

US EPA ARCHIVE DOCUMENT



Greening America's Capitals

U.S. Environmental Protection Agency
2012

GREENING LOWER GRAND AVENUE

Phoenix, Arizona

Greening America's Capitals is a project of the Partnership for Sustainable Communities between the U.S. Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (DOT) to help state capitals develop an implementable vision of distinctive, environmentally friendly neighborhoods that incorporate innovative green building and green infrastructure strategies. EPA is providing this design assistance to help support sustainable communities that protect the environment, economy, and public health and to inspire state leaders to expand this work elsewhere. Greening America's Capitals 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.

Phoenix, Arizona, was chosen in 2011 as one of five state capital cities to receive this assistance, along with Montgomery, Alabama; Jackson, Mississippi; Lincoln, Nebraska; and Washington, D.C.

More information about Greening America's Capitals is at <http://www.epa.gov/smartgrowth/greencapitals.htm>.



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All images courtesy of PLAN*et unless otherwise noted.



Figure 1: A property owner individualizes and accents her building with paint and landscape. Photo Credit: city of Phoenix.

EXECUTIVE SUMMARY

In 2011, the city of Phoenix applied to receive design assistance from EPA's Greening America's Capitals program. Phoenix requested assistance with developing environmentally and economically sustainable designs to support the revitalization of Lower Grand Avenue and to serve as an example for other streetscape improvements in arid regions.

The final design options developed with the EPA team's assistance create streetscape and public realm improvements along Lower Grand Avenue. The designs encourage pedestrian and bicycle activity with enhancements that make pedestrians and bicyclists safer while maintaining on-street parking and providing space for a future streetcar or trolley. The design options would not require any changes to the existing street section or curb line. They would convert outside travel lanes to parking and rain gardens, narrow the remaining travel lanes, add crosswalks, widen sidewalks where needed, and create curb bulb-outs that reduce the distance required to cross the street.

Rain gardens designed and planted for arid environments could capture stormwater and reduce ambient temperatures. Reflective paint marking bicycle lanes and crosswalks can also reduce ambient temperatures. To build on Lower Grand Avenue's sense of place, artist-designed crosswalks, distinctive lighting, public art, and wayfinding signs could also be added to the streetscape. Public art can contribute vitally to a healthy, attractive community. It can express a city's pride in its history and culture, draw new investment, and stimulate its residents' creativity and sense of community.

The design options were developed through a public process that included a three-day workshop. Community stakeholders and city staff identified short-, mid-, and long-term strategies that could be implemented by the city, private property owners, and public-private partnerships. Residents, business owners, stakeholders, and city staff are clearly dedicated to improving Lower Grand Avenue to support broader neighborhood revitalization.



Figure 2: Many property owners work with artists to paint their buildings, creating a site-specific and eye-catching environment. Photo Credit: city of Phoenix.

1 INTRODUCTION

Grand Avenue cuts diagonally through the Phoenix metropolitan area's grid of streets. Lower Grand Avenue is defined as the area of Grand Avenue between the Interstate 10 (I-10) overpass and the intersection at Van Buren Street and 7th Avenue. Lower Grand Avenue is a historic Phoenix street that was designed as part of the original 1888 Grand Avenue plat.

Historically, Grand Avenue was lined with hotels, automobile repair shops and dealerships, and manufacturing, warehousing, and commercial developments. As the Phoenix suburbs developed, Grand Avenue, like much of downtown, lost businesses and residents to outlying areas. Today, the street has many vacant lots and storefronts and limited pedestrian and bicycle facilities. With the renaissance of downtown Phoenix, the success of the Roosevelt Row arts district, the Capitol Mall, and the new downtown Arizona State University campus, the Lower Grand Avenue area is poised for revitalization as well. Now seen as an extension of the Roosevelt Street Arts District and downtown Phoenix's arts and employment center, Lower Grand Avenue is evolving into a location for artists' galleries and studios, offices for design professionals, and new and traditional manufacturing uses.

Recognizing the importance of Lower Grand Avenue as a gateway to downtown Phoenix and as a neighborhood with a strong and engaged community, the city of Phoenix, supported by residents and local business leaders, applied for EPA's Greening America's Capitals program. The city's goal for the project is to revitalize Grand Avenue as a model of Southwestern sustainable community design and as a catalyst for a healthier and more prosperous neighborhood.

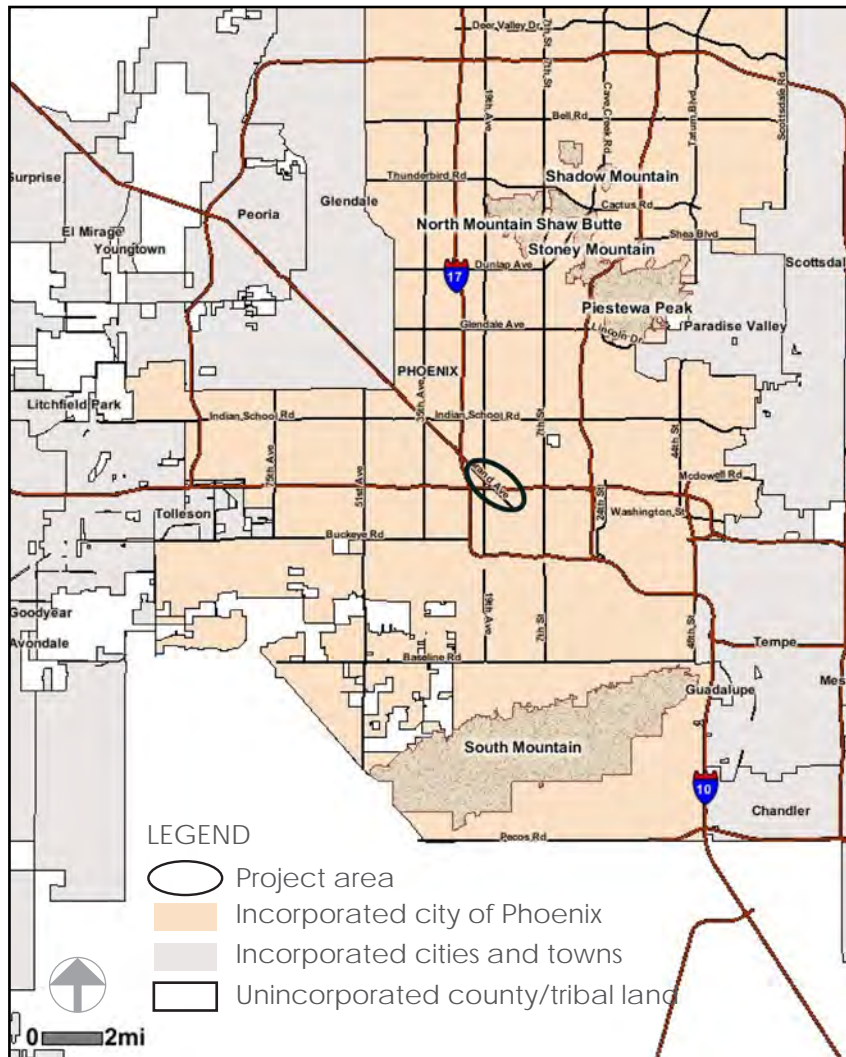


Figure 3: Regional Location Map. Source: City of Phoenix. www.maps.phoenix.gov/WebPMO/MapService/WebPMO.aspx. Access date August 7, 2012.

2 PLANNING PROCESS

After Phoenix was selected for the Greening America's Capitals program, EPA put together a team of designers to develop the design options. The city of Phoenix, the Grand Avenue Merchants Association (GAMA), and the EPA team engaged the neighborhood in the planning process with a site walk, informal meetings with local merchants, a community workshop, and web-based community input. Based on the input from the community, the team developed design options for Lower Grand Avenue. The city of Phoenix and community partners collaborated throughout the planning process and continue to work together to explore which design options to implement. A list of community partners and design team members is in Appendix A.

SITE WALK

Before the workshop, community members, representatives of GAMA, city of Phoenix staff, community members, and the design team walked the project area to identify key opportunities and challenges along Lower Grand Avenue. The initial ideas from the site walk helped the design team identify opportunities to use green infrastructure¹ strategies and street retrofit tools that have been successfully used in other Southwestern locations. To customize these ideas for Lower Grand Avenue, the team developed specific applications of these tools for Lower Grand Avenue and presented them at the community workshop.

COMMUNITY WORKSHOP

A community design workshop was held from February 28 to March 1, 2012, at Bragg's Pie Factory, an art gallery in the project area. Residents and local businesses could drop by the workshop at any time to talk to the design team as concepts for Lower Grand Avenue were developed. The workshop was widely advertised by the city and project stakeholders, and over 100 people participated in the opening-night meeting.



Figure 4: Community members, city of Phoenix staff, and the design team participated in the site walk. Photo Credit: city of Phoenix.



Figure 5: Site walk participants gathered along Lower Grand Avenue. Photo Credit: city of Phoenix.

¹ Green infrastructure is an approach that communities can choose to maintain healthy waters, provide multiple environmental benefits and support sustainable communities. Unlike single-purpose gray stormwater infrastructure, which uses pipes to dispose of rainwater, green infrastructure uses vegetation and soil to manage rainwater where it falls. By weaving natural processes into the built environment, green infrastructure provides not only stormwater management, but also flood mitigation, air quality management, and much more. US EPA. Green Infrastructure. www.epa.gov/smartgrowth. Access date: August 11, 2012.

WORKSHOP DAY 1 - PROJECT OBJECTIVES AND COMMUNITY VISION

To learn about key opportunities and challenges, city staff, EPA staff, and the design team held stakeholder meetings focused on mobility, economics, community culture, and design and green infrastructure. The opening-night meeting provided basic information on potential design tools that could be used on Lower Grand Avenue. Through feedback forms and in discussion groups, participants provided their thoughts on project objectives, challenges, and key locations for near-term action.

WORKSHOP DAY 2 - DESIGN CONCEPT DEVELOPMENT

Based on ideas generated at the first night's meeting, the team further developed design options and presented them to the community for review and comment. The design options offered potential changes to Lower Grand Avenue that included:

- Reducing roadway travel lanes.
- New bike lane and parking configurations.
- Options for public transit within the existing roadway.
- Green infrastructure strategies for improved stormwater management.
- Incorporation of public art and pedestrian amenities.
- New spaces for outdoor community events.

