



# **BUILDING RESILIENCE:**

## **DEVELOPING PARTNERSHIPS TO STRENGTHEN COMMUNITIES**

**IAFSM CONFERENCE 2020**



# LOYOLA UNIVERSITY MEDICAL CENTER

559-BED HOSPITAL

BURN CENTER

CARDINAL BERNARDIN CANCER CENTER

RONALD MCDONALD CHILDREN'S HOSPITAL

OUTPATIENT CARE CENTER

STRITCH SCHOOL OF MEDICINE

NIEHOFF SCHOOL OF NURSING



LOYOLA  
UNIVERSITY  
HEALTH SYSTEM



LOYOLA  
UNIVERSITY CHICAGO





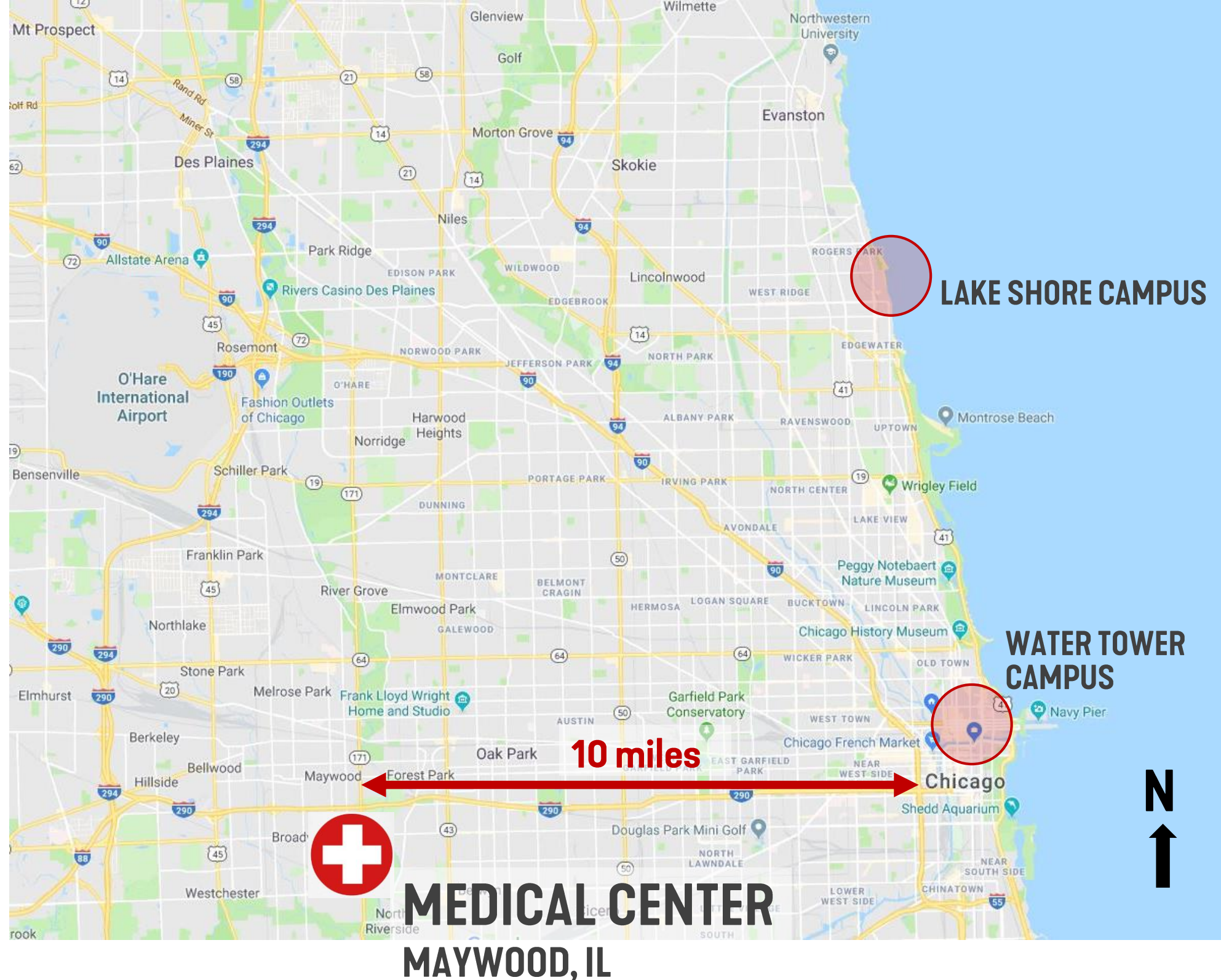
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UNIVERSITY  
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UNIVERSITY CHICAGO

