



Lewis Creek Watershed Hydrologic and Hydraulic Studies

City of Bulverde

Oak Village North

June 18, 2015



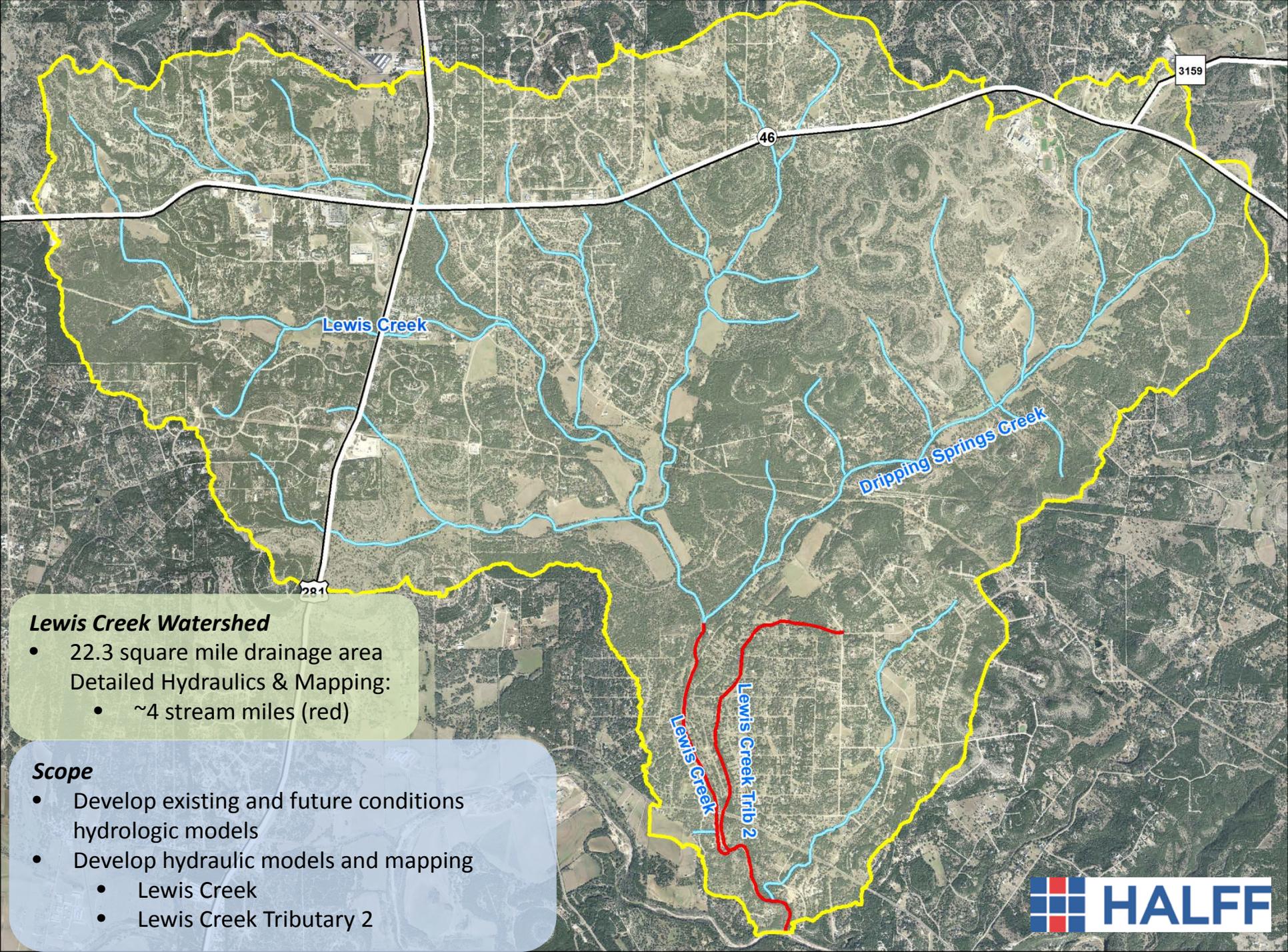
Agenda

- Existing and future conditions studies
- Possible future studies
 - Regional detention analysis and other flood mitigation alternatives
- TWDB Flood Protection Planning Grant application



