



## City of Markham Case Study

A Municipal point of view and  
challenges to identify and rectify  
cross bores

# Storm Sewer Condition Assessment

## Project Team

- Robert Muir, M.A.Sc., P.Eng.
  - Manager, Stormwater (AM Department)
- Philip Zhang, P.Eng.
  - Engineering Design Assistant (AM Department)
- Robert Maritzel, C.E.T.
  - Technical Coordinator (Operations)
- Tanya Stephens, A.Sc.T., GIS (pg)
  - TDS Consulting, NASSCO Trainer

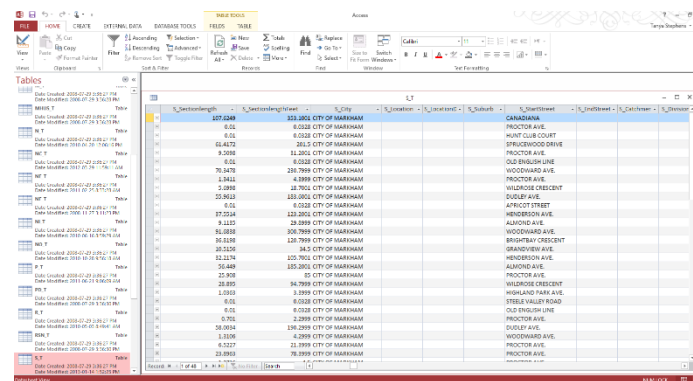
# Storm Sewer Condition Assessment

CCTV contracts help determine the internal condition of pipe by reporting observed defects in a standard coding method. Codes are recorded to capture defect type, severity, and length of occurrence.

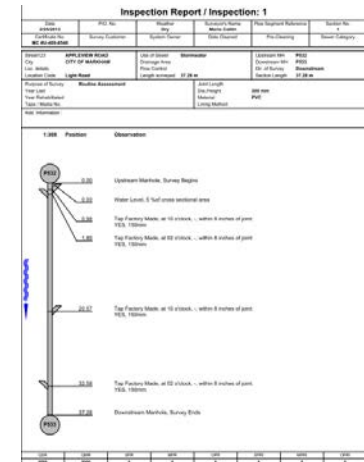
## Deliverables:



Video File



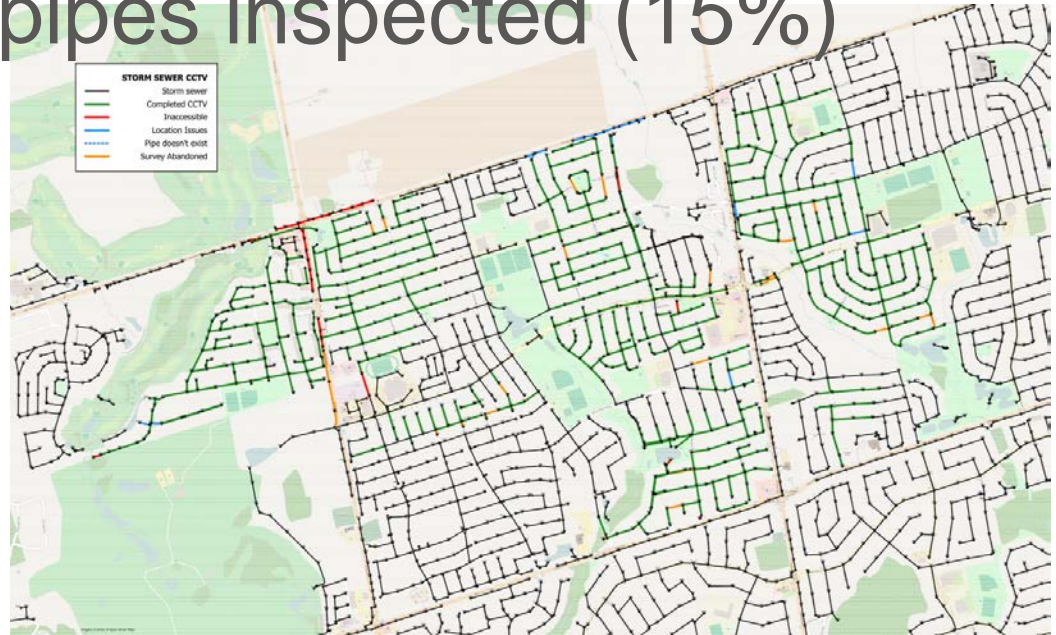
Database (.mdb)



Report (.pdf)

