globeville
stormwater
systems study

resiliency planning | education | outreach
INTRODUCTION AND APPROACH

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EXECUTIVE SUMMARY

Urban or stormwater flooding is considered a growing threat in the United States and often referred to as the nation’s hidden challenge.

Flooding is not a new issue for the communities within the Globeville-Utah Junction basin (Globeville basin), especially for the Globeville neighborhood. Due to the neighborhood’s low elevation and adjacency to the South Platte River, its residents have experienced both stormwater and river flooding throughout the years. The combination of stormwater flooding conditions and a potential for spill of the South Platte River during high water levels make the Globeville basin a high-priority basin for drainage improvements, infrastructure investment, and increased community benefits.

The Globeville Stormwater Systems Study is a culmination of an extensive effort by the City and County of Denver Public Works Department (CCD PW) and the North Denver Cornerstone Collaborative (NDCC), in partnership with the project team, the community, and stakeholders to better understand the causes of flooding in the area; explore solutions for river and local stormwater flooding; and to identify the preferred neighborhood solutions that alleviate flooding and provide multiple community benefits.
STUDY APPROACH AND GOALS

This study followed a unique approach and process. Previous drainage infrastructure studies were integrated into a community first approach that emphasized the need for community-centric discussions of solutions at the neighborhood scale.

Essential to the process was the Stakeholder Vision Implementation Team (VIT) consisting of stakeholders from the communities within the basin including residents, business owners, neighborhood associations and community organizations. This group of community representatives guided the direction of the study, keeping in mind the needs and vision of the greater community. The VIT was supported by community member input throughout the process at three community meetings and numerous neighborhood conversations.

Input from community members and VIT representatives helped establish the goals that guided the direction of the study. The goals include the primary goals to alleviate local stormwater flooding; reduce the risk of river flooding, avoid floodplain designation; and improve water quality; as well as many supporting community goals to increase community benefits.

FLOODING ISSUES IN THE GLOBEVILLE BASIN

The Globeville basin is located along the west bank of the South Platte River, downstream of downtown Denver. The eastern boundary of the basin is defined by the South Platte River while the rest of the boundary is defined by topographic ridges that lead to the highpoint of the basin near Federal Boulevard and I-70. The part of the basin that lies within the City and County of Denver includes the entire Globeville neighborhood and parts of Chaffee Park and Sunnyside neighborhoods, while the northern section is located in Adams County.

Understanding the topography of the Globeville basin is fundamental to understanding the flow of water across the basin and the two flooding issues that impact the basin: stormwater flooding and river flooding. The basin slopes from its highest elevation point near I-70 and Federal Boulevard to its lowest elevation point near York Street and 58th Avenue, roughly 270 feet lower.

STORMWATER FLOODING

The natural stormwater drainage pattern within the basin is from its highest elevation zone in the northwest and southwest to its lowest elevation zone in the northeast and eventually to the South Platte River. The development of the basin, including transportation elements, such as the railroads and highways have directly impacted the natural drainage pattern. In today’s context, rather than flowing directly from the high point of the basin to the river, infrastructure such as streets, highways, railroads, underpasses and rail cuts guide the direction of stormwater runoff flows. In some cases, the presence of infrastructure not only impacts the direction but also the concentration, depths, and velocities of stormwater runoff. As a result, stormwater runoff accumulates in low elevation areas resulting in stormwater flooding in areas like underpasses and the Globeville neighborhood. The elevation of the Globeville neighborhood within the footprint of the old river bed becomes the resting place for stormwater coming from various origination points within the basin.

RIVER FLOODING

In addition to the risk of stormwater flooding, the Globeville Basin is subject to flooding risk from the South Platte River. Historical natural and man-made river alterations and regional urbanization have affected the South Platte River. Current studies and recent river modeling and analysis identify a location where the river would overtop the banks during a 100-year storm event (storm event with a 1 percent chance of happening any given year). The location of the spill is just south of 38th Street on the west bank of the river, south and upstream of the existing levee. If water does overflow the banks, the spill water flows north along the low elevation of the Globeville neighborhood before returning to the river. It has also been determined that the height of the existing levee is now approximately 2 feet lower than required by the Federal Emergency Management Agency (FEMA) in most locations. The height and length of the levee are factors in the possible re-mapping of the Globeville area as a FEMA regulated floodplain. This study addresses the evaluation of options and recommendations to reduce risk of river flooding and avoid this floodplain re-designation.
EXECUTIVE SUMMARY

STUDY RECOMMENDATIONS

Recommendations in this study are organized by geographic location within the Globeville Basin and are relevant to the characteristics of the water flow in each area and the associated community-identified needs. In the high basin, recommendations are focused on increasing infiltration, improving water quality and slowing the flow of water across the surface. The focus of the recommendations in the mid basin is to detain stormwater runoff and manage the rate of flow. In the low basin, recommended improvements are designed to move stormwater away from properties and into the river. The recommendations to alleviate flooding also prioritize community benefits. Pipe infrastructure was examined in relation to detention locations and options for creating park space, water quality improvements, and green streets. All recommendations include opportunities to increase community awareness of area flooding and personal property actions, improve local connectivity, and leverage other area investments.

HIGH BASIN RECOMMENDATIONS

51ST AND ZUNI PARK SPACE
Implement water quality and moderate detention opportunities.

MID BASIN RECOMMENDATIONS

DETENTION AND PARK SPACE
Identify and implement detention and potential park opportunity located along the stormwater runoff path before it gets to Globeville. Potential options include the following:

OPTION 1: SUNNYSIDE (SOUTH OF I-70 AND WEST OF RAILROADS)
Integrated detention and park opportunity south of I-70 and west of the railroad tracks.

OPTION 2: INDUSTRIAL AREA (NORTH OF I-70 AND EAST OF RAILROADS)
Detention located north of I-70 along 48th Avenue in industrial area.

OPTION 3: UPPER RIDGE (ALONG 48TH AVE - BETWEEN I-25 AND LINCOLN ST)
Detention and gateway park/plaza opportunity near the Globeville Neighborhood that utilizes underused space.

TRUNCATED PROJECT “L” (Northwest Denver Sub-Area Drainage and Transportation Study)
Implement Truncated Project “L” pipe improvement along Jason Street alignment to the South Platte River.

LOW BASIN RECOMMENDATIONS

48TH AVENUE GREEN CORRIDOR
Further study and implement new stormwater pipe along 48th Avenue with a new outfall at the South Platte River; a stormwater overflow management area at Argo Park and green infrastructure and mobility improvements along 48th Avenue to Washington Street.

RIVER RECOMMENDATIONS

FLOOD PROTECTION FROM THE SOUTH PLATTE RIVER
Design and implement improvements to the height of the existing levee and extension of levee from 38th Avenue to approximately 35th Avenue along Ringsby Court. Levee improvements and extension coupled with a vision for neighborhood amenities along the river.
SUMMARY TABLE

ISSUES

Stormwater Flooding

Stormwater Flooding within the basin at the 38th Avenue and Fox Street underpass during a heavy storm on July 7, 2011 (Source: CBS Denver).

River Flooding

River Flooding within the basin near Globeville during the 1965 flood (Source: Denver Public Library).

STUDY GOALS

Primary Goals

- Alleviate local stormwater flooding
- Reduce risk of river flooding and avoid floodplain designation
- Improve water quality

Supporting Community Goals

- Create innovative solutions that provide community benefit and reconnect the community
- Encourage natural and sustainable solutions
- Provide individual support against flooding, communicate flood risk, strengthen community partnerships and improve safety during rain events
- Coordinate and leverage concurrent projects in the area
- Be consistent with the Globeville Neighborhood Plan

COMMUNITY BASED SOLUTIONS

INFRASTRUCTURE SUMMARY

Recommendations | Recommendation Strategy | Estimate*  
---|---|---  
A | 51ST AND ZUNI PARK | $3,000,000 - $4,000,000*  
B | DETENTION AND PARK SPACE
OPTION 1: SUNNYSIDE (SOUTH OF I-70 AND WEST OF RAILROADS) | $22,000,000 - $26,000,000*  
OPTION 2: INDUSTRIAL AREA (NORTH OF I-70 AND EAST OF RAILROADS) | $15,000,000 - $18,000,000*  
OPTION 3: UPPER RIDGE (AT 48TH AVE · BETWEEN I-25 AND LINCOLN ST) | $13,000,000 - $16,000,000*  
C | TRUNCATED PROJECT “L” | $33,000,000 - $40,000,000*  
D | 48TH AVENUE GREEN CORRIDOR | $38,000,000 - $46,000,000*  
E | FLOOD PROTECTION FROM THE SOUTH PLATTE RIVER | $38,000,000 - $46,000,000*  
OVERALL LAND ACQUISITION | ** | $28,000,000 - $34,000,000**  

*This is a planning estimate only, which is based on historical data for similar type projects. Additional analysis of detailed engineering data (i.e. surveys, geotechnical analysis, environmental assessments, hydraulics, etc.) will be required to refine the estimates. Therefore, the amounts shown may change significantly as design and implementation of projects progress.

**While land acquisition is included, only a limited market study has been completed and amounts are subject change.

Individual Property Strategies | Neighborhood Design Strategies | Basin-Wide Stormwater Infrastructure Strategies | Regional River Infrastructure Strategies

GLOBEVILLE STORMWATER SYSTEMS STUDY
INTRODUCTION

Over the last decade, the frequency and severity of stormwater flooding in our cities has increased, making it one of the greatest natural threats in the United States. Both subject matter experts and the public are beginning to understand the relationship between our development patterns, the built environment, and the magnitude of stormwater flooding.