City of Bulverde

EXISTING AND FUTURE CONDITIONS STUDIES



Lewis Creek Watershed

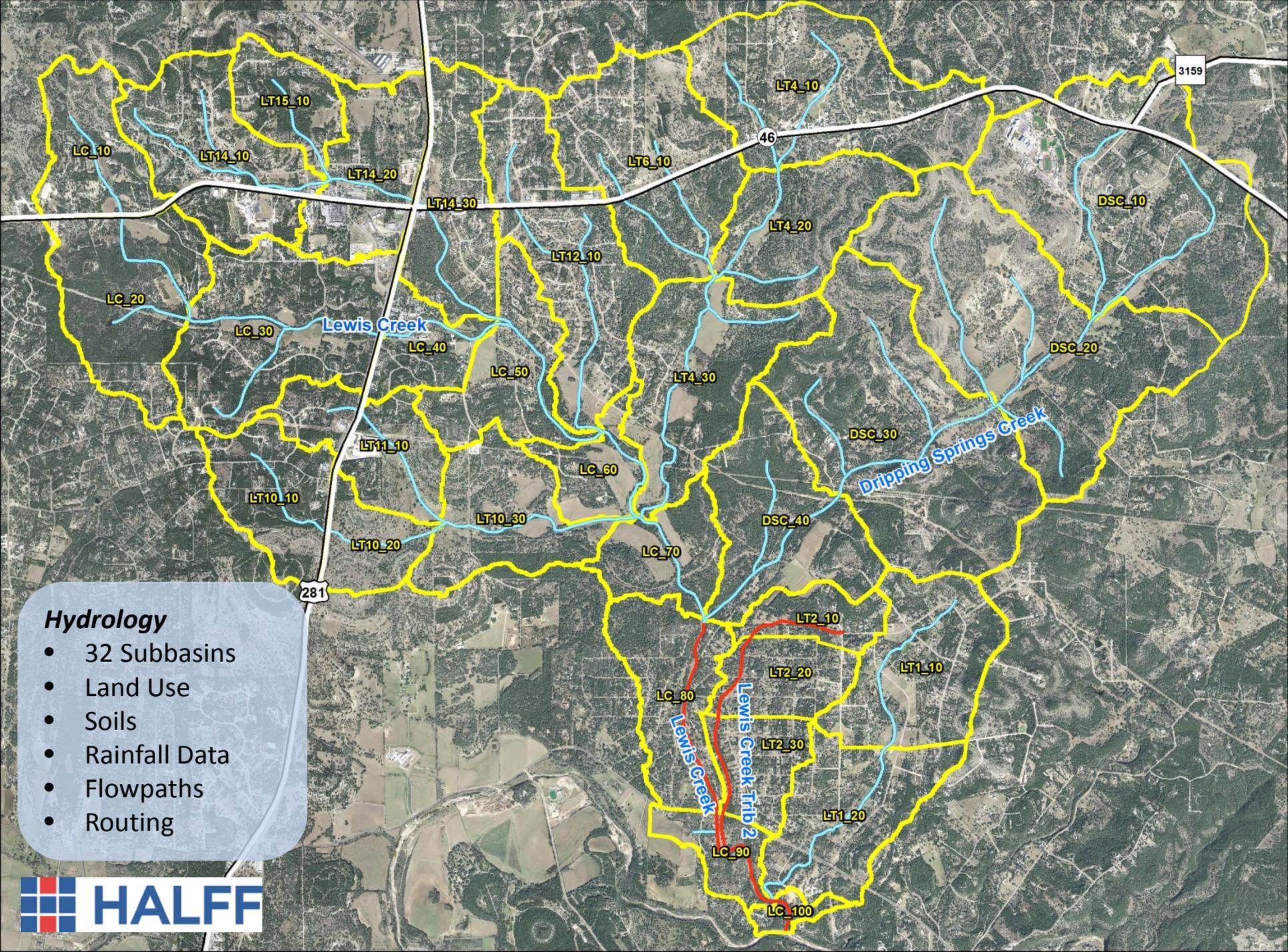
- 22.3 square mile drainage area

Detailed Hydraulics & Mapping:

- ~4 stream miles (red)

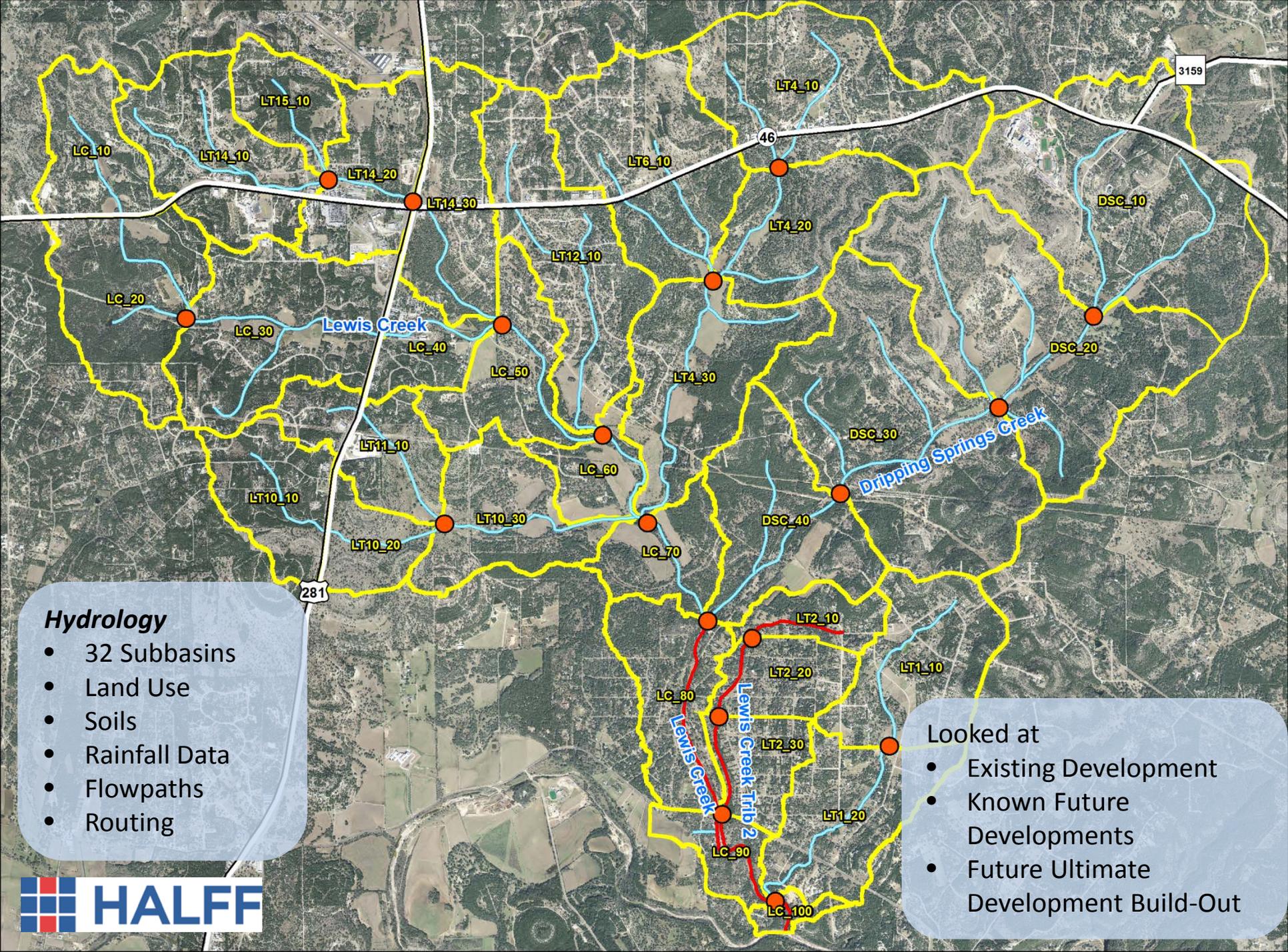
Scope

- Develop existing and future conditions hydrologic models
- Develop hydraulic models and mapping
 - Lewis Creek
 - Lewis Creek Tributary 2



