Ignite
Spatial Hartford

NeURISA

AppGeo

Connecticut GIS User to User Network
A voluntary association of GIS Users

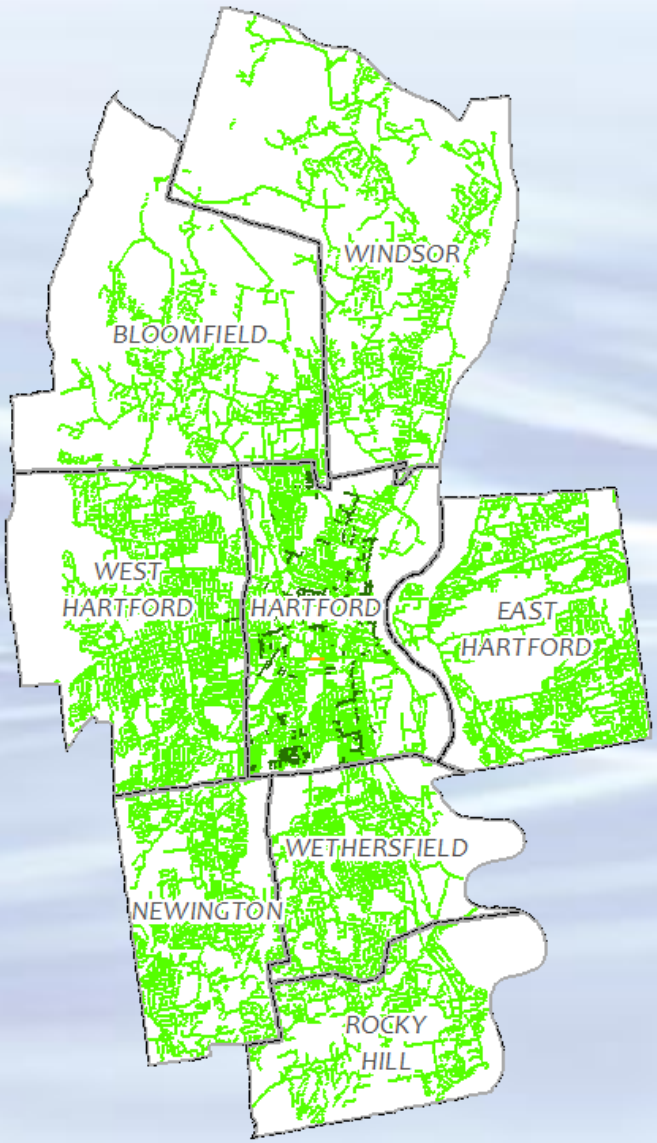
CITY OF HARTFORD
POST NUBILA PHOEBUS
CONNECTICUT

Easy Access to CCTV Data

Jim Wysor

Access to CCTV Data

- Sanitary sewer service to eight towns
  - 1,216 miles of sanitary sewer
  - Average age 51 years
  - National average 41 years
- Problems
  - Cracks/fractures
  - Holes
  - Roots
  - Deposits



Clean Water Project
the choice is clear

MDC

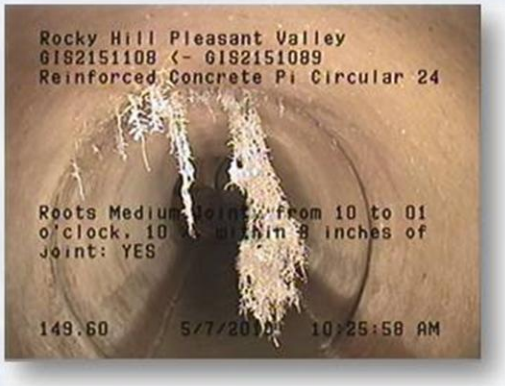
Reduce/Eliminate SSOs

- CMOM Compliance
  - Capacity, Management, Operations, and Maintenance
  - Regulate Sanitary Sewer Overflows (SSO)
- CCTV Inspect 8% (96 miles) of system each year

What is CCTV?

- Closed Circuit Television
- Send self propelled camera through sewer main with near 360° view
- Document condition of pipe

  (cracks, infiltration, vermin)
- Uses:
  - Project Inspections
  - Pre/Post Pipe Rehabilitation
  - Maintenance Planning

