Basement Flooding
Windsor’s Approach to the Challenge
A Presentation of
Our City’s Reduction Measures and Successes
Windsor, Ontario
Culminating Rain Events

June 5 & 6, 2010
90 mm of rain fell in Windsor between 11:00 pm June 5th and 3:00 am June 6th

November 29, 2011
75 mm of rain fell
187.4 mm in November
111.9 mm more than our normal

In 2011 (Windsor’s wettest year on record)
1,568 mm of rain fell compared to the average annual rainfall of 844 mm
June 2010 Event

2,281 flooded basement calls to 311

311 flooding calls inputted into database as of 7pm June 14, 2010
June 2010 Event

Flood Survey

• **1,276** homes visited or surveys submitted

• **49%** of homes had downspouts connected

• **4.7%** of homes had the power go out

• **90%** of respondents say water came up through floor drain or plumbing
The aftermath – June 2010 Event

445 tonnes of extra garbage as a result of flood damage
• Lots of press coverage
  • How did this happen?
  • Why did this happen?

• Pressure to do something to prevent it happening again.
  • What can be done?
Windsor’s Sewer Infrastructure

- 226 km of combined sewers and 24.5 km of over/under sewers.
- In the 80’s installed sanitary sewers to eliminate septic tanks
- Aging infrastructure & private drain connections
- Many homes have crossed/mixed connections
- Annual Capital Sewer Program
Cross Connections
Solution?

Approximately $700 to $900 million worth of work is required to separate all of the over-and-under and combined sewers and complete the Priority 1 storm relief sewers. (long-term)

What can be done in the short-term?

What is the best “bang for the buck”.

[Image: Three people in a meeting setting, possibly discussing the solution to the problem.]
AT SOURCE MEASURES ($) VS LARGE PROJECTS ($$$$$)

• There is no instant or magic solution

• During the 2012 Budget Process, $4,000,000 was allocated towards a 7-point program
Short-Term Measures Implemented (At Source)

- In 2011, implemented a Basement Flooding Protection Subsidy Program (for existing residential properties)

- $500,000 per year allocated
Basement Flooding Protection Subsidy Program

Eligible Amounts

<table>
<thead>
<tr>
<th>Install Backwater Valve(s) (Licensed plumber required)</th>
<th>Up to 80% of cost, ($1,000 maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install sump pump to disconnect foundation drains to floor drains</td>
<td>Up to 80% of cost, ($1,750 maximum)</td>
</tr>
<tr>
<td>Install backwater valve and sump pump</td>
<td>Up to 80% of cost, ($2,800 maximum)</td>
</tr>
<tr>
<td>Disconnect foundation drains from floor drain and/or dye testing and camera work as required.</td>
<td>Up to 80% of cost, ($400 maximum)</td>
</tr>
</tbody>
</table>

THE MAXIMUM ELIGIBLE SUBSIDY LIMIT IS $2,800 PER HOME/UNIT.
Some advice:

Expect upward pressure on pricing and lots of interest from private contractors.
### Slowly Chipping Away at the Problem...

**Basement Flooding Protection Subsidy Program**

Table 1. Basement Flooding Protection Subsidy Program  
Number of Applications by Electoral Ward With Eligible Work as Determined Upon Courtesy Inspection  
As of: May 7 2013

