Executive Summary

Stormwater System Assessment and Capital Improvement Program

With

Town-Wide Ranking of Recommended Alternatives

Prepared For:

Department of Infrastructure

and

Development Services

Lisa A. Pyles

Director

Prepared by:

HALFF

TBPE Firm No. F-312

AVO 31481

August 2017

HALFF

August 28, 2017
AVO 31481

Lisa A. Pyles
Director Infrastructure and Development Services
Town of Addison
16801 Westgrove Drive
Addison, Texas 75001

RE: Stormwater System Assessment and Capital Improvement Program
Executive Summary with Town-Wide Ranking of Recommended Alternatives and Individual Basin Documentation

Dear Ms. Pyles:

Halff Associates, Inc. has completed the Stormwater System Assessment and Capital Improvement Program (SSA/CIP) study for the entire Town of Addison. The enclosed Town-Wide Executive Summary presents the major findings and recommendations for the thirteen (13) severe flooding problem areas identified in the SSA/CIP reports for each basin in the Town as shown in Table II-1 of the Executive Summary.

Also included are the individual reports for each basin (Addison Circle, South Addison, Farmers Branch, White Rock Creek, Rawhide Creek, Hall Branch, Keller Springs Branch and Hutton Branch). Each of these reports contains detailed information for that basin.

Please note that the individual report for the Keller Springs Branch Basin was first submitted to the Town of Addison in June of 2010. Since then, the recommended Stormwater Capital Improvement Program for the Keller Springs Branch Basin was revised in December 2014 and has been updated for this document. The Hutton Branch Basin draft report was submitted to the Town of Addison in December of 2016. That draft report has been updated in this document.

It has been a privilege for our firm to assist the Town of Addison and its staff with the development of this Stormwater System Assessment and Capital Improvement Program. We hope that it serves the Town of Addison well in reducing flood risk throughout the Town.

Please do not hesitate to contact me at (214) 217-6650 if you have any questions on the SSA/CIP or anything contained in this report.

Sincerely,
HALFF ASSOCIATES, INC.

Maria C. Martinez, P.E., CFM
Project Manager

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Lisa A. Pyles
Director of Infrastructure &
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Acronyms and Definitions

The following list of acronyms and definitions is for frequently and generally used terms in the Town of Addison Stormwater System Assessment and Capital Improvement Program study reports. Not every term listed is used in this report.

BFE – Base Flood Elevation: FEMA term for the elevation that defines the level of flooding resulting from the one percent chance (100-year flood) storm event.

CCTV - Closed-Circuit Television: Video inspection method for underground stormwater systems.

cfs - cubic feet per second: Rate of flow.

Channel: Any river, stream, creek, brook, branch, natural or artificial depression, ponded area, lake, flowage, slough, ditch, conduit, culvert, gully, ravine, swale, wash, or natural or man-made drainageway, in or into which surface or groundwater flows, either perennially or intermittently.

Critical Facility: A facility that is critical to the community's public health and safety, is essential to the orderly functioning of a community, stores or produces highly volatile, toxic or water-reactive materials, or houses occupants that may be insufficiently mobile to avoid loss of life or injury. Examples of critical facilities include jails, hospitals, schools, fire stations, nursing homes, wastewater treatment facilities, water plants, and gas/oil/propane storage facilities.

CN - Curve Number: Empirical parameter used in hydrology for predicting direct runoff from rainfall.

Design Storm: A selected storm event, described in terms of the probability of occurring once within a given number of years, for which stormwater or flood control improvements are designed and built.

Detention Facility: A man-made structure for the temporary storage of stormwater runoff with controlled release during or immediately following a storm.

Drainage Area: The land area upstream of a given point that contributes stormwater to that point.

Emergency Overflow: The structure in a stormwater management system designed to protect the system in the event of a malfunction of the primary flow structure or a storm event greater than the system design. The emergency overflow capacity initiates at the facility design high water level or base flood elevation.

FEMA: Federal Emergency Management Agency and its regulations promulgated at 44 C.F.R. 59-79 effective as of October 1, 1986

FFE - Finished Floor Elevation: For this study, it is the elevation of the lowest floor of a structure.

Flood Frequency: A period of years, based on a statistical analysis, during which a flood of a stated magnitude may be expected to be equaled or exceeded.

Flood-Proofing: Any combination of structural or non-structural additions, changes, or adjustments to structures or property which reduce or eliminate flood damage to real estate, improved real property, water and sanitary facilities, structures and their contents.

GI - Green Infrastructure: A practice that manages stormwater and creates healthier urban environments, same as LID.

GIS - Geographic Information Systems: System designed to capture, store, manipulate, analyze, manage and present spatial or geographic data.

GPS - Global Positioning System: Navigation system to determine exact location.

HSG - Hydrologic Soil Group: An indicator of infiltration that is predetermined for each soil type. HSG is organized into 4 groups (A, B, C, and D). The letter A indicates rapid infiltration, and the letter D indicates that rainwater generally runs off the surface.

iSWM - integrated Stormwater Management: The integrated Stormwater Management program is a cooperative initiative of the North Central Texas Council of Governments (NCTCOG) that assists communities in achieving their water quality protection, streambank protection and flood mitigation goals, while also helping to meet their construction and post-construction obligations under TCEQ stormwater permits. NCTCOG facilitated the cooperative development of the *i*SWM Design Manual for Site Development and Design Manual for Construction.

LF - Linear Feet: Length measurement.

LID - Low Impact Development: Managing stormwater for less impact on the natural environment.

LiDAR - Light Detection and Ranging: Remote sensing method used to digitally examine the surface of the earth.

Mitigation: Measures taken to minimize flood risk and damage from stormwater overflows.

NCTCOG - North Central Texas Council of Governments: Association to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development.

NRCS - Natural Resources Conservation Service: Federal agency that provides technical assistance to farmers, private landowners and managers for the environment (formerly known as the Soil Conservation Service or SCS).

Overflow: Excessive stormwater in the street as a result of underground stormwater systems that cannot accommodate design flood event flows.

Ponding: Ponding is when stormwater pools/accumulates in a low area.

Post-Construction Stormwater Quality Features: Permanent stormwater facilities that minimize the impact of stormwater runoff rates and volumes, prevent erosion, and capture pollutants.

RCBC - Reinforced Concrete Box Culvert: Rectangular or square shaped concrete conduit used to convey or store water.

RCP - Reinforced Concrete Pipe: Circular shaped concrete conduit used to convey or store water.

Record Drawings: Upon completion of the land disturbance, a professional engineer licensed in the State of Texas or land surveyor shall certify construction drawings as to actual construction, documented in a set of record drawings.

ROW - Right-Of-Way: Publicly owned land for transportation, drainage and/or utility use.

Runoff: Stormwater generated from rainfall that flows over the ground surface.

SCS - Soil Conservation Service: See NRCS.

Spill: Stormwater runoff that flows from one system into another area that was not intended to receive the flow.

SSA/CIP - Stormwater System Assessment/Capital Improvement Program

SSURGO - Soil Survey Geographic Database: Digital soil data produced and distributed by NRCS.

Stormwater System: Combination of features that convey stormwater (pipe, box culvert, open channel, inlets, outfall, manholes, etc.).

Storm Drainage System: See stormwater system.

Structures Flooded: Structures where the flood level is higher than the lowest floor elevation of the structure.

Structures Potentially Flooded: Structures where the lowest floor elevation is less than 0.5 feet above a specified flood level, usually that of the 100-year flood.

Swale: A vegetated channel, ditch, or low-lying or depressional tract of land that is periodically inundated by conveying stormwater from one point to another.

SWMP - Stormwater Management Program: Established by the Town of Addison as part of the Texas Pollution Discharge Elimination System permit process to address stormwater quality.

T_C - Time of Concentration: The longest time required for a drop of water falling at the upper limit of a drainage area to travel to the point under consideration.

TIN - Triangular Irregular Network: Digital data structure used in GIS for the representation of a land surface.

TNRIS - Texas Natural Resources Information System: Principal state archive in Texas for natural resources data.

TCEQ – Texas Commission on Environmental Quality: An agency to protect the state's public and natural resources consistent with sustainable economic development.

TPDES - Texas Pollutant Discharge Elimination System: Permit to discharge stormwater from its Municipal Separate Storm Sewer Systems (MS4s) into surface waters of the State.

TR-55 - Technical Release 55 (Urban Hydrology for Small Watersheds): An NRCS publication that presents simplified procedures to calculate storm runoff volume, peak rate of discharge, hydrographs, and storage volumes required for floodwater reservoirs.

USDA - United States Department of Agriculture: Federal organization that manages programs related to food, agriculture, natural resources, rural development and nutrition.

WSEL - Water Surface Elevation

XPSWMM - XP Stormwater Management Model: Proprietary software for planning, modeling and managing stormwater sustainable drainage systems. Hydraulically, flows are simulated in 1D channels and pipes, coupled to a 2D surface grid for comprehensive (dynamic, two-dimensional) flood modeling.

100-year Storm Event: Refers to rainfall or flood event that has one percent (1%) probability of occurring in any given year.

I. INTRODUCTION

The Town of Addison is served by an urban storm drainage system that consists of streets, curb inlets, underground pipes and box culverts, open (manmade) drainage channels and natural streams. From a hydrologic and terrain standpoint, the drainage system consists of 8 separate basins as shown on **Figure I-1.**

The existing system was constructed over time to varying levels of service. Currently, the design standard used for a typical large storm drainage system in Addison is the 100-year storm event, which is defined as a flood having a one percent chance of happening at least once in any given year. The Town is virtually completely built out with very few undeveloped parcels remaining. A notable exception is the Mary Kay campus next to the Dallas North Tollway in the Keller Springs Branch Basin. Also notable, some sites remain to be developed in Vitruvian (Farmers Branch Basin). This study assumes all sites are developed according to zoning.

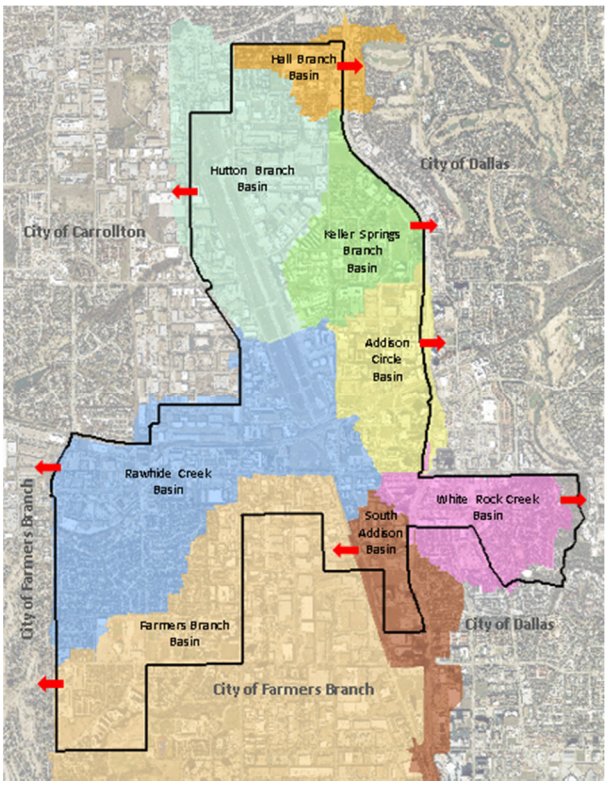

Figure I-1: Town of Addison Basins

Drainage problems occur when storm runoff exceeds the capacity of the stormwater system. This Stormwater System Assessment and Capital Improvement Program (SSA/CIP) study has examined the existing systems in detail and located 85 areas of concern based on mapping of the 100-year (1%) storm event. The benefit to the Town and its citizens from upgrading all of these problem areas to current Town drainage standards would be marginal while the cost would be likely prohibitive. Therefore, further detailed investigations were performed to characterize the problems in terms of the potential for impacting public safety and causing significant damage to private and public structures. As a result, 13 of the 85 areas of concern were found to be in need of corrective measures (mitigation) due to serious threats to public and private property. **Figure I-2**. shows the location of these 13 severe problem areas. An inventory of flooded structures for the 100-year storm event in these 13 serious flood risk areas includes 10 residential and 6 commercial structures with about 36 other structures potentially impacted. A variety of mitigation alternatives were investigated for each problem area and the best alternative was recommended. Please note that no severe problem areas were found in the Hall Branch and South Addison Basins.

