village center stormwater mitigation strategy

Prepared for:
Village of New Albany
November 2010

village center stormwater mitigation strategy

Prepared by:

MSI

Andrew Overbeck, AICP
Jason Sudy, AICP

EMH&T

Miles Hebert, P.E., CFM
Doug Turney, P.E., LEED AP

Village Staff:

Joe Stefanov, Village Administrator
Jennifer Chrysler
Kathryn Meyer
Michelle Murphy
Bill Dorman

FOREWARD

The Rose Run stream corridor has long been a natural feature in the heart of New Albany's village center. Though the physical parameters of the stream corridor have been altered throughout the years, it has continually connected the community to the natural environment and been a source of civic pride.

The community established a vision for the restoration of this natural corridor with the 2003 Rose Run Greenway Corridor Enhancement Plan. This plan, and the efforts since, have improved the Rose Run stream corridor as a restored watershed even as development continues within it. The Village Center Stormwater Mitigation Strategy aims to build upon this solid planning foundation by providing new strategies that help balance preservation and enhancement of the stream corridor with the need for economic development. By actively identifying holistic solutions to development impacts in the watershed, this document will guide mitigation efforts and private investment.

The Village Center Stormwater Mitigation Strategy outlines the current stormwater issues in the Village Center and develops a stormwater mitigation strategy to accommodate continued investment. The purpose behind the stormwater mitigation strategy is clear: define the best possible solutions and practices that should be implemented as development continues in the Village Center. This involves five strategic improvement areas that address both stormwater quality and quantity concerns in a manner that enables development and enhances the stream corridor.


LEARNING CAMPUS
MARKET SQUARE
VILLAGE HALL
MAIN STREET
HIGH STREET


TRIBUTARY STREAM
HISTORIC VILLAGE
GRANVILLE STREET
ROSE RUN
TRIBUTARY STREAM

INTRODUCTION

A COMPREHENSIVE APPROACH

The Village of New Albany has a proven track-record in addressing stormwater and watershed planning efforts in a proactive manner. From the Rocky-Fork Blacklick Accord to the Rose Run Greenway Corridor Enhancement Plan, the community has made an ongoing commitment to restoring native habitat and protecting the existing natural features.

The Village Center Stormwater Mitigation Strategy is an effort to achieve two goals: 1) Establishing a strategic approach to improving stormwater runoff (quality and quantity controls) throughout the Village Center; and 2) Facilitating redevelopment in the Village Center by establishing a comprehensive approach to stormwater that does not solely rely on individual site improvements.

In order to facilitate these efforts, it was vital to involve the key stakeholders in the process. MSI Design and EMH&T held a series of meetings with representatives of all affected Village departments to undertake the plan. This "working group" based their efforts on an understanding of past planning work in the Village Center and of stormwater practices throughout New Albany. Incorporating the ideas of the Village's Public Service, Community Development, Administration and Engineering staffs, the design team proposed a series of possible stormwater improvements. Understanding that successful implementation will require a close public/private partnership between the Village and private development interests, the group also met with the New Albany Company (a key landholder in the Village Center).

Following these meetings, draft concepts emerged. These concepts were further discussed with staff and were used as a collaborative effort to achieve the "green" goals of the ongoing Village Center Strategy. As a happy collaboration between these efforts and prior allocated street improvement funds from the Public Service Department, immediate efforts to implement the "green street" approach with a pilot project on 3rd Street begun while this plan was still in process.

Finally, Stormwater Strategy elements were shared with Village Council at a public meeting as part of both the Village Center Strategic Implementation Plan and 3rd Street Improvement Plan presentations.

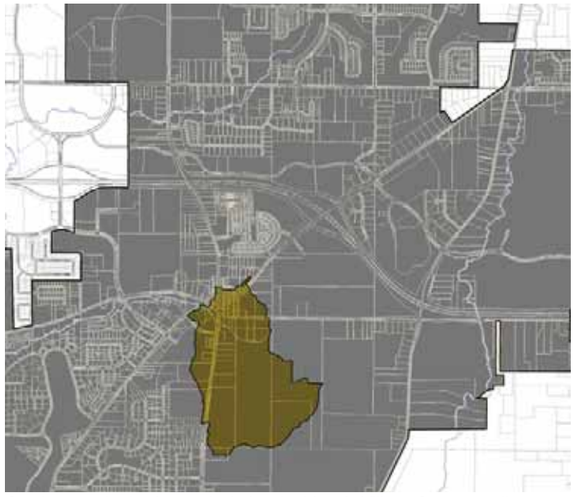
By planning and implementing comprehensively and utilizing sustainable, system-wide approaches to managing stormwater quantity and quality, redevelopment will be enabled. The continued restoration and enhancement of the Rose Run corridor will also create additional recreational and educational opportunities for village residents. Taken together, this strategy will promote the continued enhancement of the Rose Run corridor making it a more attractive amenity and a regional showcase for riparian habitat restoration.

PLANNING CONTEXT

The Village of New Albany is located largely within the Rocky Fork watershed in northeastern Franklin County. The Rose Run and its tributaries are significant components of this watershed and are impacted by development within the Village Center and beyond. The Rose Run watershed is comprised of four sub-areas that need to be addressed on an individual basis due to specific drainage characteristics and hydrology. The Mitigation Strategy focuses on five specific improvements that will address stormwater concerns both in individual sub-areas and the watershed as a whole. These improvements will both solve existing quantity and quality issues and anticipate the demands on the watershed by future development.

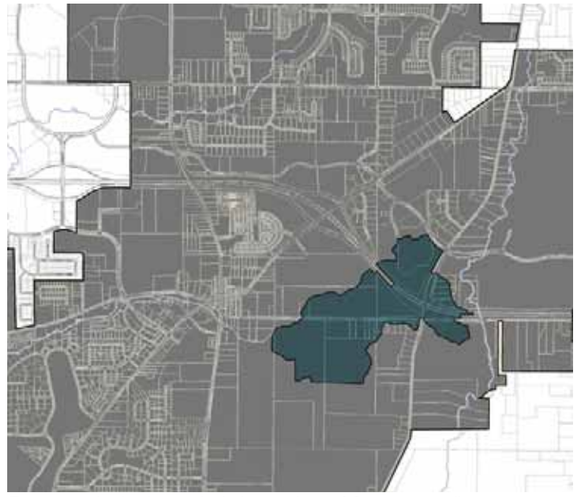
While more considerate of environmental concerns than in past decades, previous development did not completely address stormwater quality (see Quantity vs. Quality, p.10). In addition to these existing issues, the stormwater impacts created by anticipated redevelopment areas within the Village Center will need to be addressed. To avoid the typical suburban solution of individual retention ponds that address individual developments, a set of comprehensive stormwater strategies has been developed that apply on a Village Center-wide basis. Proactively dealing with these stormwater issues will enable redevelopment of these currently vacant or underutilized sites within the Village Center.