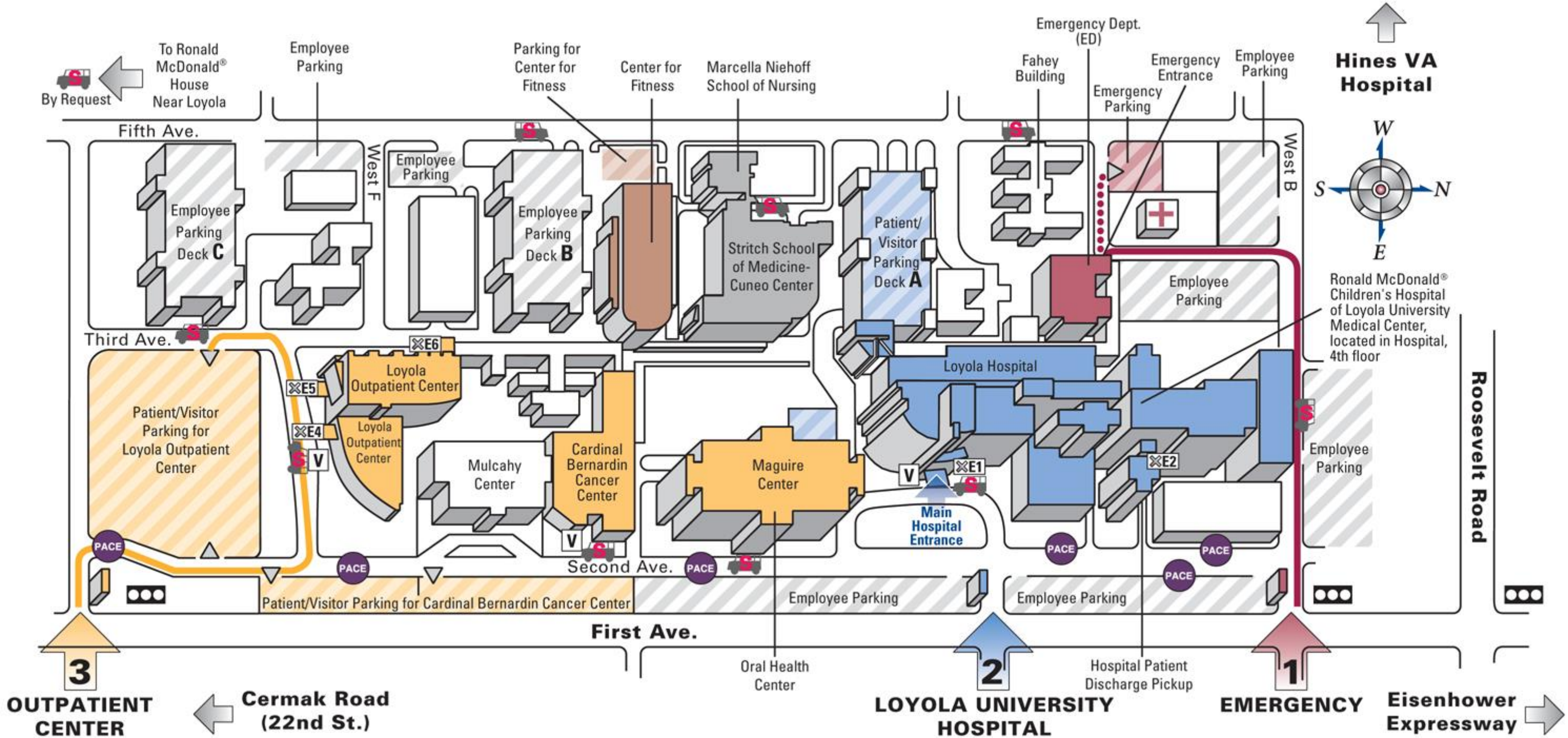
# MEDICAL CENTER

- 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



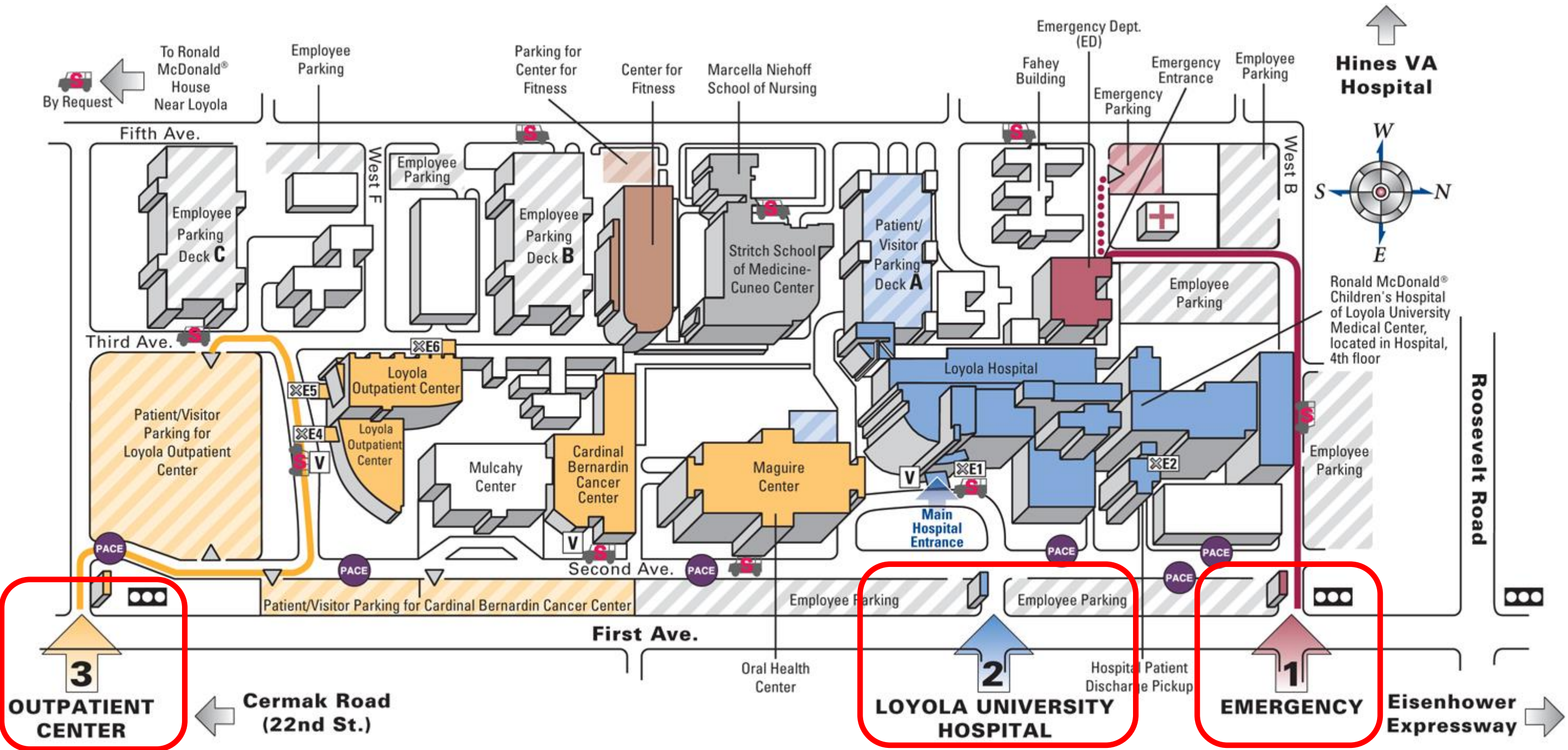


**MEDICAL CENTER c.2012**



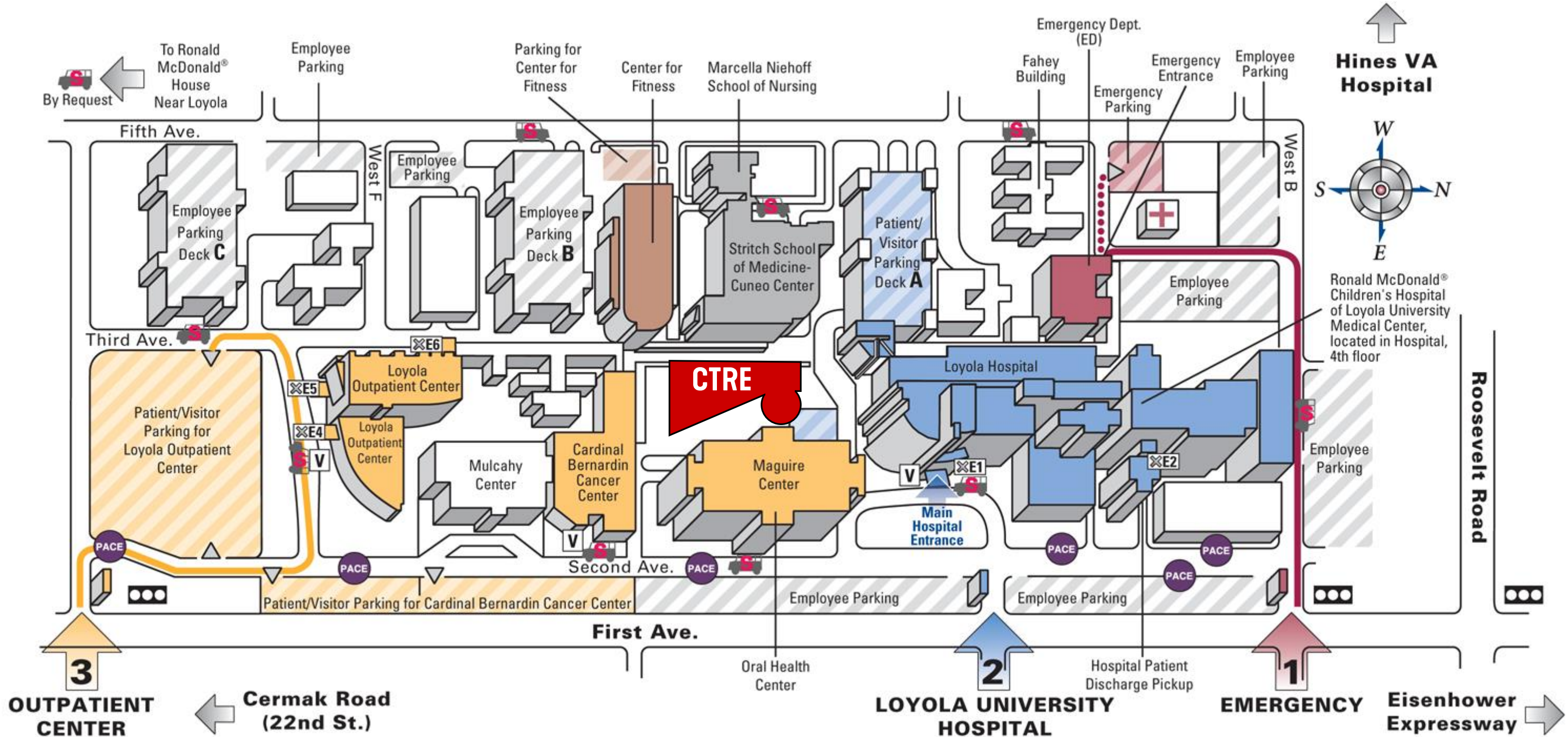


# MEDICAL CENTER c.2012





**MEDICAL CENTER c.2012**





# CTRE // CENTER FOR TRANSLATIONAL RESEARCH AND EDUCATION



courtesy of SCB



# APRIL 2013 FLOODING

RADIOLOGY WORK AREA



RADIOLOGY PATIENT CARE

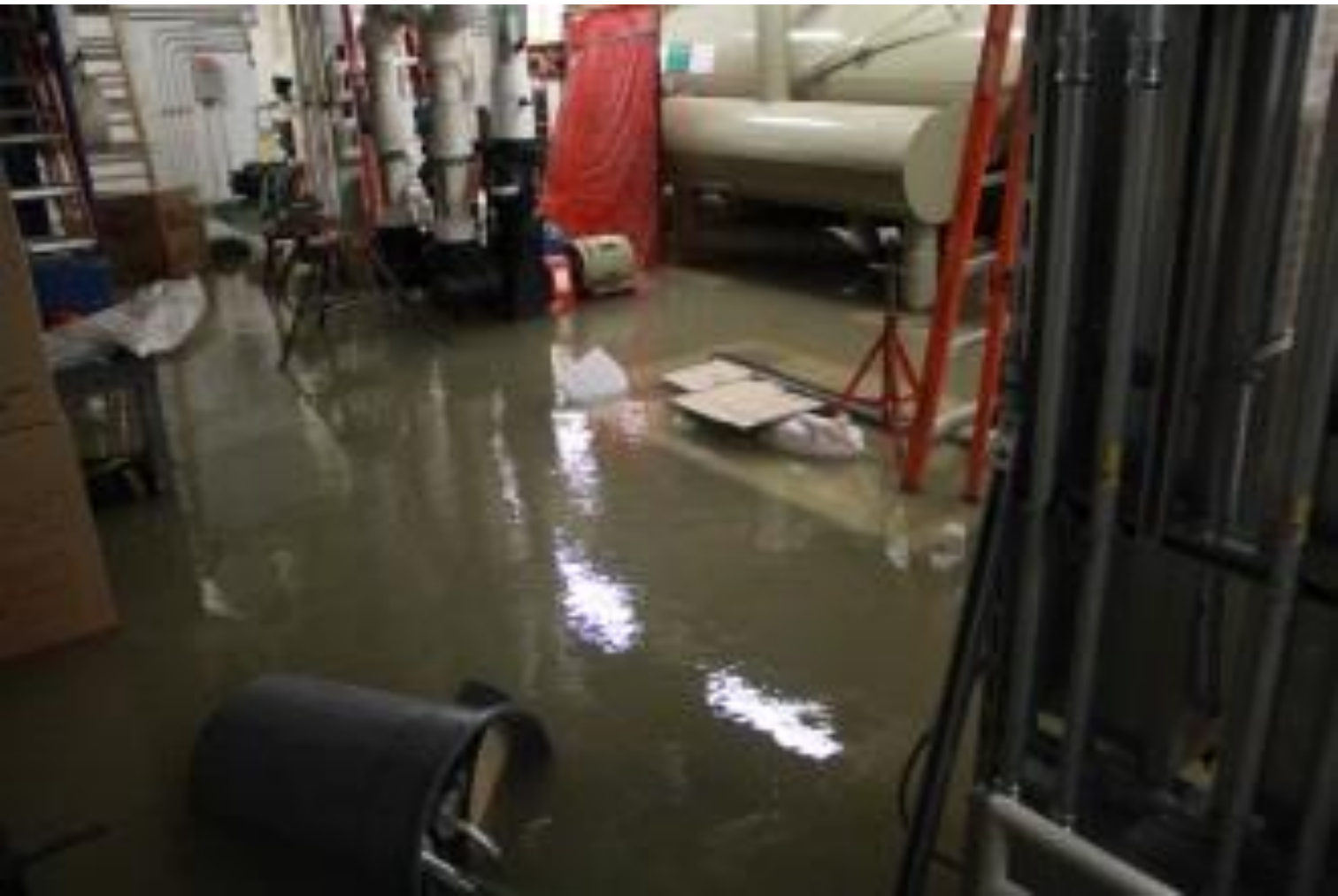


*courtesy of LUC*



# APRIL 2013 FLOODING

CANCER CENTER MECHANICAL ROOM



HALLWAY OUTSIDE RADIOLOGY



*courtesy of LUC*



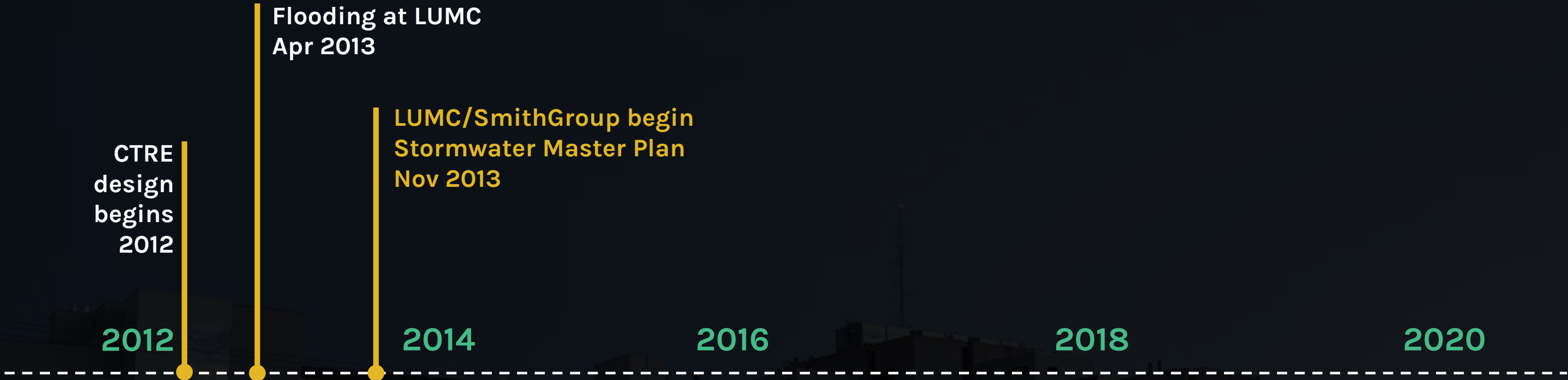
# APRIL 2013 FLOODING

FIRST AVENUE – MEDICAL CENTER ACCESS



*courtesy of LUC*





A horizontal timeline with a dashed white line. Three vertical yellow lines mark specific dates. The first line is at 2012, the second at April 2013, and the third at November 2013. The years 2012, 2014, 2016, 2018, and 2020 are marked along the timeline. The background is a dark, low-angle photograph of a modern building at night.

Flooding at LUMC  
Apr 2013

CTRE  
design  
begins  
2012

LUMC/SmithGroup begin  
Stormwater Master Plan  
Nov 2013

2012

2014

2016

2018

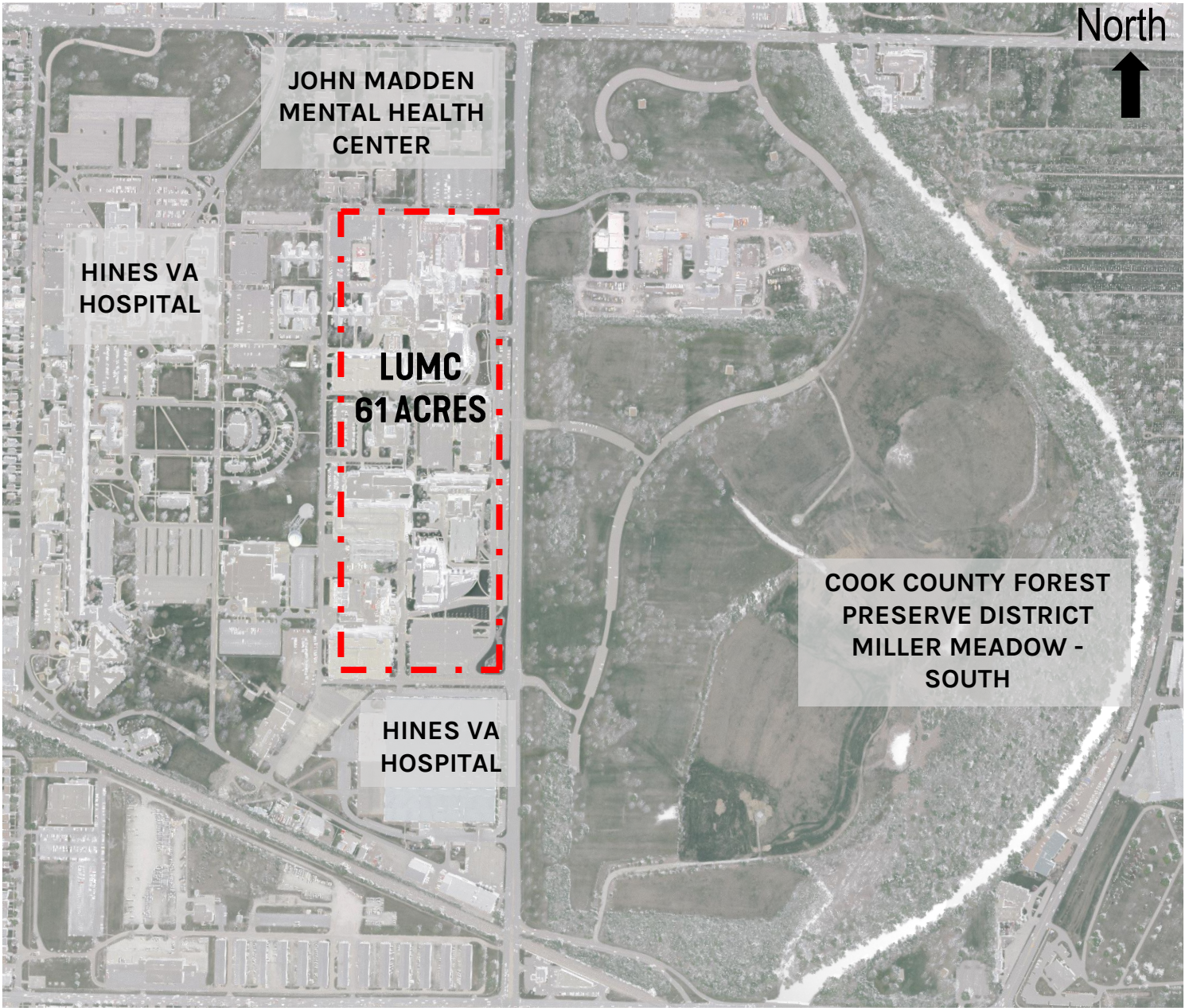
2020

“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

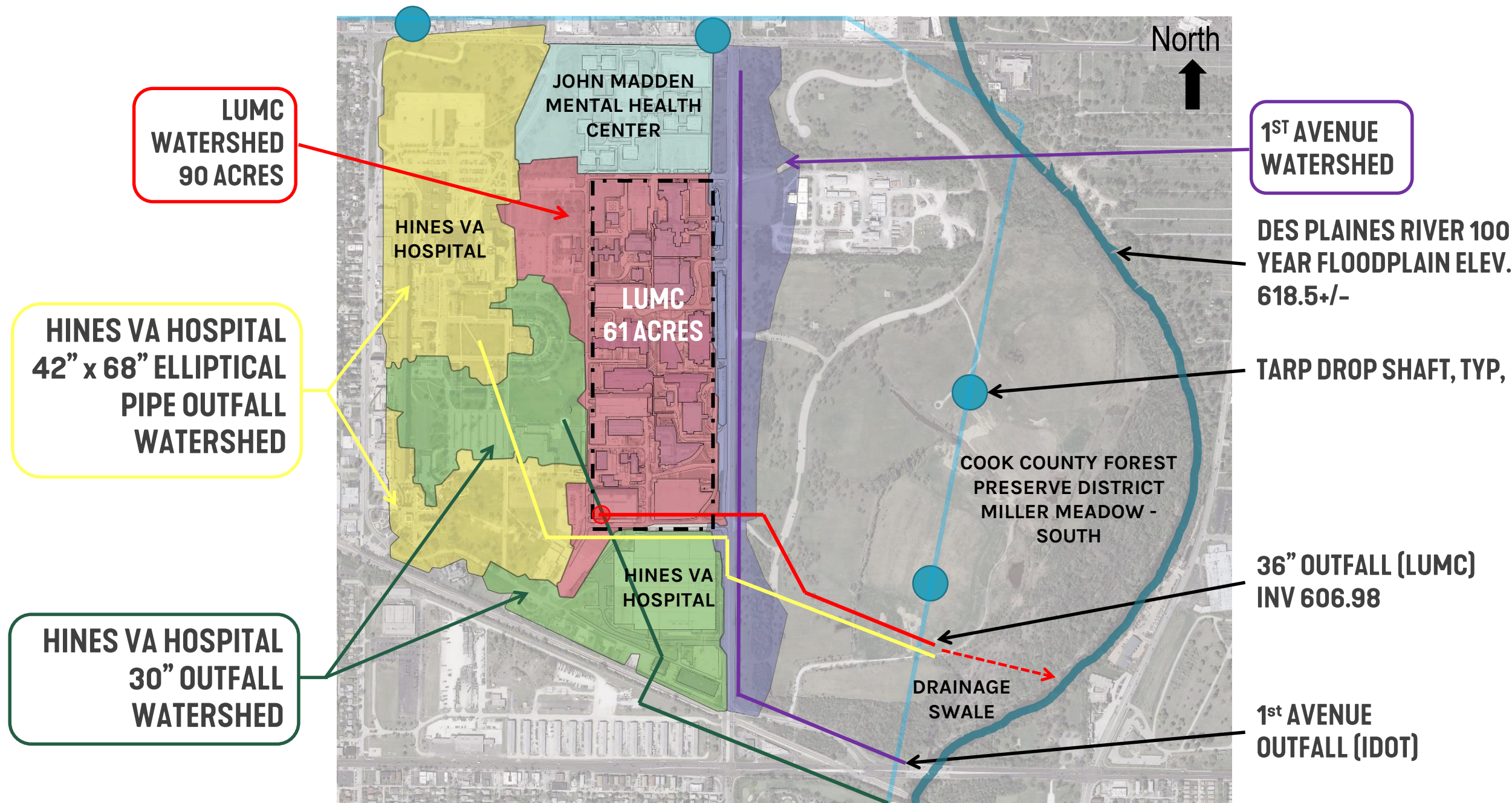


# NEIGHBORING PROPERTIES



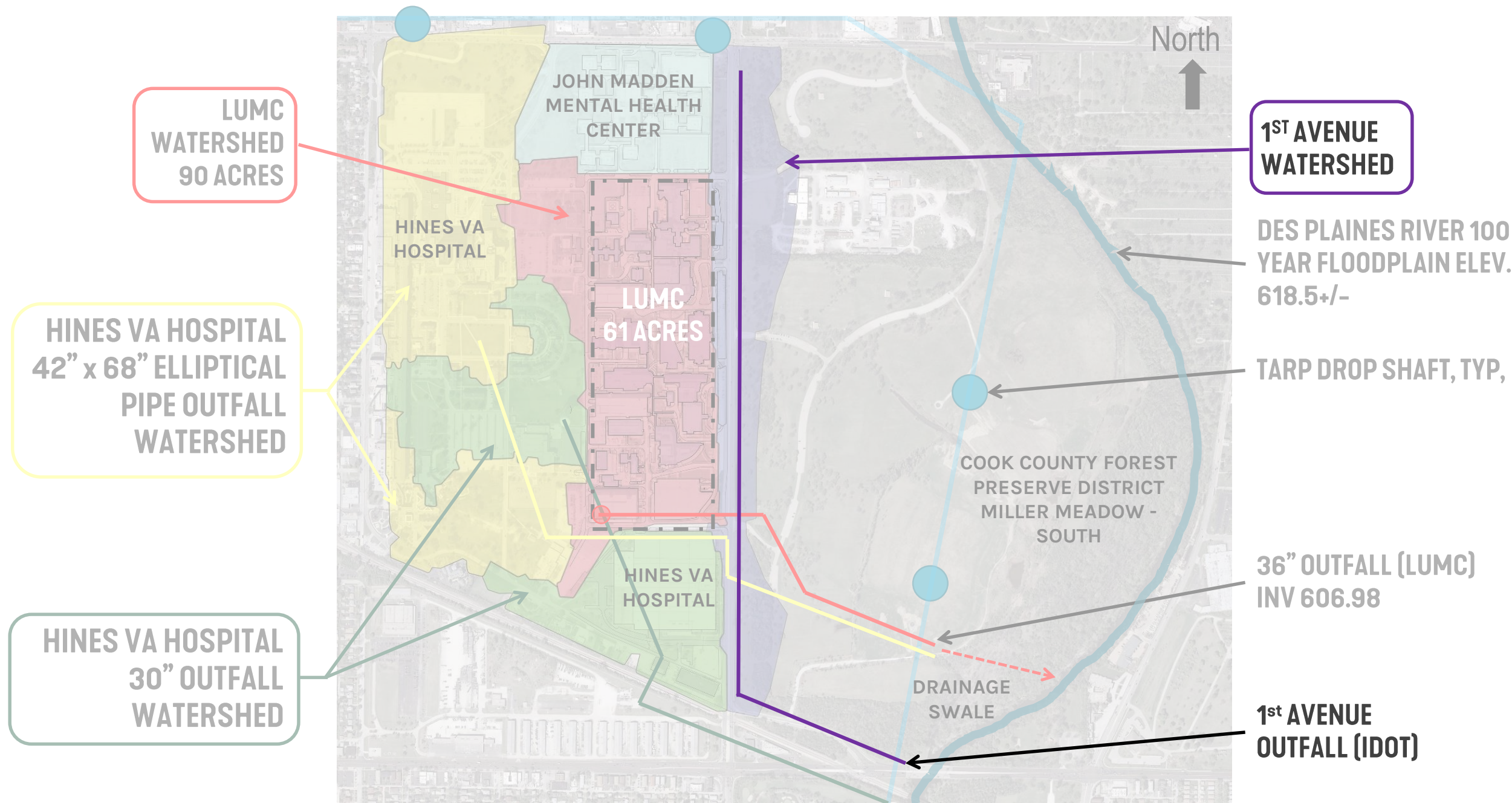


# LOCAL WATERSHEDS





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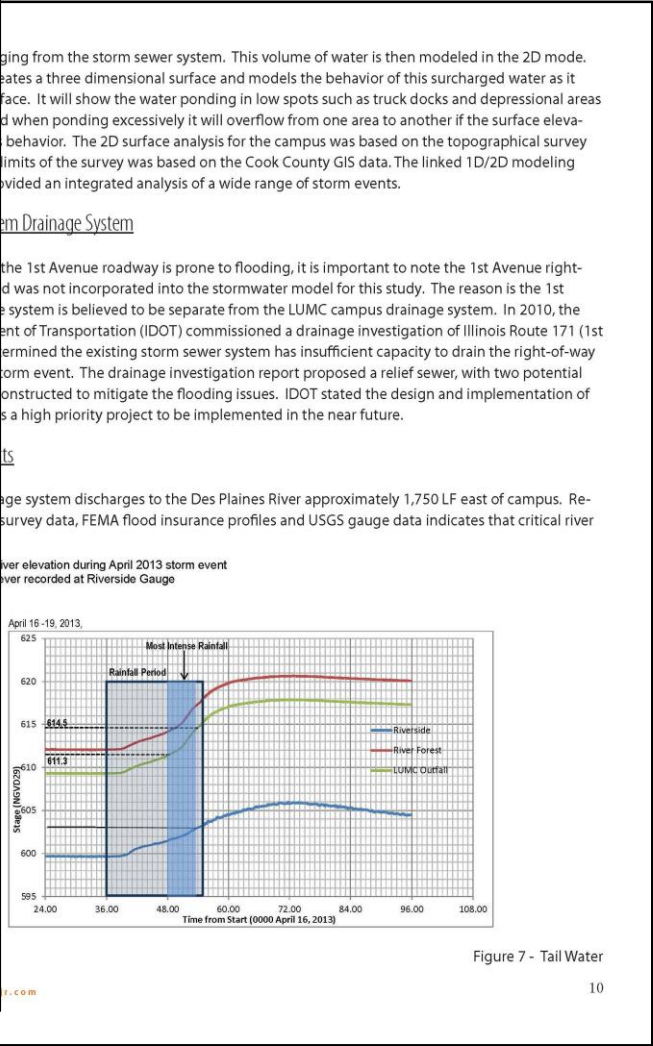
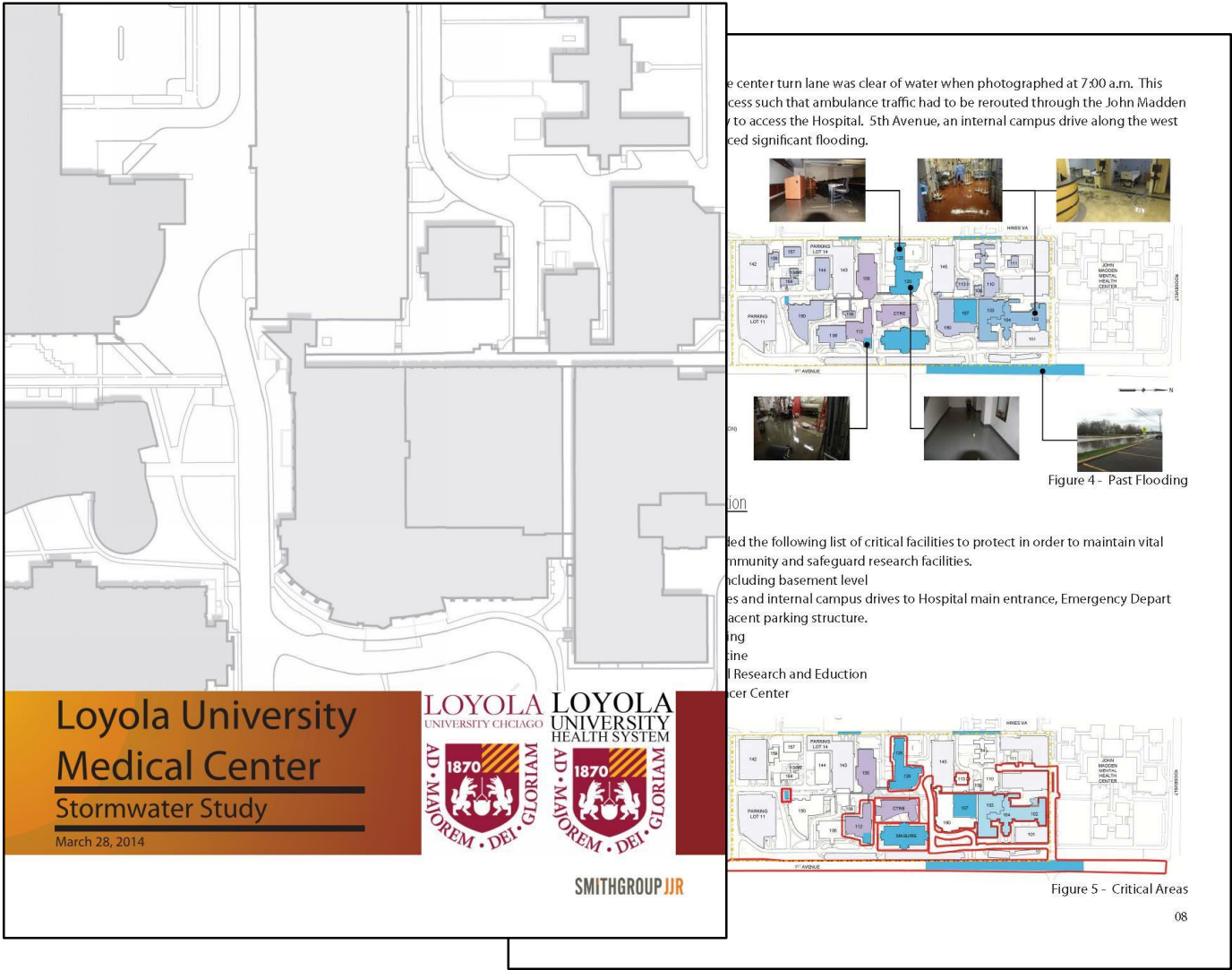