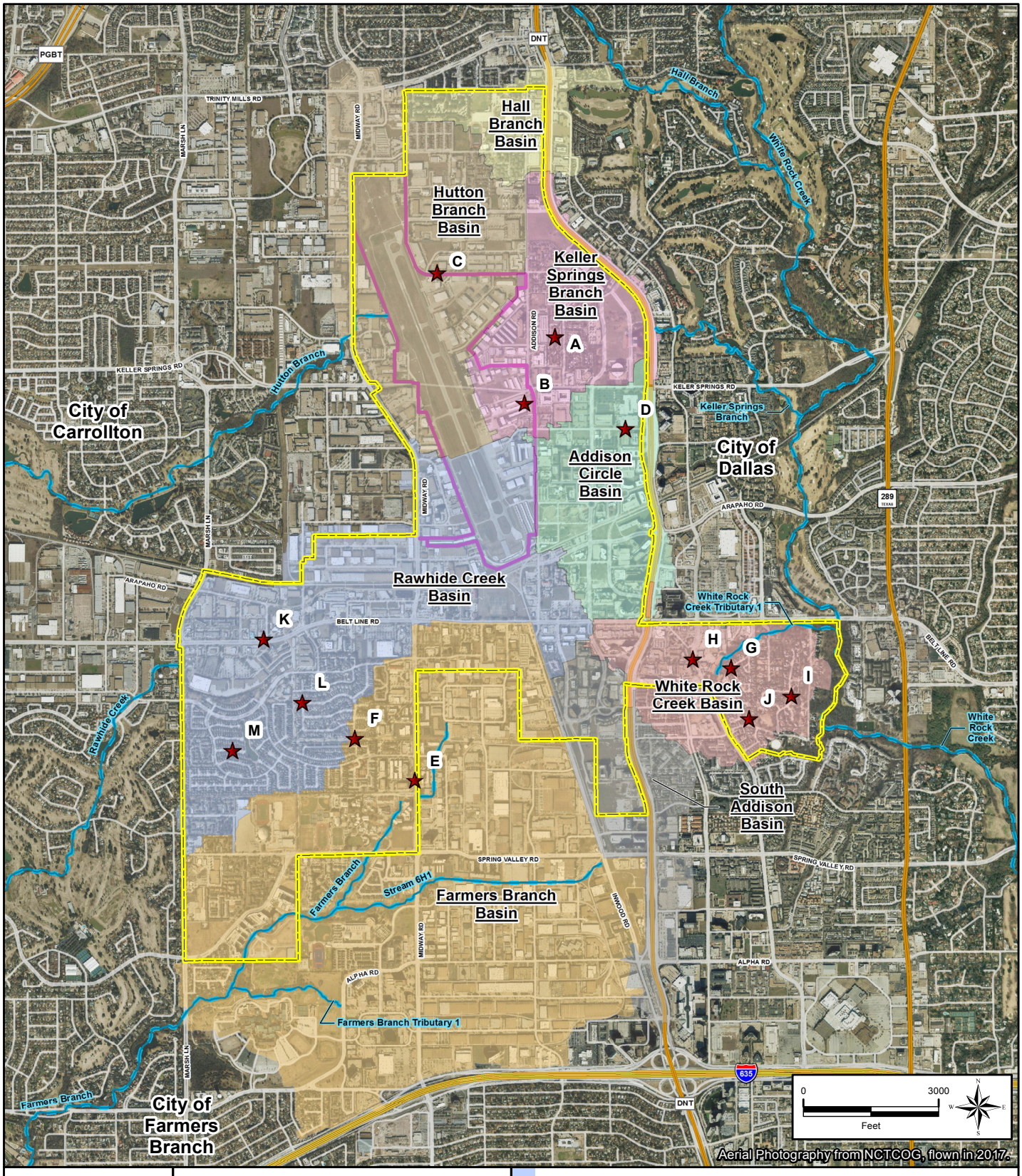

Figure I-2

Problem Area Locations

Stormwater System Assessment & Capital Improvement Program

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KEY TO FEATURES

- Streams
- Airport Boundary
- Addison City Limits

Refer to Table 1

- General Location of Management Plan Alternatives

Drainage Basins

- Addison Circle
- South Addison
- Hall Branch
- Hutton Branch
- Keller Spring
- Rawhide Creek
- White Rock Creek
- Farmers Branch

II. TOWN-WIDE RANKING OF RECOMMENDED ALTERNATIVES

Next, the mitigation alternatives for the 13 problems areas were compared and ranked on the basis of potential to reduce flood risk, estimated cost and other factors. **Table II-1** summarizes these rankings. The total estimated cost of all 13 mitigation measures is $13,739,000. A possible Phase 1 consisting of the top 6 ranked mitigation recommendations is estimated to cost a total of $4,765,000.

Table II-1: Ranking of Stormwater Capital Improvement Program Recommendations

Basin [1]	Problem Area		Location Description	Recommended Alternative	Cost	Ex. Conditions Flood Depth 100-yerr / 10-year	100-year Flood Depth with Recommended Alternative	Duration of Flooding for the 100-year[8]	Structures flooded or potentially flooded by the 100-yearr flood		Structures flooded or potentially flooded by the 10-year flood		Comments	Ranking
	See Figure 2	Original Designation in the individual reports							Flooded[2]	Potentially Flooded[3]	Flooded[2]	Potentially Flooded[3]		
Keller Springs Branch Basin	A	No. 2 thru No. 10	Keller Springs Road Quorum Drive Mary Kay Campus	Structural (Parallel Relief System with Surface Detention at Mary Kay)	$5,900,000	2.7' for the 100 yr	< 1'	51 min	0	7 Residential[7] 1 Commercial	0	0	Cannot be initiated until Mary Kay campus development moves forward	7
	B	No. 1	Airport	Structural (Enlargement of Existing System)	$900,000	2.7' / 2.1'	< 1'	117 min	3 Hangars	2 Hangars	2 Hangars	2 Hangars	Keller Springs Road system (A) must be constructed first	8
Hutton Branch Basin	C	No. 1	Intersection of Westgrove Drive and Sunbelt Drive	Automated Flood Warning Alert (Town-Wide)	$650,000[4]	3.9' / 1.4'	3.9'	135 min	0	0	0	0	Street flooding. The Flood Alert System should be coordinated with NCTCOG (Early Flood Warning Initiative)	6
Addison Circle Basin	D	No. 1, 2, 3	Airport Parkway	Structural (Parallel Relief System)	$800,000	1.3' / 0.7'	0.6'	33 min	0	0	0	0	10 yr flooding is minor	12
Farmers Branch Basin	E	No. 1	Midway Road	Structural (Relief of Existing System)	$630,000[6]	1.8' / 1.3'	0.4'	Duration of Flooding > 24 hrs	0	2 Commercial	0	0	Coordinate with street reconstruction project	9
	F	No. 2	Le Grande Drive to Midway Road	Structural (Minor Diversion)	$643,000	3' / 2.5'	0.7'	145 min	0	0	0	0	Cul-de-sac flooding	11
White Rock Creek Basin	G	No. 4	Montfort Drive	Structural (Add Inlets)	$101,000	1.4' / 0.9'	0.5'	Duration of Flooding > 24 hrs	0	0	0	0	Street flooding	10
	H	No. 5	Oaks North Drive	Structural (Add Inlets)	$90,000	1.2' / 1'	0.4'	Duration of Flooding > 24 hrs	3 Residential	4 Residential	3 Residential	1 Residential	Street flooding spills to adjactent homes	2
	I	No. 10	Bellbrook Drive	Structural (Diversion)	$670,000	1' / 0.7'	0.6'	57 min	2 Residential[5]	4 Residential	0	1 Residential	Street flooding spills to adjacent homes.	3
	J	No. 13	Maiden Court	Structural (Enlargement of Existing System & Proposed Relief Sytem)	$490,000	2.1' / 1.1'	0'	Duration of Flooding > 24 hrs	1 Residential	1 Residential	0	0	Existing system inadequate	5
Rawhide Creek Basin	K	No. 1 & 2	3939 Belt Line Rd Commercial Drive Belt Line Road	Automated Flood Alert System (Town-Wide)	See Hutton Branch	2.9' / 2.3' 3.2' / 2' 2.3' / 1.2'	2.9' 3.2' 2.2'	75 min 55 min 120 min	1 Commercial / 1 Parking Garage	0	1 Parking Garage	0	Stormwater spills from drainage channel north of Belt Line Road. Long Term solutions range from $4 to $6 million	6
	L	No. 5 & 9	Sherlock Drive Fire Station #2	Structural (Parallel Relief)	$1,100,000	2.3' / 1.4' 1.2'/0.6'	0.6' 0.25'	70 min 35min	3 Residential 1 Commercial	2 Residential	1 Commercial	2 Residential	Documented flooding of residential structure	1
	M	No. 7	Waterside Court Waterford Drive Les Lacs Avenue	Structural (Parallel & Proposed Relief System)	$1,765,000	2' / 0.3' 1.4' / 0.7' 1.9' / 0.6'	0' 0.05' 0.17'	75 min 65 min 35 min	1 Residential	13 Residential	0	0	Existing system inadequate	4
				Total	**$13,739,000**				**10 Residential 6 Commercial**	**31 Residential 5 Commercial**	**3 Residential 4 Commercial**	**4 Residential 2 Commercial**		

[1] No significant flooding in South Addison & Hall Branch Basins

[2] **Structures flooded** are those where the flood level is higher than the lowest floor elevation (garage or main floor)

[3] **Structures potentially flooded** are those where the lowest floor elevation is within 0.5' of the WSEL

[4] Town-Wide Authomated Flood Alert monitoring system with warning lights at 5 locations

[5] One residential structure was not surveyed due to access restrictions, therefore it was considered to be impacted

[6] Cost reflects relief of problem area only and does not include stormwater replacement proposed by street reconstruction project

[7] Units within apartment complex

[8] Duration of flooding is the time of flooding > 0.5' of depth

[9] This cost is for the entire Town-Wide Authomated Flood Alert System

III. PROBLEM AREAS DISCUSSION BY BASIN

The results of the existing stormwater system analysis for the 100-year storm event were evaluated to identify flooding problem areas within the Town. This section describes the 13 severe problem areas that were identified. All flooding references refer to the 100-year storm event unless otherwise noted. For more detail information on any one problem area, please refer to the report for that individual basin.

A. Keller Springs Branch Basin

1. General

The Keller Springs Branch Basin storm drainage system drains 316 acres of Addison. The headwaters originate within Addison Airport as shown in **Figure I-2**. The stormwater systems flow generally east to the Dallas North Tollway in Dallas. The Addison portion of the basin flows via an underground pipeline from the airport, through commercial and apartment areas between Addison Road and Quorum Road, then crosses the Mary Kay Campus ultimately discharging to a tributary of White Rock Creek in Dallas.

2. Problem Areas

Flood mapping based on a detailed analysis of the existing drainage system in Addison resulted in the identification of 11 areas of concern. Problem areas were analyzed further and prioritized based on the degree of hazard to the public. Based on this additional analysis, two (2) areas were categorized as severe. These are Problem Areas A and B on the Town-wide list of serious drainage problems. Please refer to **Table II-1 and Figure I-2.**

- Problem Area A – Between Addison Road and the Dallas North Tollway: To the east of the airport, the existing underground storm system is inadequate and stormwaters will pond to depths of up to 2.7 feet for the 100-year storm event in several commercial and apartment areas between Addison and Quorum Roads. Stormwater overflows (100-year flood event) will spill into the Mary Kay campus, combine with runoff generated in the campus, and collect in low areas with depths of up to 2.1 feet. Onsite first floor surveys of potentially affected structures reveal none of the structures would experience flooding as a result of a 100-year storm event.

