

White Rock Creek Master Plan and Downstream Assessments

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History

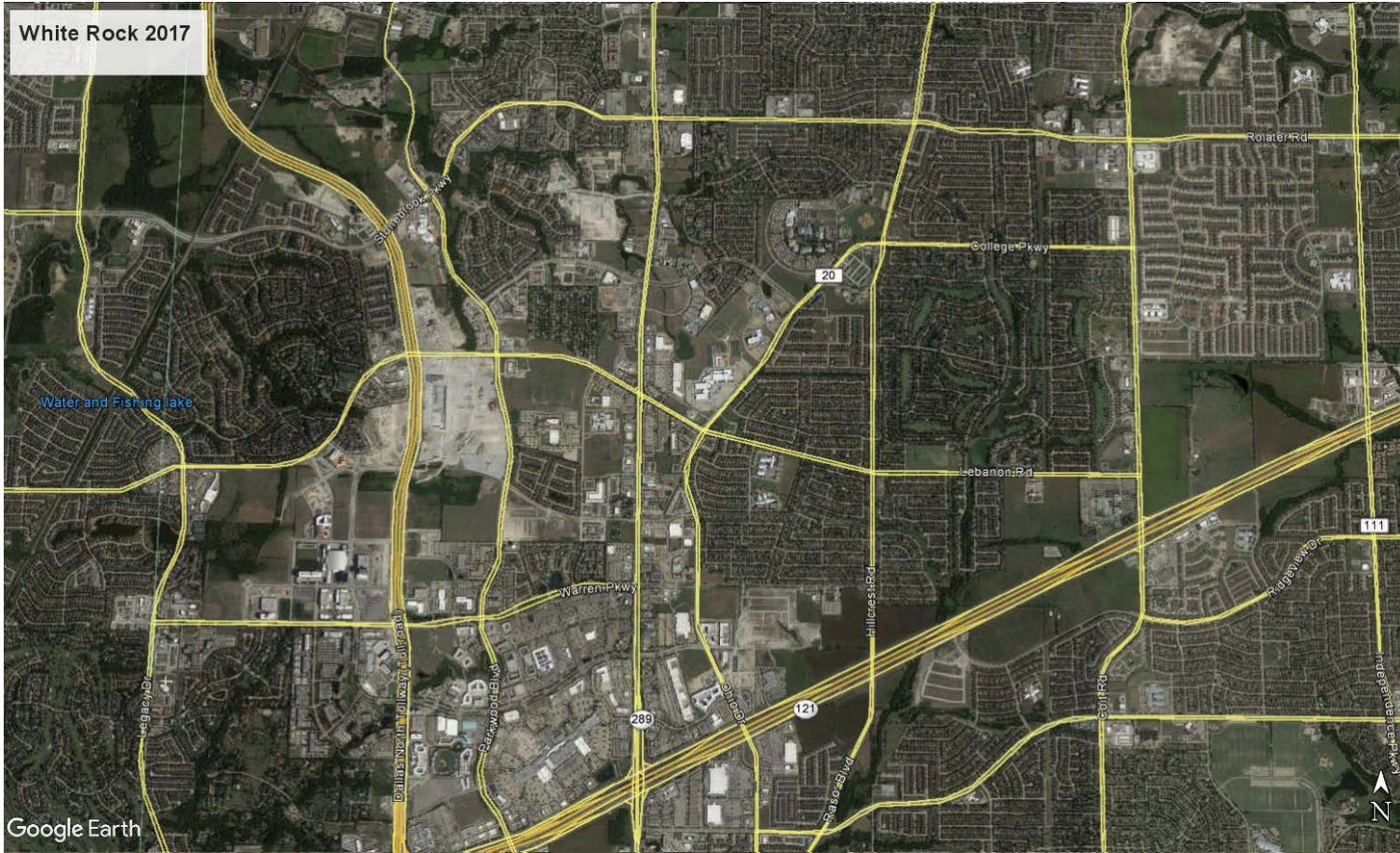
- Prior to 2012
 - Frisco criteria required detention to single-family Rational Method conditions
 - Single-family development required no detention



History

- 2012 Design Criteria
 - Frisco criteria required detention to pre-development Rational Method conditions
 - In lieu of detention, provide a Downstream Assessment
 - If development is larger than 20 acres, required study of downstream system to evaluate capacity. Requires unit hydrograph study.

