16TH AVE GREEN STREETS STRATEGY
COMMUNITY VISION & GOALS

PRIMARY GOALS

- Alleviate Flooding
- Improve Water Quality

COMPLEMENTARY NEIGHBORHOOD GOALS

- Reduce Impervious Surfaces Within the Neighborhood
- Explore Green Infrastructure Projects Within the Neighborhood
- Maintain Neighborhood Character and Aesthetics
- Find Co-Benefits: Slow Traffic Speeds and Encourage Walking or Biking
- Increase Education and Awareness of Stormwater Through Local Projects
- Incentivize Homeowners to Participate in Flood Proofing
This area of the Upper Montclair Basin frequently experiences flooding during summer and spring rain events. The impacts can be severe; recent storm events have caused tens of thousands of dollars in property damages and left parts of this neighborhood under several feet of water.

Red dots (*) on the adjacent map illustrate areas that have reported significant losses due to flooding.

This study area is primarily single-family homes with few open spaces or park areas. As a result, the 16th Ave Green Streets Strategy explored opportunities for stormwater management and water quality improvements within the streets, alleys and adjacent spaces.

Often known as green streets, these interventions are built entirely within the existing street and alley rights-of-way (ROW), replacing pavement with more natural alternatives such as bioswales or permeable pavement.

As stormwater falls onto our streets or alleys, it is conveyed into underground pipe network through gutters or other entry points. In Upper Montclair, however, the existing pipe network is out-dated, undersized, and often overwhelmed by stormwater run-off even in smaller storm events. Green streets work to help alleviate this pressure by slowing down or soaking in some of the stormwater before it reaches the underground pipe network. These types of interventions also provide much-needed water quality improvements in the basin.

While results vary significantly based on a variety of factors, successful implementation of green streets can extend the life of existing pipes or reduce the size of pipe upgrades.

The study area includes approximately 9,650 linear feet of alleys. Each alley is about 16 feet wide and present an opportunity for green infrastructure projects.

**STREETS**

Streets in the 16th Ave Study Area generally have a 60 ft. ROW and 30 ft. curb-to-curb distance. All streets allow two-way traffic and neighborhood street parking on both sides.

**ALLEYS**

The study area includes approximately 9,650 linear feet of alleys. Each alley is about 16 feet wide and present an opportunity for green infrastructure projects.
Community conversations and multiple public meetings identified several types of green streets applications that were favored by area residents. Some interventions received unanimous support in most locations throughout the neighborhood; others were considered favorable only at select locations.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION</th>
<th>COMMUNITY MEETING INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERSECTION BULB-OUTS</td>
<td>Intersection bulb-outs are green infrastructure treatments placed at the intersection of streets and avoid any major impacts to parking. These landscaped areas are designed as rain gardens or vegetated swales that filter and capture stormwater. Intersection bulb-outs extensions can add green space, increase wildlife habitats and reduce impervious surfaces in the neighborhood.</td>
<td></td>
</tr>
<tr>
<td>PERMEABLE STREETS</td>
<td>A permeable street is paved with a porous material that allows stormwater to filter through to the soil below. Commonly used materials include permeable interlocking concrete pavement, porous asphalt, and pervious concrete. Permeable pavement is appropriate on low volume residential streets with minimal slope.</td>
<td></td>
</tr>
<tr>
<td>GREEN ALLEYS</td>
<td>Similar to permeable streets, a green alley is constructed with porous materials that allows stormwater to filter through to an underground system. Pavement can be used on the full width of the alley, or in a center trench where water collects. While types of pavement can vary, each treatment is designed to withstand current servicing needs by garbage, fire, or other vehicles. Designs can generally feature more vegetation than permeable streets.</td>
<td></td>
</tr>
<tr>
<td>TREE LAWN BIOSWALEs</td>
<td>Located behind curb in the existing tree lawns, this type of bioswale is designed to have minimal impact on existing parking or transportation facilities. Bioswales are designed to remove silt, pollution and other harmful chemicals from our water while also slowing the conveyance of stormwater. Generally designed as shallow trapezoids, these areas can be planted with native grasses, herbaceous perennials or other drought tolerant native materials.</td>
<td></td>
</tr>
<tr>
<td>MID-BLOCK, SMALL BULB-OUTS</td>
<td>Midblock bulb-outs function similarly to intersection bulb-outs, but can provide a larger and more linear space for water retention. Bulb-outs extend into the existing street and may not have any effect on existing tree lawns. They can vary largely in size, based on available space and desired effectiveness, and create many ancillary benefits including traffic calming, improving pedestrian safety, reducing heat island effects, and increasing native vegetation.</td>
<td></td>
</tr>
<tr>
<td>CORRIDOR LENGTH PROJECTS</td>
<td>A corridor project may have larger impacts on stormwater conveyance and water quality and completely re-imagines a neighborhood street. Entire traffic lanes or corridors could be repurposed for green infrastructure solutions, creating the opportunity for major impacts. This intervention may be most appropriate on low volume residential streets where automobiles are deemphasized.</td>
<td></td>
</tr>
</tbody>
</table>

