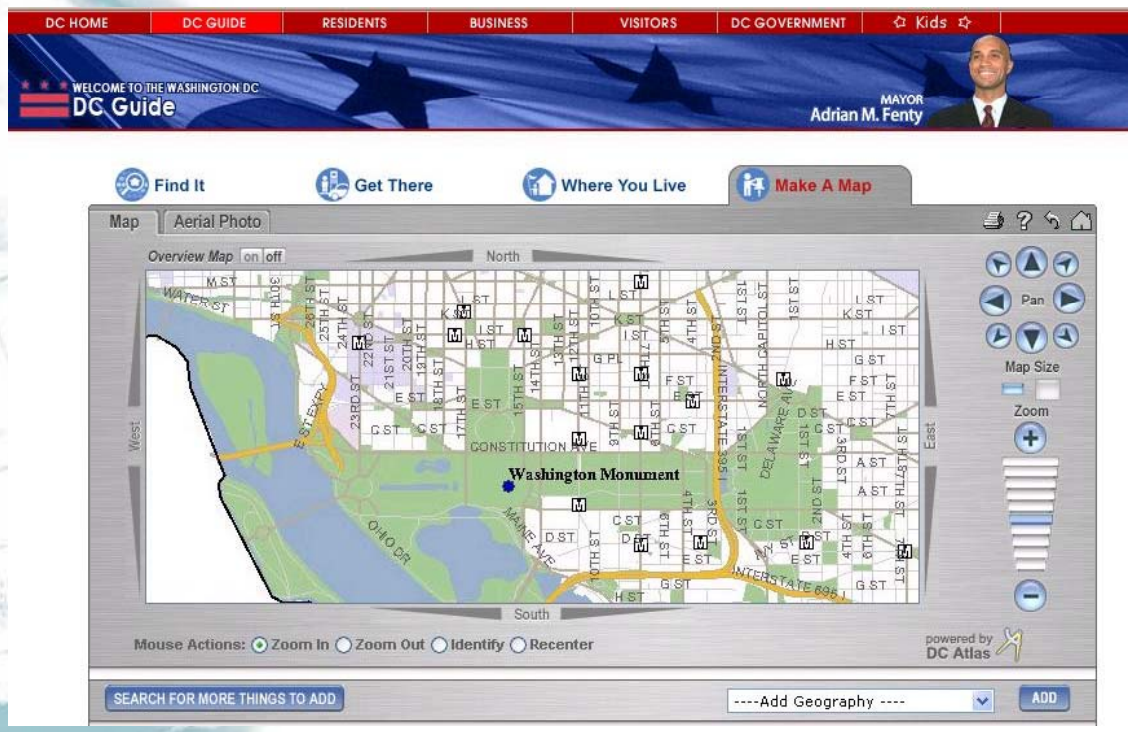
DC GIS Strategic and Business Planning:
Revised Business Plan



Presented to the DC GISSC

August 4, 2009

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DC GIS


GIS
DC
data
District
GISSC
Office
Program
services
OCTO
support
Government
government
Data
Columbia
geospatial
Planning
National
Department
agencies
Plan
applications
activities
stakeholders
Strategic
technology
business
planning
following
development
program
agency
available
public
including
within
example
standards
information
members
Information
Technology
programs
Group
also
Mayor
Source
process
needs
federal
include
departments
coordination
Service
Map

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DC GIS Business Planning: Steps

- ✓ Form Business Plan Subcommittee (BPS) at GISSC meeting (end of May 2009)
- ✓ Share draft document with BPS (start of June 2009)
- ✓ Schedule teleconferences and meetings to get feedback and input from BPS and OCTO staff (June-July 2009)
- ✓ Refine draft and derive presentation to make at next GISSC meeting (August 4, 2009)
- o Provide Final Draft Business Plan document for GISSC Budget Meeting (September 2009)
- o Finalize Business Plan based on Budget Meeting

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DC GIS Business Planning: Four-Month Schedule

GISSC Action Items	June		July		August		September	
	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half	1st Half	2nd Half
Establish Business Plan Subcommittee (BPS)								
Establish Bylaws Subcommittee (BLS)								
Distribute preliminary draft of Business Plan to BPS								
Present revised draft of Business Plan to OCTO DC GIS								
Present revised draft of Business Plan to full GISSC								
BLS to meet and develop proposed Bylaws								
Present proposed Bylaws to OCTO DC GIS								
Present proposed Bylaws to full GISSC								
Finalize Business Plan based on GISSC feedback								
Present to OCTO DC GIS								
Finalize Bylaws based on GISSC feedback								
Present to OCTO DC GIS								
Annual Budget Meeting								
Vote on Bylaws								
Vote on Business Plan investment priorities								
Finalize Bylaws as needed								
Finalize Business Plan as needed								

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DC GIS Business Planning: Background

- We got a head start in 2008 with DC GIS Staff
- Preliminary planning focused Data, Applications, and Services (i.e. Goals #2 and #3 from Strategic Plan)
  - Develop and operate enterprise **mapping data, geospatial applications, and Web services** that enhance the utility, reduce the cost, and expand the interoperability of citywide and agency IT systems
  - Provide outstanding **customer service and training** that enable DC GIS users and stakeholders to leverage the full power of GIS technology
- Participatory: GISSC represented by Business Plan Subcommittee (BPSubcom)

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DC GIS Business Planning: Portfolio Mgt

- Applying “Portfolio Management”
- Projects have different life-cycles and investment strategies:
  - Invest (build or enhance)
  - Maintain (provide basic support)
    - Keep status quo/minimal investment
    - Version upgrades only
    - No active development of new capabilities
  - Sunset (migrate toward retirement & end-of-life)
  - Migrate (move to – or “reinvent” on – a new platform)
  - Divest (shut-off spending and “kill it”)

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DC GIS Business Planning: Platforms

- A platform is:
  - A base technology (or technologies) on which other technologies or processes are built
  - A whole “economic unit” for the purposes of aggregating and assessing costs for budget purposes

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DC GIS Business Planning: Program Elements

- Data
- Applications & Web Services (Dev & Sys)
- Customer Service

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OCTO GIS Budget Allocation (Approximate)

Program Element	Percent of OCTO GIS Budget *
Data	34%
Applications & Web Services (Dev & Sys)	42%
Customer Service	17%
Other (Admin, Supplies, Dues)	7%
Total (Mix of Cap. and Op. Funding)	**100%**

*** Does not include stand-alone capital projects**

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DC GIS Data Platforms

1) Photogrammetric
   a) Orthoimages
   b) Planimetrics
   c) Impervious Surfaces
   d) Elevation
   e) 3D Buildings
2) Property
   a) VPM
   b) MAR
   c) Zoning
   d) Planning
   e) ROW
   f) Survey
3) Demographics
4) Ground Imagery
5) Transportation
6) Routing (pedestrian, vehicular, & mass transit)
7) Aerial Oblique Imagery
8) Business Data
9) LiDAR
10) Regional Data
11) Dynamic Data
12) Partner Data
13) Utilities Data
14) All Other
    a) OCTO Maintained
    b) Agency Contributed

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Data Platform Investment Strategies

Data Type	Investment Strategy	Data Type	Investment Strategy
▪Photogrammetric	Maintain/Invest in next cycle	▪Business Data	Invest
▪Property	Invest	▪LiDAR	Invest
▪Demographics	Invest	▪Regional Data	Maintain
▪Ground Imagery	TBD	▪Dynamic Data	Invest
▪Transportation	Maintain	▪Partner Data	Maintain
▪Routing	Invest	▪Utilities	Invest
▪Aerial Oblique Imagery	Maintain	▪All Other	Maintain

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DC GIS Application Platforms

1) Google Maps
2) Google Earth
3) Citrix
4) EFS (Pictometry Family)
5) ArcGIS Desktop
6) ArcIMS
7) DC Guide DB
8) DC Guide WS
9) DC Guide Link
10) MAR
11) ArcGIS Server (and Extensions)
12) Oracle
13) RouteSmart
14) VM Ware (OCTO Environment)
15) ArcPAD
16) Others?

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Application Platform Investment Strategies

Platform Type	Investment Strategy	Platform Type	Investment Strategy
▪Google Maps	Invest	▪Route Smart	Invest
▪Google Earth	Invest	▪Oracle RDBMS	Maintain
▪EFS (Pictometry Family)	Maintain	▪VM Ware	Maintain
▪ESRI ArcGIS Desktop	Maintain	▪DC Guide DB	Sunset
▪ESRI ArcIMS	Sunset	▪DC Guide WS	Sunset
▪ESRI ArcGIS Server (and ext.)	Maintain	▪DC Guide Link	Sunset
▪ESRI ArcPad	Maintain	▪Citrix	Maintain

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Data Wish List c/o BP Subcommittee (1 of 3)

1) Maintain the current set of widely used data layers, for users of both **ESRI and Google** technologies and applications
2) Add **OGC style web services** to data offerings
3) Determine the **level of essentialness** of each layer by monitoring demand and identifying application dependencies and willingness to cost-share when sensible
4) Budget for **recurring investment** in data acquisition to update planimetric layers (e.g. photogrammetric flyovers to acquire new imagery should occur every two years; once the data is acquired, it needs to be maintained and distributed to DC GIS stakeholders that depend on it)

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Data Wish List c/o BP Subcommittee (2 of 3)

5) Assess the **update frequency** required for other essential layers, since this is a cost-driver (i.e. for major data platforms, should update frequency be increased, or decreased?)
6) Develop and refine data to **support routing** applications (e.g. oversized vehicle routing, delivery of meals, trash pick-up, and property assessments); currently, multiple departments are in need of fully routable street networks, and there is a risk of duplication of effort in acquiring suitable data sets
7) Complete the **cadastral fabric** needed for the District (i.e. property maps) and resolve 'fitting' issues vis-à-vis what has been surveyed
8) Research the creation of **photo-realistic building** textures