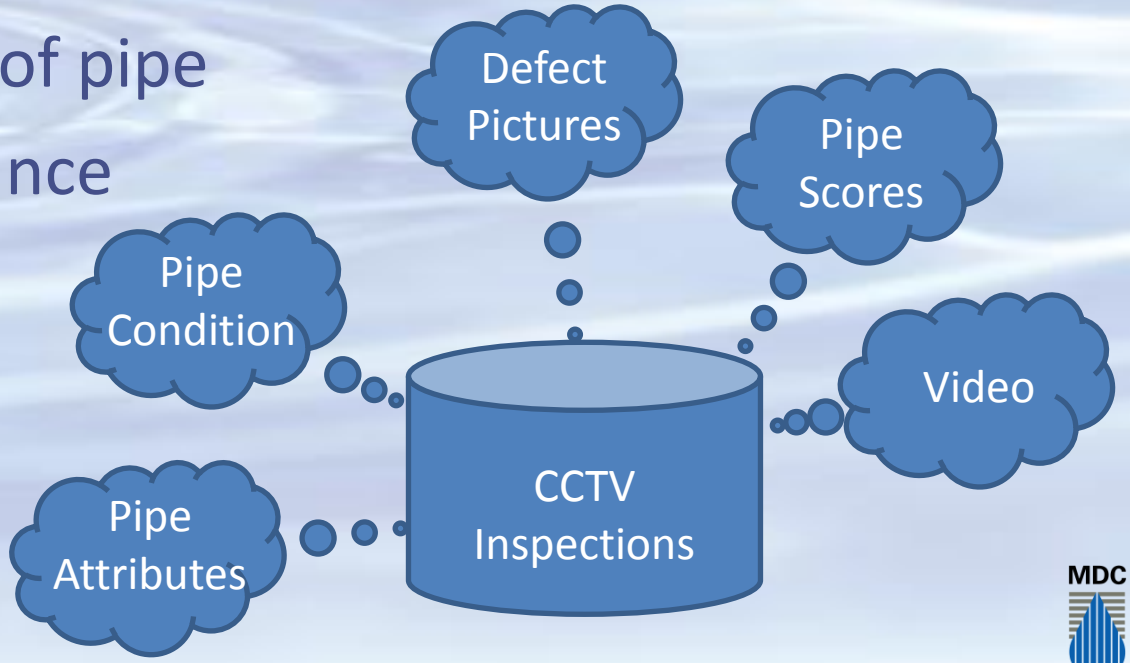


Clean Water Project
the choice is clear

MDC

Advantages of CCTV

- Minimal traffic disruption
- No Digging
- Safe
- Lots of data
  - Simple 1 – 5 rating of pipe
  - Proactive maintenance



Clean Water Project
the choice is clear

MDC

Access to CCTV Data

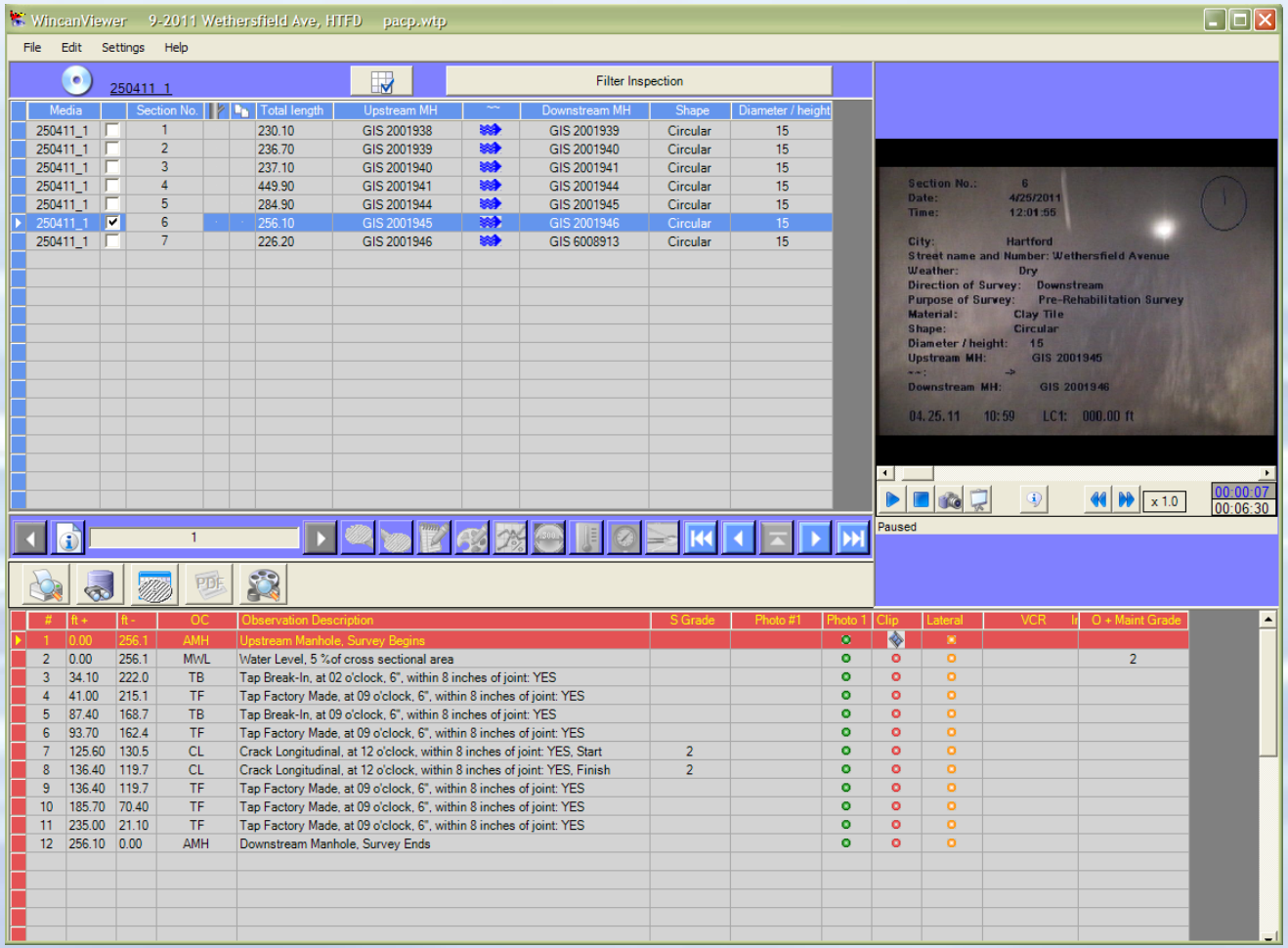
- Point and Click Access to all CCTV Information
  - CCTV status
  - CCTV log report
  - DVD
  - Photos
  - Query the GIS (draw a polygon or query by year)
  - Query the GIS for pipe index = *N*
  - Include all future/past CCTV data
- You have 5 days