White Rock 2017



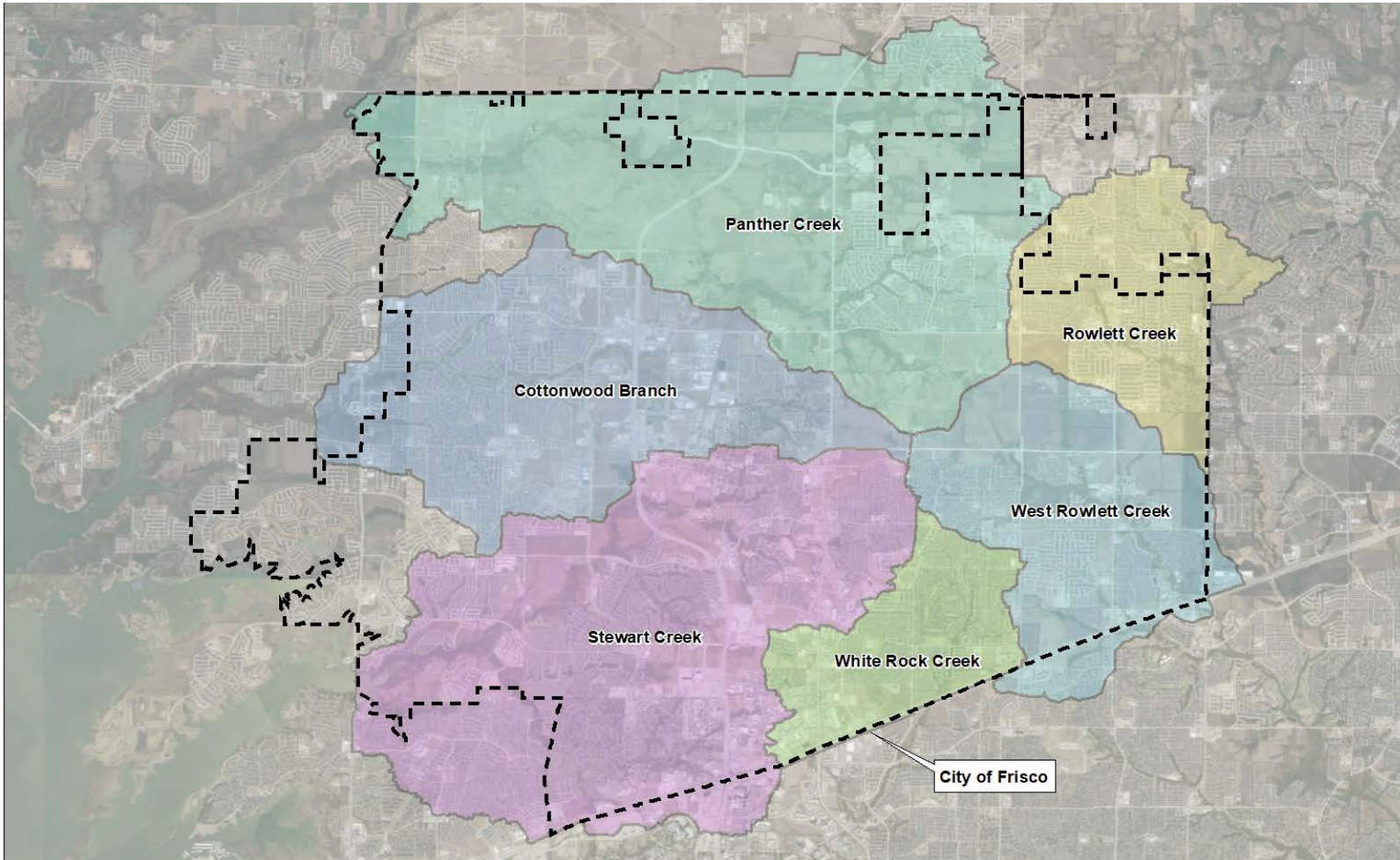
Downstream Assessment Issues

- Inconsistent studies between projects
- Complaints from community regarding requirements
- Increased review time

Watersheds and Downstream Assessments

- City prepares Master Plan base models for each watershed
- Provides developers with base models for downstream assessments
 - Consistency
 - Fully-developed conditions
 - Updated for new development