Flooding is not a new issue for Globeville. The neighborhood is located in what once was the riverbed of the South Platte River. Due to the neighborhood’s lower elevations, its residents have experienced flooding throughout the years. Under severe conditions, standing water levels can reach up to four and a half feet in the core of the Globeville neighborhood, near Argo Park. Stormwater flooding conditions and potential spill of the South Platte River, during high water levels, combine to make Globeville a high-priority basin for drainage improvements, infrastructure investment, and community benefits.
STUDY APPROACH

In early 2018, the City and County of Denver Public Works Department (CCD PW) and the North Denver Cornerstone Collaborative (NDCC) launched a study of the Globeville-Utah Junction Stormwater basin (Globeville basin) designed to explore solutions to the South Platte River and local stormwater flooding, in partnership with the community. Project team members, city staff, elected officials, stakeholders, and community members participated in basin tours, on-site meetings, and extended discussions of the impacts of historical growth patterns in the area and the physical conditions of the basin that contribute to today’s flood conditions and neighborhood concerns. The Globeville Stormwater Study is a culmination of an extensive effort by the city, project team, community, and stakeholders to better understand the causes of area flooding and to identify the preferred neighborhood solutions to alleviate that flooding.

The approach is based on the recognition that green and gray infrastructure can be components of an integrated solution to stormwater management, and that through a cohesive evaluation of options, neighborhoods can solve not only their flood concerns but also address other local needs and build stronger, more resilient communities. This community based approach serves as the basis of the study, resulting in increased awareness of neighborhood flooding issues and an active engagement process.

Figure 01: Study Approach

In an effort to better incorporate community needs, the City and County of Denver developed a new approach that encourages conversation around community building and produces innovative solutions to flooding that bring multiple community benefits.

Unique to this study process, was an approach that recognizes the importance of previous drainage infrastructure studies within the basin while also emphasizing the need for a “community-centric” discussion of solutions at the neighborhood level (Figure 01). The project team prioritized “community first” in the conversation by understanding local needs and flood concerns; conveying complex, technical drainage information in easy-to-understand graphics; and seeking collaborative solutions.

The approach is based on the recognition that green and gray infrastructure can be components of an integrated solution to stormwater management, and that through a cohesive evaluation of options, neighborhoods can solve not only their flood concerns but also address other local needs and build stronger, more resilient communities. This community based approach serves as the basis of the study, resulting in increased awareness of neighborhood flooding issues and an active engagement process.

STUDY PROCESS AND ENGAGEMENT

The Globeville Stormwater Systems Study followed a year-long community process, which kicked off in Spring of 2018 with in-depth discussions of the factors affecting today’s flood conditions and community input on key flood locations, experiences, and concerns. Community members identified the locations where multiple flooding incidents have occurred and highlighted the need for mobility options and safety improvements during flood events. Community awareness of flood path, flood risk mitigation, and flood insurance options were some of the topics discussed through this study. Community input informed each phase of the study, including the development of the final recommendations.

Figure 02: Study Process Timeline

Throughout the process several groups supported the study. The different groups include the city’s Project Management Team (PMT), Stakeholder Vision Implementation Team (VIT), and the community.

The PMT was an interdepartmental group that met monthly throughout the process to coordinate communication, offer department perspective, and ensure technical support of the evaluation and planning process. Throughout the process, the project team relied on the dedicated involvement of the stakeholder VIT which consisted of stakeholders from the neighborhoods within the basin including residents, business owners, neighborhood associations, and community organizations. The purpose of the group was to guide the direction of the study by representing the community, keeping in mind the needs and vision of the greater community. The group met nine times at key milestones throughout the project and was critical to the review of existing conditions, the development of a vision and goals, identification of community driven investigations, and the development of easy-to-understand concepts and recommendations.

The group kicked off the study with a tour of the Globeville basin. The group followed the perspective of a "drop of water" rolling through the basin, making its way from the high point near 51st & Zuni Park across the industrial area and to the river. Throughout the tour, the project team shared with the group some of the preliminary analysis of the basin while stakeholders shared their experiences with flooding and other community needs.

PMT members on basin tour looking at railroad cut “channel”

VIT members at group meeting
Fundamental to the process was communication with the community including the Globeville, Sunnyside, and Chaffee Park residents and Registered Neighborhood Organizations (RNOs). The project team hosted three community meeting events, attended RNO meetings and found numerous opportunities to converse with community members throughout the process. Meetings and events were designed to encourage residents to share their first hand experiences, increase awareness of flood potential, provide education around practices to mitigate flood risk on individual properties, and provide input on ideas for solutions.

The kick-off meeting provided the community with foundational information about the study and their flood risk, and allowed for the project team to learn about flooding in the community from the residents. This initial meeting was held May 9, 2018 at the Stapleton Recreation Center. Attendees gathered to learn about the study purpose and approach; relevant existing conditions related to basin history, stormwater runoff, river characteristics, and flooding issues. Community members shared their first-hand experiences with flooding at specific locations, concerns about travel during times of flooding, issues with private property, and other neighborhood priorities that became the basis for the study goals.

During the final community meeting, the project team shared the draft recommendations for review and input. The meeting took place at Laradon Hall on April 3, 2019, and attendees explored stormwater and river flooding recommendations and how these recommendations work together to accomplish community goals. Input from the attendees shaped the development of the final recommendations.
STUDY GOALS
Input from VIT members and community led to the development of the study goals which were the basis for further conversations, investigations, and recommendations.

Primary Goals
- Alleviate local stormwater flooding
- Reduce risk of river flooding and avoid floodplain designation
- Improve water quality

Supporting Community Goals
- Create innovative solutions that provide community benefit and reconnect the community
- Encourage natural and sustainable solutions
- Provide individual support against flooding, communicate flood risk, strengthen community partnerships, and improve safety during rain events
- Coordinate and leverage concurrent projects in the area
- Be consistent with the Globeville Neighborhood Plan

FLOOD RESILIENCY
“The highways, railroads, and river are not going away, but we should try to ease them. The railroads and highways devastated Globeville, we lived in isolation. However, our community is resilient, we took in and highlighted the positive aspects of being isolated”.

John Zapien (Longtime Globeville Resident)

Based on Colorado’s climate change projections, The City and County of Denver Climate Adaptation Plan identifies the following three key potential impacts for Denver:
- Increase in temperature and urban heat island effect
- Increase in extreme weather events
- Reduced snow pack and earlier snowmelt

These anticipated climate changes could result in increased sudden risks, such as flooding, that threaten the well-being of communities within Denver. Flood resilience refers to the ability of a community to respond, adapt, and recover in a sustainable way from flooding events and associated challenges. The challenge of river and stormwater flooding can be understood in terms of sudden risks and stressors.

Associated conditions specific to the Globeville basin such as aging and undersized infrastructure, lack of pervious surface, and high levels of systemic inequity are some of the stressors, or daily conditions, that weaken our community and increase susceptibility to shocks such as flooding making it harder to recover.

Natural Environment Stressors (Globeville basin):
- Lack of park space
- Lack of tree canopy

Human Environment Stressors (Globeville basin):
- High levels of inequity
- Low access to opportunity
- High vulnerability to displacement

Through this study, communities within the basin worked with the city to understand the characteristics of river and stormwater flooding and identify the stressors that impact flooding within the basin by looking at the history of the basin, origin of flood patterns and related impacts.

By understanding the characteristics of river and stormwater flooding and its related stressors, this study seeks solutions that enhance local resiliency by offsetting the stressors related to flooding and therefore strengthening the natural, built, and human environments and providing multiple community benefits.
The Globeville basin is located on the west bank of the South Platte River, downstream of downtown Denver, and is subject to flooding risk from two sources: stormwater runoff and river overflow.

This chapter provides an understanding of the characteristics that make this basin unique from a stormwater and river perspective. It analyzes the natural, historic, built environment, and social elements that make up the basin and their relationship to stormwater and river flooding.
WHERE IS THE GLOBEVILLE BASIN?

The Globeville basin is located along the west bank of the South Platte River, downstream of downtown Denver. The basin is four square miles and the majority of the basin lies within the City and County of Denver while the northern section sits in Adams County (Figure 04). The eastern boundary of the basin is defined by the South Platte River and the western boundary is the highpoint near Federal Boulevard and I-70. The basin includes the entire Globeville neighborhood and parts of the Chaffee Park and Sunnyside neighborhoods (Figure 04). Previous studies based the boundary of the basin on stormwater collection systems. This study uses topographic features as the boundary of the basin. Therefore, the boundary in this study is slightly different from previous studies. Figure 04: Globeville Basin Study Area

WHAT IS A BASIN?

A drainage basin, also known as a watershed, is an area of land where all surface water from rain, melting snow, or ice converges to a single point at a lower elevation. Basins are defined by topographic conditions and are usually separated by a ridge of high land. Any water falling into the basin will flow according to existing land forms and towards the lower elevation.

Figure 05: Drainage Basin Diagram

ELEVATION MATTERS

Understanding the topography of the Globeville basin is fundamental to understanding the flow of water across the basin. The basin slopes from its highest elevation of 5,368 feet at I-70 and Federal Boulevard to its lowest elevation near York Street and 58th Avenue, roughly 270 feet lower. The Chaffee Park and Sunnyside neighborhoods are located within the highest elevation zone while the Globeville neighborhood sits in the lowest elevation zone, along the South Platte River (Figure 06).
FLOODING IN THE GLOBEVILLE BASIN

The Globeville basin is subject to flooding risk from two sources: stormwater runoff and river spill or overflow. Stormwater runoff occurs when stormwater inundates the drainage system and flows freely across the surface from higher elevations within the basin to the South Platte River during a heavy rain event. River spill or overflow occurs when river levels are very high and water overflows along the western bank of the South Platte River near Ringsby Court. In addition to the risk of a river spill or overflow, the height of the existing levee is lower than that now required by FEMA. The height and length of the levee are currently factors in the potential re-mapping of parts of the Globeville neighborhood as a FEMA regulated floodplain.

This study evaluates the options, seeks solutions, and identifies recommendations to reduce the risk of stormwater and river flooding and avoid the floodplain re-designation.

STORMWATER FLOODING

Stormwater Flooding within the basin at the 38th Avenue and Fox Street underpass during a heavy storm on July 7, 2011 (Source: CBS Denver)

RIVER FLOODING

River Flooding within the basin near Globeville during the 1965 flood (Source: Denver Public Library)

Figure 07: Stormwater Flooding Pattern in the Basin

Figure 08: River Flooding Pattern in the Basin

Areas with less than 1 foot of flooding

Potential Inundation Areas (more than 1 foot of flooding)
STORMWATER FLOODING

WHAT IS STORMWATER FLOODING?

