



4.0 SOURCE IDENTIFICATION

This section documents the County's compilation of source identification data, including Geographic Information System (GIS) data and other information as required by its NPDES Storm Sewer System Permit under Part III.C. Source Identification. This section also documents tracking of new and existing stormwater management facilities through the Urban Best Management Practices (BMP)/Stormwater Management (SWM) Facilities database.

4.1 GIS SOURCE IDENTIFICATION DATA

This section documents permit-required efforts under Parts III.C.1 and 2. Frederick County has collected source identification data on all permit-required topics. During 2009, the various GIS sections within Frederick County continued to make progress in enhancing the County's GIS capabilities and in compiling source identification data. This section details County GIS efforts, GIS data layers that are currently complete with countywide data, as well as GIS layers that are in the process of being created or updated from CADD, photoimagery, or other original data.

An inventory of Frederick County GIS holdings as of 2009 is presented in Appendix B. The status of specific data called out in the NPDES permit is listed in Table 4-1.

Source Identification Data	Have Data	Have in GIS	Notes, Schedule for Completion by Watershed
Topographic features	Yes	Yes	DEMs, 2-foot contours, break lines and spot elevations were compiled in March 2005 during the production of new 6" digital orthophotography.
Existing and planned land use based on present zoning or current master plans	Yes	Yes	The Comprehensive Land Use Plan and Zoning data layers are complete and undergoing updates.
Public and private land ownership	Yes	Yes	Maryland Property View is available from MD Department of Planning. The Maryland Property View package also contains parcel centroids with State Assessment data. Frederick County has completed its work with an outside contractor to produce more accurate vector parcel data. Data are currently maintained by Frederick County Enterprise GIS. Properties owned by and located in Frederick County are now in a separate GIS database, which is current as of August 2009.
Population density	Yes	Yes	These data consist of census tracts and census block groups from 2000 and 1990. Population estimates are completed every six months and can be used to provide population density information for any geographic location needed.
Streams	Yes	Yes	Streams and rivers and lakes in shapefile format; complete. A dam database created in 2005 from MDE inspected dams data is available for GIS use.

Table 4-1. (Continued)

Source Identification Data	Have Data	Have in GIS	Notes, Schedule for Completion by Watershed
Floodplains	Yes	Yes	FEMA Floodplain data available in GIS format. The data are from FEMA's contractor, AMEC Earth and Environmental, Inc. The FEMA mapping was adopted by the County Commissioners in September 2007 and the final date shown on the Community Panel mapping is September 19, 2007. The data received from AMEC are in shapefile format and include a Base Flood Elevation file for areas with a detailed study and the usual FEMA flood mapping file.
Storm drain systems, including major outfalls, inlets, appurtenant conveyances, and associated drainage areas	Yes	Yes	Features loaded into ArcSDE database system with topological rules developed. This information is under review for data structure changes and will be improved for reporting and mapping use. The database continues to be accessed by County staff through Enterprise GIS resources via desktop and wireless utilization.
Stormwater management facilities	Yes	Yes	SWM Facility Maintenance database is maintained by the Division of Permitting and Development Review and is planned for migration into the ArcGIS 9.3 application environment for Enterprise GIS access.
Sanitary sewer systems	Yes	No	Files are updated in AutoCAD 2007 when as-built drawings become available but are not publicly available due to security reasons. Water and Sewer service areas were completed in GIS in 2004. Water & Sewer service areas are under constant update.
Sewage treatment plants	Yes	No	Files in AutoCAD 2007, see sanitary sewer systems above.
Industrial operations	Yes	Yes	Up-to-date information available from EPA Envirofacts website
Hazardous waste sites	Yes	Yes	Up-to-date information available from EPA Envirofacts website
Landfills	Yes	No	This list is maintained by the Division of Utilities and Solid Waste Management (DUSWM) in AutoCAD.
NPDES permitted sites (both point source and stormwater permittees)	Yes	Yes	Up-to-date information available from EPA Envirofacts website
Impervious areas (e.g., roads, parking lots, and rooftops)	Yes	Yes	Current method of estimating impervious area employs The Center for Watershed Protection's imperviousness calculations based on land use classifications. County roadway centerlines are complete and updated as required. Planimetric data became available in late 2007. The County plans to use the data to digitize impervious area in 2010.
Bridges	Yes	Yes	The current bridges database (>20 foot spans) has been updated with current weight restrictions and enhanced with height restriction attribution. Bridges with spans of less than 20 feet are being updated into this database with all bridge features being linked to a web based bridge inspection database for Bridge Management Program staff.
Estimated pollutant loads	Yes	Yes	Prepared annually for NDPEs Annual Report.
County properties	Yes	Yes	During Winter 2008, WMS finished digitizing county-owned parcels from county property lists using draft parcels. This project was transferred to IIT Enterprise GIS, who compiled six different data sources for county owned properties. The data layer has been available to County users since August 2009.