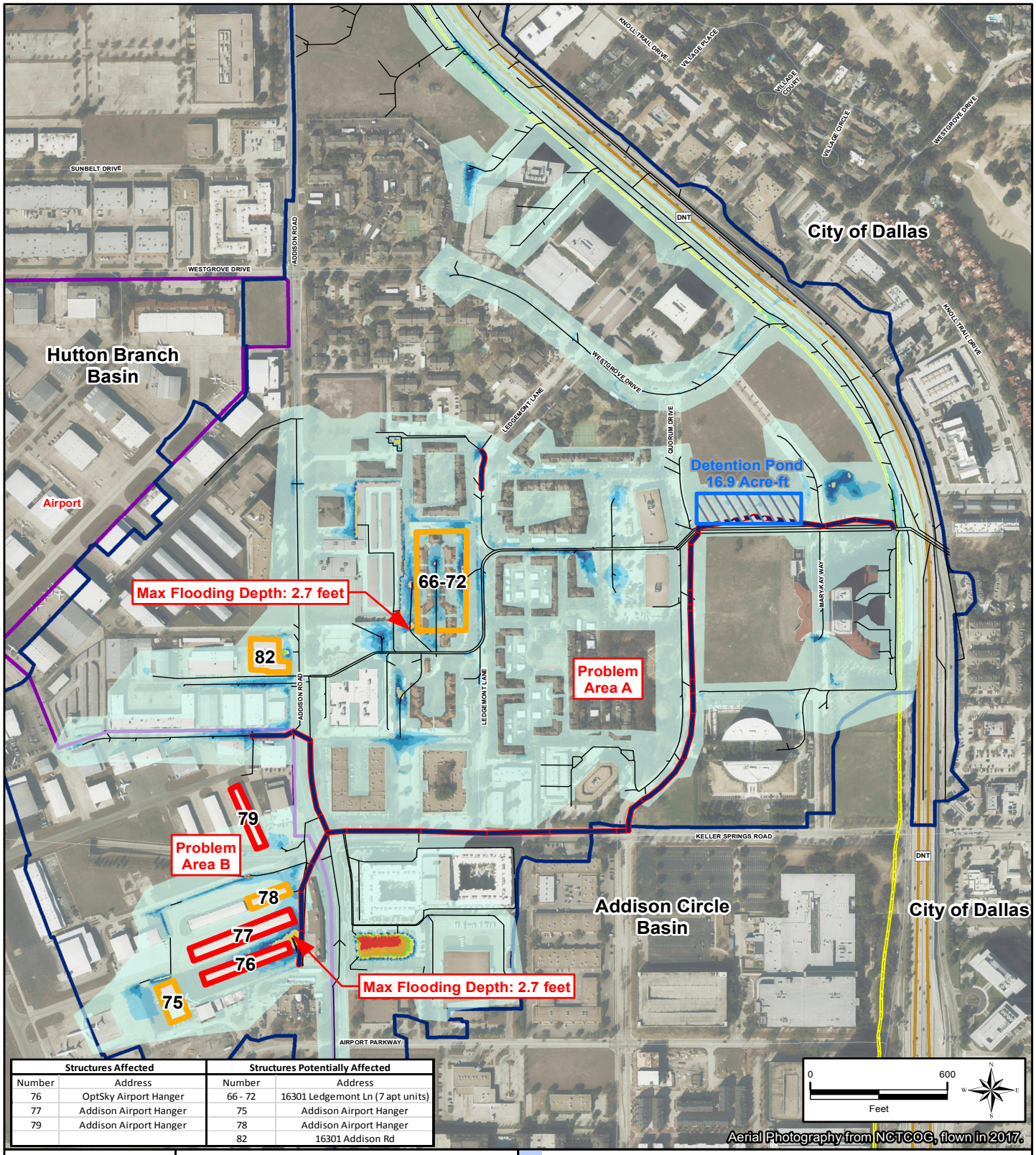
- Problem Area B - Addison Airport: Within the Airport between Jimmy Doolittle Drive and Airport Parkway, drainage systems are inadequate and large storms will cause ponding of up to 2.7 feet deep for the 100-year storm event. Just to the north, other Airport areas within this basin are impacted by stormwater flooding to a lesser degree (up to 1.9 feet of ponding). Onsite first floor surveys of potentially affected structures reveal that 3 hangars would experience flooding as a result of a 100-year storm event.

3. Recommended Plan

A variety of stormwater mitigation alternatives were investigated to address the flood problems identified in Problem Areas A and B of the Keller Springs Branch Basin. The recommended mitigation measures are discussed below. Refer to **Table II-1** for rankings of all problem areas throughout the Town.

- Problem Area A – Between Addison Road and the Dallas North Tollway: A underground stormwater relief system running from the Airport east along Keller Springs Road, then north along Quorum Road to connect to the existing underground stormwater system that traverses through the Mary Kay campus is the recommended alternative to reduce flood risk in Problem Area A of the Keller Springs Branch Basin. The proposed drainage improvement will consist of reinforced concrete box (RCB) culverts ranging up to 8-ft by 5-ft in size. Stormwater detention is needed within the Mary Kay campus to meet Mary Kay development needs and avoid increased flooding downstream in Dallas. The estimated total project cost of the recommended mitigation measures for the drainage problems in the remaining Keller Springs Branch Basin is $5,900,000. This includes the construction cost for the recommended above-ground stormwater detention pond within the Mary Kay Campus.

- Problem Area B – Addison Airport: The best alternative to correct flooding in this part of Addison Airport (Problem Area B) is to construct an enlargement of the existing system. The proposed storm drainage improvement will consist of reinforced concrete box (RCB) culverts ranging from 5-ft by 3-ft to 7-ft by 4-ft in size. The estimated total project cost of the recommended mitigation measure for Addison Airport drainage problems in the Keller Springs Branch Basin is $900,000. Before these Airport drainage improvements can be constructed, the recommended drainage improvements for the remaining Keller Springs Branch Basin areas (see above) must be constructed. **Figure III-1** shows the 100-year flooded areas along with the Stormwater Master Plan recommendations for Problem Areas A and B in the Keller Springs Branch Basin.



Structures Affected		Structures Potentially Affected	
Number	Address	Number	Address
76	OptSky Airport Hanger	66 - 72	16301 Ledgemont Ln (7 apt units)
77	Addison Airport Hanger	75	Addison Airport Hanger
79	Addison Airport Hanger	78	Addison Airport Hanger
		82	16301 Addison Rd

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Figure III-1

Problem Areas A & B Recommended Plan

(100-YR Storm Event)

Keller Springs Basin Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Drainage Relief System
- XP Model Storm Drainage Relief
- Proposed Detention
- Structures Flooded
- Structures Potentially Flooded
- Keller Springs Overall Basin
- Highway
- Addison City Limits
- Airport Boundary

B. Hutton Branch Basin

1. General

Hutton Branch is a tributary of the Elm Fork of Trinity River. Its headwaters, draining approximately 613 acres, are located in the Town of Addison. Most of the Addison Airport lies within the Hutton Branch Basin. The remaining portions of the basin in Addison are predominantly in commercial and industrial land uses with a small amount of residential. The basin is virtually built out with only a few isolated vacant parcels remaining. Stormwater runoff from this area is discharged to Hutton Branch in the City of Carrollton, just west of Midway Road and north of Kellway Circle.

2. Problem Areas

Flood mapping based on a detailed analysis of the existing drainage system in Addison resulted in the identification of 10 areas of concern. Problem areas were analyzed further and prioritized based on the degree of hazard to the public. Based on this analysis, two (2) areas were categorized as severe. One of these areas has already been corrected by modification to a recent Addison Airport drainage project. The other one is located at the intersection of Westgrove Road and Sunbelt Drive. This is Problem Area C on the town-wide list of serious drainage problems. Please refer to **Table II-1 and Figure I-2**.

Problem Area C is located at the intersection of Westgrove Drive and Sunbelt Drive. The underground stormwater system at this location is surcharged and design storm runoff exceeds system capacity. The road has a low area (sag) at which stormwaters will pond to a depth of 3.9 feet for the 100-year storm event. The existing system along Sunbelt Drive does not have capacity to convey the 100-year storm event. As a result, the system will surcharge, resulting in large street flows (approximately 200 cfs), which spill to the south and collect at the sag area in Westgrove Drive. Onsite first floor surveys of potentially affected structures reveal none of the structures would experience flooding as a result of a 100-year storm event.

3. Recommended Plan

A variety of stormwater mitigation alternatives were investigated to address the flood problems identified in the Hutton Branch Basin. The recommended mitigation measure is discussed below. Refer to **Table II-1** for rankings of all problem areas throughout the Town.

The costs of the structural drainage relief alternatives to reduce flood risk at Problem Area C are very expensive. The 100-year flood depths at the intersection of Westgrove Drive and Sunbelt Drive do not result in the flooding of any structure based on the surveyed first floor elevations. However, the street flooding does constitute a public safety issue and vehicles have been damaged as a result of drivers attempting to negotiate the flooded street. Therefore, it is recommended that the Town incorporate this area into their Emergency Action Plan (EAP). This will be most effective when combined with an Automated Flood Alert System to alert drivers of the flood hazard at this and other locations throughout the Town. The estimated total project cost of the recommended Automated Flood Alert System that includes this and four other areas within the Town of Addison is $650,000. **Figure III-2** shows the 100-year flooded areas along with the Stormwater Master Plan recommendation for Problem Area C in the Hutton Branch Basin.

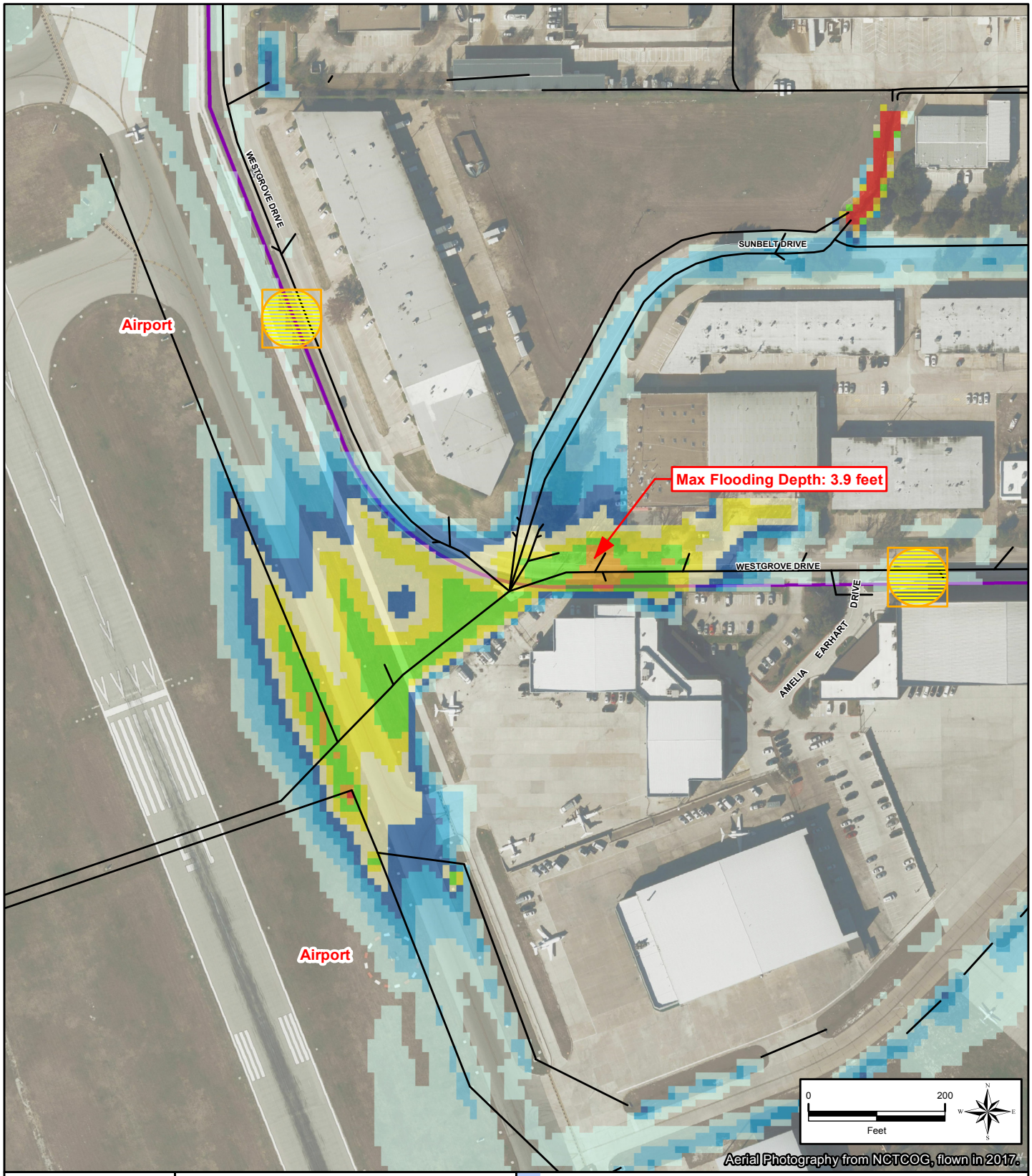

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Figure III-2

Problem Area C Recommended Plan

(100-YR Storm Event)

