THE TRANSITORY ISLAND OF OTTAWA
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OTTAWA, ILLINOIS

- ONLY RATED CLASS 2 CRS COMMUNITY IN ILLINOIS AND REGION 5 !!
- ONLY ONE OTHER COMMUNITY HAS HIGHER RATING
- CONGRATS - OUTSTANDING FLOODPLAIN MANAGEMENT PROGRAM

Bryan Martindale, P.E. CFM
OVERVIEW
ARE YOU IN THE RIGHT SESSION?

FREQUENT FLOODS “CUT-OFF” PORTION OF OTTAWA ......AKA “EASTSIDE”

“CUT-OFF” = LOSS OF ACCESS = DAMAGES

FIX IS EXPENSIVE!

FUNDING FOR FIX \(\rightarrow\) PDM GRANT

PDM GRANT PROCESS - NORTH CENTRAL ILLINOIS COUNCIL OF GOVERNMENTS

BENEFIT COST ANALYSIS VIA FEMA’S BCA TOOL

CHALLENGES!
• PROJECT LOCATION

• PRE-MITIGATION CONDITIONS “FLOODING & DAMAGES”

• POTENTIAL MITIGATION “COSTS”

• BCA TOOL MODELING

• BC RESULTS
OTTAWA, ILLINOIS

LOCATED IN LASALLE COUNTY
EASTSIDE OF OTTAWA

EFFECTIVE FIRM
MAY 19, 2014
TWO ACCESS POINTS

NOT IMPACTED AT THE SAME FREQUENCY

CAUSES MODELING ISSUES – DISCUSSED LATER
EFFECTIVE FIS

100-YEAR = 473.5 NAVD

PROBLEMS BEGIN AT 467.0 < 5 YEAR EVENT
QUANTIFY FLOOD DAMAGES

STRUCTURES, CONTENTS, VEHICLES....STUFF

ELIMINATION OF FLOOD DAMAGES....

PROVIDES BENEFITS!

BUT.......

IAFSM 2019 ANNUAL CONFERENCE

THE TRANSITORY ISLAND OF OTTAWA

March 14, 2019
REAL AND ATYPICAL FLOOD DAMAGES

LOSS OF ACCESS....FOR DAYS!!
300 RESIDENTS, BUSINESSES AND THE HIGH SCHOOL

GAGE DATA & CITY RECORDS

16 EVENTS SINCE 1985

### Table 1: Flood Events Causing Only Green Street Closure

<table>
<thead>
<tr>
<th>Flood Event</th>
<th>Peak Flood Elevation</th>
<th>Flood Dates</th>
<th>Main Street Closes @ Elevation 470.0</th>
<th>Duration of Closure</th>
<th>Green Street Closes @ Elevation 467.0</th>
<th>Duration of Closure (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>468.2</td>
<td>November 1985</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>2</td>
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<tr>
<td>2</td>
<td>468.4</td>
<td>November 1990</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>1</td>
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<tr>
<td>3</td>
<td>468.0</td>
<td>May 12-14, 2002</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>3</td>
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<tr>
<td>4</td>
<td>467.8</td>
<td>December 11-13, 2005</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>3</td>
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<tr>
<td>5</td>
<td>467.6</td>
<td>January 8-10, 2008</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>3</td>
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<tr>
<td>6</td>
<td>468.9</td>
<td>December 28-31, 2008</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>4</td>
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<tr>
<td>7</td>
<td>467.5</td>
<td>May 2009</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>1</td>
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<tr>
<td>8</td>
<td>467.9</td>
<td>June 16-19, 2015</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>4</td>
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<tr>
<td>9</td>
<td>468.1</td>
<td>December 29-31, 2015</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>3</td>
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<tr>
<td>10</td>
<td>466.5</td>
<td>May 2, 2017</td>
<td>NO</td>
<td>0</td>
<td>YES</td>
<td>1</td>
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</table>
QUANTIFY DAMAGES – THREE CATEGORIES

