



Retrofitting Streets for Mobility Improvements in Montgomery County, Maryland: Image Library



Prepared for:
Montgomery County Planning Department
Maryland-National Capital Park and Planning Commission



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RESIDENTIAL STREET - EXISTING

Residential street with metered parking on both sides, center turn lane.





RESIDENTIAL STREET - **RETROFIT** - ADD BUFFERED BIKE LANE

Residential street with metered parking on both sides, center turn lane, add painted buffered bike lane.





RESIDENTIAL STREET - EXISTING - GRASS-LINED SWALE

Existing grass-lined swale providing drainage in residential community.





RESIDENTIAL STREET - **RETROFIT** - ADD BIOSWALE PLANTINGS

Add groundcover, grasses, and low shrubs to improve aesthetics and stormwater quality of existing swales.





RESIDENTIAL STREET - EXISTING - CURB / CATCH BASIN

Residential street with curb and gutter and traditional drain inlet with catch basin.





RESIDENTIAL STREET - **RETROFIT** - ADD NATURAL DRAINAGE SWALE

Residential street with natural drainage bioswale added upstream of traditional catch basin. Project would be retrofit of existing facilities, including curb cuts, regrading, amending soils, and adding plantings. Tree near corner removed (relocated) for safety/visibility.





RESIDENTIAL STREET - **RETROFIT** - ADD NDS SWALE WITH BULB-OUT

Residential street with natural drainage system (NDS) bioretention feature added upstream of and around traditional catch basin, including curb bulb-out to add treatment area and reduce pedestrian crossing distance. Project would include new curb, regrading, amending soils, and adding plantings.





RESIDENTIAL STREET - EXISTING - CURB AND GUTTER

Typical residential street with curb and gutter, drain inlets to catch basin at low points, no pavement striping.





RESIDENTIAL STREET - **RETROFIT** - ADD CURB BULB-OUT & RAIN GARDEN

Residential street with retrofit that adds curb bulbouts that contain rain gardens, near low points. Rain gardens help improve water quality of storm runoff, and may reduce irrigation needs for nearby lawn and trees. Adding fog lines demarcates parking/rain garden areas and helps calm traffic.





RESIDENTIAL STREET - EXISTING

Typical residential street with raised curb between pavement and streetside plantings.





RESIDENTIAL STREET - **RETROFIT** - ADD NATURAL DRAINAGE

Simple retrofit to residential street, creating curb cuts and regrading and amending streetside soils, adding groundcover and hardy grasses. Can improve stormwater quality and reduce runoff rates.





EXISTING



RETROFIT



RESIDENTIAL STREET - WIDEN SIDEWALK WITH POROUS PAVING

Widen and repave existing sidewalks to make them more accessible and convenient to use. Using porous pavement (such as pervious concrete) can reduce impervious footprint, provide noise absorption, and allow stormwater infiltration under appropriate soil conditions.





EXISTING



RETROFIT



RESIDENTIAL STREET - ADD PEDESTRIAN LANE

Residential street in area with no sidewalks. Paint line on roadway to demarcate pedestrian area. Add signage and paint/stripping as necessary to prohibit parking in and specify lane for pedestrian use. Use only in areas with appropriate vehicular travel speeds.





EXISTING



RETROFIT



URBAN STREET - ADD CURBSIDE PLANTINGS

Retrofitting the street edge with plantings along the curb can help discourage parking in no-parking zone, help pedestrians navigate the sidewalk (clarifies path of travel, provides safety buffer between pedestrians and vehicles), and improve aesthetics and environmental performance of street.



URBAN STREET - EXISTING

Typical street condition in urban area with narrow sidewalk. Amenities (signage, trash receptacles, newspaper racks, etc) further limit pedestrian path of travel.



URBAN STREET - **RETROFIT** - NEW CURB LINE

Urban street retrofitted with new curb line, wider sidewalks. Clear path of travel has been widened. New sidewalks include space for street trees.





URBAN STREET - EXISTING

Typical urban street serving residential and commercial/retail uses. Two travel lanes, with parking allowed on one side only. Limited streetside vegetation.



URBAN STREET - **RETROFIT** - ADD BIKE LANE & STREET PLANTINGS (GRASS)

Retrofit to travel lanes adds bike lane in each direction by adding new and altering existing paint striping. Greenery (trees and grass) can be added to one side of street that was only pavement by retrofitting a portion of the existing sidewalk, still leaving adequate space for pedestrians.





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URBAN STREET - EXISTING

Typical urban street with wide travel lanes and parking on both sides. No existing vegetation area between curb and sidewalk.





URBAN STREET - **RETROFIT** - ADD BIKE LANE

Adding bike lane striping can provide improved visibility and facility for cyclists, help control vehicular speeds. Optional addition of plantings can also help improve street experience for all users.





URBAN STREET - EXISTING - DROP-OFF LANE

Existing urban arterial street with drop-off pullout lane. Drop-off lane forces jog in pedestrian route, cramps pedestrians against buildings.





URBAN STREET - **RETROFIT** - DROP-OFF LANE

Retrofit drop-off lane to keep pedestrian route consistent, provide outdoor space.





ESD CHOICES / PRIVATE PROPERTY - EXISTING

Existing pavement is impervious and increases runoff rate to stormwater system.





ESD CHOICES / PRIVATE PROPERTY - **RETROFIT** - PERVIOUS PAVEMENT

Replace impervious paving with pervious concrete pavement. Allows water an opportunity to infiltrate.





ESD CHOICES / PRIVATE PROPERTY - **RETROFIT** - PERVIOUS PAVEMENT

Replace impervious pavement with permeable interlocking concrete pavers.





TRANSITION / CROSSING - EXISTING

Existing raised crossing at a major driveway entrance.





TRANSITION / CROSSING - **RETROFIT** - BANDING

Add thermoplastic or inset concrete banding to an existing raised crossing zone to delineate pedestrian priority zone.





TRANSITION / CROSSING - EXISTING

Existing pedestrian crossing at development driveway with curb ramps and crossing at roadway grade.



TRANSITION / CROSSING - **RETROFIT** - CREATE RAISED CROSSING

Retrofit pedestrian crossing with raised crosswalk at grade with sidewalk, helping to alert drivers to look for pedestrians and give them priority in crossing.





TRANSITION / CROSSING - EXISTING - UNMARKED CROSSING

Curb ramps at a driveway give a minor cue to drivers and pedestrians of an intended crossing area, and provide minimal accessibility.



TRANSITION / CROSSING - **RETROFIT** - DETECTABLE WARNING & STRIPING

Adding detectable warning strips improves accessibility of crossing by alerting pedestrians that they are entering a crossing (left). Also adding high-contrast crosswalk striping further clarifies the crossing path for pedestrians and alerts drivers to watch for and yield to pedestrians.