Most Important Project Objectives In Order Of Popularity

- Increase pedestrian facilities and bicycle activity.
- Plants, trees, and shade.
- Slow down traffic.
- More retail, business, and artist work spaces.
- Properties that interact with street and sidewalk; innovative design.
- Mixed use development and new development.
- Local identity, signing.
- Implement trolley.
- Better lighting.
- More parking.
- Reduce urban heat island effect.
- No restrictions on commercial or truck traffic.
- Maximize existing resources.
- Shade and color.
- Historic preservation.
- Connections to adjacent neighborhoods.
- Safety.
- Community garden.
- Community gathering.
- Safe bike lanes.
- Less impact on adjacent neighborhoods from noise and events.
- Gateway to downtown Phoenix.
- Screen parking areas from pedestrian view.
- Street art.
- Comprehensive plan.
- Permeability.

Figure 6: Information compiled from feedback forms used by workshop participants described the most important objectives.

WORKSHOP DAY 3 - CONCEPT REFINEMENT

Various stakeholders provided comments on initial design options through in-person discussion and by filling out feedback forms. The overall feedback emphasized the following:

- Improving the appearance of the street.
- Reducing ambient temperatures.
- Improving safety for pedestrians.
- Providing on-street parking.
- Retaining the special character of Lower Grand Avenue.



Figure 7: Workshop participants review and provide comments on draft design options. Photo Credit: EPA.



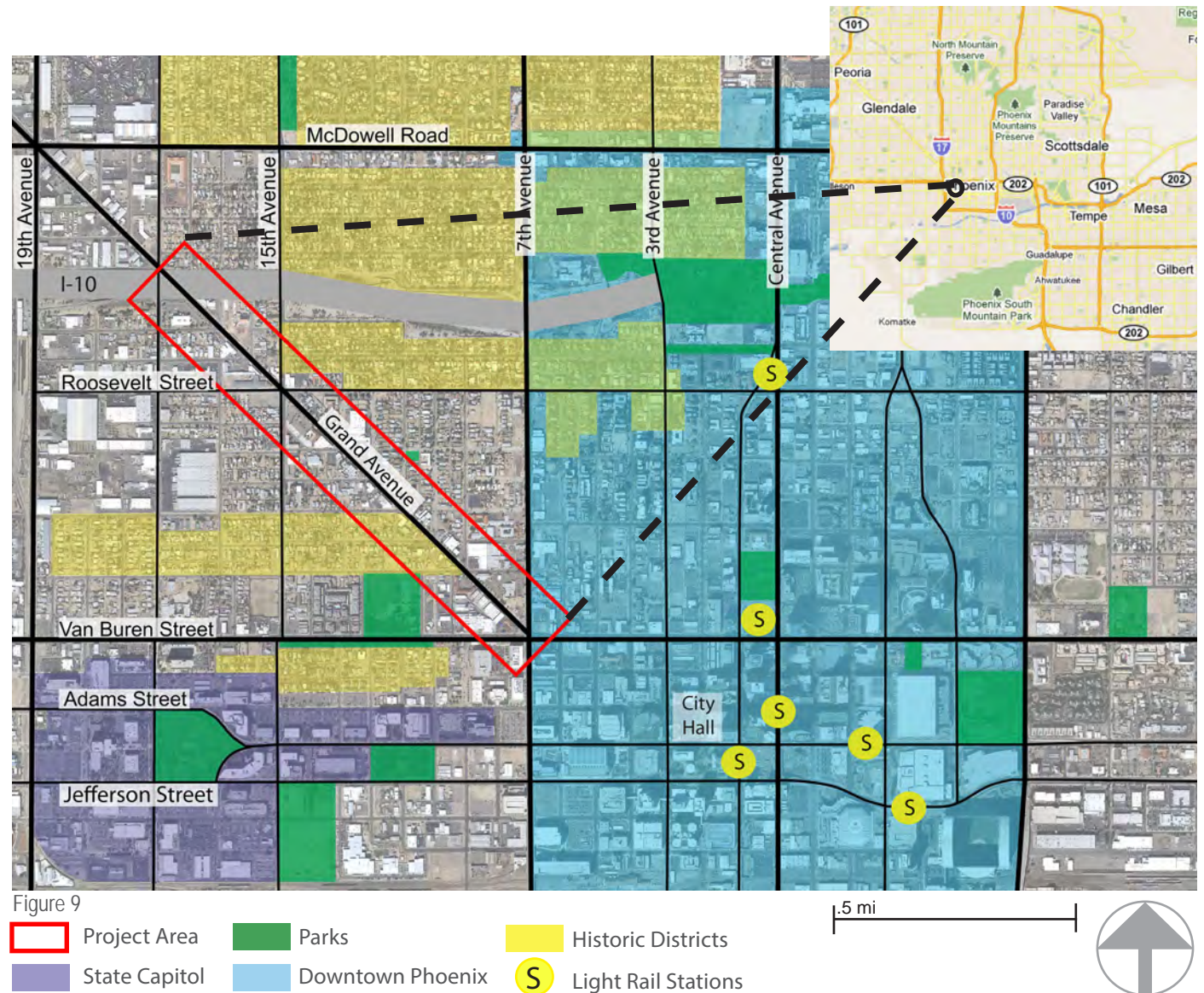
Figure 8: To encourage community participation, the workshop was held at Bragg's Pie Factory, an art gallery in the project area. Community members could easily review design options and share their ideas with the design team. Photo Credit: EPA.

3 SITE ANALYSIS

GEOGRAPHIC CONTEXT

The Phoenix metropolitan region is the 14th largest in the United States, and Phoenix is the sixth largest city in the country. Downtown Phoenix includes the Arizona State Capitol, Arizona State University's downtown campus, over 16 million square feet of office space, a convention center with almost 1 million square feet, museums, art galleries, apartments, houses, and condominiums. Light-rail stations are half a mile east of the intersection of Grand Avenue and Van Buren Street and one mile east of the intersection of Grand Avenue and Roosevelt Street.

Lower Grand Avenue is one of two diagonal streets in the Phoenix street grid. The five-lane street starts between downtown Phoenix and the Capitol Mall. As Grand Avenue proceeds northwest, it passes through historic residential districts and the downtowns of Glendale, Peoria, El Mirage, and Surprise. Grand Avenue ends approximately 60 miles from its origin in downtown Wickenburg, Arizona.



STREET CHARACTER

Lower Grand Avenue is an eclectic mix of industrial, residential, and retail buildings interspersed with vacant lots. Some buildings are repurposed as artists' galleries and work spaces or professional design offices. Other buildings house manufacturing and automobile dealerships and repair shops. Many fenced vacant and parking lots front onto the street.

Retail development along Lower Grand Avenue is mostly at the intersection of Grand Avenue, Roosevelt Street, and 15th Avenue and includes established businesses such as the Rodriguez Boxing Gym and newer uses such as galleries, the Oasis apartments, and restaurants and bars. These establishments serve the neighborhood and attract residents and visitors to Grand Avenue. South of the Roosevelt Street, 15th Avenue, and Grand Avenue intersection, galleries and professional uses predominate. Some buildings in this area are being renovated for new restaurants, retail, and offices.

Lower Grand Avenue includes five 12-foot-wide traffic lanes. Sidewalks on both sides of the roadway range from five to eight feet wide and are separated from the roadway by landscaped areas that vary from three to 12 feet wide.

The diagonal path of Lower Grand Avenue through the Phoenix street grid creates both five-point and six-point intersections. With the exception of Roosevelt Street and 15th Avenue, these intersections do not have traffic signals or crosswalks. Grand Avenue is a commuter route from the West Valley to downtown Phoenix, and most vehicle trips on Grand Avenue occur during morning and evening rush hours. During other times, traffic volume is low and speeds are high. As a result, people do not feel comfortable crossing Grand Avenue.



Figure 10: Decorative fencing along Lower Grand Avenue adds to the unique and eclectic character of the street.

The first Friday of every month ("First Friday"²) is a community arts festival that takes place throughout downtown and midtown Phoenix, with the epicenter at Roosevelt Street between Central Avenue and 7th Street, approximately one mile east of the intersection of Grand Avenue and Roosevelt Street. As this monthly event has outgrown the space available on Roosevelt Street, some artists have relocated to Grand Avenue, and the crowds have started to follow them. To attract people to Grand Avenue on First Fridays, artists on Lower Grand Avenue hold openings or concerts in their galleries. To bring visitors during other times, some studio owners have landscaped areas of the sidewalk, painted murals on vacant building and perimeter walls, and enhanced building façades with decorative fencing or art. Lower Grand Avenue merchants and artists have built on the success of First Fridays by adding a Third Friday and an annual Grand Avenue Festival.³

CLIMATIC CONTEXT

Downtown Phoenix is on the northern edge of the Sonoran Desert in the Salt River Valley Region at approximately 1100 feet above sea level. Phoenix has temperate winters with daytime temperatures between 60 and 80 degrees and very hot summers with temperatures that regularly exceed 100 degrees.⁴ Pavement, sidewalks, and building walls and roofs absorb heat during these hot summer months, and these surfaces retain the heat throughout the night. These consistently hot temperatures create a harsh environment for people walking and riding bicycles along Phoenix's streets. In addition, the hot, desert context is a harsh environment for trees and other vegetation that can shade sidewalks for pedestrians and limit solar gain on buildings and pavement.

The Phoenix region has two rainy seasons that occur in late summer and in mid-winter. Summer monsoons are the result of low pressure combined

2. First Friday is organized by ArtLink, a downtown artists organization. See www.artlinkphoenix.com/. Access date: August 22, 2012.
3. The Grand Avenue Festival is an annual event sponsored by the Grand Avenue Merchants Association. Grand Avenue Merchants Association. www.grandavephoenix.com/. Access date August 11, 2010
4. Southwest Climate Change Network. www.southwestclimatechange.org/impacts/people/urban_heat_island/statistics. Access date: August 10, 2012.

with moist air from the Sea of Cortez and the Gulf of Mexico. Severe storms during the summer monsoon season are responsible for about one third of the annual rainfall, which for Phoenix is between only five and eight inches each year.⁵

Streets in Phoenix's desert climate, such as Lower Grand Avenue, must be designed to address these special stormwater management needs and to mitigate high temperatures. Plants used along streets and sidewalks should be adapted to survive both hot summers and large amounts of rainfall during rainy periods.