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Data Wish List c/o BP Subcommittee (3 of 3)

10) Strengthen methods of **notifying data subscribers** of changes
11) Investigate geospatial data availability and suitability for **areas adjacent** to the District
12) Monitor and **investigate public data** for usefulness and relevance to the District (e.g. geo-tagged photos)
13) Support **Utility and ROW data** collection and data management efforts

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Application Wish List c/o BP Subcommittee (1 of 2)

1) As mentioned in the context of data, **routing is emerging as a much needed application across many departments**, and initiatives in this direction need to be coordinated and leveraged for maximum benefit to the enterprise
2) In addition to routing, new applications and/or integration to routing are needed to support **mobile computing, green buildings, tracking and dispatching**
3) No new applications will be built on **ArcIMS; it is being sunset** by the vendor (ESRI)
4) Numerous applications are currently deployed on ArcIMS, which is a platform in its latter life stage; it would be disruptive to cease support for ArcIMS, but a **migration strategy is needed** for the applications and/or functionality currently in use, including DC Guide and DC Atlas, to move or re-factor onto a new platform

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Application Wish List c/o BP Subcommittee (2 of 2)

5) There are not enough resources to migrate everything in lock-step, so **prioritization is needed** to designate the primary candidates; the Subcommittee consensus is that **DC Guide Web Services and DC Atlas will be the first to migrate and/or reinvent** onto a new platform; there are Web services linked to DC Guide that also need to be migrated, before the current version of DC Guide can be shut down
6) Applications that are not scheduled for migration and/or re-factoring will be left running on **ArcIMS for the time-being, with minimal support**

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Web Services Wish List c/o BP Subcommittee (1 of 1)

1) For reasons mentioned above, **Web services linked to DC Guide need to be migrated** onto a new platform to remove any ArcIMS dependencies
2) A growing list of departments and **applications that depend on DC GIS Web Services** is included in this Plan, in the section on Web Services
3) Web services tend to be less visible to end-users, but they are **critically important to application developers**, both internal and external to OCTO and DC GIS
4) New **Web services to routing, ROW, and utility data** are needed to support new applications
5) Facilitate links to **Google Maps Street View**

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Applications Using DC GIS Web Services

Examples of Applications Using DC GIS Web Services	
Application Context	*Purpose*
Citywide Applications	311 Service Requests
	Citywide Data Warehouse
	DC.gov
Public Safety	911 Computer-Aided Dispatch (CAD)
	I-Mobile Client (Inside FEMS and MPD Vehicles)
	Fusion Center
	MPD Data Warehouse
Economic Development	Accela Permitting
	Historic Preservation
	Office of Planning Tools
	Office of Zoning Tools
Education	Attendance Boundaries
	Student Transportation
Environment	Impervious Surface Billing
	Watershed Protection
Government Operations	Sanitation
	Facilities Management
	City Works
Human Services	Common Client Intake
	Meals on Wheels
Revenue Generation	Computer-Aided Mass Appraisal (CAMA)
	SDS Analysts Service
	I2TS

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Customer Service Wish List c/o BP Subcom (1 of 4)

1) Investigate a **website for knowledge-sharing** (e.g. Wiki); strengthen channels of communication and collaboration for GIS technicians to communicate
2) Explore getting onto the educational program for the **Capital City Fellows** with a GIS overview
3) Consider **on-line training for specific GIS topics**, including “Address-Matching” and “Cartography,” as an alternative to classroom training for certain topics; investigate on-line training materials, including videos, that may be available for this purpose

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Customer Service Wish List c/o BP Subcom (2 of 4)

4) Implement formal **follow-up surveys** to get a sense of how people are using (or not using) what they were taught in DC GIS classes
5) Continue to develop awareness of **resources outside of OCTO** for referrals and access to additional expertise, and work towards a comprehensive 'clearinghouse' of services (i.e. a service offering catalog)
6) If new applications such as **routing** are developed, **corresponding coursework** will be needed

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Customer Service Wish List c/o BP Subcom (3 of 4)

7) Explore a **"Centers of Excellence"** concept whereby various departments with special expertise and mission requirements can be leaders in certain initiatives or application areas, such as routing for instance
8) Explore collaborative approaches with external parties for **alternatives to DC GIS coursework** and curriculum development
9) Apply **Content Management System (CMS)** as it becomes available
10) Investigate the viability of an **"IT Class for Managers"** that would include a GIS component; the GISSC could advocate for this, as an alternative to an "executive friendly" GIS-only class

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Customer Service Wish List c/o BP Subcom (4 of 4)

11) Review departmental websites for **reconciliation across departments** and with regard to DC GIS
12) Continue to provide **support to Jefferson Middle School** teachers and students
13) Update and **reconcile distribution lists** for data notifications and news dissemination

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Discussion

Thank you!

Rich Grady

Applied Geographics, Inc.
Empowering People with Spatial Solutions

rgrady@appgeo.com

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Impervious Surface Area Charge: Investing In Our Local Waterways

Presentation to the DCGIS Steering Committee

August 4th, 2009

Louis Desjardins, DCWASA

IMPERVIOUS SURFACE AREA CHARGE PROJECT

WHAT IS THE IMPERVIOUS SURFACE AREA CHARGE?

- DC WASA has implemented an impervious surface area charge to more equitably allocate the costs of the CSO† Long Term Control Plan. The charge is based upon contribution to surface runoff from wet weather events.

† - CSO: Combined Sewer Overflow

WHAT IS THE IMPERVIOUS SURFACE AREA CHARGE, (Cont.)

- Impervious Surface Area is an area that does not allow water to easily penetrate, such as rooftops, sidewalks, paved driveways, patios, and parking lots.

- This fee has been implemented to recover the debt service costs of executing the Combined Sewer Overflow – Long Term Control Plan (CSO-LTCP) .

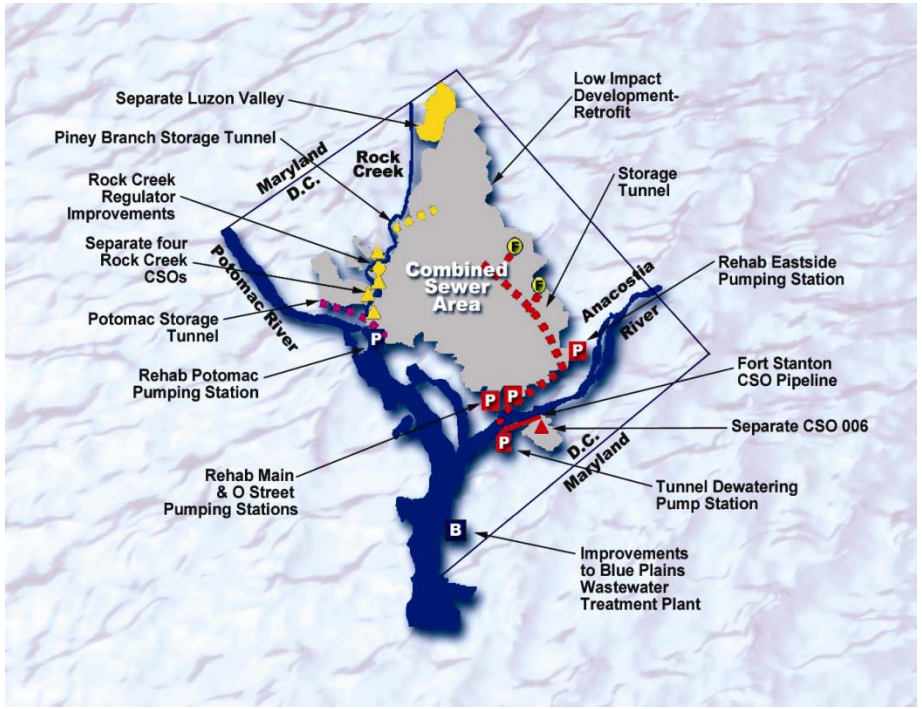
- The amount of impervious area on each property will be determined from information contained in the District of Columbia's Geographical Information System (DCGIS).

  Current Database is built on the 2004 Planimetric Data and the September 2008 Vector Property

- Initially, all residential customers will be charged based upon one ERU (Equivalent Residential Unit): a simplified billing that represents a *typical* house.
  - 1 ERU = 1000 square feet of impervious surface.
  - In line with DCWASA Board Resolution #08-34 and Policy #3 on Impervious Surface Area Charge, a preliminary review of the data and rate options to consider a multi-tier rate structure was completed.
  - DC WASA and the District Department of the Environment (DDOE) are exploring an incentive program for the future to recognize property owners that have implemented wet weather control techniques.

