3.3.2 Hartford Seminary Bioretention

Hartford Seminary Bioretention	
Objectives:	Runoff reduction Pollutant reduction Public Outreach
Estimated Cost:	$50,000 - $75,000
Responsible Entity:	Hartford Seminary
Timeline:	2 to 3 years

The Hartford Seminary, located between Sherman Street and Girard Avenue in Hartford, has landscaped grounds similar to Bloomfield Town Hall, with a main building surrounded by grass and ornamental landscaping. The on-site storm drainage system is connected to the City's combined sewer system. Portions of the site experience localized flooding that is believed to be associated with blockages in the on-site drainage system and/or capacity issues associated with the combined sewers in the neighborhood.

Areas on the southern portion of the site could be retrofitted to function as bioretention systems, treating and potentially infiltrating stormwater from the parking lot and lawn (*Figure 3-6*). A bioretention retrofit project in this location would also provide educational and outreach benefits for visitors to the site and residents of the surrounding neighborhood.

3.3.3 Connecticut Historical Society Stormwater Retrofit

Connecticut Historical Society Stormwater Retrofit	
Objectives:	Stormwater treatment Flood detention restoration Public outreach
Estimated Cost:	$1,800,000 - $3,800,000
Responsible Entities:	Connecticut Historical Society MDC City of Hartford CTDEP
Timeline:	3 to 6 years

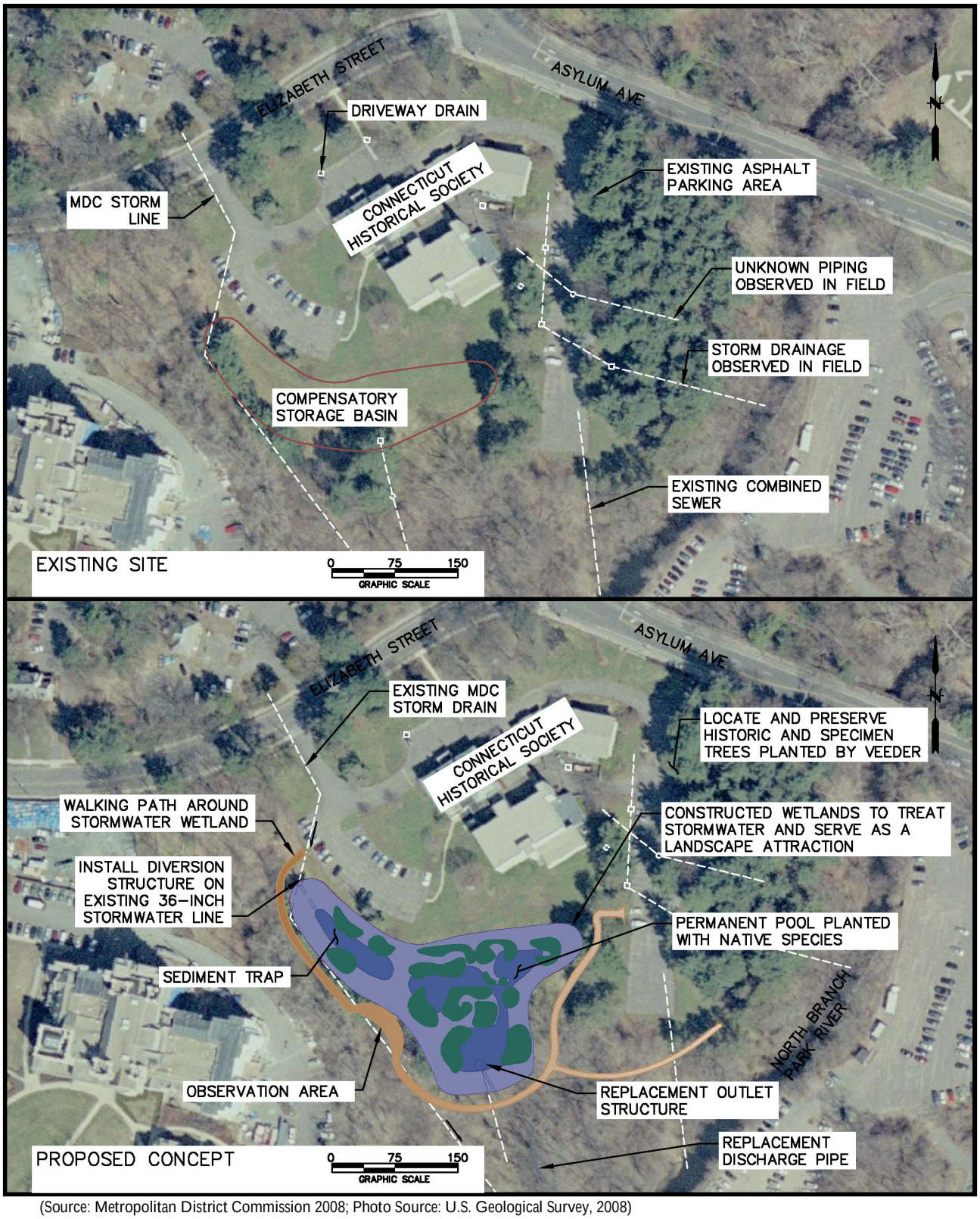
The Connecticut Historical Society (CHS) is located at the Veeder Estate south of the intersection of Elizabeth Street and Asylum Avenue and is situated along the North Branch Park River. Beneath the site is located a combined sewer pipe that crosses under the river as well as a separate stormwater drainage system that receives discharges from residential areas to the north and west. The southern portion of the site contains a large depression that was constructed as compensatory flood storage for building expansion that occurred on the site, although the hydraulic connection between the compensatory storage area and the river is now minimal or non-existent due to a failed outlet structure.