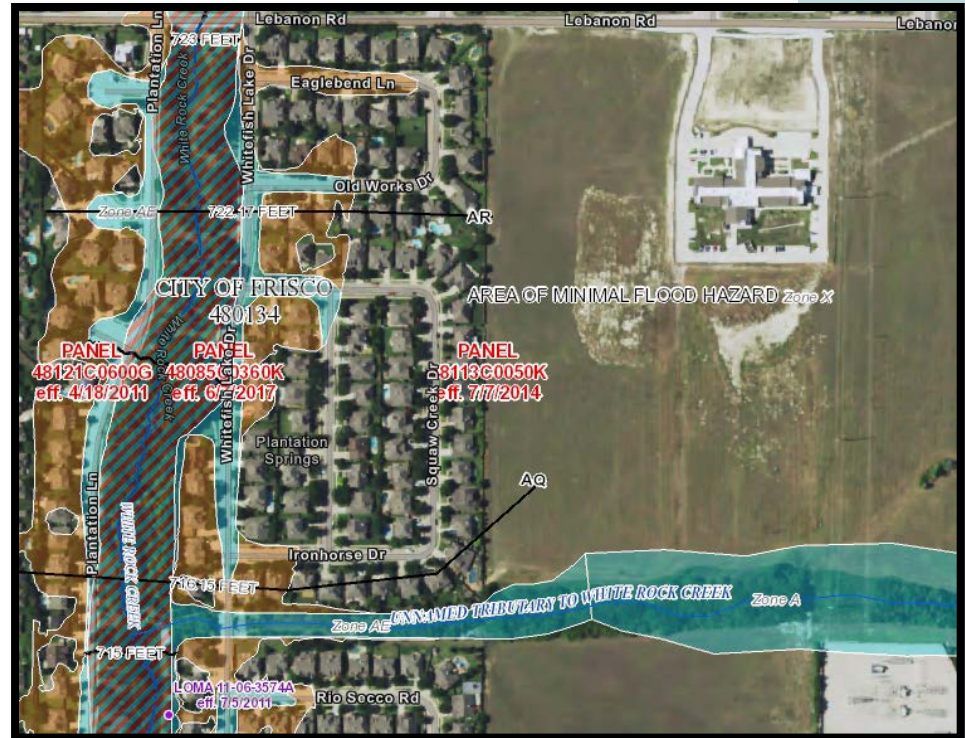
Watersheds



White Rock Creek Watershed

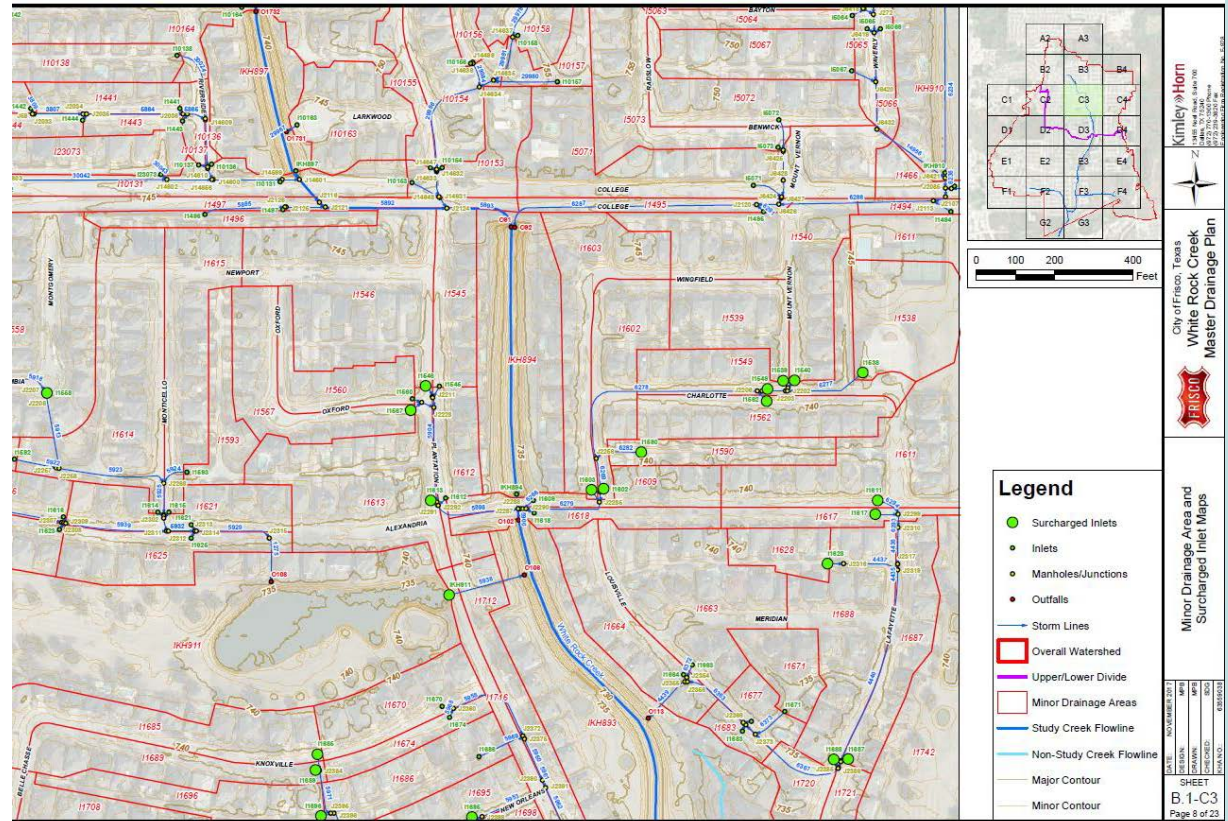
- Watershed has seen major changes in development over the past 30 years
- Storm sewer inadequacies have been noted by residents
- Special Flood Hazard Areas from new FEMA maps impact multiple properties

