

**CITY OF NEWARK  
DELAWARE**

**CITY COUNCIL  
WORKSHOP AGENDA**

**Monday – September 30, 2013 – 7:00 pm - CC**

A Workshop will be held on Monday, September 30, 2013, at 7:00 pm in the Council Chamber, to hear a presentation by City staff on stormwater issues in Newark followed by a discussion.

/rkb

Posted: September 17, 2013

Advertised: Newark Post – September 20, 2013



# Public Works and Water Resources Department

## Storm Sewer Investigation and Planning

# City of Newark

- Storm Sewer Investigation
  - Pennoni was hired to assist Newark with visual observation and assessment.
  - Used Envirosight pole camera to scope existing system for existing and potential future problems.
  - Video information supplemented with notes and photographs.



# City of Newark

- Initial Areas of Concern
  - East Main & Haines Street
  - Haines Street
  - Kells Avenue
  - Arbour Drive
  - Swarthmore Road, Devon Place
  - Barksdale Road, Julie Lane, Leroy Hill Field
- Additional Area of Concern Reviewed by City Staff
  - Paper Mill Road Culvert
  - Timberline Culvert



# City of Newark

- Action Items
  - Immediate Action Items
  - Short Term Action Items
  - Long Term Actions Items



# East Main Street

- East Main Street and Haines Street
  - Recent rain events in Summer of 2013 caused flooding events on East Main Street at Haines Street
    - Video taken during storm event on August 13, 2013.
  - Issues discovered
    - Large pipe upstream of small pipe
    - Utility pipes crossing through manhole
    - Utility pipes crossing through storm sewer
    - Protruding pipe connections into storm sewer



# East Main Street



# East Main Street



# East Main Street



## East Main Street – Inlet 366

Near 133 East Main Street  
Left – Inflow pipe (24" Diameter)  
Above – Outflow pipe (15" Diameter)



## East Main Street – Manhole 78

Between Haines and Center Streets

Photo looking into manhole 78 from street level.





## East Main Street Blockage

Just west of Academy Street

Internal pipe photo looking upstream from Inlet 66 showing a pipe crossing and debris accumulation.





## Pipe Protrusion Downstream of MH1-D

HDPE from east; CMP from west



# Kells Avenue

- Kells Avenue
  - Flooding during recent storm events
  - Issues discovered
    - Three pipes outlet to watercourse flowing through Kells Park to single pipe crossing Amtrak railroad.
    - Sanitary sewer crossing storm channel south of East Park Avenue.
    - Utility Pipe Crossings in various locations
    - Overgrown vegetation along the flow channel





## Sanitary Sewer Crossing Storm Channel

Sanitary sewer main crossing stone storm channel at east end of Kells Avenue to be addressed by sanitary sewer project