# STORMWATER MASTER PLAN

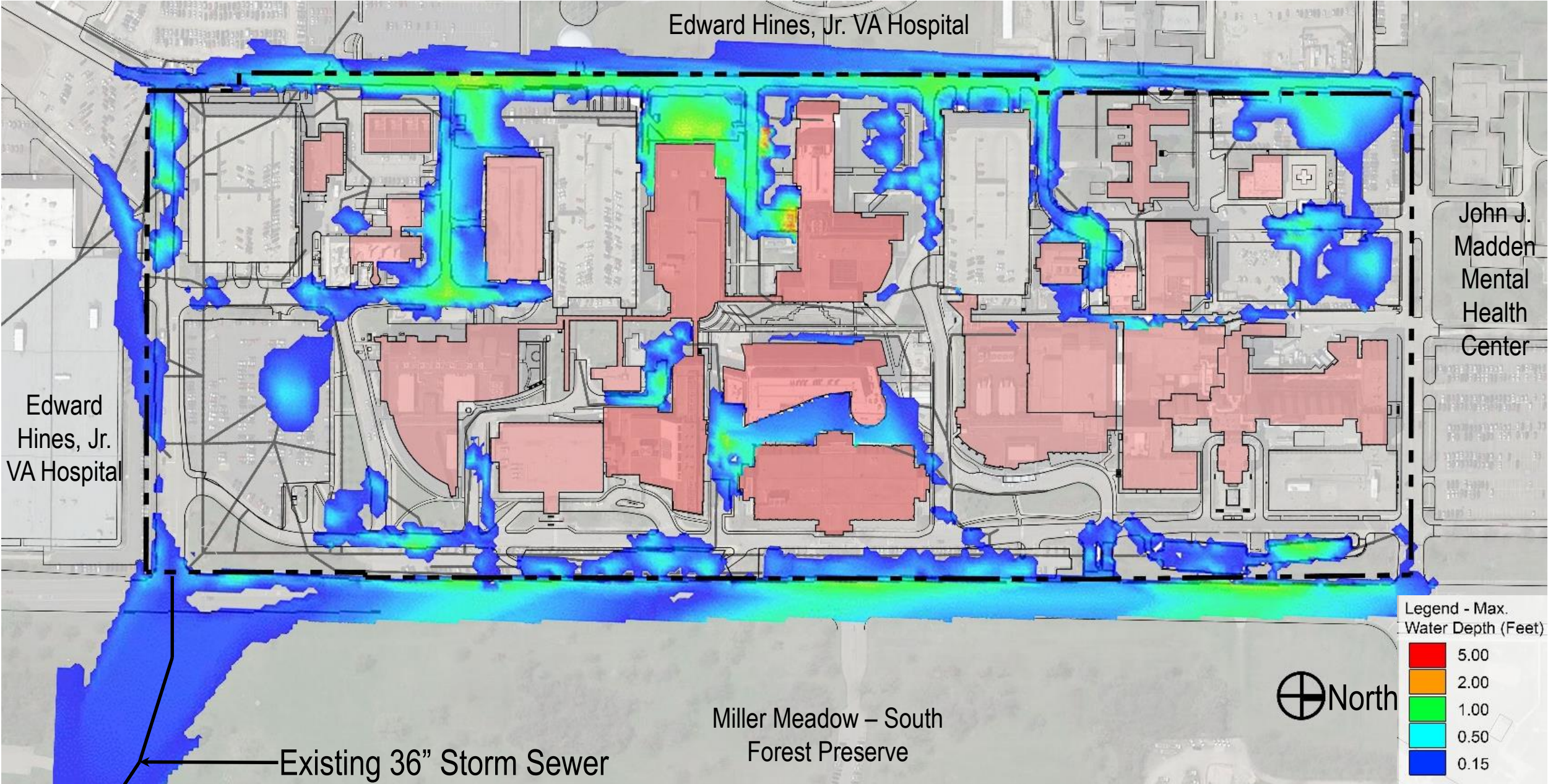
## FACTORS OF FLOODING

- 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





# APRIL 2013 STORM MODELING

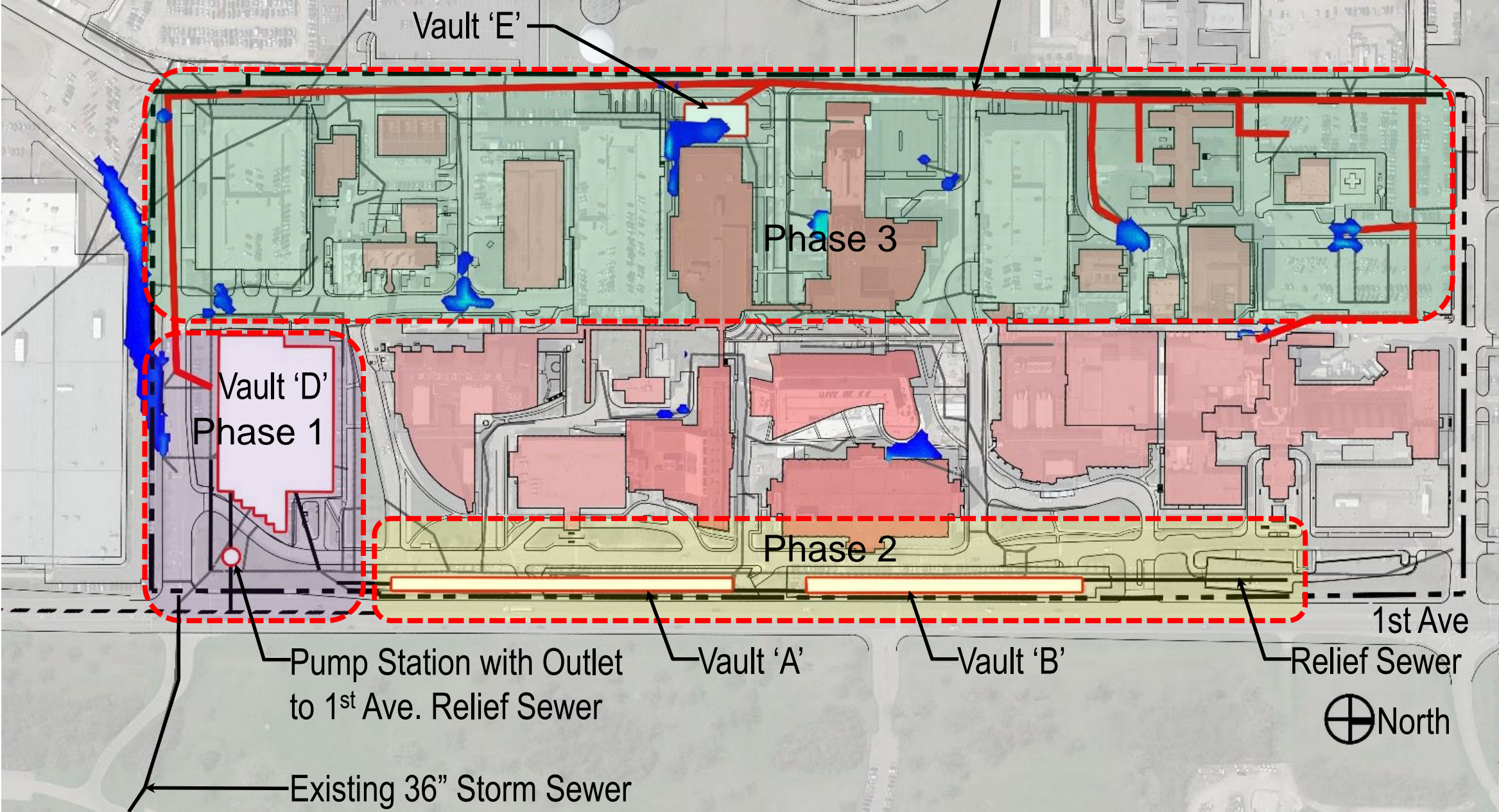


**5.55 inches of rainfall over 48 hours**



# STORMWATER MASTER PLAN

## 50-YEAR STORM SWMM ANALYSIS



### 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**

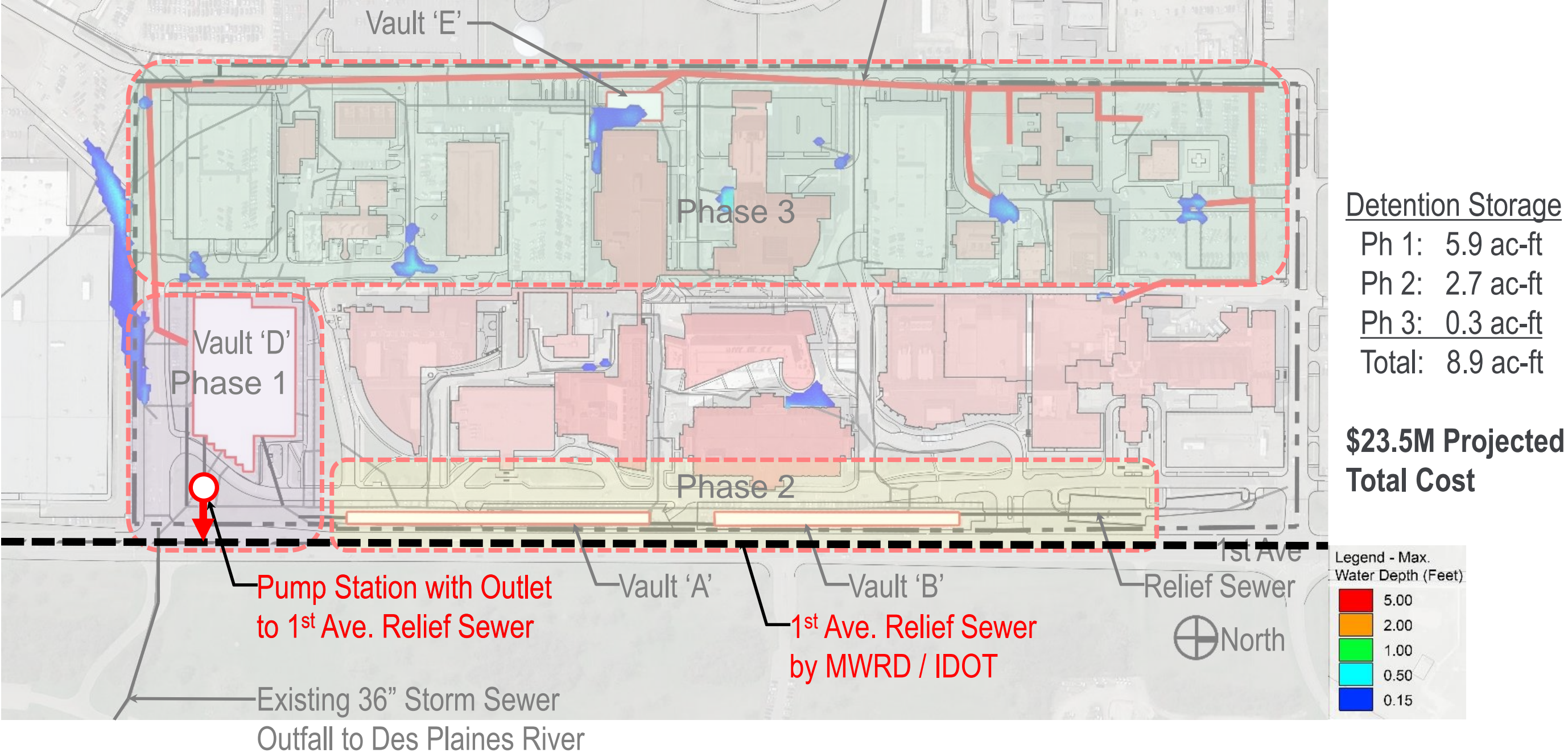
Pump Station with Outlet to 1<sup>st</sup> Ave. Relief Sewer

Existing 36" Storm Sewer Outfall to Des Plaines River



# STORMWATER MASTER PLAN

## 50-YEAR STORM SWMM ANALYSIS





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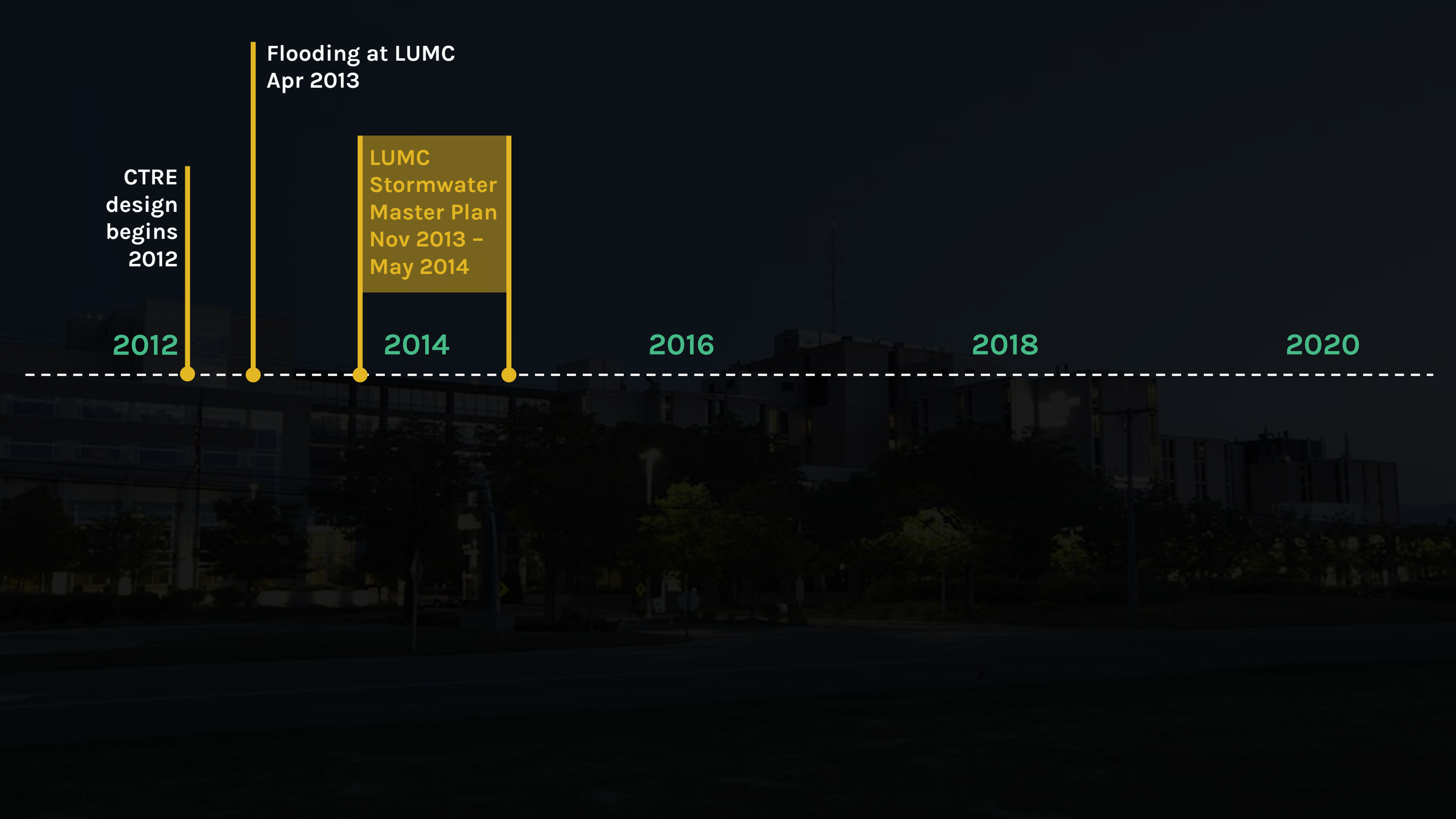
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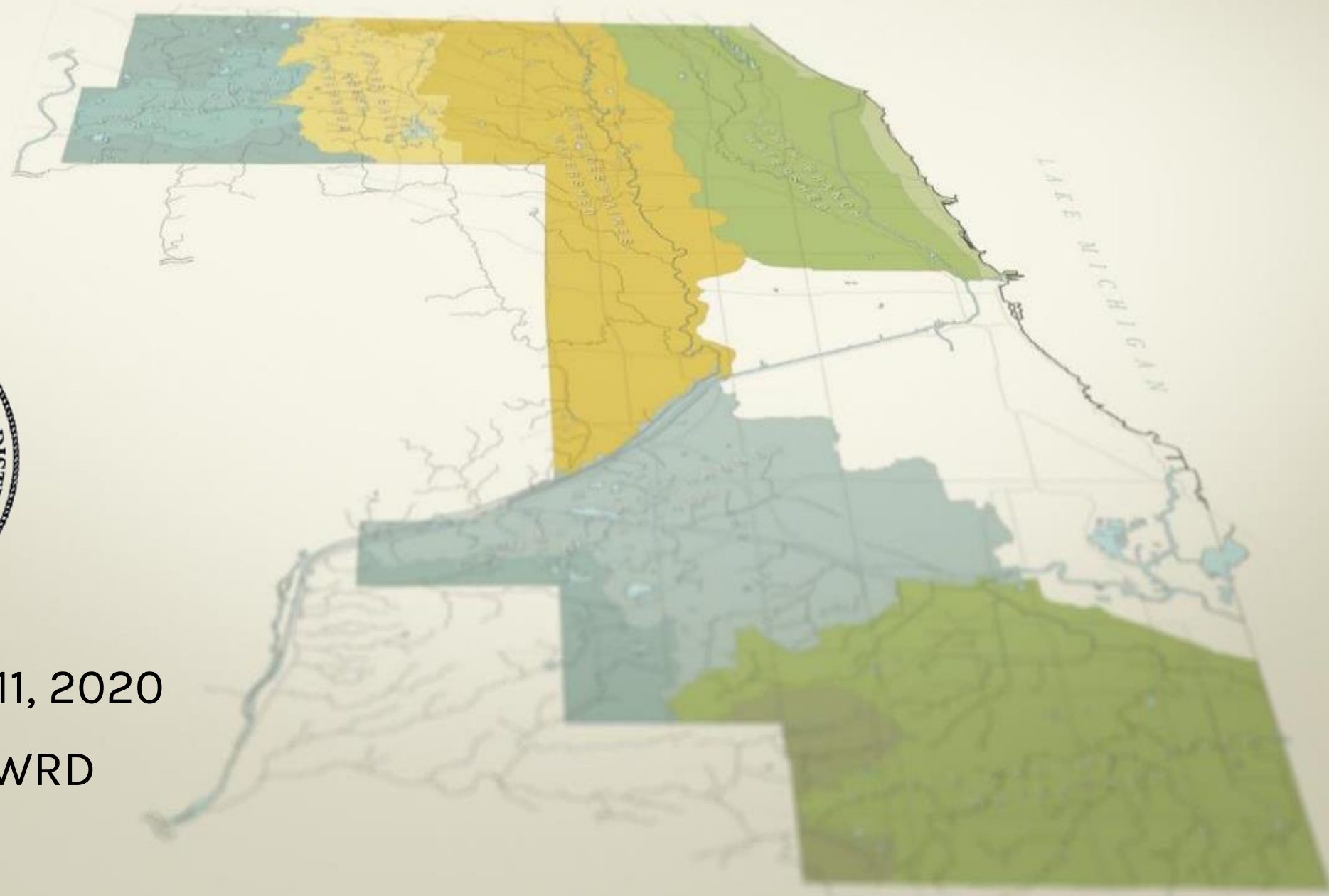