Hydrology

- 32 Subbasins
- Land Use
- Soils
- Rainfall Data
- Flowpaths
- Routing

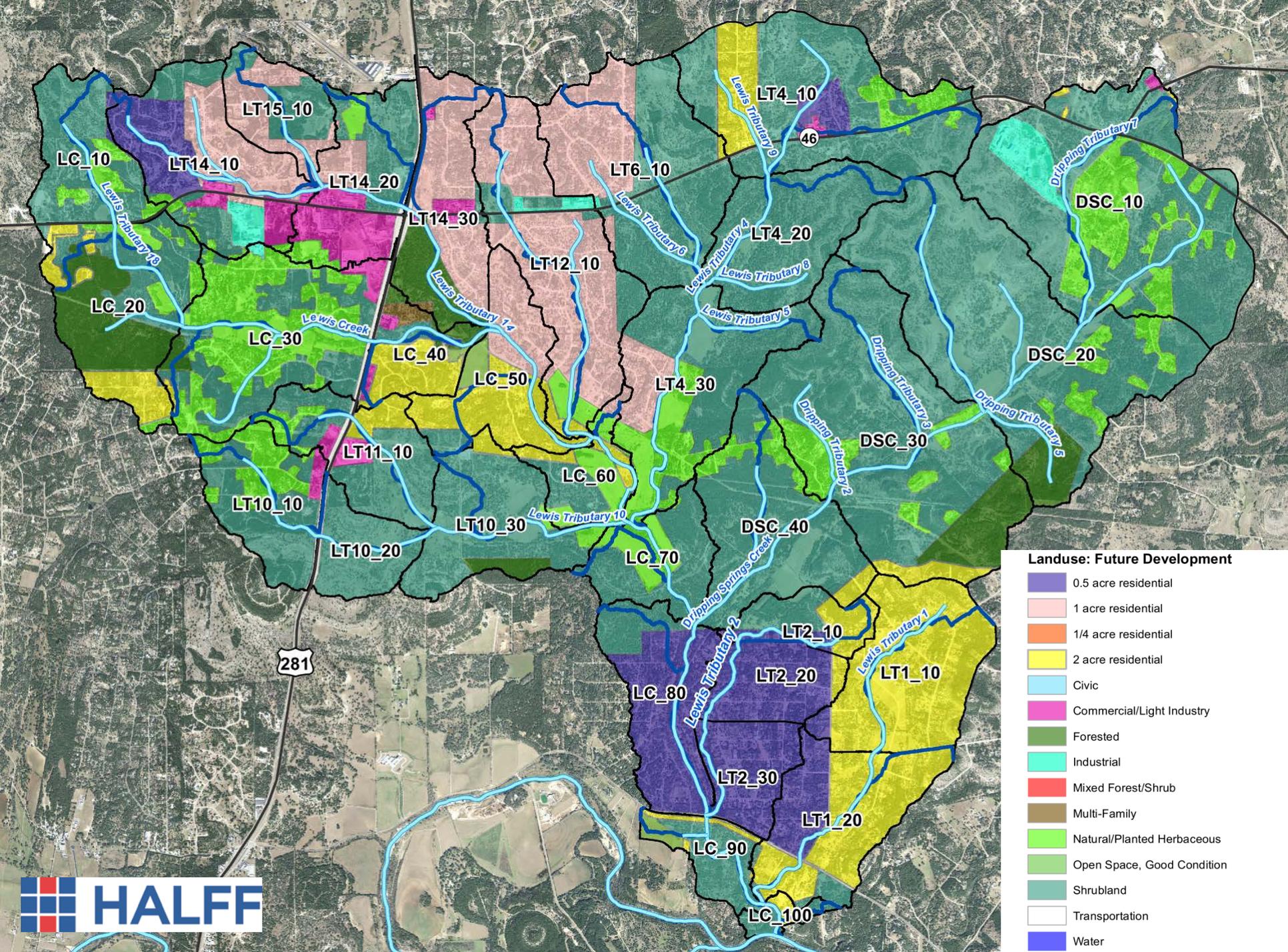


Hydrology

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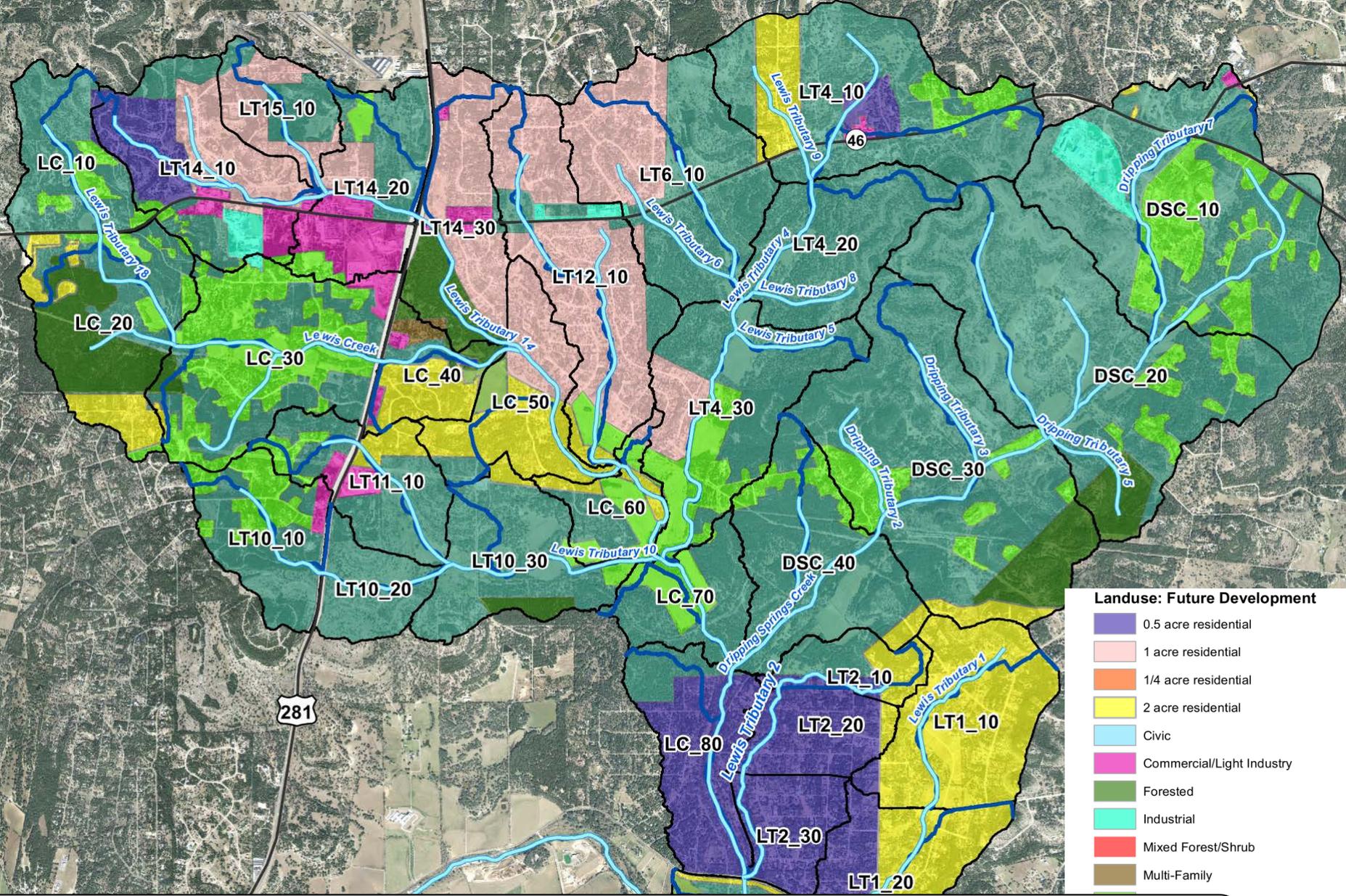
Looked at

