universities / ***Equelas y Universidades***
- Art and Culture / ***Arte y Cultura***
- Grocery / convenience / ***Supermercado y tiendas***
- Government / ***Gobierno***
- Public open space / ***Espacio publico abierto***
- Trees / ***Arboles***
- 100-year floodplain / ***Planta de inundación de 100 años***

FIGURE 23 *Analysis of existing conditions on International Blvd. at Texas Southmost College.*

SITE 4: PERFORMING ARTS CENTER AND BUENA VIDA COMMUNITY

There are many cultural, commercial, and open space amenities in downtown that residents of the Buena Vida neighborhood access. Most of the neighborhood is residential. There is one park (image 1) in the Buena Vida neighborhood and an occasional small business.

Pedestrian foot traffic is common between residents of the Buena Vida neighborhood and downtown; however the sidewalks along most of the connecting streets are narrow and do not provide a pleasant pedestrian experience (image 2). The streets between Buena Vida and downtown are one way streets, with occasional traffic lights. This encourages drivers to drive fast, which makes walking along the street feel unsafe at times. Many bus lines pass through the Buena Vida neighborhood; going to and from the main transfer station, at the transition between downtown and Buena Vida (image 3).

Stormwater runoff from this area flows directly into the resaca located north of the neighborhood, underneath U.S. Highway 69/77/83. The entire stormwater system in this neighborhood is curb and gutter with storm drains.

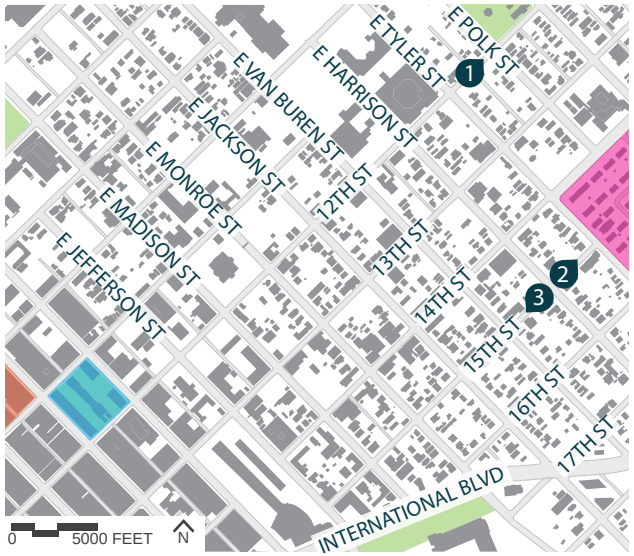
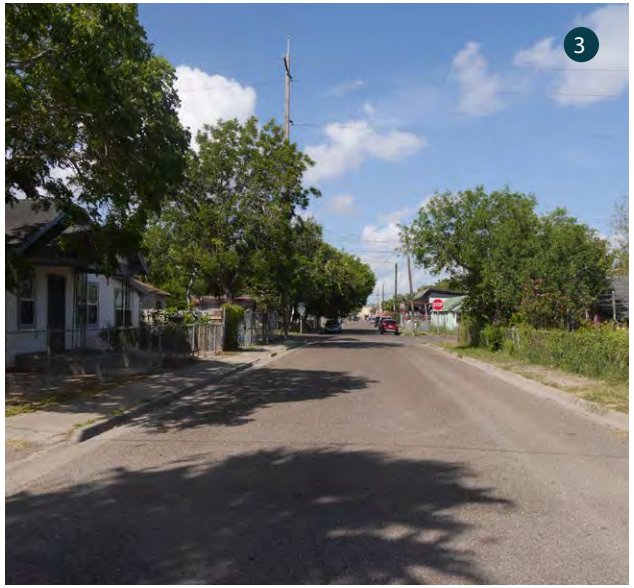


FIGURE 24 *A map of Site 4.*



FIGURES 25-27 *Existing site views (numbers correspond to viewpoints on site map)*

SITE 5: MARKET SQUARE

There are three main land uses that drive the day to day activity in this site. The first is Market Square (image 1), which provides open space in downtown and will soon provide additional open space when the renovation is completed, estimated to be by the end of 2017 (image 2). The second is Washington, Adams, 11th, and 12th streets, which all contain small businesses and restaurants that bring residents and visitors downtown every day. The third is the entertainment district on Adams Street which brings in night life, especially on the weekends. This will be augmented by the soon to be completed performing arts center; bringing more cultural activity, which is expected to be completed in 2018.

Vehicular and pedestrian traffic is more balanced than the other sites, but vehicular traffic is still dominant. Traffic lights are on a faster rotation than other sites, providing more pedestrian crossing opportunities. Sidewalks are adequate for pedestrian movement, but do not provide adequate space for stopping or resting (image 3). Shade is limited due to palm trees and inconsistent and deteriorating building awnings.

Stormwater runoff from roofs, sidewalks, and streets flow directly into storm drains, located at the curb and gutter of the streets.

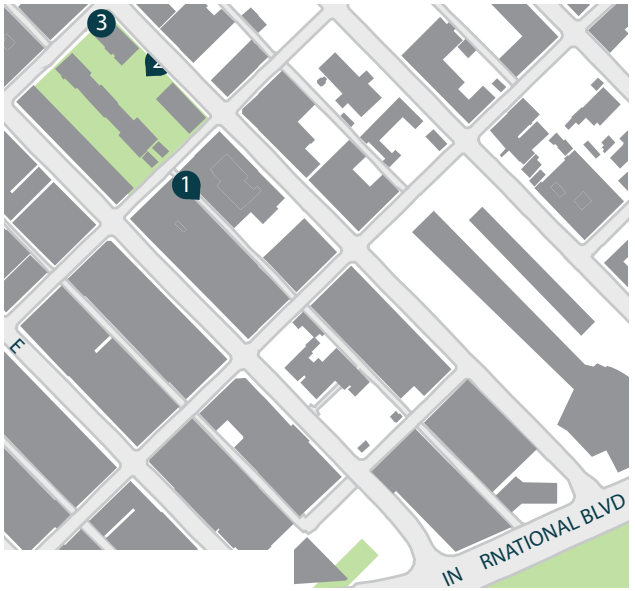
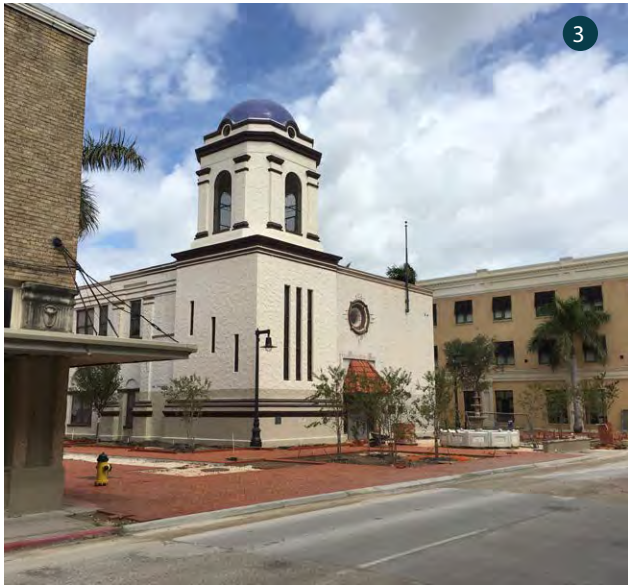
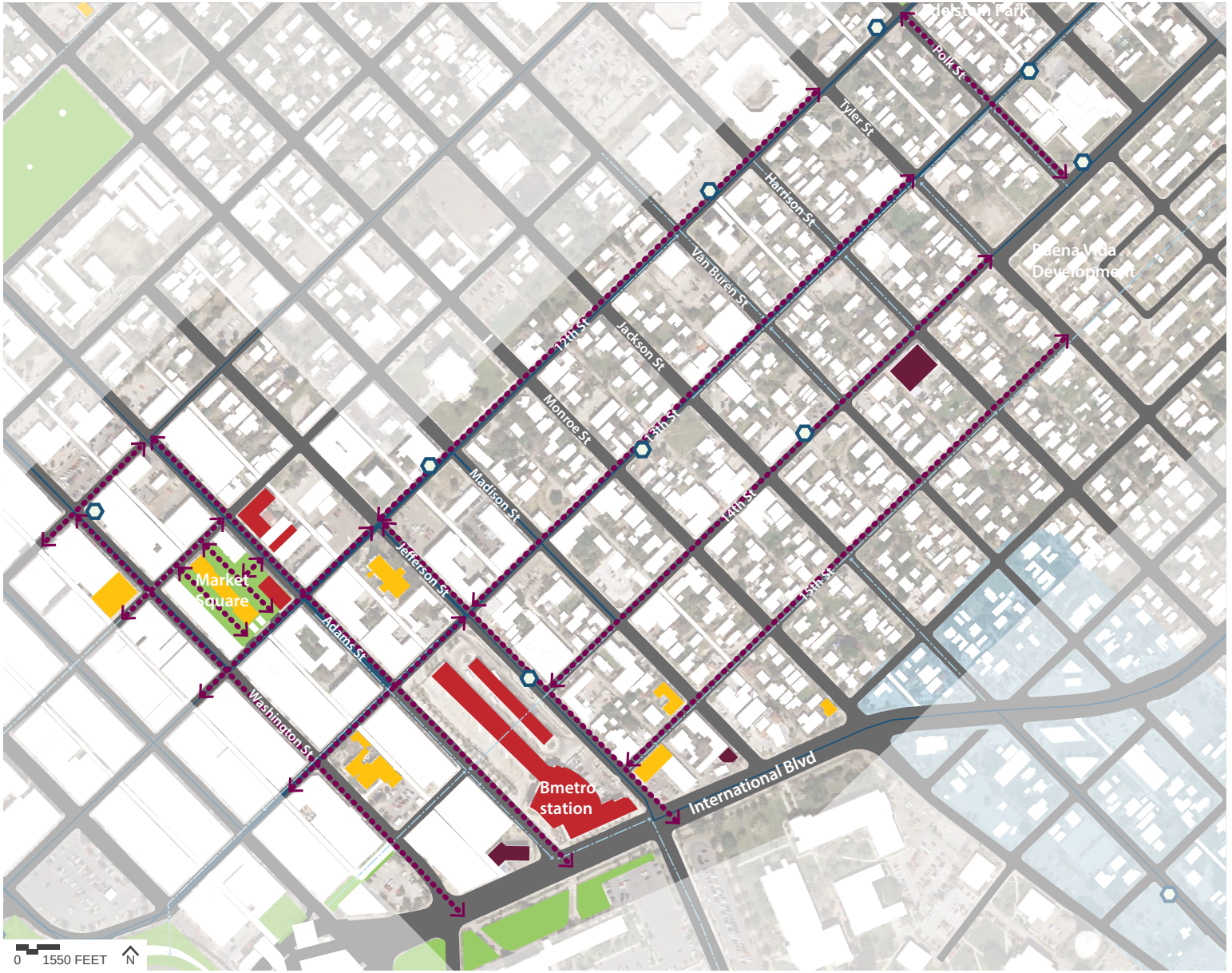


FIGURE 28 *A map of Site 5.*



FIGURES 29-31 *Existing site views (numbers correspond to viewpoints on site map)*

