BUILDING RESILIENCE:
DEVELOPING PARTNERSHIPS TO STRENGTHEN COMMUNITIES

IAFSM CONFERENCE 2020
MEDICAL CENTER

- Level One Trauma Center
- Regional Healthcare Coordinating Center
- 50,000 ER visits and 8,000 surgeries annually
- Originally part of Edward Hines, Jr. VA Hospital
- Lower Des Plaines River Watershed
CTRE // CENTER FOR TRANSLATIONAL RESEARCH AND EDUCATION
APRIL 2013 FLOODING

RADIOLOGY WORK AREA

RADIOLOGY PATIENT CARE

courtesy of LUC
APRIL 2013 FLOODING

CANCER CENTER MECHANICAL ROOM

HALLWAY OUTSIDE RADIOLOGY

courtesy of LUC
APRIL 2013 FLOODING

FIRST AVENUE - MEDICAL CENTER ACCESS

courtesy of LUC
“As the region’s Level One Trauma Center, our community depends on our ability to serve the region during an area-wide emergency. We had to develop a comprehensive stormwater management plan to ensure that our facilities are always available to the community we serve.”

- Kana Henning, Associate VP for Facilities, Loyola University Chicago
NEIGHBORING PROPERTIES

HINES VA HOSPITAL

JOHN MADDEN MENTAL HEALTH CENTER

LUMC 81 ACRES

HINES VA HOSPITAL

COOK COUNTY FOREST PRESERVE DISTRICT MILLER MEADOW - SOUTH

North
LOCAL WATERSHEDS

- **LUMC Watershed**: 90 acres
- **Hines VA Hospital**: 42” x 68” elliptical pipe outfall watershed
- **Hines VA Hospital**: 30” outfall watershed
- **1st Avenue Watershed**
- **Des Plaines River 100 Year Floodplain Elev. 618.5 +/-**
- **Tarp Drop Shaft, TYP**
- **36” Outfall (LUMC) INV 606.98**
- **1st Avenue Outfall (IDOT)**
LOCAL WATERSHEDS

- LUMC Watershed 90 Acres
- Hines VA Hospital 42” x 68” Elliptical Pipe Outfall Watershed
- Hines VA Hospital 30” Outfall Watershed

1ST AVENUE WATERSHED

- Des Plaines River 100 Year Floodplain Elev. 618.5 +/-
- Tarp Drop Shaft, TYP.
- 36” Outfall (LUMC) Inv 606.98
- 1st Avenue Outfall (IDOT)
Building Resilience: Developing Partnerships to Strengthen Communities

STORMWATER MASTER PLAN

FACTORS OF FLOODING

- Backflow from Des Plaines River
- Undersized Storm Sewers
- Flow from Hines VA Hospital
- Restriction discovered in First Avenue Outlet
- Flat Topography
- Lack of Stormwater Overflow
Existing 36" Storm Sewer
Outfall to Des Plaines River

5.55 inches of rainfall over 48 hours
Building Resilience: Developing Partnerships to Strengthen Communities

Existing 36" Storm Sewer Outfall to Des Plaines River

Vault ‘A’
Vault ‘B’
Vault ‘D’
Vault ‘E’

Pump Station with Outlet to 1st Ave. Relief Sewer

Relief Sewer for West Side Flooding

Phase 1
Phase 2
Phase 3

Detention Storage
Ph 1: 5.9 ac-ft
Ph 2: 2.7 ac-ft
Ph 3: 0.3 ac-ft
Total: 8.9 ac-ft

Total Cost:
$23.5M Projected
STORMWATER MASTER PLAN

50-YEAR STORM SWMM ANALYSIS

- Existing 36" Storm Sewer Outfall to Des Plaines River
- Relief Sewer for West Side Flooding
- Pump Station with Outlet to 1st Ave. Relief Sewer by MWRD / IDOT

Detention Storage
Ph 1: 5.9 ac-ft
Ph 2: 2.7 ac-ft
Ph 3: 0.3 ac-ft
Total: 8.9 ac-ft

$23.5M Projected Total Cost
2012

2014

LUMC Stormwater Master Plan
Nov 2013 – May 2014

2016

2018

2020

Flooding at LUMC
Apr 2013

CTRE design begins 2012
The authority for general supervision of stormwater management in Cook County was conveyed to the District by the Illinois State legislature.

Detail Watershed Plans (DWPs) completed for the 6 major watersheds of Cook County: Cal-Sag Channel, Little Calumet River, Lower Des Plaines, North Branch of the Chicago River, Poplar Creek, and Upper Salt Creek.

District’s authority amended to allow for flood-prone property acquisition and to plan, implement, and finance local stormwater management projects.

Initiated Five Master Plan Pilot Studies
Green Infrastructure Plan Adopted

Regional (Phase I) DWP Projects
Identified from the DWPs to address overbank flooding “riverine flooding”

Local (Phase II) Projects and Green Infrastructure Plan
Working with local communities and agencies to address local drainage problems.