HISTORY

Grand Avenue was originally conceived in 1888 to connect downtown Phoenix to the newly formed city of Glendale. As the city of Phoenix developed towards the west, new cities and towns formed in western Maricopa County, and all of Grand Avenue prospered. Lower Grand Avenue became a desirable location for travellers, automobile dealerships, business, and industry such as the O.S. Stapley Company Hardware Store, Bragg's Pie Factory and Quebedeaux Chevrolet.

With the opening of I-10 to Los Angeles in the 1970s, Grand Avenue's importance waned as I-10 access from downtown shifted traffic patterns and the desirability of Grand Avenue as a location for hotels and services. The I-10 overpass physically and visually separates Lower Grand Avenue from the Arizona State Fairgrounds and the northern portion of the roadway, which further removed Lower Grand Avenue from active commercial uses associated with the railroad and state fairgrounds. Reflecting these trends and the shift in traffic patterns to the 19th Avenue and I-10 interchange, Grand Avenue's U.S. 60 designation was removed and placed on 19th Avenue.

As the city continued to develop on the fringes, businesses and retail left central Phoenix, which resulted in vacant buildings and declining housing values along Lower Grand Avenue. In the early 1990s, artists and residents began to settle in large, unused industrial and retail buildings along

5. The Phoenix Metropolitan Area (PMA) includes over 1,900 square miles and because rain in the desert can be very localized, a single observation station can not represent the spatial and temporal distribution of precipitation over the PMA. Historically, only one rain gauge was located at Phoenix Sky Harbor Airport. The annual rainfall measure reflects the average of many rain gauges throughout the Valley. NOAA National Weather Forecast Office, Phoenix Arizona. www.wrh.noaa.gov/psr/PRI/#. Access date August 21, 2012.

Lower Grand Avenue. New development, including a stadium, a downtown Arizona State University campus, housing, high-rise office buildings, light rail, and retail continue to fuel downtown Phoenix's revitalization. Benefitting from this renewal, Lower Grand Avenue is also experiencing a renaissance, with renewed interest in historic buildings from artists, design professionals, and restaurants.



Figure 11: Bragg's Pie Factory circa 1947. Source: City of Phoenix.



Figure 12: The O.S. Stapley Company was a hardware store. Source: City of Phoenix.



Figure 13. Quebedeaux Chevrolet Showroom.

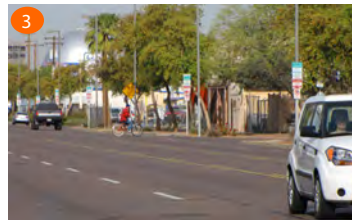
PHOTO INVENTORY AND STREET CHARACTER



View of 1-10 overpass - the northern gateway to Lower Grand Avenue.



Iglesia La Luz Del Mundo contributes to Grand Avenue's distinctive character.



Lower Grand Avenue does not include bicycle lanes or pedestrian amenities.



Grand Oasis live-work residential units are an example of successful redevelopment.



Varied building facades create an eclectic and distinctive character.



Chain link fence dominates much of the Lower Grand Avenue frontage.



Figure 14



Vacant properties and parking lots make up a substantial portion of Lower Grand Avenue's frontage.



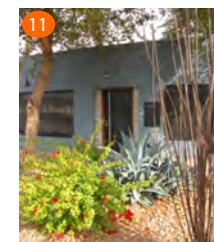
Local residents and merchants maintain the landscape in the city-owned right of way.



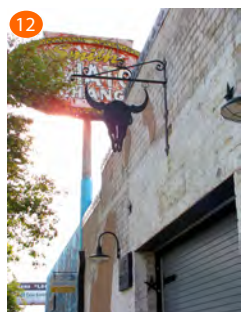
Some buildings have been re-purposed as art galleries, offices, and studios.



This locally-owned bakery is a tenant in a re-purposed building.



Individual planting in the city right of way adds to the avenue's eclectic character.



Distinctive signs often indicate art galleries or artist workshops.





Lower Grand Avenue's width encourages traffic to move at high speeds, especially during rush hour.



Murals painted on walls add color and life to the street.



Artistic facades add to the avenue's character.



Artist work is displayed on Lower Grand Avenue



Portions of the city right of way lack trees and shade elements, and some landscaping needs maintenance or replacement.



Vacant properties present an opportunity for new businesses.



Five-point intersections present opportunities for public art.



Unmarked, five point intersection make crossing the five-lane street unsafe.



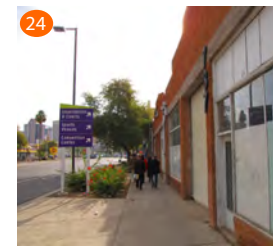
Las Palmas Inn is an old hotel located along Lower Grand Avenue.



The wide city-owned landscaped area and sidewalk provide potential locations for bicycle lanes and bicycle racks.



Lower Grand Avenue offers excellent views of downtown Phoenix. These views are important to the avenue's historic character.



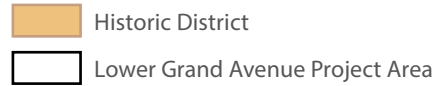
The lack of wayfinding signs is a lost opportunity to identify connections to downtown Phoenix, historic districts, and Capitol Mall.



Lower Grand Avenue is used as a higher speed downtown commuter route and most of the vehicle trips on Lower Grand Avenue occur during rush hours.



HISTORIC DISTRICTS



Lower Grand Avenue connects the F.Q. Story, Oakland, and Woodland historic districts. Each of these districts is named for the original subdivision plat or developer. These neighborhoods are significant due to the diversity of architectural styles from the 1880s through the 1940s.

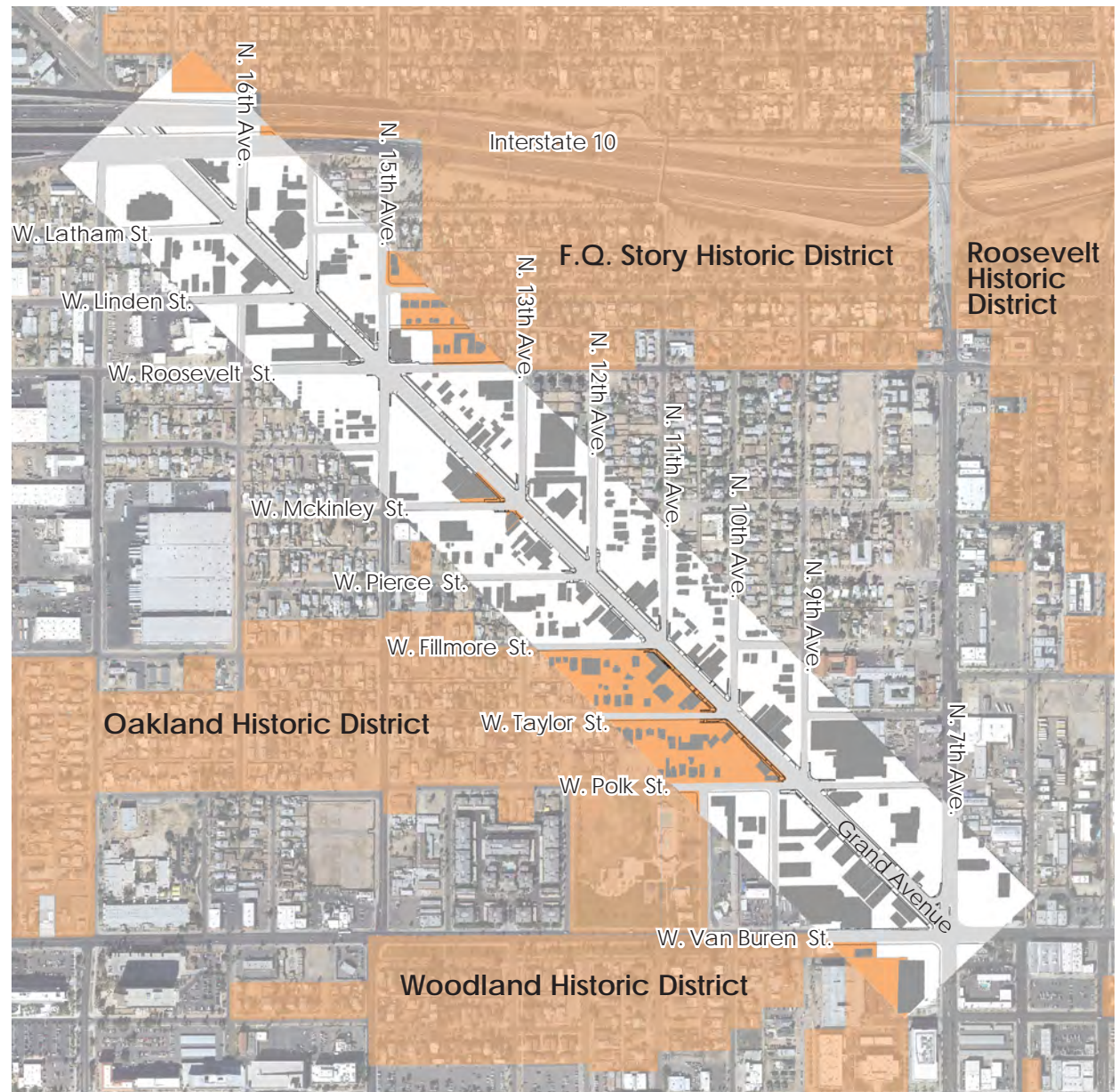


Figure 15

HISTORIC BUILDINGS

An updated survey would be required to accurately assess current streetscape and building eligibility.

- Listed on the National Register of Historic Places ONLY
- Listed on the Phoenix Historic Property Register ONLY
- Listed on both the National Register of Historic Places and the Phoenix Historic Property Register
- Previously determined eligible; will require re-evaluation

Two buildings along Lower Grand Avenue are listed on the National Register of Historic Places and the Phoenix Historic Property Register. Five other buildings along Lower Grand Avenue are known to be eligible for listing on both registers; numerous other buildings have not been assessed for inclusion in either register.

