Development of E3 Urban Practices for Phase 6
REVISED 10/6/16

The E3 Scenario is an estimate of applying management actions to the fullest possible extent.

- A "what-if" scenario of watershed conditions with theoretical maximum levels of managed controls on load sources
- It is used with the No-Action scenario to define controllable loads, the difference between No-Action and E3loads.
- There are no cost and few physical limitations to implementing BMPs for point and nonpoint sources in E3.
- For most nonpoint source BMPs, it was assumed that the load from every available acre of the relevant land area was being controlled by a suite of existing or innovative practices.

Approved E3 Urban Sector Scenario for Phase 5.3

- E3 Stormwater Management
  - Regions with karst topography (low permeability) and Coastal Plain Lowlands (high groundwater)
    - 50 percent of area—impervious cover reduction
    - 30 percent of area—filtering practices designed to reduce TN by 40 percent, TP by 60 percent, and SED by 80 percent from a pre-BMP condition
    - 20 percent of area—infiltration practices designed to reduce TN by 85 percent, TP by 85 percent, and SED by 95 percent from a pre-BMP condition
  - Ultra-urban regions—defined as high- and medium-intensity land cover
    - 50 percent of area—impervious cover reductions, e.g., cisterns and collections systems to capture rainwater for reuse
    - 30 percent of area—filtering practices, e.g., sand filters, bio-retention, dry wells
    - 20 percent of area—infiltration practices, e.g., infiltration trenches and basins
  - Other urban/suburban regions
    - 10 percent of area—impervious cover reduction
    - 30 percent of area—filtering practices, e.g., sand filters, bioretention
    - 60 percent of area—infiltration practices

- E3 Erosion and sediment controls
  - Controls of the runoff from all bare-construction land use areas are assumed to be at a level so that the construction loads are equal to the nutrient and sediment edge-of-stream loads from pervious urban under E3 conditions

- E3 Nutrient management on urban
  - All pervious urban acres are under nutrient management

- E3 Controls on extractive (active and abandoned mines)
  - Controls of the runoff from all extractive land use areas are assumed to be to a

degree so that the loads are equal to the nutrient and sediment edge-of-stream loads from pervious urban under E3 conditions

- E3 Forest conservation and urban growth reduction
  - All projected loss of forest from development is retained or planted in forest

- E3 Riparian forest buffers on urban
  - 10 percent of pervious riparian areas without natural vegetation (forests and wetlands) associated with urban lands are buffered as forest for each modeled hydrologic segment in the Chesapeake Bay watershed
  - The area of un-buffered riparian land is determined using the best available data (1) 1:24K National Hydrography Dataset, and (2) 2001 land cover

- E3 Tree planting on urban
  - Forest conservation and urban riparian forest buffers account for tree plantings in the urban sector

Recommended Assumptions for E3 Scenario for the Urban Sector in Phase 6 Model

Table 1. Recommended Assumptions for E3 Scenario for the Urban Sector in Phase 6 Model [2]

BMP	Land Use [1]	Treatment Assumption
Retrofits	IC, TIC & PC	RR Retrofits sized to treat 1.0 inch IA for all urban land uses for 75% of each land use
New Development	IC, TIC & PC	All new development has RR BMPs sized for 1.5 inch IA
Street Cleaning	TIC	10% of TIC swept using SCP-1, 20% of TIC swept using SCP-3 and 20% of TIC swept using SCP-3
UNM Plans	PC	90% of PC has UNM Plans which are split 20% High Risk and 80% Low Risk
State Fertilizer Laws	PC	All Bay States Receive Credits for P and N Fertilizer Laws
Grey Infrastructure & Storm Drain Clean Outs	SC	5% of Urban N and P load Removed due to both credits
Stream Restoration	SC	15% of urban stream miles in the RBS are restored @ twice the default SR value
ESC	C	100% of all construction sites are treated to ESC Level 3 and have high risk UNM plans

[1] Land Use Codes: IC= Impervious Cover, TIC= Transport Impervious Cover, PC=Pervious Cover, C= Construction, SC= Stream Corridor, TC Tree Canopy, RBS: River Basin Segment

[2] Prior assumptions for Phase 5.3.2 E3 urban practices are retained for: Forest conservation and urban growth reduction, riparian forest buffers on urban, tree planting on urban and controls on extractive land uses

The Urban Stormwater Workgroup reviewed the E3 assumptions originally proposed for the urban sector at its July 26 meeting (see Appendix A). Several signatory members suggested some changes based on the technical feasibility of implementing some of the practices (see USWG meeting minutes 7/26/16). The USWG chair and the stormwater coordinator met in early October to propose some potential revisions, which were shared with modeling team and are described below.

