resiliency planning
education
outreach

upper montclair
stormwater systems study

JUNE 27, 2017

16th AVE WORKSHOP
FINDING GREEN INFRASTRUCTURE SOLUTIONS

DENVER PUBLIC WORKS
16th Ave Workshop & Discussion

- Share City / Consultant field visit observations
- Discuss any existing neighborhood interventions
- Discuss street / alley opportunities
- Discuss other green infrastructure opportunities in ROW
TOOLBOX OF GREEN INFRASTRUCTURE

• Green Streets
• Green Alleys
• Permeable Paving
• Rain Gardens
• Rain Barrels
• Green Roofs
• Blue Roofs
GREEN STREETS

• Different typology depending on adjacent streets and land uses. Includes: Streetside stormwater planters, curb extensions, bioswales and more
• Stormwater flows to curb and gutter and into a vegetated facility. Stormwater infiltrates into soils in facility and into ground, cleansing the water
• Appropriate for many streets— from narrow neighborhood streets to wide commercial streets
• Multi-functional: improve water quality, depave pervious streets, increase vegetation, and improve pedestrian safety at certain intersections
• Can provide peak-flow reduction
GREEN ALLEYS

- Pervious paving absorbs stormwater into subsurface where it can be treated to improve water quality
- Maintains existing access and operations
- Can improve alleys to be more pedestrian friendly or inviting
- May require minimal space if alley is center-drained; easily installed in many cases
PERMEABLE PAVING
PERMEABLE PAVING

- Pervious paving absorbs stormwater into subsurface where it can be treated to improve water quality
- Flexible applications: parking lots, streetside parking, sidewalks, walkways, plazas, etc.
- Variety of materials to meet urban design needs: concrete pavers, permeable concrete, permeable asphalt
- Can maintain existing uses and operations
RAIN GARDENS

• Native plants with deep roots absorb runoff and provides pollutant reductions
• Can be installed and maintained by residents to treat driveway and roof runoff
• Cost effective and easily installed. Blends in well with residential landscapes
• Can provide peak-flow volume reduction in addition to water quality
RAIN BARRELS
RAIN BARRELS

• Catches rain water before it enters the storm water pipe system
• Can be installed at single-family residents or multi-family apartments with fewer than four residents
• Maximum storage capacity of 110 gallons
• Harvested rain water can be used for watering lawns, plants and/or gardens
GREEN ROOFS
GREEN ROOFS

• Rainfall can be absorbed or slowed by green roofs. Highly effective at volume reduction in flood-prone areas

• Can be installed on new buildings or existing buildings as a retrofit (both residential and commercial properties)

• Multi-beneficial: stormwater management, heat island reduction, air quality improvement, habitat, attractive in mult-story, urban environment

• Works very well with Solar. Cooling effect improves efficiency of panels as well as providing additional insulation to building roofs

• Industry has matured in USA; technology has improved and costs have dropped over last several years
BLUE ROOFS

• Creates temporary ponding that gradually releases stormwater into the system
• Can be less costly than green roofs
• Can be combined with green roofs to create a more multi-functional, ecologically diverse roof
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