Current Situation

- CCTV data prior to 2009
  - Not included, yet
- 500 GB External Hard Drive
  - 2009 and 2010 only (495 GB)
  - Individual project databases
  - Not networked
  - Stored offsite
  - 1 person access
  - Video on DVD and hard drive

Current Situation

- WinCan Viewer Required
- Need access to external hard drive
- Nice integration of observations, pictures, and video
- No search or spatial or attribute query capabilities

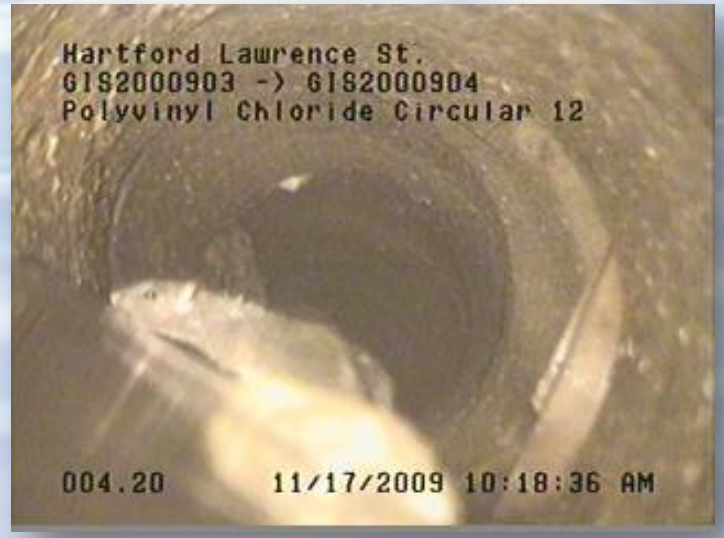


Clean Water Project
the choice is clear

MDC

Current Situation

- CCTV Log Files
  - Nice summary report
  - Can show pictures
  - Manually printed



City : Hartford

MDC
125 Maxim Rd
Hartford, CT
Tel: 860.278.7850
Fax: 860.251.7260
E-mail: www.mdc.net

Inspection Report / Inspection: 1

Date	P/O. No.	Weather	Surveyor's Name	Pipe Segment Reference	Section No.
4/25/2011		Dry	James Sanches		6
Certificate No.	**Survey Customer**	**System Owner**	**Date Cleaned**	**Pre-Cleaning**	**Sewer Category**
U-409-8596				Not Known	

Street123	Wethersfield Avenue	Use of Sewer	Combined	Upstream MH	GIS 2001945
City	Hartford	Drainage Area	HWPCF	Dowstream MH	GIS 2001946
Loc. details	amesite	Flow Control	Not Controlled	Dir. of Survey	Downstream
Location Code	Main Highway - Suburban/Rural	Length surveyed	256.10 ft	Section Length	256.10 ft

Purpose of Survey	Pre-Rehabilitation Survey	Joint Length	
Year Laid		Dia./Height	15.00 inch
Year Rehabilitated		Material	Clay Tile
Tape / Media No.	9	Lining Method	

Add. Information :