Hutton Branch Basin
Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- XP Model Storm Sewer Lines
- Automated Flood Warning System
- Hutton Branch Overall Basin
- Airport Boundary
- Addison City Limits

C. Addison Circle Basin

1. General

The Addison Circle Basin is part of the White Rock Creek watershed. The Addison Circle Basin drains approximately 294 acres. Most of this area (256 acres) is in the Town of Addison with a small portion (38 acres) in the City of Dallas. The basin in Addison is comprised of almost entirely commercial land uses.

2. Problem Areas

Flood mapping based on a detailed analysis of the existing drainage system in Addison resulted in the identification of 10 areas of concern. Problem areas were analyzed further and prioritized based on the degree of hazard to the public. Based on this analysis only one (1) area was categorized as severe. This is Problem Area D on the town-wide list of serious drainage problems. Please refer to **Table II-1 and Figure I-2**.

Problem Area D is located at the intersection of Airport Parkway and the Dallas North Tollway (southbound service road). The existing underground stormwater system along Airport Parkway will surcharge and is insufficient to carry the design storm runoff. As a result, stormwaters (100-year flood event) will pond to a maximum depth of 1.3 feet. This results in a fairly large street flow which spills to the east into the Dallas North Tollway system.

3. Recommended Plan

A variety of stormwater mitigation alternatives were investigated to address the flood problems identified in the Addison Circle Basin. The recommended mitigation measure is described below. Refer to **Table II-1** for rankings of all problem areas throughout the Town.

The proposed system will consist of a parallel storm drainage relief system (reinforced concrete pipe (RCP)) ranging in size from 18-in to 36-in. The estimated total project cost of the recommended mitigation measure for this problem area in the Addison Circle Basin is $800,000. **Figure III-3** shows the flooded areas based on current conditions along with the recommended drainage relief system for Problem Area D.

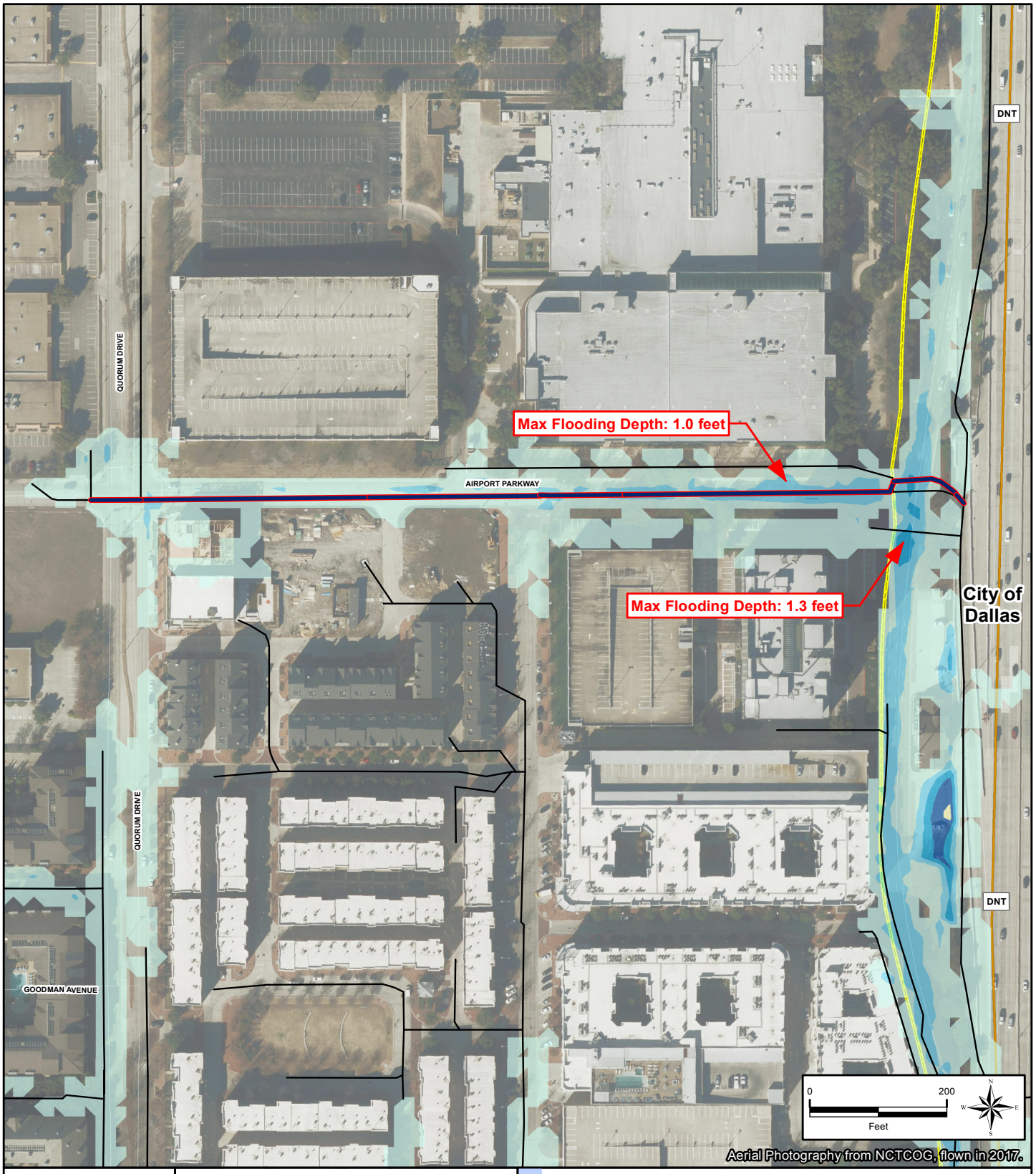

Figure III-3

Problem Area D Recommended Plan

(100-YR Storm Event)

Addison Circle Basin Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Sewer Relief System
- XP Model Storm Sewer Lines
- Highway
- Addison Circle Overall Basin
- Addison City Limits

D. Farmers Branch Basin

1. General

The Farmers Branch storm drainage system drains 1,750 acres of Addison and the City of Farmers Branch upstream of Marsh Lane. The channels and stormwater systems drain generally to the southwest towards the City of Farmers Branch with the headwaters originating near Belt Line Road in Addison. The upper basin in Addison is commercial, served by an underground stormwater system. Most of the remaining drainage is open channel (improved and unimproved or natural) and traverses through both the Town of Addison and the City of Farmers Branch. The most downstream portion of the channel in Addison flows through the Vitruvian development. Of the area upstream of the dam at the pedestrian bridge in Vitruvian, approximatelly 1,280 acres of the basin lie within the City of Farmers Branch and 470 acres lie within the Town of Addison.

2. Problem Areas

Flood mapping based on a detailed analysis of the existing drainage system in Addison resulted in the identification of 12 areas of concern. Problem areas were analyzed further and prioritized based on the degree of hazard to the public. Based on this analysis, two (2) areas were categorized as severe. These are Problem Areas E & F on the Town-wide list of serious drainage problems. Please refer to **Table II-1 and Figure I-2**.

- Problem Area E – Midway Road: This problem area is located on Midway Road near its intersection with Hornet Road. At this location, the capacity of the existing underground stormwater system is exceeded, which causes the system to surcharge. Stormwaters pond in this area to a maximum depth of 1.8 feet for the 100-year and 1.3 feet for the 10-year storm events. Detailed onsite surveys in the area result in two (2) commercial structures potentially impacted by the 100-year storm event.

- Problem Area F – LeGrande Drive: This problem area is located at end of the LeGrande Drive cul-de-sac. At this location, the capacity of the existing underground stormwater system is exceeded, which causes the system to surcharge. Stormwaters pond in this area to a maximum depth of 3 feet for the 100-year and 2.5 feet for the 10-year storm events. Detailed onsite surveys in the area reveal that no structures are impacted or potentially impacted by flooding at this location.

3. Recommended Plan

A variety of stormwater mitigation alternatives were investigated to address the flood problems identified in the Farmers Branch Basin. The recommended mitigation measures are discussed below. Refer to **Table II-1** for rankings of all problem areas throughout the Town.

- Problem Area E – Midway Road: The best alternative to correct flooding along Midway Road is to add inlets and upsize the existing system. The proposed upsized system will consist of a 36-in RCP and a 5-ft by 4-ft RCB. The estimated total project cost of the recommended mitigation measure for the Midway Road drainage problem in the Farmers Branch Basin is $630,000. **Figure III-4** shows the flooded areas based on current conditions and the recommended drainage

relief system for Problem Area E. The Town of Addison is currently pursuing a paving and drainage reconstruction project for Midway Road in this area.

- Problem Area F – Le Grande Drive: The best alternative to correct flooding at Le Grande Drive is to add inlets and divert flow to the existing system along Midway Road. The proposed diversion will consist of a 30-in RCP. The estimated total project cost of the recommended mitigation measure for the Le Grande Drive drainage problem in the Farmers Branch Basin is $643,000. **Figure III-5** shows the flooded areas based on current conditions along with the recommended drainage relief system for Problem Area F.