Stormwater or urban flooding is the accumulation and ponding of stormwater that flows along streets and across properties during a high intensity rain event. Typically, urban stormwater is carried in three ways: through streets and gutters; in drainage pipes; and through natural creeks or channels.

Flooding associated with stormwater runoff typically occurs because of four primary reasons:

- Runoff rates are too high to be carried effectively through the streets;
- Stormwater pipe infrastructure is undersized and not able to handle the runoff rates;
- Lack of natural channels prohibit the conveyance of stormwater runoff, or;
- Significant paved or impervious surfaces prohibit infiltration or absorption of runoff into the ground.

The Globeville basin is one of 62 Topographic Drainage Basins that lie within the Denver metro area. It is one of three large basins that has no natural drainageway, the others being Montclair and Park Hill basins. Without a natural drainage channel to move stormwater into the South Platte River, stormwater flows across the Globeville basin toward the river via storm drain pipes and street networks. The street network is designed to carry and direct stormwater into inlets that connect to a network of underground pipes. The network of pipes conveys the water downstream into outfalls that convey the water to the river.

The storm pipe infrastructure throughout the Globeville basin, however, is too small to handle significant water flows. During heavy rains, stormwater pipes fill quickly causing stormwater to travel overland across the surface of the basin. The stormwater flows from areas of high elevation in the west to areas of lower elevation in the east and northeast, filling streets, railroads, and properties along the way, before eventually draining into the South Platte River.

This runoff pattern is particularly important to understand for the Globeville community. The Globeville neighborhood is located within the lowest elevations of the basin, adjacent to the South Platte River. In fact, alluvial soils found throughout the area indicate that the neighborhood sits in what was once the old river bed of the South Platte River when it flowed in its natural and uncontrolled state (Figure 10). While the neighborhood elevation slopes gently toward the river, the slope is not enough to avoid significant ponding and accumulation of water in the community during intense rain events. Inadequate pipe infrastructure and inlets contribute to the poor drainage in areas of lower elevation, resulting in standing water as deep as four and a half feet during a major storm event.

To better understand the factors that affect stormwater, it is important to look at how the basin developed throughout history.
## THE HISTORY AND CHANGING LANDSCAPE OF THE GLOBEVILLE BASIN

### 1. UNDEVELOPED PRAIRE
During the early 1800’s, the Globeville basin was an open prairie landscape with hills on its west side and a meandering South Platte River to the east.

### 2. FIRST TOWNS
The discovery of Gold in 1858 brought on the Gold Rush and subsequent Silver Boom (1879), as well as the first railroads to the area in the 1870’s. Before this area was incorporated into the City of Denver, it was home to several workforce towns that developed around the smelting and meat packing industry. The first areas established were the Town of Swansea (1873) and the Town of Argo (1879).

### 3. INDUSTRIAL GROWTH
The 1880s and 1890s saw the expansion of economic prosperity and development in the form of smelters, meat packing plants, stockyards, and railroad expansion. The railroads became a defining and catalytic feature of the area and supported industrial expansion and the development of the Town of Elyria (1890) and the Town of Globeville (1891). However, the railroad separated and shaped the geometry of the area, creating physical barriers in the community that still exist today.

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**Figure 12:** 1862 Basin Map and Development Patterns

**Figure 13:** 1889 Basin Map and Development Patterns

**Figure 14:** 1899 Basin Map and Development Patterns
RAILROAD AND HIGHWAY CONVERGENCE

During the post World War II era, two major highways (I-25 and I-70) were planned within the basin, further transforming the industrial footprint of the mid-section of the basin from railroads to a convergence of railroads and highways, separating the residential areas on either side of the highway infrastructure.

HIGHWAY ERA AND TRUCK-ORIENTED USES

Many of the changing industrial uses were trucking-based businesses with a heavy reliance on the surrounding highway network and an expansive footprint of paved drives, parking lots, and warehouse operations. The imprint of the early and mid-century transportation infrastructure was expanded with the consolidation of some of the railroads in the Rennick Yards in 1977.

PASSENGER RAILS

In the early 2000s, passenger rail was approved in Denver area and additional commuter rail now operates out of the same area. The 41st and Fox Station is located within the basin and serves both the G Line and the B Line. Other stations, such as the 38th and Blake Station and the future 48th and Brighton National Western Center Station, are in close proximity of the basin.
TODAY’S BUILT ENVIRONMENT AND STORMWATER RUNOFF

BUILT ENVIRONMENT

The built environment includes both the physical structures, a manifestation of land use patterns, and the defining infrastructure that allows them to function.

When the built environment footprint is shown in relationship to the topography of the area, it becomes apparent that the transportation infrastructure, land use patterns, and open space likely influence the stormwater runoff patterns and related flood risks throughout the community.

TRANSPORTATION

Today, transportation elements such as railroads and highways are a constraining element for the basin directly impacting its natural drainage pattern. Rather than flowing directly from the high point of the basin to the river, stormwater runoff flows from Chaffee Park neighborhood through the industrial uses to the Rennick rail yards. Once here, the water follows the rail yards south to the 48th Street rail cut and flow easterly to the Globeville neighborhood, Argo Park, and eventually to the South Platte River (Figure 19).

Similarly, the rail yards south of I-70 collect northerly flows from the Sunnyside neighborhood and these waters flow under the I-70 overpass to the 48th Avenue rail cut and follow the cut to the Globeville neighborhood and Argo Park area, before eventually releasing to the South Platte River (Figure 19).

Stormwater that flows from the southern portions of the Sunnyside neighborhood crosses Park Avenue area toward the South Platte River. However, due to lower topographical elevations to the north, the waters flow northward along Old Globeville Road and the adjacent rail yards before flowing to the underpass of I-70 at Lincoln Avenue (Figure 20). These southern waters flow into the streets and properties in the Globeville neighborhood. As described earlier, the elevation of the Globeville neighborhood within the footprint of the old river bed, becomes the resting place for stormwater coming from various origination points within the basin.
MANAGEMENT THROUGH STORMWATER INFRASTRUCTURE SYSTEMS

STORMWATER SYSTEMS
Stormwater runoff is carried by pipe infrastructure to the South Platte River, known as an outfall. The stormwater regulations in place today, implemented in the 1980’s, are designed to mitigate stormwater runoff and reduce the risk of stormwater flooding. However, it is important to understand that most of the basin’s infrastructure was developed prior to the 1980s stormwater regulations, resulting in an existing, undersized stormwater system. Many of the pipes within the basin are sized only to support a 2-year storm event, which is considered a relatively small rain event. The pipe systems in the area are usually smaller than 60-inch diameter and expected to carry stormwater from a large surface area. The larger pipe systems, greater than 60 inches, that outfall into the South Platte River include:

- A pipe system within Adams County along 55th and 54th Avenues that connects to Heron Pond and eventually outfalls to the river.
- A pipe system along 51st Avenue that connects to Heron Pond and then outfalls to the river.
- A CDOT pipe that travels along 48th Avenue and outfalls into the river at 49th Avenue. This pipe system only carries CDOT stormwater and does not take any stormwater from the neighborhoods.
- A pipe system along 48th Avenue that outfalls into the river between 47th and 48th Avenues, downstream of the railroad spur bridge.
- A pipe system along 47th Avenue that outfalls upstream of the railroad spur bridge.
- Pipe systems along I-70 that outfalls into the river near the intersection of I-70 with the river.
- A pipe system along 45th Avenue that outfalls into the river at 45th Avenue.
- A pipe system along Inca Street that outfalls into the river near Park Avenue.

WATER QUALITY
As stormwater runs across the surface, it collects debris and pollutants along the way. Without infiltration into the ground, this water carries those pollutants directly to the river. By increasing absorption and infiltration into the ground, water quality in the basin can be greatly improved. Parts of the Globeville basin are classified as high-priority areas in terms of water quality. For more information see the Green Infrastructure Implementation Strategy.

WATER RELATED PROJECTS UNDERWAY
The following are the projects underway within the basin related to stormwater or the river. In addition, there are many other projects underway within or near the basin, such as Washington Street Final Design, 41st and Fox Next Steps Study, and National Western Center Campus Placemaking Study and Horizontal Design.

- **Platte Farm Open Space**
  - The Platte Farm Open Space Project, located near E 49th Avenue and Grant Street, is a 5.5 acre brownfield to open space project in the Globeville neighborhood. The project is a partnership between the City and County of Denver, Urban Drainage and Flood Control District, Groundwork Denver, and the community. The project incorporates a detention pond that will alleviate localized flooding, frequently reported by adjacent homeowners.

- **43rd and Sherman**
  - This project is the construction of a new storm drain at the intersection of 43rd Avenue and Sherman Street in the Globeville neighborhood. This intersection has long been prone to ponding and flooding and has received numerous neighborhood complaints. The new storm pipe will be built in Sherman Street and connect to an existing storm system at 44th Avenue and Sherman Street.

- **52nd and Emerson**
  - This project is a 19 acre-feet regional water quality treatment facility incorporated into the redesign of the future Heron Pond/Heller/Carpio Sanguinette Park. The new park will also include recreational trails, gathering areas, an overlook, and open space. The project is currently in the design phase.

- **Urban Waterways Restoration Study**
  - This study is being led by the United States Army Corps of Engineers (USACE) in conjunction with local partners. The Final Integrated Feasibility Report and Environmental Impact Statement (EIS) was released in April 2019. This study identified restorative improvements to three major urban waterways in Denver, one of them being the South Platte River from 6th Avenue to 58th Avenue. The study reassessed the conditions of the waterways considering flood risk assessment, ecosystem health, and recreational opportunities.