# MWRD STORMWATER MANAGEMENT DEPARTMENT

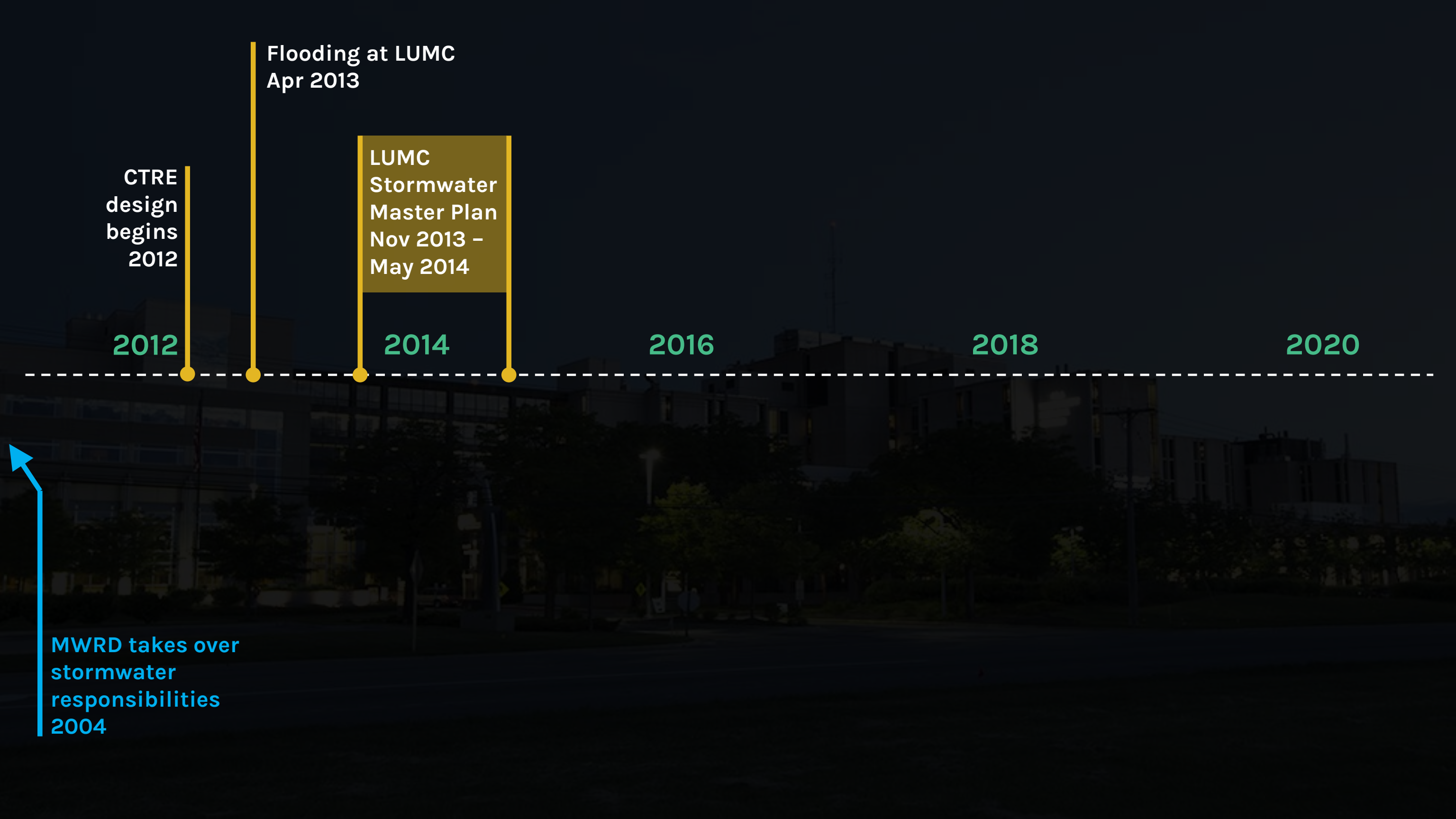


IAFSM – March 11, 2020

Holly Sauter, MWRD







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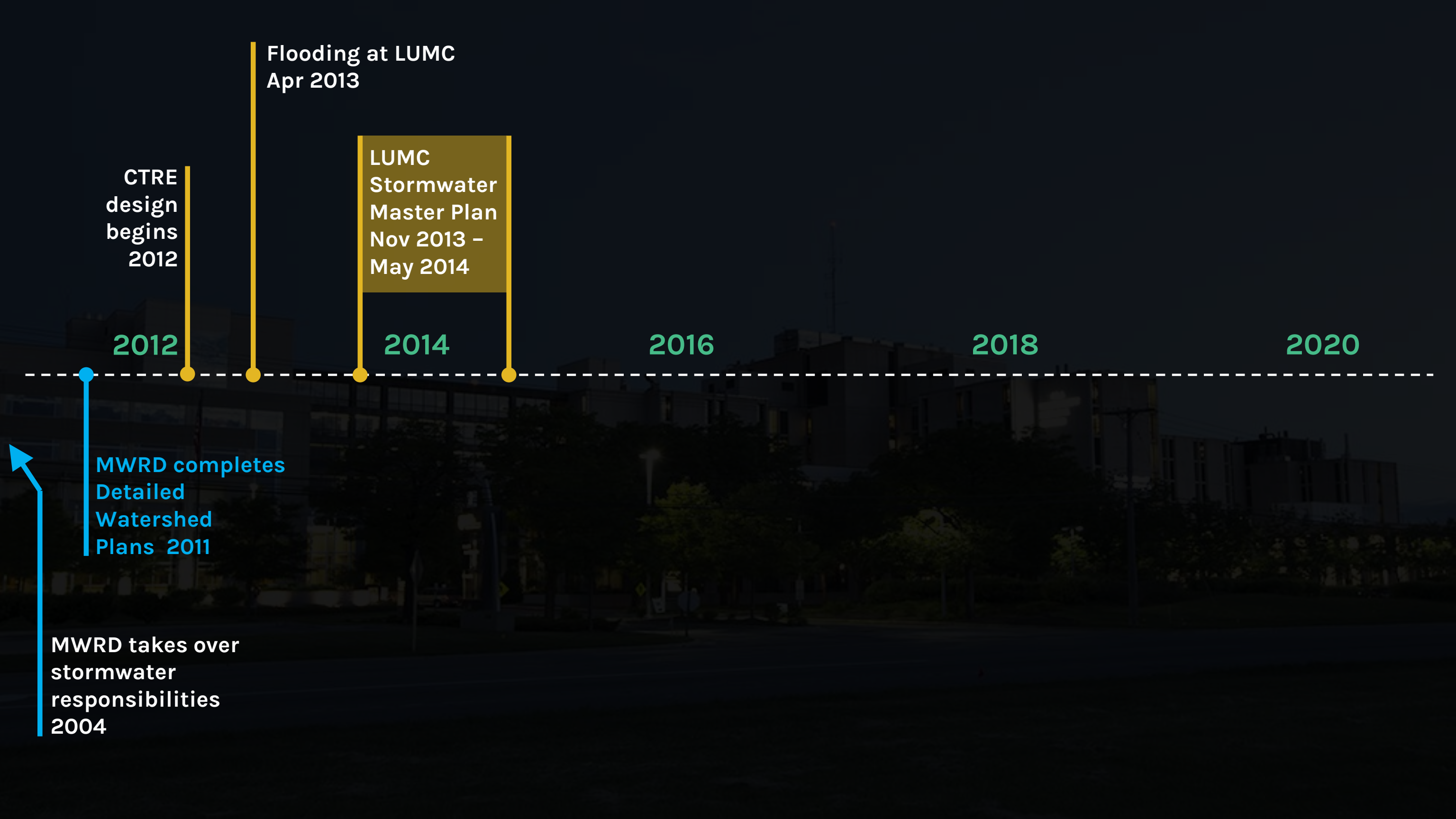
2016

2018

2020

MWRD takes over  
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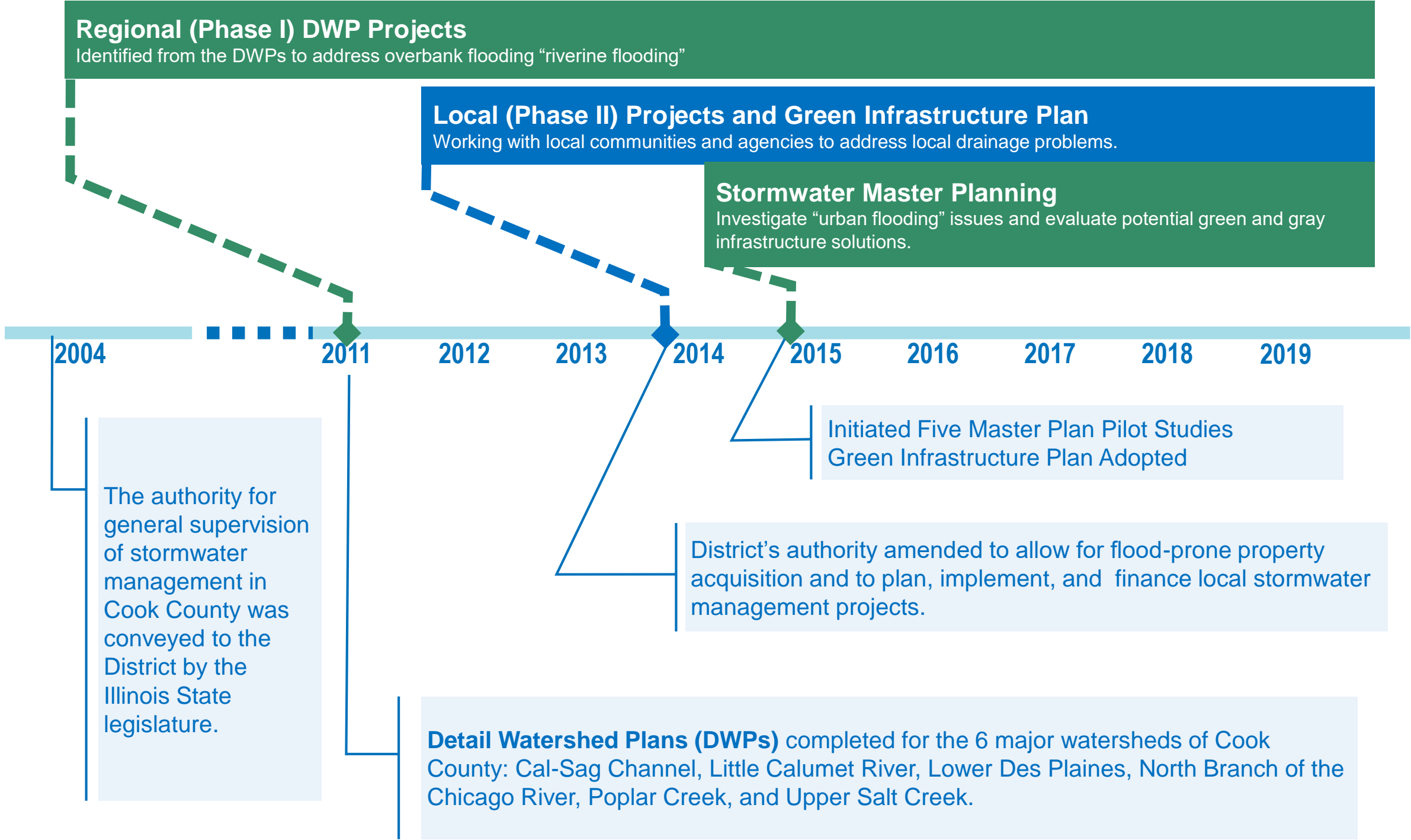
2020

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# STORMWATER MANAGEMENT TIMELINE





# STORMWATER PROGRAM TO DATE

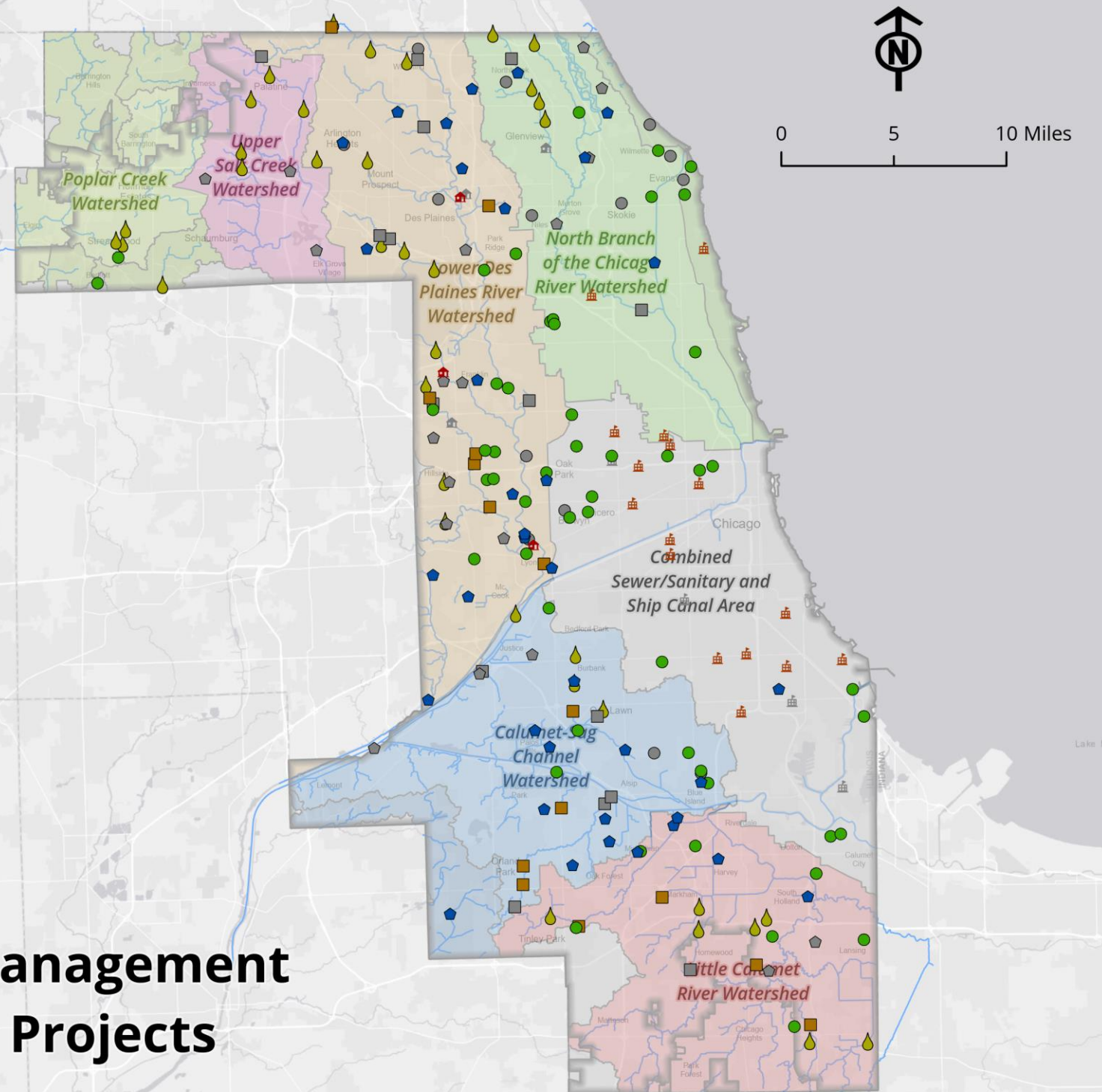
Program Component	Current Number of Projects	Structures Protected / Removed	Construction / Acquisition Cost (\$Million)	MWRD Cost (\$Million)
Regional Stormwater Projects (Phase I)	27	4,423	\$369	\$315
Local Stormwater Partnership Projects (Phase II)	52	>6,000	\$186	\$95
Green Infrastructure Projects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

\*-includes all 34 Space to Grow projects to be completed by 2022.