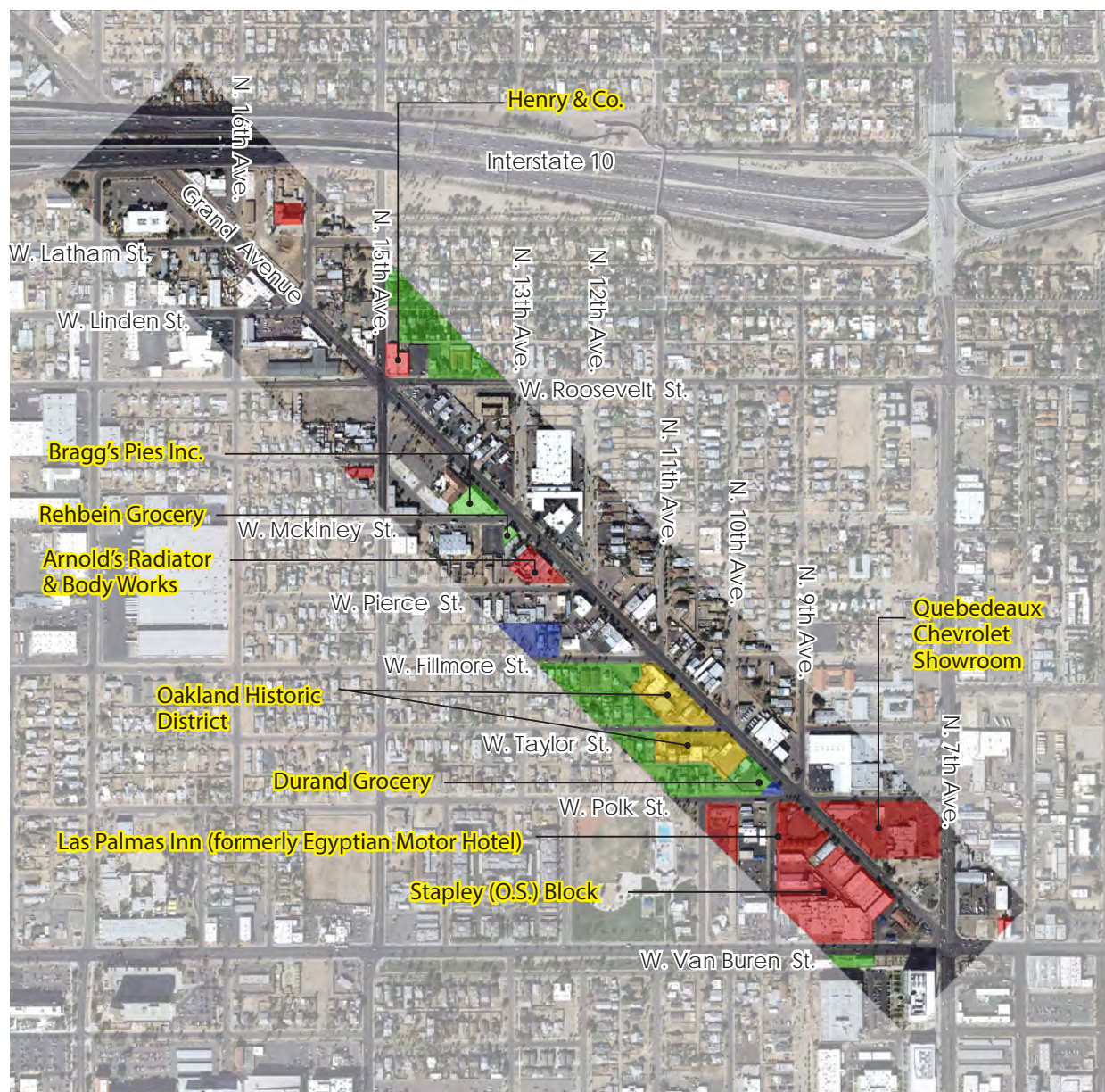
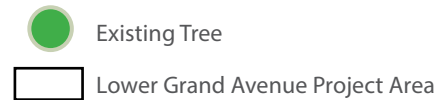


Figure 16



EXISTING TREES AND VEGETATION



Trees along Grand Avenue are spaced, on average, 80 feet apart. A total of 139 trees are located within the project area. The majority of the trees (70 percent) are Indian Rosewood (*Dalbergia Sissoo*). Forty percent of all trees and 31 percent of the Indian Rosewood trees are in good condition. The Indian Rosewood is well suited to an arid climate and with proper care can provide ample shade. The Sissoo is relatively fast growing, thornless, and more vertical than other desert native species.

Trees are in an approximately 12-foot-wide, city-owned landscape strip with little to no ground cover. This landscaped area also includes a utility easement abutting the curb. Portions of the landscape strip have working city-owned and -maintained irrigation.

Some property owners place and maintain plants in the city-owned landscape strip in front of their property. The city continues to maintain street trees in the landscape strip.



Figure 17



STORMWATER

When it rains in the desert, the impact of stormwater can be severe. The desert ground is hard and dry and it does not absorb water quickly. Quantities of rain that would be absorbed by the ground in more temperate locations, can result in severe flooding in a desert environment. The Southwest has rainy seasons in the winter and summer. The summer rains usually occur during the Monsoon season. The Monsoons are a series of thunderstorms that occur over a one

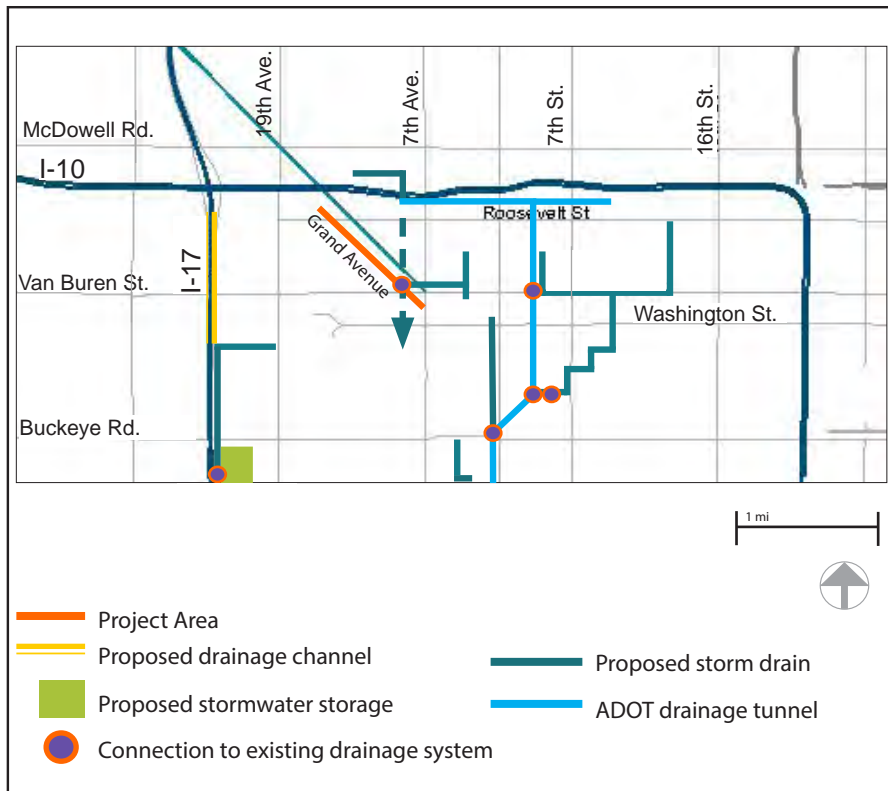


Figure 18: Information courtesy of Flood Control District of Maricopa County. 2008 Metro Phoenix Area Drainage Master Plan Newsletter. August 2008. More information at www.fcd.maricopa.gov. Access date: August 10, 2012.

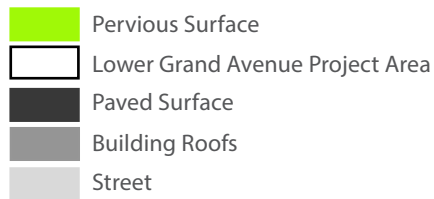
to three month time period, with a mean time period of 69 days.⁶ Monsoons generally provide approximately 1/3 the total annual rainfall within the region. Monsoon storms can cause flooding and other wind related damage.

Lower Grand Avenue is located within the Cave Creek 100-year floodplain. In the downtown, stormwater generally flows from north to south. Side streets channel stormwater to Grand Avenue, where it is conveyed to in-ground storm drains. Lower Grand Avenue and the storm drain system serving it help to prevent flooding and provide important capacity for downtown stormwater management. The 2008 Metro Phoenix Area Drainage Master Plan did not note any specific flooding problems within the Lower Grand Avenue project area. However, the study did identify the area's excess stormwater infrastructure capacity as a component of future downtown stormwater management. To preserve this important function, the team integrated into the design concepts options to capture and recharge stormwater before it enters the storm drain system. Additionally, due to the expense of regrading Grand Avenue and relocating the stormwater system, the city determined that any improvements to Lower Grand Avenue must leave the existing curb and stormwater drainage infrastructure intact.

Currently, underground stormwater and other utilities are located within an easement that includes the first five feet of city-owned landscape right of way adjacent to the curb. Trees and other deep root vegetation are planted outside of this easement.

6. Arizona State Climate Office. 2010 Monsoon Information. www.azclimate.asu.edu/monsoon.php. Access date: August 10, 2012

IMPERVIOUS AND PERVIOUS SURFACE AREAS



Impervious surfaces store heat during the day and release it as temperatures cool at night, as well as cause any rainfall to flow as overland runoff that must be managed through the public storm sewer system. Pervious surfaces allow water to pass through them enabling stormwater to infiltrate the soil and recharge the groundwater table and cool the air as water evaporates.

With the exception of the landscape right of way and a few unpaved lots, Lower Grand Avenue is mostly impervious surfaces. These impervious surfaces contribute to the heat island effect, which describes developed areas that are hotter than surrounding rural areas. Impervious surfaces in the project area also limit opportunities for stormwater to infiltrate into the ground below.

Removing pavement and replacing it with landscaped areas can enhance groundwater recharge and evapotranspiration, the process by which plants transpire water through leaves or evaporate it through a combination of plants and soil. Replacing pavement with vegetation also can help lower air temperatures. Adding linear rain gardens, or bioswales, can capture and recharge stormwater before it enters the storm drain system.



Figure 19



PARKING LOTS



Figure 20

- Parking Lots
- Lower Grand Avenue Project Area

Parking on Lower Grand is largely limited to off-street options and is often privately owned. Currently, on-street parking is permitted all weekends and weekdays from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. However, many merchants and property owners feel that parking is inadequate. During the workshop stakeholders highlighted these common concerns related to parking in the area and along Grand Avenue:

- Parking is viewed as an necessity for redevelopment.
- Current on-street parking is unsafe because it is temporary and unmarked.
- Limited lighting along Grand Avenue makes on-street parking feel unsafe at night.
- Traffic speeds along Grand Avenue are high and people are afraid of being hit while getting in and out of their vehicles.