1:615	Position		Code	Observation	MPEG	Photo	Grade
GIS 2001945	0.00		AMH	Upstream Manhole, Survey Begins	00:00:00		
	0.00		MWL	Water Level, 5 %of cross sectional area	00:00:00		M 2
	34.10		TB	Tap Break-In, at 02 o'clock, 6", within 8 inches of joint: YES	00:01:04		
	41.00		TF	Tap Factory Made, at 09 o'clock, 6", within 8 inches of joint: YES	00:01:22		
	87.40		TB	Tap Break-In, at 09 o'clock, 6", within 8 inches of joint: YES	00:02:15		
	93.70		TF	Tap Factory Made, at 09 o'clock, 6", within 8 inches of joint: YES	00:02:34		
	125.60	S1	CL	Crack Longitudinal, at 12 o'clock, within 8 inches of joint: YES, Start	00:03:18		S 2
	136.40	F1	CL	Crack Longitudinal, at 12 o'clock, within 8 inches of joint: YES, Finish	00:03:43		S 2
	136.40		TF	Tap Factory Made, at 09 o'clock, 6", within 8 inches of joint: YES	00:03:45		
	185.70		TF	Tap Factory Made, at 09 o'clock, 6", within 8 inches of joint: YES	00:04:46		
	235.00		TF	Tap Factory Made, at 09 o'clock, 6", within 8 inches of joint: YES	00:05:50		
GIS 2001946	256.10		AMH	Downstream Manhole, Survey Ends	00:06:26		

QSR	QMR	SPR	MPR	OPR	SPRI	MPRI	OPRI
2200	2100	4	2	6		2	2

9-2011 Wethersfield Ave, HTFD // Page: 1

Clean Water Project
the choice is clear

MDC

Our mission…

Engineer Requirements

CCTV Status
- Yes/No

CCTV Log Report

Video and Pictures
- # and Location
- hyperlink

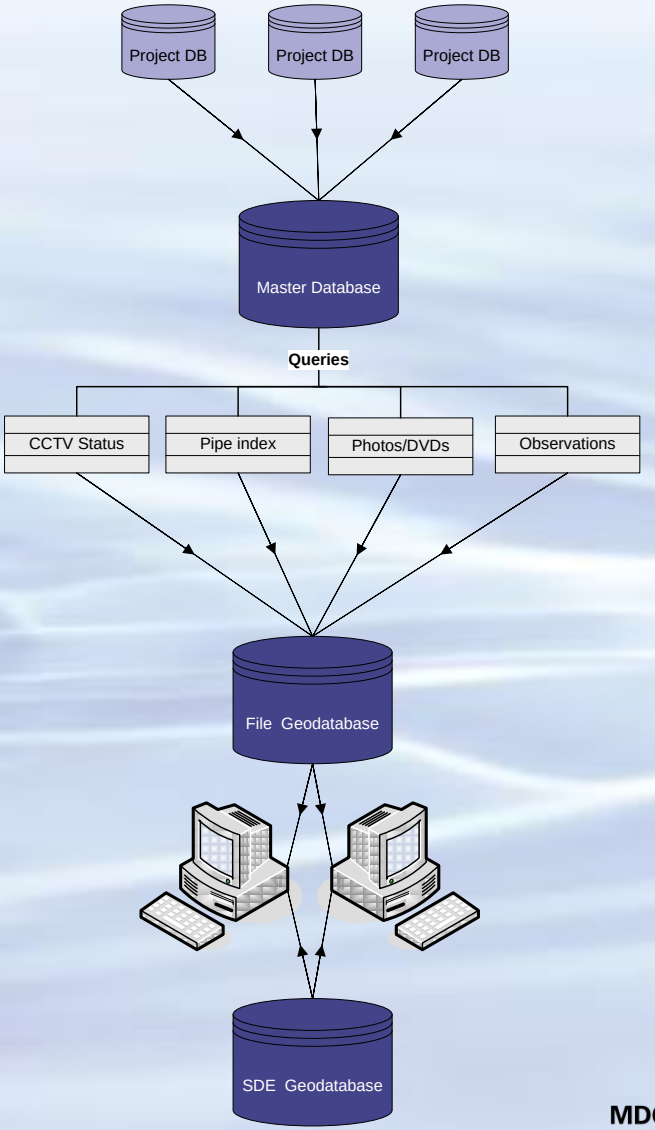
Query
- By Pipe Index
- By CCTV date
- Spatial

Clean Water Project
the choice is clear

MDC

Our Approach

- Create Master Database
- Queries to hold key info
  - CCTV status
  - Pipe Index
  - Hyperlink to photos & DVD
  - Observations
  - ~~PDF Log Files~~
- Use Pipe ID for relating/joining queries to sewer main feature class