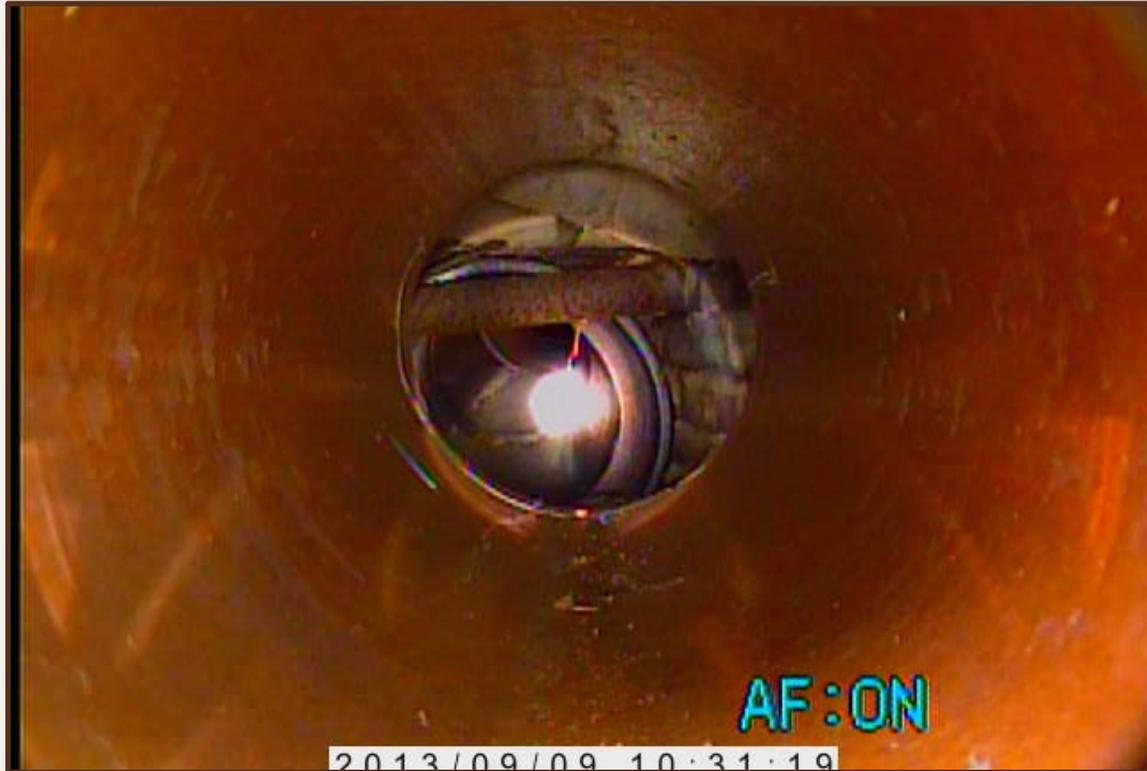




## Overgrown Vegetation

Vegetation growth at Headwall 26A for pipe under Amtrak Railroad south of Kells Avenue





## Utility Pipe Crossings

Near Inlet 22 on Kells Avenue



# Arbour Drive

- Arbour Drive
  - Runoff and ponding along gutter line overtopping rolled curb
  - Issues discovered
    - Low point not at inlet structure along curb
    - No inlets on downslope of Arbour Drive to capture gutter flow
    - Acute flow angle and directly opposing flow at manhole 215
    - Some inlets and manholes in need of repair



# Arbour Drive

Curb Transition



## Arbour Drive and manhole 215

Left – View from Inlet 213 to east showing upright curb and transition to roller curb near driveway  
Right – acute flow angle and opposing flow channel in manhole 215 (damaged frame, deteriorated chimney)

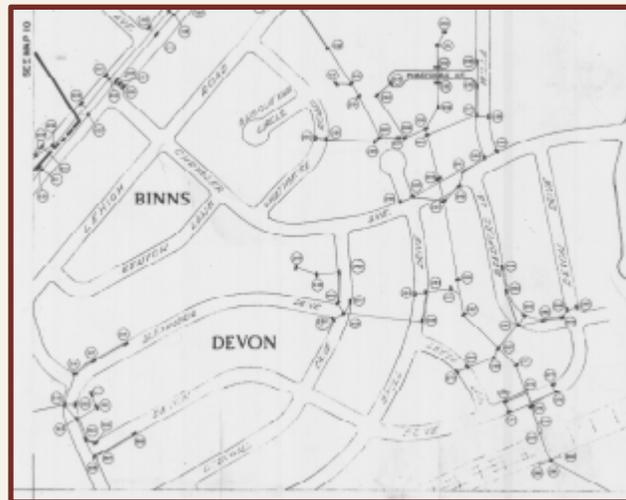
# Swarthmore Road, Devon Place

- Swarthmore Road, Devon Place
  - Roadway flooding on Swarthmore Road, Shull Drive, and Chrysler Avenue
  - Issues discovered
    - Limited storm sewer systems in place (Lehigh Rd., Kenyon Ln., Chrysler Ave., Swarthmore Rd., Susquehanna Cir., Alexandria Dr., Devon Dr., Cornwall Dr., and Shull Dr.)
    - Grading, above ground structures and vegetation inhibiting effectiveness of inlets in the easement areas.
    - No storm water routes for runoff associated with larger storms.
    - Obstruction in front of headwall 279 on Amtrak property
    - Had to remove debris from grate of inlet 228 and 229 in private yard to gain access to pipe.



# Swarthmore Road, Devon Place

Devon Place, as represented below on the Newark Storm Sewer System Map Sheet 11, has fewer structures for surface runoff compared to other areas of the city. Impervious cover has increased since construction and is contributing additional runoff to the existing facilities.