## Legend

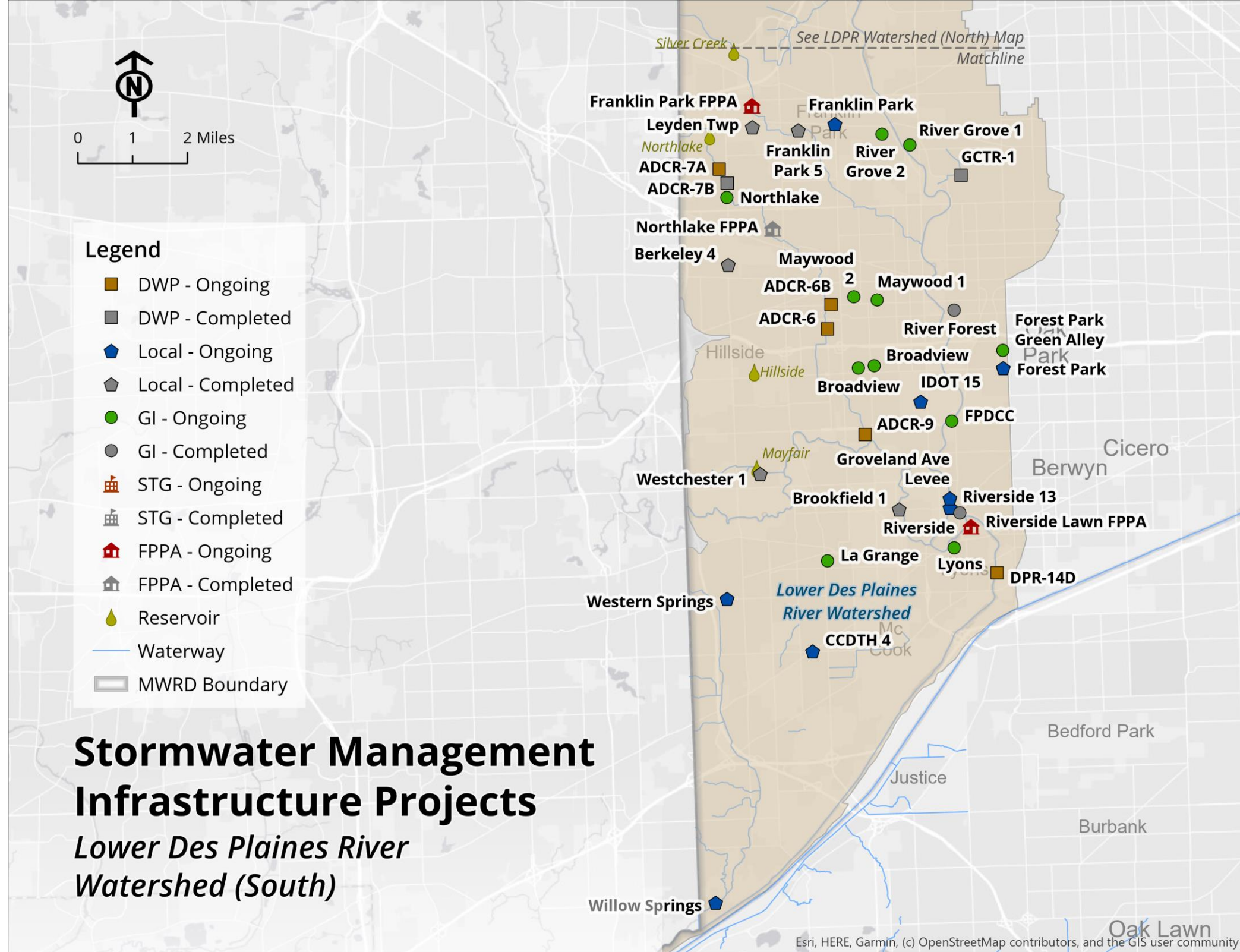
- DWP - Ongoing
- DWP - Completed
- ◆ Local - Ongoing
- ◆ Local - Completed
- GI - Ongoing
- GI - Completed
- 🏠 STG - Ongoing
- 🏠 STG - Completed
- 🏠 FPPA - Ongoing
- 🏠 FPPA - Completed
- 💧 Reservoir
- Waterway
- ▭ MWRD Boundary



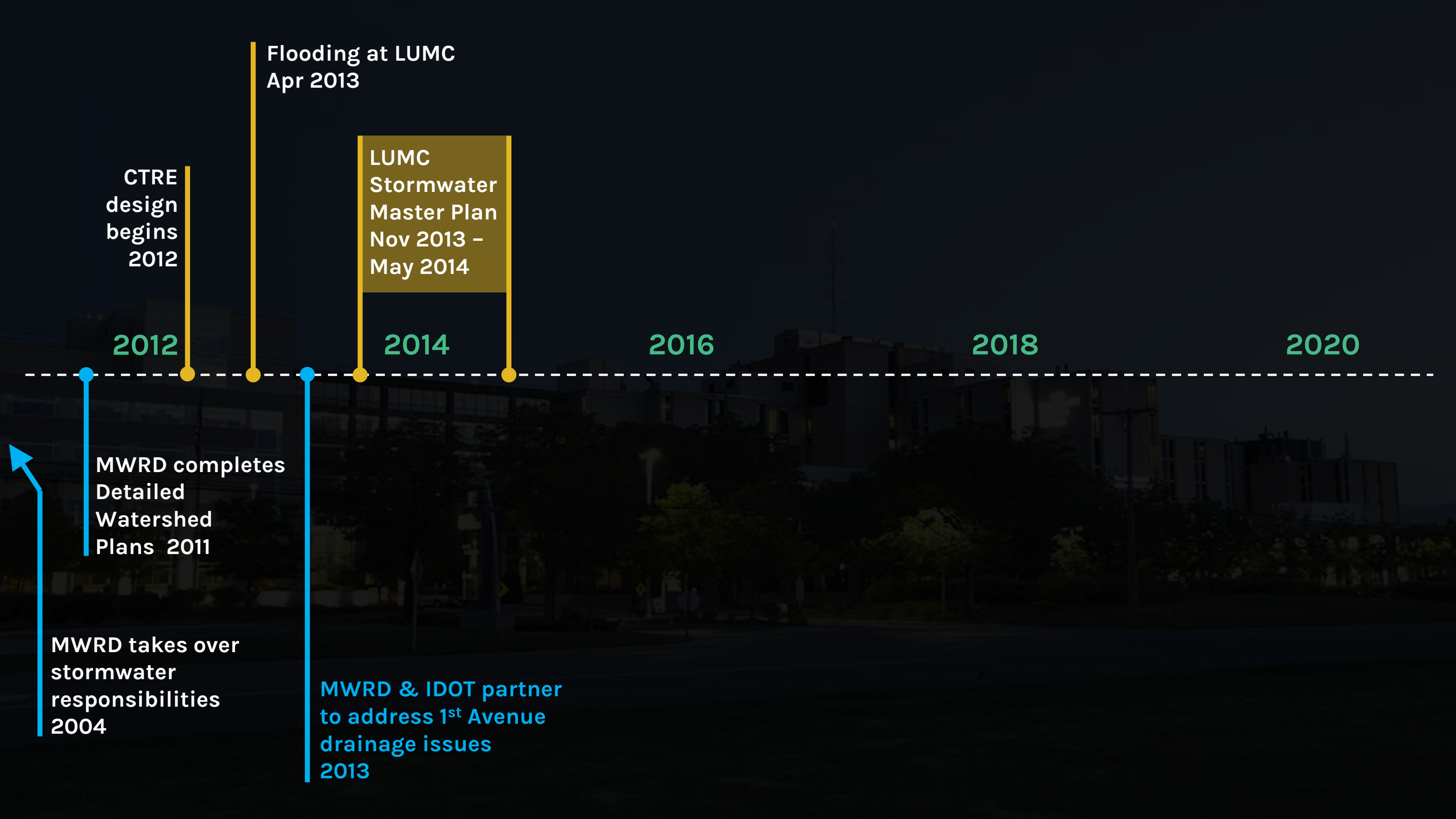
# Stormwater Management Infrastructure Projects

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community









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drainage issues  
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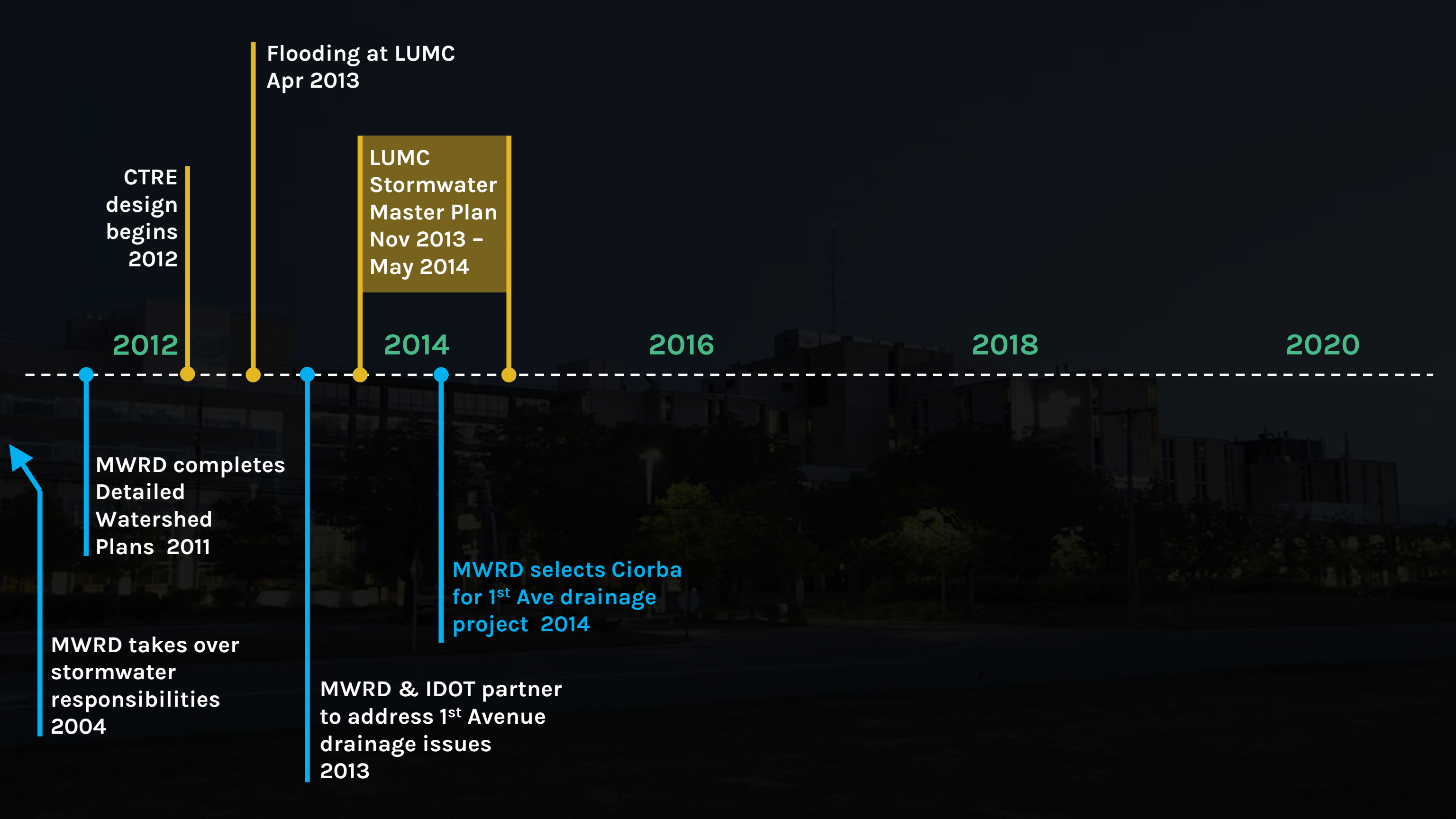




## **14-111-5F, FLOOD CONTROL PROJECT ON 1ST AVENUE**

- **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**





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# CIORBA'S INTRODUCTION TO 1<sup>ST</sup> AVENUE

JUNE 24, 2014 FLOOD EVENT

- 5-Year Flood Event – IDOT Impacts





# CIORBA'S INTRODUCTION TO 1<sup>ST</sup> AVENUE

JUNE 24, 2014 FLOOD EVENT

- 5-Year Flood Event - LUMC Impacts





# CIORBA'S INTRODUCTION TO 1<sup>ST</sup> AVENUE

JUNE 24, 2014 FLOOD EVENT

- 5-Year Flood Event - FPDCC Impacts





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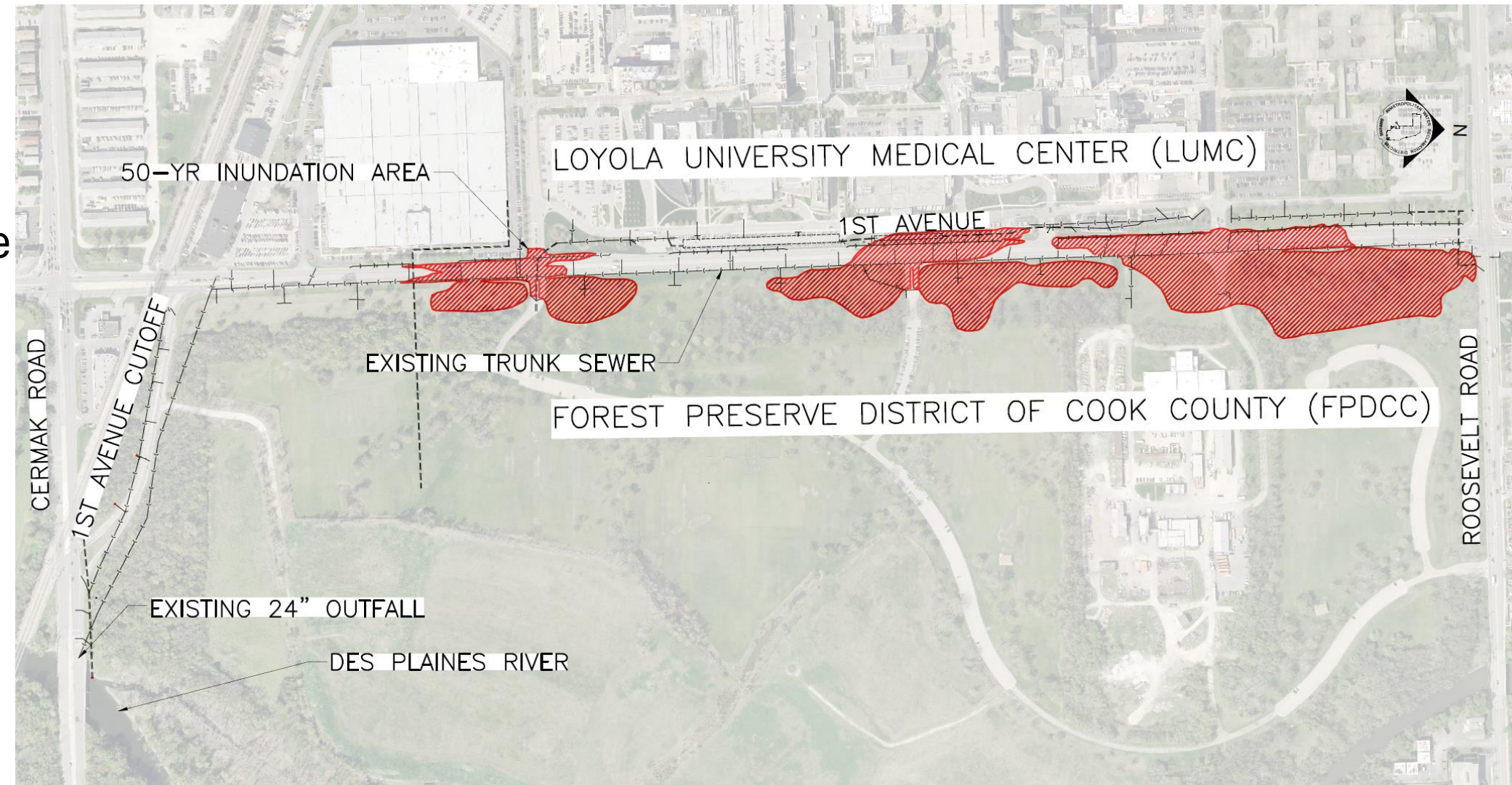
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# 1ST AVENUE FLOOD CONTROL

## EXISTING CONDITIONS ANALYSIS & COORDINATION

- 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 1<sup>st</sup> 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