White Rock Creek Watershed



XPSWMM Modeling

- Storm sewer
- Channels and lakes





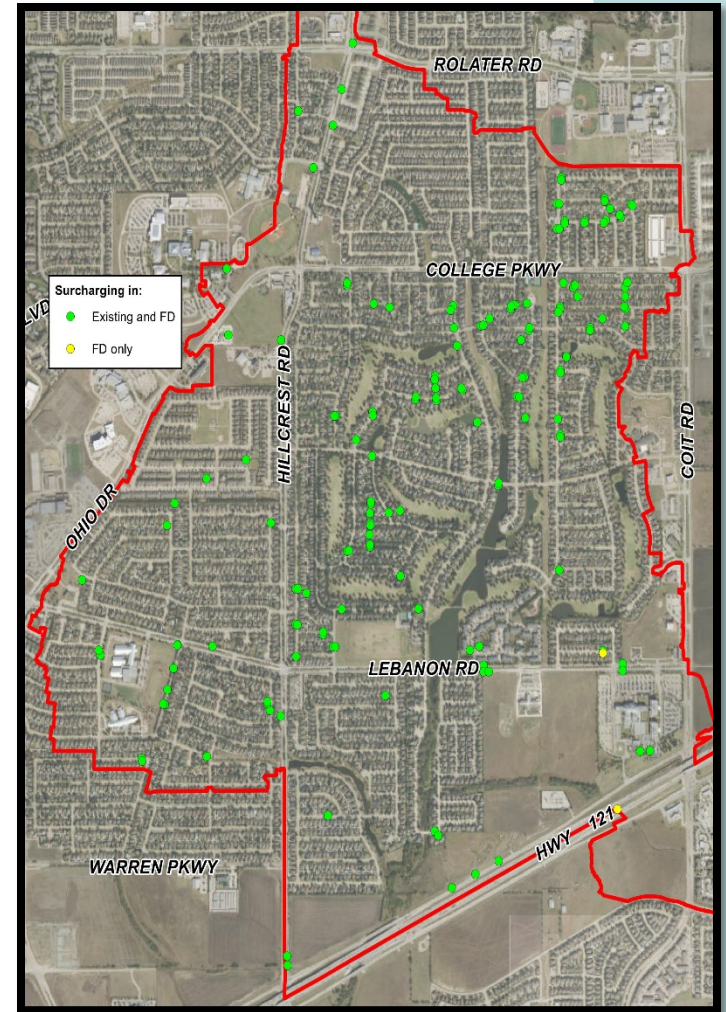






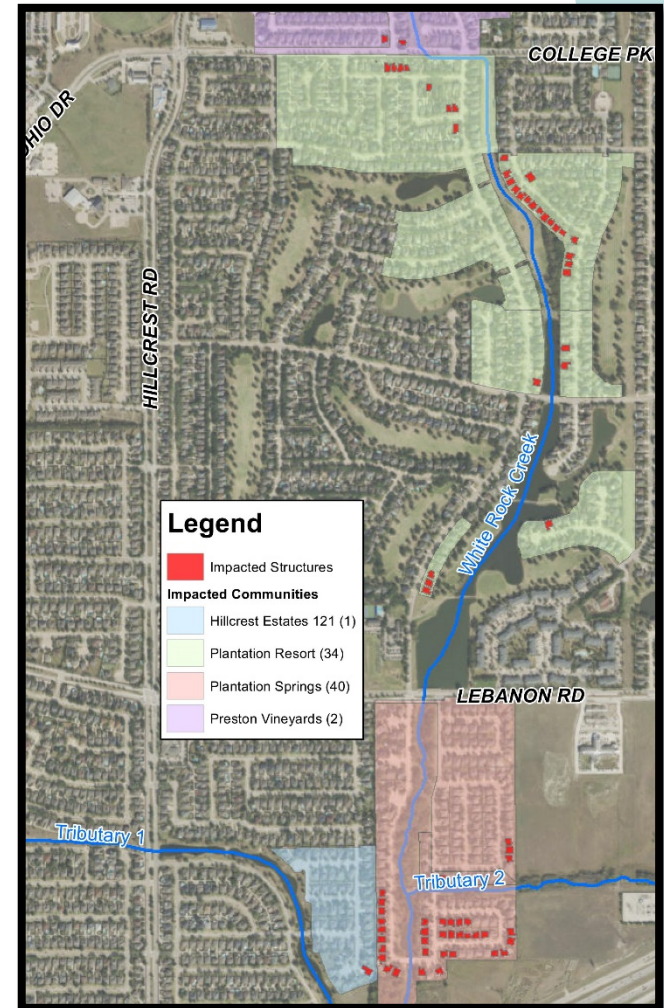
Storm Sewer Modeling

- Results show over 150 inlets that would surcharge in the 100-year existing event
- Only 2 additional inlets would be surcharged in fully-developed conditions