Table 1. Recommended Assumptions for E3 Scenario for the Urban Sector in Phase 6 Model [2]

BMP	**Land Use [1]**	**Treatment Assumption**
Retrofits	IC, TIC & PC	RR Retrofits sized to treat 1.0 inch IA for all urban land uses for 75% of each land use
New Development	IC, TIC & PC	All new development has RR BMPs sized for 1.5 inch IA
Street Cleaning	TIC	10% of TIC swept using SCP-1, 20% of TIC swept using SCP-3 and 20% of TIC swept using SCP-3
UNM Plans	PC	90% of PC has UNM Plans which are split 20% High Risk and 80% Low Risk
State Fertilizer Laws	PC	All Bay States Receive Credits for P and N Fertilizer Laws
Grey Infrastructure & Storm Drain Clean Outs	SC	5% of Urban N and P load Removed due to both credits
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Changes from July 26 version:

Retrofits: Retrofit sizing drops from 1.5 to 1.0 inch, and applies to only 75% of existing land uses;

> *Rationale:* Retrofitting is not always feasible on all existing urban land and even when it is, it is often impractical to achieve more than an inch of storage.
>
> *Modeling Team Comment:* We need to end up with 100% coverage of the relevant urban domain for E3 –boundary thinking is in terms of "never feasible" and "can never be achieved" and not "not always feasible" and "often impractical to achieve". There needs to be as little judgment as possible. Is there data we can look at about physical limitations to substantiate shifts to 1.0 inch and 75%?

Street Cleaning; Goes from 100% of TIC swept at highest frequency (SCP-1) to a more realistic level of street cleaning effort (60% of total TIC) at several different frequencies ranging from two sweeper passes per week to one pass a month.

> *Rationale:* The proposed changes reflect a more realistic version of the upper limit to expand local street cleaning

Modeling Team Comment: Same basic comment. This is the E3 scenario and not the "Maximum Feasible" scenario. If you had $1 trillion to spend each year in Fairfax and Ellicott City, is there a physical limitation to sweeping all the streets frequently? I understand not sweeping highways, but streets?

UNM Plans: Coverage drops from 100% of pervious cover to 90%

Rationale: Reflects the fact that there is an upper limit for property owner participation.

Modeling Team Comment: Again, you can't make judgment calls on how many could participate since E3 is "everyone", not "everyone minus 10%". 90% would be a "Maximum Feasible" scenario. Agriculture E3 pretty much has everything at 100% of a domain that can be defined using data.

Stream Restoration*:* Slight change in language about urban stream miles in the river basin segment since it is not exactly clear what methods will be used to represent the extent of the urban stream network in the Phase 6 model.

Appendix A Original E3 Assumptions 6-21-16

BMP	Land Use [1]	Treatment Assumption
Retrofits	IC, TIC & PC	RR Retrofits sized to treat 1.5 inch IA for all urban land uses
New Development	IC, TIC & PC	All new development has RR BMPs sized for 2.0 inch IA
Street Cleaning	TIC	100% of TIC swept using SCP-1
UNM Plans	PC	100% of PC has UNM Plans; 20% High Risk/80% Low Risk
State Fertilizer Laws	PC	All Bay States Receive Credits for P and N Fertilizer Laws
Grey Infrastructure& Storm Drain Clean Outs	SC	5% of Urban N and P load Removed due to both credits
Stream Restoration	SC	15% of stream network restored @ twice the default SR value
ESC	C	100% of all construction sites are treated to ESC Level 3 and have high risk UNM plans
[1] Land Use Codes: IC= Impervious Cover, TIC= Transport Impervious Cover, PC=Pervious Cover, C= Construction, SC= Stream Corridor, TC Tree Canopy		
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