Staff at CHS report that the grounds historically contained a pond and gardens, but these site features were abandoned at some point during the 20th century. A handful of rare specimen trees that were incorporated into the estate gardens may still remain within the wooded fringes of the parcel. The CHS grounds provide opportunity for both LID and end-of-pipe stormwater retrofits.

LID management measures that could be implemented at the site to infiltrate and treat stormwater most cost-effectively may include rooftop leader disconnection from the Historical Society building and bioretention areas to collect and infiltrate stormwater from existing paved parking areas and driveways. If additional funding can be secured, other more significant restoration measures could be incorporated into the project, including retrofitting the parking area from a conventional asphalt lot to permeable pavement and reducing the size of the parking area since a portion of the lot appears to be underutilized. Such measures would need to be implemented in keeping with the historical context of the site.

(Photo Source: U.S. Geological Survey, 2008)

Figure 3-6. Hartford Seminary Bioretention Retrofit Concept



(Source: Metropolitan District Commission 2008; Photo Source: U.S. Geological Survey, 2008)

Figure 3-7. Connecticut Historical Society Stormwater Wetland Concept

An opportunity also exists to convert the compensatory storage area behind the building into a regional stormwater treatment wetland and an educational attraction. A stormwater wetland including shallow emergent wetlands, small pockets of open water, and higher steps could potentially treat on-site stormwater and stormwater from the existing drainage line that passes below the site (*Figure 3-7*). The project could also include restoring the hydraulic connection between the North Branch Park River and the basin, restoring its function as a storage area for flood flows.

Since CHS is a high-traffic location with an educational focus and a popular location for picnicking and dog-walking, a walking trail could be incorporated into the perimeter of the site, following the approximate alignment of a path that existed historically on the estate's grounds. The path could provide both access points to the stormwater wetland as well as remaining historical site features, such as rare and specimen trees.

Incorporating a regional stormwater treatment wetland as well as educational and recreational amenities into the CHS site is a major project that would require a significant financial commitment and cooperation between multiple entities including the City of Hartford, CHS, MDC, CTDEP, and others. A detailed cost-sharing agreement would be required to ensure that long-term maintenance would be performed and would not pose a financial hardship on CHS.

3.3.4 Green Streets Retrofit

Green Streets Retrofit	
Objectives:	Runoff reduction Pollutant reduction
Estimated Cost:	Varies
Responsible Entities:	MDC City of Hartford
Timeline:	2 to 10 years

Residential land use is the single most common land use in the North Branch Park River watershed. Stormwater from most residential neighborhoods discharges to separated storm drainage systems, which in turn discharge directly to the North branch Park River and its tributaries, or discharges to combined sewers. Proposed sewer separation efforts by the MDC will also result in several new separated stormwater outfalls to the North Branch Park River. Opportunities exist to augment proposed sewer separation efforts and ongoing municipal stormwater management in residential areas through distributed stormwater management approaches. A green streets retrofit project is recommended in a residential area of the City of Hartford to demonstrate the potential benefits and feasibility of LID and green infrastructure approaches within the public realm in a residential neighborhood.

Adams Street, located between Albany Avenue and Norfolk Street, is a typical dense residential neighborhood with multi-family residences that appear to date from the early 20th century. Adams Street is currently served by combined sewers with traditional curb and gutter drainage. The roof drains of the majority of residences are piped into the sanitary sewer as well. Adams Street is not proposed for combined sewer separation under the MDC CSO Long Term Control Plan, although surrounding neighborhoods are. The paved width of the street itself is approximately 31 feet, and sidewalks on each side extend the width of the City's Right of Way to approximately 43 feet. The street is designated as one-way, with on-street parking allowed on both sides and more than adequate width for vehicle travel in the center.