- Existing Development
- Known Future Developments
- Future Ultimate Development Build-Out



Landuse: Future Development

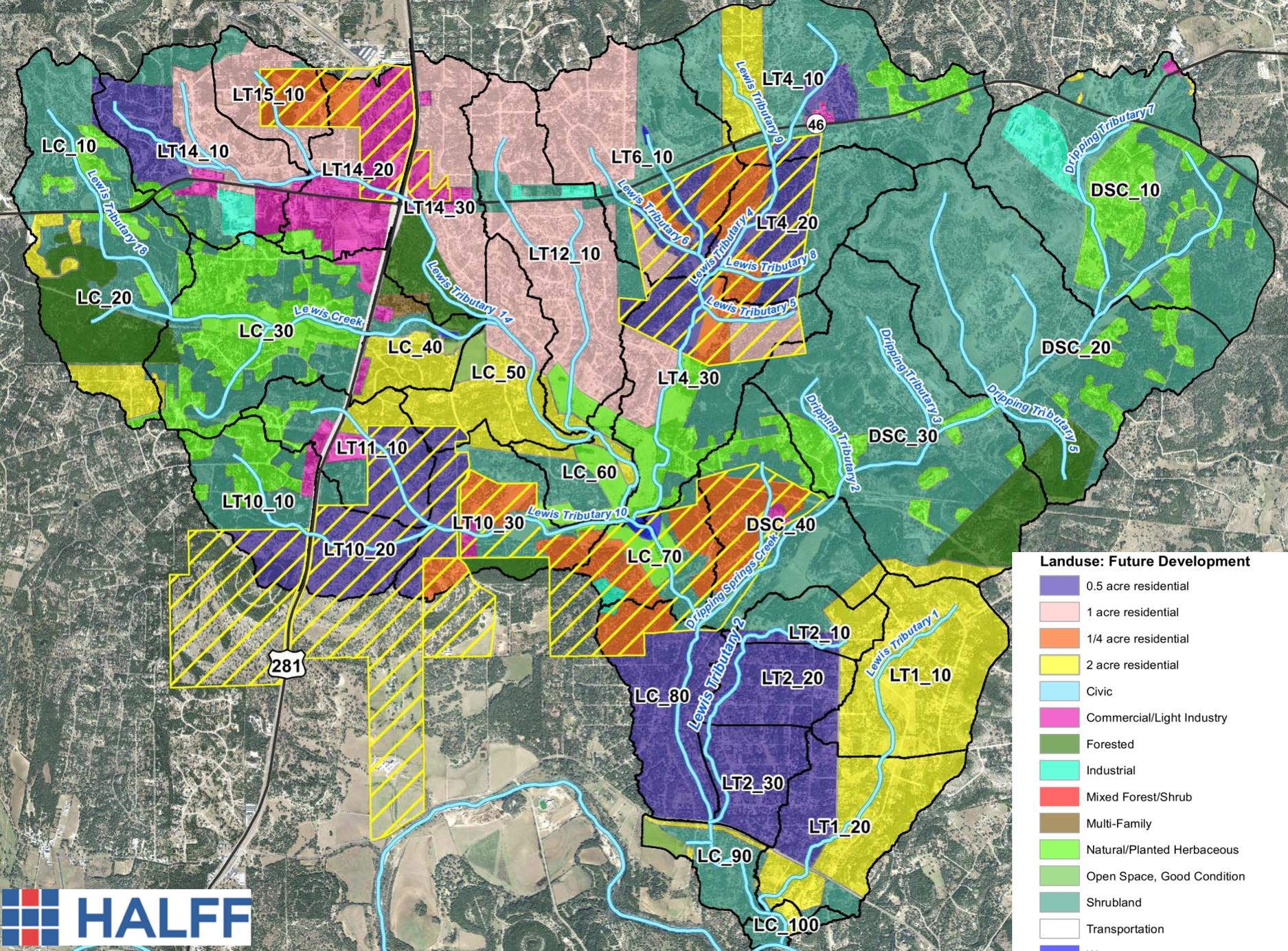
- 0.5 acre residential
- 1 acre residential
- 1/4 acre residential
- 2 acre residential
- Civic
- Commercial/Light Industry
- Forested
- Industrial
- Mixed Forest/Shrub
- Multi-Family
- Natural/Planted Herbaceous
- Open Space, Good Condition
- Shrubland
- Transportation
- Water