Source Identification Data	Have Data	Have in GIS	Notes, Schedule for Completion by Watershed
Sampling locations	Yes	Yes	Sampling locations provided and maintained by the County's NPDES consultant, Versar, Inc.
Orthophotography	Yes	Yes	Available for free download or media purchase and subject to GIS license agreement. 2007 Ortho Project digital image Specs: 0.5 Ft. Pixels, 1:1200 Mapping Scale are available. This imagery is planned for updating in 2010 if funding allows. Pictometry orthophotography (oblique imagery) is now accessible only to County staff with the capability to measure imaged features in all dimensions. If funding is available, these data will be updated starting in 2010.
Watersheds	Yes	Yes	County has created 20 watershed classifications that were developed by Planning and DPW. The County updated the watershed and catchment boundaries in 2008. Subwatersheds and catchments have also been digitized for each of the 20 NPDES watersheds. Also have Md_Wtrsheds.shp GIS layer from MD-DNR.

4.1.1 2009 Division of Public Works GIS Data Activities

The following illustrates efforts made by the Division of Public Works (DPW) GIS Section to enhance the County's GIS capabilities.

1) Pavement Management

DPW is planning to search for a new pavement management application in the near future as funding allows and increased applications development occurs.

2) Storm Drain System Updates

DPW continued the efforts to update GIS data on the County's storm drain system. In 2008, the data were uploaded into the main data server and topology rules were developed. This information was under review during 2009 for data structure changes and will be improved for reporting and mapping use. The database continues to be accessed by County staff through enterprise GIS resources via desktop and wireless utilization. In 2010, staff will continue digitizing features in-house.

3) DPW GIS Gateway Application

This GIS desktop console provides quick and easy access to DPW and County Enterprise GIS resources such as digitally published base and thematic maps (roadway sinkholes, roadway assets, bridges and division base maps), GIS-based desktop tracking applications (roadway sinkholes tracking and inspection and sign inventory tracking), digital document access of approved development and bridge plans, as well as recreational park master plans and additional Intranet and Internet map services. This application has undergone an upgrade that improves

user access to GIS resources with future upgrades planned for 2010. A customized version of this application has also been developed for the Division of Parks and Recreation.

4) Permit Related GIS Projects to be completed in 2010

- Impervious Surface Analysis by Watershed Catchment
- Delineation of NPDES-BMP Drainage Areas
- Stormwater Data Collection Database Restructuring

5) Snow Plow Data Download Project

The goal of this project is to allow wireless data downloads of snow plow truck operational parameters (brine applications, quantity and location of salt applied to roadways, roadway surface temperatures, etc.) and to map them, post storm event, within the existing snow routes map service. This will allow Highway Operations staff to analyze operation effectiveness and amount of material applied for budget planning, environmental impact, and snow plow operations efficiency. These spatial data will be available for archival use as needed.

6) Enhancement of the Bridges Database

The GIS bridges database historically has only included Frederick County-maintained bridges of more than 20-foot spans. This database is currently being improved with the addition of the remaining bridge spans of 20 feet or less (totaling more than 400 bridges). To improve efficiency, each feature is being linked to web-based bridge inspection application records to provide a “dedicated database” for all bridge inspection and repair data. To maintain security, the public will not have access to these bridge data other than for bridge closures and height/weight restriction postings.

7) Enhancement of Roadway Assets Data

DPW will be increasing the types of features collected within its roadway assets database with the collection and update of traffic light, street light, and speed hump locations. This database expansion will provide roadway assets database users with a more complete awareness of Frederick County roadway assets being installed and maintained.

8) Archival Aerial Imagery Access

Recently aerial photographs from 1987 to 1991 were discovered and it was decided to scan and georeference them to make the information accessible. This project is currently underway and when completed will provide environmental, permit, and other GIS data users with the ability to detect changes as witnessed through aerial imagery.

4.1.2 2009 Enterprise GIS Data Activities

The following illustrates efforts made by the Enterprise GIS Section to enhance the County's GIS capabilities. Efforts were made in six areas as outlined below:

1) Countywide Roadway Imaging Data Collection (eRoadway Web Viewer)

Roadway imaging is being used to “virtually drive” county roadways from the desktop. This data collection provides access to county roadway images allowing data users to view all aspects of roads from ditch line to ditch line and associated roadway assets. These data allow for the collection of roadway assets information such as stormwater inlets, signing, guardrails, etc. There is a web application that allows users to search roadway images by address.

2) Pictometry Data

Pictometry data are oblique, six-inch resolution, aerial photography. These aerial photographic data are currently in use County-wide. These data allow for viewing of aerial image features in four different directions, and measurement of ground features in height, depth, width, and distance. They may also be utilized with other GIS data either in Pictometry viewer or in ArcGIS.