Figure 3-8a through Figure 3-8c present several concepts that illustrate alternative green streets and associated lot-level LID approaches to stormwater management. The first concept illustrates a traditional separation approach; a new stormwater collector is installed, roadway catch basins are connected to it, and roof leader downspouts are disconnected from each residence and directed to the adjacent ground surface. The second concept illustrates lot-level bioretention, where a rain garden is incorporated into landscaped areas on individual residential lots. Wide-scale implementation of this approach is likely unrealistic due to issues related to public acceptance, cost, maintenance requirements, and site constraints such as existing utilities, soils, and available space. The third and fourth concepts illustrate green streets approaches, using a portion of the public road right-of-way for the dual purpose of stormwater management and traffic calming. . Stormwater swales and stormwater curb extensions, such as the concepts presented in the Adam Street example, as well as other green streets retrofit options are being implemented in cities across the country.

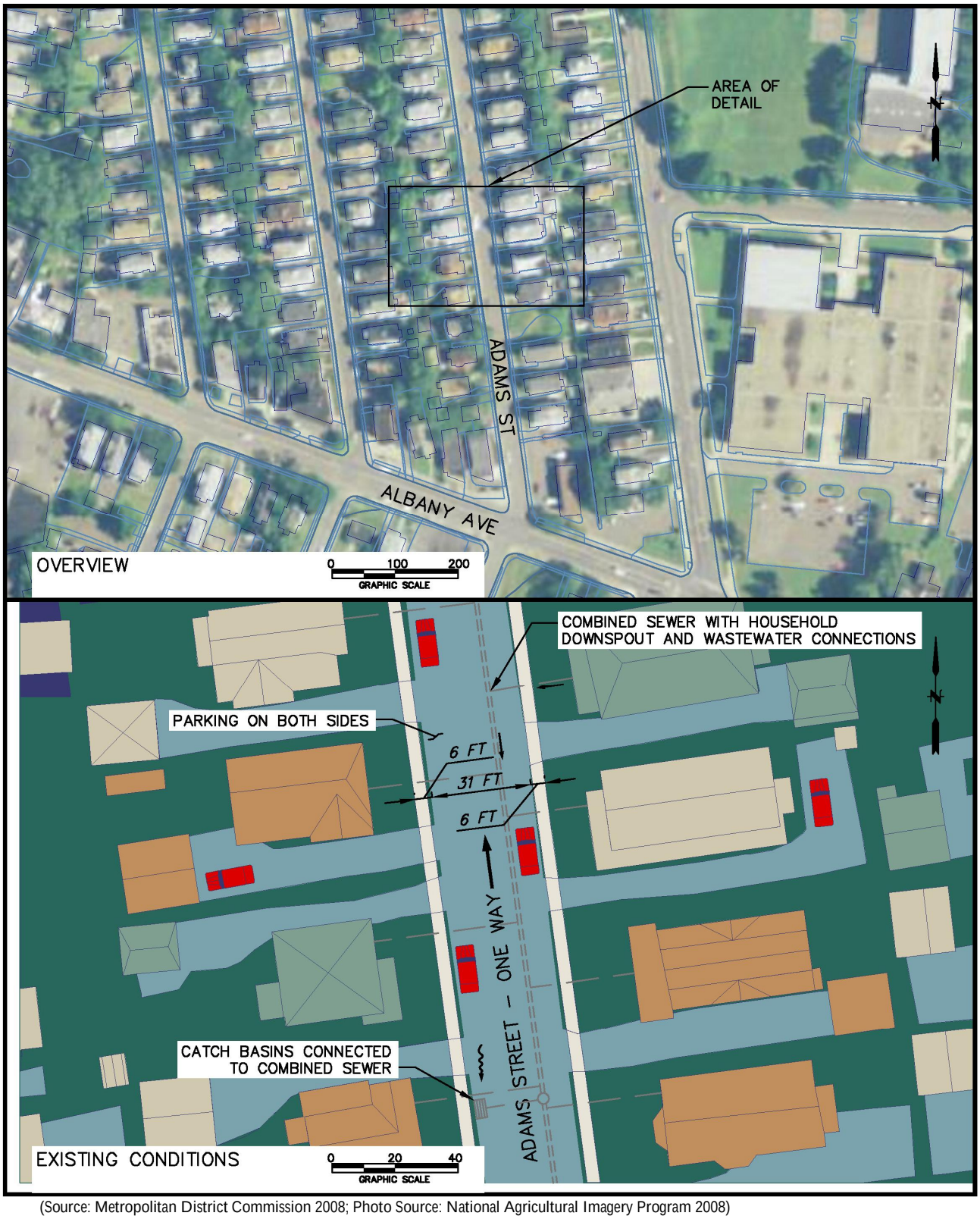
3.3.5 Woodland Drive Stormwater Retrofit