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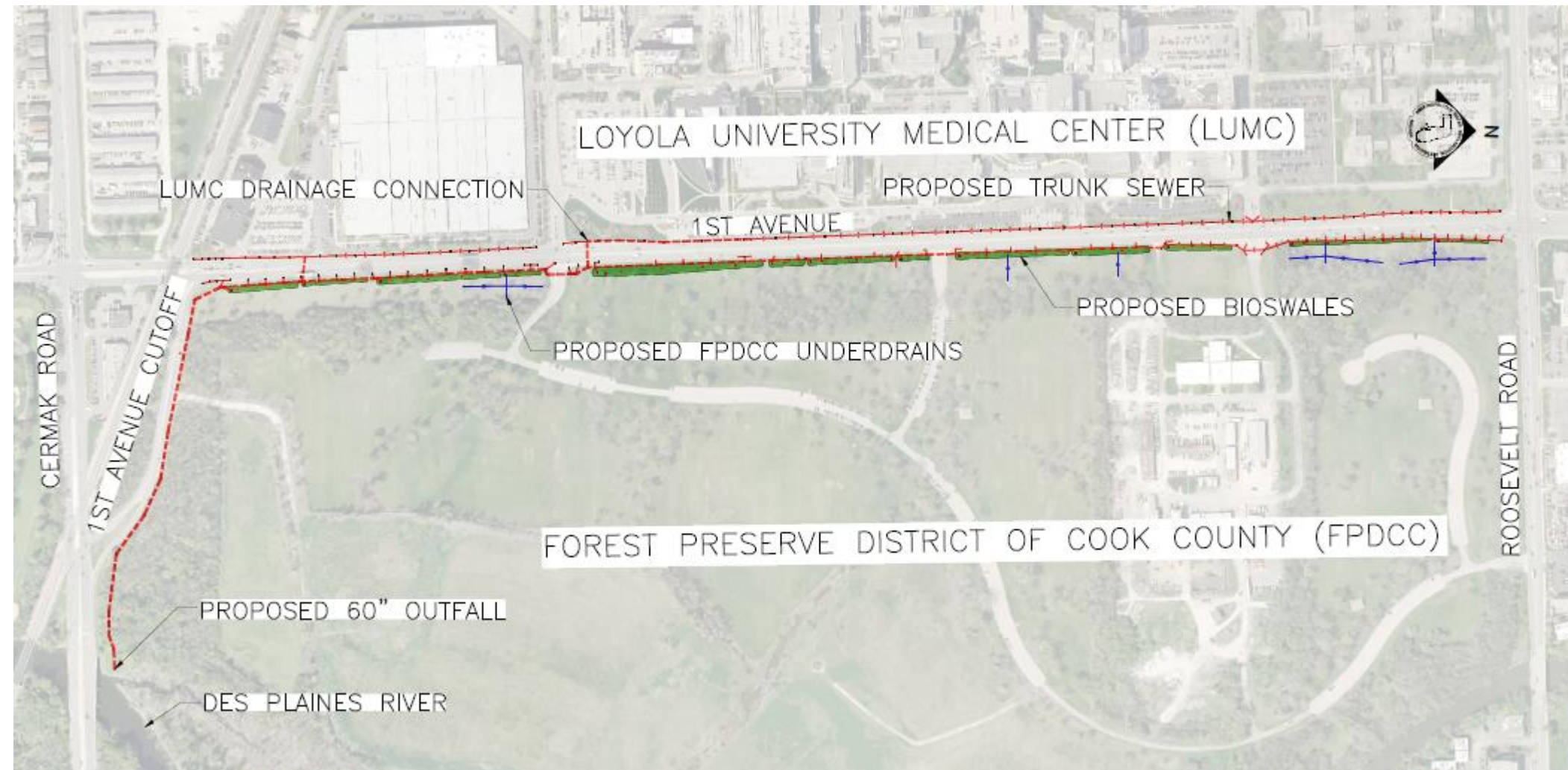
MWRD/Ciorba  
begin 1<sup>st</sup>  
Avenue Final  
Engineering  
Feb 2019



# 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

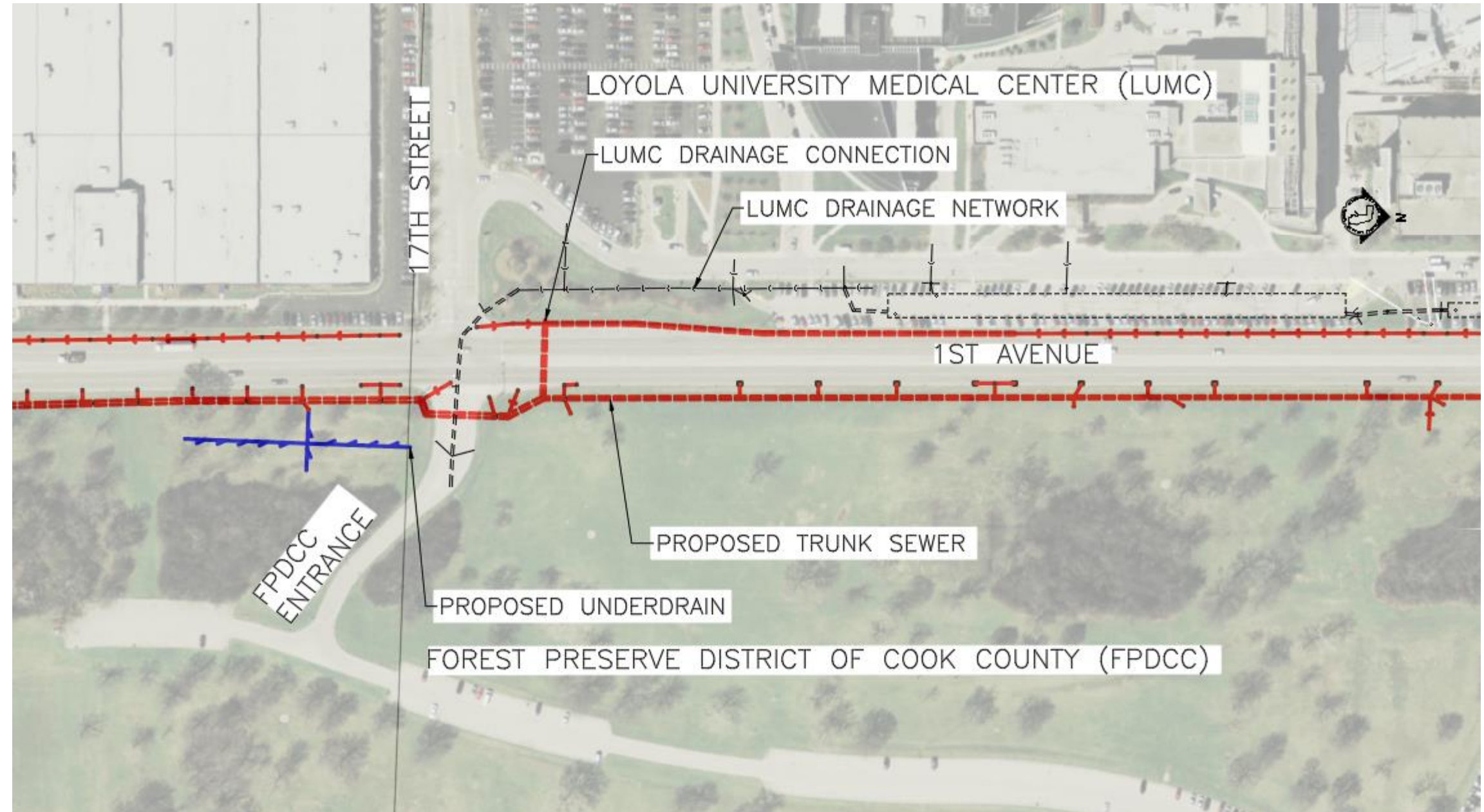




# 1ST AVENUE FLOOD CONTROL

## FINAL DESIGN & COORDINATION

- LUMC Connection





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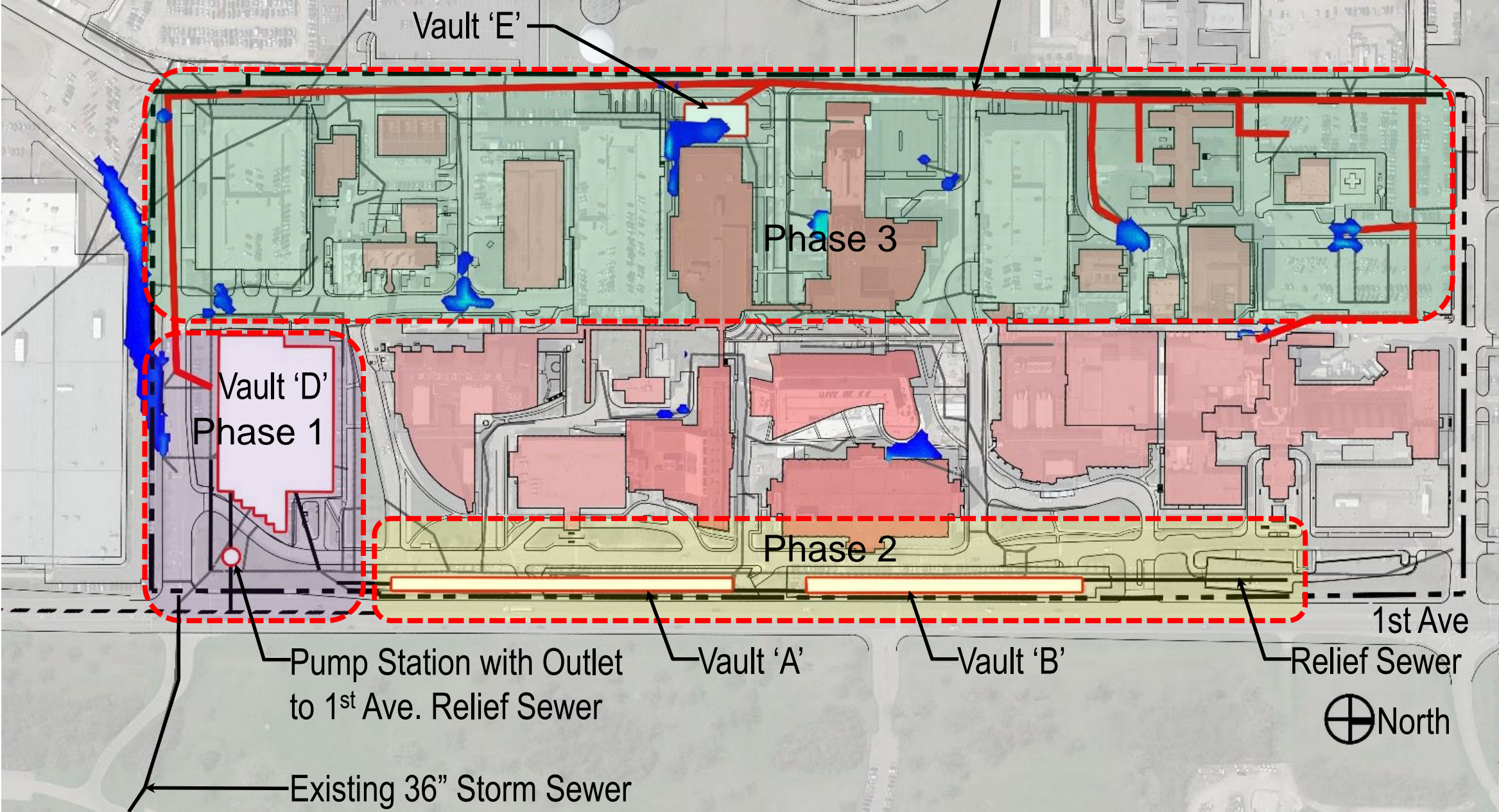
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# STORMWATER MASTER PLAN

## 50-YEAR STORM SWMM ANALYSIS



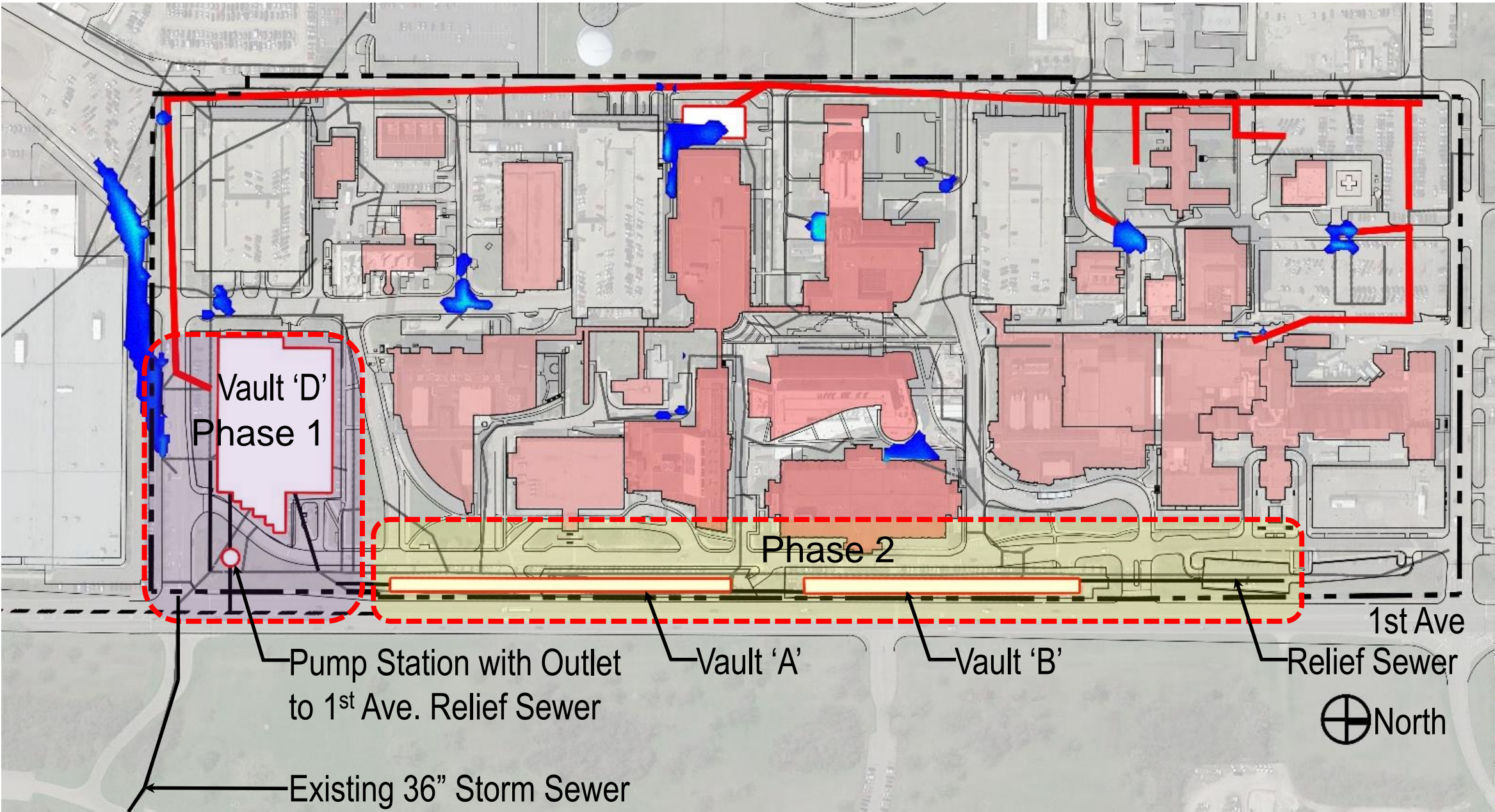
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Total:	8.9 ac-ft

**\$23.5M Projected Total Cost**



# FUNDING PROPOSAL (APRIL 2015)



Grant Request:  
**\$15.9 million**

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

Phase 2:  
Vaults A and B  
Relief Sewer  
\$6.6 million

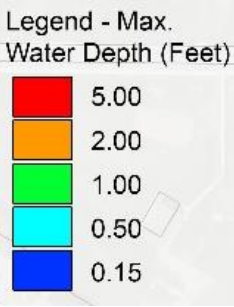
Pump Station with Outlet  
to 1<sup>st</sup> Ave. Relief Sewer

Vault 'A'

Vault 'B'