# Storm Sewer CCTV Contract

- 2012-2014 CCTV (7 year cycle)
- 2367 of 16306 pipes inspected (15%)



# Storm Sewer CCTV Contract

- NASSCO's Pipeline Assessment Certification Program (PACP) standard
- OBI condition grade 5



Courtesy of NASSCO

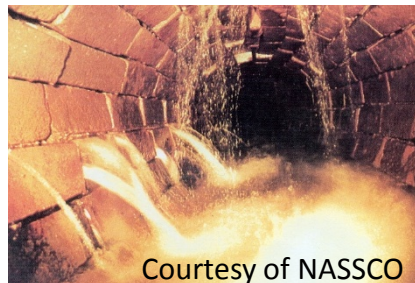
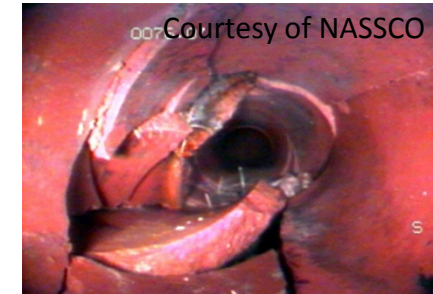
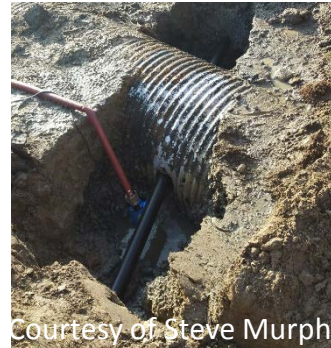
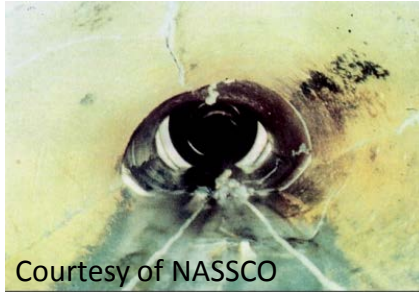
**Damage (holes) must  
also be coded and  
report cross bores  
immediately!**



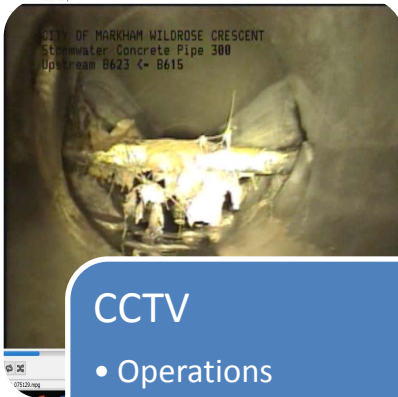
# Grade 5 Defects

Prioritize using PACP Quick Rating

- OBI
- X
- D
- HSV / HVV
- BSV / BVV
- DI
- SRP / SRC / SMW
- IG
- Blockages >30%
- MWLS >75%



# Decision Making Process



## CCTV

- Operations
- Maintenance
- Work Orders
- O&M Budget



## Asset Management

- Database
- GIS
- Criticality/Priority/Risk

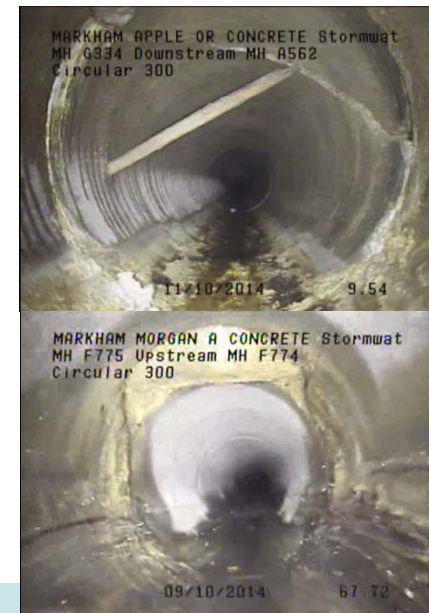
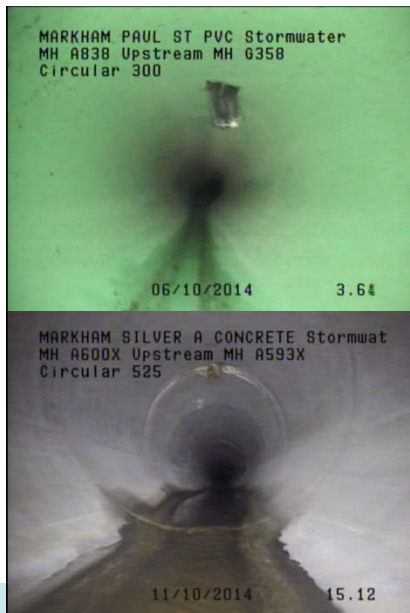