Channel and Pond Modeling

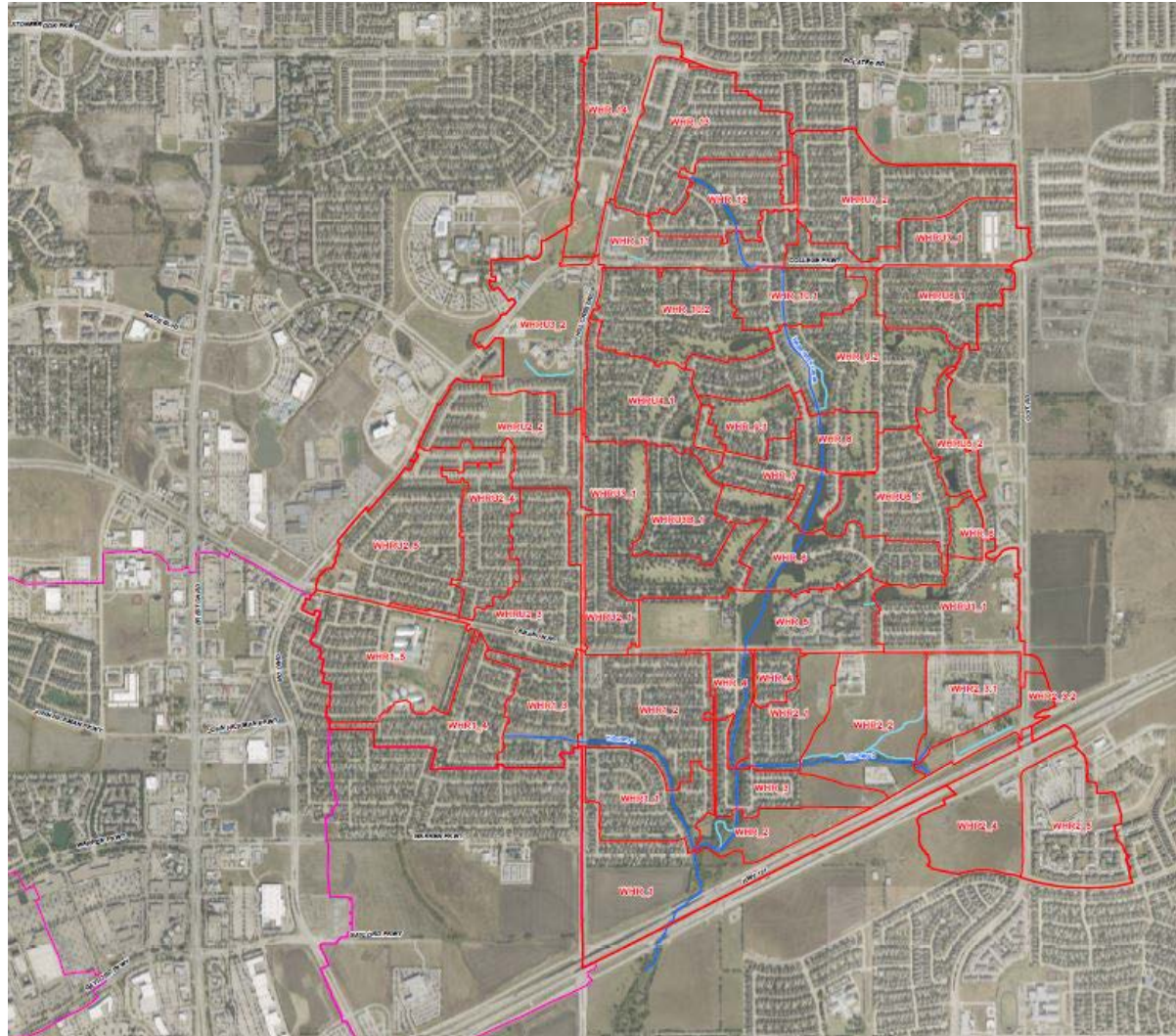
- Multiple existing structures were shown in the floodplain in existing conditions
- Fully-developed conditions has little to no impact on properties in the northern portions of the watershed
- Development in the southern portion of the watershed can result in increased flooding potential