Privately owned lots are generally closed during community events such as First Fridays.



4 DESIGN OPTIONS

The design options reflect priorities expressed by city staff and participants at the workshop, through feedback forms, and during subsequent conversations between the EPA Team, city staff, and stakeholders. Lower Grand Avenue has art galleries and retail alongside industrial buildings, and the design options seek to meet the needs of both types of buildings and the different users in the area. The Lower Grand Avenue design options include:

- **Gateways**, which mark entrances to Lower Grand Avenue and are located at the intersection of Grand Avenue and the I-10 overpass and the intersection of Grand Avenue, Van Buren Street, and 7th Avenue.
- **Hubs**, which are centers of activity and community gathering places. The intersection of Roosevelt Street, 15th Avenue, and Grand Avenue is a hub. As Grand Avenue continues to revitalize, additional hubs could develop around galleries, restaurants, and entertainment venues.
- **Links**, which are the street blocks that connect hubs. Sidewalk and streetscape improvements, as well as new trees and landscaping, invite pedestrians to travel from hub to hub.
- **Rooms**, which are areas in front of buildings that span the sidewalk and the landscaped area between the sidewalk and curb. Unused driveways are potential locations for outdoor rooms where seating, art, and other amenities could be added by local property owners or through public-private partnerships. Garden rooms could be created in landscaped areas between the sidewalk and curb by adding vegetation and curbside rain gardens. Within these rooms, the city's landscape and sidewalk guidelines would apply.

All landscape installed will be consistent with the Parks and Recreation Department's *Street Landscape Maintenance Standards*⁷ and the Arizona Landscape Contractors Association's *Sustainable Landscape Management: Standards for Landscape Care in the Desert Southwest*.⁸

7. City of Phoenix Parks and Recreation Department. *Street Landscape Standards*. 2006. www.phoenix.gov/webcms/groups/internet/@inter/@dept/@streets/documents/web_content/streetman.pdf. Access date: August 10, 2006

8. Available from the Arizona Landscape Contractors Association. www.azlca.com. Access date: August 10, 2006

HUBS, LINKS, GATEWAYS, AND ROOMS

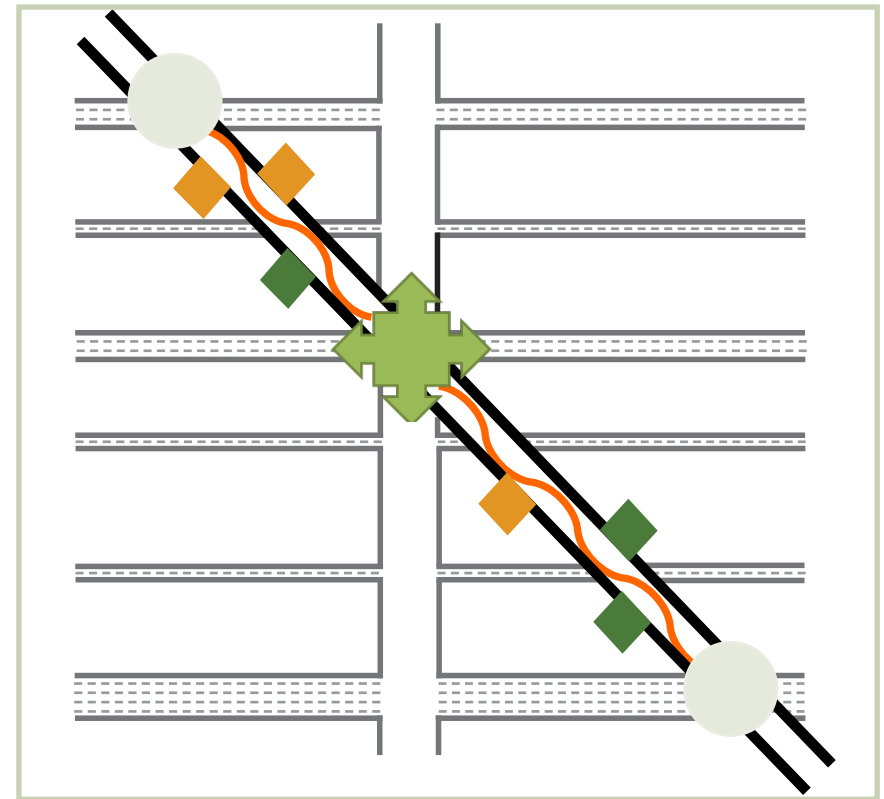
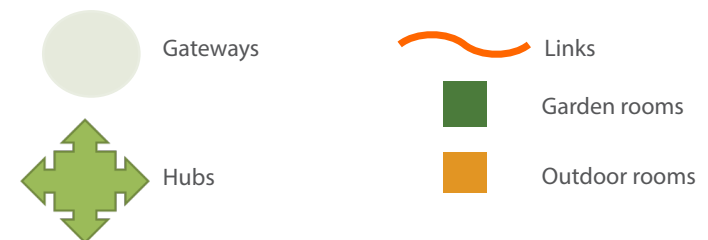


Figure 21



DESIGN OPTIONS KEY MAP



Figure 22

- 1 I-10 and Grand Avenue (Gateway)
- 2 Roosevelt Street and Grand Avenue (Hub)
- 3 Pierce to Taylor Street (Links and Rooms)
- 4 7th Avenue/Van Buren Street and Grand Avenue (Gateway)

X Detailed Plan View

Perspectives





Figure 23

Current Conditions: The I-10 overpass separates two distinct portions of Grand Avenue. The street north of I-10 features fewer trees and buildings with edges close to the sidewalk, and traffic tends to move faster because the street is eight lanes wide until the block leading up to I-10. South of I-10, Grand Avenue transitions to a street with fewer travel lanes, more retail, smaller buildings fronting onto the street, and the potential for more people walking along sidewalks.

Design Concept: As vehicles pass under the I-10 overpass, Grand Avenue could change from five travel lanes north of the overpass to three travel lanes south of the overpass. As vehicles transition to the narrower roadway, they will naturally slow down, making pedestrian crossings safer. Narrowing the roadway would create space for bicycle lanes in each direction. A new pedestrian crossing at Moreland Street would allow easier pedestrian connections to nearby neighborhoods. The landscaped area between the sidewalk and the street would provide a buffer between the sidewalk and the street and could include trees to shade pedestrians and linear rain gardens to capture rainwater. A shortened median helps maintain vehicular access from southbound Lower Grand Avenue to the Iglesia la Luz Del Mundo just south of I-10.

- 1 Painted bike lane .
- 2 Landscaped area with deep-root plants and trees.
- 3 Linear rain garden with shallow root plants that do not interfere with underground utilities.
- 4 Median landscaped with drought tolerant vegetation.
- 5 Pedestrian crossing.

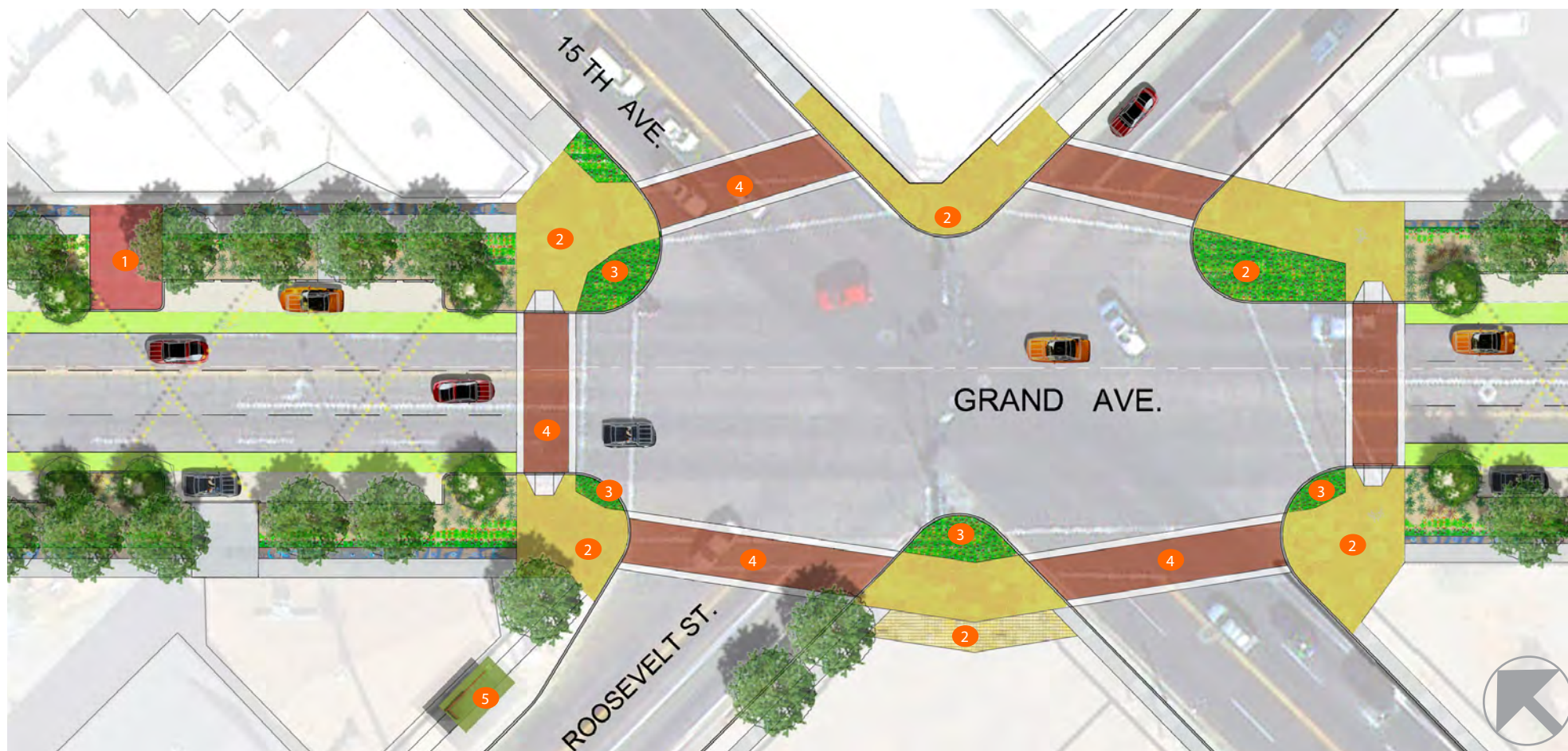


Figure 24

Current Conditions: The intersection is a major entrance to Lower Grand Avenue from nearby neighborhoods but it currently lacks defining signs or features to mark this entry point. This six point intersection is large and dominated by automobiles, making it feel less safe for people crossing the street. The intersection includes mixed-use buildings and housing that create the potential for more people using crosswalks. City-owned landscaped areas house utility boxes and are not well planted or maintained.