## Capital Plan

- Repair/Replace

# Storm Sewer Asset Management

- 6 potential cross bores found
- \$500,000 annual repair budget



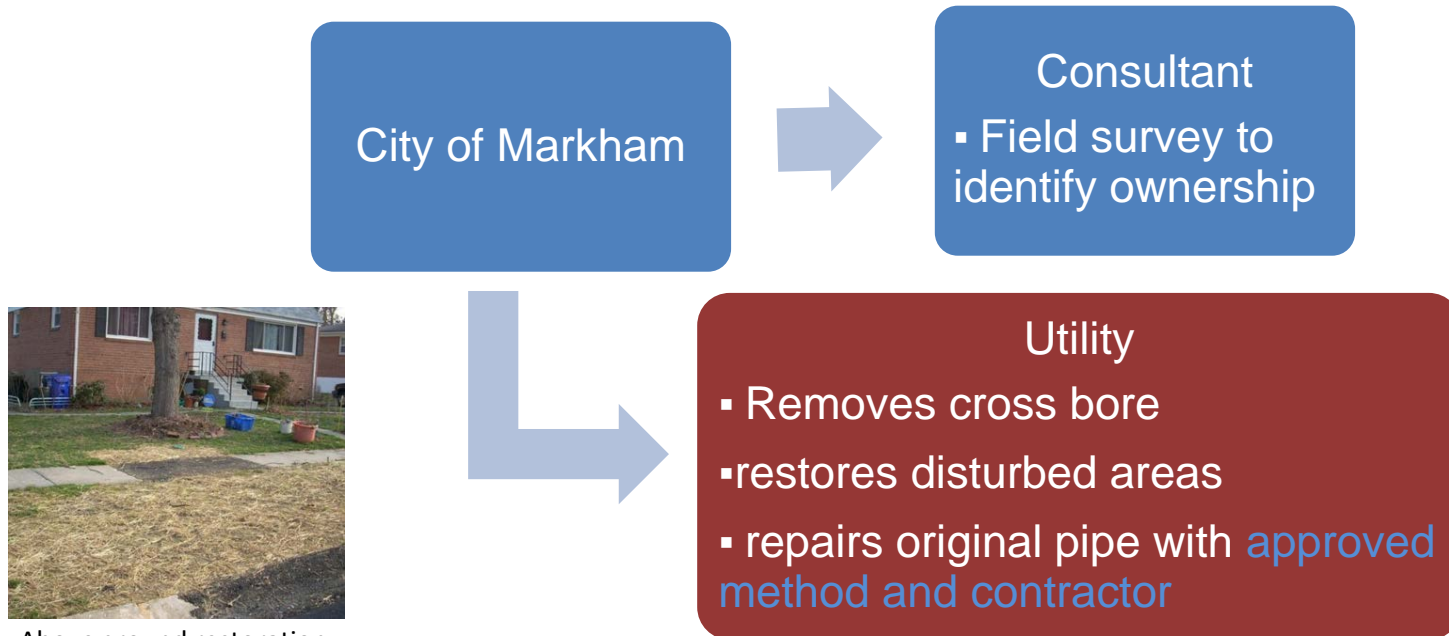


# Decision Making Process



**RISK TO PUBLIC SAFETY AND THE ENVIRONMENT TOO HIGH!**

# Rectifying Cross Bores



Above ground restoration

**BLUE** represents costs to the City that are not necessarily budgeted. Unanticipated projects, regardless of scope, require administration and project management.

# Lessons Learned

- **QA/QC of CCTV data**
  - Communication with contractor regarding immediate reporting of grade 5 defects.
  - Data review for efficient decision making.
  - In-house PACP certification.
- **Further our goals towards Asset Management**
  - Create a data repository.
  - Ability to bring issues to the forefront from a single data source.
  - Ability to track trends from historical condition data.
  - CCTV database link to GIS.
  - Criticality and Prioritization Workshop.
- **Approval of utility's repair**
  - Utility Reporting to include post rehab CCTV and above ground photographs.

# Questions?

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**Tanya Stephens, A.Sc.T., GIS (pg)**

Email: [tdsconsulting@rogers.com](mailto:tdsconsulting@rogers.com)

Phone: (416) 616-5521



<http://www.linkedin.com/in/stephenstanya>