- **Globeville Levee**
  - The first phase of levee improvements to meet FEMA levee criteria is underway in conjunction with the upgrades to Carpio-Sanguinette Park. The levee will be raised approximately two feet to meet freeboard requirements and will be setback from the river for future wetland enhancements which were identified in the Urban Waterways Restoration Study.
UNDERSTANDING THE BASIN

LAND USE AND IMPERVIOUS SURFACE

LAND USE

Land use within the basin and the City and County of Denver is mostly industrial and single family residential. 23 percent of the parcels located within the basin are industrial and 21 percent are single family residential. The residential areas, as noted in the history section of this chapter, were developed early in Denver’s development history around the smelters and economic nodes. The residential parcels are small in size and can be found in the three neighborhoods within the basin. The residential areas located along the boundaries of the neighborhoods near the railroad corridor, I-25, and the river and surround the core residential area.

IMPERVIOUS SURFACE

Throughout the basin’s development history, the permeable surfaces or open space, which allows water to infiltrate into the ground, have been replaced with impervious surfaces such as roads, parking lots, rooftops, sidewalks, and driveways. Impervious surfaces, often asphalt or concrete, impact our environment in many ways, including stormwater flooding and urban heat island effect. They prevent stormwater from entering into the ground resulting in more stormwater runoff and increased stormwater flooding. In addition, they also absorb the sun’s energy and can cause air temperatures to rise.

The portion of the Globeville basin within the City and County of Denver is approximately 53 percent impervious surface. Streets, parking lots, and roofs account for most of the coverage. Streets are the highest area covered by impervious surface, which account for 17 percent. Parking lots and roofs each represent 16 percent. Driveways and sidewalks account for 2 percent each.

Figure 23: Existing Land Use Map

Figure 24: Impervious Surface Map
ENVIRONMENTAL JUSTICE AND EQUITY

PARK SPACE

The large quantity of paved surfaces means that there is little remaining space for parks or open spaces that provide natural management of stormwater runoff. Parks and open spaces are part of the natural green infrastructure systems of a city, often referred to as "the lungs of a city" for their many environmental benefits like pervious surface that results in better infiltration, heat reflection, and air cleaning. They also provide many social and recreational benefits to a community. These types of spaces foster and encourage many recreational, leisure, social, and community building activities where community members can come together, connect with each other, and strengthen relationships. Activities that can also have a positive impact on the overall health and well-being of the neighborhood residents.

There is an opportunity and need to increase park space and park access within the basin. Game Plan for a Healthy City identified high-priority areas for new park space within the three neighborhoods of the basin. The plan suggests improvements can be accomplished through investment in new park land and/or partnerships that increase access to parks, open space, and other recreation opportunities. Blueprint Denver further analyzed the relationship between the priority areas lacking park access and the future growth areas. The Sunnyside and Globeville neighborhoods have some areas that are both high-priority areas for new parks and future growth areas. See Blueprint Denver for more information.

Figure 25: Park Space and Priority Areas for New Parks

TREE CANOPY COVERAGE AND HEAT ISLAND EFFECT

Denver’s average tree canopy coverage is 20 percent consisting of 2.2 million trees citywide. The neighborhoods within the basin all have a different tree canopy coverage: Sunnyside at 26 percent coverage; Chaffeepark with 17 percent tree canopy coverage; and Globeville at only 12 percent. A lack of tree canopy does not only contribute to higher stormwater runoff and stormwater flooding, it also contributes to poor air and water quality and higher surface temperatures. If an impervious surface, such as concrete or asphalt, is not partially shaded by tree canopy, the sunlight’s energy is absorbed and stored by the impervious surface and released slowly into the environment. The heat released from the hot impervious surfaces prevents air from cooling as rapidly as it normally would when day transitions into night. Within the basin, Globeville has the lowest tree canopy coverage and, therefore, higher surface temperatures.

EQUITY INDEX

The Equity Index from the Denver Department of Public Health and Environment classifies the neighborhoods within the basin as those with the highest level of inequity based on social determinants of health, built environment characteristics, access to health care, morbidity and mortality. For more information see Denver Equity Index Map.

In addition, the recent update to Blueprint Denver identifies Globeville as an area with less access to opportunity and more vulnerable to displacement. For more information see Blueprint Denver.

CLIMATE CHANGE AND EQUITY

The characteristics described in this section highlight the susceptibility of the communities within the basin to potential climate change impacts identified in the Climate Adaptation Plan, such as an increase in temperature, urban heat island effect, extreme weather events, and reduced snow pack.
WHAT IS RIVER FLOODING?

River flooding occurs when intense rainfall and/or snow melt takes place over an extended period of time and causes a river to exceed its capacity and spill over the river banks.

The Globeville basin and City and County of Denver sit downstream of a much larger watershed associated with the South Platte River (Figure 29). The collection of water from across the region flows via numerous tributaries and to the river, north past Denver and the Globeville basin. When we talk about the risk of flooding associated with the South Platte River, we need to consider the impact of regional stormwater runoff and snow melt in managing this river.

Historical river alteration and regional urbanization have drastically affected the South Platte River. Past major flood events prompted the USACE to construct 3 major dams with a primary function for flood control, resulting in Chatfield, Cherry Creek, and Bear Creek Reservoirs. In addition, the Urban Drainage and Flood Control District (UDFCD) was established by the Colorado legislature in 1969 to assist local governments in the Denver metropolitan area with multi-jurisdictional drainage and flood control challenges. Despite all these efforts to mitigate flood risk, the urbanized area downstream of the dams still provides enough runoff during a major event to put Globeville and other low-lying areas along the river at risk of flooding.
In order to understand the significance of the South Platte River and potential river-related flood risk, it is important to understand the topography of the Denver metro area and the location and role of the primary waterways (Figure 30).

In 1924, Charles Burdick, an Hydraulic and Sanitary Engineer of Chicago described Denver’s natural drainage system.

“Denver has been favored by nature with one of the best natural drainage systems that we have observed in the larger American cities. It lies high and dry on both banks of the River Platte, ascending gradually to an elevation about 300 feet above the river in a distance of about six miles to the eastward, and rising about 400 feet in a distance of two to three miles to the westward” (Denver Municipal Facts 1924)

The South Platte River is Denver’s major drainageway and the majority of the city’s stormwater runoff flows to this waterway. While the topography and natural drainage pattern remain the same, the built environment over the years has changed significantly and impacted the direction and flow of stormwater across the surface to the South Platte River.
Early settlement along the river came with the discovery of gold in 1858 and the founding of Auraria in 1860. The first settlers were warned by the Native Americans in the area against camping in the bottoms of the river on account of great floods which had come down the creek in the past.

In 1870 the arrival of the railroads followed. The area's topography, adjacency to the South Platte, and proximity to the city made this area a prime location “tame the treacherous Platte”. The Cherry Creek flood of 1933 wreaked havoc on lower downtown Denver and resulted in the construction of the Cherry Creek Dam in 1950.

The battle between development of the city and the management of these two waterways continued over the years. The Cherry Creek flood of 1933 wreaked havoc on lower downtown Denver and resulted in the construction of the Cherry Creek Dam in 1950.
1965 S. PLATTE RIVER FLOOD
The last major flood event associated with the South Platte River took place in 1965 and was devastating to the northern areas of Denver, including Globeville. Heavy rains in the Castle Rock area and flows from Plum Creek to the South Platte River brought significant rising river levels to communities downstream, such as Globeville.

DAM CONSTRUCTION
Following the 1965 South Platte River flooding of Denver, the Urban Drainage and Flood Control District was formed and subsequent regulations and actions resulted in the construction of Chatfield Dam in 1975 and Bear Creek Dam in 1982. These two dams, along with Cherry Creek Reservoir, are fundamental to managing water levels in the South Platte River and controlling flooding within the Denver area.

LEVEE CONSTRUCTION
In 2008 the City and County of Denver constructed a levee and flood control project from 38th Street/Washington Street to Franklin Street, within the Globeville neighborhood. This action served to further protect the community from river flooding and removed the community from the FEMA designated floodplain. The area is now classified by FEMA as a “zone protected by levee”.

TODAYS CONDITIONS
In our efforts over the last century to manage and control the South Platte River, we have drastically changed the character of the river from a sandy, shallow bottomed river subject to changing course to a channelized river through the city. However, the nature of the river continues to be the same: a sandy river subject to changing course with low banks in certain areas prone to overflow.
RIVER FLOODING - POTENTIAL SPILL

Current studies and recent river modeling and analysis identify a location, just south and upstream of the existing levee, where the river would overtop its banks during a 100-year storm event (storm event with a 1 percent chance of happening any given year). The location of the spill is just south of 38th Street on the west bank of the river. Flows from the river associated with flooding impact the majority of the Globeville community, as shown in Figure 31. These spill waters flow north along the low elevation of the Globeville neighborhood, returning to the river downstream of the existing levee in Adams County.

It has also been determined that the height of the existing levee is approximately 2 feet lower than required by FEMA in most locations. The height and length of the levee are currently factors in the possible re-mapping of the Globeville area as a FEMA regulated floodplain. This study addresses the evaluation of options and recommendations to avoid this floodplain re-designation.

The current floodplain in Globeville impacts 15 structures towards the downstream end of the river, near Franklin Street. Recent studies show that if the spill were to happen, over 700 additional structures would be impacted during a 100-year event.

RIVER SECTION AT POTENTIAL SPILL LOCATION

Figure 32: River Section at Potential Spill Location

River cross section at potential spill location (looking northeast - downstream). West bank is lower at this point.
In keeping with the goals of the study, the recommendations seek to increase community benefits in conjunction with flood mitigation solutions.

Recommendations are organized by geographic location within the Globeville Basin and are relevant to the characteristics of the water flow in each area. In the high basin, recommendations are focused on increasing infiltration, improving water quality and slowing the flow of water across the surface. The focus of the recommendations in the mid basin is to detain and manage the rate of stormwater runoff flow. In the low basin, recommendations move stormwater away from properties and to the river.