<table>
<thead>
<tr>
<th>Electoral Ward</th>
<th># of Applications with Eligible Work</th>
<th>%</th>
<th># of Applications Expired (*)</th>
<th># of Remaining Applications</th>
<th># of Subsidies Paid (as of May 7, 2013)</th>
<th>$ Subsidies Paid (as of May 7, 2013)</th>
<th># of Remaining Applications with No Subsidy Paid (as of May 7, 2013)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>257</td>
<td>23%</td>
<td>42</td>
<td>215</td>
<td>210</td>
<td>$342,222</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>63</td>
<td>6%</td>
<td>21</td>
<td>42</td>
<td>40</td>
<td>87,355</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>74</td>
<td>7%</td>
<td>18</td>
<td>56</td>
<td>47</td>
<td>106,336</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>116</td>
<td>10%</td>
<td>39</td>
<td>77</td>
<td>64</td>
<td>155,300</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>89</td>
<td>8%</td>
<td>22</td>
<td>67</td>
<td>59</td>
<td>118,164</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>271</td>
<td>24%</td>
<td>92</td>
<td>179</td>
<td>164</td>
<td>311,179</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>111</td>
<td>10%</td>
<td>36</td>
<td>75</td>
<td>70</td>
<td>98,580</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>81</td>
<td>7%</td>
<td>28</td>
<td>53</td>
<td>46</td>
<td>90,042</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>32</td>
<td>3%</td>
<td>13</td>
<td>19</td>
<td>17</td>
<td>18,811</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>2%</td>
<td>11</td>
<td>13</td>
<td>11</td>
<td>23,960</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,118</strong></td>
<td><strong>100%</strong></td>
<td><strong>322</strong></td>
<td><strong>796</strong></td>
<td><strong>728</strong></td>
<td><strong>$1,351,949</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

(*) Note: Applications are considered to be 'expired' if a Building Permit has not been taken out within 60 days of the Courtesy Inspection
Expanded the downspout disconnection program

**Downspout disconnection:**
- Reduces instances of basement flooding
- Reduces sewage treatment expenditures
- Adds sewer capacity
- Reduces need for costly trunk sewer projects
Downspout Disconnection

• Voluntary Program
• Began in March 2012
• 1,933 downspouts have been disconnected so far (1,128 in 2012, 805 in 2013).
• Additionally, there were 1,738 instances where disconnection could not be done because of drainage or safety issues.
Other Measures in the Short-Term:

• Flow monitoring and hydraulic modelling of the City’s sewer system

• CCTV inspection – 1% of capital allocated

• Purchased permanent flow monitoring equipment

• Targeted smoke and dye testing

• Development of a Master Plan
Installed more rain gauges for better data

1. AMBASSADOR (1021 SPRUCEWOOD)
2. CMH WOODS (620 RIVERSIDE DR. W.)
3. DROUILLARD (290 DROUILLARD RD.)
4. FIRE STATION #5 (1905 CABANA RD.)
5. FIRE STATION #6 (6660 TECUMSEH ROAD E.)
6. GRAND MARAIS (3006 GRAND MARAIS RD. E.)
7. HOWARD GRADE SEPARATION (2479 HOWARD AVE.)
8. HURON ESTATES (2365 LAMBTON ST.)
9. LOU ROMANO WRP
10. PILLETTE (3499 PILLETTE RD.)
11. PONTIAC (LITTLE RIVER PCP)
12. SIXTH CONCESSION (1477 DUCHARME)
13. TWIN OAKS (7750 TWIN OAKS DR.)
14. WELLINGTON UNDERPASS (1395 WELLINGTON)
Other Measures: (cont.)

Participate in the Insurance Bureau of Canada’s study with respect to residential basement flooding being conducted in several cities across Canada

Update the Rainfall Intensity Duration and Frequency (IDF) curves through the Essex Region Conservation Authority (ERCA) in partnership with interested local municipalities
Other Measures: (cont.)

Upgraded the information on the City’s website with respect to basement flooding and provided links to:

• The How to Reduce the Risk of Basement Flooding video provided by the Insurance Bureau of Canada;

• The Institute for Catastrophic Loss Reduction’s (ICLR) Handbook for Reducing Basement Flooding, authored by Dan Sandink; and

• Conversion of Sump Pump to Discharge Outside House.
Conversion of Sump Pump to Discharge Outside House

Existing Typical

Conversion

*NOTE: PIPE SIZES SHOWN ARE MINIMUMS

REVISION: SEPTEMBER 11, 2008
DATE: SEPTEMBER 22, 2006
DRAWN BY: W. ROY
PUBLIC WORKS - GEOMATICS
• Also included informational videos on the City’s You Tube channel:

  “Downspout disconnection program”
  “Wastewater: Where does it go?”
  “Climate change adaptation plan”
Large Project ($$$$

Riverfront Treatment Basin (RTB)

• $67 million project (entire capital budget is typically $100m of which $60m is spent on roads & sewers)
Riverfront Treatment Basin (while under construction)
Riverfront Treatment Basin once completed
Thank You

Questions?