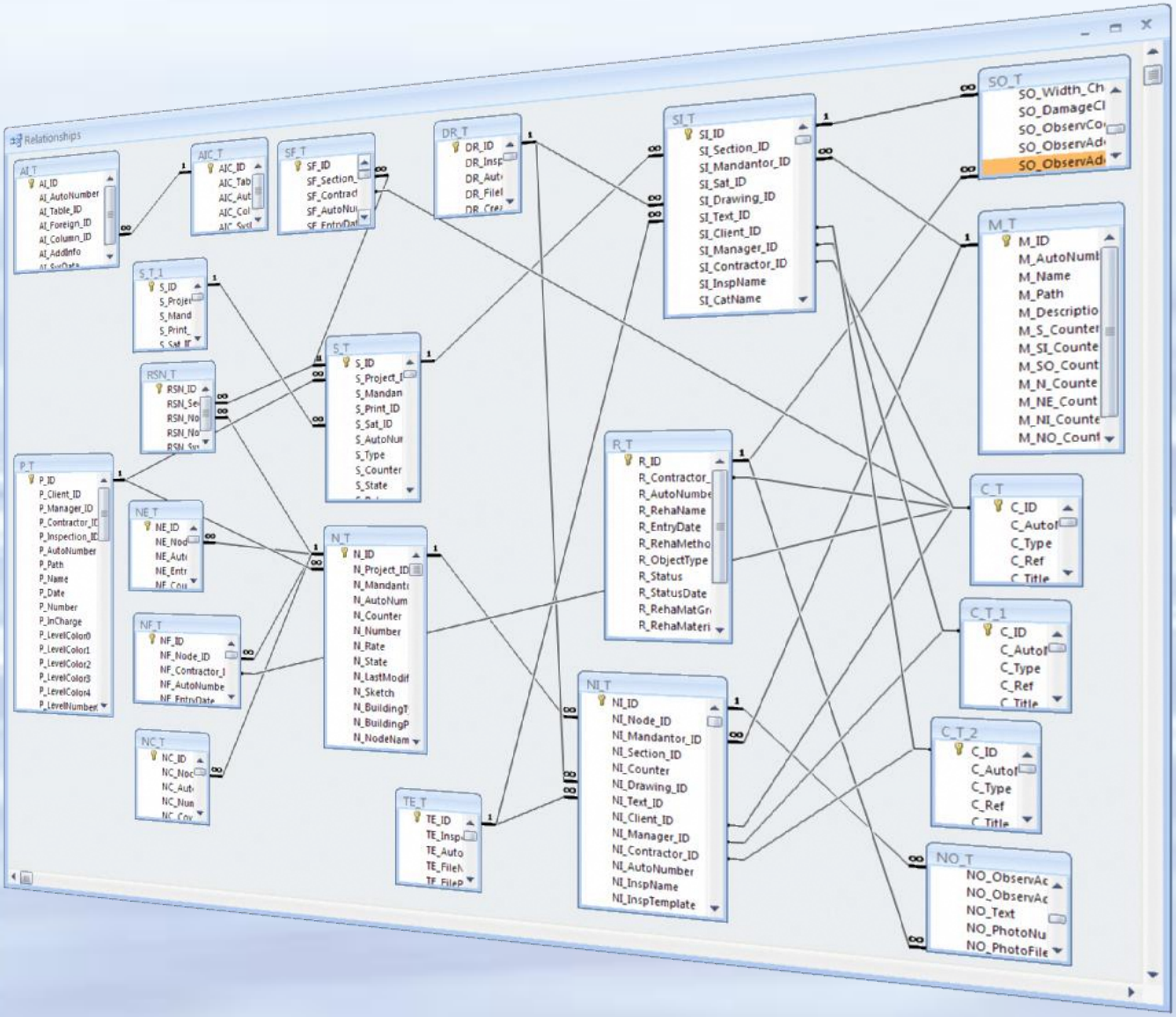


Clean Water Project
the choice is clear

MDC

Then we looked at the data…

- 1507 databases
- 23 tables
- 1458 fields

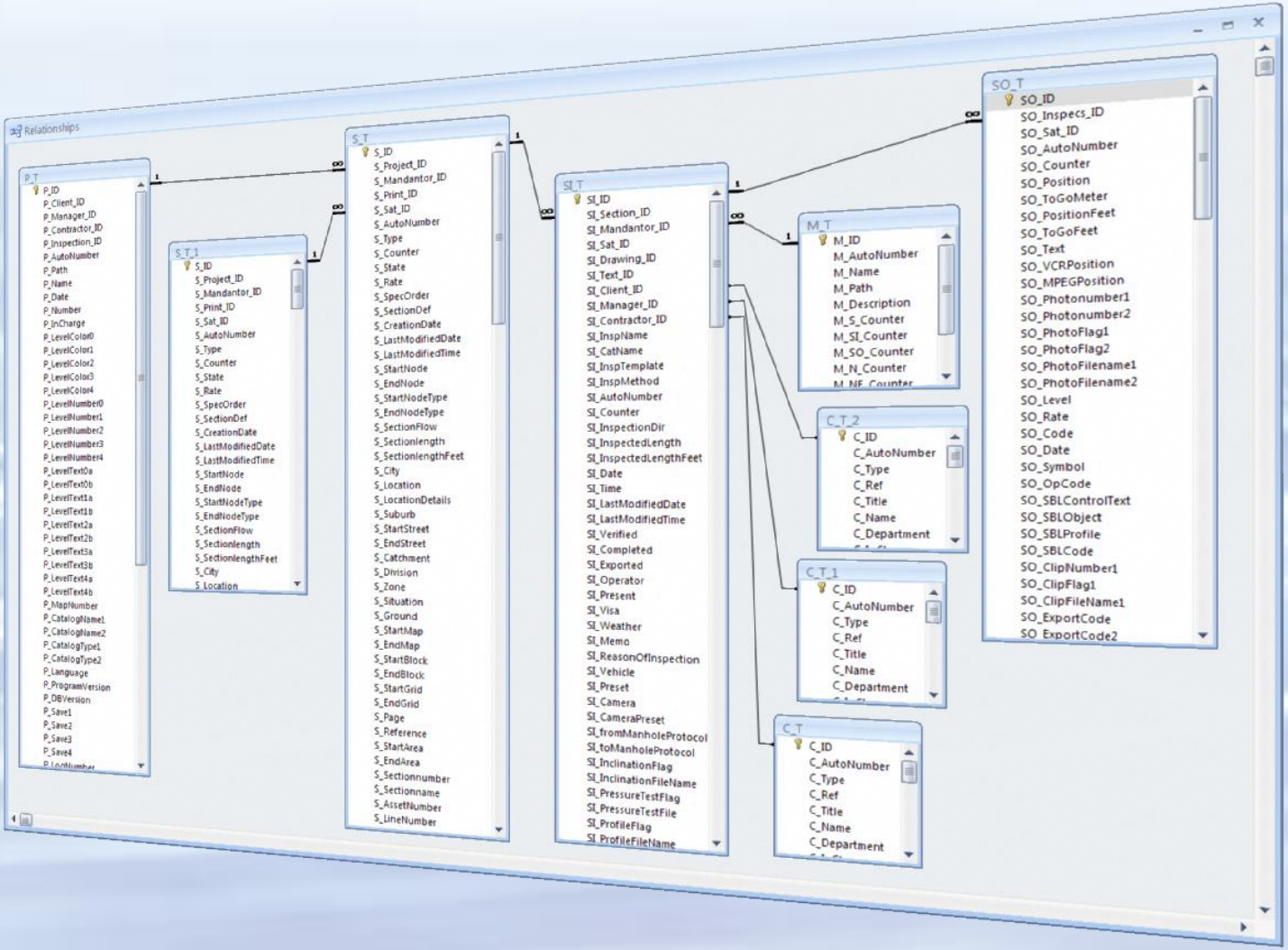


Clean Water Project
the choice is clear

MDC

It’s not so bad…

- 650 project databases
- 5 tables
  - 3 required
- 536 fields
  - 97 populated
  - Only 20 needed
- SQL *Insert Into* to create on DB



Clean Water Project