Woodland Drive Stormwater Retrofit	
Objectives:	Stormwater treatment Open space protection
Estimated Cost:	$530,000 - $1,100,000
Responsible Entities:	MDC City of Hartford
Timeline:	2 to 5 years

A large area of combined sewers north of Albany Avenue is proposed for separation, which will result in a new stormwater discharge to the North Branch Park River. The new outfall is proposed for a City of Hartford-owned parcel adjacent to Woodland Drive. This parcel is associated with an adjacent public housing complex and is currently in degraded condition; it contains an abandoned building, a paved area, and several areas of dumping. Three existing stormwater outfalls discharge to the river in this area. This parcel is also along the route of the proposed Park River Greenway and is identified in this watershed management plan (as well as the City of Hartford Plan of Conservation and Development), along with an adjacent parcel to the north, for a conservation restriction as part of "Goodwin's Wild."

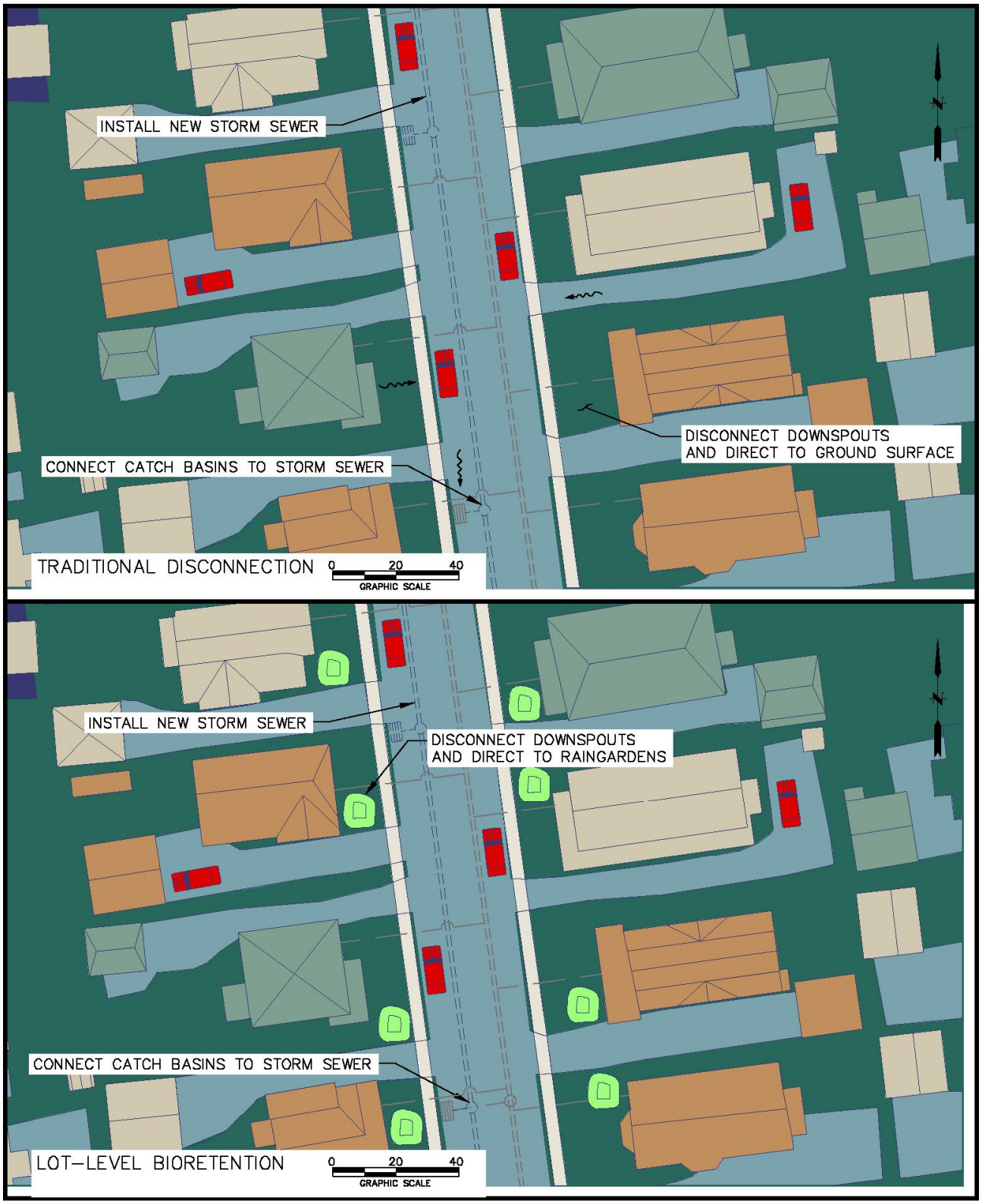
This site provides an opportunity for achieving multiple goals and benefits, including treating new stormwater discharges through a regional stormwater wetland system, conserving a portion of the site as riparian forest area through a conservation restriction, and accommodating the planed Park River Greenway trail system using a low-impact, context sensitive approach. A constructed stormwater wetland on this site could treat existing and proposed stormwater discharges from the adjacent neighborhood. The stormwater wetland could be designed with a high-flow bypass to target the water quality volume and serve a larger drainage area.