## Obstruction at Headwall 279

Obstruction in front of the top of pipe at Amtrak Railroad crossing to downstream system on former Chrysler site



# Barksdale Road

- Barksdale Road, Sue Lane, Julie Lane
  - Roadway flooding at Barksdale Road and Casho Mill Road, and on Julie Lane
  - Issues discovered
    - Inlets on Julie Lane are missing mortar and bricks, which have fallen into the storm drainage pipes.
    - Debris in pipes and blocked end section.
    - Julie Lane Culvert has a utility crossing in manhole, poorly designed inlet protection.
    - Casho Mill Road Culvert being addressed by DeIDOT Project





## Julie Lane at Sue Lane – Inlet 58

Deteriorated walls missing brick and mortar enter storm sewer and may contribute to debris build-up





## Julie Lane – End Section 69

Vegetation and yard waste blocking the outlet.



## Casho Mill Road Culvert

Near Blair Court, south of Barksdale Road

Protruding storm sewer pipe connection to be addressed by current DELDOT project.



# Paper Mill Road Culvert

- Paper Mill Road
  - Roadway flooding at Paper Mill Road
  - Known Issues
    - Jenny's Run overflows onto Paper Mill Road around Curtis Lane due to restriction at culvert under entrance to park
    - Culvert under entrance to park partially filled with sediment
    - Culvert opening repeatedly blocked with debris
    - Pipe condition deteriorating





## Paper Mill Road Culvert

The existing CMP is partially blocked. The pipe condition is deteriorating.



# Timberline Culvert

- Timberline Culvert
  - Roadway Flooding
  - Known Issues
    - Insufficient culvert capacity causes stream to overtop Timberline Drive
    - No wing walls on upstream end of culvert





## Timberline Culvert

Past erosion issues at edges of wall and invert of box culvert.



# City of Newark

- Immediate Action Items

- Active Maintenance in All Areas

- Storm pipe flushing and overgrowth removal
    - Structure and flow channel repairs
    - Frame, cover, and grate repairs
    - Encourage property owners to take an active roll to keep system functioning properly

- Julie Lane Culvert

- Remove upstream grate (complete)
    - Maintain existing vegetation upstream of culvert (ongoing)

- Casho Mill Road Culvert

- DELDOT project to correct pipe protrusion (November 2013)

- Arbour Drive

- Modification of pipe connection protruding into manhole (in progress)
    - Install additional manhole to realign storm sewer (in design)



# City of Newark

- Short Term Action Items
  - East Main Street
    - Analyze drainage area upstream of inlet 366 to determine adequate pipe sizing (2013)
    - Address pipe size reduction at manhole 366 by replacing the existing pipes and modifying the pipes connecting to manhole 76 and inlet 367 (2014)
  - Julie Lane/Leroy Hill Ball Field
    - Soil Remediation and berm installation as part of Parks Department project(Fall 2014)
    - Install new culvert end protection



# City of Newark

- Long Term Action Items
  - East Main Street
    - Remove or relocate utility crossings where possible or install access points at the crossings to enable maintenance for removal of debris
    - Prepare drainage area model to determine system capacity
    - Develop construction project to address capacity problems and replacement of deteriorated pipe if necessary
    - Consider modifications to City regulations regarding storm sewers



# City of Newark

- Long Term Action Items
  - Haines Street
    - Relocate utility pipe crossings where possible or install access points at the crossings to enable maintenance for removal of debris
    - Review University of Delaware detention basin capacity
    - Prepare drainage area model to determine system capacity
    - Develop construction project to address capacity problems and replacement of deteriorated pipe if necessary
    - Consider modifications to City regulations regarding storm sewers
    - Relocate sanitary sewer pipe to clear channel



# City of Newark

- Long Term Action Items
  - Kells Avenue
    - Prepare drainage area model to determine system capacity
    - Develop construction project to address capacity problems and replacement of deteriorated pipe if necessary
    - Consider modifications to City regulations regarding storm sewers



# City of Newark

- Long Term Action Items
  - Arbour Drive
    - Modify sewer alignment at manhole 215 to eliminate acute flow angle
    - Investigate the addition of new pipes and inlets along downslope of Arbour Drive to collect gutter flow.