Figure 33: Basin Sections
RECOMMENDATIONS OVERVIEW

HIGH BASIN RECOMMENDATIONS

**51ST AND ZUNI PARK**
Implement water quality and moderate detention opportunities.

MID BASIN RECOMMENDATIONS

**DETENTION AND PARK SPACE**
Identify and implement detention and potential park opportunity located along the stormwater runoff path before it gets to Globeville. Potential options include the following:

**OPTION 1: SUNNYSIDE (SOUTH OF I-70 AND WEST OF RAILROADS)**
Integrated detention and park opportunity south of I-70 and west of the railroad tracks.

**OPTION 2: INDUSTRIAL AREA (NORTH OF I-70 AND EAST OF RAILROADS)**
Detention located north of I-70 along 48th Avenue in industrial area.

Detention and gateway park/plaza opportunity near the Globeville Neighborhood that utilizes underused space.

**TRUNCATED PROJECT “L” (Northwest Denver Sub-Area Drainage and Transportation Study)**
Implement Truncated Project “L” pipe improvement along Jason Street alignment to the South Platte River.

LOW BASIN RECOMMENDATIONS

**48TH AVENUE GREEN CORRIDOR**
Further study and implement new stormwater pipe along 48th Avenue with a new outfall at the South Platte River; a stormwater overflow management area at Argo Park and green infrastructure and mobility improvements along 48th Avenue to Washington Street.

RIVER RECOMMENDATIONS

**FLOOD PROTECTION FROM THE SOUTH PLATTE RIVER**
Design and implement improvements to the height of the existing levee and extension of levee from 38th Avenue to approximately 35th Avenue along Ringsby Court. Levee Improvements and extension coupled with a vision for neighborhood amenities along the river.
The Stakeholder Vision Implementation Team and community conversations were key to understanding community needs with regard to local flood concerns. Goals from the Globeville Neighborhood Plan and those developed during this study gave clear direction on desired community benefits.

The project team reviewed and analyzed many drainage studies, neighborhood plans, and area specific master plans as a starting point to understand the basin. Stormwater drainage studies identified the Globeville neighborhood, near Argo Park, as the area most impacted by stormwater flooding.

The traditional approach to stormwater management relies solely on the basin-wide strategies of pipe infrastructure and detention, leaving the responsibility mostly to the city. This new approach understands solutions as a bundle of strategies that attack the problem from different scales and perspectives (individual, neighborhood, basin-wide and regional). In this new approach, we all have a role to play when solving the issue, and the time complexity and cost increases with the scale of the solution.
INDIVIDUAL PROPERTY STRATEGIES

These strategies connect community members with educational materials, information, partnerships, and resources to help private property owners implement actions to improve stormwater quality, increase stormwater infiltration within their property, and reduce overall runoff. Some actions include replacing driveways with pervious surfaces, designing rain gardens on-site, and using rain barrels.

NEIGHBORHOOD DESIGN STRATEGIES

These strategies work in conjunction with the stormwater and river analyses by looking for opportunities that respond to the community’s goals. These strategies are implemented by the city in coordination with neighborhood improvements and can include parks, plazas, community spaces, green infrastructure, and connectivity improvements.

BASIN-WIDE STORMWATER INFRASTRUCTURE STRATEGIES

Basin-wide urban stormwater detention and infrastructure recommendations from previous studies were explored through this process. These strategies are implemented by the city and usually have a large impact on flood risk reduction. However, they also have high costs and impacts, making them challenging to implement.

REGIONAL RIVER INFRASTRUCTURE STRATEGIES

South Platte River infrastructure strategies and technical investigation can help protect Globeville during a major flood event. Strategies at this scale are undertaken by municipalities, regional districts, and the state or federal government. Some examples include dams, levees, river restoration and improvements to the river’s edge.
BACKGROUND ANALYSIS

PREVIOUS DRAINAGE STUDIES

The Globeville Basin is unique in that it does not have a formal drainage channel to convey runoff to the South Platte River. Rather, it relies on storm drain pipes and the street network. However, many of the existing storm drain pipes are too small to convey even minor flows resulting from smaller rainfall events. For this reason, the Globeville basin has been heavily studied in recent years. The previous drainage studies provide a wealth of information and technical evaluation of the basin drainage problems and recommended solutions. See Appendix A for a detailed stormwater technical analysis.

2012 Northwest Denver Sub-Area Drainage and Transportation Study

This study identified that runoff from the Sunnyside and Highlands Basins can overwhelm the existing storm drain pipes causing excess water to flow into the Globeville neighborhood. Alternative solutions were evaluated. The study recommended further study and design of two new detention ponds that outfall to the existing storm pipe system. Another alternative (Alternative C) consisted of a storm sewer interceptor made up of large diameter storm pipes that would convey runoff to the South Platte River.

2013 the Globeville-Utah Junction Watershed Outfall Systems Plan (OSP)

This plan is the main stormwater master plan within the basin. The study found that the current storm drain system does not have the capacity to convey the 5-year or 10-year storms and does not convey a major, 100-year storm event. The study also aligned with the findings from the 2012 Northwest Denver Sub-Area Drainage and Transportation Study that identified stormwater runoff flows from the Sunnyside neighborhood. The OSP’s primary focus was to improve the storm drainage pipes to meet the minor and major storm event design criteria established during the study.

The OSP developed and analyzed five alternatives based on routine maintenance and rehabilitation of existing facilities, increased storm drain capacity and increased detention capacity. Three of the alternatives focused on reducing street flooding to meet the street flow depth criteria (six-inches) during three different minor storm scenarios (2-year, 5-year, and 10-year events). The fourth alternative focused on evaluating detention at specific locations throughout the basin as a means of reducing demand on the existing pipe system. This alternative was considered to be the least effective at reducing surface flooding. Finally, the fifth alternative was developed as a combination of the other four alternatives.

The fifth alternative became the recommended alternative from the study and focused on addressing flooding problems throughout the Globeville basin, including the overflows from the Sunnyside neighborhood through a combination of new pipes, and detention. The OSP recommended plan includes improvements for six different outfall systems that include the following:

- 58th Avenue Outfall
- 54th Avenue Outfall
- 48th Avenue Outfall
- I-70 Outfall
- Sunnyside Outfall
- Heron Pond Outfall

However, after further review from project stakeholders (UDFCD, City and County of Denver and Adams County), a Selected Plan Letter was submitted, which made modifications to the recommended plan including the removal of detention ponds within the selected parks leaving only a few recommended detention ponds which include the Inca Street Detention Pond, a Pond within the Platte Farm Open Space area, and a pond at Washington Street and 58th Avenue. The OSP also provided a prioritization and phasing recommendations element.

It is important to highlight that the 2012 Northwest Denver Sub-Area Drainage and Transportation Study and the 2013 Outfall System Plan have their own study area boundaries. Their boundaries do not overlap, yet the fact that stormwater runoff crosses those boundaries links these two areas together. The 2014 City-wide Storm Drainage Master Plan (SDMP) includes both areas, yet each area was studied separately. These two areas were first studied together in 2017 by ICON Engineering.

2017 Globeville-Utah Junction Storm Drain Master Plan Evaluation

In 2017 ICON Engineering performed further analysis of some of the concepts from 2013 OSP and the 2012 Northwest Denver Sub-Area Drainage and Transportation Study. The ICON evaluation used elements and components from the two previous studies as a base and analyzed them as a system all together to evaluate the following projects:

- Project A: 48th Avenue Outfall
- Project B: 84th Avenue Outfall
- Project E: 51st Avenue Collection System
- Project J: Interstate 70 Outfall
- Project L: Northwest Subarea Interceptor Storm Drain

The study evaluated combinations of the above projects on their effectiveness on reducing the potential inundation areas (flooding areas equal to, or greater than 1 foot of depth).

The study recommended

- Project A: 48th Avenue Outfall with an additional 5 outfalls (inlet location from Broadway to Argo Park)
- Truncated Project L Outfall.

The Globeville Stormwater Systems Study project team used the recommendations from the evaluation performed by ICON in 2017 as a starting point. Since the publication of the OSP, the City and County of Denver Parks Department is now open to conversations of strategic detention locations in park areas that provide both community and flood reduction benefits. VIT and community members continually suggested this study should explore existing park space, as well as potential future locations, for detention purposes. The project team further explored detention opportunities within the basin and analyzed their effectiveness in helping alleviate stormwater flooding in the lower part of the Globeville basin.
PREVIOUS NEIGHBORHOOD STUDIES

In addition to drainage studies, the Globeville Stormwater Systems Study project team reviewed previous citywide comprehensive plans, area specific master plans, and neighborhood plans within the vicinity of the basin. The project team analyzed and explored opportunities that aligned with both the goals of this study and goals from previous plans that could work in conjunction with stormwater infrastructure improvements and river flood protection improvements.

2014 Globeville Neighborhood Plan

This plan documents the community’s vision for the Globeville neighborhood around a unique, strong, connected, and healthy Globeville. The plan documents the neighborhood’s strengths such as its proximity to downtown and tranquility of streets as well as its challenges, such as lack of pedestrian environment and multiple highways and railroads that create mobility barriers. The plan recognizes stormwater flooding as a challenge within the community and recommends identifying funding sources for storm drainage improvements and embracing the South Platte River.

In terms of open space and parks, the Plan recommends the creation of new parks, open space, and recreation facilities as well as the incorporation of water quality into open space design. It also recommends the transformation of the leftover areas into neighborhood assets such as pocket parks or community serving spaces, and the transformation of rails to trails if any of the rail lines are abandoned.

In terms of connectivity, the plan recommends to re-instate the grid where possible with the creation of complete streets to reconnect the community and break down some of the barriers. The plan provides a couple of options for a new street grid between Washington Street and the South Platte River.

In addition, connections to green space, the river, and the National Western Center are highlighted as important considerations.

The plan recommends an increase of green infrastructure, Low Impact Development and tree canopy in street and alley beautification projects. The additional width along streets and alleys could be used to showcase sustainable streetscape design that uses green infrastructure and stormwater management techniques.