Other areas of the parcel, generally located along the river on the parcel's western boundary, are better wooded and have less evidence of dumping, although invasive plant species are thick in some areas. This portion of the parcel should be protected as open space under a conservation restriction to preserve the existing riparian buffer and wildlife habitat. Additionally, it appears that the proposed greenway trail could be accommodated along existing disturbed areas on the parcel, either along the existing rail line to the east, or starting from the north along the rail line and then diverting to the south, hugging the development envelop of the residential buildings along Woodland Drive. *Figure 3-9* illustrates the restoration concept for this site.



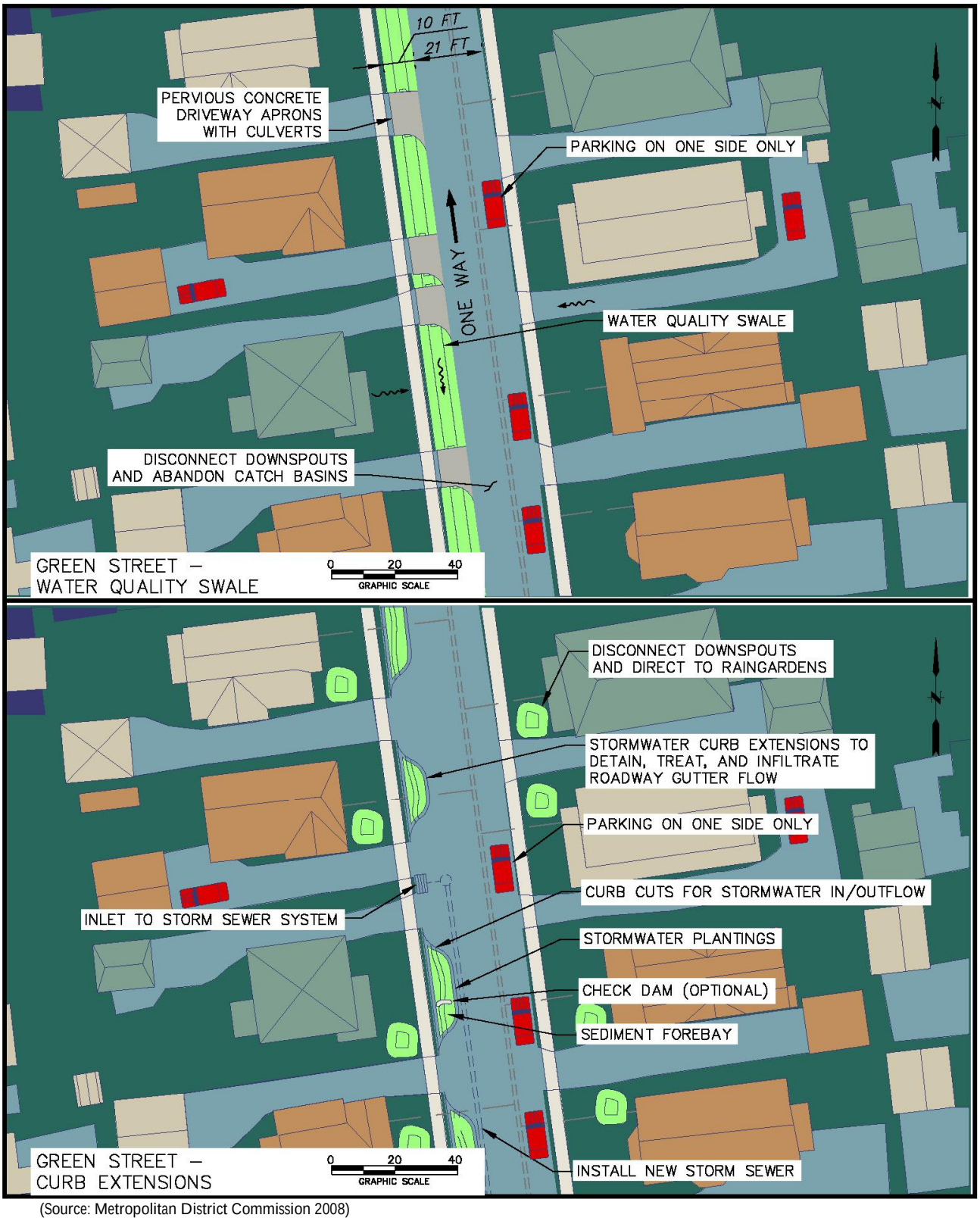
(Source: Metropolitan District Commission 2008; Photo Source: National Agricultural Imagery Program 2008)