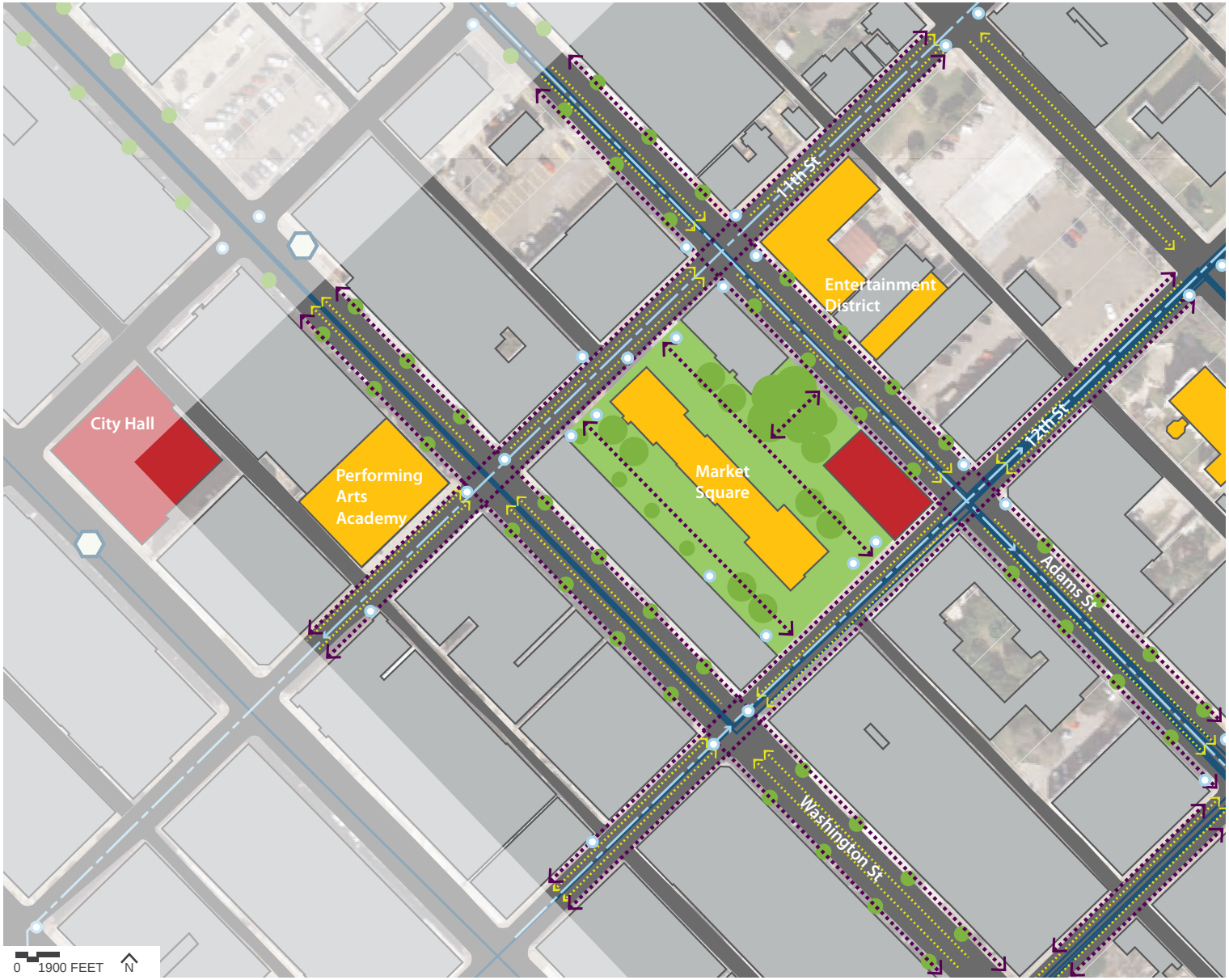


Sites 4: Performing Arts Center and Buena Vida Community

Sitios 4: Centro de artes escénicas y Buena Vida Comunidad

- Vehicle Movement ***Movimiento vehicular***
- Pedestrian Movement ***Movimiento peatonal***
- Bus Stops ***Paradas de autobus***
- Stormwater pipes ***Tuberías de drenaje***
- Bus Routes ***Rutas de autobús***
- Art and Culture ***Arte y Cultura***
- Government ***Gobierno***
- Grocery / convenience ***Supermercado y tiendas***
- Public open space ***Espacio publico abierto***
- 100-year floodplain ***Planta de inundación de 100 años***

FIGURE 32 *A map of connections between downtown Sites 4 and 5.*



Sites 5: Market Square ***Sitios 5: Plaza del Mercado***

- Vehicle Movement ***Movimiento vehicular***
- Pedestrian Movement ***Movimiento peatonal***
- Bus Stops ***Paradas de autobus***
- Inlets ***Entradas***
- Stormwater pipes ***Tuberías de drenaje***
- Bus Routes ***Rutas de autobús***
- Art and Culture ***Arte y Cultura***
- Government ***Gobierno***
- Public open space ***Espacio publico abierto***
- Trees ***Arboles***

FIGURE 33 *Analysis of downtown transportation and amenities.*

5 DESIGN OPTIONS

FIGURE 34 *Illustrating the project area in relation to the larger context.*

LAYOUT AND PROGRAM

The major issues and concerns at this site, as observed by the design team and voiced during the charrette, were pedestrian safety and comfort, disorganized traffic, and how the large amount of asphalt creates an unfriendly and unwelcoming user experience. The design option works to address these issues and concerns in several ways.

This design increases pedestrian safety and addresses traffic, by better organizing vehicular pathways entering and exiting through U.S. Customs and Immigration. A lush, tree-lined median near this entry point slows and reorganizes traffic on International Boulevard and acts as a focal point, with unique welcoming signage and a lush planted berm (figures 37 and 38). While the median is not meant to be activated on the western side near U.S. Customs and Immigration, the eastern side can be occupied by commuters and students crossing from campus to downtown. In addition to pedestrian safety, the unwelcoming nature of the site is addressed by visually improving upon the existing connection between Matamoros, MX and Brownsville, Texas. The design seeks to meet the local community's desires to create a beautiful, iconic, and monumental gateway at the U.S. / Mexican Border.

The design option further addresses pedestrian comfort by creating two public gathering spaces by replacing a portion of West University Boulevard, connecting it to International Boulevard. One of these spaces, the "campus plaza," is an open plaza space that connects to campus and enhances the existing Xeriscape Park, where people currently wait for rides after crossing from Matamoros. This plaza serves as a flexible multi-use space for students and community members. The second space, a "stormwater park," will provide increased stormwater management capacity at the site.

These pedestrian comfort components also help create better traffic flow. Drop-off and pick-up points are very important at the international crossing. The design better organizes traffic around the site and provides travelers with a shaded space for refuge. The primary waiting and loading zone is located on International Boulevard, directly off the campus plaza and features a shade structure and ample plaza space. The taxi pickup is located on West University Boulevard near the stormwater park; and the drop off area is located on East Elizabeth Street. The separation and distinction of these three points serves to clearly organize traffic around this intersection.

The design for the site utilizes several methods for storing and treating stormwater. The stormwater park to the south of the campus plaza highlights stormwater as a major park feature. The purpose of the park is to detain, or hold, water during a rainstorm and then slowly release the water into the ground and the stormwater system. This slow release keeps the overall stormwater infrastructure system from becoming overwhelmed with rainwater, helping to reduce localized flooding. The stormwater park holds the water in planted detention areas. This cleans the surface water runoff and helps to improve the water quality before it goes into the stormwater system. Additionally, the stormwater park acts as an educational feature for the college and community, where park-goers can learn about the importance of stormwater management; and can interact with the native fauna and flora. In addition, the campus plaza and the International Boulevard median feature permeable pavers and a series of rain gardens to reduce stormwater runoff.

FIGURE 35 *Before: A view of International Boulevard toward Texas Southmost College .*

1. FLEXIBLE PLAZA SPACE WITH PERMEABLE PAVING
2. SLOW TRAFFIC AT ENTRANCE TO INTERNATIONAL BLVD. BY REDUCING LANE WIDTHS AND ADDING MEDIAN
3. PLANTED BERM AND WATER WALL WITH ENTRY SIGNAGE
4. PRIMARY WAITING ZONE AND PICK UP
5. TAXI PICK UP
6. TRAFFIC TABLES
7. DROP OFF AREA
8. STORMWATER PARK. A PARK WITH DETENTION BASINS AND LUSH PLANTING THAT MANAGE STORMWATER AND PROVIDE EDUCATIONAL OPPORTUNITIES FOR THE COMMUNITY
9. ENTRY PLAZA: A PLAZA THAT SLOWS AND DIRECTS TRAFFIC

V PERSPECTIVE VIEW, FIGURE 37

FIGURE 36 *A design proposal for Site 1.*

FIGURE 37 *After: A view of the design proposal at International Boulevard from East Elizabeth Street toward Texas Southmost College, featuring a lush planted berm and unique welcoming signange incorporated into a water wall.*

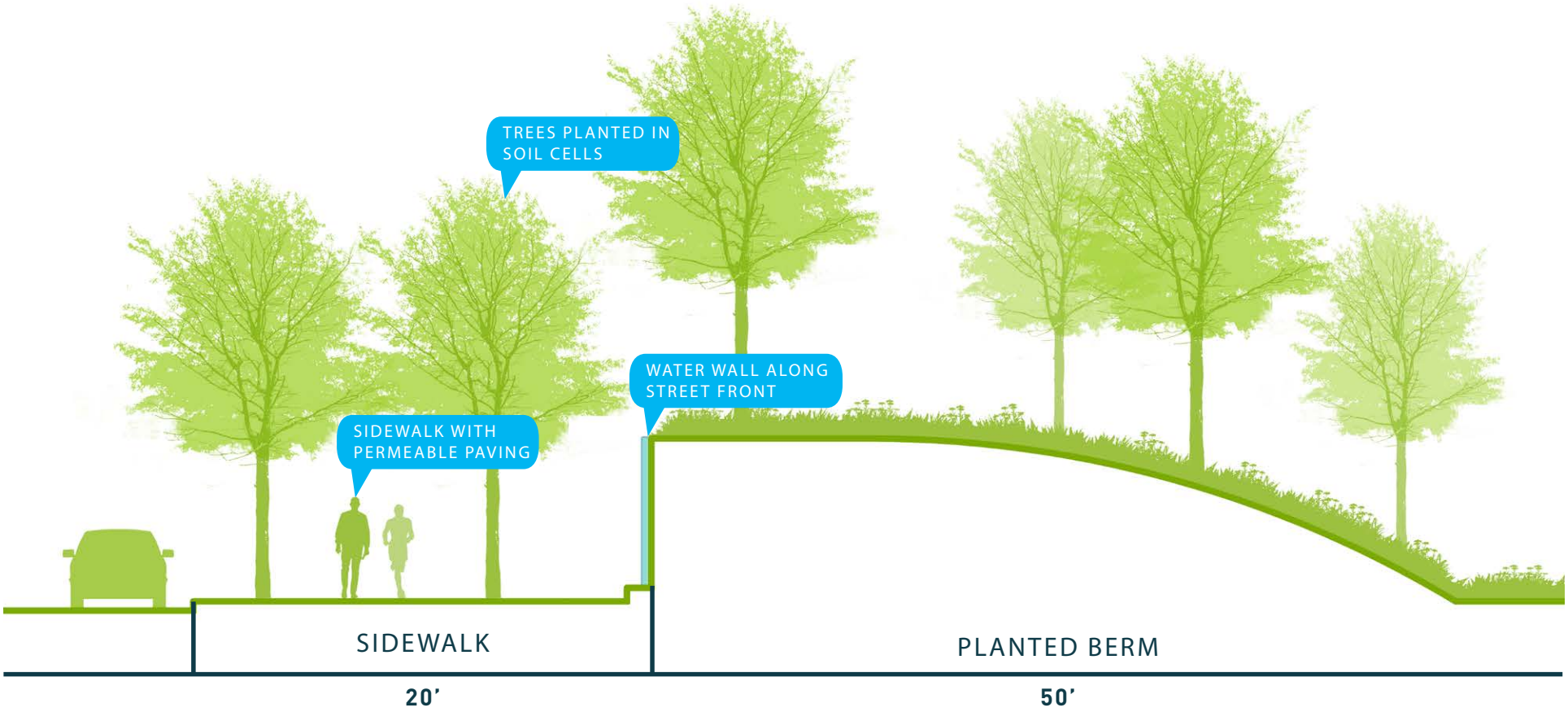


FIGURE 38 *A section through International Boulevard at the border crossing illustrating a planted berm and water wall facing the street.*

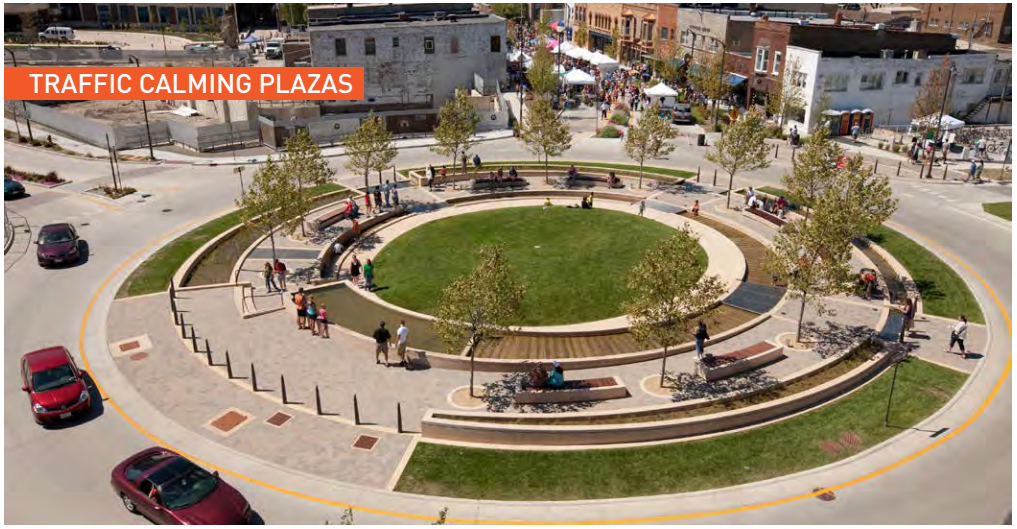


FIGURE 39 *Uptown Circle, Normal, Illinois*
PHOTO CREDIT *cityparksblog.org*

FIGURE 40 *Uptown Circle, Normal, Illinois*
PHOTO CREDIT *uptownnormal.com*

Traffic calming plazas can help calm and organize traffic and create pedestrian safe zones. They can also serve as a plaza space or waiting zone within a transportation hub.