WATERSHED SUB AREA 1



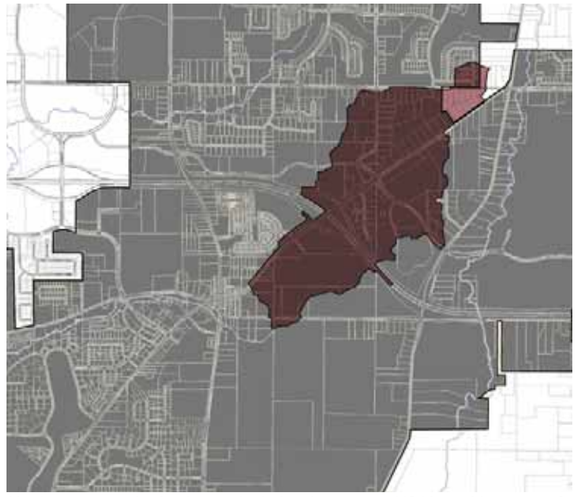
South watershed sub-area includes the historic Village Core as well as significant areas south of Dublin-Granville Road

WATERSHED SUB AREA 2



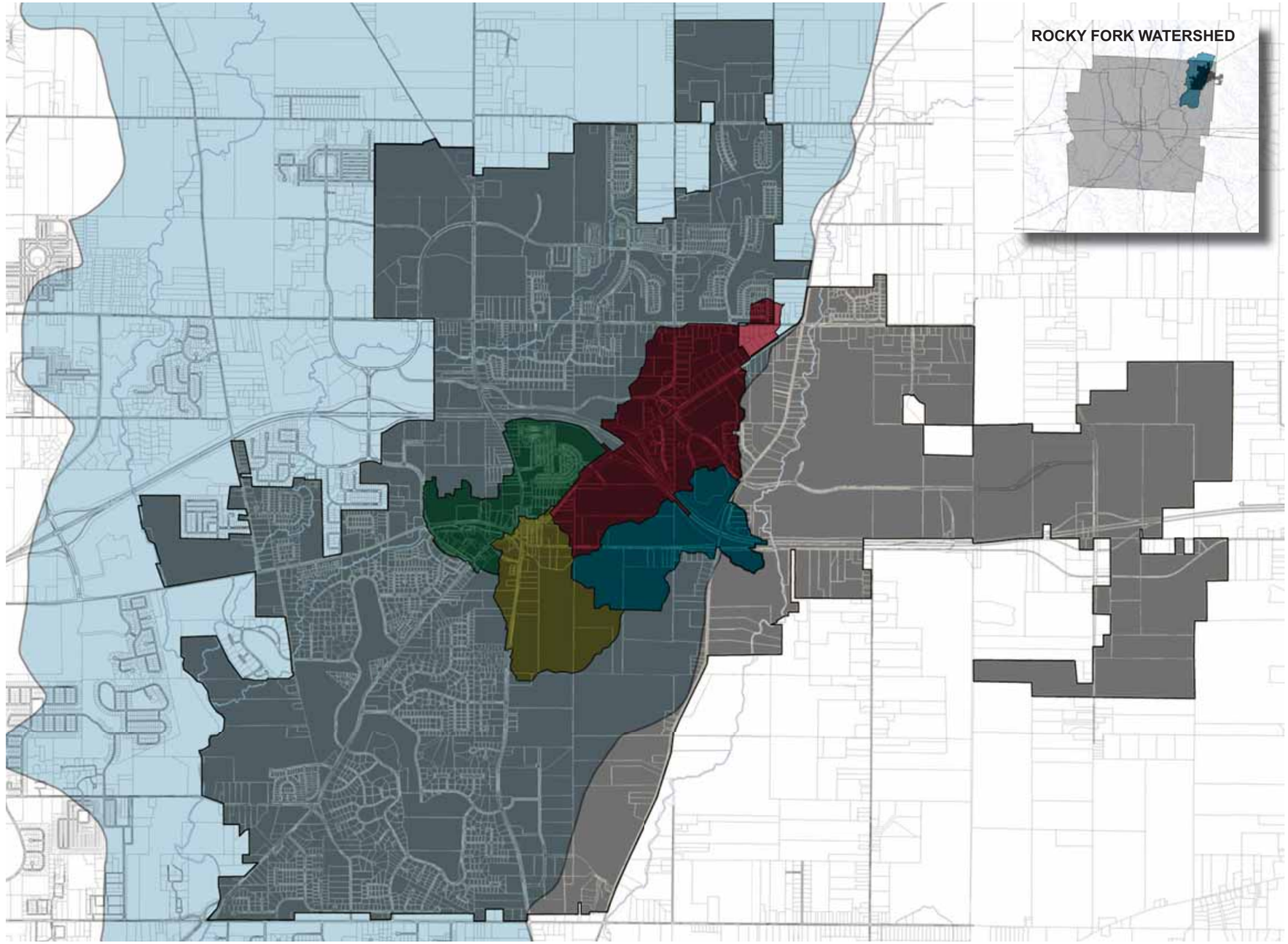
East watershed sub-area includes portions of Ganton as well as areas south of Dublin-Granville Road

WATERSHED SUB AREA 3

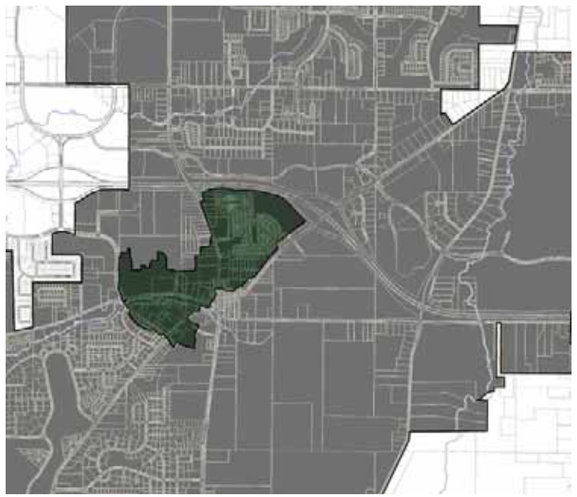


Northeast watershed sub-area includes the eastern US62 corridor, most of Ganton, Zarley Park and additional development areas north of SR161

Addressing current stormwater infrastructure shortfalls and developing comprehensive strategies for existing and future stormwater issues, allows the community to both improve the Rose Run Stream corridor's biology and ecology while enabling redevelopment. This comprehensive and sustainable approach to watershed planning will set the Village of New Albany apart from other communities in Central Ohio by combining environmental efforts with economic development priorities.



WATERSHED SUB AREA 4



West watershed sub-area includes Windsor, the eastern US 62 corridor, portions of the school campus and the Market Square area

STORMWATER TOOLBOX

INTRODUCTION

There are numerous best management practices for handling stormwater quantity and quality (see quantity vs. quality at right). The primary purpose of managing stormwater "quality" is to ensure that non-point source pollutants are removed and that the stormwater is cooled prior to reaching bodies of water. Likewise, the primary purpose of managing stormwater "quantity" is to ensure the amount of stormwater that reaches bodies of water does not increase from its pre-development state.

In addition to traditional stormwater controls such as detention basins, there are now green stormwater infrastructure solutions that can more easily be integrated into urban environments where space is often an issue. Green stormwater infrastructure seeks to mimic the natural water cycle by slowing stormwater at, or close to, its source, which also allows for treatment through infiltration. By treating and infiltrating stormwater on site, green approaches also eliminate or reduce the need for typical stormwater infrastructure such as detention ponds, storm sewers, drainage appurtenances and other infrastructure costs. Green infrastructure can also offer life-cycle cost savings over traditional stormwater solutions.

The following are the traditional and green options that were determined to be the best fit for the Village Center to address existing issues and future development needs.

