



County of Fairfax, Virginia

MEMORANDUM

DATE: 2/1/08

TO: Sterling Wheeler
Department of Planning and Zoning

FROM: Randy Bartlett
Stormwater Management, DPWES

SUBJECT: Stormwater management opportunities in Tysons Corner

We have evaluated the stormwater management implications of the three development scenarios (Base Case, Advanced Prototype A, and Advanced Prototype B) in relation to the existing condition for Tysons Corner. All scenarios, including the existing condition, are similar from an impervious cover standpoint and thus are likely to have the same stormwater management implications. While there are no substantial differences among alternatives in terms of stormwater management, redevelopment can provide substantial opportunities for stormwater management improvements. Improvements in on-site controls through the redevelopment process will be essential to addressing stormwater management deficiencies in the Tysons Corner area.

As is the case in many areas of Fairfax County, much of Tysons Corner was developed before stormwater regulations were in place and therefore has limited or absent stormwater management controls. There was no regulation of stormwater quantity control prior to 1972 and no requirement for water quality treatment until 1993. Developed areas that are lacking or deficient in stormwater management lead to numerous environmental problems including stream bank erosion, water quality degradation, loss of habitat, and property damage caused by flooding and erosion. The absence of stormwater management leads to sediment, nutrient and pollutant transport, further polluting the Potomac River and Chesapeake Bay. Because Tysons Corner is a high point in the county and therefore at the headwaters of several watersheds, namely Difficult Run, Scotts Run, and Pimmit Run, it is especially critical to address the lack of stormwater management here. Of the area that lies within Scotts Run and Pimmit Run watersheds, 70 percent of the parcels with future redevelopment potential are not controlled by any existing stormwater management facilities. Only 10 percent of the total developed parcel area has both water quality and quantity control.

By seizing the opportunity of redevelopment in Tysons Corner and other areas in the county, many stormwater problems experienced downstream can be mitigated. Improving stormwater management at the source will also facilitate success of downstream restoration efforts recommended in the county's Watershed Management Plans.

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Under current ordinance requirements, there would be little improvement required for redevelopment projects where there is currently a substantial amount of impervious cover. There is no requirement to reduce peak flow if imperviousness does not increase, and only a 10 percent reduction of phosphorus is required for redevelopment. Efforts well above and beyond current ordinance requirements will be needed for redevelopment projects in Tysons Corner if downstream conditions are to improve. There are considerable opportunities for improvement associated with such efforts. Redevelopment of suburban areas to urban settings will allow for the incorporation of new storm water management techniques as a part of the rezoning process. The goal is to encourage innovation and utilization of low impact development techniques in combination with structural controls by designers of redevelopment projects in order to meet performance based criteria.

A watershed management plan has been adopted for the Difficult Run Watershed and a management plan for the Middle Potomac Watersheds (a group of five watersheds which includes Scotts Run and Pimmit Run) is nearing completion. Without efforts to reduce stormwater runoff peak flows and volumes through redevelopment in Tysons Corner, watershed management planning goals and objectives cannot be attained. If improved stormwater management is not included in the redevelopment effort the alternative for the county will be to implement vast, expensive, and ecologically unfriendly projects downstream such as extensive rip-rap, concrete, or gabion basket walls. These “hard cover” techniques, while potentially inhibiting erosive velocities and preventing erosion, will reduce or eliminate habitat and may not be accepted by the community due to their appearance.

The Middle Potomac Watersheds Management Plan provides specific recommendations to improve watershed conditions. Within the plan, the Tysons Corner Stormwater Strategy identifies the following recommendations:

- For redevelopment sites that will be subject to the zoning process, a minimum of 30 percent phosphorus (P) removal from existing conditions is suggested. Where there are opportunities to increase P removal, implementation of such controls should be encouraged. Redevelopment sites should be evaluated on a case-by-case basis by county staff during the rezoning process to optimize stormwater management controls.
- The adequate outfall study area should be extended beyond minimum requirements such that the adequate outfall study will not end within a drainage pipe but will extend downstream to the receiving stream channel.
- For redevelopment sites that may not have a future increase in the amount of impervious area and that do not have existing stormwater quantity controls, there is an opportunity to provide peak flow and runoff volume reduction to help mitigate the effects of existing impervious area on stormwater runoff. Consideration should be given to evaluating redevelopment sites on a case-by-case basis to determine the potential for providing stormwater quantity controls.

Comment [nhk1]: Is there any need to provide a short background on what adequate outfall is, why it's important, and what analysis is and is not required now?

The Difficult Run Watershed Management Plan contains language that recommends stormwater management controls that will be equal to predevelopment rates. The above

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recommendations from the Middle Potomac plan can also be applied to the Difficult Run watershed.

There are many innovative strategies available to reduce stormwater runoff volumes and peak flows in urbanizing areas such as Tysons Corner. Low Impact Development (LID) uses many small-scale controls that infiltrate, filter, store, evaporate and detain runoff, thereby reducing the volume that reaches streams and also improving water quality (see Public Facilities Manual 98-07-PFM). Many of these techniques, such as vegetated ponds, rain gardens, vegetated swales, porous pavement, vegetated roofs, and tree box filters, to name a few, can easily be incorporated into landscape and open space plans and become amenities. For example, a vegetated roof can provide a pleasing view for higher stories that look down onto it, or, with the addition of pavers, become a rooftop garden. A vegetated pond can become a water feature in a landscaped courtyard. Vegetated swales can become pleasing perennial borders along pedestrian walkways. Tree box filters used along sidewalks and in parking areas provide shade. Storage and reuse is also an option. Stormwater runoff can be collected in cisterns and used to water landscape plantings instead of using potable water. These techniques are in keeping with the Board of Supervisor's Cool Counties initiative and 30-Year Tree Canopy Goal.

These approaches represent only some examples and in many cases several techniques would be used in combination to achieve the required outcome. Specific approaches for a site will depend on a number of site-specific factors. Retrofits of existing controls should be used together with creation of new LID features.

In general, we would like to see the following recommendations incorporated into Comprehensive Plan guidance for Tysons Corner:

- Stormwater quantity controls that will be substantially more extensive than what would be required for redevelopment, with an emphasis on incorporating practices that serve to return water into the ground, reuse it, or significantly delay its runoff into the stream system such that adverse downstream impacts of stormwater runoff will be reduced from existing conditions. Ideally, the stormwater quantity and quality control rates of redeveloped parcels will be returned to the predevelopment condition.
- Stormwater quality controls that will, at a minimum, be consistent with the 30% reduction target recommended in the Tysons Corner Stormwater Strategy (see bullets on page 2). This target should be surpassed when possible.
- Evaluation of adequate outfall that will extend beyond minimum requirements such that the adequate outfall study will not end within a drainage pipe but will extend downstream to the receiving stream channel, consistent with the recommendation of the Tysons Corner Stormwater Strategy (see bullets on page 2).

As is consistent with Policy Plan guidance, stormwater management and water quality controls for redevelopment should be optimized.

Comment [nhk2]: I think it's a good idea to set a goal, and the word "ideally" doesn't lock us in to anything that proves to be infeasible. I like this but wonder if it should be run by John Friedman, Valerie Tucker, and/or others in LDS as a sort of reality check.

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Bioinfiltration in a parking area.



Bioinfiltration in a parking area.



Example of a tree box filter.



Liberty Center Parking Garage (650 NE Holladay)
Stormwater planter next to parking garage.



A courtyard with bioinfiltration.



Integrated stormwater management.

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