FIGURE 41 *Binghamton Courthouse Traffic Circle, Binghamton New York*
PHOTO CREDIT *commons.wikimedia.org*

FIGURE 42 *Binghamton Courthouse Traffic Circle, Binghamton New York*
PHOTO CREDIT *landscapeonline.com*

FIGURE 43 *Manassas Park Elementary School in Manassas Park, VA.*
PHOTO CREDIT *ASLA.org/2011awards*

Planted detention ponds store and slow stormwater runoff, mitigating flooding in the surrounding areas. Detention ponds also act as an educational feature, providing community members and students with an outdoor classroom or a space for social gatherings.

LAYOUT AND PROGRAM

The priority issues and concerns of this site, as observed by the design team and voiced during the charrette, are that Alice Wilson Hope Park is cut off from downtown by streets that lack safe pedestrian crossings; cut off from the river by the border wall; and a lack of programming within the park.

The overall design acknowledges the constraints and parameters of designing near a border protection wall. The adjacent land use upriver to the park include U.S. Customs and Border Protection, which does not wish to have park visitors observe its operations. The site also has adjacent commercial properties upriver, downriver, and across the city streets. The design proposal looks to increase community connections and visibility to the park along various street frontages, and to create a destination point within the park.

The design seeks to address these issues and enhance Alice Wilson Hope Park by creating a dynamic park space, with an iconic observation tower; and flexible open space for large events and recreational activities. To accommodate these features, the park will expand from approximately 1.3 acres to 5 acres, including the Rio Grande embankment, extending downriver to the Gateway International Bridge.

The observation tower serves as the main focal point of the park and a destination for the community—a key desire expressed by the community during the engagement process (figures 46, 50, and 51). The tower will provide locals and visitors with a space for bird watching or educational opportunities for community members (figure 48). The architecture is suggested to be iconic; the tower needs to be accessible to persons with disabilities; and shall not offer direct views of the U.S. Customs and Border Protection operations. Surrounding the tower, open park space will provide community members with a place for active recreation and local events.

The design proposes to strengthen connections to downtown along Sam Perl Boulevard, East St. Charles Street, and East St. Francis Street, by increasing ADA accessible access points and introducing green streets amenities, like crosswalks, bump outs, street trees, and bike lanes. In addition, the park will be made more visible with a terraced garden, attractive signage, and a ramp welcoming visitors into the park. These features will help create a more easily accessible and exciting experience. Pedestrian connections to the two adjacent international bridges into Matamoros should also be enhanced; and link the park's walking trail to proposed improvements on International Boulevard.

Rain gardens along the street frontage edges and riverfront edges of the site collect and treat stormwater runoff from two major drainage outfall points. A stormwater park on the river side of the border wall, cleanses stormwater runoff through a series of terraced rain gardens before entering the Rio Grande; providing habitat for local fauna and flora. The stormwater park will also serve as overflow capacity for the Rio Grande during large storm events, mitigating potential flooding impacts (figure 49).

FIGURE 44 *Before: A view of site 2.*

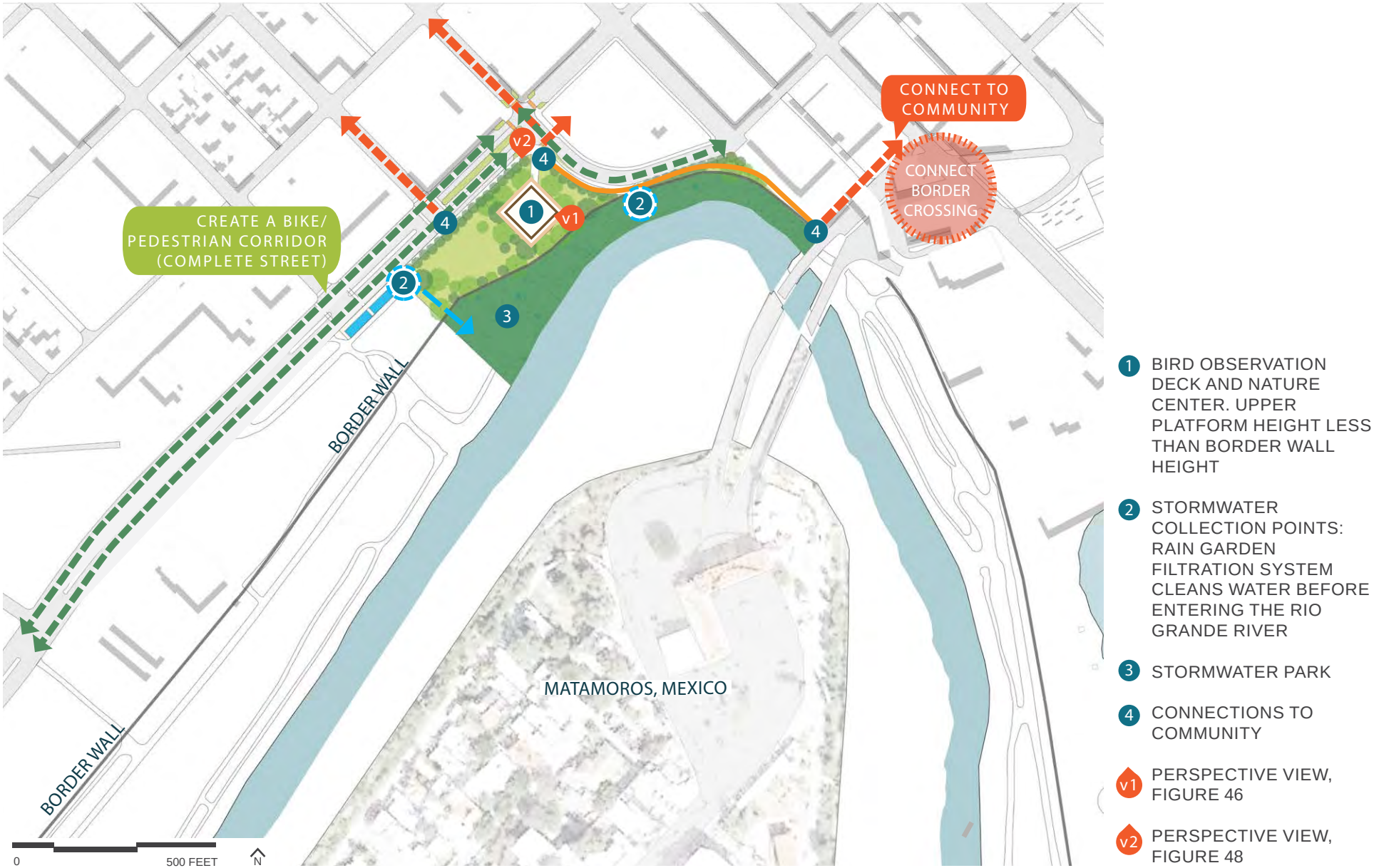


FIGURE 45 *A design proposal for Site 2.*

FIGURE 46 *After: A rendering of the Site 2 design proposal. This view includes the observation tower and running trails along with stormwater management features like rain gardens.*

FIGURE 47 *Before: A view of Site 2.*

FIGURE 48 *After: A rendering of Site 2 with design interventions including enhanced site connections, a terraced garden, attractive signage welcoming visitors into the park, and an ADA accessible ramp.*

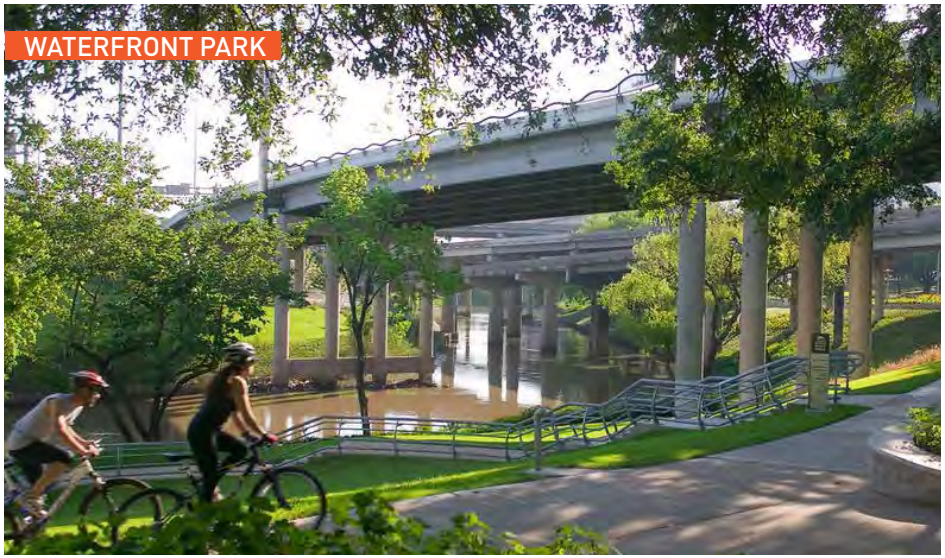


FIGURE 49 *Buffalo Bayou. Houston, Texas*
PHOTO CREDIT *SWAGroup.com*

Waterfront parks can utilize stormwater management practices, mitigating flooding in the surrounding areas. Biking and walking trails can connect to the surrounding pedestrian infrastructure and promote healthy living in communities.

Observation decks and pavilions serve as a destination within the park for community gathering, outdoor education, and bird-watching.

FIGURE 50 *City Park Observation Deck. New Orleans, Louisiana.*
PHOTO CREDIT *SpackmanMossopMichaels.com*

FIGURE 51 *Bird Observation Tower. Graswarder, Germany*
PHOTO CREDIT *GMP-Architekten.com*

LAYOUT AND PROGRAM

Issues and concerns at this site, as observed by the design team and voiced during the charrette, focused on the lack of connectivity between downtown and the TSC and UTRGV campuses. This lack of connectivity is due to the 84 feet width of International Boulevard and the lack of safe pedestrian crossings across the boulevard. The goal of the design option for this site is to create a unique and desirable streetscape with safer access points to downtown businesses.

The design option for this segment of International Boulevard addresses these issues and concerns by focusing on redesigning the traffic layout and providing better pedestrian and bicycle infrastructure along and across International Boulevard.

The design option adjusts the width of the vehicular lanes and removes parking on the campus side of International Boulevard, to create a safer street that is more desirable for the community. Overall, the existing vehicular use of the street (parking, drive, and turning lanes) is reduced from 84 feet to 52 feet. Community members suggested eliminating parking along the campus side of International Boulevard. In addition to that, parking along the downtown edge of the street is reduced from 10 feet to 8 feet wide, and the shoulder along both sides of the street is removed. These parking recommendations are based on the large amount of available free, metered, and campus controlled parking within walking distance of the site. Currently, the city ordinance specifies parallel parking spaces to be 9 feet by 22 feet. The design team proposes a policy update for the city that reduces the parallel parking space requirement to 8 feet by 20 feet. This allows for more flexibility in design and increased planting opportunities along the street edge.

The space saved by reducing vehicular traffic lane and parking width is redistributed to the sidewalk on both sides of the street as well as the planted median. The center turning lane is transformed into a planted bioswale median, framing the streetscape and capturing and storing stormwater. The design also features generous space for a shared bike/pedestrian path that serves as the campus “art walk” along the campus edge of International Boulevard. The art walk provides the campus with a unique opportunity to develop an identity and branding feature. A tree-lined streetscape forms a buffer between vehicles and pedestrians. There is ample space along the campus art walk for site amenities, like benches and an iconic paving pattern; which provide a unique character and identity to the shared path.

Through this design option, the reduction of hardscape surfaces creates multiple benefits, including increased opportunities for shade and reduced surface water runoff. These improvements to the roadway have several benefits. They enhance pedestrian access and interaction between the campuses and downtown businesses. They aid in improving public health and safety of the community. The improvements calm traffic and improve pedestrian safety, increasing the likelihood of more pedestrian activity (figure 57). Finally, they meet Texas Department of Transportation’s (TXDOT’s) stormwater best management practices. More information can be found at: http://www.txdot.gov/inside-txdot/division/environmental/swmp.html. Overall, the design for International Boulevard along the TSC and UTRGV campuses edge creates a safe and enjoyable space for biking and walking, while defining a unique campus edge for students and visitors.