QUANTITY VS. QUALITY

As urbanization occurs, the hydrological function and natural water cycle of watersheds is dramatically altered. As native ecosystems are replaced by impervious surfaces such as streets, rooftops, driveways, and parking lots, rain no longer naturally infiltrates into the surrounding landscape, instead becoming stormwater runoff that must be managed by other means. As this runoff travels over impervious surfaces it carries numerous urban pollutants such as sediment, oil, grease, chemicals, heavy metals, nutrients, pesticides, bacteria and road salt. Traditionally, storm sewer conveyance in urban areas was designed to drain excess water away from developed sites as quickly as possible and into receiving waters. The impact of this increased flow and rate of flow degraded waterways, causing floods and erosion that created safety issues in addition to harming habitat. All of the harmful pollutants in the runoff are carried directly into streams and waterways with no treatment. Additionally, this method does not allow stormwater the time it needs to reduce in temperature, further harming waterways.

To address these issues, stormwater quantity controls are now in place to allow for a controlled release of urban runoff. In many cases these quantity controls involve routing runoff to a detention basin that is designed to control runoff release at a rate that mimics that of its pre-developed state. In addition to quantity controls, regulations are now in place to address quality concerns caused by pollutants. While detention basins effectively manage quantity concerns, they typically are not engineered to address quality issues. Today these basins can be designed to effectively address quantity and quality issues by allowing non-point source pollutants to settle out and allowing high temperatures to dissipate. Encouraging plantings and other enhanced biological habitat can aid in enhancing stormwater quality by mimicking previously naturalized habitat. Other methods such as streambank restoration and the use of green infrastructure can be used to enhance stormwater quality and quantity by slowing the flow of water and promoting on-site infiltration.

Streambank erosion, pollutant runoff, and stormwater temperature are all issues associated with altering the hydrological function of watersheds. Slowing the flow, allowing pollutants to settle out and be filtered are all part of efforts to address stormwater quantity and quality concerns as part of urbanization.

TRADITIONAL STORMWATER CONTROLS

Wetland Basin: Wetland basins store stormwater for gradual release into streams following storm events. Can vary in depth between shallow and deep water, and include wetland plantings that provide treatment and aesthetic and habitat value. (Limited applicability in urban settings)

WETLAND BASIN

Wet Detention Basin (Retention): A wet basin has a permanent pool of water. The pond treats incoming stormwater by allowing particles to settle and relying on biological activity for pollutant uptake. (Limited applicability in urban settings)

WET DETENTION BASIN

Detention Basin: Detention basins detain stormwater for a minimum time to allow for some particles to settle. Designed to be dry except during and after storm events. (Limited applicability in urban settings)

DETENTION BASIN

Stream Corridor Protection Zone: A stream corridor protection zone includes the riparian corridor along a stream which provides stormwater storage, slows down peak flows, reduces erosion and improves water quality. This protected corridor is set where over-bank flooding, meander migration, and stream processes freely occur. Provides storage and treatment of stormwater and restores stream habitat. (Applicable in urban settings)

STREAM CORRIDOR PROTECTION ZONE

STORMWATER TOOLBOX

GREEN INFRASTRUCTURE STORMWATER CONTROLS

Curb Extension: Extends the curb into the parking or travel lane of the street and transforms it into a landscaped area that treats stormwater and provides temporary retention and some infiltration. Can also integrate a curb ramp and pedestrian crossings.

CURB EXTENSION

Street Planter: Stormwater planters that treat, retain and infiltrate runoff between the sidewalk and the curb in areas with limited space. Can be designed to allow for on-street parking.

STREET PLANTER

Tree Lawn Swale: Variation of street planter, requiring minimal infrastructure and no planter walls. These swales can be installed in an excavated area behind a curb in the tree lawn with curb cuts for inflow and outflow, and vegetation to treat, retain and infiltrate stormwater.

TREE LAWN SWALE

Silva Cells: Silva Cells are modular subsurface integrated tree and stormwater systems that hold soil (not compacted), while supporting traffic loads beneath paving and hardscapes. These systems may be appropriate for use on numerous Village street types including boulevard and street medians and on tighter streets that don't have tree lawns.

SILVA CELLS

Permeable Pavers: Permeable pavers allow for stormwater to infiltrate between the spaces of the bricks. They are formed just like traditional clay pavers but have larger spacers to allow water to infiltrate. Stormwater is stored in the sub-grade and allowed to infiltrate naturally or held and released slowly into the receiving stream. This approach is optimal for areas where on-site retention is mandated but there is limited area to accommodate it. Ideal for neighborhood streets, dedicated on-street parking, and alleys.

PERMEABLE PAVERS

Downspout Disconnection: Roof runoff is typically routed to a dry well or storm sewer. By disconnecting downspouts, this runoff can be taken off the stormwater system which relieves peak flows. This allows for a reduction in sizing of stormwater systems, and designed in concert with other green infrastructure, is an important part of developing an integrated approach to stormwater control. Roof runoff can be directed into open areas, constructed rain gardens and other areas that allow for infiltration.

DOWNSPOUT DISCONNECTION

CASE STUDY:
THE HEADWATERS AT TRYON CREEK

The Headwaters at Tryon Creek is a $14 million residential development in Portland, Oregon, that serves as a demonstration in green stormwater infrastructure and habitat restoration. The 2.8 acre development includes LEED Silver rated senior housing, townhomes and market-rate apartments.

The project was designed around the daylighting of the formerly piped tributary stream to Tyron Creek. The restored stream is planted with native trees, shrubs, and grasses that provide wetland habitat in addition to helping direct flow below the surface for groundwater recharge. The stream eventually terminates in a rain garden that treats the remaining stormwater from the development and surrounding streets, helping to filter pollutants as well as reduce the rate and magnitude of stormwater flows. The results speak for themselves. Prior to redevelopment, a drop of rain from the top of the 65-acre watershed took just 20 minutes to reach Tryon Creek. Today, it takes 48 hours.

In addition to the daylighted stream, the project includes numerous other green infrastructure facilities to treat stormwater onsite and maximize infiltration. These include treelawn swales along the street, flow-through planters adjacent to building to capture roof runoff, green roofs to capture and detain roof runoff, and pervious pavement in the parking lots.