Findings from this investigation will inform the development of a refined green streets strategy, concept design, costing and phasing of green infrastructure improvements for the E 16th Avenue area. Concept design will be coordinated directly with the concurrent E 16th Avenue Pipe Design project and community input will continue as these two efforts move forward.
E Colfax Avenue is home to many local businesses and features an active Business Improvement District (BID). Business owners in this corridor have experienced serious damage from stormwater flooding over the years, indicated by the red dots (●) on the adjacent map.

This area also features one of the most flood prone locations in the entire basin - 14th & Krameria.

About the investigation:
This investigation combines two critical focus areas - the E Colfax Corridor and the intersection of 14th Ave & Krameria St. While current city planning efforts are taking a more comprehensive look at land use and transportation in this area, the Upper Montclair investigation has focused on providing stormwater specific analyses and recommendations.

About the area:

Lots of (small) lots:
Between Colorado Blvd and Monaco Pkwy, there are roughly 110 parcels with 100 different owners on Colfax. Only 18 of these properties are larger than ½ acre, the City's current threshold for triggering on-site detention requirements.

Street section:

Main street:
Buildings along Colfax are built close to the sidewalk, creating an active pedestrian and retail environment. When the street floods, however, this means buildings (and valuables) are close to water.
INVESTIGATION B
COLFAUX, 14TH / KRAMERIA & B.I.D.

INVESTIGATION OUTCOMES

BUS RAPID TRANSIT

Continue to work with the City and County of Denver Public Works and RTD through the BRT design process to investigate and advance the design of green infrastructure improvements within Colfax Avenue and along adjacent streets and alleys within the inundation area.

MORE GREEN, PLEASE

Continue to explore a green streets strategy and potential shared use design for streets in the 14th & Krameria inundation area. Green improvements to public streets or private properties within the Mayfair Town Center inundation area will work hand-in-hand with future pipe infrastructure improvements in the area.

BUILD SMARTER

Consider alternative development policies or practices that support the design of green infrastructure and stormwater management improvements to individual properties located along Colfax Avenue and adjacent streets within inundation areas, including:

- Financial incentives such as grants, rebates, or tax incentives
- Permit fee reductions or refunds
- Specialty loan program
- Property tax exclusions
- Entitlement incentives such as density bonuses or height incentives
- Variances on lot sizing, setbacks, or utilization of space
- Parking space requirement reductions
- Expedited permitting process
- Modified on-site detention and water quality requirements to include smaller lot sizes

WHAT’S NEXT

Recommendations from this study are informing current planning efforts in the East Area Plan. To follow the latest progress of the East Area Plan, please visit www.denvergov.org

INTEGRATED INTO ONGOING PLANS & STUDIES

PROJECT PARTNERS

DENVER THE MILLENNIAL CITY

CIVITAS
INVESTIGATION C
HALE PARKWAY & SEVERN SYSTEM
COMMUNITY VISION & GOALS

PRIMARY GOALS

- Alleviate flooding
- Improve water quality

COMPLEMENTARY NEIGHBORHOOD GOALS

- Seek solutions with multiple community benefits
- Improve & preserve neighborhood green space
- Preserve Lindsley Park & its recreational uses
- Maintain tree canopy along Hale
- Increase pedestrian & bike connectivity
- Manage future traffic on Hale (and surrounding streets)
Built over the historic, natural drainage way, today’s Hale Parkway often sees flooding during Denver’s storm events. Hale Parkway sits at a low point in the drainage basin and receives stormwater run-off from adjacent streets north and south of the parkway. Water in this part of the basin flows northwest toward Colorado Blvd.

This area also features one of the basin’s most problematic intersections -- Severn Place and Jersey St.

Hale Parkway was identified by the community as an opportunity site in the Upper Montclair Basin early in the study process. Through four public meetings, several focused stakeholder meetings and numerous neighborhood conversations, community members debated the question - 'What is the right approach to managing stormwater and providing water quality along Hale Parkway.

The first step was to identify the right approach for the parkway - conveying stormwater run-off through an 'all pipe' solution, an 'all greenway' solution, or a 'hybrid' that relied on some pipe improvements and additional greenway capacity. The community agreed on a ‘hybrid’ approach that would not only address the run-off along Hale Parkway, but provide the outlet to drain the Severn & Jersey area.

Hale Parkway today has a 150’ right-of-way (ROW) width that includes two travel lanes in either direction and additional turning lanes at many intersections. The 110’ curb-to-curb width also includes a 38’ median.