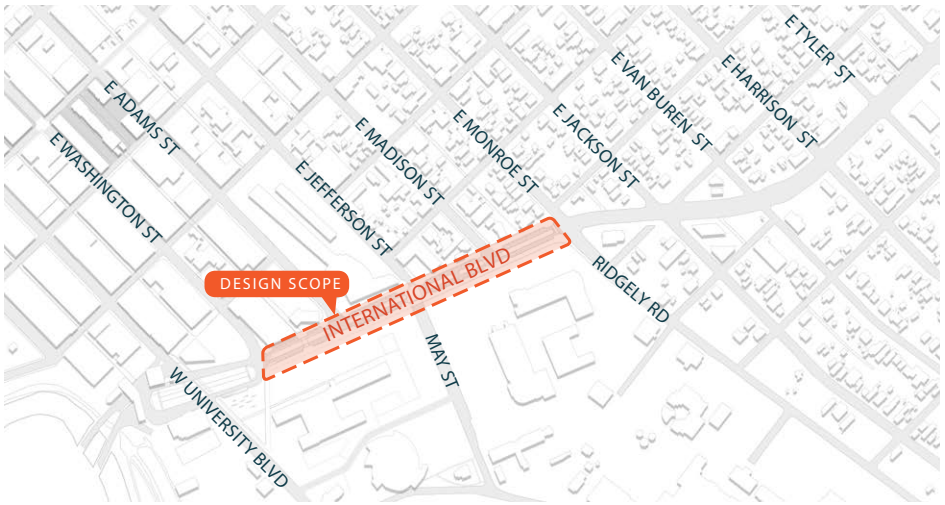


FIGURE 52 *A map of the design scope along International Boulevard.*

FIGURE 53 *A design proposal for Site 3.*

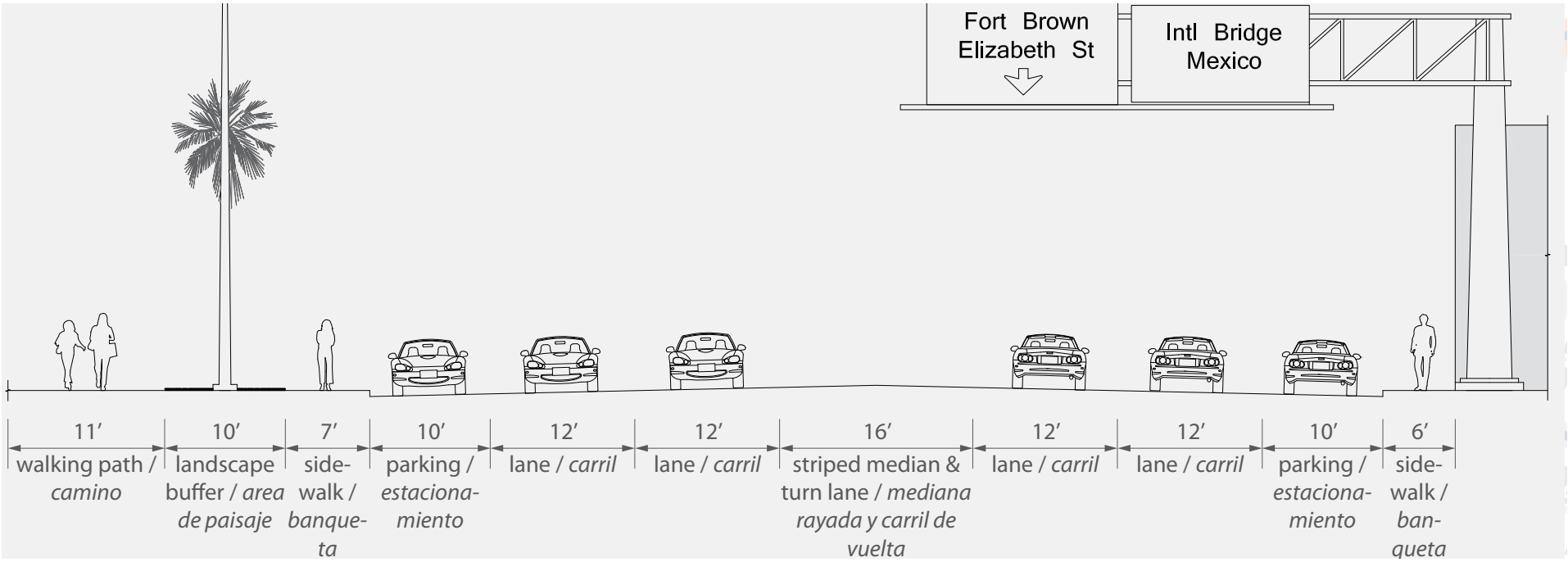


FIGURE 54 *An existing section cut of International Boulevard, showing pedestrian paths, landscape buffer, and traffic lane dimensions.*

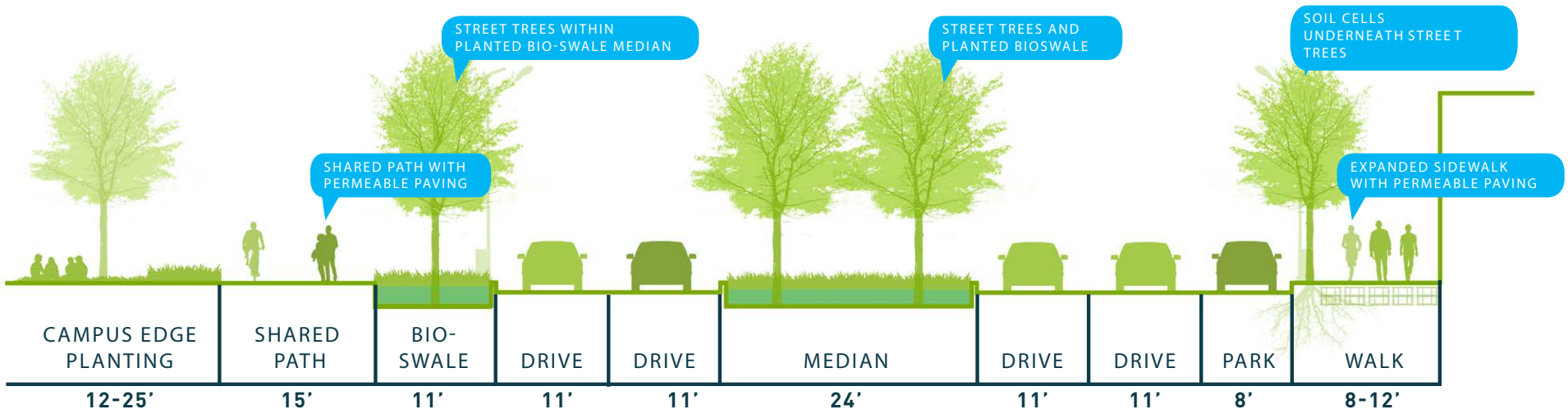


FIGURE 55 *A proposed street design for site 3.*

FIGURE 56 *Before: A view of International Boulevard on Texas Southmost College campus.*

FIGURE 57 *After: A rendering of improvements on International Boulevard on Texas Southmost College Campus with new street trees in a planted bioswale and a shared path.*

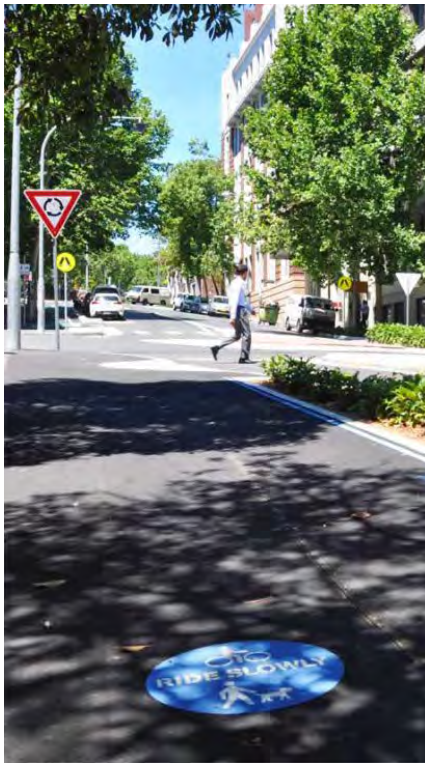


FIGURE 58-59 *Shared Paths, Sydney, Austrailia,*
PHOTO CREDIT *Spackman Mossop Michaels*

Shared bike and pedestrian paths create a safe, flexible zone for users and encourage walkability in cities.

FIGURE 60 *Tabacalera, Mexico City*
PHOTO CREDIT *marketurbanism.com*

Complete streets are safe, attractive places for people. On busy roads, they include sidewalks and bicycle routes. On quiet neighborhood streets, they may feature leafy shade trees and lower traffic speeds. As public spaces, complete streets are inviting and accessible places to walk, bike, or ride for people of all ages and abilities.

EXPANDING THE DESIGN SCOPE

During the workshop the community requested additional guidance for the design of the entire length of International Boulevard. In response, the design team developed a typical street section (figure 63) that builds off of the character of the design option for International Boulevard at the TSC and UTRGV campuses. This specific block was selected because it is typical of this portion of the street, and it is two blocks away from the Buena Vida housing development.

The existing roadway can be reduced from 74 feet to 48 feet by reducing lane width; removing the shoulders along the edge of the street; and removing the continuous turn lane. This space can then be added to the pedestrian right of way as sidewalk and median space. The sidewalks become well defined at 15 feet with new paving and strategic planting of trees and soil cells where possible. Currently, many businesses have curb cuts or parking lots that flank the street frontage. This becomes an obstacle when designing a pedestrian-oriented, tree-lined streetscape. The design option relies on effective access management (reducing and consolidating driveways) and a tree-lined central median with a shared bike and walking path (figure 64). Well defined crossing zones and bicycle forward stop bars at the intersection of International Boulevard and Ridgely Road, will seamlessly transition the bike and pedestrian path on the northern section of International Boulevard, to the shared path on the southern section along the campus edge. A bicycle forward stop bar is a place for bicyclists to stop in front of motorists at intersections, giving bicyclists a clear view of the intersection, a shorter crossing distance, and making bicyclists more visible to motorists (figure 68).

In order to fully complete a green street with a consistent tree-lined streetscape and an uninhibited bike/ pedestrian path, the city will need to review the building ordinance along this state highway; and work with TXDOT to adjust the existing traffic structure. This would include exploring an ordinance change that requires any new development directly abutting the sidewalk, to have parking at the rear; possibly accessed by side streets, where possible, in order to create a more comfortable sidewalk and allow for more street trees and plantings. These types of street redesign and land use changes will go a long way in uniting neighborhoods on either side of International Boulevard. An added benefit is that a green, tree-lined International Boulevard will fit into the community's vision of a future green corridor under the highway overpass to the north.