the choice is clear

MDC

Not so fast…

- Data clean up
- Key field poorly populated
  - 2300 records
  - 707 with pipe id
  - Calculate from/to MH
- Lots of typos
  - From/to MH lots of errors
- Pictures no unique file name

Almost there…

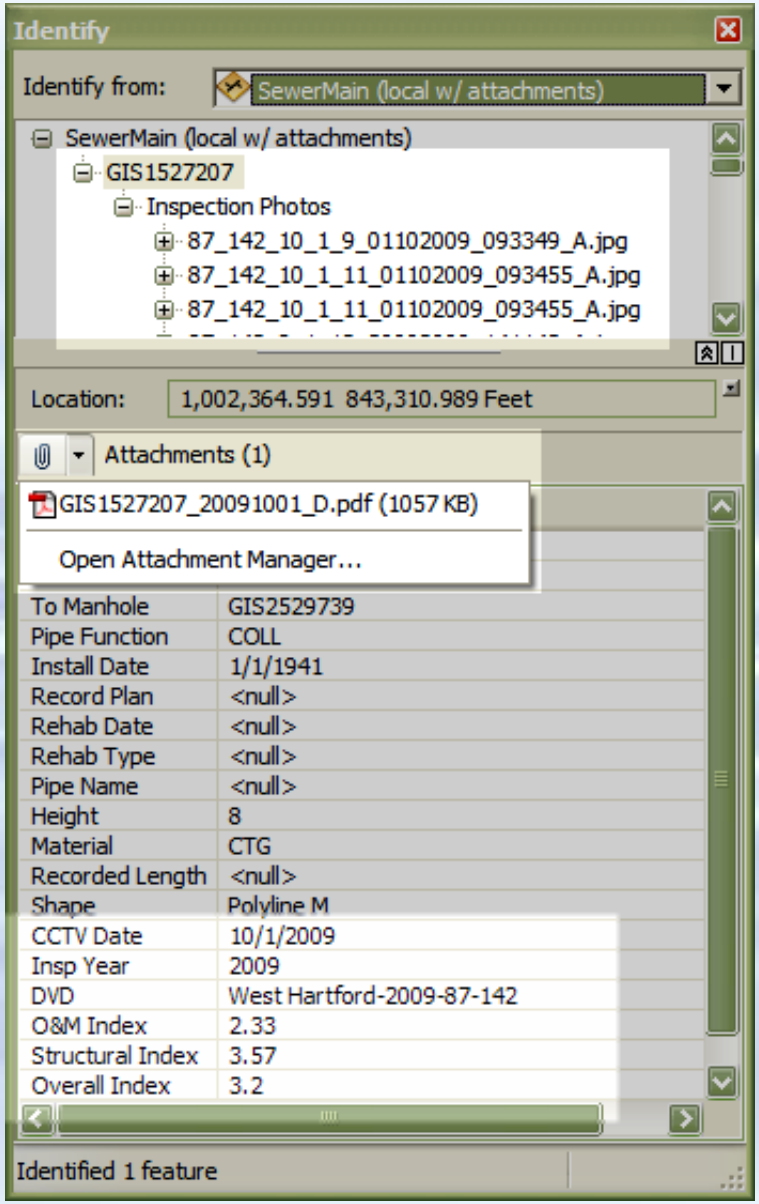
- Clean database, mostly
- 1772 Pipe Ids from existing data
- Three primary queries
  - Picture/videos
  - CCTV Observations
  - Pipe Ratings