Design Concept: Pedestrian crosswalks and curb bulb-outs designed with distinctive colors and textures can make street crossings safer at this large intersection. Landscaped areas with drought-tolerant vegetation would make this outdoor space more comfortable and inviting and can help manage stormwater. Nearby attractions, including arts venues and historic neighborhoods, would be identified with wayfinding signs. A potential transit stop on Roosevelt Street would better connect Lower Grand Avenue to downtown and other districts.

- 1 Outdoor rooms.
- 2 Enhanced paving at corners.
- 3 Curbside rain gardens.
- 4 Artist designed crosswalks.
- 5 Potential transit or circulator stop.

3 LINK: PIERCE STREET TO TAYLOR STREET ALONG GRAND AVENUE

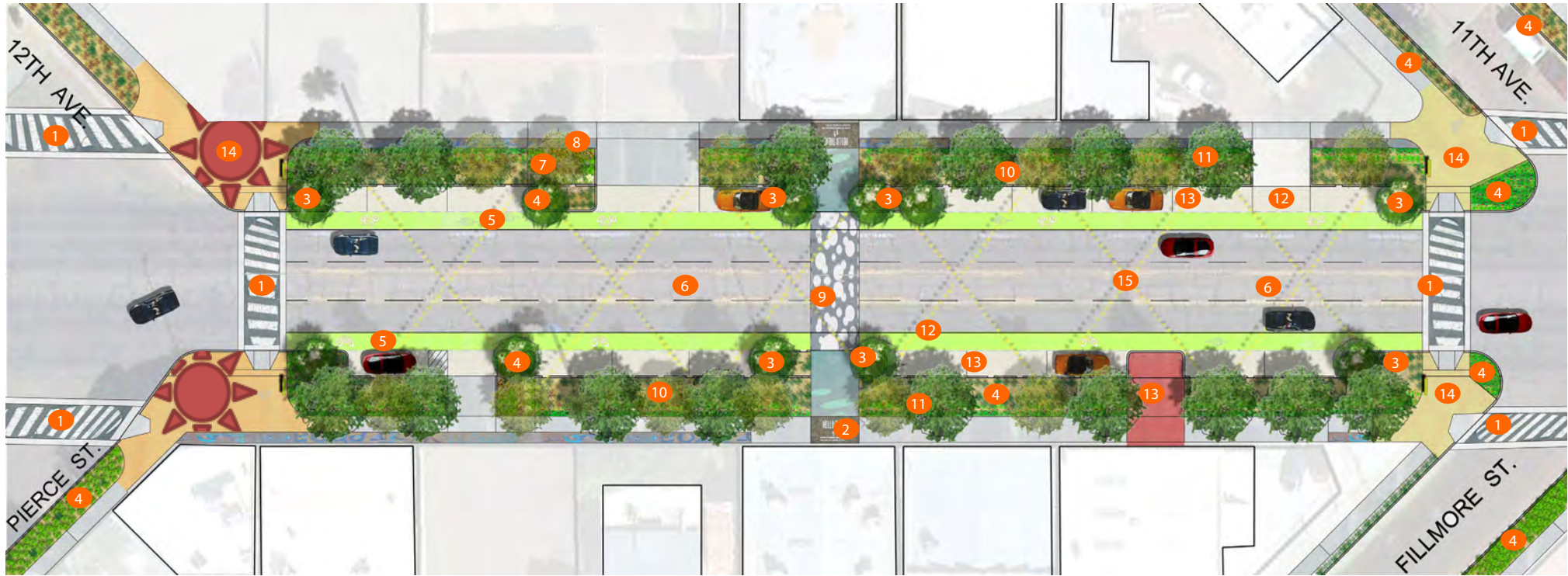


Figure 25

Current Conditions: Block fronts include vacant lots and buildings, and sidewalk widths vary. Existing vegetation is not well maintained and provides little shade. This section of Lower Grand Avenue has no crosswalks, bicycle lanes, or transit facilities.

Design Concept: Creating a shaded, welcoming, safe, cool, and distinctive streetscape along Lower Grand Avenue could make walking and biking more appealing, giving people more transportation options, and linking destinations along the street.

- Shade is provided by trees planted in the city-owned landscaped area, making the pedestrian environment more pleasant and helping to reduce air temperatures.
- Wayfinding incorporated into the street pavement directs pedestrians to historic neighborhood features and nearby attractions, including downtown Phoenix, the Capitol Mall, neighborhoods, and the Roosevelt Street Arts District.
- Marked mid-block and intersection crossings and strings of lights across Grand Avenue enhance pedestrian safety and define an outdoor space.
- Garden rooms and outdoor rooms provide public gathering spaces and add vegetation to create shade, reduce ambient temperatures, or manage stormwater.
- Public art can be placed at intersections and in the landscaped areas. Property owners could work with artists and the city to feature art in outdoor rooms to create a festive atmosphere and emphasize Grand Avenue's artistic character.



- 1 Artist-designed crosswalks help keep pedestrians safe by making the crosswalks more visible to drivers.
- 2 In-pavement wayfinding directs visitors to downtown, historic buildings, and other attractions.
- 3 Curb bulb-outs with decorative, permeable pavers and trees and ground cover reduce crossing distances for pedestrians and can also function as rain gardens.
- 4 Curbside rain gardens reduce pavement, help to capture and infiltrate stormwater to the ground below, and reduce ambient temperatures through evapotranspiration. Rain gardens along Lower Grand Avenue bookend parking areas and create garden rooms. Curbside rain gardens at corners and along intersecting streets capture north-to-south stormwater flows and use it as irrigation for plants.
- 5 Painted bike lane.
- 6 An 11-foot-wide center turn lane reserves space in the street for possible future transit along Lower Grand Avenue.
- 7 Garden room.
- 8 A consistent 8-foot-wide sidewalk is created by widening the sidewalk where necessary. Adding permeable materials to the existing concrete would allow stormwater to infiltrate. Trees added to the existing landscaped area increase shade.
- 9 Mid-block crossings with enhanced paving connect possible future transit stops to the sidewalk.
- 10 Curb cuts direct stormwater from the street into a linear rain garden. Because the linear rain garden is over a narrow utility easement, it is planted with ground cover and shallow-root, drought-tolerant vegetation.
- 11 Trees create shade for pedestrians and help to lower ambient temperatures.
- 12 Permeable pavers allows infiltration of stormwater.
- 13 Parking areas with pervious pavement.
- 14 Enhanced paving, which includes different designs or colors at each intersection.
- 15 Strings of lights across street create a "ceiling," give the roadway volume, and provide light at night.

DETAILED TYPICAL SIDEWALK SECTION

Streetscape improvements can help reduce temperatures along Grand Avenue through shade, vegetation that replaces pavement and encourages evapotranspiration, and lighter colored materials:

- Impervious surfaces are reduced by replacing street pavement with permeable surfaces and curbside rain gardens. Stormwater flows from the street across permeable pavers into the rain garden through a curb cut. Stormwater not captured in the rain gardens flows into the existing city stormwater system.
- Stormwater capture is enhanced with new linear rain gardens over an existing utility easement that extends approximately 5 feet from the back of the curb into the landscaped area. The linear rain garden is planted with drought-tolerant, shallow-root ground cover.
- The landscaped area outside the utility easement is planted with shade trees and ground cover to help reduce ambient temperatures and make the pedestrian environment more attractive.
- Lightly colored or reflective paint is used to mark the bicycle lane and help reduce ambient temperatures.

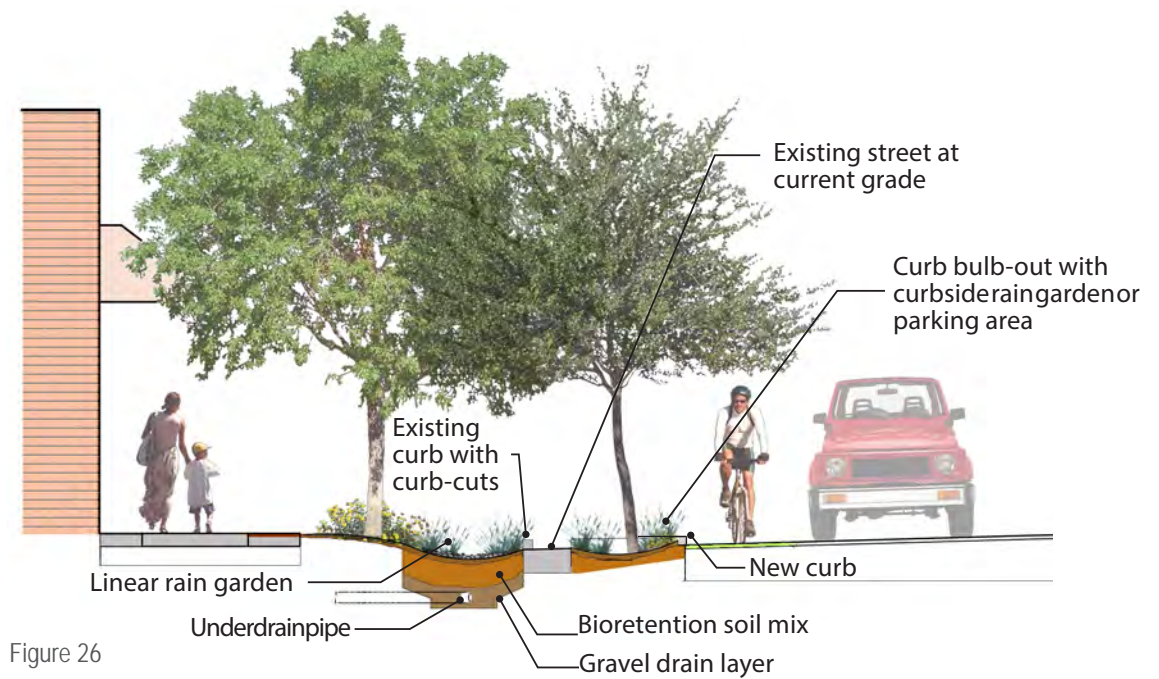


Figure 26

4 GATEWAY: 7TH AVENUE, VAN BUREN STREET, AND GRAND AVENUE



Figure 27

Current Conditions: This gateway to Lower Grand Avenue is at the western edge of downtown Phoenix and the eastern edge of the Capitol Mall. Grand Avenue's width and the southbound right-turn lanes make crossing the street difficult. The 5-foot-wide sidewalk and narrow landscaped area provide little buffer between the pedestrian realm and the wide street.