PROJECT BACKGROUND AND UNDERSTANDING

Combined Sewer Overflow (CSO) Long-Term Control Plan



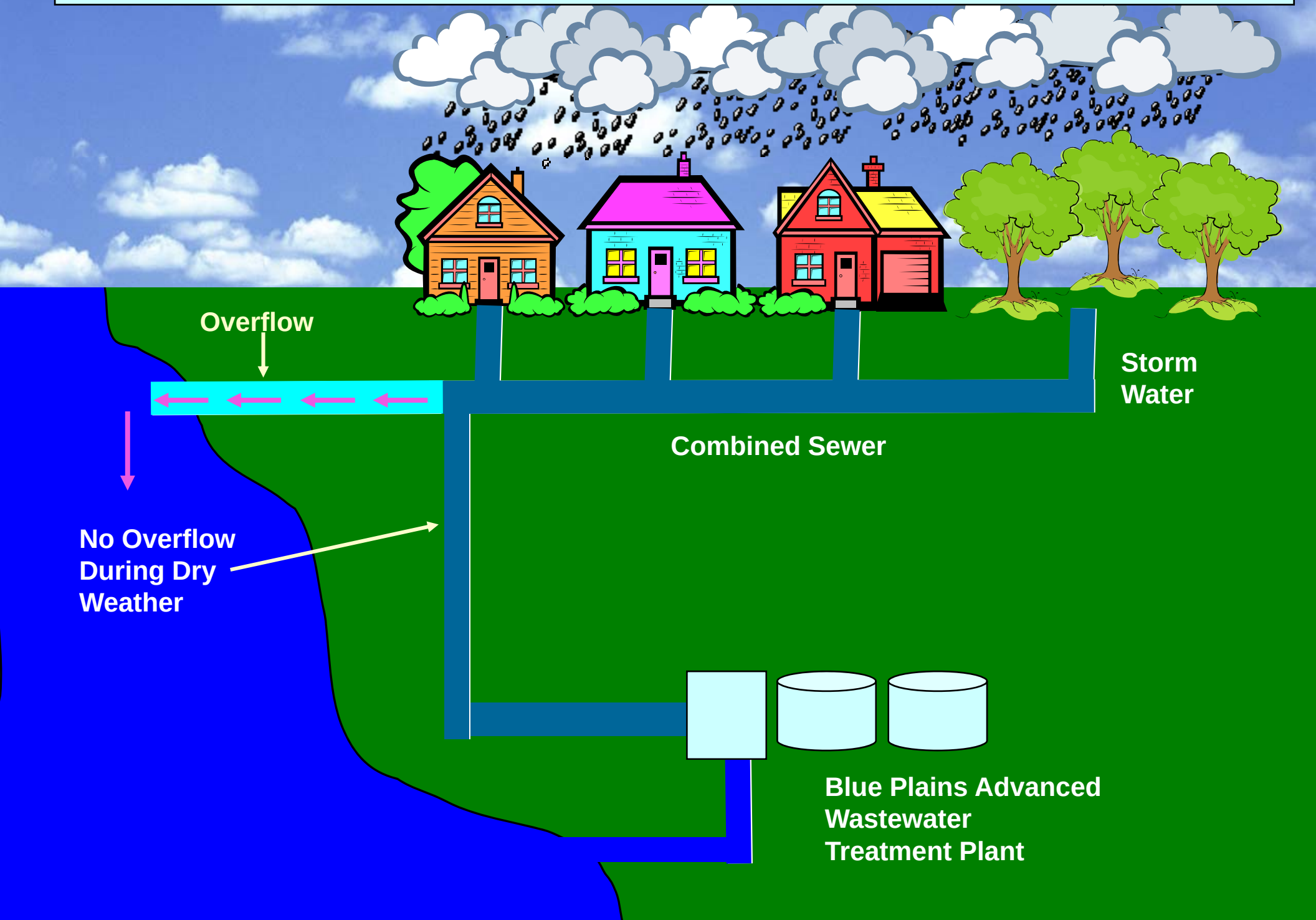
- **2005 federal mandated twenty-year $2.2 billion program**
  - ✓ **Consent decree**
  - ✓ **Facility planning and geotechnical work has begun**
- **Projected to reduce 96% of CSOs**
  - ✓ **98% reduction on Anacostia River**
- **Plan includes:**
  - ✓ **3 large storage tunnels**
  - ✓ **Pumping station improvements**
  - ✓ **Targeted sewer separation**
  - ✓ **Consolidation/elimination of several outfalls**
  - ✓ **Low Impact Development projects**

✓ Nine Minimum Control CSO improvements completed by 2008; reduce 40% of CSOs

✓ Received federal funding of about $122 million to date

•Future additional federal funding of $20 million has been proposed for FY 2010

Impervious Surface Area Illustration



IAC Project Status

- City Council approved and Mayor signed IAC legislation.
- The DC geographic and property data has been integrated into a database to identify all impervious area and the owners.
- Board proposed FY 2009 IAC Rulemaking in January 2009 and a Public Hearing was held on Wednesday February 18, 2009.
- IAC customer website was redesigned in mid February 2009 to allow individual customers to review the impervious data assigned to their accounts.
- IAC legislation effective March 26, 2009
- Board approved IAC Final Rulemaking April 2, 2009 and Notice of Final Rulemaking regarding IAC to be published in DCMR April 24, 2009.
- “Go-Live” May 1, 2009.

ESTIMATES OF IMPERVIOUS AREA, EQUIVALENT RESIDENTIAL UNITS, IA RATE, AND CUSTOMER BILL IMPACTS

Comparison of Share of ERUs to Share of Water Consumption by Customer Category

Category	Share of Equivalent Residential Units (%)	Share of Metered Water Consumption
Residential	24.4%	21.3%
Commercial	33.2%	33.0%
Multifamily	10.9%	20.7%
Federal	21.0%	16.9%
Municipal	6.7%	3.2%
DCHA	1.2%	2.9%
WASA	2.6%	2.0%
Totals	**100%**	**100%**

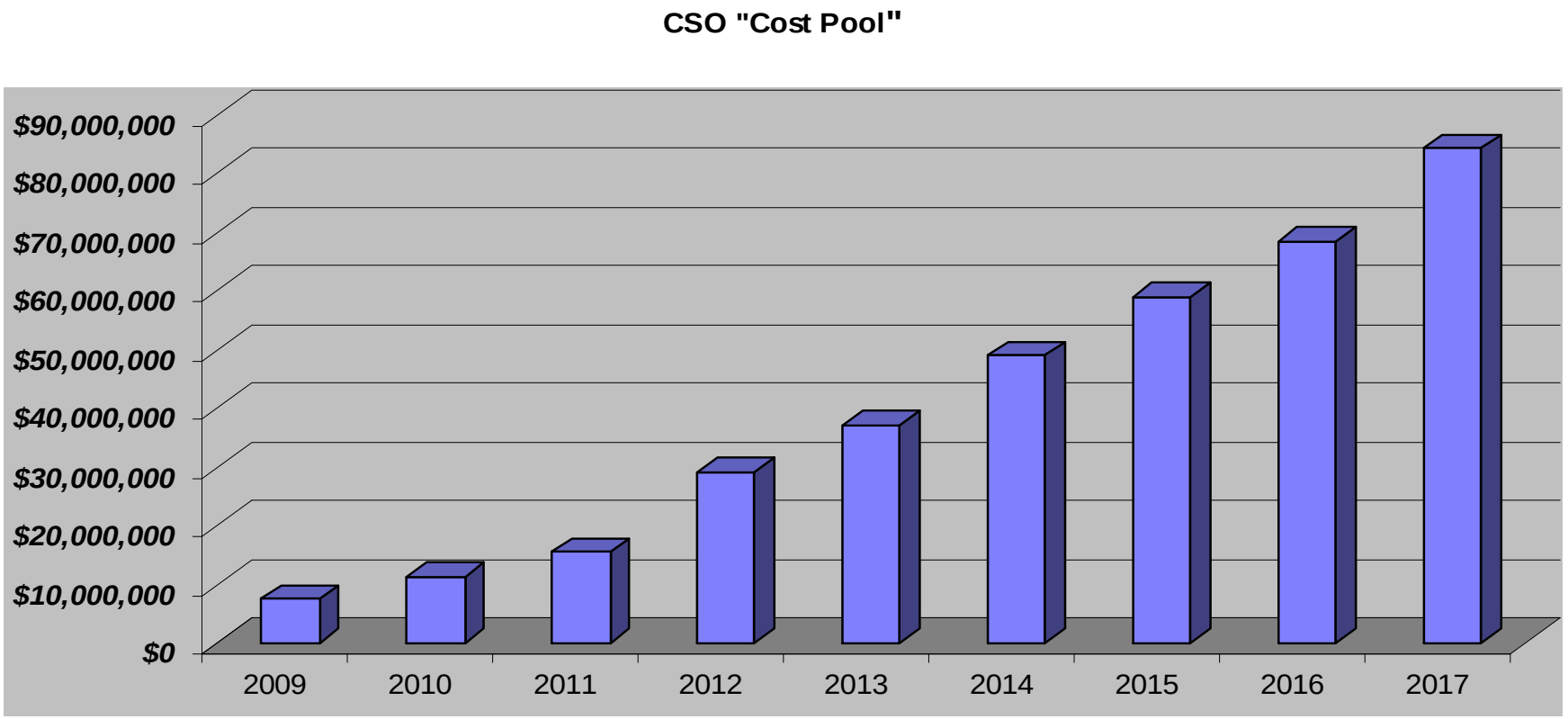
- The table compares the share of impervious area equivalent residential units to the metered water consumption for each customer category.
- An impervious area rate structure will cause a shift in the cost allocation between customer categories due to differences in their water use and the amount of impervious area.
  - Multi-family properties will see a major reduction in costs allocated to that group due to the high-density of the land use.
  - Federal properties will see a larger portion of costs allocated to them due to same reason as above.