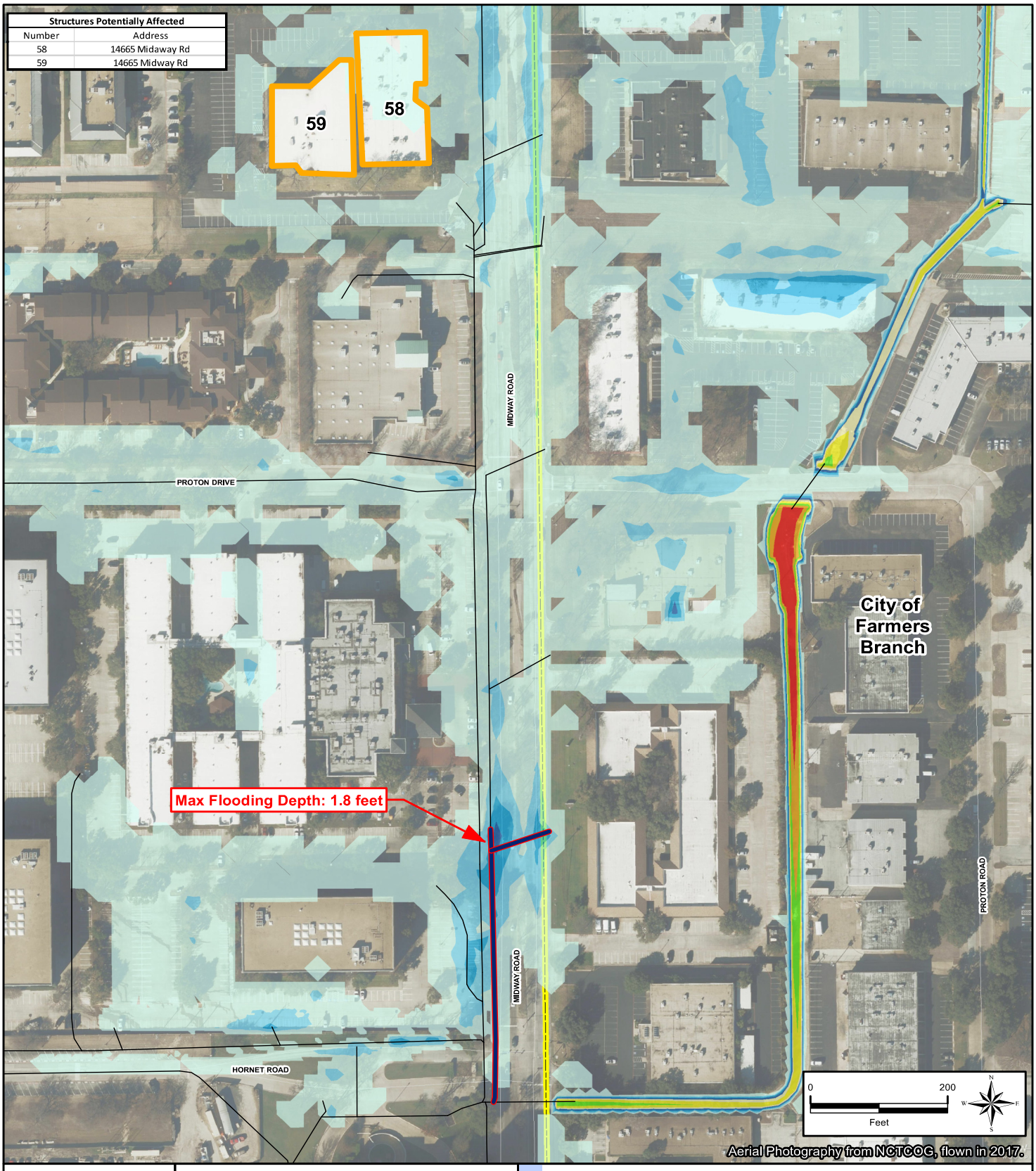

Figure III-4

Problem Area E Recommended Plan

(100-YR Storm Event)

Farmers Branch Basin Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Sewer Relief System
- XP Model Storm Sewer Lines
- Structures Potentially Flooded
- Farmers Branch Overall Basin
- Addison City Limits

Figure III-5

Problem Area F
Recommended Plan
(100-YR Storm Event)

Farmers Branch Basin
Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Sewer Relief System
- XP Model Storm Sewer Lines
- Farmers Branch Overall Basin
- Addison City Limits

E. White Rock Creek Basin

1. General

The White Rock Creek Basin is served by a storm drainage system that drains 285 acres of Addison and the City of Dallas to small tributaries that flow generally west to White Rock Creek. The basin in Addison is primarily residential with commercial areas near the Dallas North Tollway.

2. Problem Areas

Flood mapping based on a detailed analysis of the existing drainage system in Addison resulted in the identification of 13 areas of concern. Problem areas were analyzed further and prioritized based on the degree of hazard to the public. Based on this analysis, four (4) areas were categorized as severe. These are Problem Areas G, H, I, and J on the town-wide list of serious drainage problems. Please refer to **Table II-1 and Figure I-2**.

- Problem Area G – Montfort Drive: This problem area is located along Montfort Drive near the Village on the Parkway shopping center. The existing stormwater system does not have enough inlet capacity to convey the 100-year storm event. The lack of inlet capacity causes flood depths up to 1.4 feet for the 100-year and 0.9 feet for the 10-year storm events. There are no structures impacted or potentially impacted by flooding at this location.

- Problem Area H – Oaks North Drive: This problem area is located along Oaks North Drive. The location of the existing stormwater inlets and the steep grade of Oaks North Drive result in stormwater spilling into adjacent properties located between the road and White Rock Creek Tributary 1. The flood depth of 1.2 feet for the 100-year storm event impacts three (3) residential structures based on onsite surveys of floor elevations.

- Problem Area I – Bellbrook Drive: This problem area is located along Bellbrook Drive. The existing underground stormwater system along Bellbrook Drive is undersized in terms of current Addison drainage criteria. As a result, the system will surcharge at multiple locations and system overflows will spill to the east, ponding at adjacent properties. The spill results flood depths up to 1 foot for the 100-year and 0.7 feet for the 10-year storm events. The flooding (100-year storm event) impacts two (2) residential structures based on onsite surveys of floor elevations.

- Problem Area J – Maiden Court: This problem area is located at the Maiden Court cul-de-sac. At this location, the hydraulic capacity of the existing underground stormwater system is exceeded, which causes the system to surcharge. Stormwaters pond in this area to a maximum depth of 2.1 feet for the 100-year and 1.1 feet for the 10-year storm events. The flooding (100-year storm event) impacts one (1) residential structure based on onsite surveys of floor elevations.

3. Recommended Plan

A variety of stormwater mitigation alternatives were investigated to address the flood problems identified in the White Rock Creek Basin. The recommended mitigation measures are discussed below. Refer to **Table II-1** for rankings of all problem areas throughout the Town.

- Problem Area G – Montfort Drive: The best alternative to correct flooding at Montfort Drive is to add more inlets to the existing system. The proposed alternative is to add four (4) 10-foot curb inlets at the area of flooding. The estimated total project cost of the recommended mitigation measure for the Montfort Drive drainage problem in the White Rock Creek Basin is $101,000. **Figure III-6** shows the flooded areas based on current conditions and the recommended drainage relief system for Problem Area G.

- Problem Area H – Oaks North Drive: The best alternative to correct flooding along Oaks North Drive is to add more inlets to the existing system. The proposed alternative is to add two (2) 10-foot curb inlets strategically located at the bend in Oaks North Drive. The estimated total project cost of the recommended mitigation measure for the Oaks North Drive drainage problem in the White Rock Creek Basin is $90,000. **Figure III-7** shows the flooded areas based on current conditions and the recommended drainage relief system for Problem Area H.

- Problem Area I – Bellbrook Drive: The best alternative to correct flooding along Bellbrook Drive is to upsize the existing system and create a diversion from Bellbrook Drive through Hampton Court to relieve the existing system. The proposed system will consist of reinforced concrete pipes (RCP) ranging from 30-in to 36-in in size. The estimated total project cost of the recommended mitigation measure for the Bellbrook Drive drainage problem in the White Rock Creek Basin is $670,000. **Figure III-8** shows the flooded areas based on current conditions and the recommended drainage relief system for Problem Area I.

- Problem Area J – Maiden Court: The best alternative to correct flooding at Maiden Court is to upsize the existing system and construct a diversion through Celestial Place to relieve the existing system. The proposed system will consist of 27-in RCP. The estimated total project cost of the recommended mitigation measure for the Maiden Court drainage problem in the White Rock Creek Basin is $490,000. **Figure III-9** shows the flooded areas based on current conditions along with the recommended drainage relief system for Problem Area J.

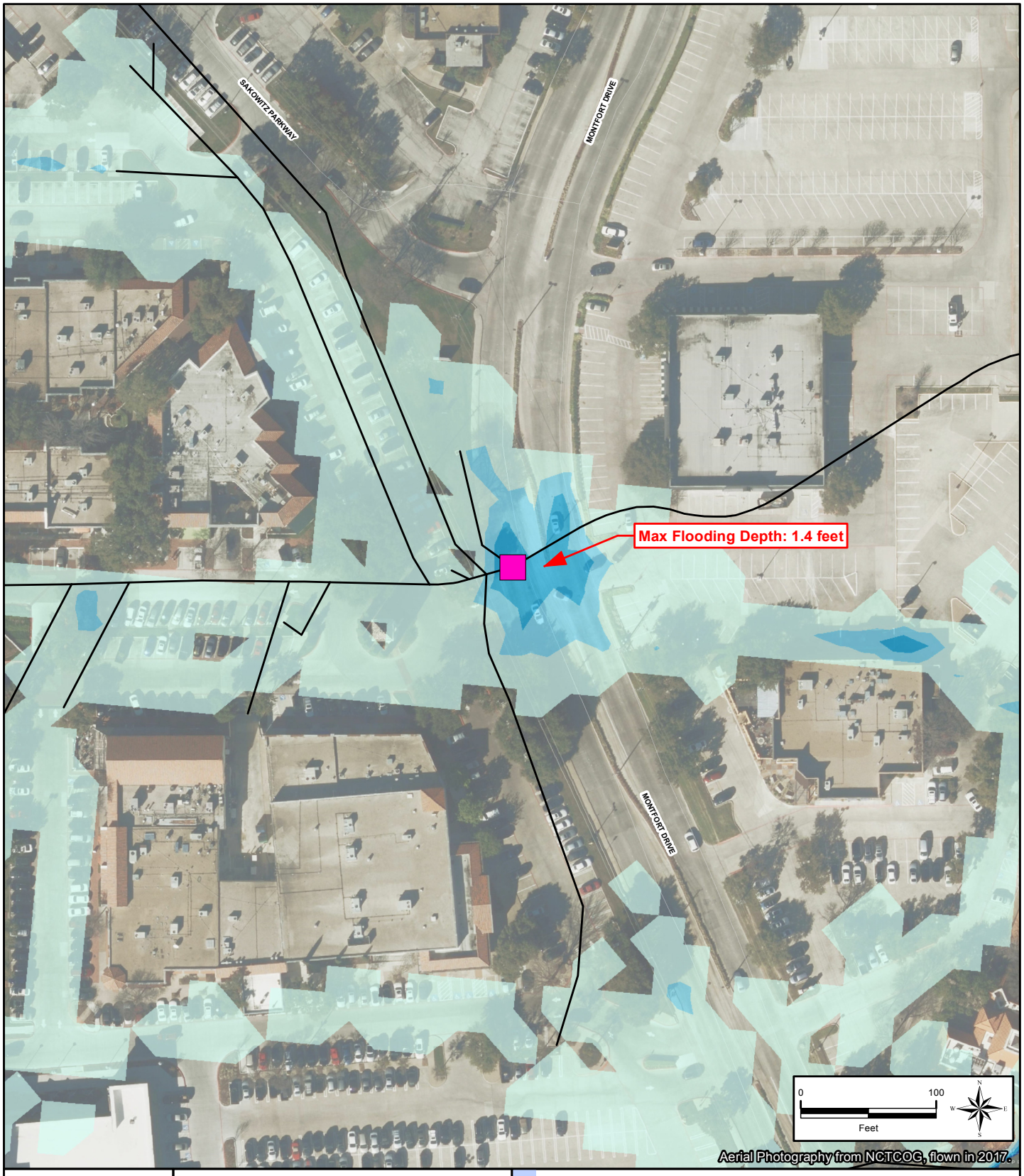

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Figure III-6

Problem Area G Recommended Plan

(100-YR Storm Event)