Design Concept: This intersection could be a gateway that entices people to explore Grand Avenue. Signs at the intersection provide information about attractions along Grand Avenue and further on to downtown and Government Mall. Pavers in curb bulb-outs demonstrate the arts-based culture of the Lower Grand Avenue neighborhood. The outside travel lane on each side of the street could be used for curb bulb-outs and wider landscaped areas with vegetation and shade trees, which could create a distinctive, cooler, and safer pedestrian environment.

- 1 Painted bike lane
- 2 Landscape area
- 3 Linear rain garden
- 4 Signs marking Lower Grand Avenue entrances
- 5 Overhead lights
- 6 Decorative crosswalk
- 7 Wayfinding element

CURRENT: GRAND AVENUE LOOKING NORTH ACROSS ROOSEVELT STREET AND 15TH AVENUE



28

Figure 28

This large six-point intersection is designed primarily for automobiles and is difficult for pedestrians to cross. The landscaped area is not well maintained and is occupied by utility boxes. Stormwater runs in the street into storm drains. There are no trees or other shade structures to offer protection from the sun.

DESIGN OPTION: GRAND AVENUE LOOKING NORTH ACROSS ROOSEVELT STREET AND 15TH AVENUE



Figure 29

Curb bulb-outs narrow the crossing distance, making it safer for pedestrians. Curbside rain gardens on the south side of the intersection and curb cuts capture and use stormwater flowing from the north, irrigating the city-owned landscaped areas. Artist-designed decorative pavement gives the intersection a distinctive identity and marks the entrance to Lower Grand Avenue. Decorative crosswalks draw people across Roosevelt Street and mark the intersection for both drivers and pedestrians.

CURRENT: LOOKING NORTH ALONG LOWER GRAND AVENUE FROM SOUTH OF FILLMORE STREET



Figure 30

Most of the traffic on Lower Grand Avenue occurs during morning and evening rush hours. At other times, the five 12-foot-wide travel lanes have low traffic volumes moving at high speeds, making on-street parking and pedestrian crossings unsafe. Street lights are designed for automobile traffic and do not shine light directly on the sidewalk for pedestrians. The I-10 overpass is an unattractive visual terminus. The street's wide expanse of dark, impervious surface makes ambient temperatures higher. Multiple driveway curb cuts interrupt the landscaping and sidewalk. Aging trees, landscaping, and shrubbery provide little sidewalk shade. No transit or bicycle facilities are present.

DESIGN OPTION: LOOKING NORTH ALONG LOWER GRAND AVENUE FROM SOUTH OF FILLMORE STREET



Figure 31
Future roadway improvements north of the I-10 overpass (U.S.-60/Grand Avenue Corridor Optimization and Access Management Plan and System Study) are being discussed by the metropolitan region. These include creating an overpass north of the project area at the intersection of Grand Avenue and McDowell Road and a freeway to freeway interchange between Grand Avenue and the I-10 north of McDowell Road.⁹ These changes could reduce traffic volumes on Lower Grand Avenue. Outside travel lanes could be converted to rain gardens interspersed with pervious parking areas. The remaining travel lanes are narrowed to 10 feet, providing room for bicycle lanes. Bicycle lanes are painted with reflective paint to set it apart from the roadway for automobiles. An 11-foot-wide center turn lane could be repurposed as a bus lane or for a streetcar or trolley in the future. Lights strung over the street enclose Lower Grand Avenue, creating a defined space and enhancing pedestrian safety at night. An artist-designed mid-block crossing celebrates the area's character and could connect a future transit stop to the sidewalk.

9. Maricopa Association of Governments. Phoenix Arizona. For information on COMPASS see www.azmag.gov/Administration/News.asp?y=2012&i=313. Access date: August 21, 2012.

CURRENT: INTERSECTION OF VAN BUREN STREET, 7TH AVENUE, AND LOWER GRAND AVENUE



Figure 32

Right turns from Van Buren Street onto Grand Avenue and double right-turn lanes from Grand Avenue onto Van Buren Street are unsafe for pedestrians and encourage faster driving. Wayfinding signs point to I-10 and downtown but do not include information about Lower Grand Avenue or other downtown attractions. Five-foot-wide sidewalks and narrow landscaped areas provide little separation between pedestrians and automobile traffic. Sparse landscaped areas on the east side of the street and intermittent shade results in an uninviting pedestrian environment and does little to reduce ambient temperatures. Because this is a five-point intersection, pedestrians can wait up to three minutes on an unshaded street corner to cross the street.

DESIGN OPTION: INTERSECTION OF VAN BUREN STREET, 7TH AVENUE, AND LOWER GRAND AVENUE



Figure 33

Eight-foot-wide sidewalks are bordered by curbside rain gardens created in repurposed outside travel lanes. The new landscaped areas create an inviting, shaded pedestrian environment, and capture and recharge stormwater. The double right-turn lanes are replaced with curbside rain gardens, on-street parking, and curb bulb-outs to make crossing the street safer. Strings of lights over Lower Grand Avenue define the street and create a more pedestrian-scaled environment.

CURRENT: LOWER GRAND AVENUE NORTH OF THE INTERSECTION OF VAN BUREN STREET AND GRAND AVENUE



34

Figure 34

The wide street has no bicycle lanes and encourages high travel speeds. Stormwater is funneled from the roadway into in-street storm drains. City irrigation systems have fallen into disrepair, resulting in neglected landscaped areas and distressed trees that provide little shade. Vacant lots and buildings create gaps in the streetscape, resulting in an unattractive pedestrian environment.

DESIGN OPTION A: LOWER GRAND AVENUE NORTH OF THE INTERSECTION OF VAN BUREN STREET AND GRAND AVENUE



Figure 35

Turning the outside travel lanes into parking lanes and narrowing the remaining travel lanes provides room for on-street parking and bicycle lanes on both sides of the street. Cuts in the existing curb channel stormwater into linear rain gardens in the landscaped area and in parking lanes with pervious paving. Drought-tolerant vegetation in curbside and linear rain gardens is established with drip irrigation and sustained with stormwater flows. Parking lanes with permeable paving increase recharge of stormwater to the ground below. Shade trees create a cooler, more pleasant walking environment and help frame the street. Pedestrian amenities, such as benches, create places for people to congregate during events or rest while walking around the neighborhood. Surrounding properties could be screened with artistic fencing to enhance the eclectic character of the street and hide outdoor storage and loading areas.

DESIGN OPTION B: LOWER GRAND AVENUE NORTH OF THE INTERSECTION OF VAN BUREN STREET AND GRAND AVENUE



Figure 36

Outdoor rooms could be created by extending sidewalk space across the city-owned landscaped area into the parking lane. These outdoor rooms could be used for dining, performances, art displays, and other activities. The existing sidewalk remains unencumbered. Property owners could add seating, planters, and other elements to help define outdoor rooms.

5 NEXT STEPS

The City of Phoenix and its partners and residents will need to decide which, if any, of the design options they want to pursue. Implementation could involve short-, mid-, and long-term actions by the city, the Grand Avenue Merchants Association (GAMA), other nonprofits, individual property owners, tenants, and other partners. Potential actions are listed below. In addition, the Partnership for Sustainable Communities between EPA, HUD, and DOT could continue to provide policy and funding support for any designs the city and its partners choose to implement.

SHORT-TERM ACTIONS (Time frame: Six to 12 months)

CITY OF PHOENIX

- Stripe Grand Avenue for on-street parking and bike lanes.
- Stripe pedestrian crossings at intersections.
- Create an interdepartmental team including staff from the city of Phoenix Street Transportation, Historic Preservation, Planning and Development, Parks and Recreation, Community and Economic Development and Neighborhood Services Departments to guide implementation.
- Develop Green Street¹⁰ cross section and standard details that accommodate the selected design options, and include these in the city's updated Street Planning and Design Guidelines.

GAMA

- Work with property owners to install decorative fencing.
- Work with property owners to place lighting on buildings to illuminate sidewalks at night.
- Work with the city's Community and Economic Development Department¹¹ and the Greater Phoenix Economic Council¹² to identify sites along Grand Avenue for new business.
- Work with organizations such as the Local Initiatives Support Corporation's Neighborhood Development Collaborative¹³

10. Low Impact Development Center. Green Streets. www.lowimpactdevelopment.org/green-streets/. Access date: August 10, 2012.

11. City of Phoenix Economic Development Department. www.phoenix.gov/econdev/index.html. Access date August 10, 2012.

12. The Greater Phoenix Economic Council works with businesses to encourage their location within the Phoenix metropolitan Area. www.gpec.org/home

13. The Local Incentives Support Corporation works with distressed neighborhoods to encourage their revitalization. www.lisc.org/phoenix/index.php. Access date: August 10, 2012.

and Arizona Multibank Community Development Corporation¹⁴ to identify projects and opportunities for revitalization.

- Consider applying for a National Endowment for the Arts Challenge America Grant¹⁵ to install wayfinding signs and public art along Grand Avenue.
- Consider short-term, affordable ways to improve public spaces and properties such as community gardens, pop up retail and cafes, and outdoor markets or events that will draw people in and potentially lead to permanent physical improvements.

14. The Arizona Multibank Community Development Corporation Multibank provides financing and access to technical assistance for the advancement of small businesses, low-and-moderate income housing, nonprofit organizations and economic development. www.multibank.org/. Access date: August 10, 2012.

15. The Challenge America Grants offer support to small and mid-sized organizations for projects that extend the reach of the arts to those whose opportunities to experience the arts are limited by geography, ethnicity, economics, or disability. National Endowment for the Arts Grants for Arts Projects. www.arts.gov/grants/apply/GAP13/Challenge.html/. Access date: August 10, 2012.



Figure 37: Participants at the first night of the Community Workshop discuss ideas and options for Lower Grand Avenue.