Clean Water Project
the choice is clear

MDC

We made it!

- ✔ CCTV Status
- ✔ DVD Location
- ✔ Pipe Index
- ✔ (CCTV Log)



Clean Water Project
the choice is clear

MDC

Defect Severity

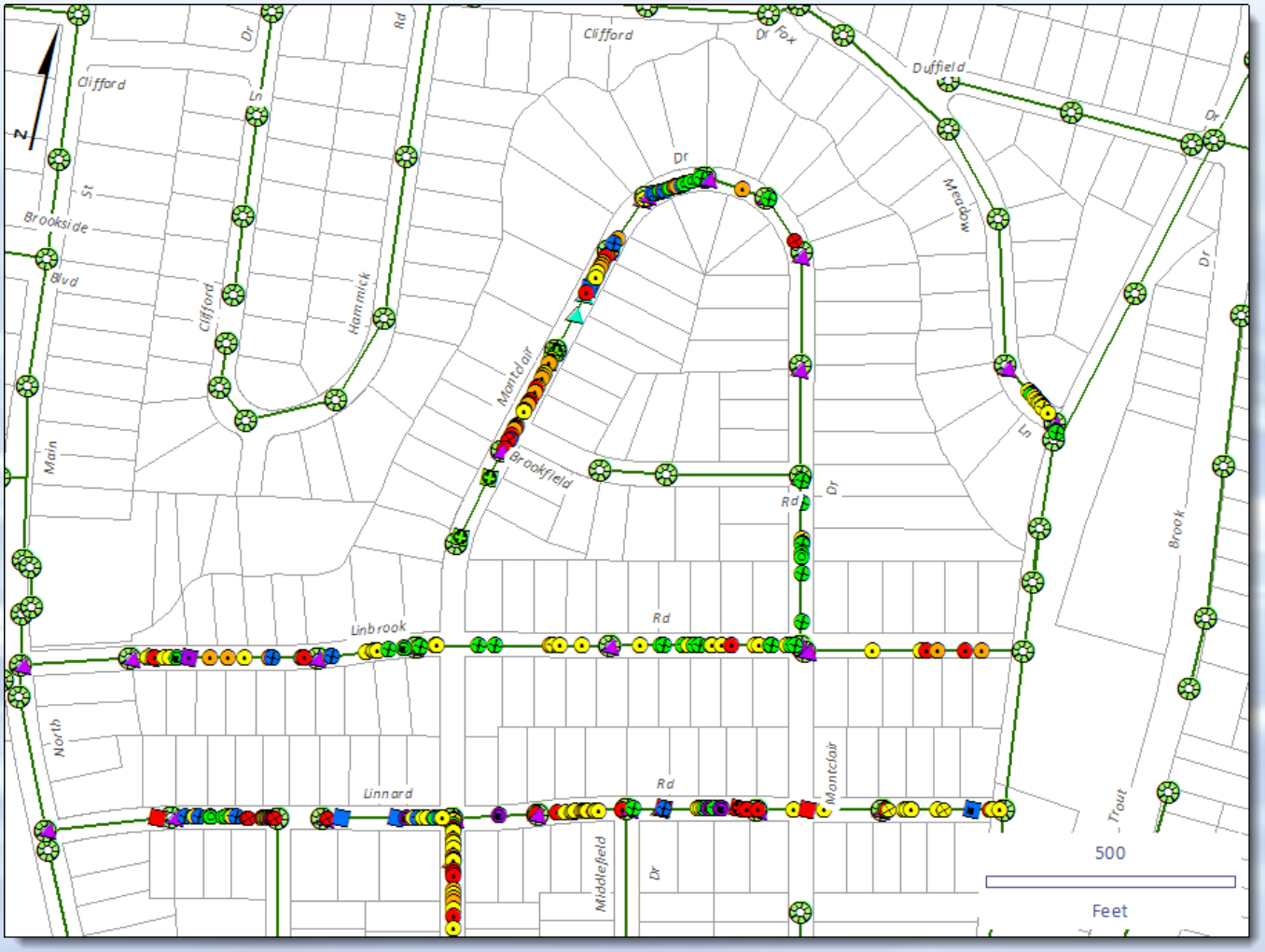
- Pipe Index
  - 1: Failure unlikely
  - 2: Unlikely to fail for 20 years
  - 3: May fail in 10 – 20 years
  - 4: Will fail in 5 – 10 years
  - 5: Has or will fail within 5 years