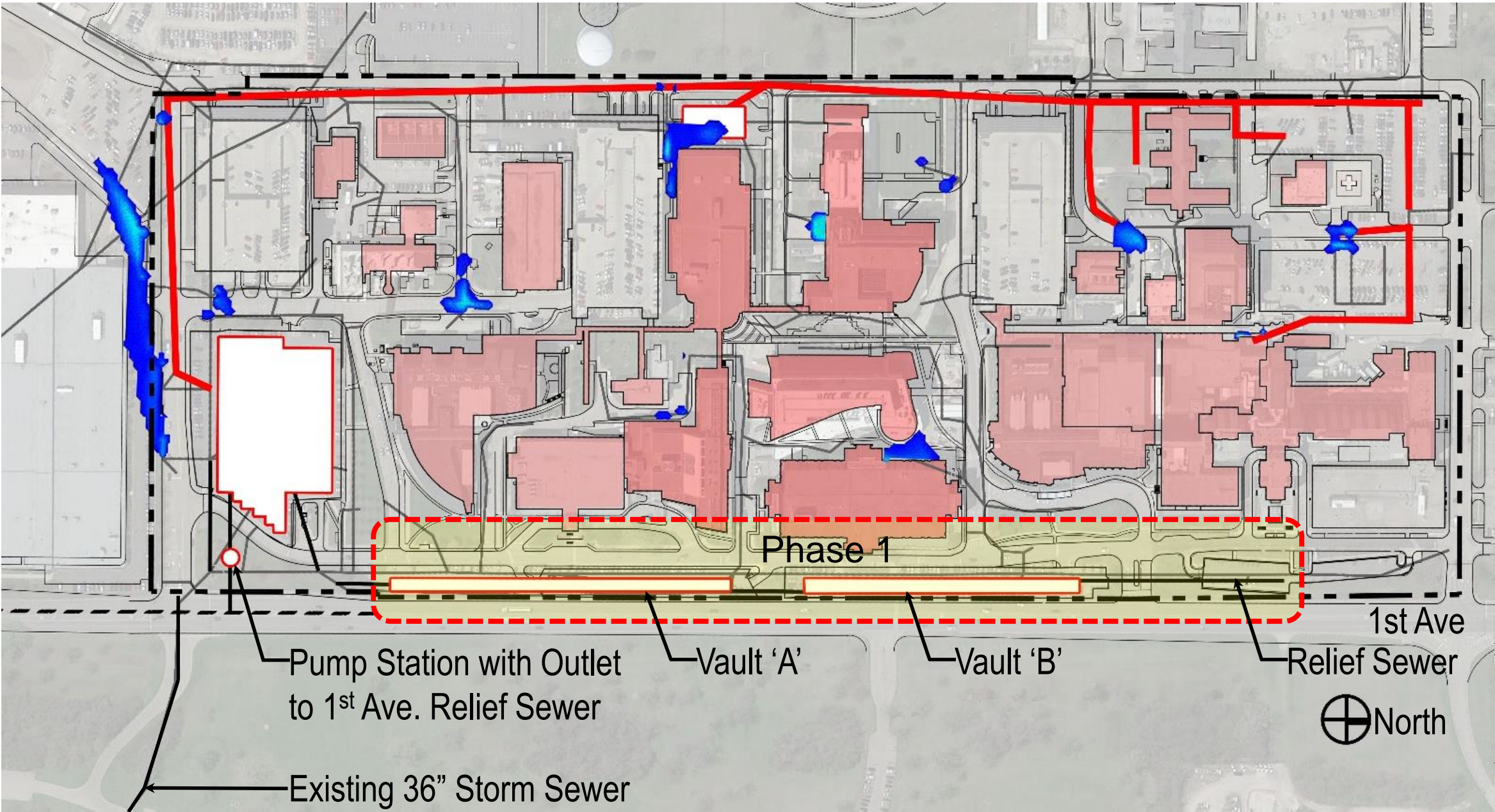
Relief Sewer

Existing 36" Storm Sewer  
Outfall to Des Plaines River





# REVISED PROPOSAL (2015 - 2016)



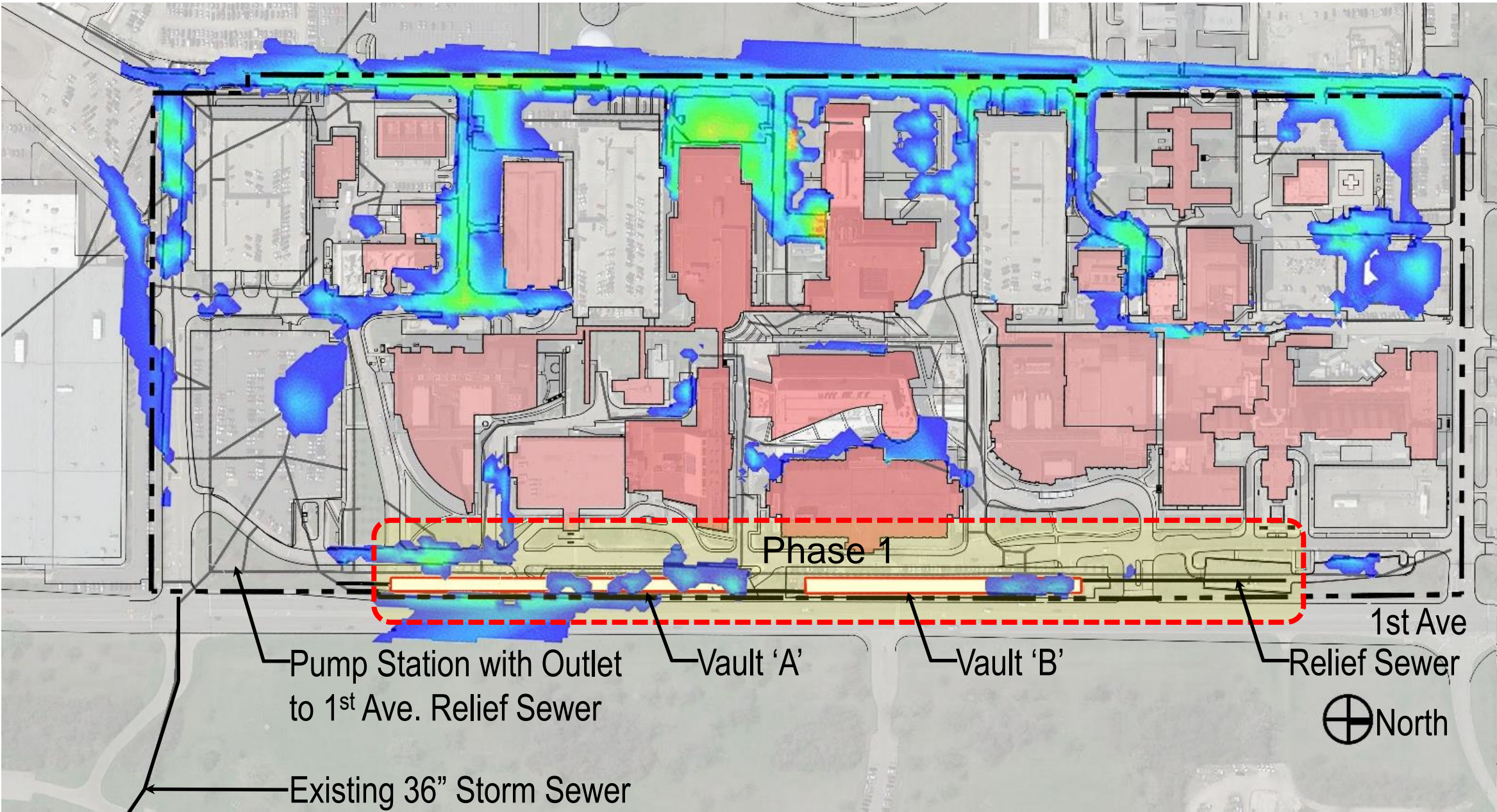
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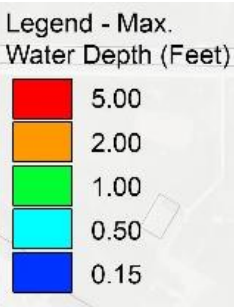
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Pump Station with Outlet to 1<sup>st</sup> Ave. Relief Sewer

Vault 'A'

Vault 'B'

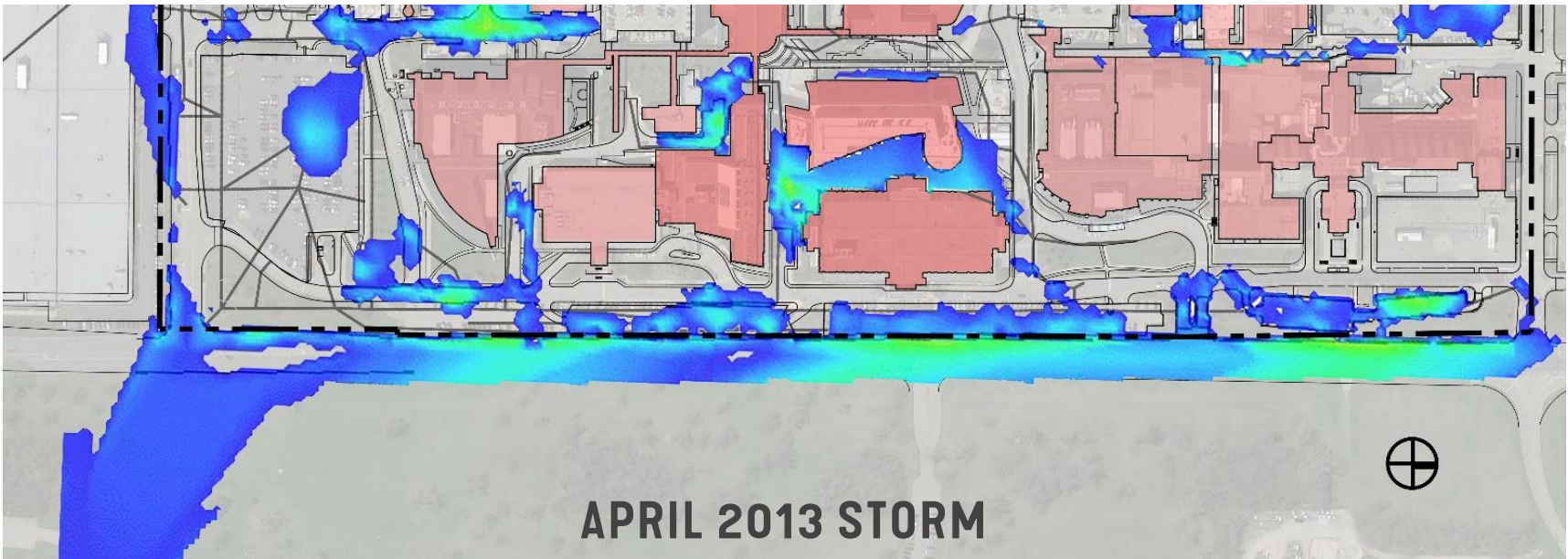
1<sup>st</sup> Ave Relief Sewer



Existing 36" Storm Sewer Outfall to Des Plaines River

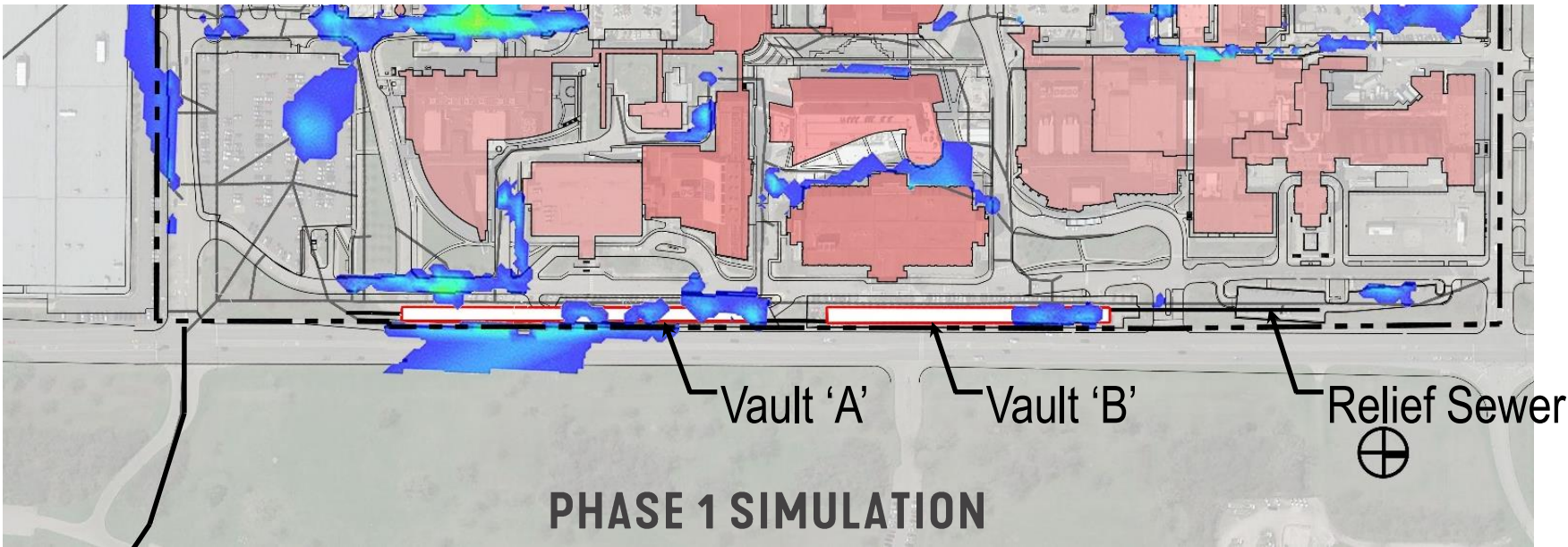


# REVISED PROPOSAL (2015 – 2016)

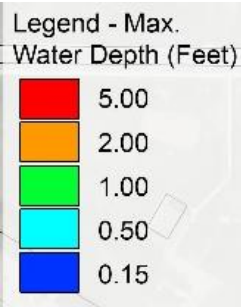


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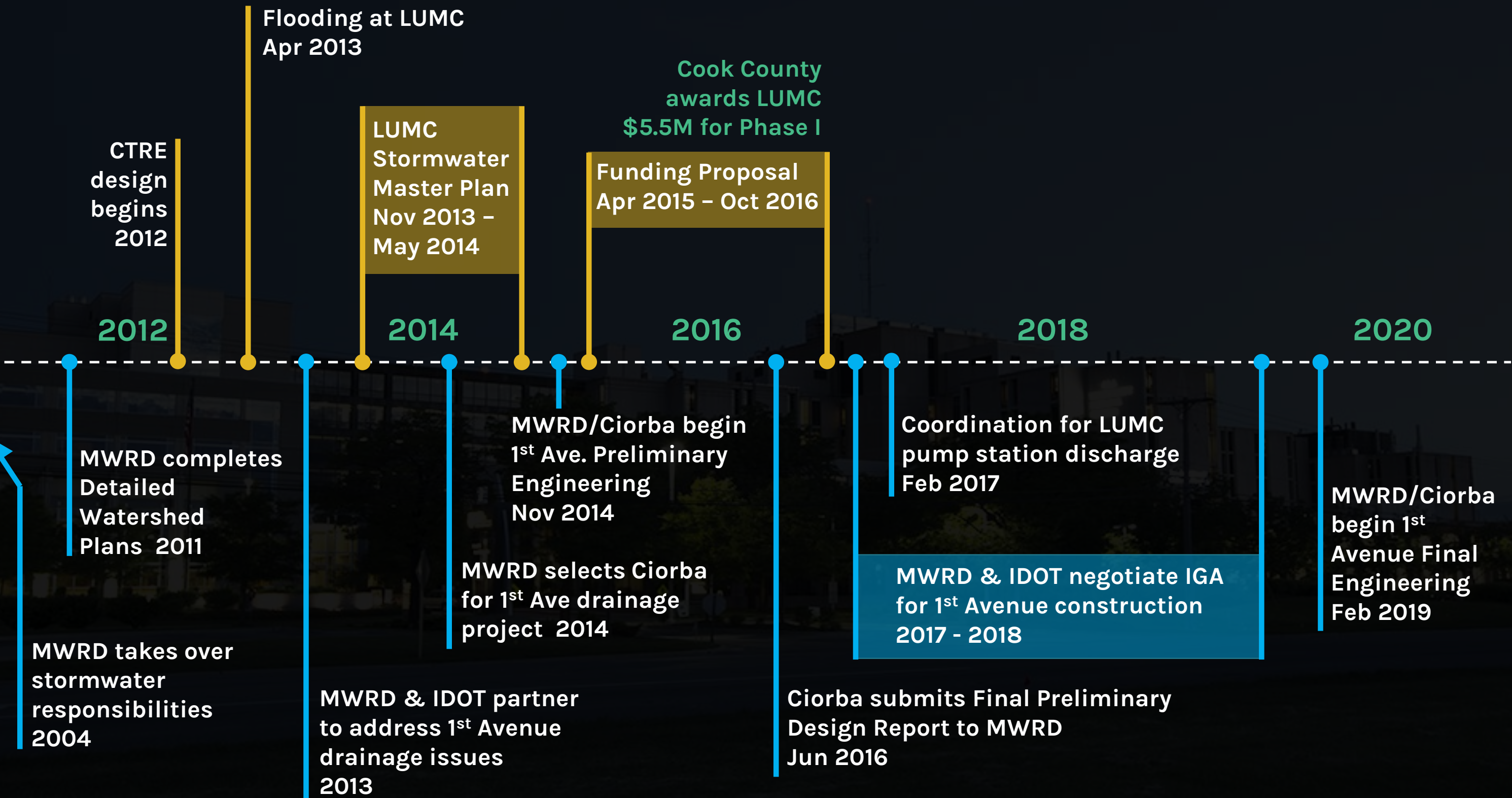
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Funding Proposal  
Apr 2015 – Oct 2016

CTRE  
design  
begins  
2012

2012

2014

2016

2018

2020

MWRD completes  
Detailed  
Watershed  
Plans 2011

MWRD takes over  
stormwater  
responsibilities  
2004

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

MWRD selects Ciorba  
for 1st Ave drainage  
project 2014

Ciorba submits Final Preliminary  
Design Report to MWRD  
Jun 2016

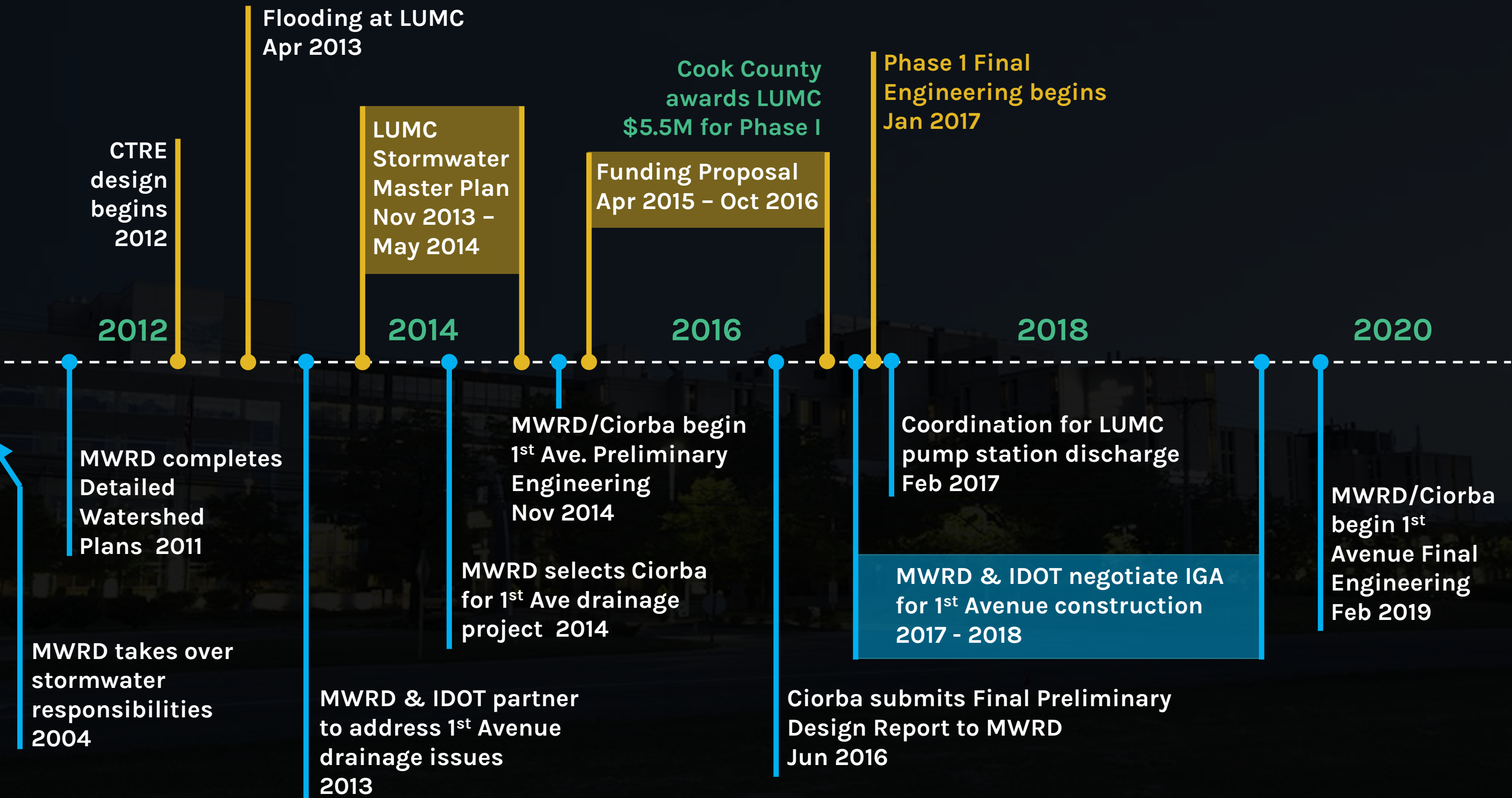
Coordination for LUMC  
pump station discharge  
Feb 2017