PARTNERSHIPS

- Develop and implement a landscape maintenance policy that allows property owners to plant and maintain the public landscape and sidewalk right of way abutting their property. (City of Phoenix/GAMA)
- Organize events to encourage physical change - for example a plant-a-thon where local growers donate plants for the city-owned right of way, or an art event where artists paint parking areas and murals. (City of Phoenix, GAMA, Downtown Phoenix, Partnership,¹⁶ Downtown Voices Coalition.¹⁷)
- Organize a regular "Clean-Up Day" along Lower Grand Avenue. (Arizona State University, adjacent neighborhoods and GAMA and the city of Phoenix.)

MID-TERM ACTIONS (One to three years)

CITY OF PHOENIX

- Continue to work with the Maricopa Association of Governments¹⁸ and maintain two-way access to Grand Avenue during development of options through the COMPASS planning process. Ensure that funding for this project includes mitigation funds to offset the impacts that rerouting Grand Avenue north of I-10 could have on Lower Grand Avenue.
- Work with the city of Phoenix Historic Preservation Department to submit historic buildings along Lower Grand Avenue for consideration for the National Register of Historic Places and the Phoenix Historic Property Register.

16. The Downtown Phoenix Partnership in a not-for-profit funded by special assessments on downtown property owners. The organization exists to strengthen downtown Phoenix development and to encourage an environment of activity, energy and vitality. www.downtownphoenix.com/. Access date: August 10, 2012.
17. Downtown Voices Coalition is a coalition of stakeholder organizations that supports healthy growth of downtown neighborhoods based upon existing downtown resources — the vibrancy of neighborhoods, the strength of the arts community, the uniqueness of historic properties, and the wonderful small businesses that dot downtown. www.downtownvoices.org/. Access date: August 10, 2012.
18. The Pedestrian Design Assistance Program provides funding to stimulate integration of pedestrian facilities into the planning and design of all types of infrastructure and development. Maricopa Association of Governments. www.azmag.gov/Documents/BaP_2012-05-25_MAG-Design-Assistance-Program-2013-Guidebook.pdf. Access date: August 10, 2012.

- Work with the city of Phoenix to apply for Pedestrian Design Assistance¹⁹ from the Maricopa Association of Governments to develop detailed construction plans for pedestrian and bicycle facilities.
- Update the Grand Avenue Historic Survey and explore opportunities for grants, such as the city of Phoenix Exterior Rehabilitation Program,²⁰ that could be used to rehabilitate the facades of designated buildings.
- Identify specific projects for Community Development Block Grant funds and include them in the consolidated 5-year plan.
- Identify projects such as streetscape improvements or economic development for HUD Community Development Block Grant funds and include them in the consolidated five-year Community Development Block Grant plans.
- Apply for DOT's Enhancement Funds²¹ to construct pedestrian and bicycle facilities.
- Apply with Arizona Department of Environmental quality for section 319 (h) grants²² to develop linear and curbside rain gardens that improve water quality.

19. Maricopa Association of Governments. www.azmag.gov/Documents/BaP_2012-05-25_Application-for-Design-Assistance-Projects-For-FY2013-Bicycle-and-Pedestrian-Facilities.pdf. Access date: August 10, 2012.
20. City of Phoenix Exterior Rehabilitation Program. www.phoenix.gov/historic/hprehab.html. Access date: August 10, 2012.
21. Arizona Department of Transportation. www.azdot.gov/highways/SWProjMgmt/enhancement_scenic/enhancement/Enhancement_Common/Support_FAQs.asp. Access date: August 10, 2012.
22. Section 319 grants are sometimes available and are designed to improve water quality. Arizona Department of Environmental Quality. www.azdeq.gov/environ/water/watershed/improvement.html. Access date: August 10, 2012.

GAMA

- Form a business improvement district²³ for security and maintenance.
- Create a block watch²⁴ organization²⁵ to reduce trespassing and vandalism. Solicit funding to enhance safety through the city's Neighborhood Block Watch Grant Program.²⁶
- Work with local merchants to complete an Authority to Arrest Form which gives police the authority to arrest trespassers²⁷ without a specific property owner request.

PARTNERSHIPS

- Engage local artists to design, fabricate, and install wayfinding signs to direct visitors to Lower Grand Avenue. The city of Phoenix would need to approve and permit any signs in the public right-of-way.
- Place photos and information about vacant and available properties on economic development websites. (City of Phoenix Community and Economic Development, GAMA, the Downtown Phoenix Partnership).
- Work with Local Initiatives Support Corporation to designate Grand Avenue as a "Corridor of Retail Excellence"²⁸ to further encourage economic development.

23. A Business Improvement District (BID) is a self-taxation district for local community improvement. For information see Warner, M; Quazi, J; More,B; Cattin, E; Bellen, S and Odekon, K. " Business Improvement Districts: Issues in Alternative Local Public Service Provision." *Prepared as part of Professor Warner's course, 'Privatization and Devolution: Challenges for Urban Public Management' in Fall 2001.* Cornell University. www.government.cce.cornell.edu/doc/reports/econdev/bids.asp. Access date: August 10, 2012.
24. City of Phoenix Block Watch Information. www.phoenix.gov/police/ppd_bw_info.html. Access date: August 10, 2012.
25. Blockwatch is a program designed to enlist the active participation of citizens to reduce crime by reporting suspicious activity to police and improve the quality of life in their neighborhoods.
26. City of Phoenix Neighborhood Block Watch Grant Program. www.phoenix.gov/police/nbwgrant.html. Access date: August 10, 2012.
27. Information and forms located at: www.sunnyslopecommunity.org/documents/authority_to_arrest.pdf. Access date: August 10, 2012.
28. Corridors of Retail Excellence are competitively selected LISC sites that are provided with experienced technical consultants, data reports, and market analyses to identify needs and opportunities, better integrate corridor work within comprehensive plans and begin to implement action plans for targeted commercial redevelopment. Local Incentives Support Corporation. Economic Development. www.lisc.org/phoenix/what_we_do/economic_development/index.php. Access date: August 10, 2012.

LONG-TERM ACTIONS (Four to six years)

CITY OF PHOENIX

- Provide pedestrian scale lighting, consider lights strung across the Street.
- Permanently designate Grand Avenue for not more than three traffic lanes.

GAMA

- Consider charging dues to pay for full-time staff to support marketing and community events.
- Consider creating promotional and marketing materials such as area maps, magnets and flags to promote the area.

PARTNERSHIPS

- Encourage new businesses to locate on Lower Grand Avenue alongside existing businesses. New businesses could include light manufacturing, fabrication architecture, landscape architecture, art and graphic design professionals. (City of Phoenix, GAMA, Downtown Phoenix Partnerships.)
- Work with Discovery Triangle²⁹ to advertise Lower Grand Avenue as an affordable location for high-tech research and design firms.

29. The Discovery Triangle is a multi-city (Phoenix and Tempe) urban development and investment initiative led by the Discovery Triangle Development Corporation (DTDC), a public/private, not-for-profit organization. The DTDC encourages, facilitates and enables (re)development opportunities within the Discovery Triangle Area for creating a sustainable future for existing and future businesses and residents. The DTC is focused on recruiting high-tech firms to locate within it. www.discoverytriangle.org/. Access date: August 10, 2012.

APPENDIX A -COMMUNITY PARTNERS

The following organizations participated in the process of developing the design options for Lower Grand Avenue:

Arizona Department of Transportation
Arizona Preservation Foundation
Arizona State Representative, District 14
Arizona State University School of Sustainability
Capitol Mall Association
City of Glendale
City of Tempe
Coalition of Arizona Bicyclists
Downtown Voices
Downtown Phoenix Partnership
F.Q. Story Historic District
Grand Avenue Merchants Association
Grand Avenue Rail Project
Local Initiatives Support Corporation, Phoenix
Maricopa Association of Governments
Maricopa County Rio Salado College
Phoenix Community Alliance
St. Luke's Health Initiatives
Sierra Club, Grand Canyon Chapter
Sustainable Cities Network EcoAid
Valley Forward
Valley Permaculture Alliance
Watershed Management Group
Western Resource Advocates

DESIGN TEAM

EPA Office of Sustainable Communities

Project Contact: Abby Hall, hall.abby@epa.gov

City of Phoenix

Project Contact: Lyssa Hall, lysistrata.hall@phoenix.gov

PLAN*et

COFFMAN Studio

Town-Green

AECOM

APPENDIX B - OPTIONAL PLANT LIST

These plants are suggested because they are well suited to a desert environment, are easily established with minimum irrigation and drought tolerant, provide color during winter and spring, and are hardy enough to withstand occasional disturbances from pedestrians.

In new or expanded landscape areas, where there is more room and pedestrian conflicts are mitigated, Thornless Palo Verde Hybrids and Thornless Honey Mesquites could be used to add vibrant color and texture to the streetscape palette. These trees are native to the southwest and drought tolerant.

Chinese Pistache are suggested to enhance the eclectic character of Lower Grand Avenue and to add fall color. These trees are drought tolerant and thrive in arid environments. They should be located where they can use captured stormwater and provide shade along the sidewalks.

Linear Rain Gardens: Brittle bush, Angelita Daisy, Agave Species, Lantan Species.

Landscape Trees: Chinese Pistache, Sisso Tree, Thornless Palo Verde Hybrid or Thornless Mesquite.

Landscape and linear rain garden ground cover: Flowering plants such as ruellia and ornamental grasses such as sedge grasses.

Curbside rain gardens: Flowering ground cover with drought tolerant plants.

All landscape installed will be consistent with the Parks and Recreation Department's *Street Landscape Maintenance Standards* and the Arizona Landscape Contractors Association's *Sustainable Landscape Management: Standards for Landscape Care in the Desert Southwest*.



Figure 38: Brittle Bush (Encelia Farinosa).
Photo Credit: AECOM



Figure 39: Angelita Daisy (Tetranauris Acaulis). Photo Credit: Coffman Studio



Figure 40: Parry's Agave (Agave Parryi). Photo Credit: Coffman Studio



Figure 41: Pistacia Chinesis (Chinese Pistache). Photo Credit: AECOM



Figure 42: Prosopis (Chilean Mesquite). Photo Credit: AECOM



Figure 43: Dalgergia Sisso (Indian Rosewood). Photo Credit: AECOM



Figure 44: Palo Verde (Parkinsonia Desert Museum). Photo Credit: AECOM



Figure 45: Ruellia (Ruellia Brittoniana). Photo Credit: AECOM



Figure 46: Katie Ruelia (Ruellia Brittoniana Katie). Photo Credit: Coffman Studio



Figure 47: Berkeley Sedge (Carax Tumulicola). Photo Credit: AECOM



GREENING AMERICA'S
CAPITALS