Impervious Area Statistics

	SF Res	Non Res	TOTALS
Number of Premises to be Billed	104,285	27,610	131,895
Total Billing Impervious Area (sq. ft.)	125,759,654	310,929,129	436,688,783
Percent of Total Billing Impervious Area (%)	28.8%	71.2%	100%
Percent of Total Water Consumption (%)	21.3%	78.7%	100%
Mean Impervious Area per Billable Premise (sq. ft.)	1,206	11,261	3,269
Median Impervious Area per Billable Premise (sq. ft.)	981		

CSO LTCP Costs through 2017

- Based on DC WASA 2009 - 2017 approved ten-year financial plan
  - ✓ Costs range from $7.4 million in 2009 to $80+ million in 2017
  - ✓ Includes all DC WASA approved LTCP costs



Current Proposal

- Sewer Rate Adjustments *(Effective May 1, 2009)*

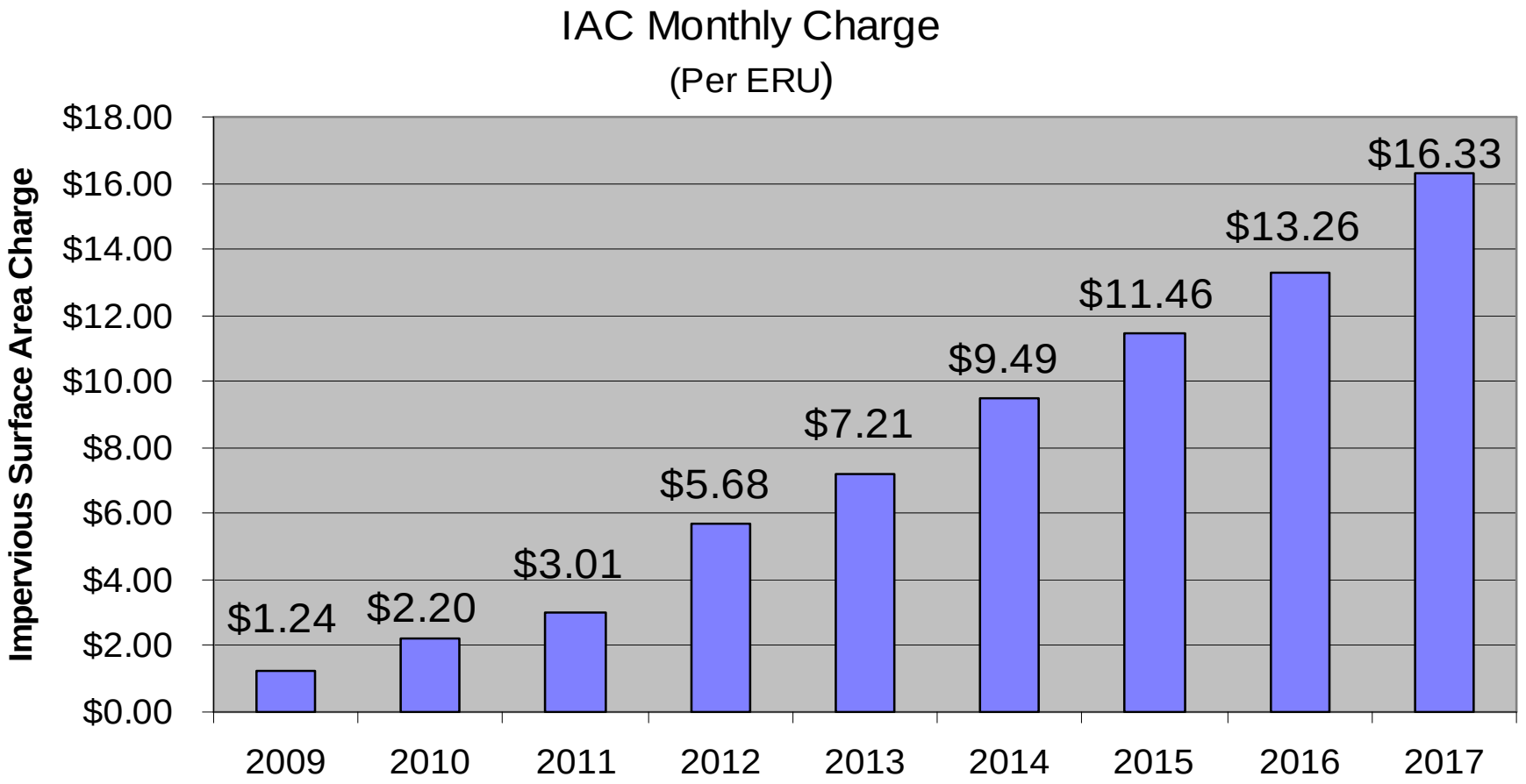
  ✓ Decrease sanitary sewer service from $3.47 to $3.31 per Ccf; and

  ✓ Implement a monthly Impervious Surface Area Charge of $1.24 per Equivalent Residential Unit (ERU) for all properties in the District of Columbia

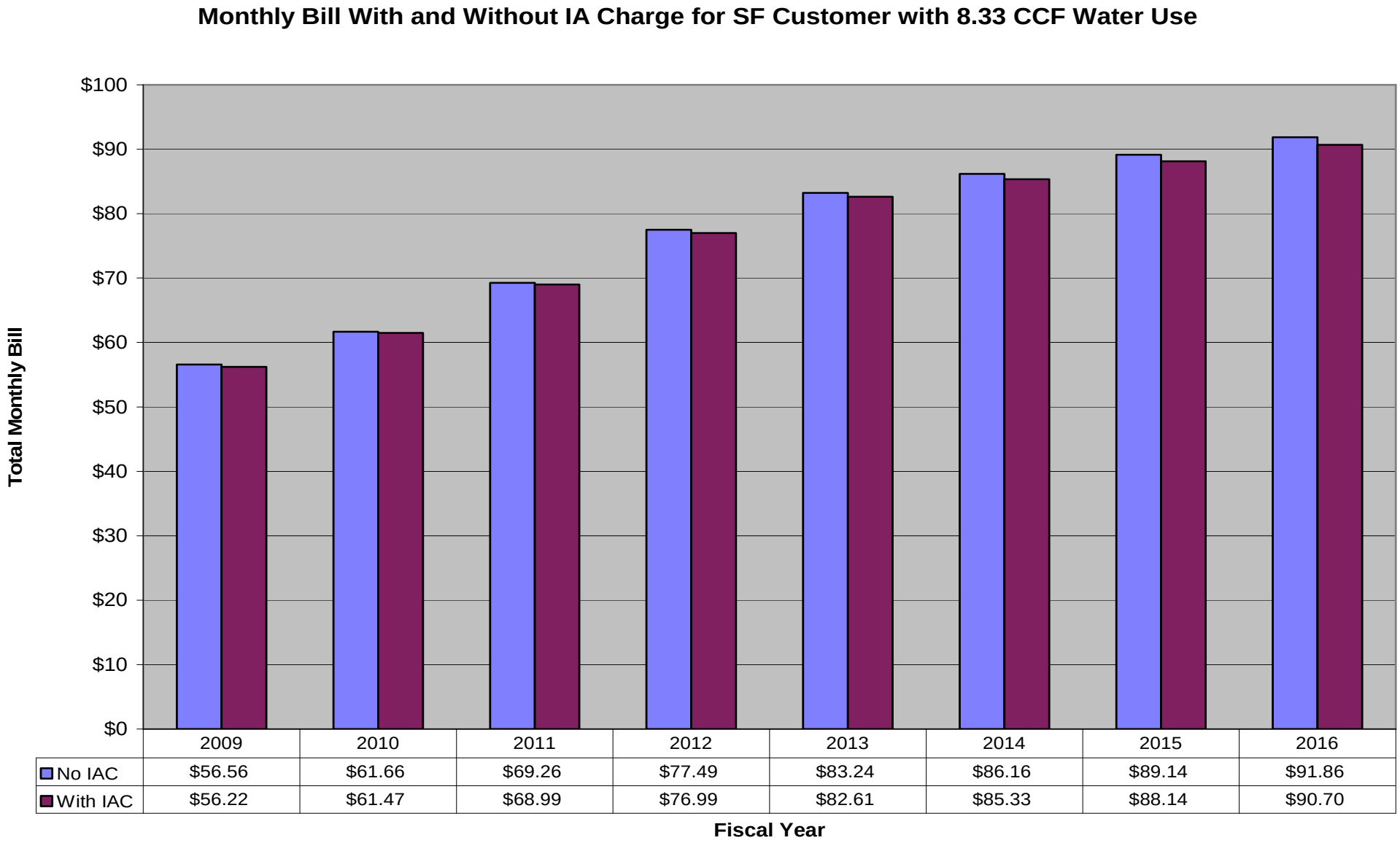
	Adopted FY 2009	Proposed May 1, 2009 w/IAC Rate	Rate Change
Exisiting Usage Rate - Water & Wastewater $/CCF*			
Water Rate	$ 2.30	$ 2.30	
Sewer Rate	$ 3.47	$ 3.31	$ (0.16)
Combined Rate	**$ 5.77**	**$ 5.61**	**$ (0.16)**
IAC Charge $/ERU	**-**	**$ 1.24**	