Existing Conditions Landuse

- Residential development > 2 acres categorized as shrubland

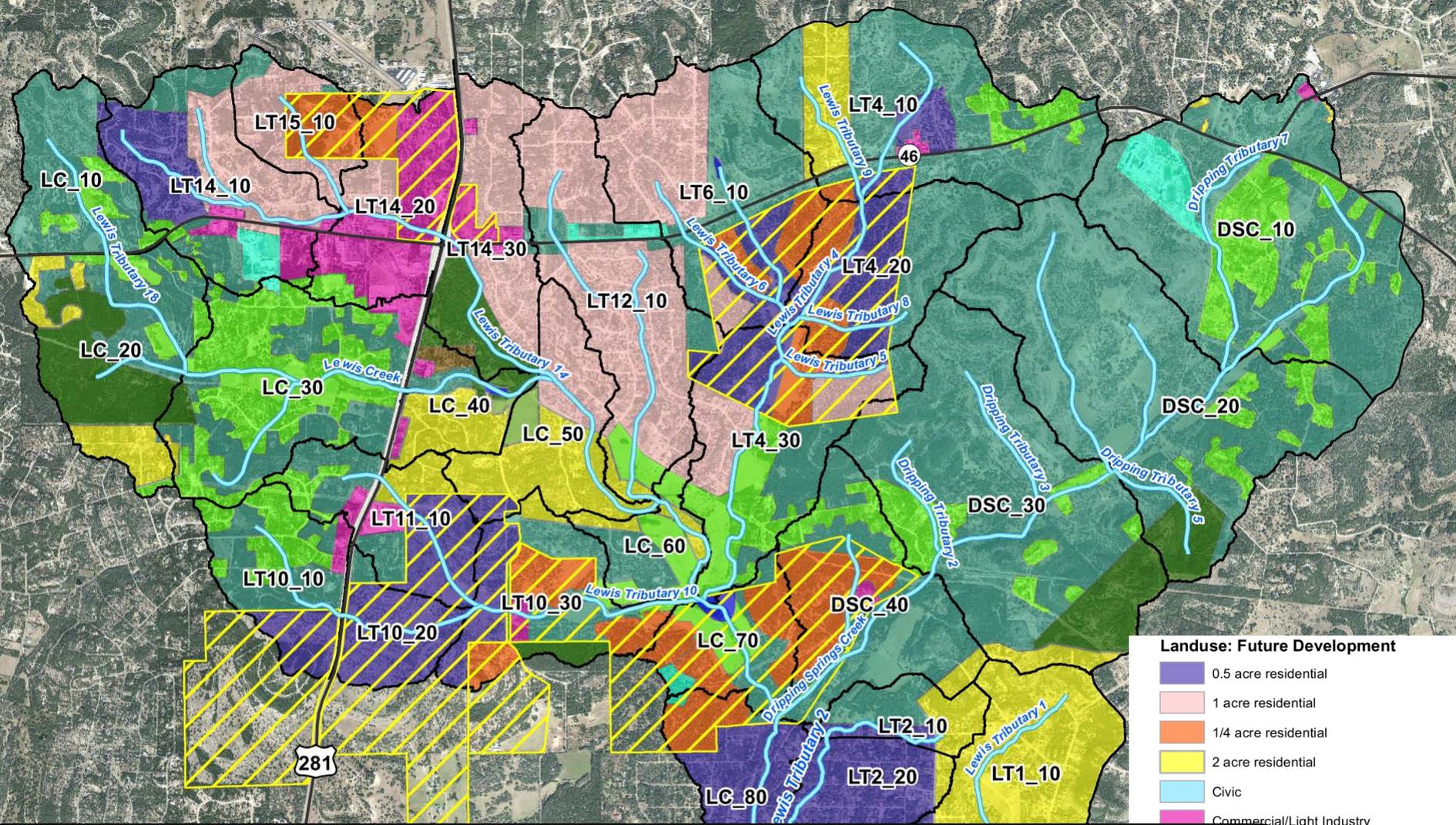
Herbaceous
Soil Condition



Landuse: Future Development

- 0.5 acre residential
- 1 acre residential
- 1/4 acre residential
- 2 acre residential
- Civic
- Commercial/Light Industry
- Forested
- Industrial
- Mixed Forest/Shrub
- Multi-Family
- Natural/Planted Herbaceous
- Open Space, Good Condition
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- Transportation
- Water