Figure 3-8a. Adams Street Stormwater Management Alternatives – Existing Conditions



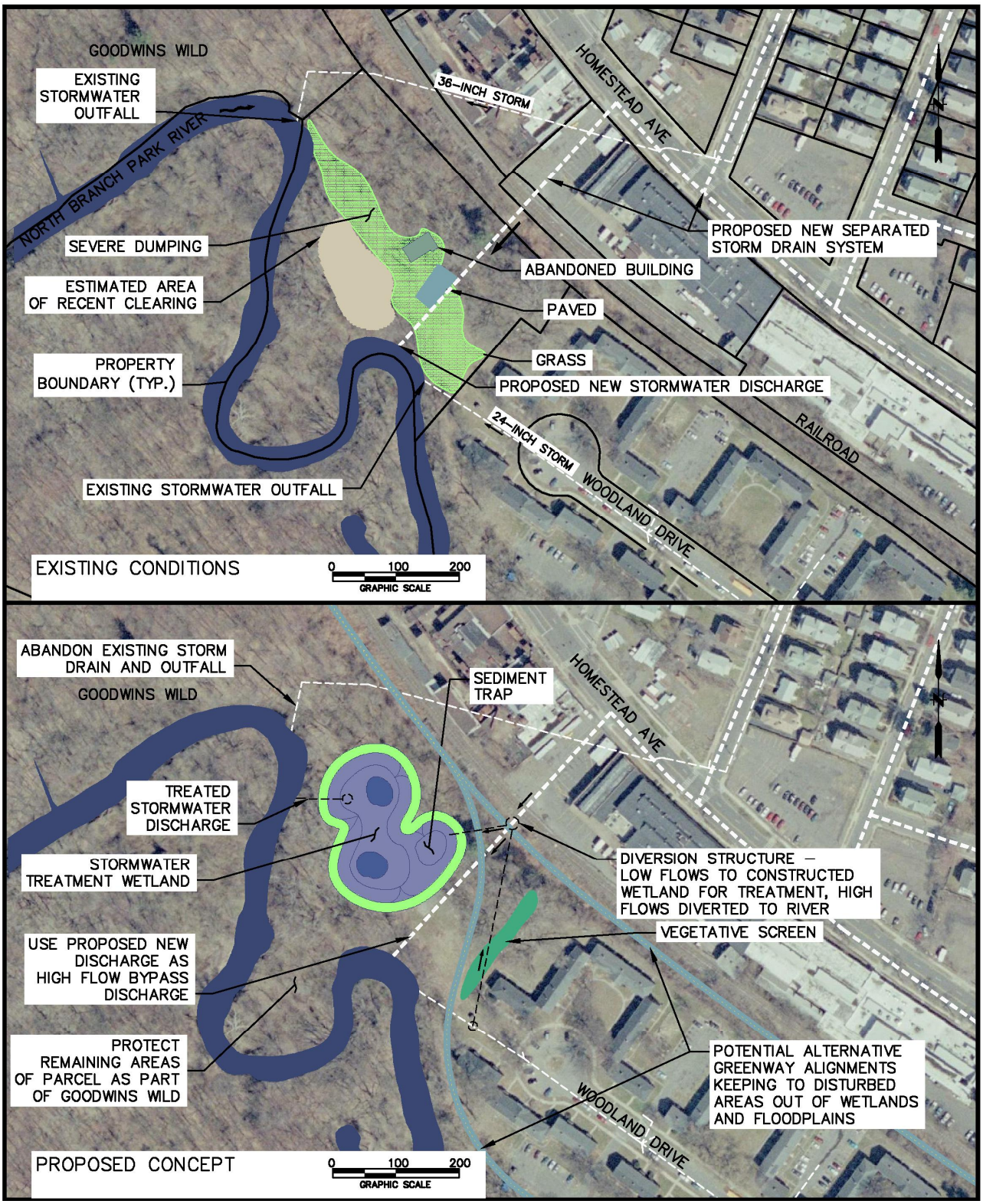
(Source: Metropolitan District Commission 2008)

Figure 3-8b. Adams Street Stormwater Management Alternatives – Downspout Disconnection and Lot-Level Bioretention



(Source: Metropolitan District Commission 2008)

Figure 3-8c. Adams Street Stormwater Management Alternatives – Water Quality Swale and Stormwater Curb Extensions



