



NATALIE CREEK PRELIMINARY ENGINEERING PROJECT

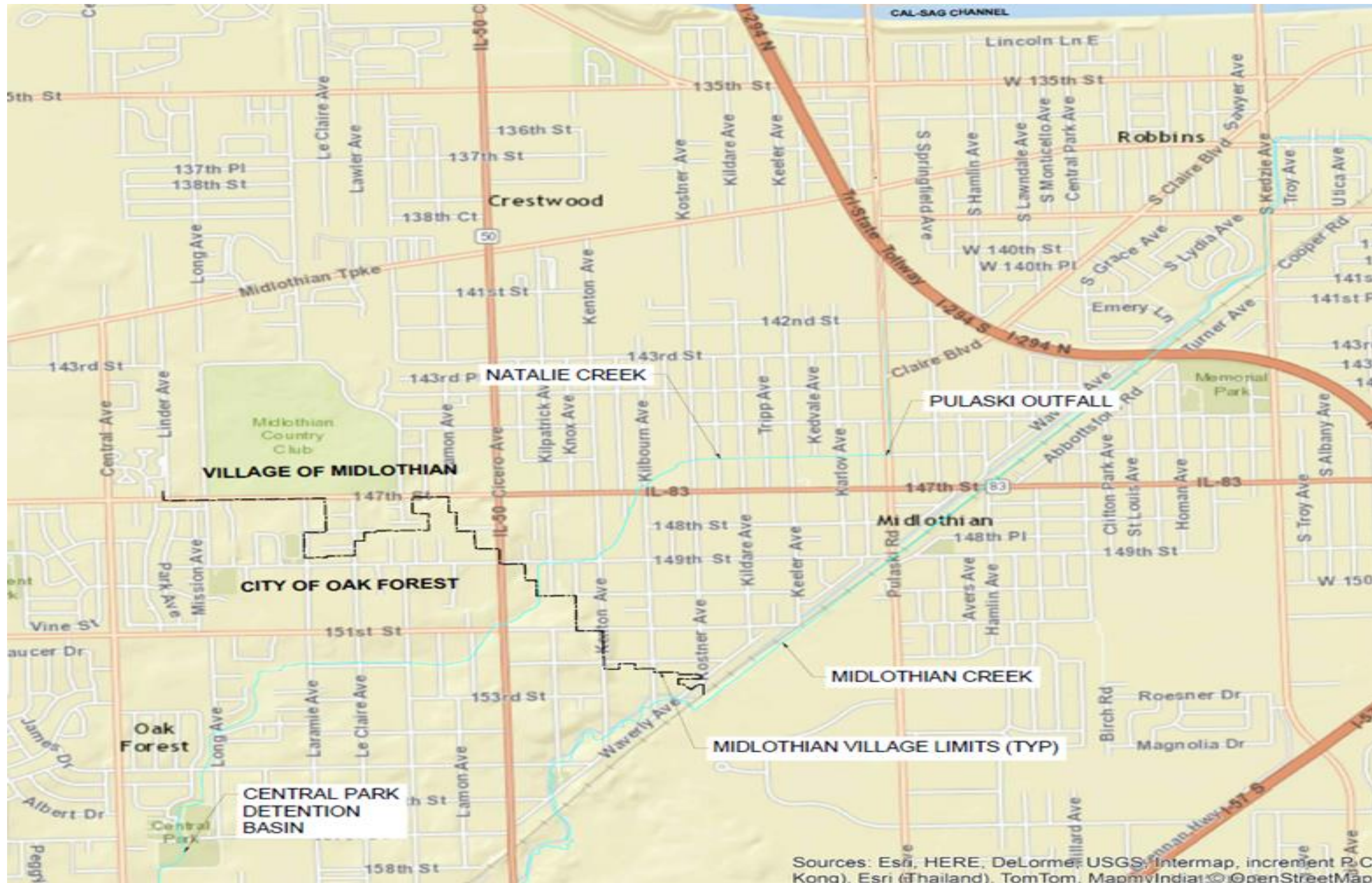
- ▶ **Project Overview**
- ▶ **Executive Summary**
- ▶ **Resident Concerns**
- ▶ **Investigation Results**
- ▶ **Improvements Evaluated**
- ▶ **Alternative Comparison**
- ▶ **Potential Alternative**
- ▶ **Summary**



PRELIMINARY ENGINEERING PROJECT OVERVIEW

- ▶ **Project Area:** Vicinity of 153rd St. and Lavergne Ave. to 146th St. and Pulaski
- ▶ **Scope of Work:** Develop Flood Mitigation Alternatives for the Natalie Creek Drainage/Project Area
- ▶ **Current Status:** Alternatives were developed and modeled, and the Draft Preliminary Design Report was presented to the Village of Midlothian (Village), & the City of Oak Forest (City) on July 8, 2015.
 - Village and City Officials support the plan.