White Rock Creek Basin

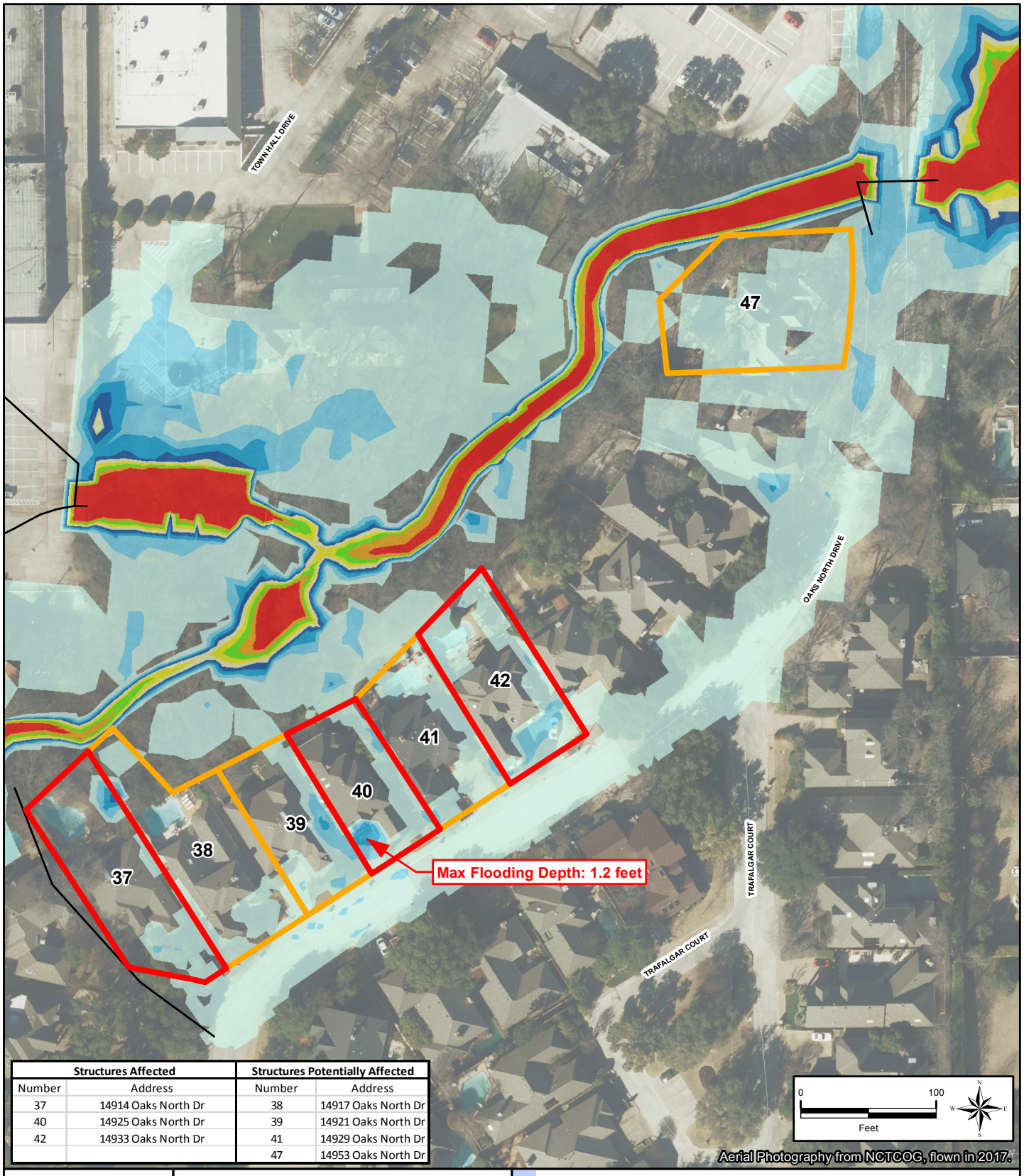
Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- XP Model Storm Sewer Lines
- Proposed 10' Curb Inlets (4)
- White Rock Creek Overall Basin
- Addison City Limits



Structures Affected		Structures Potentially Affected	
Number	Address	Number	Address
37	14914 Oaks North Dr	38	14917 Oaks North Dr
40	14925 Oaks North Dr	39	14921 Oaks North Dr
42	14933 Oaks North Dr	41	14929 Oaks North Dr
		47	14953 Oaks North Dr

Figure III-7

Problem Area H Recommended Plan

(100-YR Storm Event)

White Rock Creek Basin Stormwater System Assessment & Capital Improvement Program

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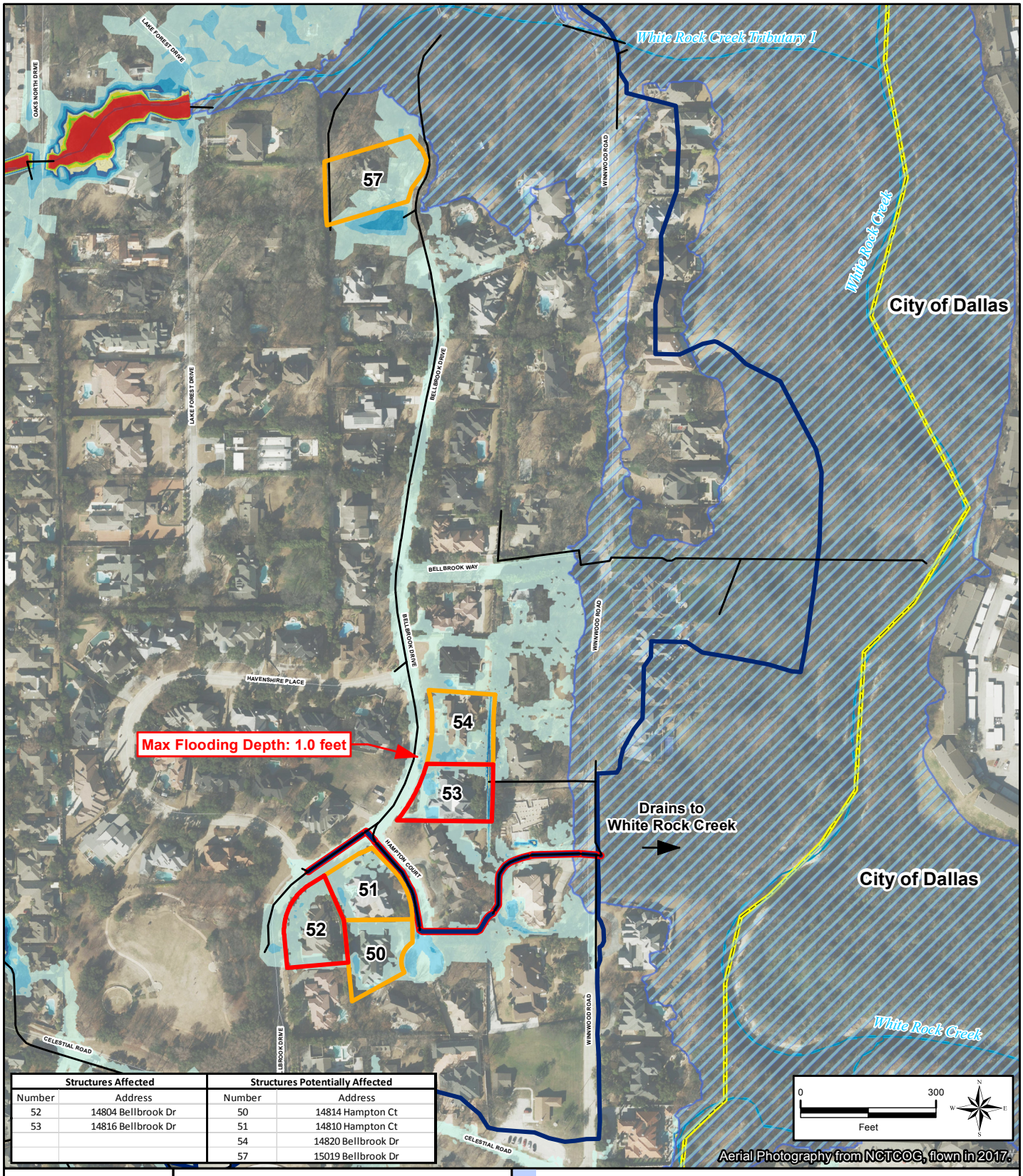
KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- XP Model Storm Sewer Lines
- Structures Flooded
- Structures Potentially Flooded
- White Rock Creek Overall Basin
- Addison City Limits



Structures Affected		Structures Potentially Affected	
Number	Address	Number	Address
52	14804 Bellbrook Dr	50	14814 Hampton Ct
53	14816 Bellbrook Dr	51	14810 Hampton Ct
		54	14820 Bellbrook Dr
		57	15019 Bellbrook Dr

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Figure III-8

Problem Area I Recommended Plan

(100-YR Storm Event)

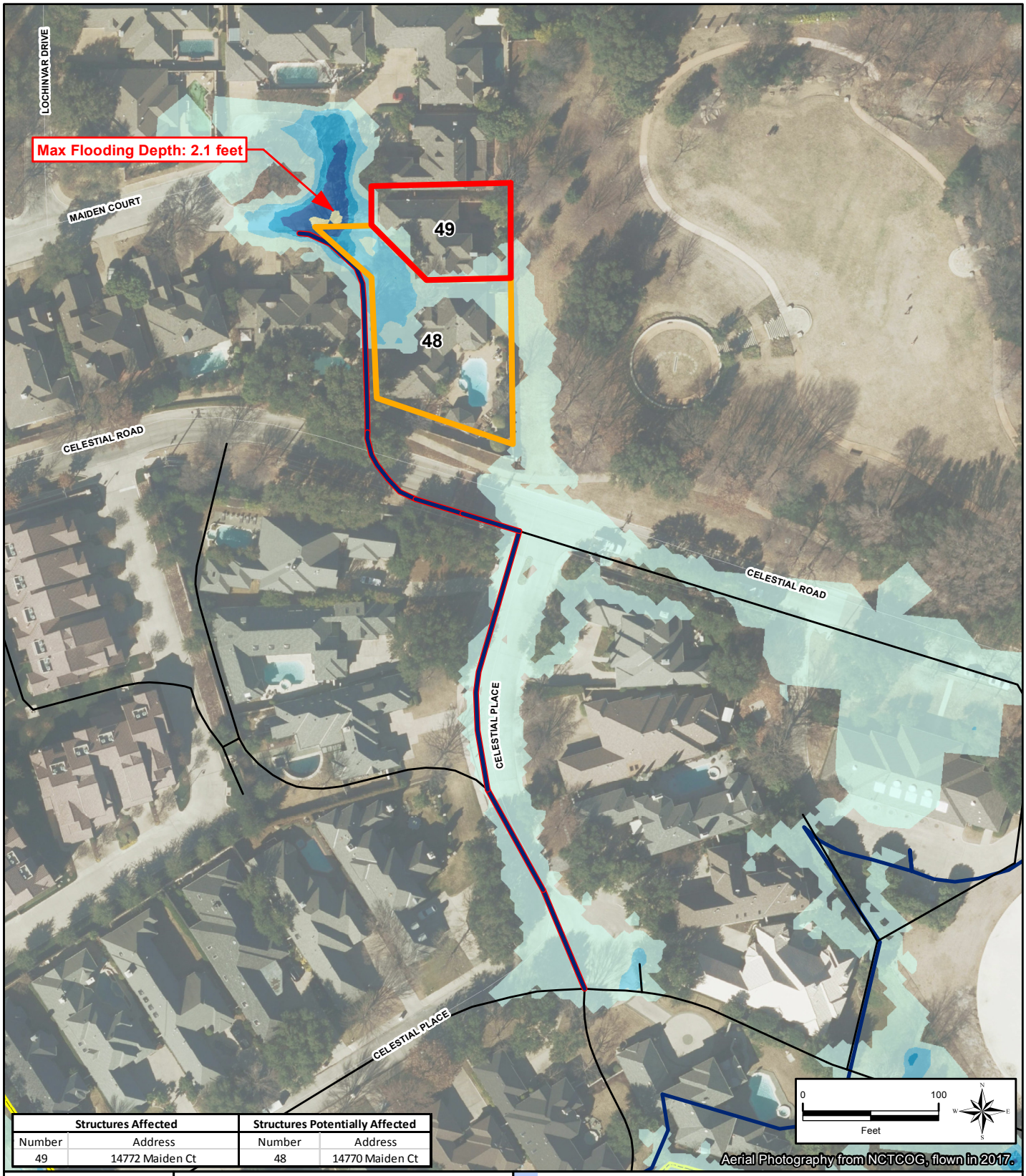
White Rock Creek Basin Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Sewer Relief System
- XP Model Storm Sewer Lines
- Stream Centerline
- Structures Flooded
- Structures Potentially Flooded
- Effective Mapping 100YR
- White Rock Creek Overall Basin
- Addison City Limits



Structures Affected		Structures Potentially Affected	
Number	Address	Number	Address
49	14772 Maiden Ct	48	14770 Maiden Ct

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Figure III-9

Problem Area J Recommended Plan

(100-YR Storm Event)

White Rock Creek Basin
Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)
- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Sewer Relief System
- XP Model Storm Sewer Lines
- Structures Flooded
- Structures Potentially Flooded
- White Rock Creek Overall Basin
- Addison City Limits

F. Rawhide Creek Basin

1. General

The Rawhide Creek stormwater system drains 887 acres of Addison generally to the west. The southern portion of Addison Airport lies within the Rawhide Creek Basin. The remaining portions of the basin in Addison are predominantly commercial and industrial with some residential land use. Most of the stormwater runoff from this area is discharged to Rawhide Creek in the City of Farmers Branch, just west of Marsh Lane and south of Belt Line Road. The rest is discharged into small unnamed tributaries to Rawhide Creek further south, also west of Marsh Lane in the City of Farmers Branch.