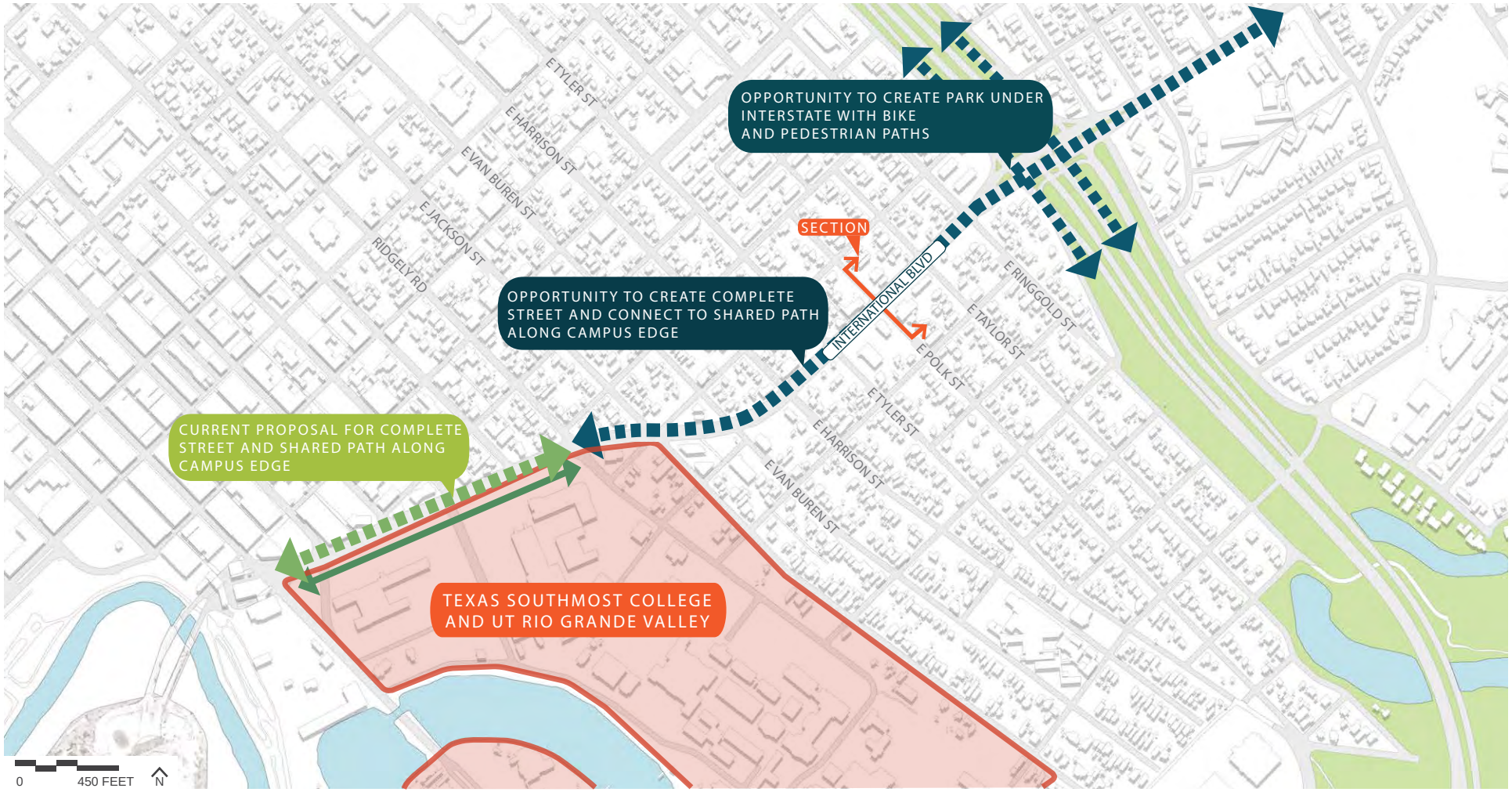


FIGURE 61 *A diagram of opportunities to expand design concepts along International Boulevard.*

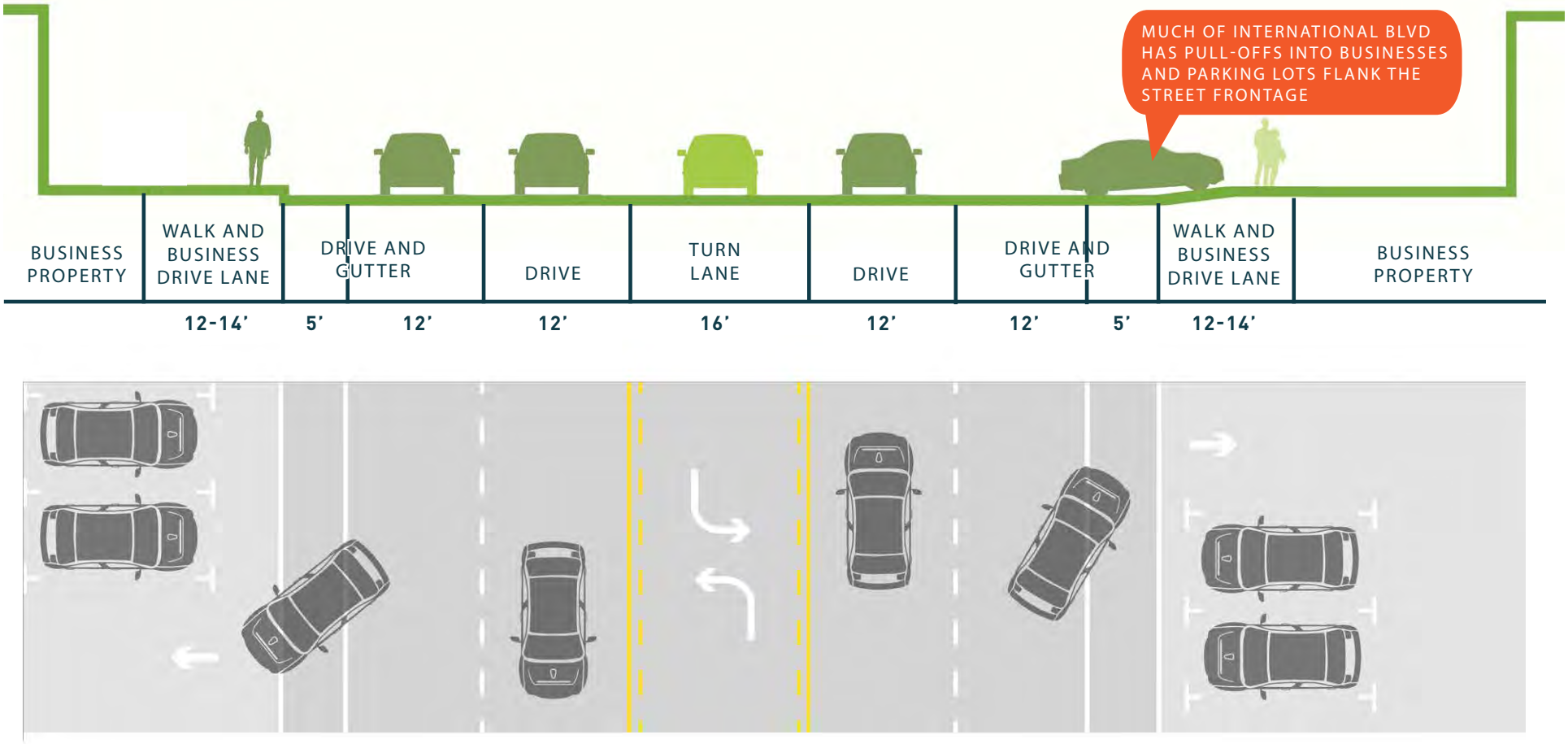


FIGURE 62 *An existing section cut of International Boulevard between Tyler St. and Polk St.*

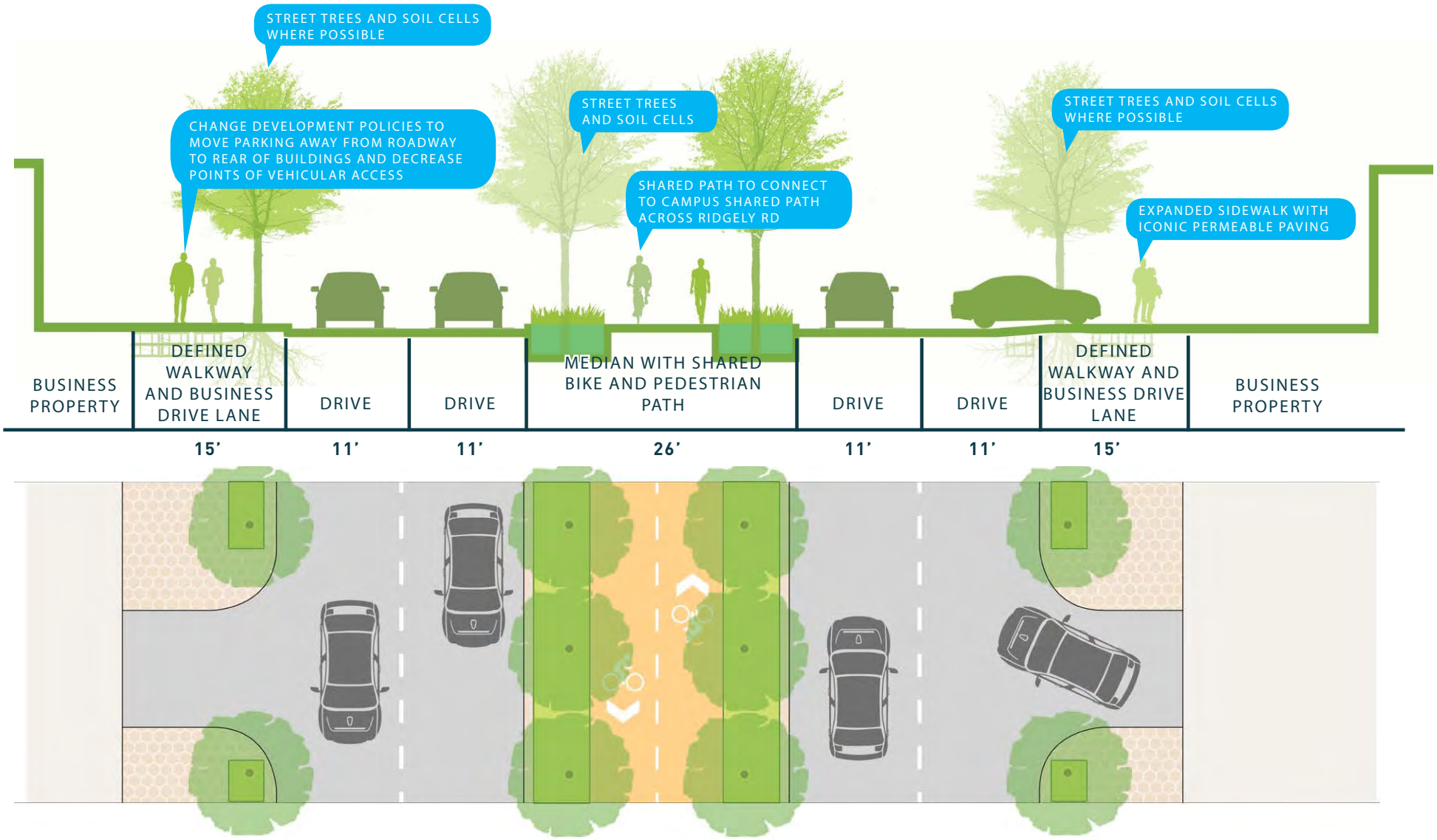


FIGURE 63 *A proposed street design of International Boulevard between Tyler St. and Polk St.*

1. ADD STREET TREES AND WIDEN SIDEWALKS TO CREATE A WELCOMING PEDESTRIAN ENVIRONMENT
2. ADD FORMAL VEHICULAR ENTRANCES
3. ADD TREES AND GREEN INFRASTRUCTURE INTO EXISTING PARKING LOTS
4. NEW PROPOSED DEVELOPMENT WITH BUILDING ALONG STREET FRONTAGE AND PARKING LOTS IN THE BACK
5. ADD PLANTED MEDIAN WITH BIKE LANE

FIGURE 64 *Best Practices for Commercial Developments along Highways. This diagram shows best practices which could occur at site 3B. It focuses on shifting store frontages to the street edge and adding street trees and buffered planting. Parking lots move behind buildings and commercial entries are shifted to side streets where possible.*

RELEVANT DESIGN PRECEDENTS

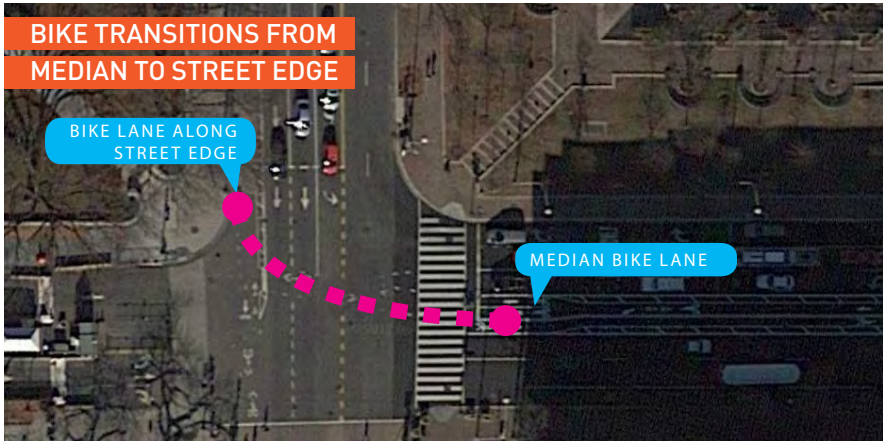


FIGURE 65 *Pennsylvania Ave median to 15th St. NW bike lane transition in Washington D.C.*
PHOTO CREDIT *Google Earth*

FIGURE 66 *Pennsylvania Ave median to 15th St. NW bike lane transition in Washington D.C.*
PHOTO CREDIT *bicycleinsuranceportland.com*

FIGURE 67 *Queens Plaza, New York*
PHOTO CREDIT *scenariojournal.com*

FIGURE 68 *Berlin, Germany*
PHOTO CREDIT *www.flickr.com*

Bike lanes along a planted median diminish many of the cyclist-vehicle conflicts, while providing a more comfortable riding space. The bike lanes can smoothly transition from a shared path within a center median to a path along a street edge; pavement markings clearly delineate the transition for cyclists.