2015 National Western Center Master Plan

This plan provides a framework for the redevelopment of the National Western Center. The plan identifies two new connections over the South Platte River between the National Western Center and the Globeville neighborhood. The first bridge is identified near 49th Avenue and the second bridge near 51st Avenue near Carpio-Sanguinette Park. Analysis by the National Western Center Placemaking Study, currently underway, has updated the southern bridge to be closer to 48th Avenue.

2017 NDCC Mobility Master Plan

This plan identifies mobility issues, opportunities and priorities for the North Denver Cornerstone Collaborative area to achieve a complete mobility system. The plan looks at pedestrian, bicycle, transit, and vehicular mobility and recommends priorities in terms of cornerstone projects, neighborhood corridors, and spot improvements. Many of these priorities are located within the Globeville Basin.

2017 Heron Pond / Heller / Carpio-Sanguinette Park Master Plan

This plan documents the vision for joining four underused parcels, totaling 80 acres, into an iconic, revitalized public park. This project also aims to restore and enhance a natural area while showcasing the history of the place. The park and open space project will include elements such as a playground and picnic area, a river overlook, a pavilion, promenade and amphitheater, and a regional water quality area.

2018 Platte Farm Open Space

This project is a resident-led, brownfield to open space project in Globeville. The 5.5 acre brownfield site will feature restored short-grass prairie, crusher fine trails, play space, and detention pond that will alleviate the flooding frequently reported by adjacent homeowners. Upon completion, the project will provide an opportunity for Globeville residents to recreate and reconnect with nature in a neighborhood that is surrounded by industry. The project is a partnership between the City and County of Denver, Urban Drainage and Flood Control District, Groundwork Denver, and the community.

2019 Green Infrastructure Implementation Strategy

This plan identifies thirty-one water quality basins including eleven priority basins, based on a number of criteria. Approximately seventy-five percent of the criteria were based on stormwater concerns, including water quality, flooding, impervious surface within the right-of-way, and network of underground pipes. The Globeville Basin includes parts of the Sunnyside water quality basin, which is one of the eleven priority basins. This plan highlights green infrastructure opportunities within the Sunnyside water quality basin such as bike and green infrastructure enhancements along Tejon Street and residential rain gardens.

2019 Blueprint Denver

The recently completed Blueprint Denver updates the citywide land use and transportation vision through the lens of an equitable city, a city of complete neighborhoods and networks, and an evolving city. This plan identifies areas within the Globeville Basin as part of the growth strategy and defines the future places and networks within the basin that contribute to the citywide vision.

2019 Game Plan for a Healthy City

This recently adopted plan understands the parks, recreation, and the urban forest as vital infrastructure to our city’s health. This plan recognizes the relationship between open space and parks with stormwater to reduce flood risk throughout the city, and identifies priority areas for new parks.
HIGH BASIN RECOMMENDATIONS

51ST AND ZUNI PARK

Background and Analysis:
Detention at the 51st and Zuni Park was originally proposed in the 2013 Outfall Systems Plan but later removed for lack of interest in integrating detention in parks at that time. In this study, strong neighborhood support for examining all possibilities led to the analysis of the effectiveness of a potential detention pond in the south west corner of the park. Results showed that detention in this location, however, has a minimal impact in alleviating flooding in lower portions of the basin. The amount of stormwater that could be detained is quickly surpassed by stormwater runoff in the mid-section of the basin, near the Rennick Yards. Based on this analysis, it was concluded that consideration of 51st & Zuni Park detention, as well as other neighborhood parks within the high part of the basin, was not appropriate for this study.

However, in coordination with the City and County of Denver’s Green Infrastructure Implementation Strategy, the 51st & Zuni Park presents a good opportunity for water quality improvements that could be implemented in conjunction with park improvements. The Green Infrastructure Implementation Strategy proposes the southwest corner of the park for a water quality treatment area (Figure 36). There was strong community support for the future reconfiguration of the southwestern corner of the park to accommodate moderate local detention and water quality improvements designed with park enhancements. An example project is the Mission Valley Stormwater Storage area in Seattle, Washington (images below) where recreational and neighborhood amenities were integrated into the design of the stormwater and water quality treatment area.

Recommendation A1: Moderate Detention and Water Quality Improvements

- Implement a water quality area on the southwest corner of the park (Figure 36), designed to accommodate community recreational needs.
- Integrate moderate detention at southwest corner of the park as a local stormwater strategy, understanding that detention this high on the basin has minimal impact on the water flows in the low section of the basin.

Recommendation A2: Park Improvements at 51st and Zuni Park

- In conjunction with the water quality and moderate detention area (B1) at 51st and Zuni Park, re-design the area to accommodate community recreational needs and park improvements. Community needs and park improvements should be explored during a separate community process more specific to the park.
GLOBEVILLE STORMWATER SYSTEMS STUDY

RECOMMENDATIONS

Madison Valley Stormwater Storage dry (Source: kk-la.com)

Madison Valley Stormwater Storage during a storm event (Source: kk-la.com)

Madison Valley Stormwater Storage as a sledding hill during winter (Source: kk-la.com)

Recreational and leisure trails in Madison Valley Stormwater Storage (Source: kk-la.com)
MID BASIN RECOMMENDATIONS

DETENTION AND PARK SPACE

Background and Analysis:
The mid-section of the basin is a prime location for detention designed to slow, detain, and manage the rate of flow of stormwater runoff from the mid-basin toward the South Platte River. The path of flow in the Globeville basin where detention would be more beneficial can be understood as a band of opportunity that includes the area in the Sunnyside neighborhood just south of I-70 and west of the railroads; the area north of I-70 and east of the railroads; and the area along 48th Avenue between I-25 and Lincoln Street (see Figure 34 at the beginning of chapter). The project engineering team evaluated this path of stormwater flow for capacity and effectiveness of future detention. Community members expressed strong support for the development of detention along the path of stormwater flow and expressed preference for design options that integrate new park and plaza space, create recreational opportunities, provide community-facing amenities, and are easily accessible by the neighborhoods. For purposes of evaluation, this band of opportunity was broken down into the following options:

B1 OPTION 1: SUNNYSIDE (SOUTH OF I-70 & WEST OF RAILROAD)

Background and Analysis:
During the initial high-level analysis, the project team found there is opportunity for a detention pond/park west of the railroad tracks and south of I-70 that can capture some of the stormwater runoff heading into Globeville from Sunnyside and convey the runoff down the Inca Street system. This option prevents the flows from Sunnyside from entering the 48th Avenue Outfall System. A surface area of 3.9 acres, with six to eight feet depths could accommodate an estimated total volume of 16 acre-feet (13 acre-feet of detention storage and 2.7 acre-feet of water quality treatment). For its proximity to the Sunnyside neighborhood, this detention pond has the opportunity to be designed in a way to accommodate usable park space.

Neighborhood Design Considerations: The Sunnyside detention option lies within an area identified in Blueprint Denver as a growth area with high-priority for park access improvements. The potential detention and park space would lie in proximity to the Denver Housing Authority Quigg Newton community and the growing residential base around the 41st & Fox Station area. The City and County of Denver’s Game Plan for a Healthy City also identifies this area as a priority area for new parks.

Recommendation B1.A: Detention Area and Water Quality
• Locate, design, and develop a 16 acre-feet detention area south of I-70 and west of the railroad tracks to capture and detain stormwater runoff and release to the Inca Street existing drainage pipe.

Recommendation B1.B: Community Park Space
• Design detention area as community-oriented park space with recreational opportunities, water quality improvements and enhancements to neighborhood bike and pedestrian elements in the area. Consider landscape, tree canopy, lighting and other amenities to shield park space from adjacent highway and to better interface with neighborhood residential.

B2 OPTION 2: INDUSTRIAL AREA (NORTH OF I-70 & EAST OF RAILROADS)

Background and Analysis:
High-level analysis identified an opportunity for a detention pond, north of I-70 and east of the railroad tracks, to capture the majority of overflow from Sunnyside and some of the northern flows from the Rennick Yards area. A surface area of 4.1 acres with a 6-foot depth could accommodate an estimated total volume of 21 acre-feet (18 acre-feet of detention storage and 2.4 acre-feet of water quality treatment). Since the location of the pond is in an industrial area, the ability to merge both detention and community amenities could be a challenge.

Neighborhood Design Considerations: North of I-70 and east of the railroads, opportunities for detention should be tied to future community serving space or buildings, redevelopment efforts and/or opportunities to transform 48th Avenue corridor into a greenway using currently underutilized right-of-way along the alignment. Strong multi-modal enhancements linking the neighborhoods to future 48th Avenue amenities would be important to neighborhood design considerations.

Recommendation B2.A: Detention Area and Water Quality
• Locate, design, and develop a 21 acre-feet detention area north of I-70 and east of the railroad tracks to capture and detain stormwater runoff and release to the 48th Avenue pipe infrastructure system.
OPTION 3: UPPER RIDGE (ALONG 48TH AVE - BETWEEN I-25 & LINCOLN ST)

Background and Analysis:
Initial high-level analysis identified an opportunity for a detention pond/park/plaza in the mid-section of the basin and near the Globeville neighborhood at the ridge located east of I-25 along 48th Avenue before heading to the low section of the basin. This location has the opportunity to implement a detention pond combined with an amenity for the community. A surface area of 5 acres with approximately a 6-foot depth could accommodate an estimated total volume of 25 acre-feet (21 acre-feet of detention storage and 3.8 acre-feet of water quality treatment).

Neighborhood Design Considerations: The Upper Ridge location along 48th Avenue east of I-25 and west of Lincoln Street was identified in Blueprint Denver as a growth area, and as an area of change in the Globeville Neighborhood Plan. This location sits at a high point along 48th Avenue and would be accessible from locations throughout the Globeville neighborhood, including the new Platte to Farm space just east of Lincoln Street.

Recommendation B3.A: Detention Area and Water Quality
- Locate, design, and develop a 25 acre-feet detention area along 48th Avenue, between I-25 and Lincoln Street to capture and detain stormwater runoff and release to the 48th Avenue pipe infrastructure system
- Develop water quality improvements within the detention area that work in conjunction with the 48th Avenue “green corridor” improvements tied to Argo Park.