2. Problem Areas

Flood mapping based on a detailed analysis of the existing drainage system in Addison resulted in the identification of 17 areas of concern. Problem areas were analyzed further and prioritized based on the degree of hazard to the public. Based on this analysis, three (3) areas were categorized as severe. Please refer to **Table II-1 and Figure I-2**.

- Problem Area K – Commercial Drive & Belt Line Road: This problem area is located along Belt Line Road and Commercial Drive. Systems upstream (north) of Belt Line Road are inadequate for the flood flows generated in this part of the basin. This results in large stormwater spills into Commercial Drive and Belt Line Road (660 cfs of spills for the 100-year and 220 cfs for the 10-year storm events). Stormwater from an open concrete-lined channel spills to a parking lot and building located at 3939 Belt Line Road resulting in flood depths near the building of up to 1 foot for the 100-year and 0.3 feet for the 10-year. Around the parking lot the flood depths are 2.9 feet for the 100-year and 2.3 feet for the 10-year. The stormwater spill continues to Commercial Drive (with a maximum depth of 3.2 feet for the 100-year and 2 feet for the 10-year) and to Belt Line Road (with a maximum depth of 2.2 feet for the 100-year and 1.2 feet for the 10-year). Predicted 100-year flood event flooded structures include one (1) commercial building and one (1) parking structure. However, flooding is limited to the parking structure for the 10-year storm event. This information was verified by detailed onsite surveys.

- Problem Area L – Sherlock Drive: This problem area is located at the intersection of Sherlock Drive and Winter Park Lane. Stormwater ponds in this area to a maximum depth of 2.3 feet for the 100-year storm event and 1.4 feet for the 10-year storm event. Upstream of this location, the capacity of the existing underground stormwater system is exceeded and it surcharges at multiple locations. Additionally, the downstream system is undersized. Flood events in recent years have caused damage to surrounding house(s). This historic flooding is one factor that makes this area a high priority candidate for storm drainage relief. Onsite first floor surveys of potentially affected structures reveal that three (3) residential structures and one (1) commercial structure in this area would experience flooding as a result of a 100-year storm event.

- Problem Area M – Les Lacs Area: This problem area is located in the Les Lacs neighborhood. The existing underground stormwater system serving Waterside Court, Waterford Drive, and Les Lacs Avenue surcharges because the runoff exceeds the system capacity. Each road has a low area (sag) at which stormwaters

will pond to depths of 2.0 feet, 1.4 feet, 1.9 feet, respectively, for the 100-year storm event. At Waterside Court, the flooding is aggravated by an unintended spill from the Les Lacs pond during the 100-year event. In addition, stormwater overflows (100-year flood event) will spill into an apartment complex on Woodway Drive. Onsite first floor surveys of potentially affected structures reveal that one (1) residential structure would experience flooding as a result of a 100-year storm event.

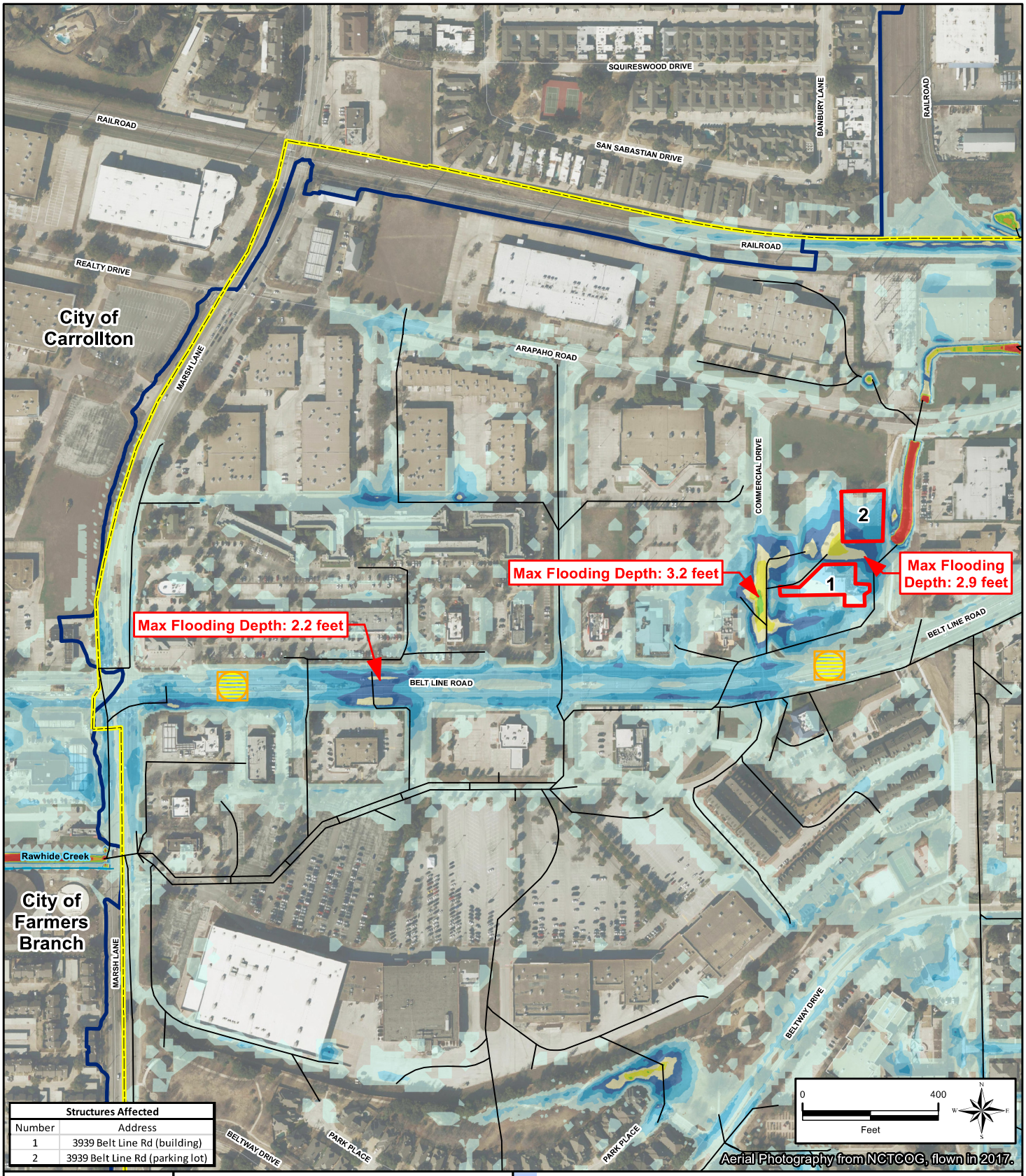
3. Recommended Plan

A variety of stormwater mitigation alternatives were investigated to address the flood problems identified in the Rawhide Creek Basin. The recommended mitigation measures are discussed below. Refer to **Table II-1** for rankings of all problem areas throughout the Town.

- Problem Area K – Commercial Drive & Belt Line Road: Several structural drainage relief alternatives were developed for Problem Area K. Costs for the various structural solutions were determined. The costs were found to be very high in light of the expected damages. Therefore, the recommended flood risk mitigation measure for Area K is to incorporate this area into the Town's Emergency Action Plan (EAP) for flooding events. Incorporating this area into the Automated Flood Alert System proposed for Problem Area C is also recommended. The estimated total project cost of the recommended automated flood alert system that includes this and other areas within the Town of Addison is $650,000. **Figure III-10** shows the flooded areas based on current conditions and the recommended flood mitigation measure for Problem Area K.

- Problem Area L – Sherlock Drive: Several alternatives were evaluated to reduce the flood risk at the intersection of Sherlock Drive and Winter Park Lane. A letter report explaining in detail the different alternatives considered was submitted to the Town of Addison in December of 2016. The recommended system consists of a parallel storm drainage relief pipe ranging in size from 39-in to 54-in RCP. The total project cost of the recommended mitigation measure for the Sherlock problem area in the Rawhide Basin is $1,100,000. **Figure III-11** shows the flooded areas based on current conditions and the recommended drainage relief system for Problem Area L.

- Problem Area M – Les Lacs Area: A underground stormwater relief system is proposed to reduce flood risk in this area. The new relief system is proposed to extend west from Waterside Court, down Les Lacs Avenue with connections to the low areas in Waterford Drive and Meadowcreek Circle. The new proposed relief then ties to the existing system at the intersection of Les Lacs Avenue and Beau Park Lane. From this point, a proposed parallel relief system continues down along Beau Park Lane then routes to the west (park area) to finally connect to the existing system at Marsh Lane. The proposed drainage improvements will consist of reinforced concrete pipe (RCP) ranging from 24-in to 54-in in size. A small underground stormwater detention facility is needed within the park at Marsh Lane to avoid increased flooding downstream in Farmers Branch. The total project cost of the recommended mitigation measures is $1,765,000. **Figure III-12** shows the flooded areas based on current conditions along with the recommended drainage relief system for Problem Area M.



Structures Affected	
Number	Address
1	3939 Belt Line Rd (building)
2	3939 Belt Line Rd (parking lot)

Figure III-10

Problem Area K Recommended Plan

(100-YR Storm Event)

Rawhide Creek Basin Stormwater System Assessment & Capital Improvement Program

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KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- XP Model Storm Sewer Lines
- Streams
- Automated Flood Warning System
- Structures Flooded
- Rawhide Creek Overall Basin
- Addison City Limits

Structures Affected		Structures Potentially Affected	
Number	Address	Number	Address
4	3900 Beltway Dr (Fire Station2)	5	3911 Winter Park Ln
7	3907 Winter Park Ln	6	3909 Winter Park Ln
8	14727 Sherlock Dr		
9	14725 Sherlock Dr		

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Figure III-11

Problem Area L Recommended Plan

(100-YR Storm Event)

Rawhide Creek Basin Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Proposed Storm Sewer Relief System
- XP Model Storm Sewer Lines
- Structures Flooded
- Structures Potentially Flooded
- Rawhide Creek Overall Basin
- Addison City Limits