LAYOUT AND PROGRAM

This site was selected by the city because of the need to connect the Buena Vida neighborhood with the performing arts academy. The academy is geared to children from the neighborhood. Buena Vida is one of the lowest income neighborhoods in the city and many residents cannot depend on a personal vehicle to get around. The design goal is to enhance public transportation and create safe and comfortable pedestrian and bicycle infrastructure to create a better connection between Buena Vida and the performing arts academy.

The design option addresses public transportation by adjusting a current bus route and introduces new bus stops. One of the parallel bus lines on either East 12th Street or East 13th Street to East 15th Street moves from its current location and connects with the existing multimodal station at the corner of East Jefferson Street and East 15th Street. During the community engagement process, local residents expressed an interest in creating a community hub on the intersection of East 15th Street and East Tyler Street; one of the intersections that borders the Buena Vida development. The hub features a new bus stop and playground space with opportunity for art installations and colorful signage. This bus stop will function as both a school bus and city bus shelter (figure 72). East 15th Street between the multimodal station and the new playground/bus stop becomes a complete street; with bioswale bump outs where applicable; and stormwater storage is added below the roadway.

Furthermore, a new bus stop at the corner of East Washington Street and East 12th Street near the performing arts academy will also be installed and connect to current improvements on East 11th Street in front of Market Square. Overall, these bus line enhancements create a more pedestrian friendly streetscape; and increase access for community members walking, biking, or using public transit to connect between Buena Vida, the performing arts academy, and Market Square.

Community members felt that vibrant, colorful crosswalks near major intersections, and paving improvements to the sidewalk and roadway would increase pedestrian visibility; and help slow down vehicular traffic. This improvement would increase pedestrian safety and create a unique identity for this transportation corridor (figures 72 and 74).

FIGURE 69 *A diagram proposing a complete street on 15th St.; a playground on 15th St.; and proposed bus stops on 15th St. and E Washington St.*

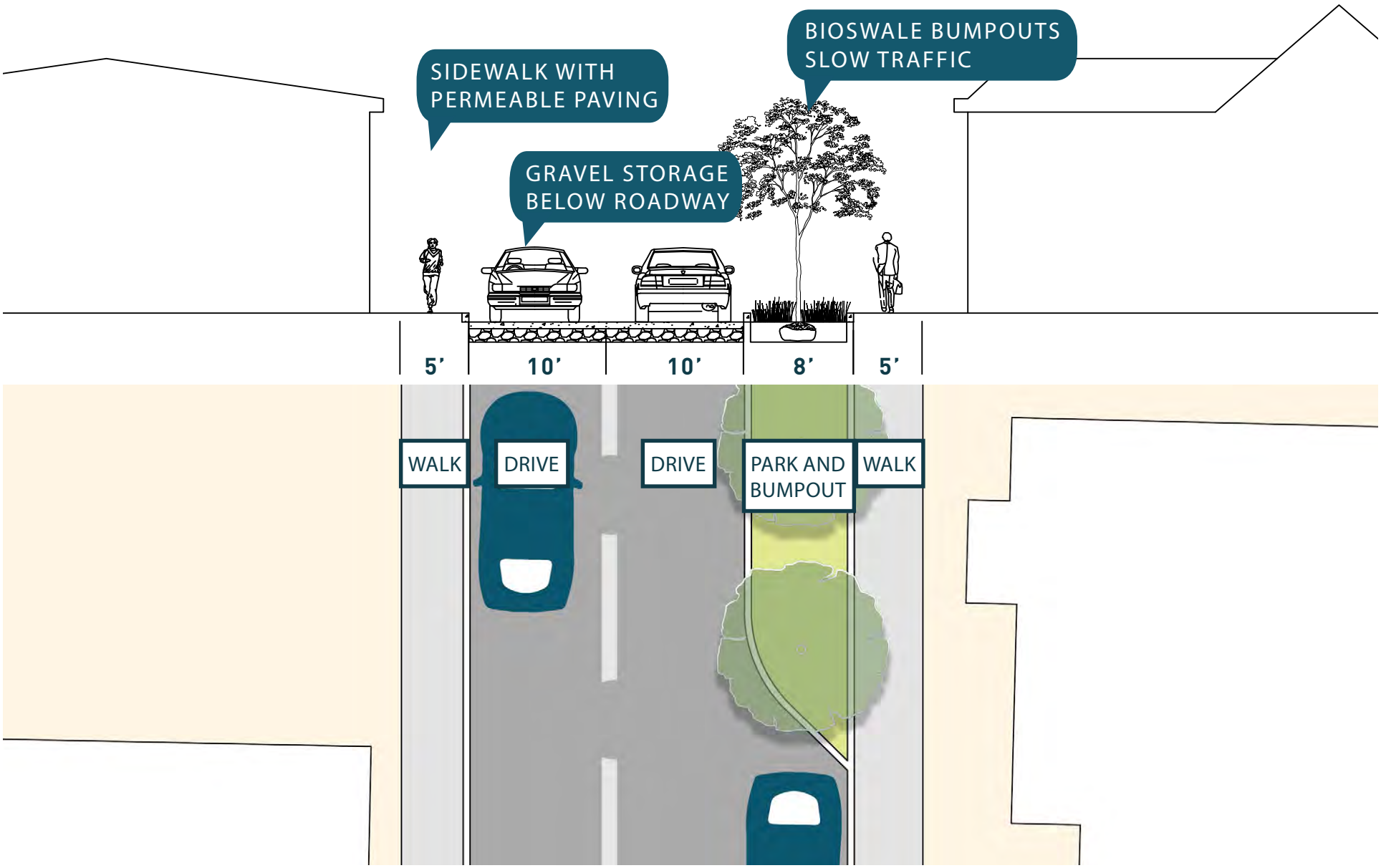


FIGURE 70 *A proposed street design of site 4.*

FIGURE 71 *Before: A view of the intersection of 15th St. and Tyler St.*

FIGURE 72 *After: A rendering of the bus stop at 15th St. and Tyler St.; with planted bioswales, a play area, shade structure, and a bench.*

FIGURE 73 *Before: A view of 15th St.*

FIGURE 74 *After: A rendering of 15th St. with a colorful crosswalk, paving improvements, new street trees, and bioswales.*

BUS STOP AND COMMUNITY HUB

FIGURE 75 *Bus stop with musical swings in Montreal, Canada.*
PHOTO CREDIT *https://travelhearttravel.wordpress.com*

Bus stops can be transformed into play spaces and art installations for the community.

PAINTED CROSSWALKS

FIGURE 76 *Crosswalk at Arizona & Second Street in Santa Monica, California.*
PHOTO CREDIT *Santa Monica Downtown Neighborhood Association/Facebook.*

Painted crosswalks create safer, more comfortable streetscapes and act as vibrant and iconic features for the community.

LAYOUT AND PROGRAM

The city selected this site due to the desire to connect International Boulevard with the momentum of the Market Square pedestrian improvements and construction of the performing arts academy. This can also help better connect the TSC and UTRGV campuses to downtown, one of the goals of site 3.

An important downtown precedent to consider is the 14th Street pedestrian plaza, which is the former semi-truck route for the Gateway International Bridge. This pedestrian plaza had good design intentions, but it's not fully utilized as there are few business openings onto the plaza. The 14th Street pedestrian plaza is visually bland, and the space does not have an appearance of being well maintained. There is potential for this design option to better connect Market Square to the 14th Street pedestrian plaza.

The design option proposes to connect Market Square to International Boulevard by improving the alleyway bisecting Market Square between East Washington Street and East Adams Street; and branding it as "Bombay Alley," its historic name, transforming it into an artful, lively downtown pedestrian corridor (figure 79).

One of the main goals that came from community members during the design charrette, was to focus on creating specific enhancements to change user perceptions of the alleyway. This can be achieved through unique branding, iconic lighting, and signage at the International Boulevard and East 12th Street entrances. Lighting will also enhance pedestrian safety, improving visibility in the alleyway.

The design option proposes to invite local artists to paint murals and design installations along the alleyway, creating a vibrant space. Stormwater runoff along the alley can be managed through unique permeable pavers and intermittent rain gardens. Making the alleyway a destination point will increase pedestrian traffic and further improve safety.

Another way the design increases safety is by introducing traffic tables at the cross-street intersections (figures 77, 84, and 85). Traffic tables slow vehicular traffic and create an identifying feature for the alley. They will be installed on East 12th Street, East 13th Street, and East 14th Street; and include a paving material similar to that currently used within the alley.

The enhancements proposed in this design schematic can help spark local developments along the alley, such as restaurants; creating a vibrant connection into downtown. In addition, the alley can begin to serve the community as an event space for festivals, local markets, and concerts.

FIGURE 77 *A design proposal for Site 5.*

FIGURE 78 *Before: A view of the alley between E Washington St. and E Adams St.*

FIGURE 79 *After: A rendering of the alley between E Washington St. and E Adams St. with paving improvements, new lighting and murals on building walls. Stormwater features for this site include permeable paving with gravel storage below ground and rain gardens.*