Recommendation B3.B: Community Park Space
- Design detention to leverage underutilized right-of-way on the ridge and create opportunities to develop community park and plaza space, neighborhood amenities and key connections to surrounding parks and recreational destinations (Figure 37-38).

Woodbriar Park in Greeley Colorado is example of an integrated park and detention area (Source: ECI Site Construction)

Figure 37: Existing Underused Leftover Area near Lincoln St. and 48th Avenue (Looking east)

Figure 38: Proposed Gateway Plaza/Park that Integrates Stormwater and Neighborhood Space (Looking east)
TRUNCATED PROJECT “L”

Background and Analysis:
Large quantities of stormwater runoff that end up flooding the Globeville neighborhood come from the Sunnyside and Highland neighborhoods. Stormwater runoff flows under I-25 and travels north along Globeville Road to end up in the area near Argo Park. Project L was originally proposed in the 2012 Northwest Area Drainage and Transportation Study (called alternative C). In 2017 ICON evaluated this pipe improvement and determined that a truncated version of this pipe improvement had a big impact in reducing flooding in the Globeville neighborhood.

The engineering team identified the combination of Truncated Project L and detention significantly alleviates flooding in the Globeville neighborhood. The Truncated Project L pipe sizes were assumed to be as proposed in the 2017 ICON evaluation. No further analysis was made at this time by the engineering team for this project. For a more detailed look at the technical alternative’s analysis of pipe improvements and detention ponds see Appendix A.

Recommendation C1: New Pipe Improvements along Jason Street
• Implement the Truncated Project “L” pipe improvement along Jason Street to drain stormwater from the Sunnyside and Highland neighborhoods to the South Platte River
• Proposed pipe type and size: 18-by-9-feet reinforced concrete box culvert

Figure 39: Proposed Location of Truncated Project “L”

A 12-by-15 feet reinforced concrete box culvert pipe part of Globeville Landing Park redesign (Source: Denver Post)
LOW BASIN RECOMMENDATIONS

48TH AVENUE GREEN CORRIDOR

Background and Analysis:
A significant level of stormwater runoff that floods the Globeville neighborhood near Argo Park, comes from the Rennick Yards and surrounding area and runs along 48th Avenue. Early on in the study, stakeholders and community members identified the 48th Avenue corridor as a good opportunity for drainage infrastructure improvements, green infrastructure, and neighborhood amenities associated with the street and Argo Park area.

The project engineering team confirmed that 48th Avenue pipe improvements and a new 48th Avenue Outfall at the South Platte River, coupled with the Truncated Project L in the mid basin, most effectively address flood levels in the Globeville neighborhood. The project engineering team analyzed alternative sizing of an improved 48th Avenue pipe against the effects of potential detention capacity in the three optional detention locations discussed previously in this study (Recommendation C). In all cases, but to differing degrees, the pipe size was significantly reduced by the addition of detention in the mid basin, creating the opportunity for 48th Avenue to be part of a gray and green infrastructure solution that also supports other community benefits.

Neighborhood Design Considerations: The project team, stakeholders, and community members worked to identify options for 48th Avenue that could slow the flow of stormwater down the street toward Argo Park, improve water quality, and provide more natural vegetation. Today 48th Avenue is a 60-foot right-of-way with a single travel lane in each direction and on-street parking along both sides of the street. Many community members mentioned that the intersection of 48th Avenue and Logan Street is misaligned and does not feel safe for approaching vehicles or pedestrians. 48th Avenue does not provide a vehicular connection to Washington Street but could support a stronger bike and pedestrian link. Natural vegetation and green infrastructure along 48th Avenue was preferred by stakeholders and community members, coupled with practical ways to use the street and park to move stormwater away from the homes and into Argo Park. Stakeholders and community members examined ways to re-think the 48th Avenue right-of-way to accommodate more green space, a bioswale, trees, and wide sidewalks, and parking to support activities within the park and neighborhood connectivity. Community members voiced preferences for a future design of 48th Avenue that made today’s roadway an improved “green corridor” connection to Argo Park and surrounding uses.

Recommendation D1: New Stormwater Pipe along 48th Avenue with new outfall at the South Platte River
• Design and implement a new reinforced concrete box culvert along the 48th Avenue from Lincoln Street to a new outfall at the South Platte River. Sizing of the pipe will depend on which detention options from Recommendation C are implemented. If options C1 and C3 are implemented, pipe sizing is assumed to be 8 feet by 5 feet.

Recommendation D2: Develop Stormwater Overflow Management Area within Argo Park
• Re-design the north side of Argo Park to better accommodate localized stormwater runoff that flows down surrounding streets and collects within the residential uses in the neighborhood. This localized flow should be directed toward the northeast area of the park to be allowed to drain to the 48th Avenue pipe through the addition of new inlets to the pipe. The park should be re-designed with a gentle slope at the edge to allow for the directed flow of water away from homes, but to retain current park uses and the existing trail within the park.

Recommendation D3: Green Infrastructure and Amenities along 48th Avenue
• In coordination with pipe improvements along 48th Avenue, design and implement green infrastructure at the surface (bioswale with trees) that connect the proposed Upper Ridge Plaza to Argo Park and improve pedestrian and bike connectivity (Figures 40-10).
• Redesign the right-of-way to improve the alignment of the intersection of 48th Avenue and Logan Street.
• Explore the feasibility of green infrastructure and green alleys on contributing alleys and streets like Clark Place.
RECOMMENDATIONS

RIVER RECOMMENDATIONS

FLOOD PROTECTION FROM THE SOUTH PLATTE RIVER

Background and Analysis:
During the existing conditions analysis of the 2015 Denver Urban Waterways Restoration Study, river modeling showed spilling on the western bank just upstream of 38th Street. In addition, it was identified that the current levee does not meet FEMA levee freeboard regulations (3 feet minimum of freeboard between the water level during a 100-year event and top of levee). The new river modeling included more detailed data including high resolution topographic elevation data. Some bridges are too low and act as obstructions causing higher water surface elevations upstream, resulting in overbank spilling upstream of 38th Street. The potential spill and the inadequate levee conditions will result in portions of the Globeville basin being placed back in the FEMA regulated floodplain, making flood insurance a mandatory requirement if the levee is not improved to meet FEMA criteria and extended upstream of 38th Street to mitigate the newly discovered spill.

The Urban Waterways Study evaluated additional proposed alternatives that included widening the river; raising the 38th Street bridge, main BNSF bridge, railroad spur bridge, and pedestrian bridge; and adding capacity to the channel where available. These improvements would eliminate the spill but would not correct the levee freeboard deficiencies. The alternatives proposed would be very costly and could take a significant amount of time to implement. The largest challenge would be modifying the main BNSF bridge due to its size and proximity to the rail yard to the south.

As part of this study and as requested by the Stakeholder VIT, additional analyses were performed by the engineering team. The analyses include:

- Widening of the channel near Ringsby Court
- Dredging of the South Platte River
- Diverting flow via an underground tunnel upstream of 38th Street.

Widening the channel showed that as flow approached the 38th Street bridge, the additional area allowed water to spread out, but in doing so, the water speed was reduced, and the water surface elevation increased. The analysis of dredging the river showed that even though one of the options analyzed could eliminate the spill, the cost, maintenance, environmental, and bridge integrity concerns related with dredging the river 6 feet make this option impractical. The analysis of diverting flow achieved a reduction of 2 feet, which is less than the 4 feet that is required to eliminate the spill. See Appendix B for the South Platte River analysis details.

Recommendation E1: Flood Protection from the South Platte River
- Increase the height of the existing levee to achieve FEMA freeboard criteria from Franklin to 38th Avenue (Figure 45).
- Extend the levee from 38th Street to approximately 35th Street along Ringsby Court. (Based on today’s land use and roadway configuration, this segment is currently assumed to be a levee wall rather than a berm) (Figure 45).
- Continue to evaluate the opportunity for bridge improvements that improve flow of river and minimize spill at Ringsby Court.

Recommendation E2: Reconnect with the South Platte River and Establish Community Amenities
- Seek opportunities to design and implement community activated plazas, green space and pedestrian amenities in conjunction with flood protection measures and design of the levee.
- Continue coordination efforts to design a future Ringsby Court along the railroad tracks and to re-imagine the existing Ringsby Court right-of-way as an improved community green space and pedestrian connection along the river (Figures 42, 43, and 44)

Recommendation E3: Incorporate recommendations from the USACE Urban Waterways Restoration Study
- Continue to coordinate and align the levee improvements with the recommendations from the Urban Waterways Restoration Study.

Ultimately, widening the river and raising the BNSF Bridge and other bridges in the area to heights above the 100-year elevation would be ideal for eliminating the overbank spill; however, this alone would not fix all the levee freeboard deficiencies. In addition, there are many technical challenges to raising the main BNSF bridge, which could be further studied, but at this point make it technically unfeasible to raise the BNSF Bridge. Therefore, this study recommends raising the existing Globeville levee to achieve FEMA freeboard criteria and extending the levee along the river to approximately 35th Street (Figure 45) to provide protection from the spill while correcting the freeboard deficiencies and ultimately avoiding FEMA regulated floodplain designation. In locations where the existing levee exists as a berm, raising the height will mean a corresponding expansion in the footprint of the levee (Figure 45). In locations where only a levee wall can be accommodated, the height of the wall will increase as needed to meet FEMA levee freeboard regulations of 3 feet minimum of freeboard between the water level during a 100-year storm and the top of the wall. At the same time, the City and County of Denver Public Works department will continue to study raising the low bridges in the area.

Neighborhood Design Considerations: Stakeholders and community members discussed concerns and interests with regard to raising and extending the levee. There was strong community support for levee improvements to be completed in a timely manner, thereby avoiding FEMA re-designation of the area as a floodplain. However, there was extensive stakeholder and community discussion of design considerations that should be carried forward into final design of the levee.