Clean Water Project
the choice is clear

MDC

Observations

- Linear Referencing
  - Display individual observations
  - Operational and Maintenance
  - Structural

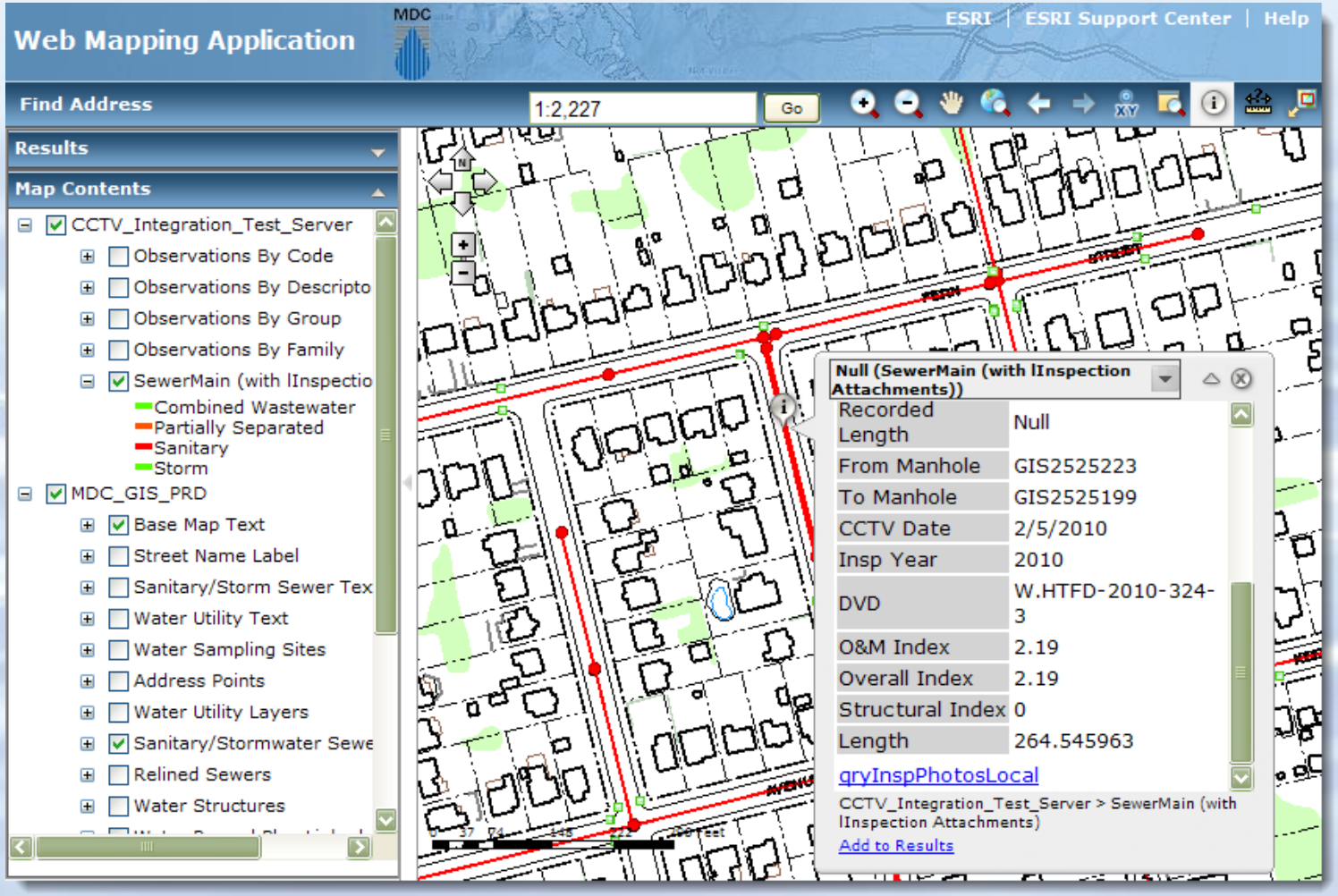


Clean Water Project
the choice is clear

MDC

Getting away from the desktop…

- Deployed via ArcGIS Server
- Improve access
- Same information



Clean Water Project
the choice is clear

MDC

What did we learn?

- Keep it simple
  - Pipe ratings
  - Pictures
- Nobody looks at the videos
  - Avoid network issues associated with viewing and storage
- Log files are nice, but duplicative
  - Information already in database
- Linear referencing of observations is nice, but not necessary

Next Steps

- WinCan modules
  - Multiple Inspections
  - GIS/Query
  - WinCan Map
- Tools to automate queries and selections

Ignite
Spatial Hartford

NeURISA

AppGeo

Connecticut GIS User to User Network
A voluntary association of GIS Users

CITY OF HARTFORD
POST NUBILA PHOEBUS
CONNECTICUT

Easy Access to CCTV Data

Jim Wysor