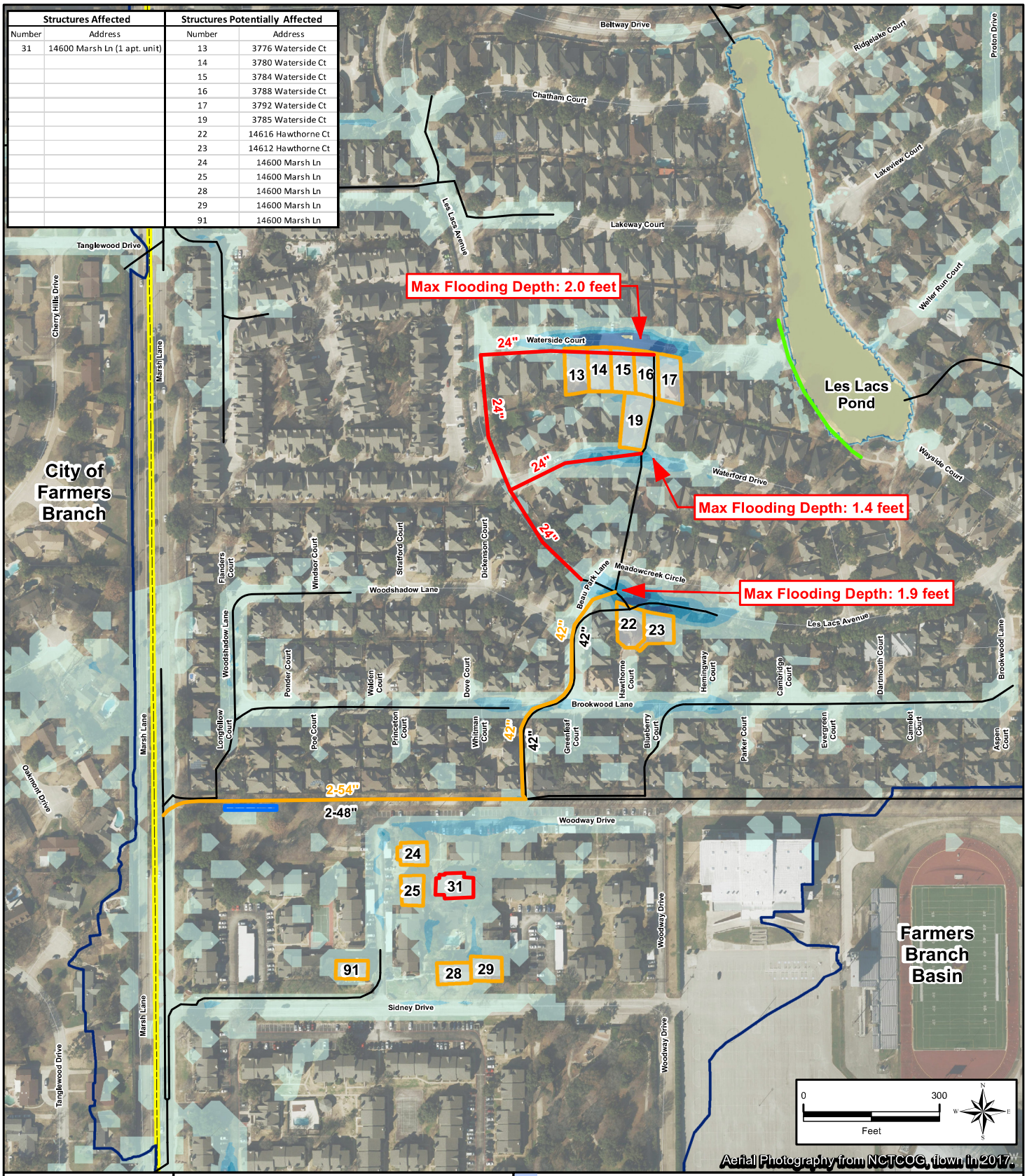

Figure III-12

Problem Area M Recommended Plan

(100-YR Storm Event)

Rawhide Creek Basin Stormwater System Assessment & Capital Improvement Program

ADDISON

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KEY TO FEATURES

Existing Floodplain Depths (ft)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 3.5
- 3.5 - 4
- > 4

- Berm
- Proposed New Storm Drainage
- Proposed Storm Drainage (Parallel)
- XP Model Storm Sewer Lines
- Proposed Surface Detention
- Structures Flooded
- Structures Potentially Flooded
- Rawhide Creek Overall Basin
- Addison City Limits

IV. OTHER RECOMMENDATIONS

- Drainage System Maintenance: Almost all of the Addison underground drainage system is comprised of reinforced concrete pipe (RCP) and reinforced concrete box culverts (RCBC). RCP and RCBC are very durable and long-lasting when properly installed and maintained. However, problems such as dropped and damaged joints, linear cracking, exposed rebar and heavy accumulation of debris can occur. Cleaning and/or repairs are recommended for problems such as these. Typically, problems in underground RCP and RCBC are found by Closed-Circuit Television (CCTV) inspections.
- Closed-Circuit Television (CCTV): The Town of Addison should undertake a systematic program of Closed Circuit Television (CCTV) inspection of its existing underground stormwater system. CCTV inspection of existing underground storm drainage systems can be performed in order to determine condition, direction, and change in conduit size. In conjunction with the CCTV process, pipe cleaning is often performed to facilitate the video inspection activities and/or to improve system performance. Priorities for CCTV can be established based on suspected problems, age of conduit and needs for determining system size, etc. where plans are not available and access to the underground system is limited. Otherwise, systems are recommended for CCTV inspection every 10 or even 20 years. CCTV inspection of underground stormwater system just east of the Airport in Addison was performed in 2009. **Photo IV-1** shows an image of one problem area from the CCTV footage.

Photo IV-1: CCTV Image of Problem Area in the Keller Springs Branch Basin

CCTV inspection is recommended for the drainage system in Addison to identify needed maintenance and repairs that may affect the capacity of the underground stormwater system. At this time, there have been no reports of severe problem areas. Therefore, the inspections should be conducted in phases. Please refer to the individual basin reports for CCTV recommendation.

- Site Development: New and/or re-development sites should include stormwater detention facilities to mitigate offsite increases in flooding in downstream areas.

- Street Reconstruction: As streets in Addison become candidates for reconstruction and/or heavy maintenance, the potential problems areas noted in the various basin reports should be re-evaluated and mitigated if practical.
- Low Impact Development (LID) / Green Infrastructure (GI): As these Stormwater Capital Improvement Projects are implemented and properties develop and redevelop in the basin, GI and LID practices should be incorporated in accordance with the Town of Addison Drainage Criteria Manual and the Town's TPDES Permit Stormwater Management Program goals. This can help to slightly reduce flooding that has been identified in this study. LID and GI methods are discussed in the individual reports.
- Town-wide Automated Flood Alert System: Implementation of an automated flood warning system is recommended to reduce flood risk at Westgrove Drive in the Hutton Branch Basin, Belt Line Road in the Rawhide Creek Basin, Winnwood Road and Montfort Drive in the White Rock Creek Basin, and in the Vitruvian Park area in the Farmers Branch Basin. The goal of such a system is to enable Addison emergency management staff to quickly alert the public of possible hazard during severe storm events. Based on the results of this study,a total of five (5) flood level monitors, two (2) rainfall gauges, and nine (9) flashing warning lights are proposed for the entire Town. The estimated project cost of the flood alert system is $650,000. Implementation and/or funding assistance may be available through State (Texas Water Development Board) and regional (NCTCOG) organizations. **Figure IV-1** shows the layout of the recommended Town-Wide Flood Alert Sytem. A detailed cost estimate can be found in Table F-8 (Appendix F) of the Hutton Branch report.
- Proposed Cotton Belt Regional Rail System: Dallas Area Rapid Transit (DART) is proposing Regional Rail System improvements along the Cotton Belt right-of-way which may include significant drainage improvements in the Addison Circle and Rawhide Creek Basins. At this time (Summer 2017) the drainage improvement plans for DART's Cotton Belt Regional Rail System (Cotton Belt) have not been made public. Generally, there are no drainage problem areas along the Cotton Belt in Addison. The Town of Addison and DART should work together to make sure that DART provides adequate and safe drainage as a part of the Cotton Belt project.
- Flood Insurance: The Town of Addison is a member of the National Flood Insurance Program. Therefore, any renter or homeowner (residential) or business owner is eligible to purchase a flood insurance policy from their insurance agent. Homes and businesses throughout the Town of Addison that are at risk of flooding have been identified in this Stormwater System Assessment study. Most of these homes and businesses are not located in a FEMA mapped floodplain and likely are not be aware of their flood risk. Nevertheless, the Town could inform these renters, homeowners and business owners of the flood risk and their eligibility to purchase a flood insurance policy from their insurance agent.

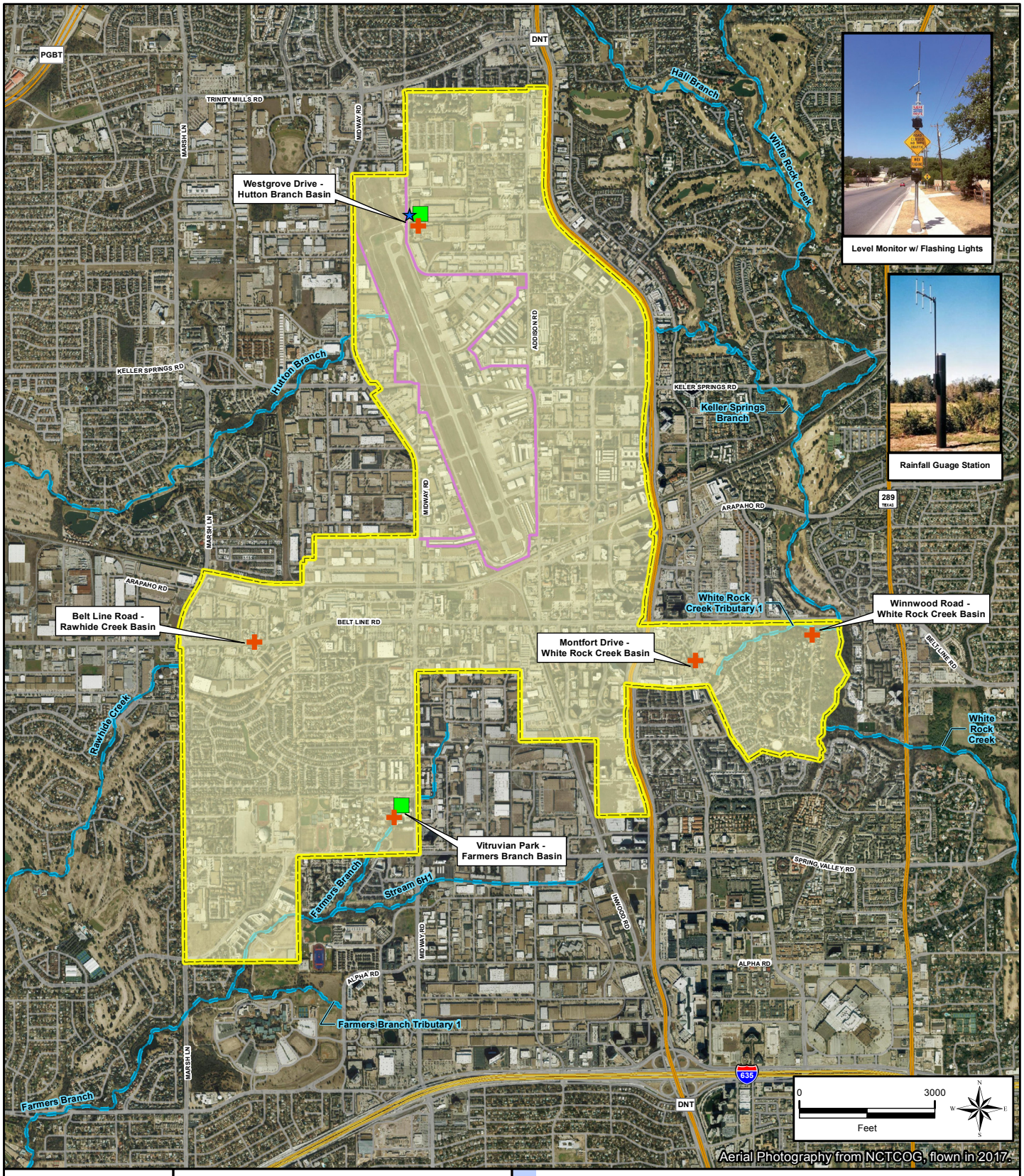

Figure IV-1

Proposed Town-wide Automated Flood Alert System

Stormwater System Assessment & Capital Improvement Program

KEY TO FEATURES

- Base Station
- Level Monitors w/ Flashing Lights
- Rainfall
- Streams
- Interstate
- Highway
- Roads
- Railroad
- Airport Boundary
- Addison City Limits

V. REFERENCES

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