*1 Ccf = 748 gallons

Projected Monthly Residential IAC Charge Per ERU

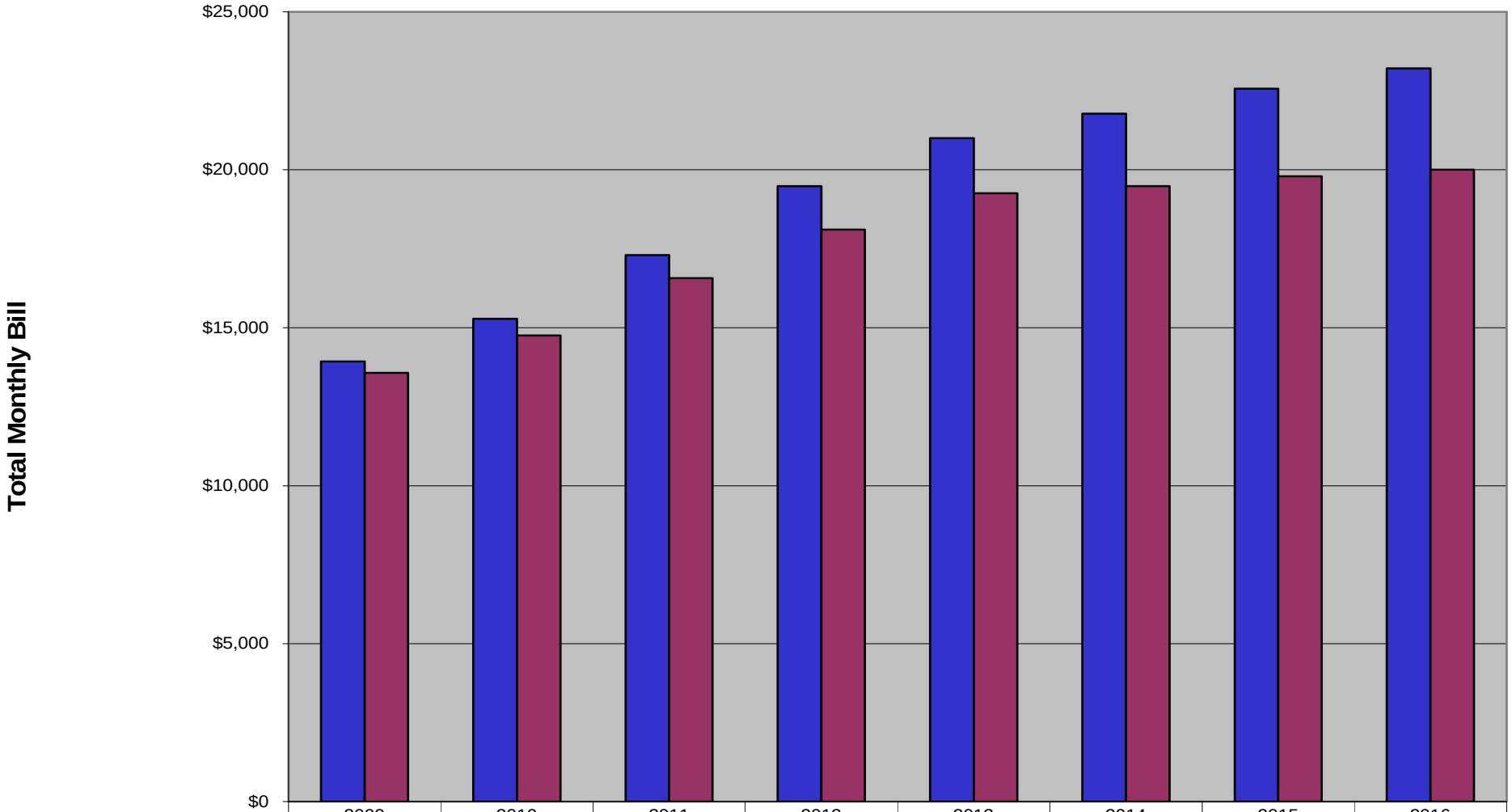


Average Monthly Bill for Residential Customer with Monthly Metered Consumption of 8.33 CCF



	2009	2010	2011	2012	2013	2014	2015	2016
No IAC	$56.56	$61.66	$69.26	$77.49	$83.24	$86.16	$89.14	$91.86
With IAC	$56.22	$61.47	$68.99	$76.99	$82.61	$85.33	$88.14	$90.70

Average Monthly Bill for Commercial Customer with Monthly Metered Consumption of 2,206.6 CCF and Impervious Area of 46,874 sq. ft. (ERUs 46.8)

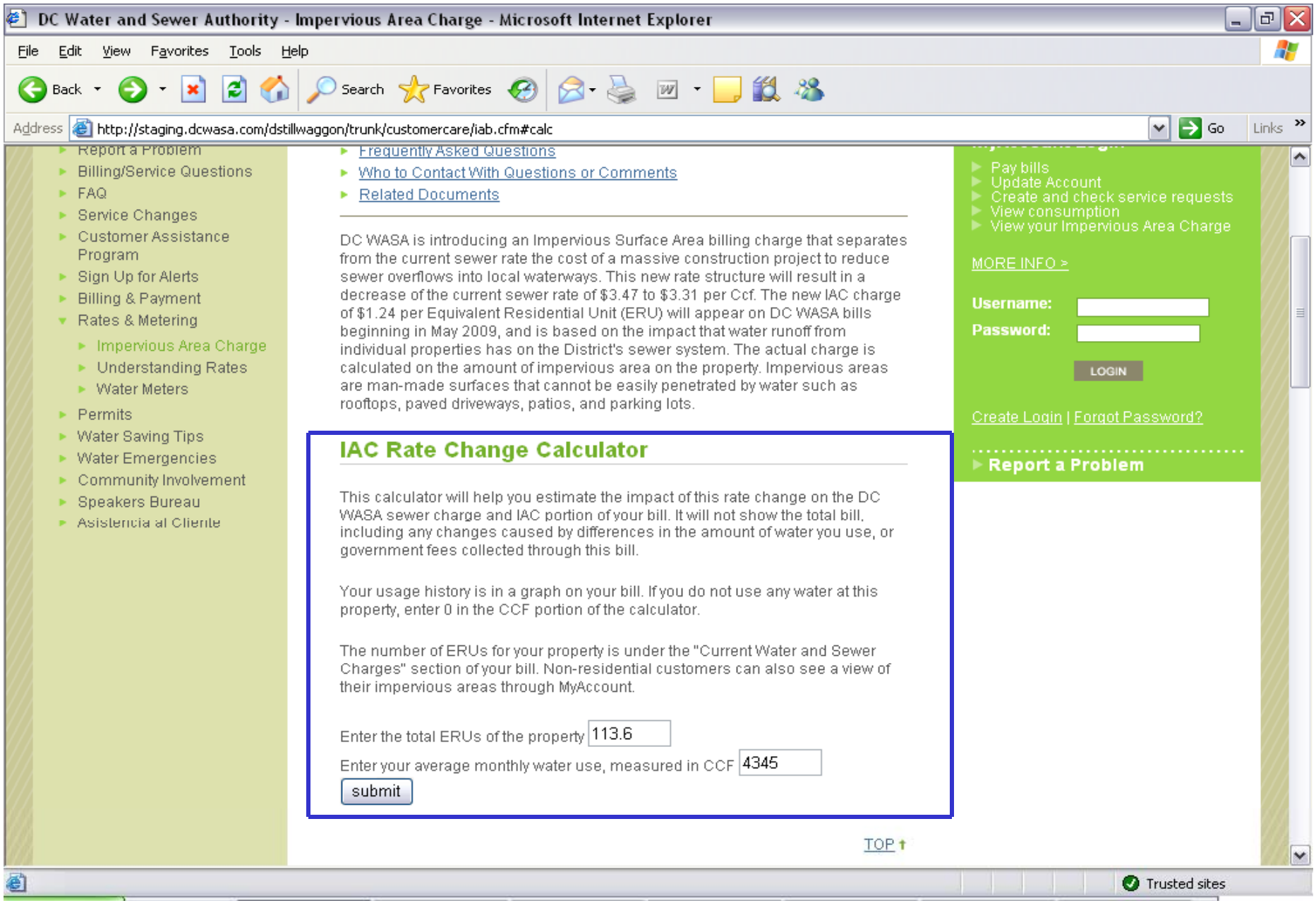


	2009	2010	2011	2012	2013	2014	2015	2016
Commercial AH-No IAC	$13,932.65	$15,284.36	$17,297.00	$19,478.02	$21,002.42	$21,775.73	$22,565.74	$23,208.79
Commercial AH-With IAC	$13,571.61	$14,752.83	$16,568.25	$18,105.01	$19,257.72	$19,480.62	$19,794.97	$20,001.74

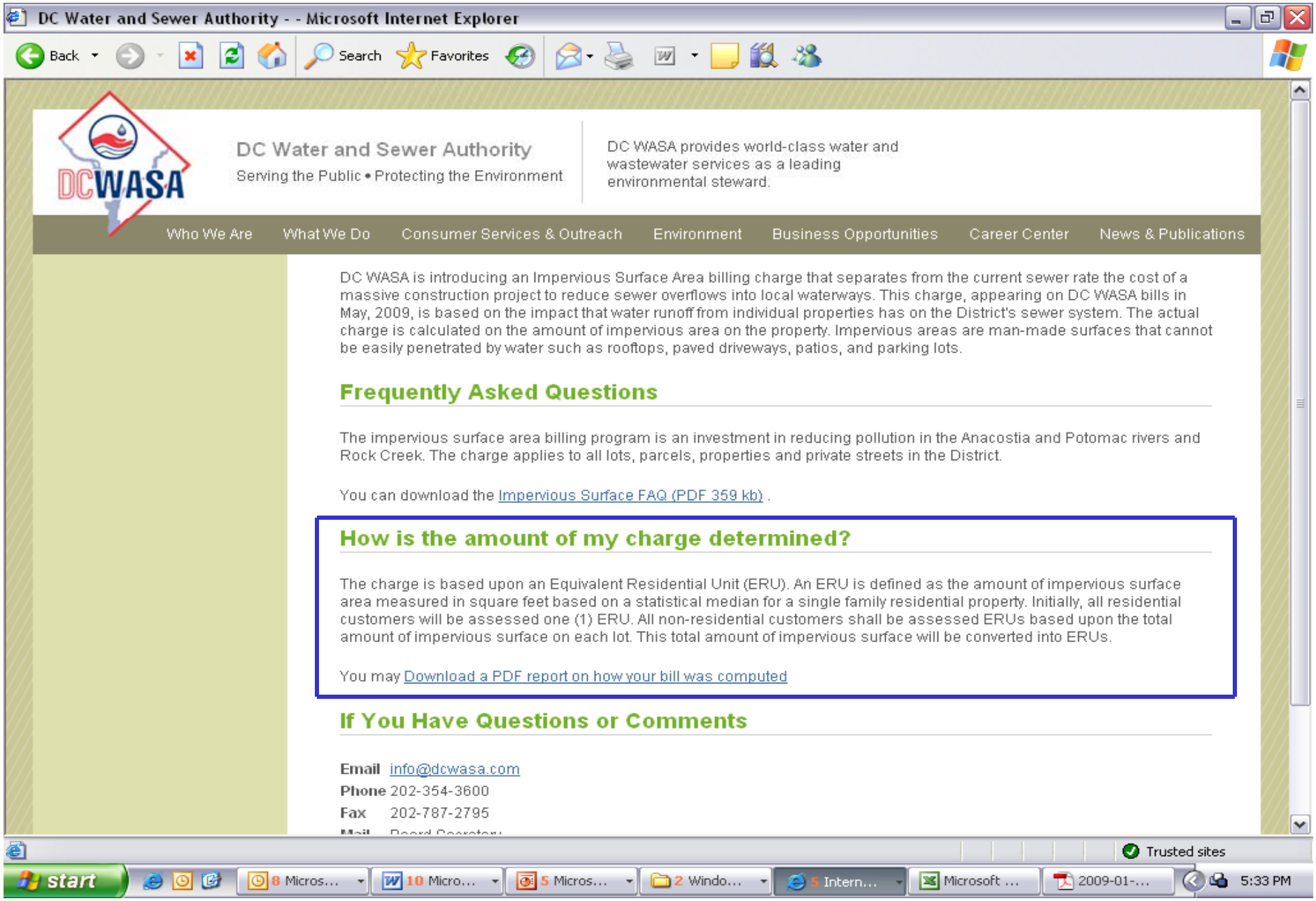
Fiscal Year

DC WASA WEBSITE INFORMATION ON IMPERVIOUS SURFACE AREA CHARGE

IAC Rate Change Calculator



My Account, Cont.