NATALIE CREEK PROJECT AREA



PRELIMINARY ENGINEERING EXECUTIVE SUMMARY



- ▶ Existing system provides a 2-year level of protection or less
 - New bridges at Keeler, Karlov, and Keystone lowered WSEL 12 inches during 100-year rainfall event
- ▶ Six (6) Alternatives were Investigated
 - Cost ranged from \$5.8 to \$56.1 Million (M)
 - Storage (Detention Pond) Alternatives ranged from 3 to 150 Acre-Ft (50M Gallons)
 - Total Structures Protected ranged from 208 to 391
- ▶ Potential Alternative will provide a 25-year level of service
 - Estimated Construction Cost - \$8.3 M (\$9 M including O&M costs)
 - Structures Protected – 237
 - Conveyance (Channel) Improvements – 5500 Feet
 - Storage (Detention Pond) – 3 Acre-Ft (1M Gallons)
 - Diversion Conduit Not Required

PRELIMINARY ENGINEERING RESIDENT CONCERNS



▶ George Dunne National Golf Course

- Model was done to simulate the golf course as a forested area in order to compare the effects on Natalie Creek
 - ▶ Model showed that the golf course had almost no effect on the water surface elevation (WSEL) downstream
 - ▶ Primary reason for flooding is due to runoff from developed areas downstream of the golf course and Central Park Detention Basin

▶ Central Park Detention (CPD) Basin

- The CPD Basin was designed for a 100-year event
 - ▶ Modeling was performed to simulate the effects of lowering the spillway. Results showed only slight impact on flood elevations downstream.
 - ▶ **Other improvements such as culvert enlargements and detention will better mitigate the flooding effects of minor storms such as the 2-year storm event**

PRELIMINARY ENGINEERING INVESTIGATION RESULTS



► Channel Improvements are Required

- Channel Restrictions (including restrictive retaining walls)
- Degraded (eroded) Channel Banks
- Sediment Build-Up in Culverts

► Culvert Improvements are Required

- Culverts located in the City of Oak Forest have adequate open area to convey flow downstream
- Culverts located in the Village of Midlothian are typically smaller (restrictive)
- Restrictive culverts are severely affecting the flow of water through Natalie Creek and are contributing to the flooding being experienced by the Village

PRELIMINARY ENGINEERING INVESTIGATION RESULTS (Cont.)



Left: Sediment Build Up at Laporte Avenue
Right: Non-Engineered Rip Rap at Lavergne Avenue

PRELIMINARY ENGINEERING INVESTIGATION RESULTS (Cont.)

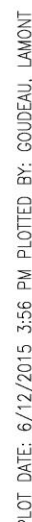


Left: Restrictive 149th St. Culverts
Right: Restrictive Kilpatrick Avenue Culvert at 149th St.

PRELIMINARY ENGINEERING IMPROVEMENTS EVALUATED



- ▶ Conveyance Improvements
- ▶ Storage Improvements (Detention Ponds)
- ▶ Diversion Conduits





ALTERNATIVE COMPARISON

► Alternatives' Improvement Differences

- **10-year Level of Service**

- Detention & Diversion Conduits are not required
- Recommended Culvert Sizes are Smaller, Culvert Upsizing at Kostner isn't required, and Modification to the 149th St. Concrete Channel isn't required

- **25-year Level of Service**

- Diversion Conduit not required
- Detention Required at Kostner Ave.
- Modification to 149th St. Concrete Channel is required
- Larger Culvert Sizes at the Six (6) previously named problem areas

- **30-year Level of Service (Same as 25-yr LOS plus)**

- Expansion of Vergne Way Park Basin with a 60" Diversion Conduit

- **45-year Level of Service (Same as 30-yr LOS plus)**

- Detention at Cicero and Kenton Aves.
- Creation of a Open Channel at Kenton Ave. (Eliminating the Culvert & Kenton Ave. Roadway over the Creek)

- **50-year Level of Service (Same as 45-yr LOS plus)**

- Detention at Laramie Ave.

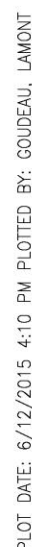
- **100-year Level of Service (Same as 50-yr LOS plus)**