(Source: Metropolitan District Commission 2008; Photo Source: U.S. Geological Survey, 2008)

Figure 3-9. Woodland Drive Parcel –
Stormwater Wetland and Open Space Protection Concept

3.3.6 Laurel School Restoration

Laurel School Restoration	
Objectives:	Stormwater treatment Riparian restoration Increased tree canopy
Estimated Cost:	$80,000 - $170,000
Responsible Entity:	Town of Bloomfield
Timeline:	2 to 3 years

The Laurel School is a Town of Bloomfield public primary school with students in Kindergarten through fourth grade, located on Filley Street. Immediately adjacent to the school to the northeast is an impacted reach of Beamans Brook. The school's grounds encroach on the brook, with paved parking lots and lawn located within 20 feet of the stream bank in one area. Two stormwater drainage pipes discharge to the brook adjacent to the school grounds.

Athletic fields are located on school grounds west of the main building, but large expanses of unused lawn areas are located north and south of the building and between the school's driveway, parking areas, and Filley Street. The Laurel School site, like other schools in the watershed, presents an opportunity for stormwater retrofits, riparian buffer restoration, and increased tree canopy. The proposed concept (*Figure 3-10*) consists of:

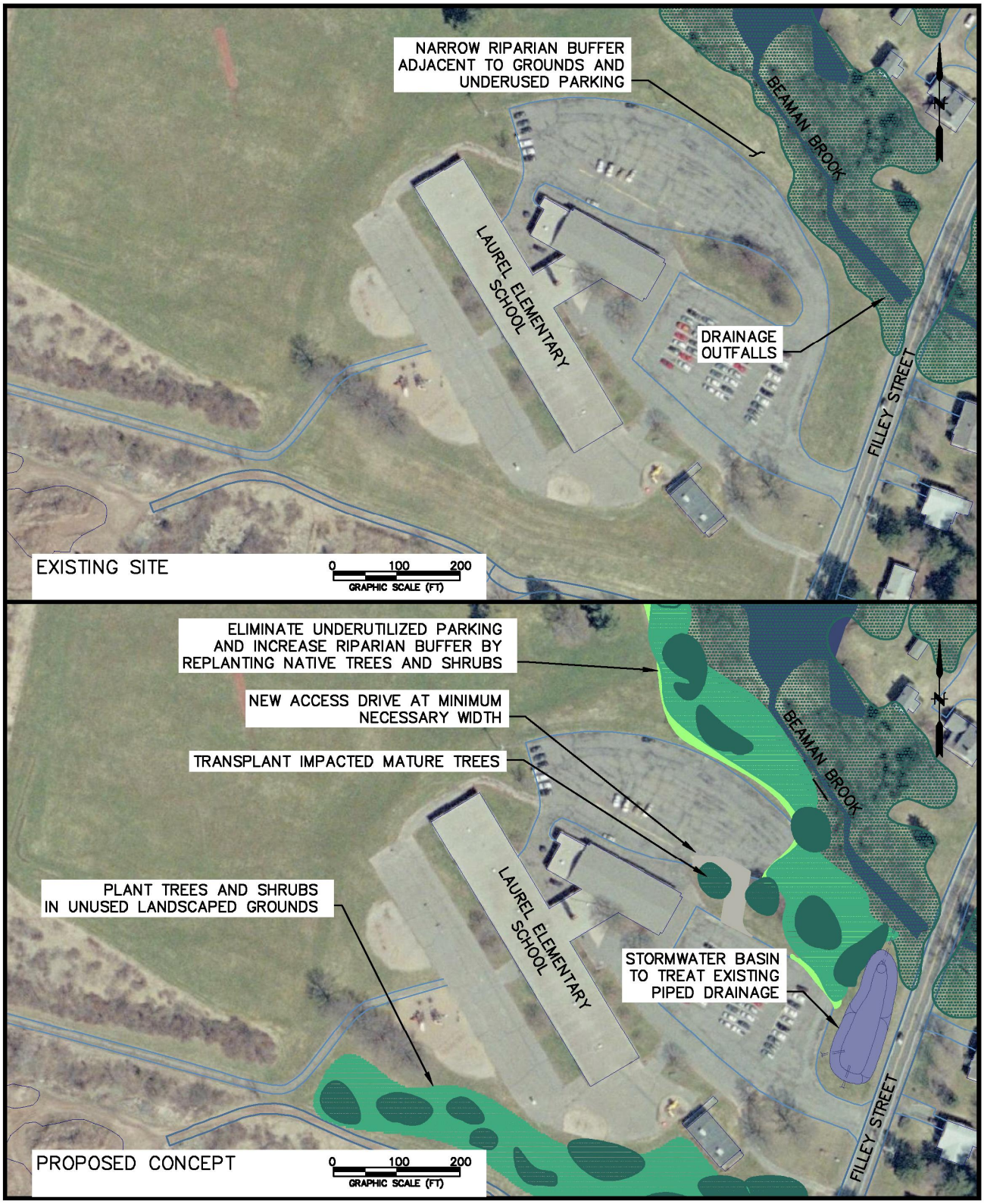
- Reduce the area of the existing parking lot north of the school and along Beamans Brook, and consider permeable pavement for all or portions of the lot as part of future site improvements. Plant the reclaimed area with native trees and shrubs to increase the riparian buffer.
- Install a stormwater basin or bioretention system in the landscaped area between Filley Street and the school's primary parking area. This stormwater retrofit is design to treat and potentially infiltrate stormwater runoff that is currently discharging directly to the river via the on-site drainage system.
- Plant native trees and shrubs in landscaped areas around the school that are not currently used for recess or athletics to increase the tree canopy and reduce maintained lawn areas on the site.