3) 2007 Orthophotography

The 2007 orthophotography data are now available to the County. This aerial photography was produced as part of a Maryland State cooperative contract.

4) Parcel Data

The Frederick County vector parcel data collection is complete, available to County staff, and is under maintenance.

5) Frederick County Unified Roadway Centerline

The new, unified centerline is conflated with the Maryland SHA centerline and will be ready to be periodically uploaded to the SHA database when completed. SHA centerline files, the e911 ICAD centerline file, and the Frederick County GIS centerline file were combined to create the new centerline. The unified centerline is currently undergoing QA/QC.

6) County-wide Address Points Database

Address points, placed at the center of parcels or buildings, are being developed and reviewed. The dataset will serve as a master address database reference for all County users.

4.1.3 2009 Division of Planning GIS Data Activities

The Division of Planning GIS staff has continued to maintain and update major datasets like water and sewer service areas, zoning, comprehensive land use plans, housing unit inventory,

and permits database. The focus of the Planning GIS staff has been the update to the Countywide Comprehensive Plan. Planning GIS staff has been preparing parcel level, detailed analysis in order to support these efforts as directed by the Frederick County Board of County Commissioners (BoCC), Frederick County Planning Commission (FCPC), and planning staff.

The Countywide Comprehensive Plan update will implement two larger projects that were mandated by the State of Maryland as part of HB1141, The Priority Preservation Plan and the Water Resource Element. GIS staff aided with the mapping and the placement of the appropriate areas for protection. The Land Preservation Section of the Division of Planning has been focusing their efforts on the Priority Preservation Plan. In order to focus their preservation areas, GIS staff aided them in their analyses of soils and areas of critical agricultural production. These analyses have lead to the creation of five areas where agricultural preservation should be focused within Frederick County. For the Water Resource Element, staff aided in the mapping and modeling of pollutant loads and impervious surface areas for current and 20-year development projections.

This update to the Countywide Comprehensive Plan will incorporate much more accurate and detailed information than previous updates, mainly due to the use of GIS. The GIS staff completed a detailed, parcel specific analysis of the developed and undeveloped areas within each of the 24 community growth boundaries. This analysis resulted in a much more realistic and accurate portrayal of residential and commercial development capacities within a given area. The Natural Resources, Agricultural, and Park/Open Space land use designations were comprehensively reapplied on a countywide scale. Using forest cover, FEMA 100-year floodplain, soils, steep slopes, sensitive areas, and green infrastructure, these land use designations were more thoroughly and accurately applied throughout the County.

Planning GIS staff has also been diligently working with the U.S. Census Bureau in preparation for the upcoming 2010 US Census. Last year staff completed the initial phase of the Local Update of Census Addresses (LUCA) program. This included the review of every address in the entire County. In 2009, we completed the appeals process for the LUCA program. This will allow more accurate 2010 Census mailings and hence more accurate demographic datasets. The Division of Planning is also the primary participant in the 2010 Participant Statistical Areas Program (2010 PSAP). Through this program, GIS staff reanalyzed the census tracts, block groups, and census designated places in the County. Staff redistricted these boundaries based on current population distributions and future areas of concentrated growth.

In 2009, the Division of Planning GIS and Data Service Section completed many updates to the twelve municipalities of Frederick County. Staff completed the re-digitization of these political boundaries to match the more accurate parcel layer. Staff created an annexation layer that is a representation of each area proposed for, and final adoption of, annexations for each municipality so that up-to-date and accurate boundaries are represented. Along with updating the political boundaries, GIS staff also completed a municipal zoning and comprehensive land use plan layer. These data represent the twelve distinct municipal-based zoning and land use plans for each municipality. In addition, the municipalities were added to the Housing Unit Inventory database. This database is a point layer based on addresses for each residential property in the County.

There were also smaller, special projects that the GIS and Data Services Section was involved in throughout 2009. Staff redistricted the Traffic Analysis Zones (TAZ). These areas are used for population forecasting and traffic modeling. The new TAZ boundaries better reflect the growth concentration in the County as well as coincide with the new census tracts and block groups. Staff also completed an underground storage tank dataset, as well as geo-referenced a set of historic orthophotography from 1952.

4.2 URBAN BMP/SWM FACILITIES DATABASE

At present, all SWM facilities have been entered into Frederick County's urban BMP database. There are 689 entries in the database, including 40 new facilities completed on or after January 1, 2009. New facilities are entered into the database upon approval of the as-built survey. The entire file is included on the accompanying CD. Example pages may be found in Appendix C. During the past year, the County continued to improve the entire database by updating and editing where necessary to ensure database integrity.