- 30" Diversion Conduit connected to the Kenton Ave. Basin



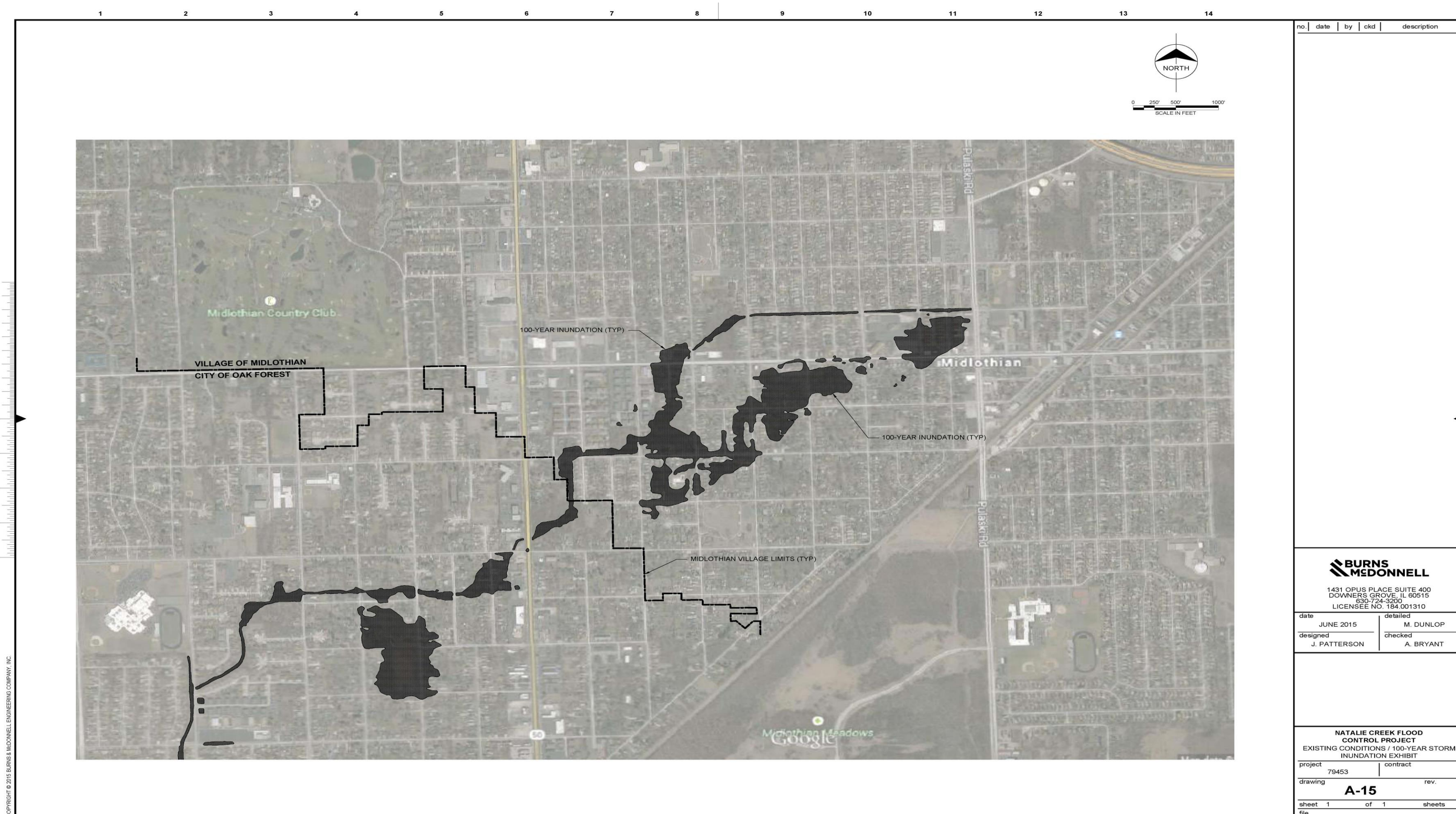
ALTERNATIVE COMPARISON

Alternative Comparison Table	10-Yr. LOS	25-Yr. LOS	30-Yr. LOS	45-Yr. LOS	50-Yr. LOS	100-Yr. LOS
Conveyance Improvements	X	X	X	X	X	X
Storage Improvements		X	X	X	X	X
Diversion Conduits			X	X	X	X
Estimated # of Property Acquisitions Required	0	8 (Vacant Land)	11	16	23	23
Benefits	\$3.0 M	\$11.7 M	\$12.3 M	\$12 M	\$12.3 M	\$12.3 M
Cost	\$5.8 M	\$9 M	\$24.2 M	\$32.1 M	\$35.3 M	\$56.1 M
B/C Ratio	0.52	1.30	0.51	0.37	0.35	0.22





Existing 100-Year Storm Inundation Exhibit





PRELIMINARY ENGINEERING SUMMARY



➤ SUMMARY

- Problem: Need to Improve Stormwater conveyance through the Village of Midlothian
- Solution: Conveyance Improvements in the City of Oak Forest with Structural Flood Control Improvements in the Village of Midlothian
 - 25 – Year Level of Service Improvements Proposal
 - Estimated Cost of \$8.3 M (Construction), \$9 M (w/O&M)

NATALIE CREEK PRELIMINARY ENGINEERING PROJECT



QUESTIONS