CATEGORY 1: LOSS OF ACCESS VIA ROAD CLOSURES

8950 TRIPS/DAY ELIMINATED!

CLOSURE PLAN FOR GREEN AND MAIN STREETS/COMMUNITY SCHOOL

<table>
<thead>
<tr>
<th>Flood Elevation</th>
<th>Green Street</th>
<th>Main Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 467.0</td>
<td>Open</td>
<td>Open</td>
</tr>
<tr>
<td>467.0 to 470.0</td>
<td>Closed</td>
<td>Open</td>
</tr>
<tr>
<td>&gt; 470.0</td>
<td>Closed</td>
<td>Closed</td>
</tr>
</tbody>
</table>
QUANTIFY DAMAGES

CATEGORY 2:

LOSS OF ACCESS
FOR MEDICAL EMERGENCY, FIRE, PUBLIC SERVICES, ETC.
QUANTIFY DAMAGES

CATEGORY 3:

SOCIAL IMPACTS

8950 TRIPS ELIMINATED
MENTAL STRESS AND ANXIETY
LOST PRODUCTIVITY

HIGH SCHOOL
$22 MILLION ANNUAL BUDGET
1400 STUDENTS
90 FACULTY
QUANTIFY DAMAGES

BCA TOOL PROBLEMS

CATEGORY 1 - ELIMINATION OF TRIPS

CATEGORY 2 - EMERGENCIES WHILE ACCESS LOST

CATEGORY 3 – SOCIAL IMPACTS
OTTAWA TOWNSHIP HIGH SCHOOL LEVEE PROJECT

INDEPENDENT OF THIS PDM PROCESS
MAIN STREET BRIDGE

RAISE BRIDGE AND APPROACHES.....NOT ECONOMICALLY FEASIBLE
GREEN STREET

ECONOMICALLY FEASIBLE AND WILL PROVIDE ACCESS FOR > 500 YEAR EVENT

APPROVED

Downtown Ottawa
Fox River
Isolated East Side
High School Levee
Illinois River

IAFSM 2019 ANNUAL CONFERENCE
THE TRANSITORY ISLAND OF OTTAWA
BENEFIT COST RATIO VIA FEMA BCA TOOL

COST...... OBVIOUS

BENEFIT (ELIMINATION OF DAMAGES) .......

NOT SO OBVIOUS

RATIO IS MATH; BIGGER IS BETTER!

\[
\text{BCR} = \frac{\text{PV}_{\text{benefits}}}{\text{PV}_{\text{costs}}}
\]

where:
\[
\text{PV}_{\text{benefits}} = \text{present value of benefits}
\]
\[
\text{PV}_{\text{costs}} = \text{present value of costs}
\]
ONE SIZE DOESN’T FIT ALL...

PRE AND POST MITIGATION CIRCUMSTANCES

UNIQUE CONFIGURATION....

- TWO ACESSES AT DIFFERENT ELEVATIONS
- POST- MITIGATION DAMAGES NOT ELIMINATED BECAUSE FLOODING STILL ELIMINATES MAIN STREET ACCESS!
WORK AROUND 1: DAMAGES
BI-DIRECTIONAL ACCESS DESTROYED (BAD) APPROACH

BCA APPROACH:
"STRUCTURES" USED TO ASSESS DAMAGES

BAD APPROACH:
FLOOD CONDITIONS USED TO ASSESS DAMAGES
WORK AROUND 1: DAMAGES
BAD APPROACH

3 FLOOD CONDITION SCENARIOS....

SPECIFIC DAMAGES “ISOLATED”