3.3.7 Filley Park Improvements

Filley Park Improvements	
Objectives:	Recreation enhancement Fish passage enhancement Streambank restoration Stormwater treatment
Estimated Cost:	$2,600,000 - $3,300,000
Responsible Entity:	Town of Bloomfield
Timeline:	2 to 5 years

Filley Park, located along Tunxis Avenue in Bloomfield, is a valuable recreational resource, providing skating and recreational water access to an artificial impoundment on Wash Brook. However, there is little or no riparian buffer, with grass down to the river. Geese congregate in the area since the river is impounded by a small dam and the grass area around the pond provides ideal habitat. Additionally, the pond has filled with sediment from upstream sources that have further degraded aquatic habitat and reduced recreational opportunities.

The Town of Bloomfield is currently evaluating improvements that will enhance the appearance and use of the park. The project provides an opportunity to incorporate water quality and habitat considerations into the design, to make the area more attractive to users, dissuade geese from using the area, and provide stream shading and riparian buffer to improve water quality and habitat and to stabilize the banks of the impoundment.



(Source: Metropolitan District Commission 2008; Photo Source: U.S. Geological Survey, 2008)

Figure 3-10. Laurel Elementary School –
Stormwater Treatment, Riparian Restoration, and Reforestation Concept

Although a design is not yet available, the Town is currently planning to provide a riparian buffer along the water's edge, limit access points to the water, construct a sediment trap to capture solids before they enter the pond, and treat stormwater discharges to the stream. *Figure 3-11a and Figure 3-11b* show potential concepts for incorporating water quality and wildlife enhancements into the project design.

3.3.8 Lower North Branch Park River Riparian Restoration

Lower North Branch Park Riparian Restoration	
Objectives:	Public access Riparian restoration Impervious surface reduction
Estimated Cost:	$900,000 - $1,900,000
Responsible Entities:	City of Hartford Private Landowners
Timeline:	5 to 10 years

The lower reaches of the North Branch Park River, between Albany Avenue and Farmington Avenue, is the last segment of the river upstream of the flood control conduit entrance and is severely impacted by riparian encroachments and in-stream modifications. Public and private parking for institutional and residential buildings are located along the east bank of the river and within the floodplain. Portions of several of these lots are known to flood periodically and have signs warning drivers not to park in areas along the river. One parking lot is state-owned and seldom used, but it is being retained as a real-estate asset.

Despite the extensive development along this portion of the river, access to the river is limited, especially along the east bank and near the conduit entrance. One of the few access points to the lower reaches of the river exists along the west bank adjacent to the UConn Law School campus.

The lower reaches of the North Branch Park River have the potential to provide significant water quality, ecological, recreational, and aesthetic benefits. Enhancements to the riparian corridor in this area are recommended to enhance these benefits. The proposed riparian restoration concepts for this area include (*Figure 3-12a and Figure 3-12b*):

- Access Improvements
  - Improve public accessibility along the lower North Branch Park river by designating access points, parking, and signage at locations such as the UConn Law School campus and locations on the east side of the river.
  - Provide limited public access and educational signage in the area of the conduit entrance. Currently, this area is privately-owned and "no trespassing" is posted in many areas.
- Riparian Buffer Improvements
  - When parking lots are resurfaced or repaved, reconfigure parking areas away from the river, providing potential areas for riparian buffer reforestation. Consider whether the parking provided is needed (e.g., in one lot, the trailer for a tractor-trailer truck appears to have been parked in the same location for several years, occupying parking spaces for numerous passenger vehicles). Excess parking could be converted to vegetated riparian area with public access points. There are several areas along the river where additional riparian buffer can be gained without loss of parking through minor lot reconfiguration.

(Source: National Agricultural Imagery Program 2008)

Figure 3-11a. Filley Park Pond – Existing Conditions