IAC Bill Determinant

Service Address:
301 BRYANT ST NW
Washington, DC 20001-1170

Premise Number (Active): 3016506
Square/Suffix/Lot: GAP 0490

Impervious Area Charge Determination

Total Impervious Area = 109,200 sq. ft
Impervious Area Charge: 109.2 ERU
Effective Date: 4/1/2009

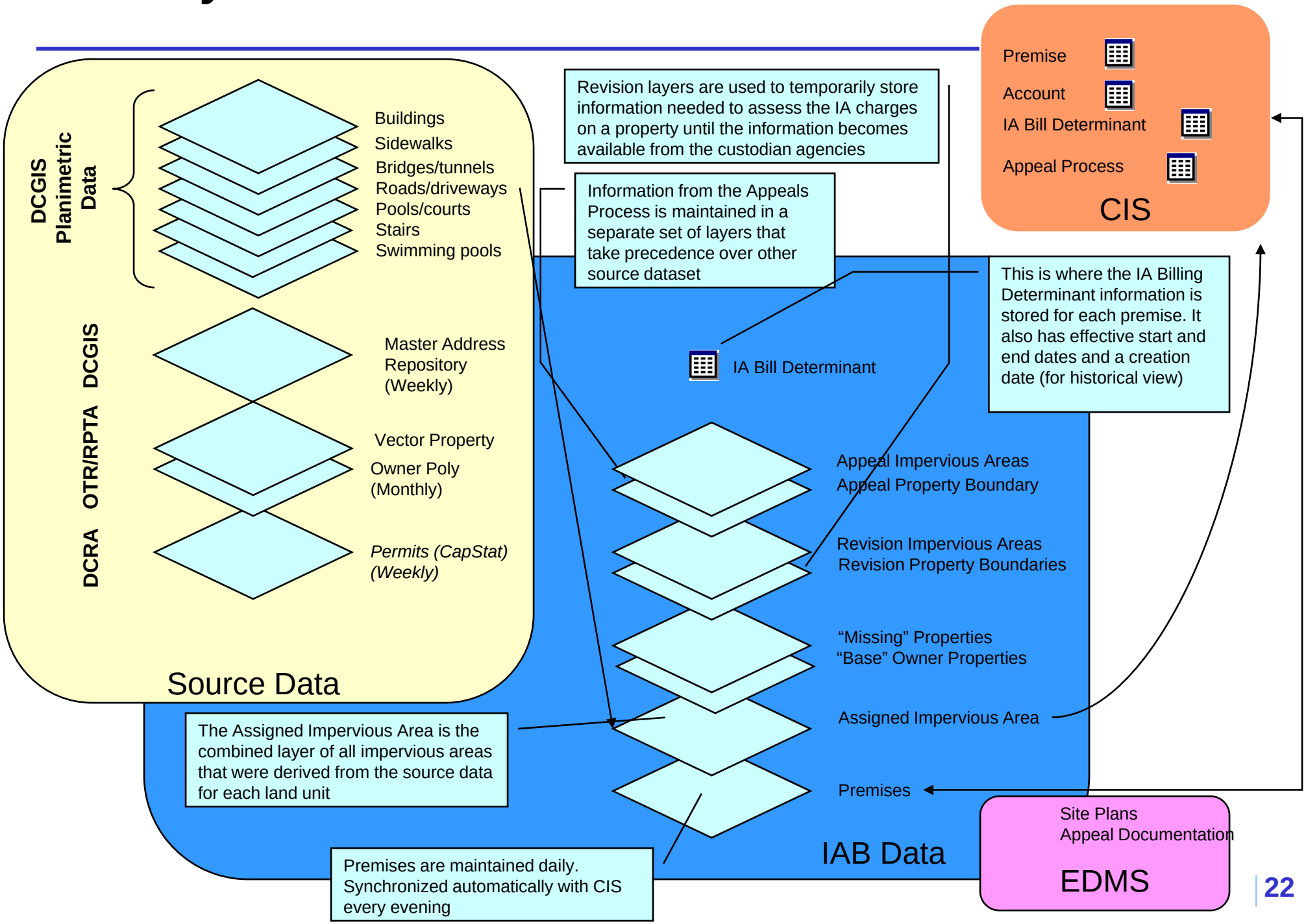
1 ERU

0 300 Feet

Building =	62,299 sq. ft	Stairs =	0 sq. ft	Property Boundary	
Road/Drive/Parking Lot =	46,815 sq. ft	Swimming Pool =	0 sq. ft	IAC Carrying Premise	
Sidewalk =	164 sq. ft	Outdoor Rec Facility =	0 sq. ft	Other Non-IAC Premise on Lot	

IMPERVIOUS AREA INFORMATION SYSTEM (IAIS)

IAIS System Context



IAIS vs CIS Responsibilities

IAIS Database

- Geo-located premise and property boundary information
- IA bill determinant information (Service Address, SSL, IA billing exemptions/hierarchy)
- Appeals Layer Property Boundary/Impervious Area information for successful appeals
- Revisions Layer information (temporary storage of information needed to assess IA charges when not available through DCGIS
- Missing Properties Layer
- Assigned impervious area to premise
- Premise information

Primary Function – Maintain Premise and Property Bill Determinant Information

CIS

- Premise status information (pending, active, inactive, purge) -- Daily synchronization with IAIS
- IA Bill determinant information - Daily synchronization
- Customer account information (e.g., billing address, outstanding balance, bill cycle, etc.)
- Service Orders
- Collections Activities
- Bill Dispute/Appeals Activities

Primary Function – Generate Bills, Maintain Customer Account and Customer Service Activities Information

Database Creation Process

- "Geocoded" all the DCWASA premises
  - Parsed and Normalized all the addresses
  - Matched against MAR
  - Matched against MAR using SSL
  - Matched against OwnerPnt using address
  - Matched against OwnerPnt using SSL
  - Matched against DDOT Streets C/L
  - Matched against TeleAtlas
  - Manually Researched and Placed

  } All of these had to be reviewed

- Purged the premises that had not billed since 2001
- Completed the land base canvas (Gap Properties)
- Created new "Impervious Only" Premises so that we had "a dot in every lot".
- Assigned the Impervious Area to each land unit
  - Total Impervious Area for the land unit is truncated to the nearest 100 sq. ft.
- Determined the "Impervious Area Charge Carrying Premise" in each land unit

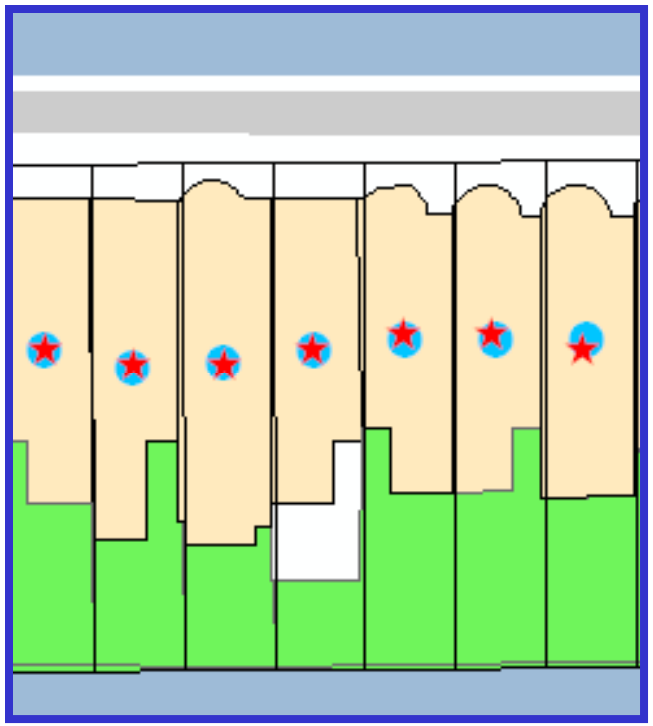
IA Types

There are six different types of IA. Each type corresponds to a DCGIS feature class:

- Buildings
  - Entire building was assigned if 80% if it's mass was in the lot
  - Some were manually assigned when it was obvious they belonged there
  - Some had to be split because the building polygons were overlapping multiple lots