FIGURE 80 *Before: A section cut of Site 5.*

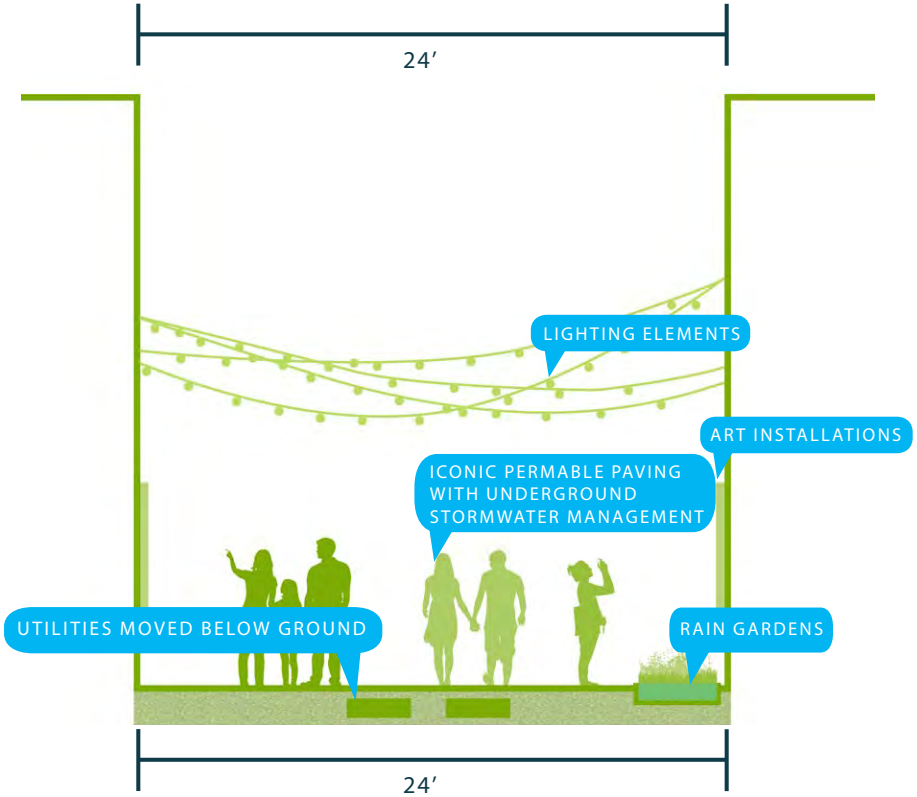


FIGURE 81 *After: A design proposal for Site 5.*

BRANDING AND IDENTITY

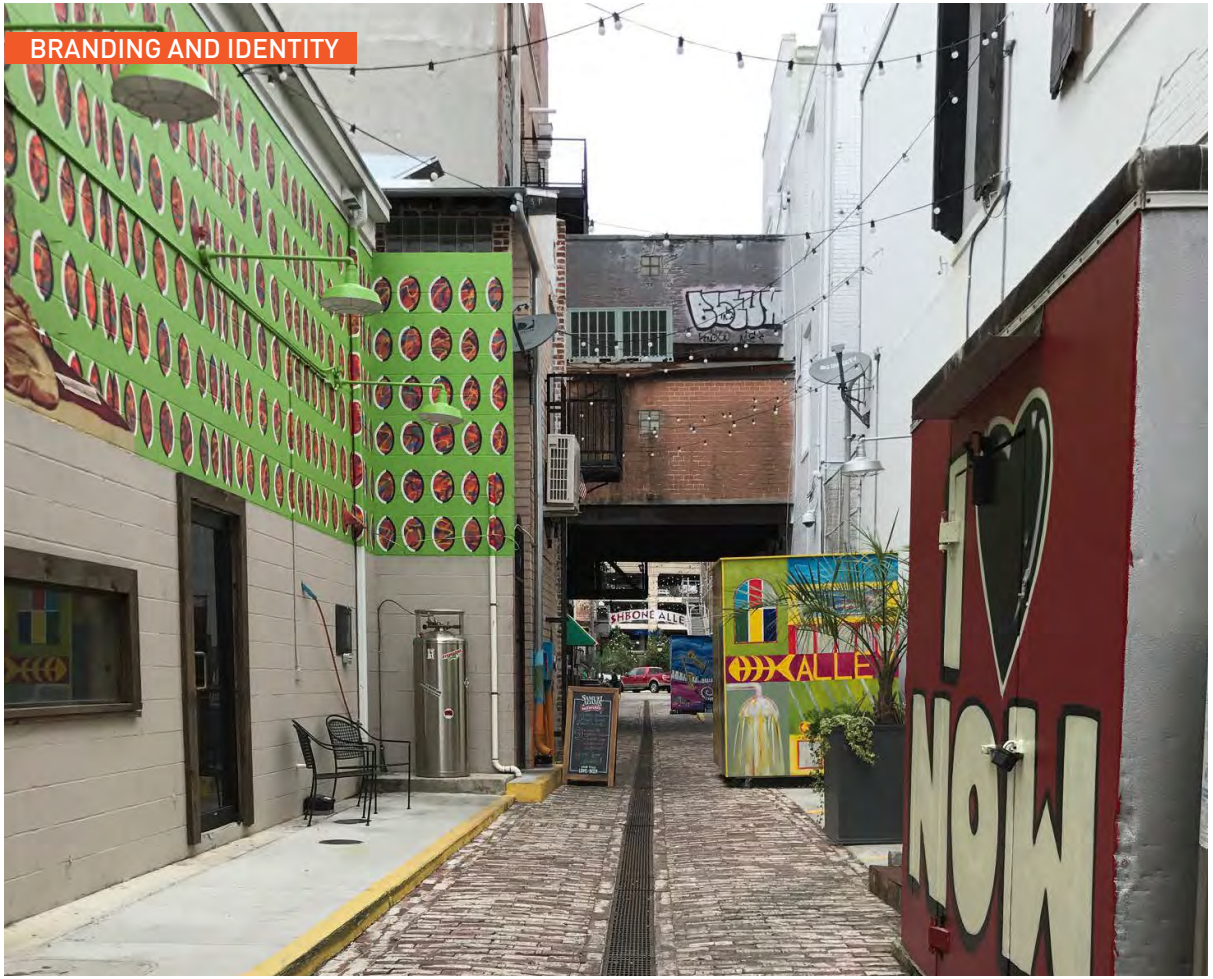


FIGURE 82 *Fishbone Alley, Gulfport, Mississippi*
REFERENCE *Sunherald.com*

Fishbone Alley is a canyon alley, meaning it has no parking areas or empty lots. Several restaurants and bars flank one side of the alley. Whimsical artwork, including graffiti and murals cover the exterior building facades. Strands of small overhead lights zigzag between buildings for a festive nighttime ambiance.

ART INSTALLATIONS

FIGURE 83 *La Calle del Arenal, Madrid, Spain*
PHOTO CREDIT *hitchhikershandbook.com*

The orange and black canopy provides shade and a vibrant aesthetic enhancement to the shopping street.

FIGURE 84 *Traffic Table Diagram*
PHOTO CREDIT: *National Association of Transportation Officials (NACTO)*

FIGURE 85 *Traffic Table, Netherlands*
PHOTO CREDIT *www.pedbikeimages.org*

Traffic tables act as a traffic calming feature near high traffic areas or pedestrian zones and allow for safer crossing points.

6 NEXT STEPS

FUTURE DEVELOPMENT PLANS AND IMPLEMENTATION OF DESIGN PROPOSALS

The Greening America's Communities initiative is plugging into existing momentum in the downtown, campus, and Buena Vida neighborhood. The Housing Authority of Brownsville was awarded a Choice Neighborhoods Planning Grant for the Buena Vida neighborhood from the Department of Housing and Urban Development (HUD). More information can be found at: https://buenavidachoice.com.

Momentum has been building via increased participation from residents, business owners, and students; increased participation from nearby organizational partners; and increased attention from outside funders. A successful implementation strategy can pair the design options and strategies with this building momentum.

Currently there are plans in development for reconstruction of East 15th Street in the Buena Vida neighborhood; there is an ongoing comprehensive plan of the Brownsville Metro (BMetro) system; and Market Square and connecting alleys are being renovated. Design options from this initiative can be implemented through these ongoing efforts, to take advantage of existing resources to improve green infrastructure and smart growth principles. Specifically, the plans for East 15th Street can incorporate green infrastructure design options; BMetro can look at how to better connect the Buena Vida neighborhood to the soon to be performing arts academy; and the alleyway improvements can incorporate artists and additional traffic calming into the finishing touches of current construction activities.

Better connecting downtown with the TSC and UTRGV campuses was a point of feedback repeatedly given during the charrette. TSC has just chosen a new president and has leadership that wants to see the downtown prosper. UTRGV will continue to grow its campus in the coming years. The design options and the feedback received during the public charrette can be useful in working with both TSC and UTRGV to improve the connection between the campuses and downtown via International Boulevard.

COMPLETE STREETS RESOLUTION

The city of Brownsville has adopted resolutions that align with the design options presented by the design team. Resolution #2012-056, the complete streets resolution, "was created to allow the City to incorporate complete streets approaches, as a way to address a wide variety of societal challenges, including pollution, climate change, traffic congestion, social isolation, obesity, physical inactivity, limited recreational opportunities, sprawl, population growth, and safety. It also reinforces the importance of creating a comprehensive, integrated transportation network that enables safe travel by all users; including pedestrians, bicyclists, and other vulnerable road users." Furthermore, the city adopted the NACTO guidelines resolution which states that "the City of Brownsville accepts NACTO (National Association of City Transportation Officials) Urban Streets Design Guide and Urban Bikeway Design guide as a resource for guidance on the development of bicycle facilities. This guide will improve the City transportation network." More information about the complete streets and NACTO resolutions can be found at: http://www.cob.us/543/Rules-of-the-Road. Additionally, section 334 of the Brownsville code of ordinances provides guidance on landscaping and appropriate plant and tree species.

Short term policy strategies can include reducing stormwater runoff and creating a stormwater maintenance fund. Comprehensive guidelines can be created for new development and property renovations that encourage property owners and developers to minimize the amount of stormwater runoff from properties via green infrastructure techniques. A portion of development or impact fees could be reallocated to fund a stormwater maintenance fund for municipally owned green infrastructure facilities. Developing policy strategies such as these can be most successful if they make use of a stakeholder and resident-informed process. The city of San Antonio, Texas has implemented a storm water utility fee that can be waived or reduced if a landowner installs and maintains low impact development/green infrastructure features. More information can be found at: http://www.sanantonio.gov/TCI/Projects/Storm-Water-Fee/Learn-About-the-Storm-Water-Utility-Fee. Additional information about operating and maintaining green infrastructure practices may be found at: https://www.epa.gov/green-infrastructure/green-infrastructure-operations-and-maintenance.

POTENTIAL FINANCING SOURCES

A robust funding approach merging local, state, and national sources can assist in achieving a successful implementation of the design options. Locally the Brownsville Community Improvement Corporation (BCIC) offers funding they allocate in several ways, including a discretionary fund. The Valley Baptist Legacy Foundation focuses on improving the quality of health of RGV residents and recently funded the Lower Rio Grande Valley Active Transportation and Active Tourism Plan, spearheaded by the city of Brownsville, including the major cities of Cameron County. Sharing this initiative with the staff and boards of these organizations may provide opportunities for funding especially if merged with resources from other organizations. Community Development Block Grant (CDBG) funds from HUD allocated to the city of Brownsville may be another local option. Funding is generally available annually. Specific funding dates and more information on CDBG funding can be found at https://www.hudexchange.info/programs/cdbg-entitlement/

At the state level the TXDOT administers the traffic safety grant program, with program areas including pedestrian and bicycle safety and speed control. A local 20% match is needed for this grant. Funding is generally available annually. Specific funding dates and more information can be found at: https://www.txdot.gov/government/funding/egrants.html. TXDOT also offers a public transportation grant program that may be used for BMetro route changes or bus stop improvements. Funding is generally available annually. Specific funding dates and more information can be found at: https://www.txdot.gov/government/funding/local-assistance.html

At the national level, the EPA administers the Gulf of Mexico Cooperative Agreements grant program, which has two priority areas that align with this initiative: 1) water quality management and 2) strengthen community resilience. Available funding can range up to $500,000. Funding is generally available bi-annually. Specific funding dates and more information can be found at: https://www.epa.gov/gulfofmexico/2017-gulf-mexico-program-request-proposals-0. Additionally, the EPA Water Finance Clearinghouse can be used to find other funding sources: https://ofmpub.epa.gov/apex/wfc/f?p=165:1::::::

Additionally, The Funders' Network provides a grant program via their Partners for Places program for up to $150,000 for green infrastructure projects that can provide a 1:1 match from a local foundation. Funding is generally available semi-annually. Specific funding dates and more information can be found at: https://www.fundersnetwork.org/partners-for-places/. This grant may be an opportunity to partner with the Valley Baptist Legacy Foundation, if the design options are paired with a public health aspect. Funding is generally available semi-annually. Specific funding dates and more information on them may be found at: http://www.vblf.org/grantmaking/

KEY PARTNERSHIPS

Key partners for implementation include the engineering, planning, public works, greens, and grants departments of the city. The LRGV Stormwater Taskforce can provide local technical support and can provide feedback on other local green infrastructure efforts that have been undertaken.

The city of Matamoros is also investigating and implementing green infrastructure and smart growth examples. For example, Matamoros is planning to turn part of the old railroad into a public park that could connect to site 2 (shoreline park). Beyond sharing best practices, Brownsville and Matamoros can coordinate on the Gateway Bridge site and the shoreline site to create a shared vision. The Mexican Consulate office is a key partnership for coordinating efforts and best practices.

The Department of Homeland Security (DHS) and the General Services Administration (GSA) are crucial partners to the Gateway Bridge site. The DHS and GSA may someday receive funding to renovate the border

crossing, which could provide an opportunity for implementation of elements of the design options. Brownsville is part of the Southern Border Program Office, more information can be found at: https://www.gsa.gov/real-estate/gsa-properties/land-ports-of-entry/southern-border-program-office. The Federal Highway Administration may be a valuable partner for improving the intersection of International Boulevard and Highway 69/77/83.

Area partners that can continue to be involved during implementation, include: Cameron County, TSC, UTRGV, the Main Street Program board, the local artist community, designers and engineers, and the Housing Authority of the city of Brownsville.

Public outreach for moving implementation forward can be successful by taking advantage of the existing momentum in the downtown, campus, and Buena Vida neighborhood. The city of Brownsville has existing relationships and partnerships that can be relied upon for getting information out, for facilitation, and for developing community engagement plans. Green infrastructure and smart growth initiatives provide hands on learning opportunities for both K-12 and higher education students. Brownsville Independent School District, Idea Schools, TSC, and UTRGV students can play a role in the implementation of the design options, as well as help with getting information out to their friends and families. Additionally, the City has existing resources such as Brownsville TV, the public access channel, the annual drainage expo, and the public libraries to engage with residents and share information.

DESIGN RESOURCES

In closing, it is important to develop any of the design options with widely used and accepted design guides, manuals, standards, and codes. The following is a brief summary of suggested resources.

The Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways provides standards for traffic, pedestrian, and bicycle traffic. This information will be valuable when coordinating with agencies, such as TXDOT along International Boulevard; and DOT and FHWA for the intersection of International Boulevard and the highway. Special attention should be given to chapter 4E - Pedestrian Control Features and chapter 9 - Traffic Control for Bicycle Facilities. The manual can be found at: https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm

The National Association of City Transportation Officials (NACTO) provides several guides on street, transit, and stormwater design.