Downstream Assessments

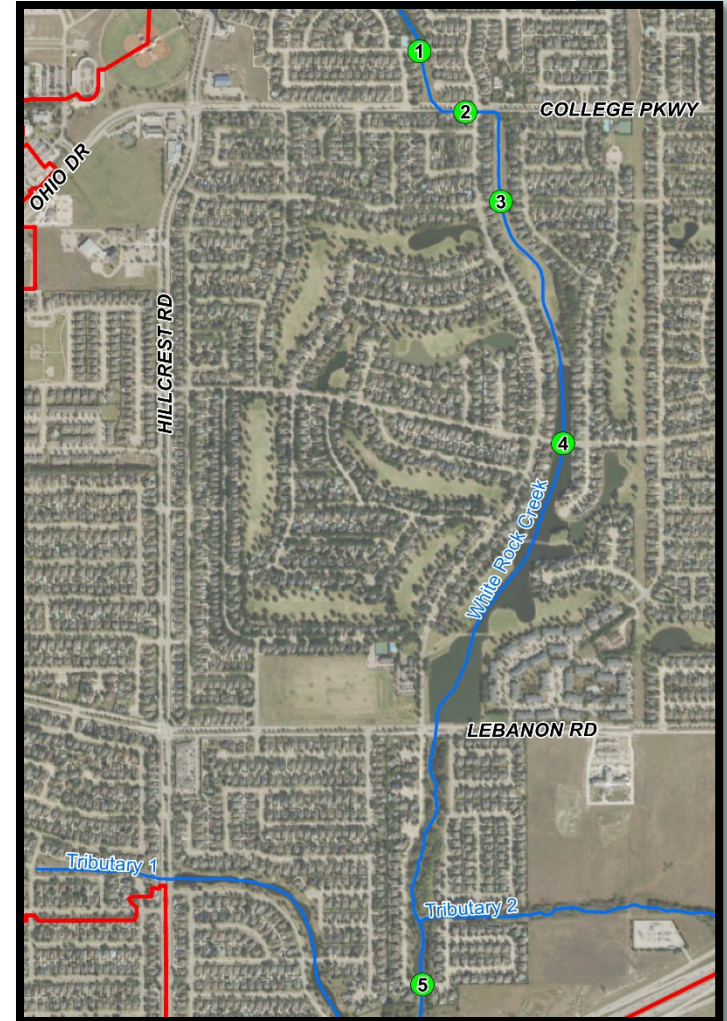
- Results of the modeling can help focus requirements for downstream assessments
- Development in the northern portions of watershed will have little to no impact on flooding
- As long as increased impervious over Future Land Use Plan is not anticipated, downstream assessment can just reference master plan
- Southern portions of the watershed can update the model to anticipate impacts

Downstream Assessments



Future Improvements

- Master Plan shows improvements to specific roadway crossings will impact existing residences



2D Modeling

- 2D modeling of areas where flow has escaped the banks of the channel can more accurately estimate the number of structures potentially impacted by the 1% annual chance of flood event