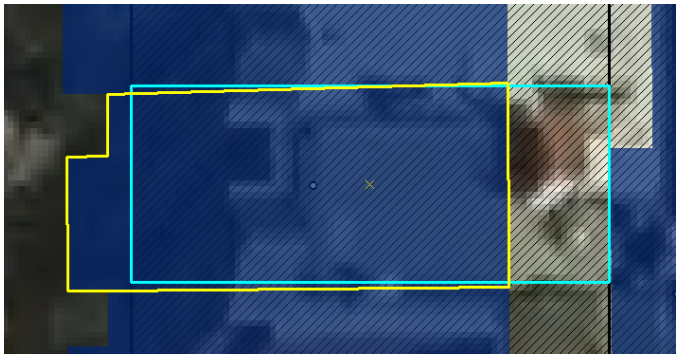
- Outdoor Recreation
- Road
- Sidewalk
- Structure
- Swimming Pool

These features were clipped at the property line



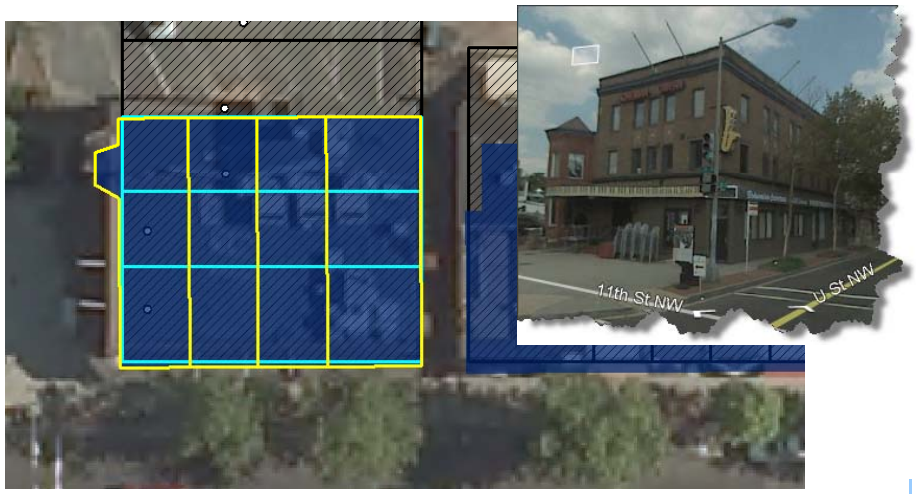
Building vs Property Issues

80% Mass Assignment Rule

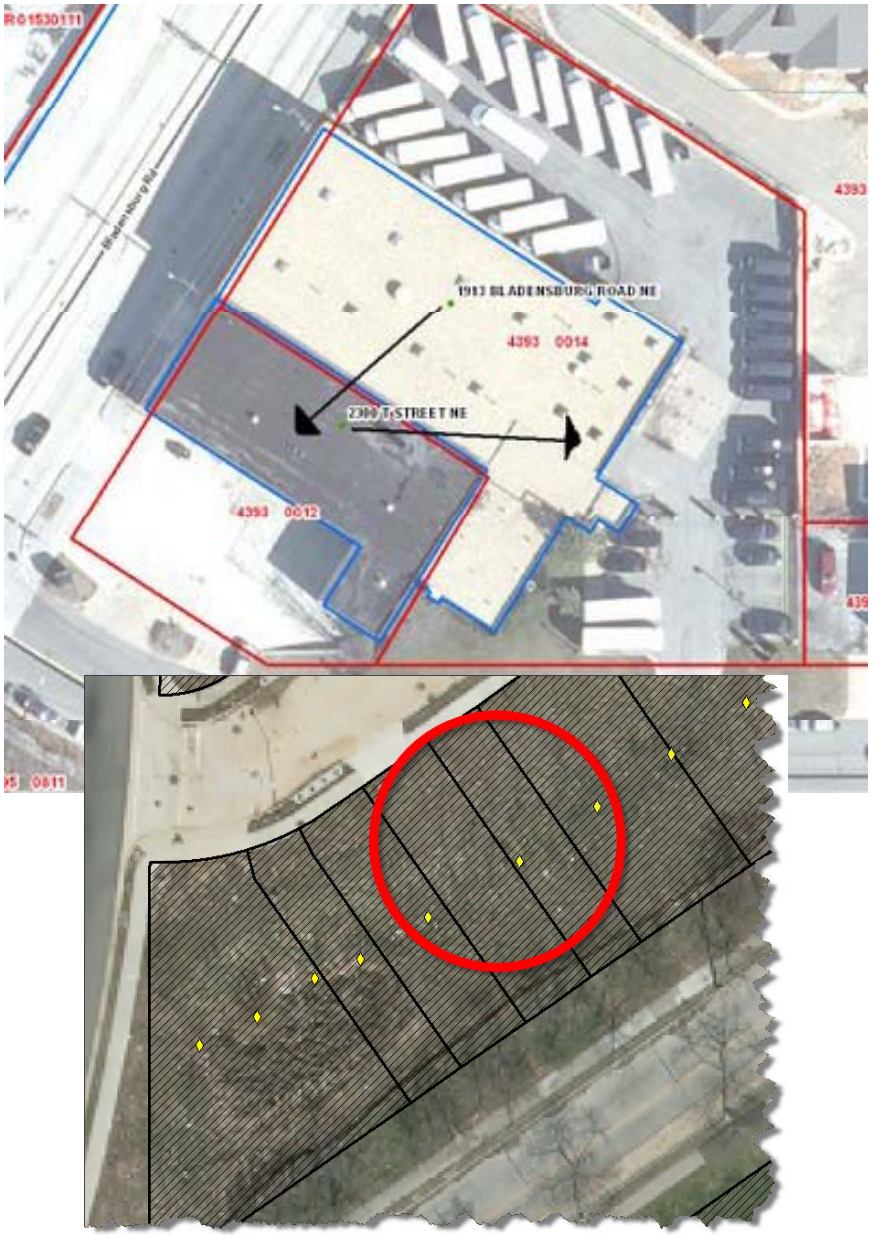


Manual Assignment Rule

Building Split Rule



MAR vs Property vs Premises Issues



Property Feature Classes

There are four parcel feature classes involved in IA assignment:

- Base Owner – BaseOwnerPly – WASA's 2D topologically correct version of OwnerPly
- Revise Owner – RevOwnerPly
- Appeal Owner - AppealOwnerPly
- Owner Gap – OwnerGapPly

Because Matt's Data isn't Perfect (yet!), we needed to cleanup a number of property conflicts (in OwnerPly) and capture 500 or so land units that were not in the database.

More Data Issues

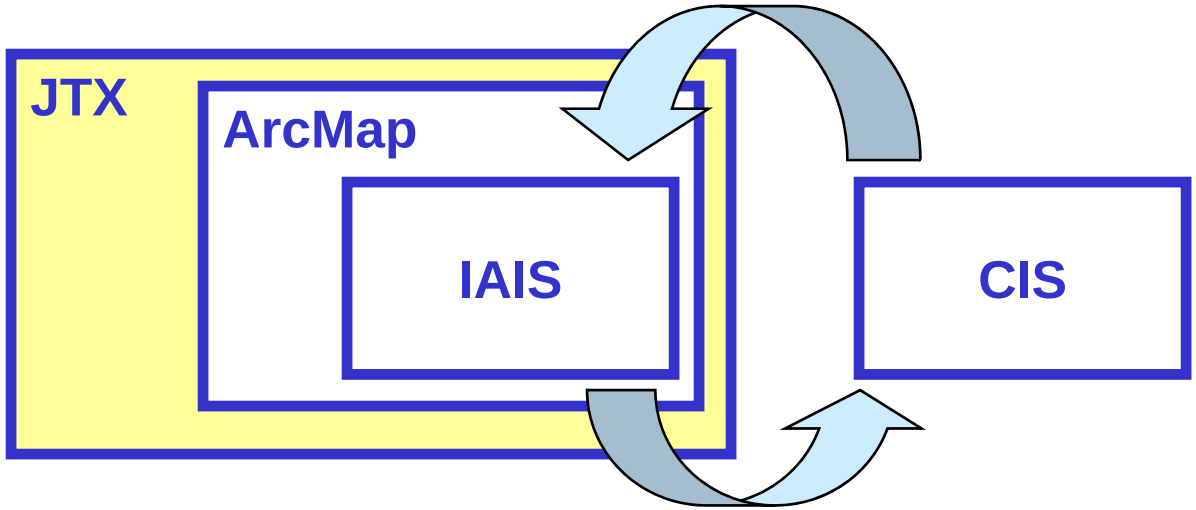
"Junk" Properties

Redevelopment

IAIS Application Design

- The IAIS Application is built on top of the ArcGIS Job Tracking Extension (JTX) Framework

  Job Tracking for ArcGIS is a workflow management application designed to improve the efficiency of any multiuser GIS project. Job Tracking for ArcGIS (JTX) provides advanced job tracking and workflow management tools