NACTO's Urban Street Design Guide provides overall guidance on complete streets to make safer streets, that are more livable and support economic viability. Intersections and pedestrian crossings are a major focus of this guide that can be applied to all sites; specifically sites 1 and 3, where increased pedestrian safety and connectivity is desired. The design guide can be found at: https://nacto.org/publication/urban-street-design-guide/

NACTO's Transit Street Design Guide is a recommended reference to be consulted for bus stop design for sites 4 and 5; and for modifications to bus stops near the other sites, specifically regarding traffic flow and accessibility. The design guide can be found at: https://nacto.org/publication/transit-street-design-guide/

NACTO's Urban Bikeway Design Guide provides guidance for cycling infrastructure, guidance that has a large consensus of agreed upon best practices. The guide is also coordinated with MUTCD. This guide can be useful for all sites, specifically for the separated bike and pedestrian path at site 3. The design guide can be found at: https://nacto.org/publication/urban-bikeway-design-guide/

NACTO also provides the Urban Street Stormwater Guide, which can be useful for all five sites. The guide provides guidance on design and technical information, but also provides crucial information on planning and maintenance. The guide recommends and provides guidance for establishing performance measures during the planning stage; to create stormwater infrastructure that meets goals and requirements,

while being feasible. The guide also discusses important maintenance recommendations for various stormwater management elements. The design guide can be found at: https://nacto.org/publication/urban-street-stormwater-guide/

The above manuals and guides will be useful reference materials when coordinating with TXDOT, which maintains International Boulevard. TXDOT case studies will be helpful references when coordinating with TXDOT on sites 1 and 3, and the suggested cross section for the area of International Boulevard between campus and the highway. A recent case study of a TXDOT road with vegetation in a median is TX-336 in McAllen, between Trenton Rd. and SH107. A planted raised median with trees has recently been constructed. Other recent TXDOT case studies with landscaped medians with trees include FM 1431 in Leander, near the intersections with 183 and 183A, and FM1960 in Houston. These case studies are not identical to what these design options are proposing; but they do show instances of TXDOT placing trees and other landscape features in medians.

7 APPENDIX: ADDITIONAL SITE ANALYSIS

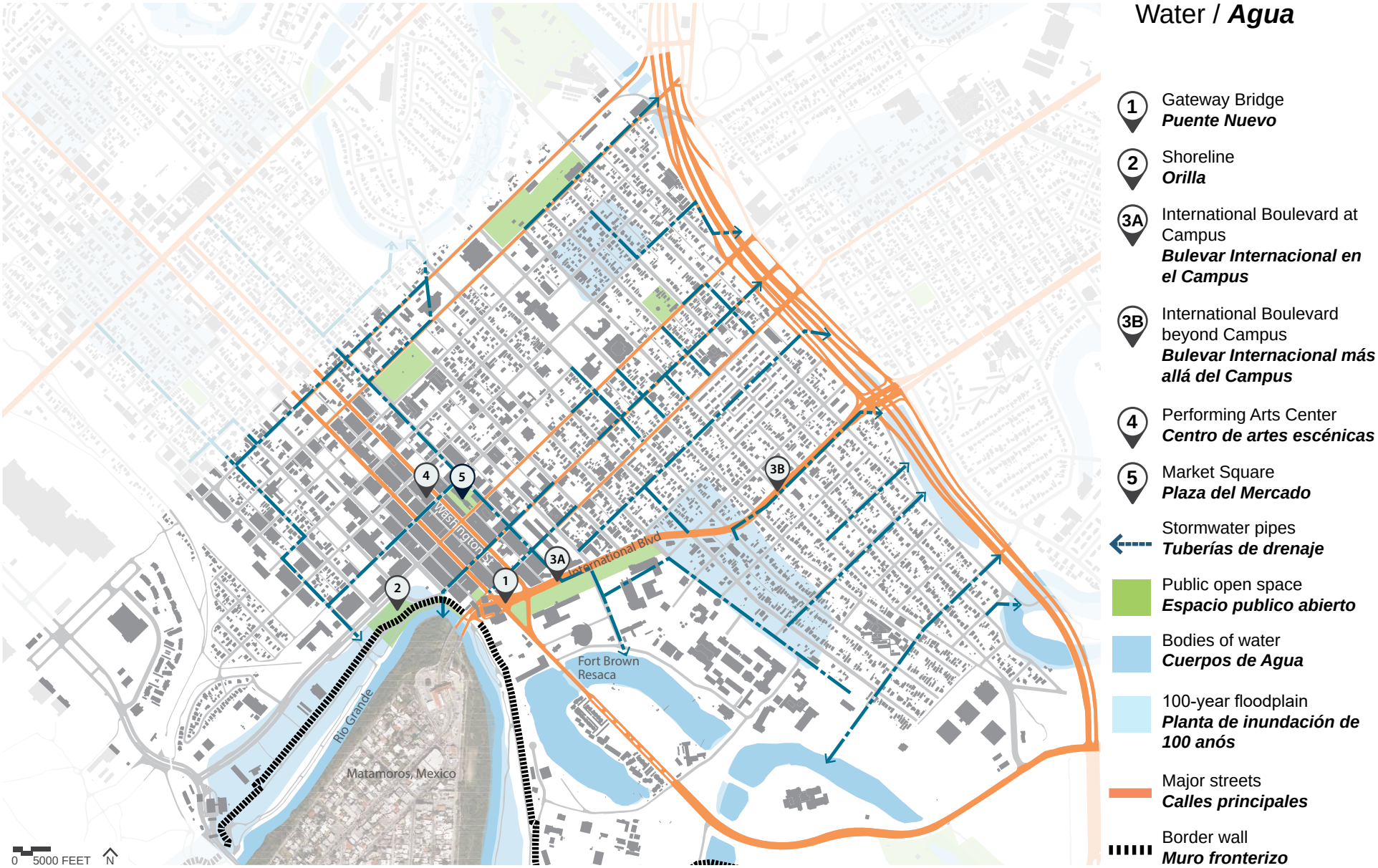


FIGURE 86 *A water analysis diagram of the project sites.*

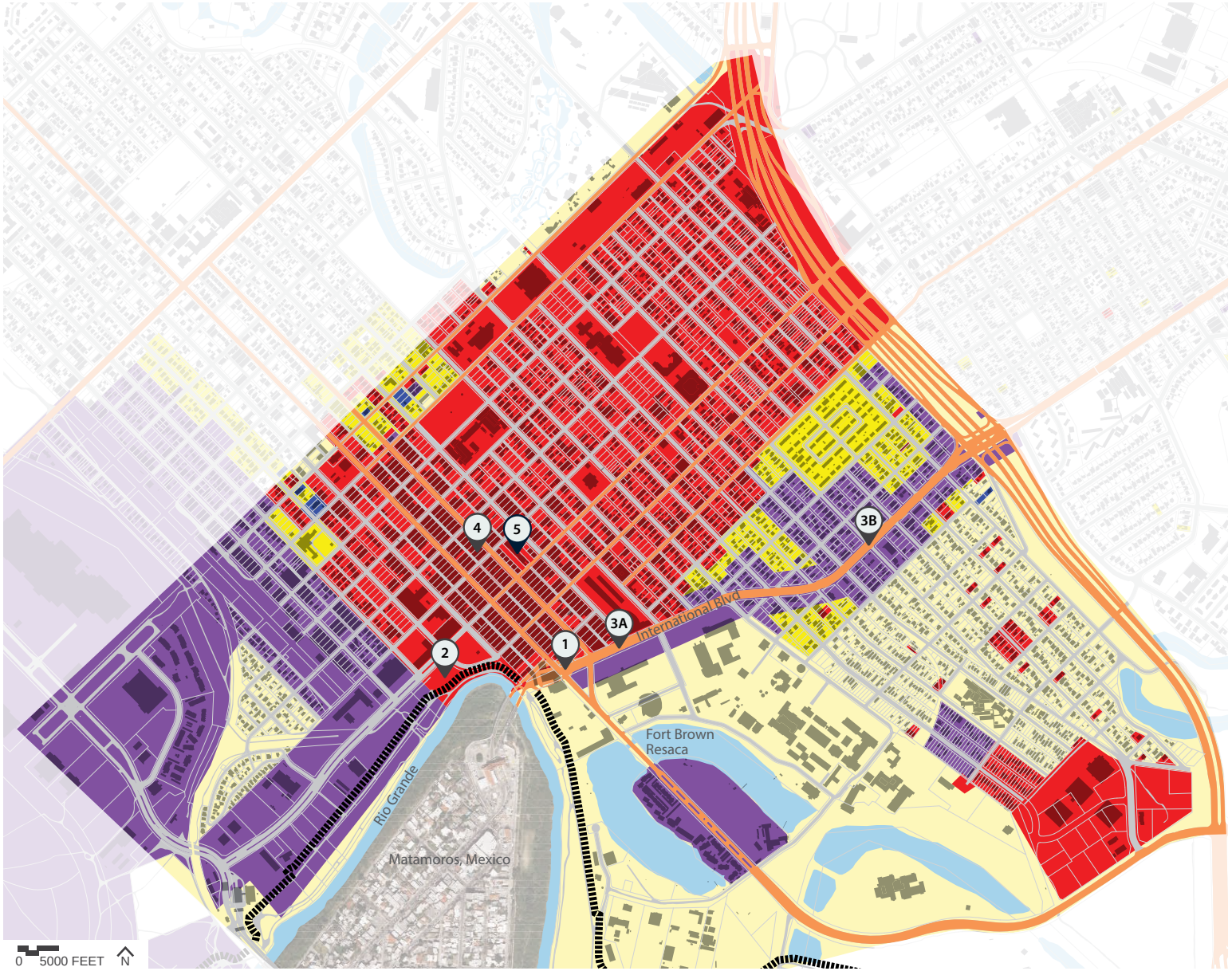


FIGURE 87 *A zoning diagram of the project sites.*

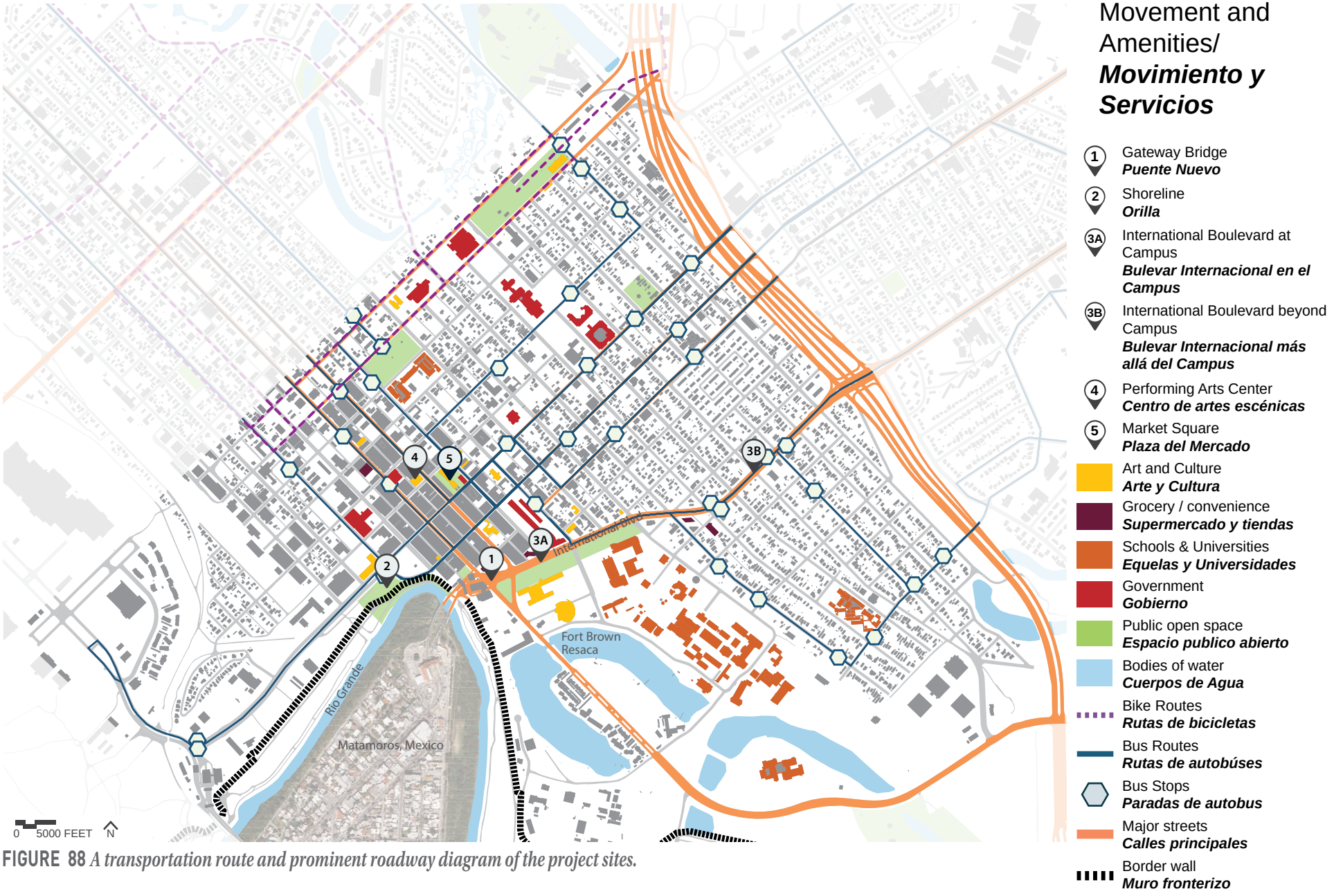


FIGURE 88 *A transportation route and prominent roadway diagram of the project sites.*


Smart Growth
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