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

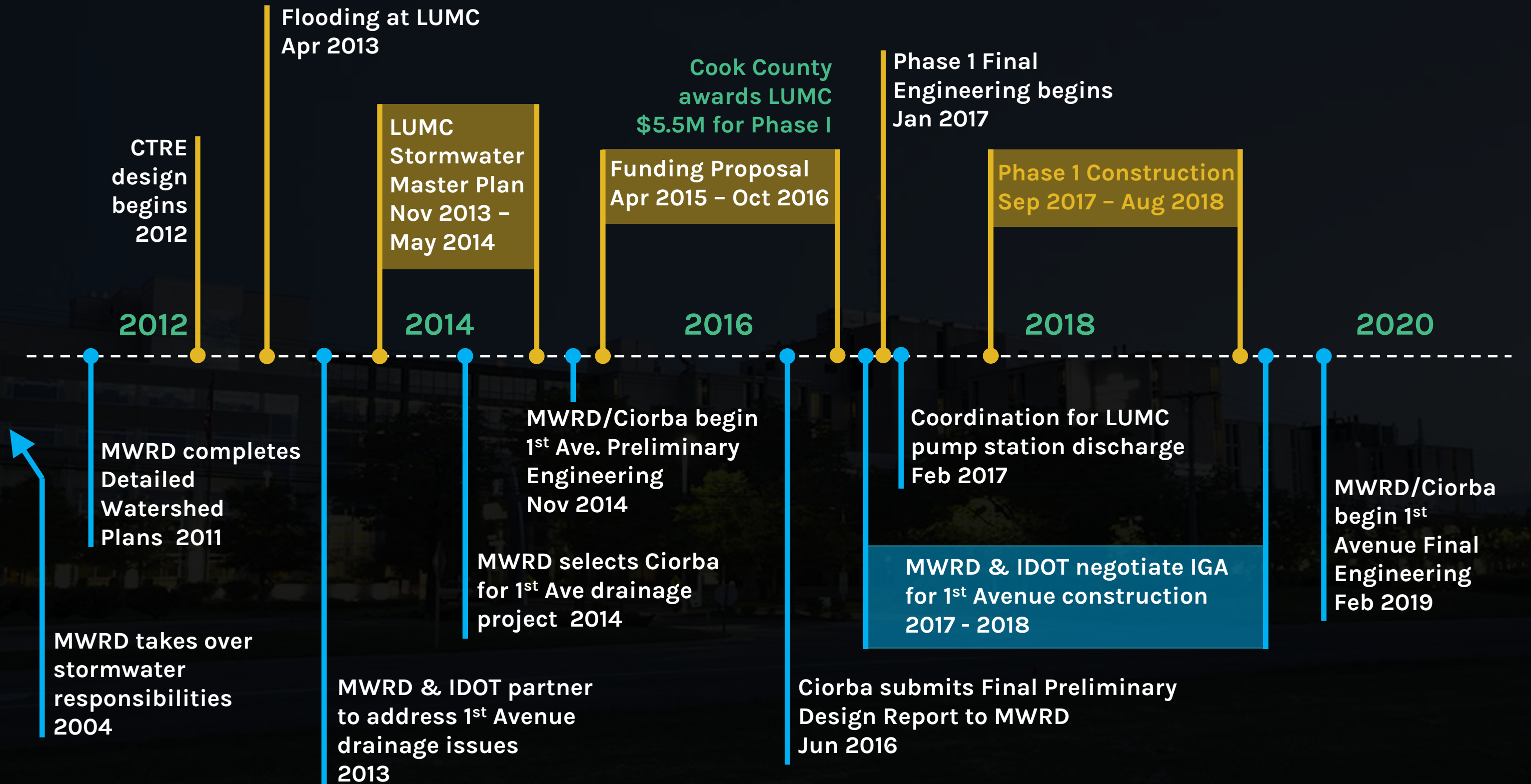
MWRD/Ciorba  
begin 1st  
Avenue Final  
Engineering  
Feb 2019

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



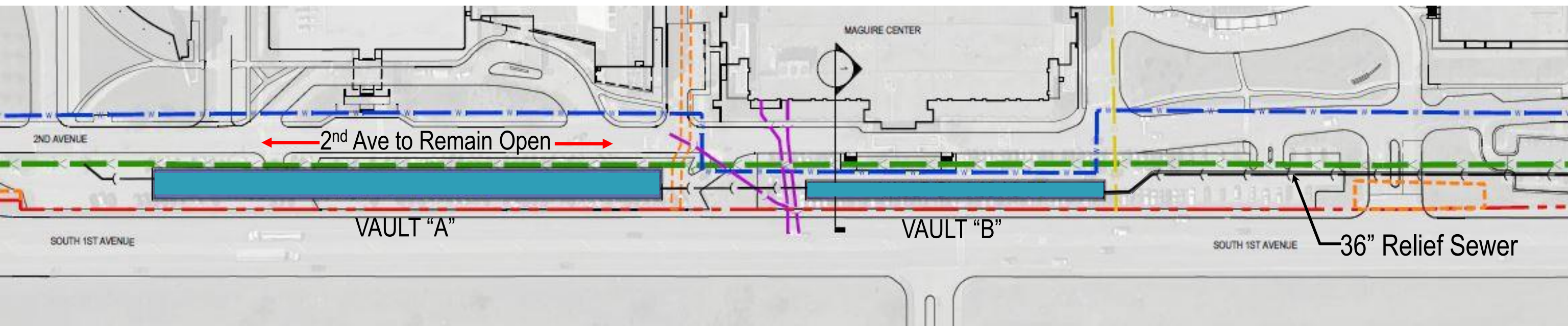
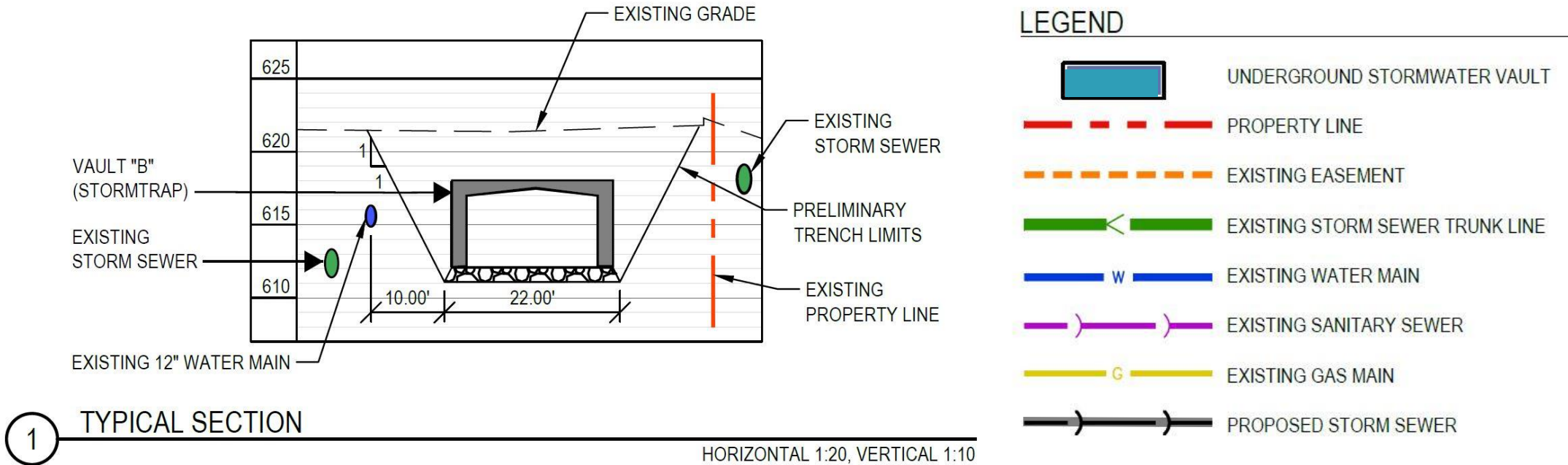








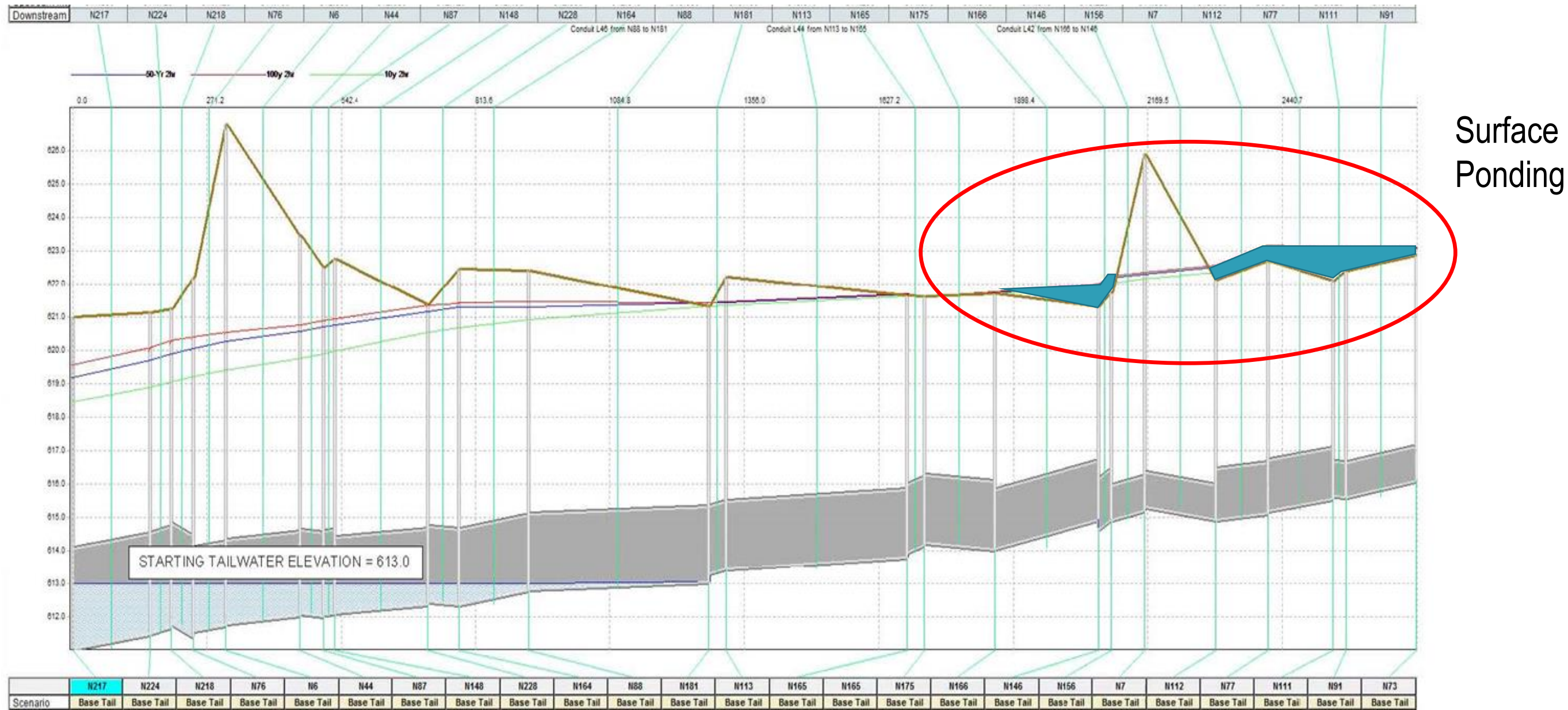
# PHASE 1 // FINAL ENGINEERING





# TRUNK SEWER

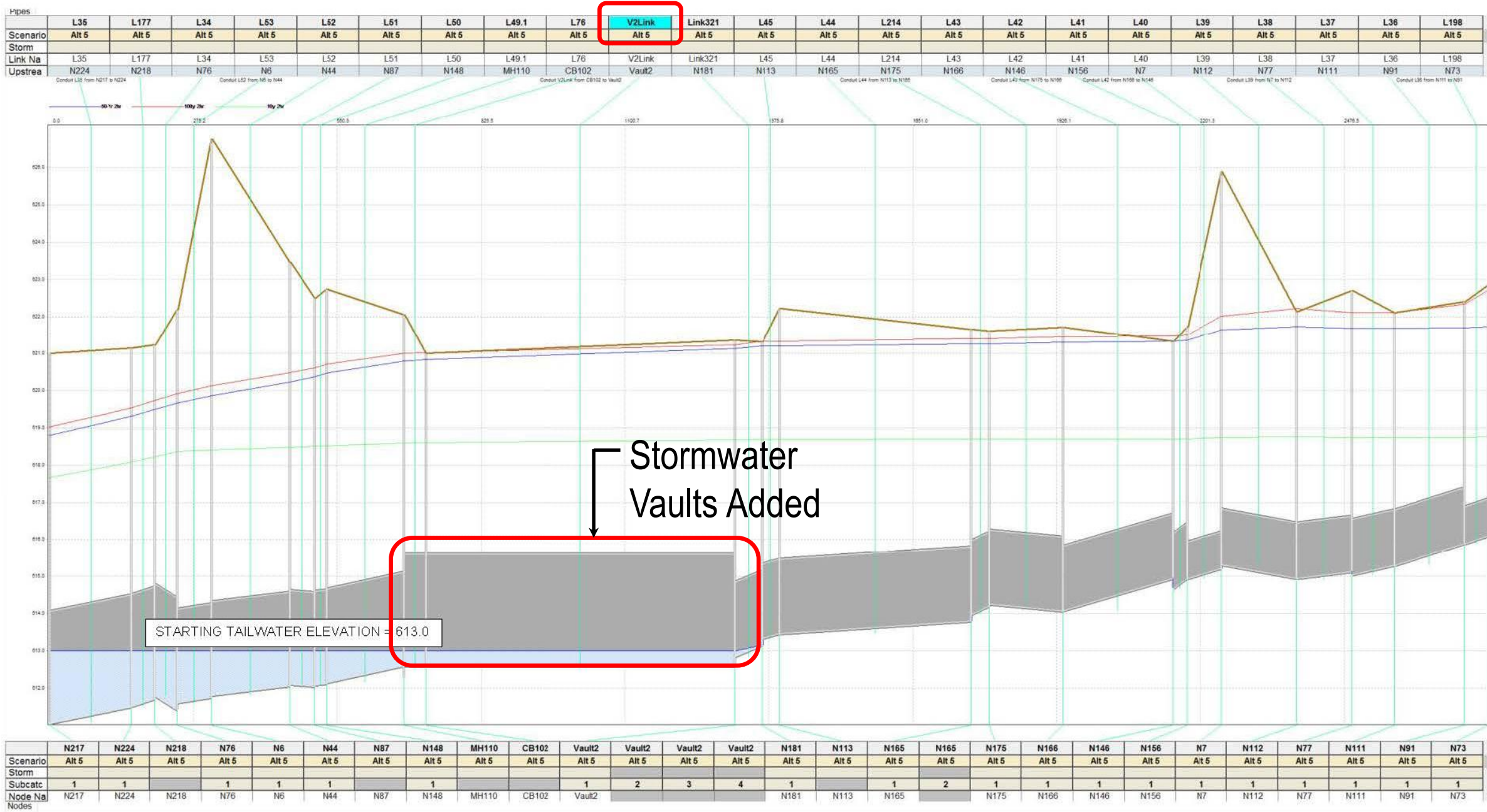
## EXISTING PROFILE





# TRUNK SEWER

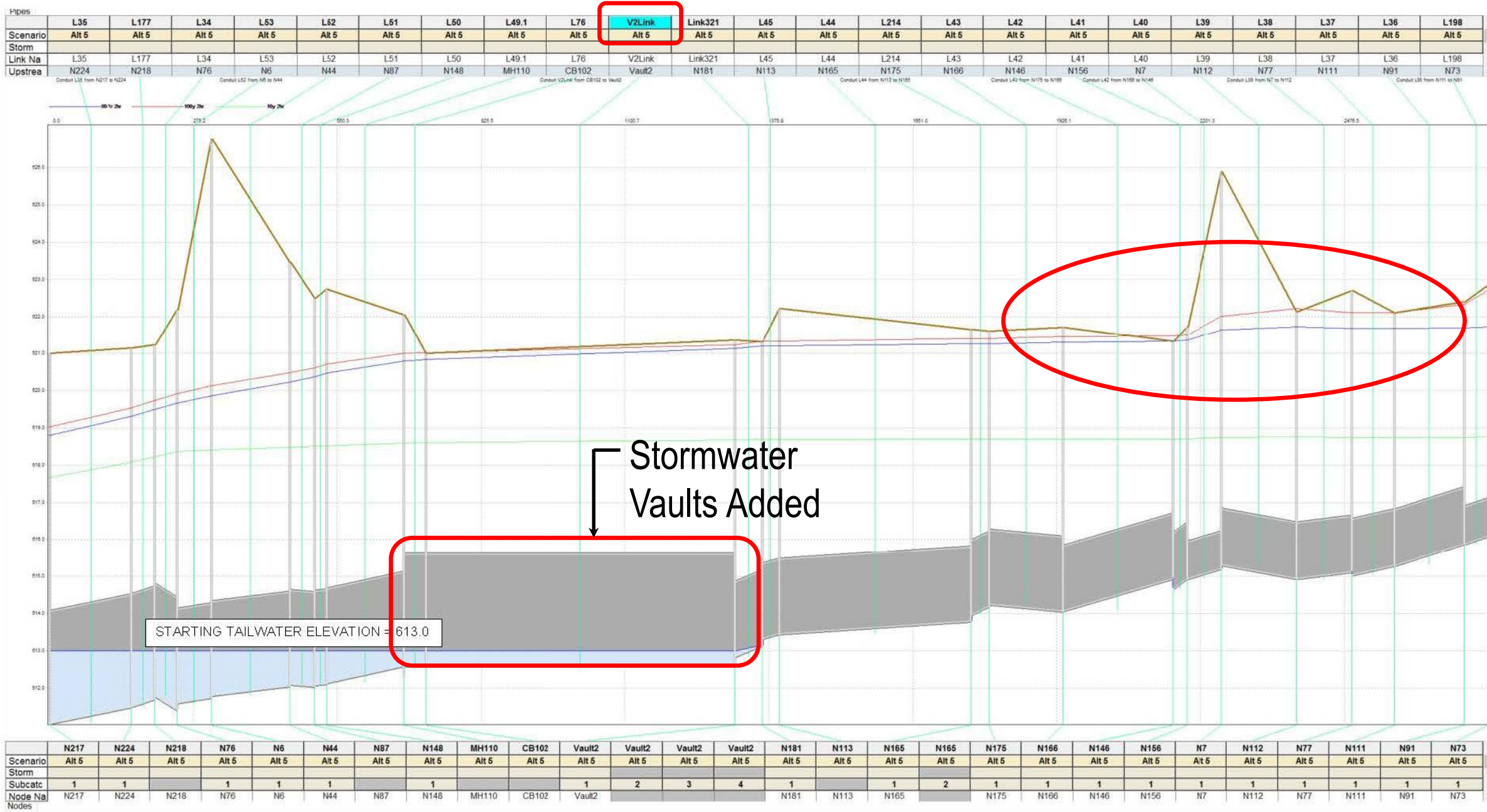
## PROPOSED PROFILE





# TRUNK SEWER

## PROPOSED PROFILE





# EXISTING PARKING LOTS

VIEW LOOKING SOUTH





# PHASE 1 CONSTRUCTION (2017)





# PHASE 1 CONSTRUCTION (2017)



*courtesy of StormTrap*



# 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



LOYOLA  
UNIVERSITY  
HEALTH SYSTEM



LOYOLA  
UNIVERSITY CHICAGO



SMITHGROUP