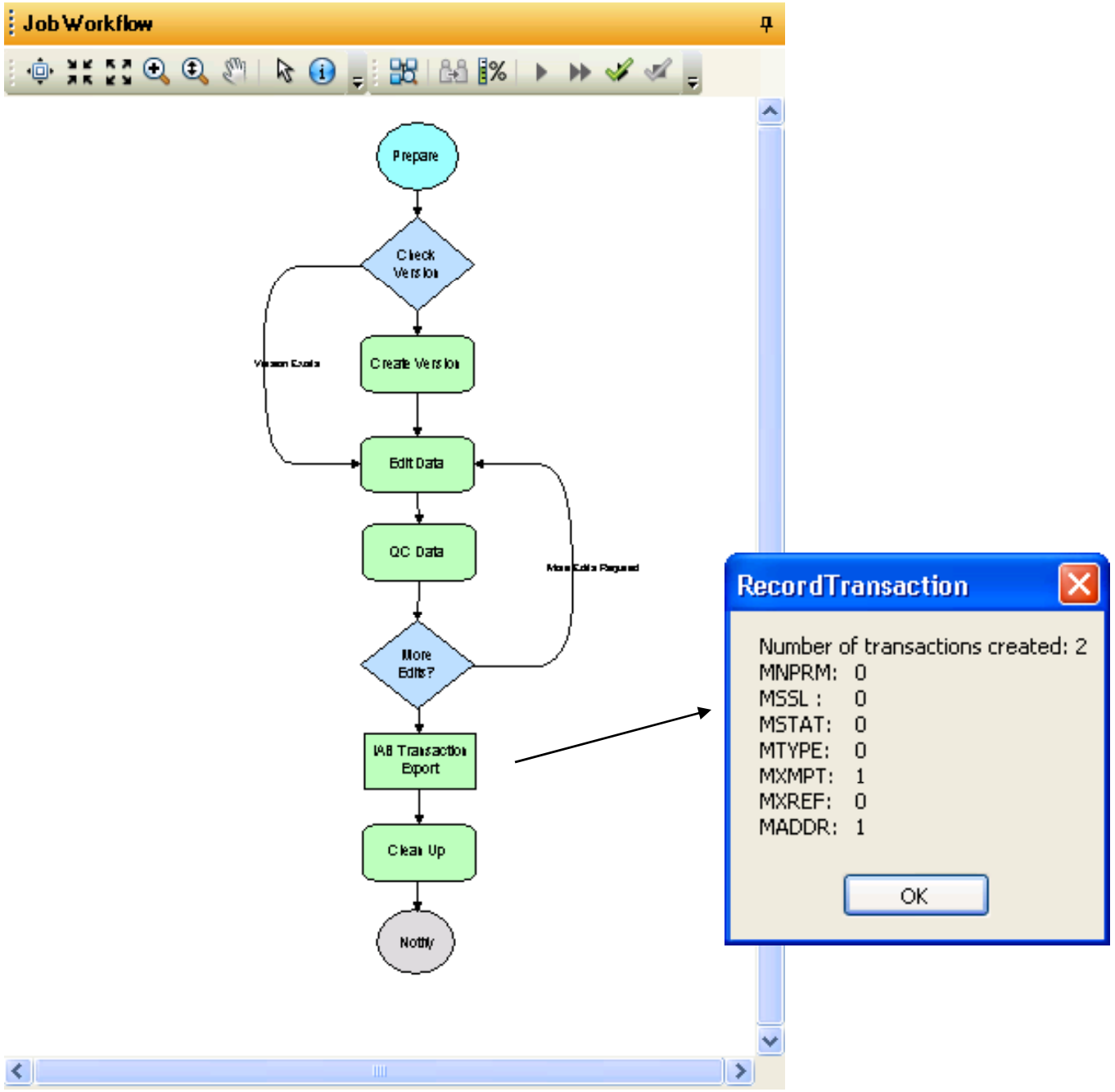


- JTX – Workflow (Job) Management
- ArcMap – Standard GIS Editing
- IAIS Tools – Premise & IA Specific Editing
- CIS – Customer Information System (Billing)

JTX Jobs vs IAC Procedures

IAC Procedure	JTX Job
4	IAC Inquiry-Report
2,3	Manage Premise
2	Setup IA Charges
6,7	Revise Property-Impervious Area
5	IAC Bill Dispute – Appeal
9	Weekly - MAR Update
10	Weekly - Property Update
1,2,3,5,6,7	Daily - IACF Export Exceptions
11	Daily - Premise Export Exceptions
3,12	Daily - Premise Import Exceptions

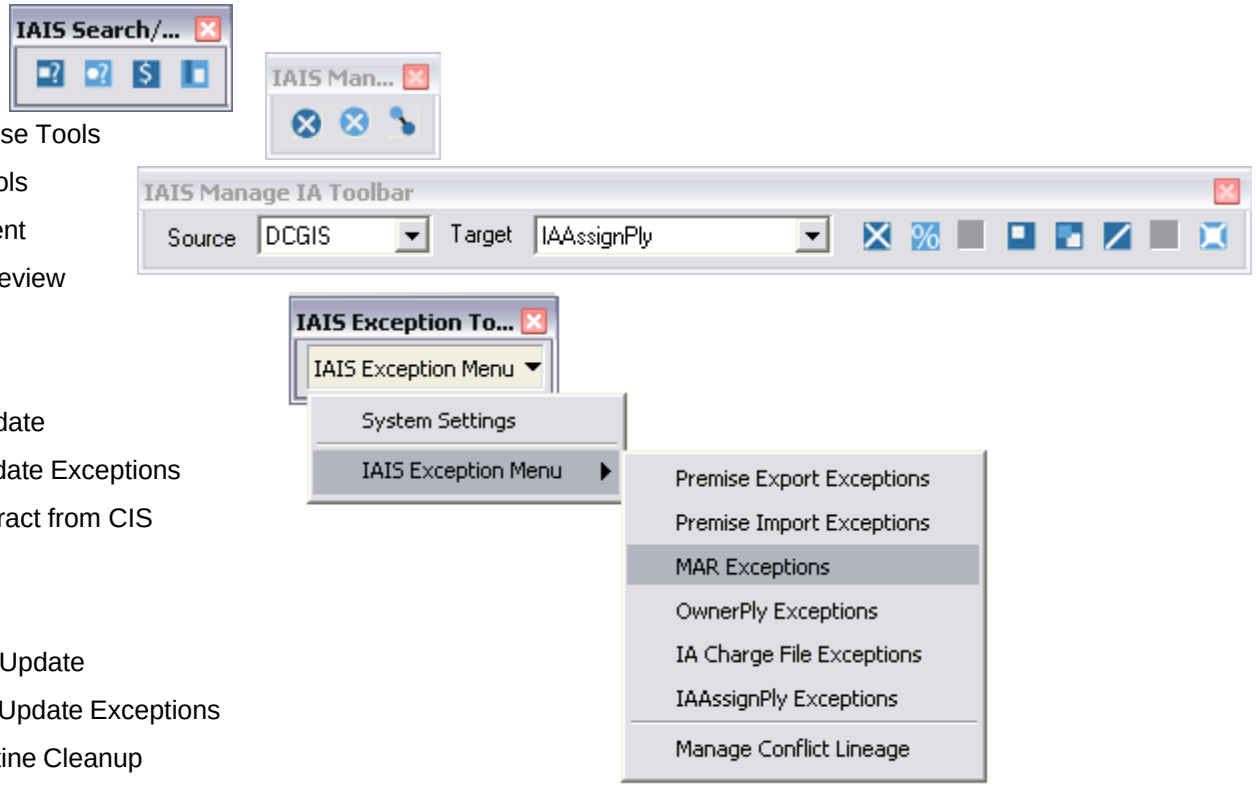
Typical JTX Workflow



IAIS Application Design

The IAIS Application is made of 3 ArcGIS Extensions and 11 batch jobs:

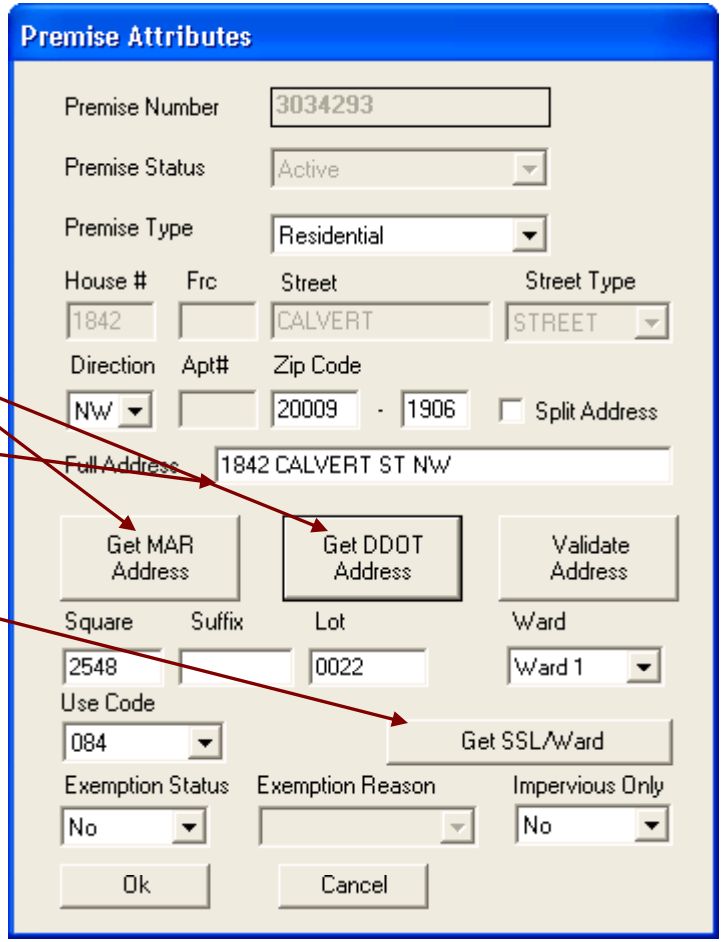
- ArcGIS Extensions
  - IAIS Query Tools
  - IAIS Manage Premise Tools
  - IAIS Manage IA Tools
    - IA Assignment
    - Exception Review



- Batch Jobs
  - Export Premise Update
  - Import Premise Update Exceptions
  - Import Premise Extract from CIS
  - Import MAR
  - Import OwnerPly
  - Export Charge File Update
  - Import Charge File Update Exceptions
  - Administrative Routine Cleanup
  - Create Bill Determinant Report
  - Download Premise Extract
  - Download DCGIS Updates

Premise Tool

- Determine or locate the Address (Service Address)
- You can use either MAR matched Address, Get MAR Address button.
- If no MAR match can be found, use Get DDOT Address button.
- If DDOT Address is not sufficient, you may manually enter an address
- SSL, Use Code, Ward are all obtained by spatial overlay



Thank You

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