# City of Newark

- Long Term Action Items
  - Swarthmore Road, Devon Place
    - Prepare drainage area model to determine system capacity
    - Develop construction project to address capacity problems and replacement of deteriorated pipe if necessary
    - Consider modifications to City regulations regarding storm sewers



# City of Newark

- Long Term Action Items
  - Julie Lane Culvert
    - Prepare drainage area model to determine system capacity
    - Develop construction project to address capacity problems and replacement of deteriorated pipe if necessary



# City of Newark

- Long Term Action Items
  - Paper Mill Road Culvert
    - Prepare drainage area model to determine system capacity
    - Develop construction project for pipe replacement and possible water main adjustment



# City of Newark

- Long Term Action Items
  - Timberline Culvert
    - Prepare drainage area model to determine system capacity
    - Develop construction project for box culvert replacement





## Budget and Financial Discussion

- Short Term Cost Summary
- Long Term Cost Summary
- Budget and Financial Discussion
  - City Tax
  - Storm Sewer Maintenance Fee



## Short Term Cost Summary

ID	Description	Potential Costs
ST-1	Julie Lane Culvert	\$100,000
ST-2	Drainage Area Analysis at East Main Street at Inlet 366	\$9,000
ST-3	*East Main St. Storm Sewer Improvements Including Engineering Services	\$87,900

*\*State Roadway*



## Long Term Cost Summary

ID	Description	Potential Costs
LT-1	Arbour Drive Storm Sewer Improvements Including Engineering Services	\$111,000
LT-2	East Main St./Haines St. Survey, Modeling Engineering Costs	\$24,500
LT-3	Haines St. Storm Sewer Improvements Including Engineering Services	\$3,720,000



## Long Term Cost Summary

ID	Description	Potential Costs
LT-4	Kells Avenue Survey, Modeling Engineering Costs	\$23,000
LT-5	Kells Avenue Storm Sewer Improvements Including Engineering Services	\$764,000
LT-6	Devon Place Survey, Modeling Engineering Costs	\$24,300
LT-7	Devon Place Storm Sewer Improvements Including Engineering Services	\$1,313,000



## Long Term Cost Summary

ID	Description	Potential Costs
LT-8	Paper Mill Road Culvert Replacement Including Engineering Services	\$280,000
LT-9	Timberline Culvert Replacement Including Engineering Services	\$530,000



## Budget and Financial Discussion

- Routine maintenance has been performed regularly, but it is clear that we need to repair and replace infrastructure to rehabilitate the storm water system
- Long- and short-term projects total almost \$7 million
- This work will address less than 25% of the drainage system
- Future spending must increase in order to maintain what we have and to implement improvement and replacement projects
- An alternative funding source must be identified in order to meet the demands of a system-wide improvement



## Funding Options – Storm Sewer Fee vs. City Tax

BILLED THROUGH EXISTING UTILITY BILL				
MTHLY FEE (RES)	ANNUAL REVENUE (RES)	MTHLY FEE (COMM)	ANNUAL REVENUE (COMM)	TOTAL ANNUAL REVENUE
\$ 5.00	\$ 622,500	\$ 20.00	\$ 398,880	\$ 1,021,380
6.25	778,125	25.00	498,600	1,276,725
⇒ 7.50	933,750	30.00	598,320	1,532,070
8.75	1,089,375	35.00	698,040	1,787,415
10.00	1,245,000	40.00	797,760	2,042,760
11.25	1,400,625	45.00	897,480	2,298,105
12.50	1,556,250	50.00	997,200	2,553,450

BILLED VIA TAX INCREASE		
Equivalent Tax Increase	Avg Mthly ▲ Homeowner w/\$71,000 AV	Avg Mthly ▲ Biz owner w/\$365,000 AV
18.6%	\$ 7.64	\$ 39.29
23.2%	9.55	49.11
27.8%	11.46	58.93
32.5%	13.37	68.75
37.1%	15.28	78.57
41.7%	17.19	88.39
46.4%	19.10	98.22



## Funding Option - Storm Sewer Fee vs City Tax

- Storm Water Utility designation becoming recognized best practice
- Lewes BPW is example of Delaware success story
  - \$5 Res, \$10 Comm, \$20 Industrial monthly fees
- Including storm water costs in tax base is not recommended
  - Cost is spread by assessed value
  - There are “winners and losers” versus the flat fee
- Flat fee recommended for cost effectiveness, ease of implementation, fairness and simplicity
- Finance projects by some method; repay debt with SW fees