BC FOR PRE AND POST MITIGATION

LOST ACCESS FOR

1 - GREEN ST
2 - GREEN ST AND MAIN ST
3 - MAIN ST (POST MITIGATION)
WORK AROUND 1: DAMAGES
BAD APPROACH

SCENARIO 1
FLOOD ELEVATION > 467.0
LOSS OF ACCESS VIA GREEN

CITY Closes GREEN STREET

ACCESS VIA MAIN ONLY

DAMAGES:
• DETOUR VIA MAIN ST.
• HIGH SCHOOL CLOSED
WORK AROUND 1: DAMAGES
BAD APPROACH

SCENARIO 2
FLOOD ELEVATION > 470.0
LOSS OF ACCESS VIA GREEN & MAIN STREETS

CITY CLOSES BOTH STREETS

DAMAGES:
NO ACCESS TO EASTSIDE - NO DETOUR.
HIGH SCHOOL CLOSED

TOTAL ISOLATION OF EASTSIDE!
WORK AROUND 1: DAMAGES
BAD APPROACH

SCENARIO 3
FLOOD ELEVATION > 470.0
LOSS OF ACCESS VIA MAIN STREET
• RAISED GREEN STREET PROVIDES ACCESS

DAMAGES
DETOUR VIA NEW GREEN STREET
HIGH SCHOOL CLOSED

WHY IS SCENARIO 3 NEEDED?

SCENARIO 2 RESIDUAL (POST MITIGATION) DAMAGES NEEDED
SCENARIO 3 DATA INPUT AS NEUTRAL;
I.E. BC = 0.0
WORK AROUND 2 : CO$T$

HOLISTIC APPROACH

PROJECT INCLUDES
GREEN ST IMPROVEMENTS
NO IMPROVEMENT TO MAIN

BENEFITS: ACCESS PROVIDED BY EACH

ACCESS = TRAFFIC COUNTS

GREEN ST. = ~40%
MAIN ST. = ~60%

DIVISION OF MITIGATION COSTS WERE SPLIT BASED ON TRAFFIC COUNTS
BCR RESULTS

BASE BCR
✓ STANDARD BENEFITS VS. COSTS

FINAL BCR
✓ INCLUSIVE OF SOCIAL IMPACTS ~ NEW WAY TO LOOK AT IMPACTS
✓ OTTAWA HIGH SCHOOL
✓ MENTAL STRESS, ANXIETY AND LOSS OF PRODUCTIVITY
✓ 1400 STUDENTS (NOT INCLUDING PARENTS) AND 90 STAFF MEMBERS
## The Numbers

### Base vs. Final

<table>
<thead>
<tr>
<th></th>
<th>Revised Projected</th>
<th>Including Social Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dec 15 2018</td>
<td>Benefits</td>
</tr>
<tr>
<td>Green Eliminated</td>
<td>$5,463,502.00</td>
<td>$1,814,664.37</td>
</tr>
<tr>
<td>Main &amp; Green Eliminated</td>
<td>$10,875,362.00</td>
<td>$2,756,278.63</td>
</tr>
<tr>
<td>Main Eliminated (post mitigation)</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>$16,338,864.00</td>
<td>$4,570,943.00</td>
</tr>
<tr>
<td><strong>Overall B/C with Social Benefits</strong></td>
<td><strong>3.57</strong></td>
<td></td>
</tr>
</tbody>
</table>

|                                | Eliminated Social Benefits |
|                                | Benefits                  | Costs                      | Individual B/C | Cost Ratios |
| Green Eliminated               | $1,037,192.00             | $1,814,664.37             | 0.57           | 39.7%       |
| Main & Green Eliminated        | $6,449,052.00             | $2,756,278.63             | 2.34           | 60.3%       |
| Main Eliminated (post mitigation) | $0.00          | $0.00                     | 0.00           | 0.00%       |
| **Totals W/O Social Benefits** | $7,486,244.00             | $4,570,943.00             |                |             |
| **Overall B/C W/O Social Benefits** | **1.64**         |                            |                |             |
UNADDRESSED ISSUE

LOSS OF LIFE

- NO METHOD TO INCLUDE
- ASSIGNING VALUE
- IMPACT TO BCR VALUE
“GOOD NUMBERS”

NORTH CENTRAL ILLINOIS COUNCIL OF GOVERNMENTS

WE HAVE A CHANCE FOR THE $$$$$!

DISCUSSION?