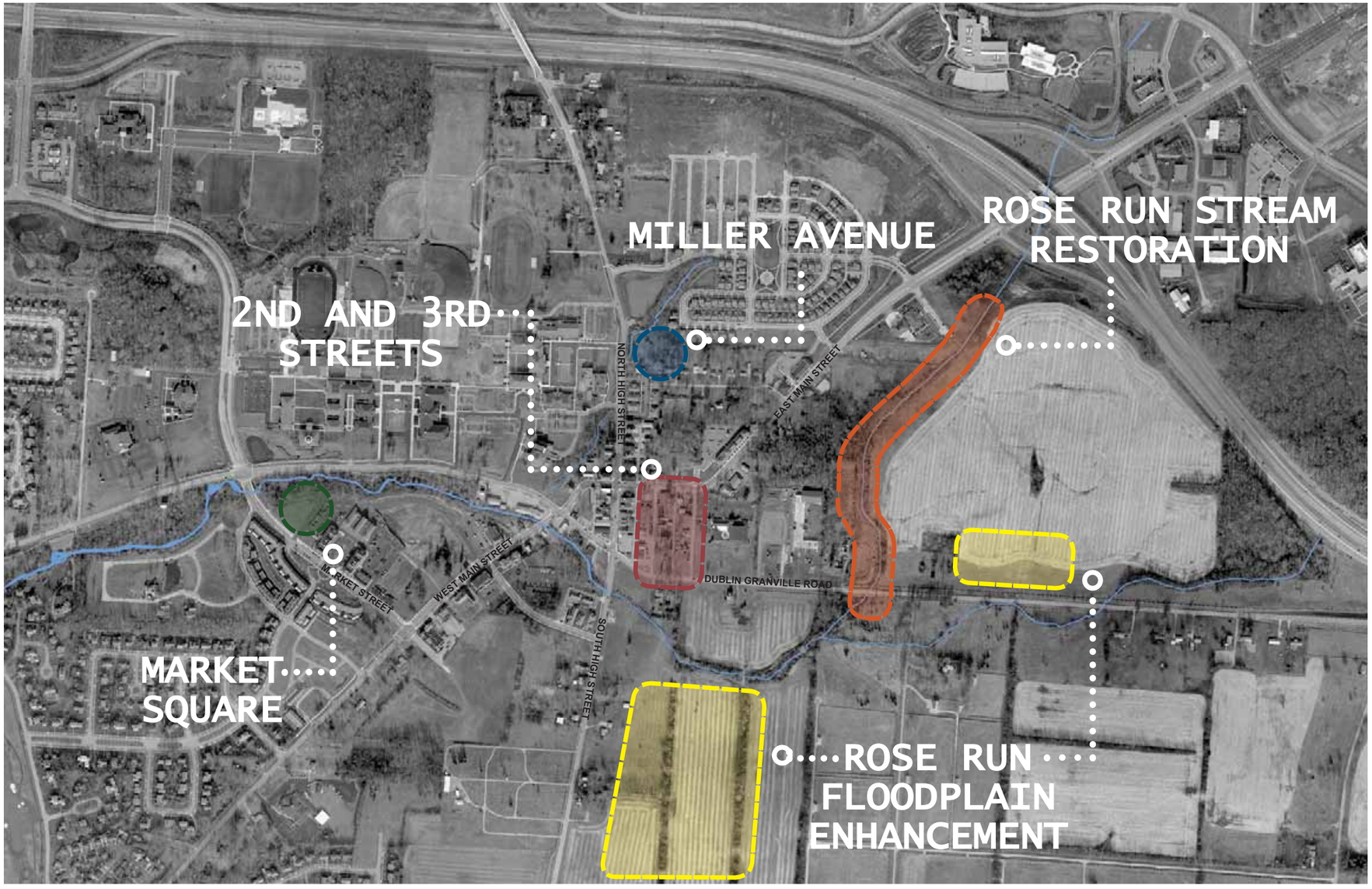
The Headwaters at Tryon Creek takes an integrated green approach to stormwater management by handling it on-site, creating unique amenities for residents.

MITIGATION STRATEGIES

STORMWATER PLANNING AREAS

Some stormwater engineering has already been implemented in the Village Center as development has occurred. These solutions have dealt more with individual sites than watershed-wide solutions. Moving forward, this plan identifies areas of development pressure and areas that are in need of stormwater control improvements. This analysis identified five priority stormwater improvement sites that will mitigate existing and future stormwater issues. These are areas where immediate implementation of new stormwater practices would provide the most benefit to the stream corridor (biology and ecology) and to the Village (economic development). The traditional and green stormwater approaches proposed for these sites are outlined in detail in the following pages.

The Mitigation Strategy includes both traditional stormwater options and innovative green infrastructure solutions in an effort to create a comprehensive approach to stormwater within the Village Center. The traditional stormwater options address current and future developments using standard end of pipe solutions such as a stormwater wetland basin at the southeast corner of Market Street and East Dublin Granville Road and a future wet basin or wetland at the west end of Miller Ave.



MITIGATION STRATEGIES

1. MARKET SQUARE

2. ROSE RUN STREAM RESTORATION

3. 2ND AND 3RD STREETS

4. MILLER AVENUE

5. ROSE RUN FLOODPLAIN ENHANCEMENT

As the primary stream and stormwater route through the Village Center, more innovative green infrastructure solutions are needed to help reduce the annual volume of runoff to Rose Run. According to the US EPA, biological degradation of streams can occur with as little as a 10-20% impervious cover in a watershed. Green infrastructure solutions generally reduce impervious areas, promote infiltration, mitigate thermal impacts, and provide pollutant uptake. This study takes a detailed look at two specific sites for the use of green infrastructure. Green infrastructure is incorporated into an existing right-of-way on 3rd Street and as part of improvements suggested for future development in the northeast and east watershed sub-areas.

Solutions for the following five areas are outlined in the following pages:

1. Market Square
2. Rose Run Stream Restoration
3. 2nd and 3rd Streets
4. Miller Avenue
5. Rose Run Floodplain Enhancement