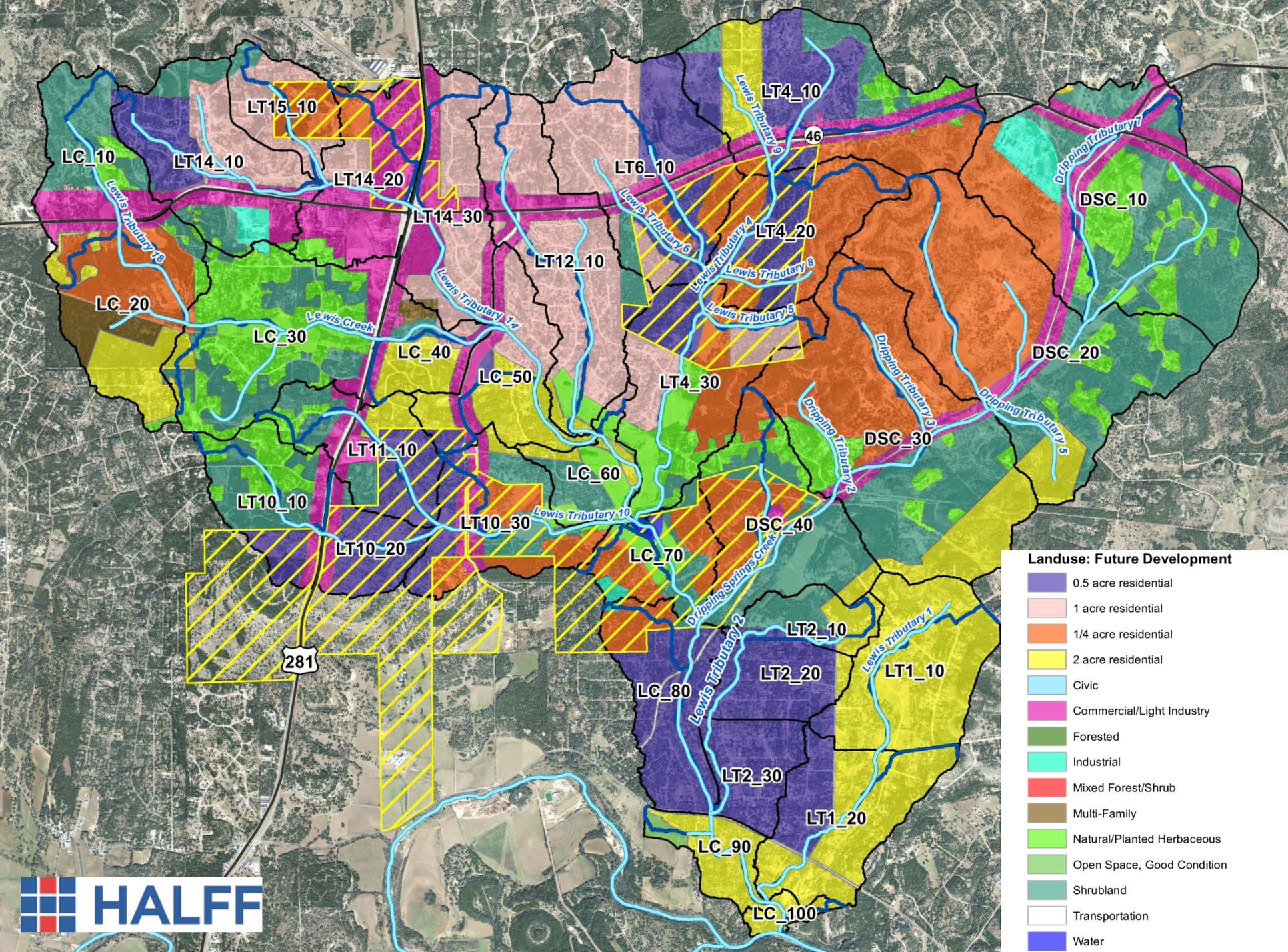




shrub
Herbaceous
Food Condition

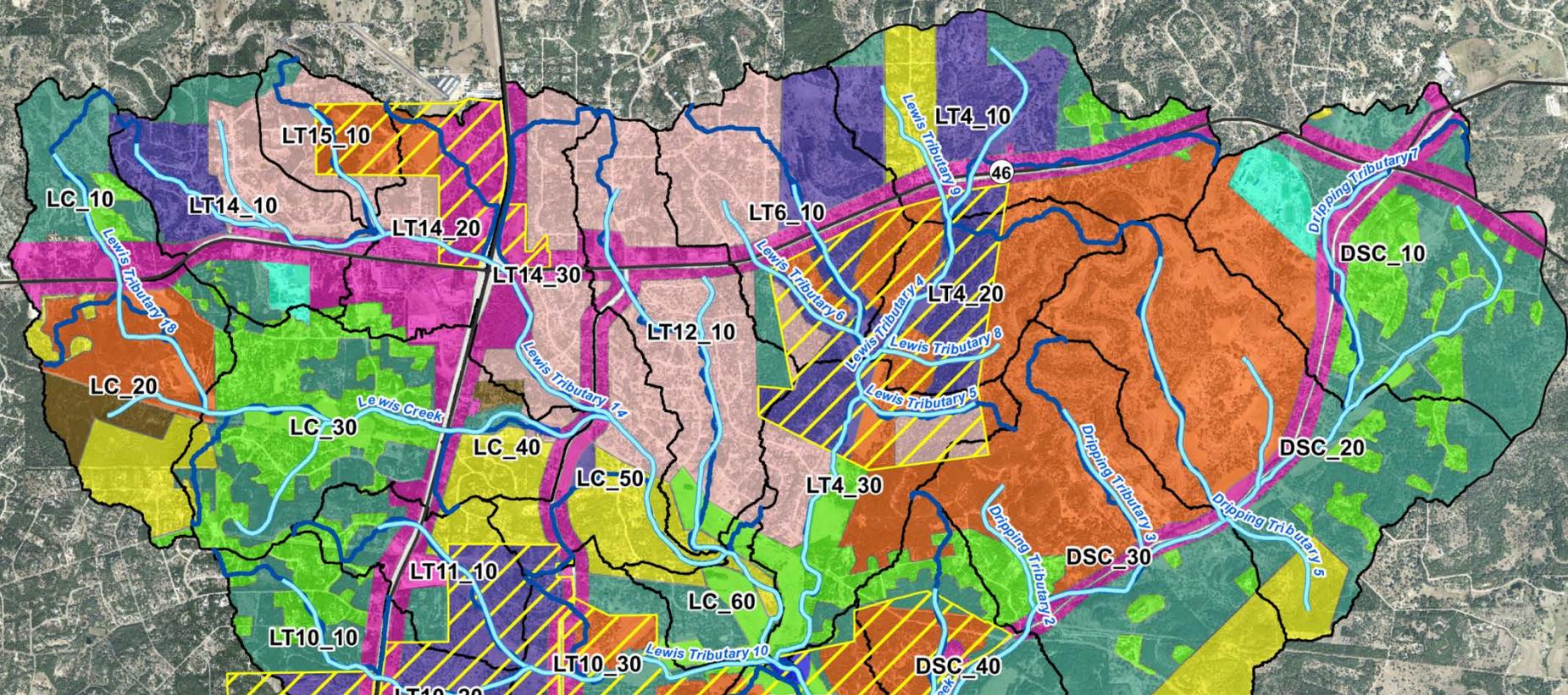
5-10 Yr Development Projection Landuse

- Existing development left unchanged
- Residential development > 2 acres categorized as shrubland
- Incorporated known future developments



Landuse: Future Development

- 0.5 acre residential
- 1 acre residential
- 1/4 acre residential
- 2 acre residential
- Civic
- Commercial/Light Industry
- Forested
- Industrial
- Mixed Forest/Shrub
- Multi-Family
- Natural/Planted Herbaceous
- Open Space, Good Condition
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- Transportation
- Water