Stormwater Master Planning
Investigate “urban flooding” issues and evaluate potential green and gray infrastructure solutions.
### STORMWATER PROGRAM TO DATE

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Current Number of Projects</th>
<th>Structures Protected / Removed</th>
<th>Construction / Acquisition Cost ($Million)</th>
<th>MWRD Cost ($Million)</th>
</tr>
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<tr>
<td>Regional Stormwater Projects (Phase I)</td>
<td>27</td>
<td>4,423</td>
<td>$369</td>
<td>$315</td>
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<tr>
<td>Local Stormwater Partnership Projects (Phase II)</td>
<td>52</td>
<td>&gt;6,000</td>
<td>$186</td>
<td>$95</td>
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<tr>
<td>Green Infrastructure Projects</td>
<td>100*</td>
<td>&gt;4,000</td>
<td>$100</td>
<td>$40</td>
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<tr>
<td>Flood Prone Property Acquisitions</td>
<td>6</td>
<td>154</td>
<td>$46</td>
<td>$27</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>185</strong></td>
<td><strong>&gt;14,000</strong></td>
<td><strong>$701</strong></td>
<td><strong>$477</strong></td>
</tr>
</tbody>
</table>

*-includes all 34 Space to Grow projects to be completed by 2022.
Stormwater Management Infrastructure Projects
Stormwater Management Infrastructure Projects

*Lower Des Plaines River Watershed (South)*
- CTRE design begins 2012
- MWRD completes Detailed Watershed Plans 2011
- MWRD takes over stormwater responsibilities 2004
- MWRD & IDOT partner to address 1st Avenue drainage issues 2013
- LUMC Stormwater Master Plan Nov 2013 – May 2014
- Flooding at LUMC Apr 2013
Location: Maywood, Illinois

Project Description:

▪ Replace the existing storm sewer with two new parallel trunk sewers and a new outlet to the Des Plaines River
▪ Bioswales will be constructed on Forest Preserve

Estimated Construction Cost: $5.2M
Cost share with IDOT
5-Year Flood Event – IDOT Impacts
CIORBA’S INTRODUCTION TO 1ST AVENUE
JUNE 24, 2014 FLOOD EVENT

- 5-Year Flood Event - LUMC Impacts
CIORBA’S INTRODUCTION TO 1ST AVENUE
JUNE 24, 2014 FLOOD EVENT

- 5-Year Flood Event - FPDCC Impacts
2012

CTRE design begins 2012

MWRD takes over stormwater responsibilities 2004

2014

LUMC Stormwater Master Plan Nov 2013 – May 2014

MWRD completes Detailed Watershed Plans 2011

MWRD & IDOT partner to address 1st Avenue drainage issues 2013

2016

MWRD/Ciorba begin 1st Ave. Preliminary Engineering Nov 2014

MWRD selects Ciorba for 1st Ave drainage project 2014

2018

2020

2012

Flooding at LUMC Apr 2013
- 29 acres tributary area to 1.1 miles of roadway
- Undersized and ineffective storm sewer system
- Miller Meadows Forest Preserve (FPDCC)
- Loyola University Medical Center
1ST AVENUE FLOOD CONTROL
ALTERNATIVES ANALYSIS & COORDINATION

- Coordination between MWRD, IDOT, LUMC, & FPDCC
- Decision on Design Criteria
  - 50-year design and less than 6” ponding in 100-year event
- Evaluation of Alternatives
  - 8 Alternatives considering storm sewer, bioswales, detention for 1st Avenue and FPDCC drainage
- Select Preferred Alternative for Design Engineering
  - Parallel trunk sewers with bioswales

- Mitigate flooding throughout Cook County
- Public safety improvement
- Green/Grey Infrastructure Hybrid
- 50-year design
- Relocate outfall sewer into easement
- Emergency vehicle access
- Stormwater overflow pumping
- Address ponding on property
CTRE design begins 2012

Flooding at LUMC Apr 2013

2012

2014

2016

2018

2020

MWRD completes Detailed Watershed Plans 2011

MWRD takes over stormwater responsibilities 2004

MWRD selects Ciorba for 1st Ave drainage project 2014

MWRD & IDOT partner to address 1st Avenue drainage issues 2013

MWRD/Ciorba begin 1st Ave. Preliminary Engineering Nov 2014

Ciorba submits Final Preliminary Design Report to MWRD Jun 2016

Coordination for LUMC pump station discharge Feb 2017

LUMC Stormwater Master Plan Nov 2013 – May 2014
Flooding at LUMC
Apr 2013

CTRE design begins 2012

LUMC Stormwater Master Plan
Nov 2013 – May 2014

MWRD completes Detailed Watershed Plans 2011

MWRD takes over stormwater responsibilities 2004

MWRD & IDOT partner to address 1st Avenue drainage issues 2013

MWRD selects Ciorba for 1st Ave drainage project 2014

MWRD/Ciorba begin 1st Ave. Preliminary Engineering Nov 2014

Coordination for LUMC pump station discharge Feb 2017

MWRD & IDOT negotiate IGA for 1st Avenue construction 2017 - 2018

Ciorba submits Final Preliminary Design Report to MWRD Jun 2016
1ST AVENUE FLOOD CONTROL
FINAL DESIGN & COORDINATION