There was strong neighborhood support that the levee should serve as a unique community amenity, rather than a barrier, and provide improved bike/pedestrian experience. Improved access to the bike/pedestrian facility should be coordinated with National Western Center, Heron Pond/Carpio-Sanguinette Park, and Washington Street. Changes to the levee should be made in coordination with the development of Heron Pond/Carpio Sanguinette Park so that work is not required to “re-do” any portions of the pond or park to incorporate flood protection. Property owners expressed concern that the levee design accommodate truck and business access to properties along the east side of Washington Street, and, where possible, provide the opportunity to improve access points and clarity. When improving the levee, stakeholders and community members expressed their interest in finding ways to increase green space, community plazas, or improved connections between the neighborhood and river to enhance the relationship of the community with the river’s edge.

Stakeholders and community members expressed their interest in finding ways to increase green space, community plazas, or improved connections between the neighborhood and river to enhance the relationship of the community with the river’s edge.

Individual Property Strategies Neighborhood Design Strategies Basin-Wide Stormwater Infrastructure Strategies Regional River Infrastructure Strategies
**RINGSBY COURT INVESTIGATION**

Although recommendations E1 and E2 are applicable to the overall levee, it is particularly important to the current floodwall assumption adjacent to Ringsby Court from 38th Street to approximately 35th Street. Stakeholders and agencies such as RTD held extensive conversations around options related to the treatment of the levee through this section, the interface with adjacent development, and the opportunity for community amenities along the river.

**RINGSBY COURT EXISTING**

*Figure 42: Existing Ringsby Court Cross Section*

Today’s Ringsby Court condition varies throughout the length of the corridor. In most of the corridor, there is approximately 29 to 34 feet of right-of-way between the property line and the edge of the road on the river bank. The road configuration is a single 10 feet travel lane in each direction, minimal shoulder along the river’s edge, and sidewalk only in areas with adjacent recent development along the west side of the street. Today’s condition provides very little opportunity to interface with the river or activate the river’s edge in the future.

The current Ringsby Court right-of-way does not allow for the construction of a levee wall at the roadway edge or sufficient travel lane width to support truck and bus travel along this road. This configuration also means little to no room would be available for pedestrian or bicycle mobility. The role of Ringsby Court in the surrounding transportation network will become increasingly important as Arkins Court, on the east side of the river, transitions to a greenway with no vehicular travel.

*Figure 45: Diagram of Proposed Levee Improvements.*

**RINGSBY COURT VISION**

*Figure 43: Ringsby Court Vision Concept*

The vision for change in this area includes the relocation of Ringsby Court to an alignment along the railroad and the use of the existing Ringsby Court right-of-way to create community green space, plaza, and significant pedestrian and bike improvements along the river’s edge. This realignment of Ringsby Court, along with travel lane width and curvature, would need to accommodate not only local traffic but RTD buses, especially in relation to the RTD service building at Ringsby Court and 31st Street.

Because this vision for a future Ringsby Court requires significant coordination between the City and County of Denver, the property owner and RTD, timing, viability, and funding of implementation is uncertain. Feasibility coordination should continue as design of the levee moves from Heron Pond/Carpio Sanguinette Park south toward Ringsby Court.

**RINGSBY COURT INTERIM OPTION**

*Figure 44: Ringsby Court Interim Solution Concept*

An interim solution has been identified for this section that allows for the design and construction of a floodwall, the addition of pedestrian space and the continued operation of Ringsby Court until such time as Ringsby Court can be relocated. The interim solution relies on the placement of the floodwall 15 feet from the edge of today’s pavement into the river embankment. The engineering team’s analysis showed that up to 15 feet into the embankment does not impact of the flow of water along the river and instead acts to channelize the flow of water under the 38th Street bridge as it is currently designed. The additional right-of-way can adequately accommodate a flood wall, elevated pedestrian path, and improved lane configuration.

*Figure 46: Cross Section of Proposed Levee Improvements*

*Figure 47: Typical 18’ Trail (Source: Denver Moves: Pedestrians and Trails)*
# Recommendations

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<tr>
<th>Recommendations</th>
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<td><strong>B</strong> DETENTION AND PARK SPACE</td>
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<td>$33,000,000 - $40,000,000*</td>
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<td><strong>D</strong> 48TH AVENUE GREEN CORRIDOR</td>
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<td><strong>E</strong> FLOOD PROTECTION FROM THE SOUTH PLATTE RIVER</td>
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<td><strong>OVERALL LAND ACQUISITION</strong></td>
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* This is a planning estimate only, which is based on historical data for similar type projects. Additional analysis of detailed engineering data (i.e., surveys, geotechnical analysis, environmental assessments, hydraulics, etc.) will be required to refine the estimates. Therefore, the amounts shown may change significantly as design and implementation of projects progress.

**While land acquisition is included, only a limited market study has been completed and amounts are subject change.

- Individual Property Strategies
- Neighborhood Design Strategies
- Basin-Wide Stormwater Infrastructure Strategies
- Regional River Infrastructure Strategies

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**INFRASTRUCTURE SUMMARY**

Figure 48: Infrastructure Summary Map
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Next Steps

This chapter looks at strategies to increase community education and awareness around local flood concerns, and ways for individuals and property owners to protect against flood risk.

Next steps also include ways to leverage and coordinate the recommendations from this study with current projects and investment in the area.

A Community Resource Guide was developed during the Study. The guide includes information about the basin history and its characteristics as well as practical ideas that all residents can adopt to help protect against local flooding.

See Appendix C for the complete guide.
NEXT STEPS STRATEGY

Advancing the recommendations of the Globeville Stormwater Systems Study requires continued partnership between the City and County of Denver Public Works, NDCC, civic and community organizations, residents, businesses and property owners across the basin. We all play a role in not only identifying the problems, but in achieving the recommended solutions to our flood conditions.

While the basin-wide infrastructure recommendations discussed in the Infrastructure Summary are a critical “next step,” so too is the continued effort around community education and awareness and the advancement of sustainable neighborhood solutions that build community benefits.

This Next Steps Strategy summarizes the actions and outcomes of this effort that are integral to the infrastructure solutions and specifically supports the community’s goals for the study.

INFRASTRUCTURE DESIGN

The infrastructure recommendations in the previous section serve as a framework for future design and implementation. Decisions to advance infrastructure improvements will be made by the City in coordination with overall capital improvement funding needs and the ability to leverage other project improvements in the area. Continued partnership with the community and coordination among the area projects is essential, however, to leveraging opportunities to further evaluate, design and construct solutions.

As a result of the Globeville Stormwater Systems Study, the City is already advancing Phase 1 of the levee design, coordinating Washington Street improvements and future lower portion of the 48th Avenue outfall and ensuring coordination with the National Western Center bridges at Bettie Cram Drive and 51st Avenue.

COMMUNITY EDUCATION, AWARENESS AND SUPPORT

Essential to success in the Globeville Basin is the ongoing effort to increase education and outreach and raise community awareness and understanding of stormwater management and water quality.

The Globeville Stormwater Systems Study documents the topographic conditions and historic actions that have contributed to today’s urban flooding issues, and the chapters within this plan can be a resource for continued neighborhood education and increased understanding of basin stormwater and river-related flood conditions.

The Community Resource Guide, developed through this study, is a quick reference for residents, businesses and property owners and can be easily shared with a broad community audience. This guide contains a brief history of the Globeville basin and explains the two flooding issues affecting the basin; urban stormwater flooding and river flooding. The guide identifies actions that personal property owners can take to protect their properties against flooding. It also identifies other available on-line resources that can provide information and guidance around stormwater flooding, river flooding, floodplain designation and flood insurance. Connecting community with educational materials, information, partnering organizations and governmental resources is fundamental to building community understanding around their local flood concerns.

Neighbors identified neighborhood safety during flood conditions as a priority. Residents and businesses alike expressed the desire to work together to identify the low-lying areas and impassable streets within the community that are frequently subject to flooding, and to identify safe ground and alternate travel patterns to avoid such areas during rain events. RNO and community organizations could lead efforts to develop neighborhood flood safety procedures and raise community awareness.

SUPPORT PRIVATE PROPERTY PRACTICES

Residents from the neighborhoods and businesses expressed interest in doing their part to address stormwater runoff. Small interventions on private properties can have cumulative effects within the neighborhood of improving infiltration, slowing runoff and protecting individual properties during typical rain events. Replacing driveways with pervious surfaces, designing rain gardens, participating in a community rain barrel program and protecting basements and personal property from stormwater runoff are actions for any property owner to consider. Civic and advocacy groups like Groundwork Denver are instrumental in developing and executing assistance with these types of installations, hosting community rain barrel programs and supporting community education of best practices.
BUILD COMMUNITY BENEFITS

Throughout the course of the study, stakeholders and community members explored solutions that not only address stormwater management and flood-risk, but also create the opportunity to leverage concurrent projects and build additional community benefits. Because pipe infrastructure and potential detention solutions mean significant construction, stakeholders embraced the opportunity to “re-imagine” areas potentially effected by construction and replace them with sustainable community-oriented improvements.

This approach is illustrated in the infrastructure and community-benefit solutions for 48th Avenue, Lincoln Street plaza, Ringsby Court and alternative detention park locations that address stormwater management through below-grade infrastructure coupled with sustainable surface treatments. These treatments could include park or plaza space, green streets with water quality improvements, enhanced tree canopy and strong pedestrian environment, as well as green alleys on contributing streets.

As the community explored ideas for 48th Avenue and the plaza on the upper ridge at Lincoln Street, the concept of a neighborhood focal point and overarching benefits theme emerged; coordinate and leverage concurrent projects in the area to re-connect segments of the historically disconnected Globeville community. The 48th Avenue green corridor, in coordination with the design of other area investments, could establish a truly connected Globeville from Lincoln Street to Platte Farm Open Space and 49th Avenue, to Argo Park, future Washington Street improvements, South Platte River trail, Globeville Landing Park, RiNo Promenade and the Bettie Cram and 51st Avenue bridges to the National Western Center. Leveraging opportunities for stormwater improvements could be an essential aspect of building community benefits, community connectivity and healthy and sustainable solutions.
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