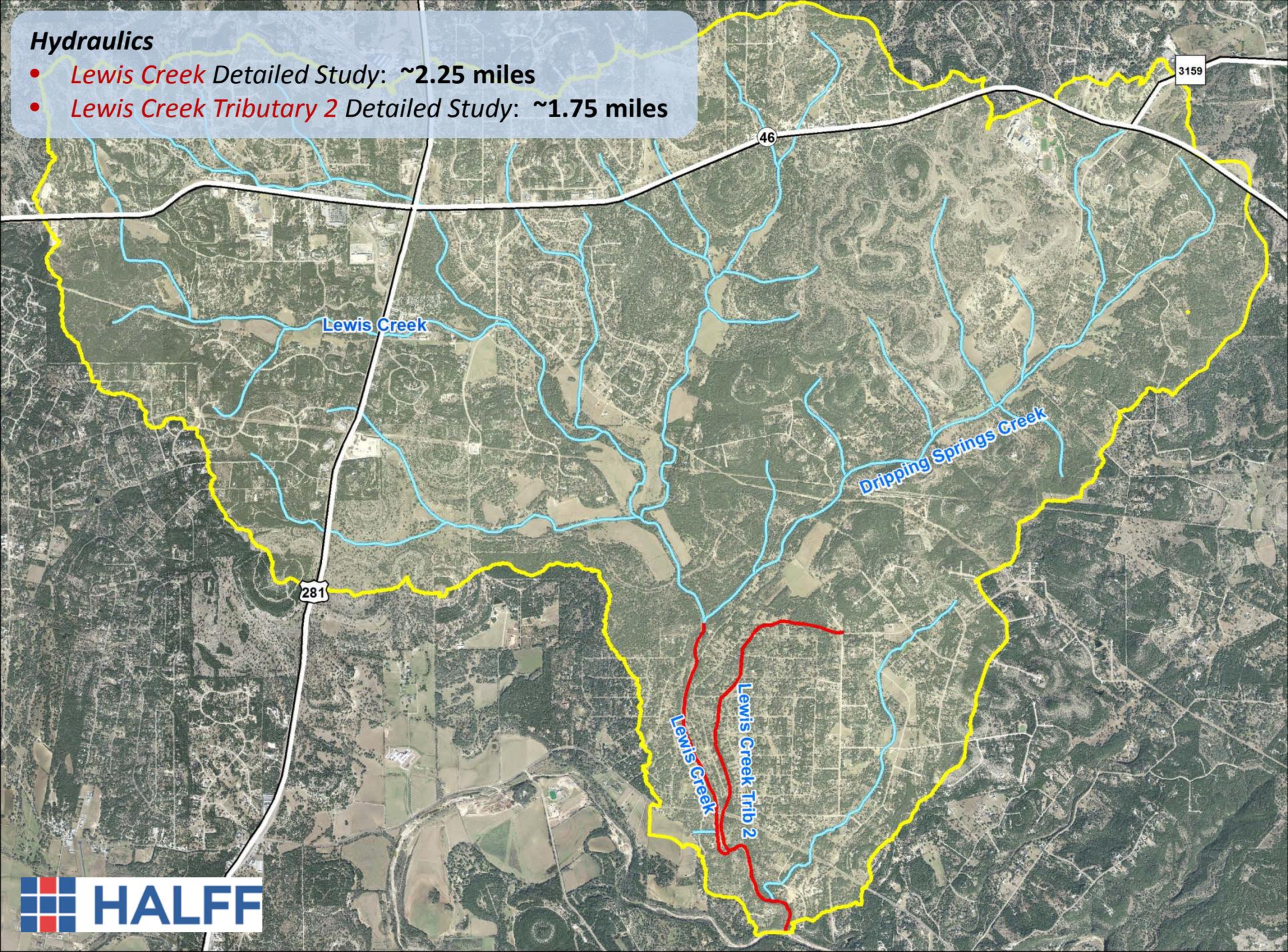
Future Conditions Landuse

- Existing development left unchanged
- Residential development > 2 acres categorized as shrubland
- Incorporated known future developments
- Incorporated the City's ongoing Master Thoroughfare Plan
- Undeveloped land was categorized for expected development or otherwise for a worst-case development scenario

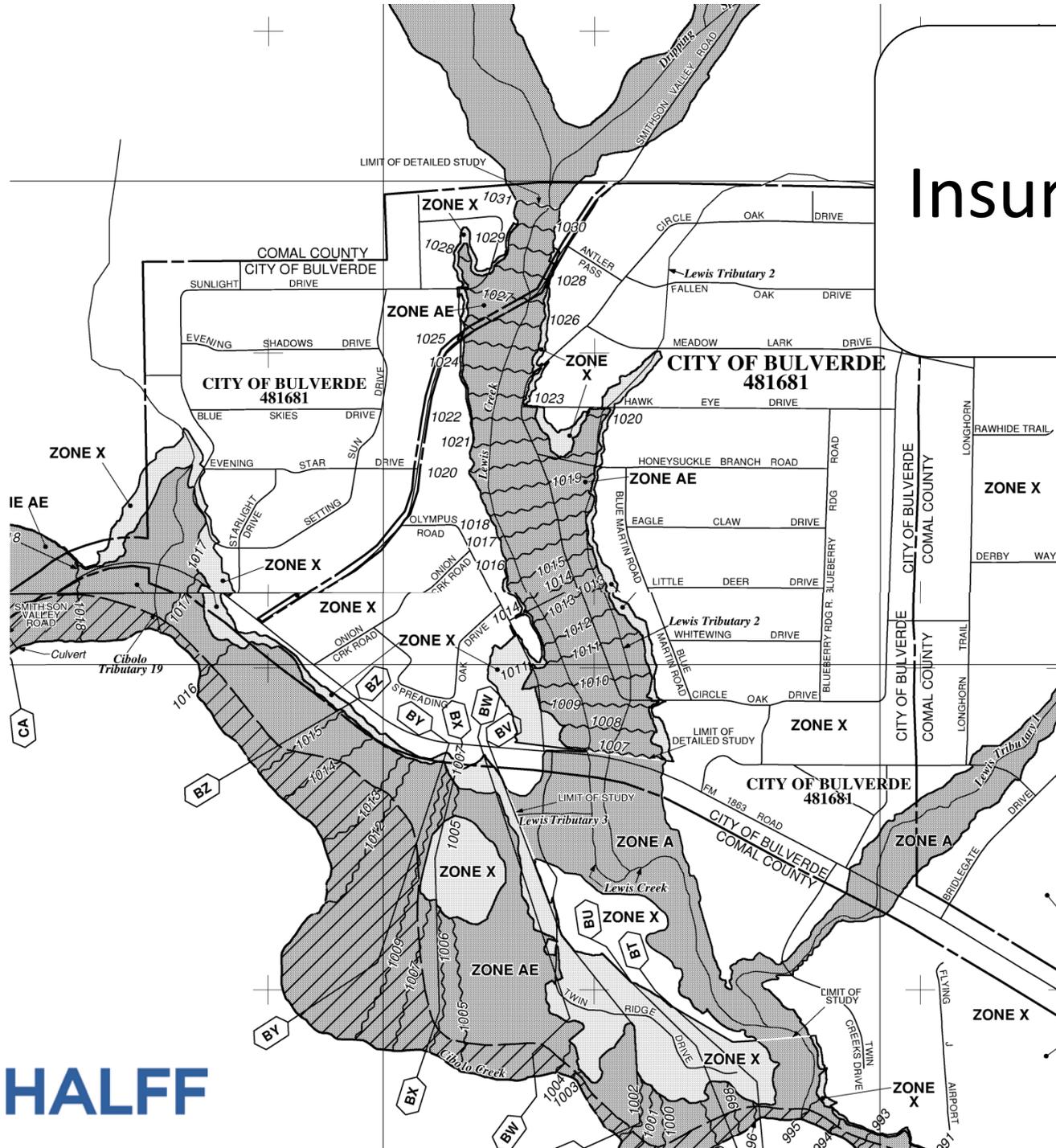
Development
 Potential
 Industrial
 Suburban
 Herbaceous
 Wood Condition