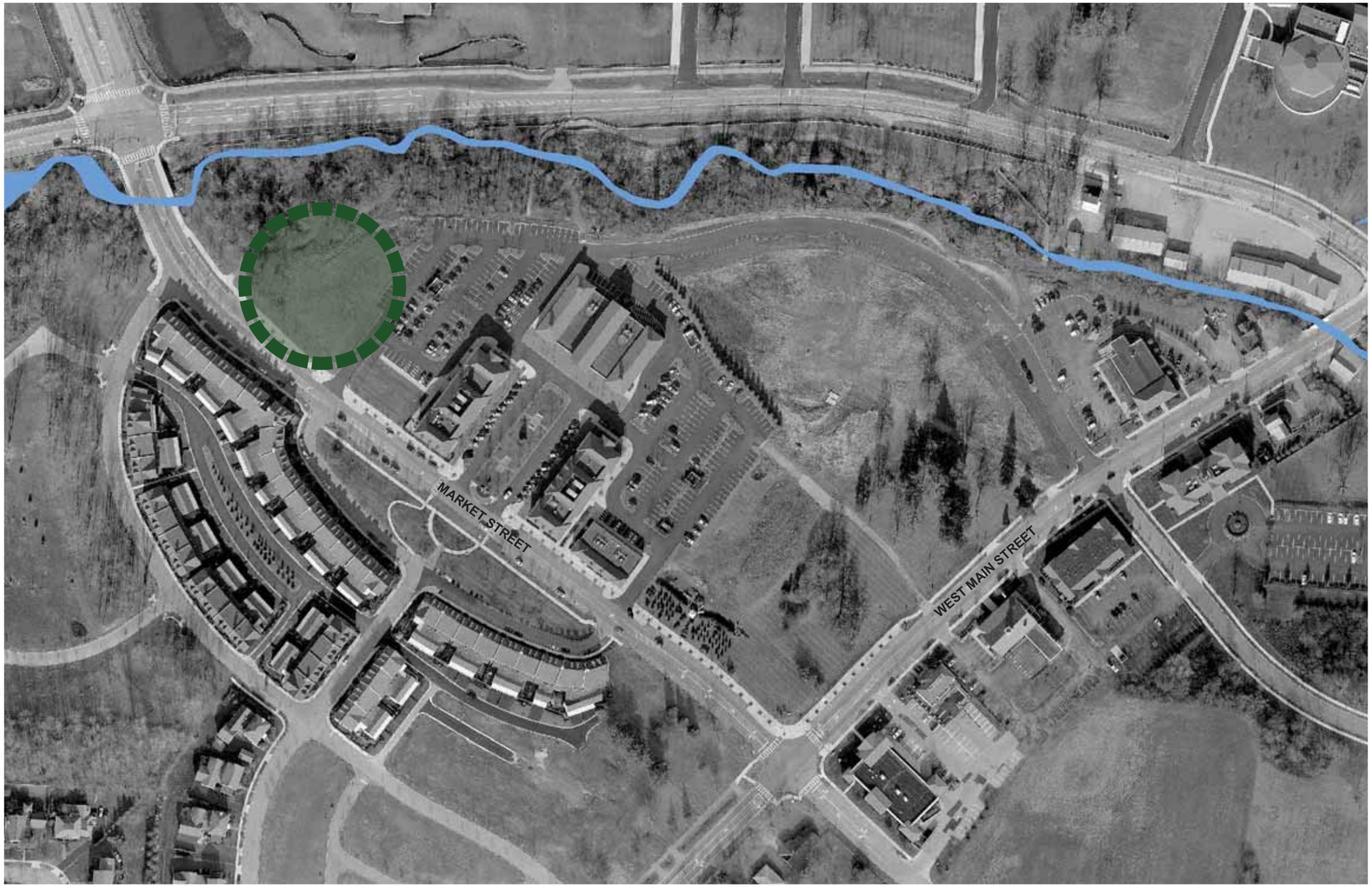
MITIGATION STRATEGIES

LOCATION: **MARKET SQUARE**

THE ISSUE:

The first phase of Market Square was developed prior to water quality regulations being put into place. As a result, the existing development does not incorporate water quality measures for stormwater runoff before it is discharged into Rose Run near Dublin-Granville Road. The untreated water entering Rose Run has high levels of parking lot pollutants, and it is at a higher temperature due to the fact that it runs directly off surface parking lots into the stream.

The current plan for the second phase of Market Square incorporates underground storage of stormwater to handle peak flows. This facility would be located at a future garage that would service Market Square businesses and the McCoy Community Center for the Arts. While underground storage will be needed, a wetland basin is necessary to provide needed water quality for existing development and proposed future phases. This wetland basin would also capture unmitigated properties located on the east side of Main Street, as well as a portion of Market Street.



Proposed location of a water quality wetland basin at Market Square to address current needs and future development.

A wetland basin would address stormwater quality issues for the entire Market Square site and handle some water quantity issues needed for phase two development.

THE SOLUTION:

In order to address the missing water quality component of the first phase of Market Square and satisfy current requirements for an eventual second phase, a wetland basin is proposed for the northwest corner of Market Square. This basin will provide an adequate amount of storage and treatment for both phases. Extending east from this basin, a wetland will be incorporated to address water quality, which in turn will also provide a natural aesthetic to the Rose Run corridor and enhance habitat availability.

The challenge to planning a wetland basin in the Market Square area is that it is not an urban element for the Village Center. Creating an edge to the pond by bordering it with a brick feature wall will help establish an urban aesthetic to the naturalized system. This feature wall may coordinate with a brick entry pier on either side of Market Street and the planned Village Center entry signage.

DETAILS:

Area treated: 28.7 acres
Size: .75 acres
Maximum storage depth: 6 feet

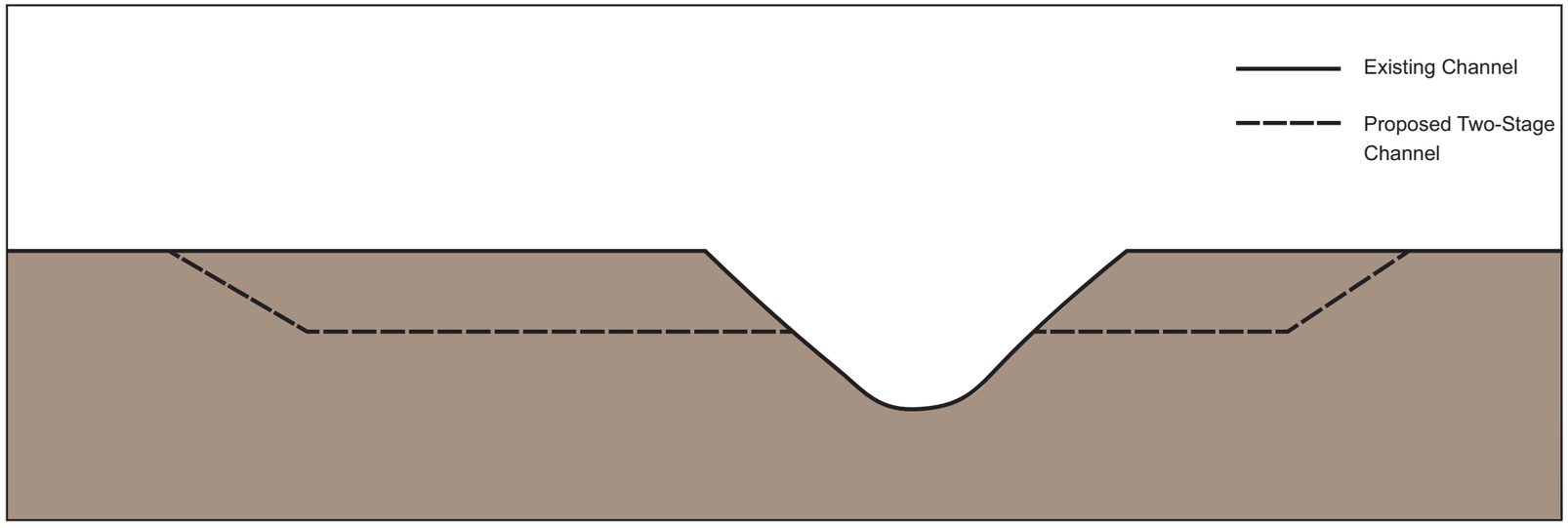
MITIGATION STRATEGIES

LOCATION: **ROSE RUN STREAM RESTORATION**

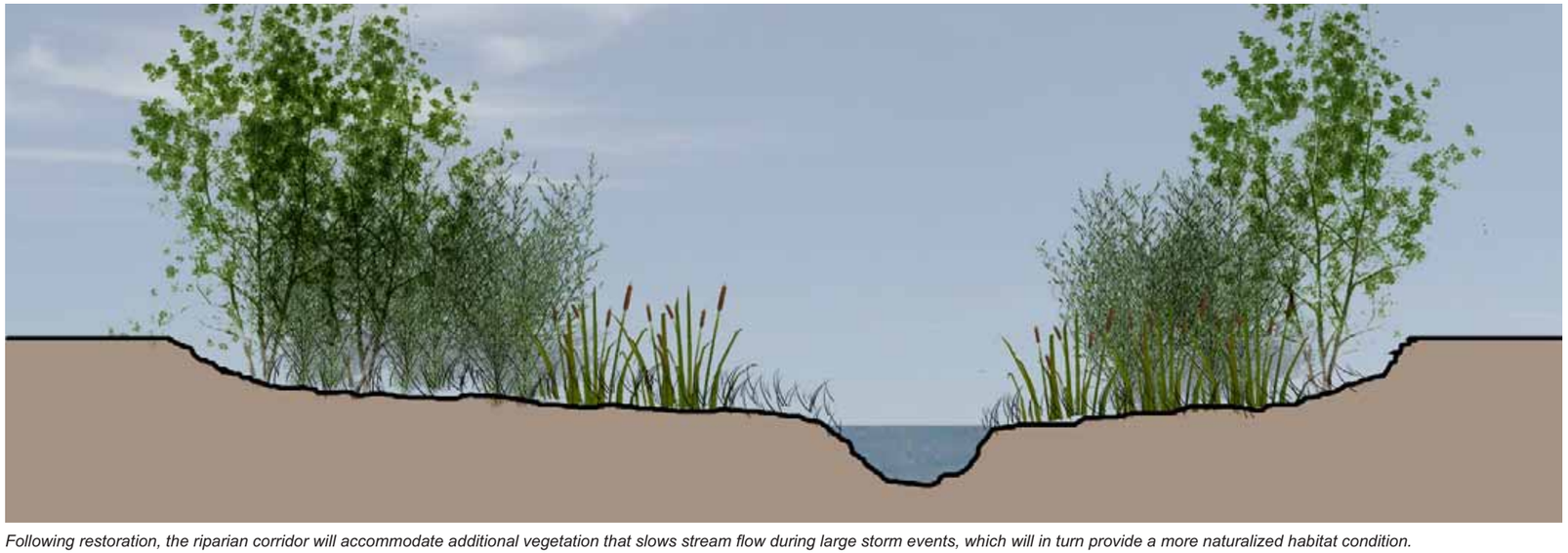
THE ISSUE:

Rose Run, from the SR161 Expressway to Dublin-Granville Road just west of the Ganton Parcel, continues to be a viable candidate for stream restoration. Previous studies have recommended leaving the channel course as it is currently aligned, and enhancing the floodplain of the stream. Currently, the stream is entrenched and has very little floodplain storage volume, which accelerates peak flows, causes erosion, and degrades the water quality within the corridor.

Proposed corridor for stream restoration.



The stream corridor protection zone provides the needed width for overbank flooding and meander migration, which in turn will enhance water quality within this corridor as well as downstream.



Following restoration, the riparian corridor will accommodate additional vegetation that slows stream flow during large storm events, which will in turn provide a more naturalized habitat condition.

THE SOLUTION:

It is recommended that a stream corridor protection zone or riparian corridor be set aside for the purposes of stream restoration. The stream corridor protection zone width is historically where over bank flooding, meander migration, and stream processes freely occur. For the Rose Run at Dublin-Granville Road, the watershed area is 423 acres. This corresponds to a stream corridor protection zone width of 126 feet centered over the stream upstream of Dublin-Granville Road using the latest Ohio Department of Natural Resources Criteria. Preliminary information indicates that rehabilitating disconnected floodplains like this one, can have appreciable water quality and peak flow rates benefits. While a detailed restoration plan is necessary to determine the exact amounts, peak flow rate and water quality credits can be obtained.

DETAILS:

- Further study needed to determine the exact peak flow rates following restoration and potential water quality credits
- Developments adjacent to this area that are eligible to receive these credits would still have to provide on-site stormwater management, preferably integrated with green infrastructure techniques.

MITIGATION STRATEGIES

LOCATION: **2nd AND 3rd STREETS**

THE ISSUE:
The historic core of the Village Center has a number of challenges when it comes to stormwater management. To start, the historic core is an amalgamation of property owners that complicates a coordinated stormwater approach. Some properties will remain as they are, while others may eventually redevelop. The ability to apply stormwater practices to the entire historic core is challenging. Second, the parcels are very small and, even with some aggregation, implementing stormwater mitigation requirements on larger projects would most likely render projects not feasible as spatial and cost problems arise. Third, the ability to maintain the dense village form found in the historic core is very important to the success of this district.

THE SOLUTION:
There are a number of green infrastructure solutions that can be implemented both in the right-of-way and on private property to properly address stormwater treatment and retention issues. The 3rd Street Green Street pilot project proposes two methods of stormwater control to handle existing runoff in the right-of-way and provide stormwater credits for future development in this area.

2nd and 3rd Street green street improvement area.

Third Street will use pervious pavement.

Pervious Pavement
Construction is underway for the 3rd Street green street using pervious clay pavers. Gaps between the pavers are filled with stone chips, allowing runoff to infiltrate to a subsurface stone storage layer. This allows for infiltration and treatment of stormwater. This pilot project will allow the Village of New Albany to understand the construction, performance, maintenance and cost for future uses within the Village.

By installing pervious pavement along 3rd Street, a stormwater credit is achieved that make redevelopment of adjacent parcels more attractive. The project generates 17,576 square feet of credit. Combined with a potential redevelopment credit of 10,120 square feet, a development with approximately 50 percent impervious coverage could be developed on 3rd Street without additional water quality controls. Developments over 50 percent could provide additional controls on site as part of the site development, or pervious pavement could be used in the adjacent alley.

Curb Extension Bump Out / Silva Cells
Optional treatment and retention could be achieved using the tree lawn area or on-street parking space along 2nd Street. Two **curb extension bump outs** could be installed to handle roof and sidewalk runoff. Designed with a soil mix that promotes infiltration, curb extension bump outs can handle up to 12 inches of water volume and have a maximum soil thickness of 30 inches. It is important that these areas are landscaped with plant materials that can tolerate extended dry weather conditions and brief periods of saturation, as well as treat and tolerate various pollutants.

Another option for 2nd Street is a subsurface bioretention swale underneath the sidewalk using **Silva Cells**. These cells hold bioretention type soil in an uncompacted state, while supporting sidewalks and pavement above. Trees can be planted on, or adjacent to, these cells. With the pervious pavers handling street runoff, the Silva Cells would treat roof runoff and sidewalk runoff, further reducing the need for future development to treat stormwater on site.

DETAILS:
Third Street
Pervious Pavement
Street Length: 550 feet
Potential Credit: 17,576 square feet

Second Street Options
Curb Extensions
Number: 2
Treatment capacity: 7,500 square feet

Silva Cells
Number: 137 cells
Size: 4’ x2’ x 16” cells

MITIGATION STRATEGIES

GREEN STREETS

While the improvements for 2nd and 3rd Streets call for pervious pavement, curb extension bump outs, and Silva Cells, there are numerous green street techniques that could be applied throughout the Village Center. It is vital that any street improvements throughout the Village Center consider options to incorporate green stormwater management techniques. This approach is not only advantageous from the aspect of positive stormwater mitigation impacts, but is often beneficial from a long-term maintenance, public investment and economic development perspective.