- MWRD/IDOT IGA
- Construction Management: the IDOT Way or the MWRD Way?
- Final Design of Preferred Alternative
- Utility Coordination
- MWRD/FPDCC IGA
LUMC Connection
Building Resilience: Developing Partnerships to Strengthen Communities

Existing 36" Storm Sewer Outfall to Des Plaines River

Pump Station with Outlet to 1st Ave. Relief Sewer

Relief Sewer for West Side Flooding

Vault ‘A’

Vault ‘B’

Vault ‘D’

Phase 1

Phase 2

Phase 3

Vault ‘E’

Detention Storage

Ph 1: 5.9 ac-ft
Ph 2: 2.7 ac-ft
Ph 3: 0.3 ac-ft
Total: 8.9 ac-ft

$23.5M Projected Total Cost

Legend - Max Water Depth (Feet)

- 5.00
- 2.00
- 1.00
- 0.50
- 0.15

North

50-YEAR STORM SWMM ANALYSIS

STORMWATER MASTER PLAN
Building Resilience: Developing Partnerships to Strengthen Communities

**Existing 36" Storm Sewer Outfall to Des Plaines River**

**Pump Station with Outlet to 1st Ave. Relief Sewer**

**Vault ‘A’**

**Vault ‘B’**

**Vault ‘D’**

**Phase 1**

- Vault D and Pump Station
  - Grant Request: $9.3 million

**Phase 2**

- Vaults A and B Relief Sewer
  - Grant Request: $6.6 million

**Grant Request:**

- Total: $15.9 million

**IAFSM 2020 Annual Conference**
Grant Request: $15.9 million

Phase 1:
- Vault D and Pump Station
  - $9.3 million

Phase 1:
- Vaults A and B Relief Sewer
  - $6.6 million
**Building Resilience: Developing Partnerships to Strengthen Communities**

**Existing 36" Storm Sewer**

**Pump Station with Outlet to 1st Ave. Relief Sewer**

**Vault ‘A’**

**Vault ‘B’**

**Relief Sewer**

**Phase 1: Vault D and Pump Station $9.3 million**

**Phase: Vaults A and B Relief Sewer $6.6 million**

**Grant Request: $15.9 million**

**REVISED PROPOSAL (2015 - 2016) North**

**Legend - Max Water Depth (Feet)**

- 5.00
- 2.00
- 1.00
- 0.50
- 0.15
REVISED PROPOSAL (2015 – 2016)

Grant Request: $15.9 million

Phase 1:
- Vault D and Pump Station
  - $9.3 million

Phase 1:
- Vaults A and B
- Relief Sewer
  - $6.6 million
Building Resilience: Developing Partnerships to Strengthen Communities

PHASE 1 // FINAL ENGINEERING

LEGEND
- UNDERGROUND STORMWATER VAULT
- PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STORM SEWER TRUNK LINE
- EXISTING WATER MAIN
- EXISTING SANITARY SEWER
- EXISTING GAS MAIN
- PROPOSED STORM SEWER

TYPICAL SECTION

EXISTING GRADE
EXISTING STORM SEWER
PRELIMINARY TRENCH LIMITS
EXISTING PROPERTY LINE
VAULT "A" (STORMTRAP)
EXISTING STORM SEWER
EXISTING 12" WATER MAIN

VAULT "A"
VAULT "B"

2nd Ave to Remain Open

36" Relief Sewer
TRUNK SEWER
EXISTING PROFILE

Surface Ponding

STARTING TAILWATER ELEVATION = 613.0
Building Resilience: Developing Partnerships to Strengthen Communities
EXISTING PARKING LOTS

VIEW LOOKING SOUTH
PHASE 1 CONSTRUCTION (2017)
PHASE 1 CONSTRUCTION (2017)
CHEERS TO...

Cook County Commissioners
Cook County Bureau of Economic Development
Cook County Department of Homeland Security
Cook County Department of Transportation and Highways
Edward Hines, Jr. VA Hospital
Forest Preserve District of Cook County
Illinois Department of Transportation

Members of Illinois General Assembly
John H. Madden Mental Health Center
Four Members of U.S. House of Representatives
U.S. Senators from Illinois
Proviso Township
Village of Maywood

SMITHGROUP
LOYOLA UNIVERSITY HEALTH SYSTEM
LOYOLA UNIVERSITY CHICAGO
METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO
Ciorba Group