The parkway median includes dozens of mature trees that help define the character of the parkway. Sidewalks along Hale Parkway are discontinuous, sometimes located on the north or south sides of the street only.

Just east of Hale Parkway, there is a low point in the basin topography at Severn Street and Jersey Place. This location ‘fills’ during rain events and the existing pipe serving this low point cannot effectively drain the water fast enough to avoid flooding.
The community explored a range of hybrid options integrating stormwater management and water quality improvements along Hale Parkway. Some options provided primarily water quality improvements along the existing street edge and others provided detention within the parkway by concentrating the transportation function on the south side of Hale Parkway and opening up portions of the north side of the road for a greenway. No particular concept has been identified as the ‘preferred’ concept, but community input indicates favor for some form of greenway on the north side of the road to manage stormwater and improve water quality, as shown in community meeting results below.

Options for the parkway should make a significant impact in improving water quality and reducing flooding.

Greenway or green space should create a usable amenity for the community.

Green infrastructure improvements must be maintained for appearance and function.

Create a stronger pedestrian environment with complete sidewalks and additional crossings of Hale Parkway, especially near Lindsley Park. Plan better recreational trails, for walking, running, and cycling.

Manage traffic and congestion, especially between Rose Hospital and Colorado Blvd and maintain access to residences and businesses along Hale Parkway.

Maintain tree canopy.

Include the community in decision making.

Input from the community will be carried forward into the next phase of work: concept design. This phase will identify a preferred hybrid design, implementation phasing and costing. Development of the concept design will include continued community involvement and will build on the outcomes of this initial investigation, taking into account all key community concerns.
Everyone has a role to play in preventing neighborhood flood impacts; stormwater management is a team effort. The City and County of Denver is currently planning and constructing major infrastructure upgrades throughout the basin, but you can help, too! Follow these simple tips and be a part of the solution at your residence or business!

### MOVE CARS TO HIGHER GROUND
Under extreme conditions, vehicles can float through streets. Plan ahead for extreme storms and park accordingly - this could save you thousands!

### CALL 3-1-1 IF INLETS ARE CLOGGED
Street inlets can become clogged with mulch, leaves, and other street debris in the spring and fall. Chip in and help remove debris when possible. When drains become seriously clogged, call Denver 3-1-1.

### IDENTIFY A FAMILY MEETING PLACE
Connect with family members and friends; have a safe and dry place to meet after a big storm. Think safety first.

### STORE VALUABLE ITEMS IN A SAFE PLACE
Flood water in the basement can cause irreparable damage to treasured assets. Keep family photos and other valuables high and dry.

### CONSIDER FLOOD INSURANCE
The Upper Montclair Basin is not a designated FEMA Floodplain, but residents are still eligible to purchase flood insurance (and at a reduced rate!) Visit denvergov.org/flood for more details.

### CHECK YOUR PROPERTY THIS SPRING
Contact Denver Public Works Wastewater and speak with the experts. Staff are able to visit your home and help talk through your specific flood risks.

### RAIN GARDENS
A rain garden uses native plants and landscaping to soak up rain water (stormwater) that flows from downspouts or simply flows over land during a rain event. The center of the rain garden holds several inches of water, allowing the stormwater to slowly seep into the ground instead of flow directly from your roof, yard or driveway into the nearest storm drain, creek or river.

**FOR MORE INFORMATION:**

### RAIN BARRELS
A rain barrel collects and stores stormwater runoff from rooftops. By detaining (temporarily holding) the stormwater runoff during a rain event, you can help add capacity to the city’s storm system and reduce overflows to our creeks and rivers. Also, the collected rain water can be reused for irrigation to water lawns, gardens, window boxes or street trees.

**FOR MORE INFORMATION:**
- [https://conservationco.org/2016/07/all-about-rain-barrels/](https://conservationco.org/2016/07/all-about-rain-barrels/)

### PERVIOUS PAVERS
Pervious pavers come in many different types. Some are used for parking/driveways, others for patio areas. The pervious paver is porous enough to let water filter through the paver which helps in stormwater control by limiting runoff at the source. This reduces downstream erosion and improves water quality by filtering pollutants.

**FOR MORE INFORMATION:**
- [https://www.wikihow.com/Install-Permeable-Pavers](https://www.wikihow.com/Install-Permeable-Pavers)

### ARE YOU READY FOR SPRING?
Is landscaping or other objects blocking the flow of water from your property to the street outlet? Does your roof run-off or downspouts point safely away from your house? Are there any low spots on your property?

**FOR MORE INFORMATION:**
- [http://www.denvergov.org/flood](http://www.denvergov.org/flood)

### WHAT’S NEXT?
Key community resources are currently being finalized (with your help!). Look for a free guide, soon available at local businesses, through RNO newsletters, and e-mailed to everyone on the Upper Montclair Basin contact list. Visit denvergov.org/uppermontclairbasin to add your input.