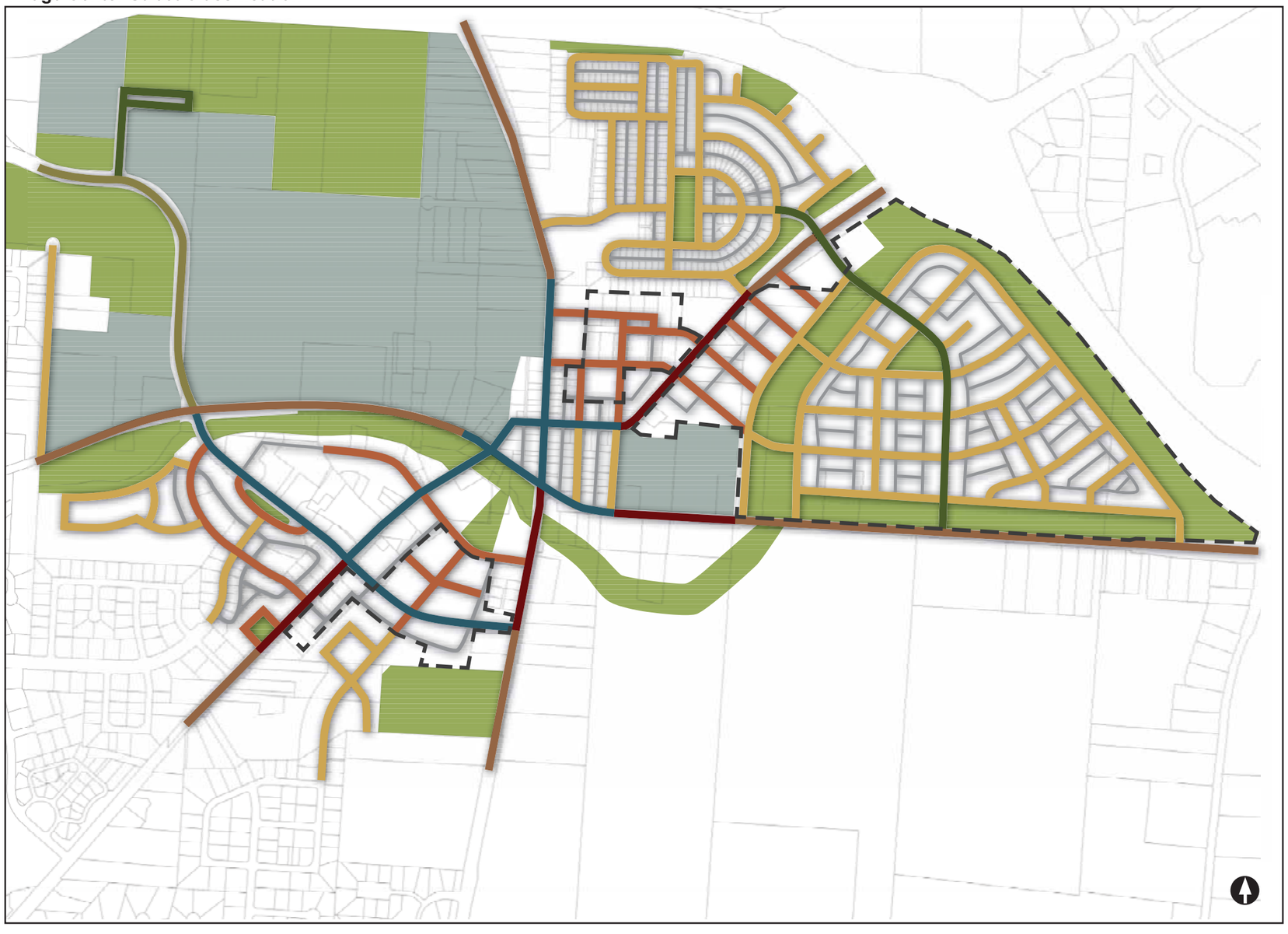
Using solutions presented in the Stormwater Toolbox section of this report (see pages 12 and 13), the following table outlines where and what type of solutions are most applicable in locations throughout the Village Center. These green solutions are applied to the street classification system shown in the diagram on page 23. While multiple green street strategies are suggested for various street types, individual street improvements should be studied in detail to determine the green solution, or solutions, that make the most sense given the particular context and constraints.

Potential Street Stormwater Management Solutions Matrix

	Road Type	Curb Extension	Street Planter*	Tree Lawn Swale*	Silva Cell	Pervious Paver
	Village Road			✔ optional in place of tree lawn		
	Four-Lane Blvd.			✔ optional in place of tree lawn		
	Two-Lane Blvd.		✔ optional in place of sections of tree lawn	✔ optional in place of tree lawn	✔ optional beneath tree lawn	✔ in parking lane
	Village Street	✔ bump-out at intersection or on-street parking			✔ optional beneath tree lawn	✔ in parking lane
	Village Avenue	✔ bump-out at intersection or on-street parking			✔ optional beneath tree lawn	✔ entire ROW
	Neighborhood Street	✔ optional	✔ optional in place of tree lawn	✔ optional in place of tree lawn	✔ optional beneath tree lawn	✔ in parking lane; entire ROW (optional)
	Signature Street	✔ bump-out at intersection or on-street parking	✔ optional, integrated with or separated from street trees		✔ optional beneath tree lawn	✔ in parking lane
	Alley					✔ entire ROW

* Can be installed in conjunction with street trees.

Village Center Street Classification



- Brown — *Village Road*
- Light Green — *Four-Lane Boulevard*
- Dark Green — *Two-Lane Boulevard*
- Maroon — *Village Street*
- Orange — *Village Avenue*
- Yellow — *Neighborhood Street*
- Blue — *Signature Street*
- Grey — *Alley*
- *Open Space Edge*
- *Campus Edge*

MITIGATION STRATEGIES

LOCATION: **MILLER AVENUE**

THE ISSUE:
Future redevelopment of the area surrounding Miller Avenue will require stormwater treatment. The area between Main Street and High Street located north of the Historic Core is planned for higher mixed-use density development. In order to achieve an urban development pattern that also protects the Rose Run, a regional-type stormwater facility will need to be planned.

General location of proposed water quality and quantity detention basin.

A detention basin could be designed to fit naturally with new development on the Miller Avenue site.

Curb extension bump-outs, disconnected downspouts with integrated planters, and treelawn swales could be part of a green approach to development that integrates stormwater controls into the overall design of the project.

THE SOLUTION:

Miller Avenue drains to the west to an unnamed tributary of Rose Run at a point just upstream of High St. A regional detention basin could be installed to provide water quality and quantity controls for the Miller Avenue tributary area of 17.46 acres.

The size of this detention basin could be reduced, or possibly eliminated, if future development incorporates green infrastructure elements such as pervious pavement, downspout disconnections, and green streets. This approach would allow for more of the site to be used for development and reduce the amount of detention basins in this area of the Village where two others already exist in close proximity.

DETAILS:

Area treated: 17.46 acres
Depth: 4’
Storage: 3.66 acre-feet.
Size: 1.7 acres

MITIGATION STRATEGIES

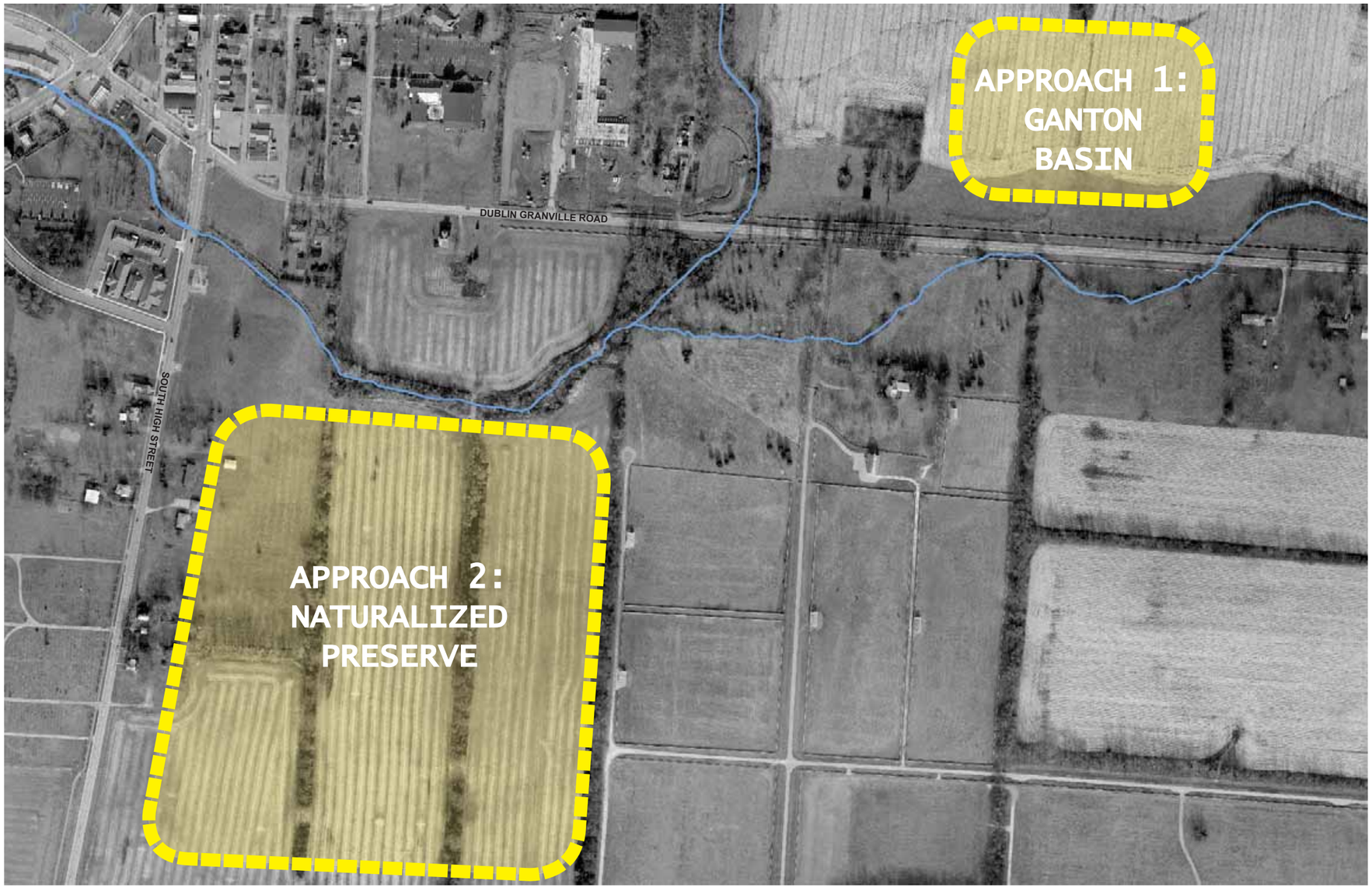
LOCATION: **ROSE RUN FLOODPLAIN ENHANCEMENT**

THE ISSUE:

While the current development pressure on the Ganton tract of land is not significant, it is the largest piece of ground yet to be developed in the Village Center. The 71 acre site is zoned for future single family residences with development equivalent to ¼ acre lots. Development at this density would increase the amount of impervious surface in the watershed. Determining an appropriate stormwater mitigation method will be essential to enhancement of the corridor.

THE SOLUTION:

It should be noted that given the lack of development pressure on this area, the amount of impervious surface created could be lowered dramatically if the development pattern were sensitive to the environment and if green stormwater controls were integrated into future development. The land use may also be reconsidered. For example, the Village Center Strategy contemplates transferring the density to other residential projects in the Village, and building a field house and practice field use that would have far less impact on the watershed. If homes are constructed per the current zoning in this area, there are two potential approaches to address both stormwater quantity and quality issues and provide downstream flood protection.



Proposed approaches for Rose Run Floodplain Enhancement. Approach 1 provides needed stormwater quantity and quality controls. Approach 2 provides some quantity benefits, but is largely a flood control measure.

Option 1: Ganton Basin is a wet basin north of Dublin Granville Road that would occupy 3.5 acres.

Option 2: Naturalized Preserve would use the area south of Dublin Granville Road that is already in a naturalized state and has existing grades that would accommodate temporary storage and provide downstream flood protection, while not altering the appearance of the land. These photos show the opportunity for restoration of the natural habitat through the reintroduction of native plantings.

Approach 1: Ganton Basin (quality and quantity)
In order to handle current zoned development on this tract of land, a 3.5 acre wet basin would need to be constructed. The permanent pool depth would be eight feet and a concrete weir 7.5 feet wide would be required to meet the critical storm requirement. With this retention basin in place, the urban stream classification would remain challenged due to the inability of a traditional stormwater basin to reduce stormwater volume on-site. This condition could be remedied by integrating this traditional solution with green infrastructure techniques as part of the site development. Using pervious pavement, disconnecting downspouts, and installing curb extensions and tree lawn swales would allow for greater on-site infiltration. This infiltration would provide significant improvements to water quality and would reduce the needed size of the wet basin.

Approach 2: Naturalized Preserve (flood protection)
While a wet basin would still be required on the Ganton site to handle development impacts, it could be made smaller if the naturalized area south of Dublin Granville Road is used to accommodate temporary storage. This undersized culvert would temporarily impound runoff from heavier rainfall events in a large natural storage area south of Rose Run and Dublin Granville Road as well as East of Reynoldsburg-New Albany Road. This area is expected to remain in a naturalized state and the proposed solution would not alter the appearance of this land. This solution would allow for a reduction in the size of a wet basin on the Ganton site and act as a downstream flood control device during large storm events.

DETAILS:

Approach 1
Area treated: 71 acres
Size: 3.5 acres
Pool depth: 8 feet

Approach 2
Size: Area variable based on level of storm event mitigation

IMPLEMENTATION

IMPLEMENTATION AND PRIORITIZATION

The Village Center Stormwater Mitigation Strategy has identified five stormwater improvement projects that mitigate existing and future stormwater issues. This implementation section aims to prioritize each of the projects based on several considerations.

The first consideration for each project is whether it is **needed to remediate an existing stormwater issue**. The second consideration identified improvement projects that would **provide an immediate environmental impact**. All of the proposed improvements would have a positive, long-term environmental impact on stormwater quality and quantity.

The next two considerations involve development. One identifies improvements that will be **needed if development occurs** on certain sites. The next consideration is somewhat related, in that it identifies **needed stormwater improvement projects to encourage the economic development** of desirable parcels. In this case, the improvements would help lead to development by offsetting stormwater quality and quantity requirements.

The last consideration addresses the **ease of completion**. Those deemed “Easy” to complete are based on the ability to gain grants and funding and the fact that the Village already controls the site. “Medium” improvements are ones that require public/private partnerships for both funding and land acquisition or usage. These also require coordination with future development. “Difficult” improvements are those that are built on sites that are currently developed and/or are privately owned.

Paired with the stormwater toolbox and proposed improvements, this matrix helps to prioritize and guide the implementation of a comprehensive stormwater plan for the Village Center. Implemented over time, this plan will provide needed quality and quantity measures, enable focused development to occur and identify improvements that will be necessary as other large tracts of land are developed.

Implementation Matrix

	Improvement	Needed for Remediation	Immediate Environmental Impact	Needed if Development Occurs	Needed to Encourage Development	Ease of Completion
	Market Square	✔	✔	✔	✔	MEDIUM
	Rose Run Stream Restoration	✔	✔			MEDIUM
	2nd and 3rd Streets*		✔ *		✔ *	EASY/MEDIUM (2nd Street requires grant funding)
	Miller Avenue		✔	✔	✔	DIFFICULT
	Rose Run Floodplain Enhancement Approach 1			✔		MEDIUM
	Approach 2		✔ **		✔ ***	

* Further implementation of green streets practices to be ongoing on other Village Center streets.
** Provides flood-impact protection.
*** On a limited basis upstream, more substantial impact downstream.