Hydraulics

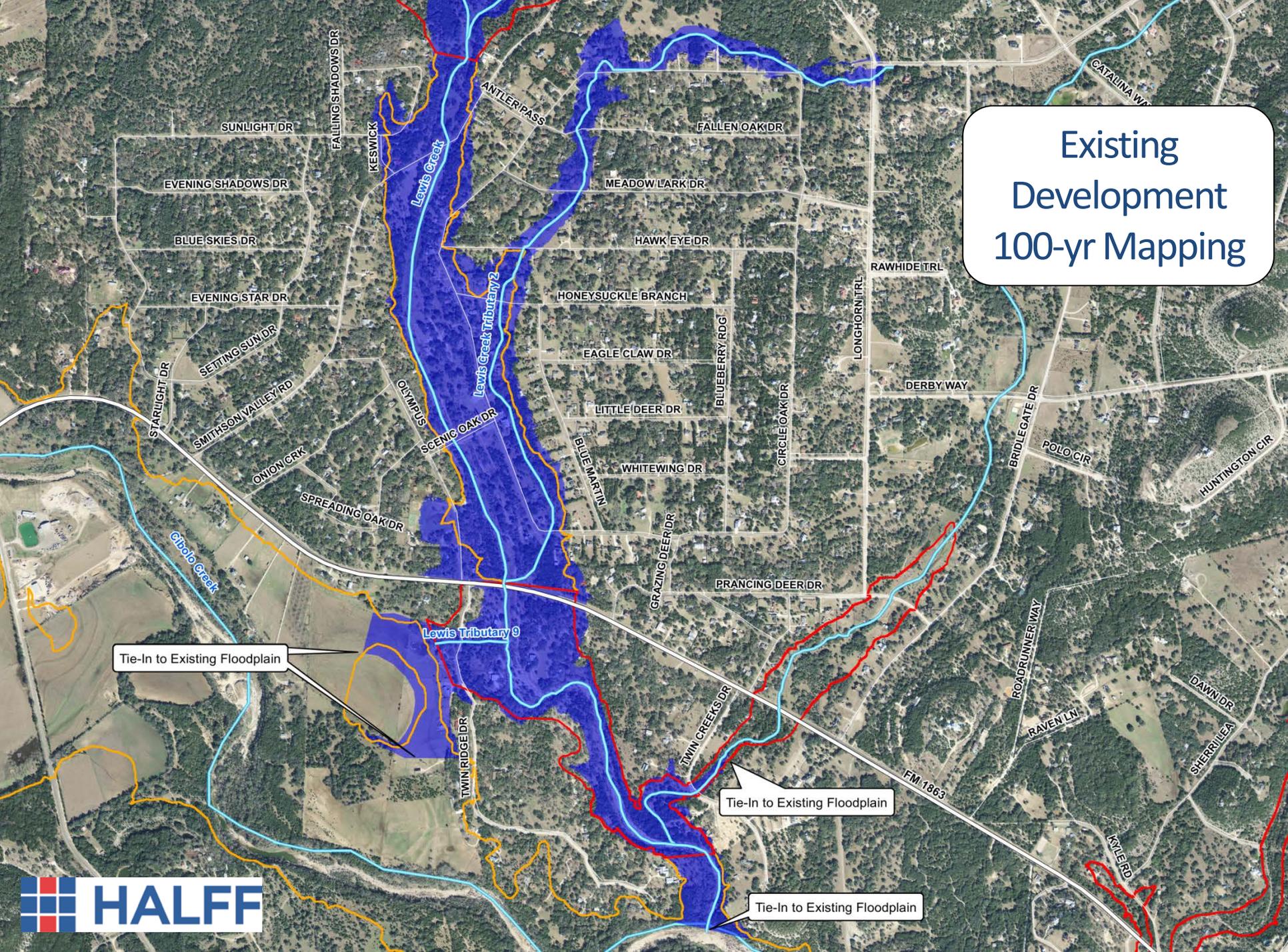
- *Lewis Creek Detailed Study: ~2.25 miles*
- *Lewis Creek Tributary 2 Detailed Study: ~1.75 miles*



Flood Insurance Rate Map



Existing Development 100-yr Mapping

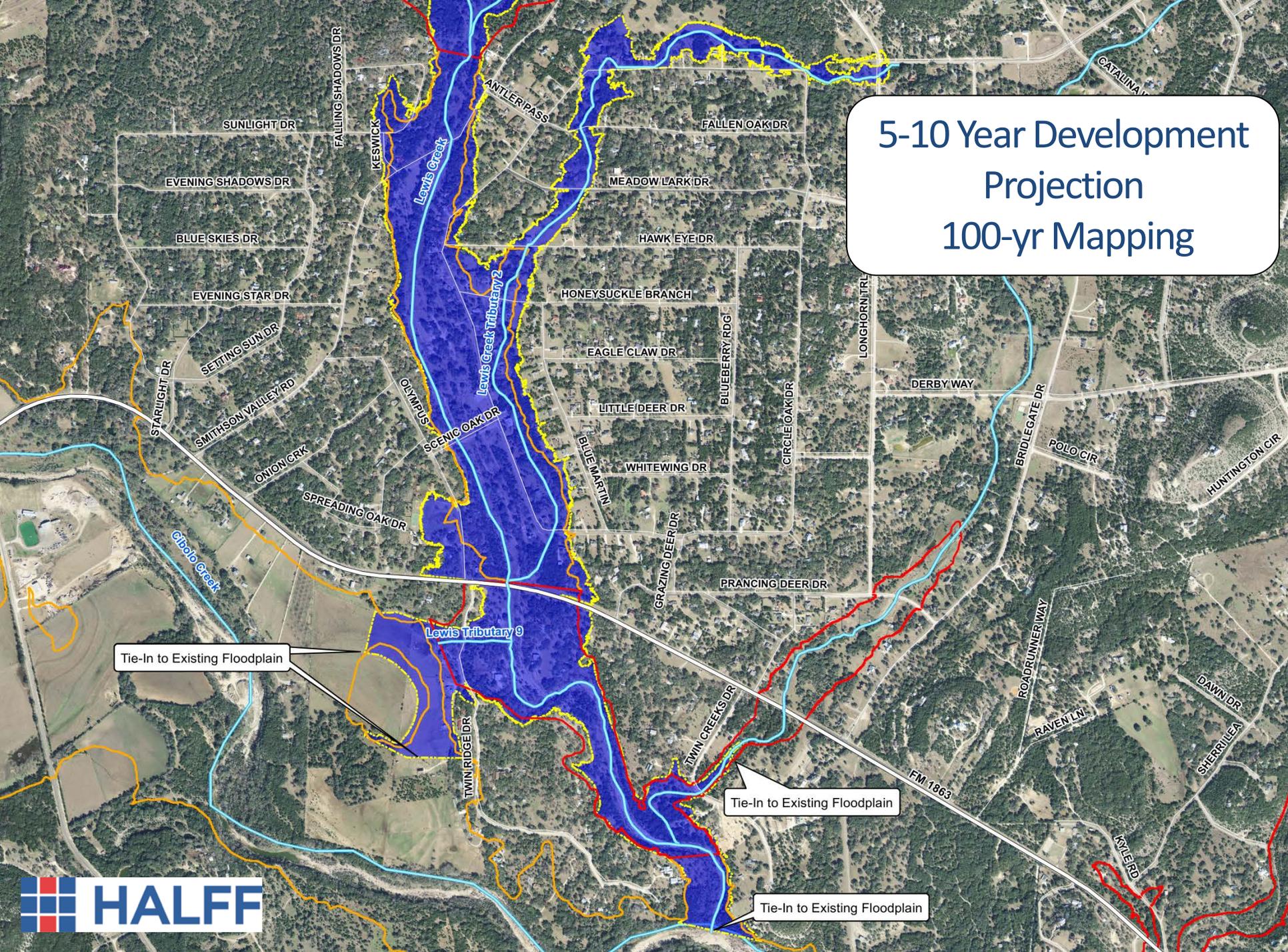


Tie-In to Existing Floodplain

Tie-In to Existing Floodplain

Tie-In to Existing Floodplain

5-10 Year Development Projection 100-yr Mapping

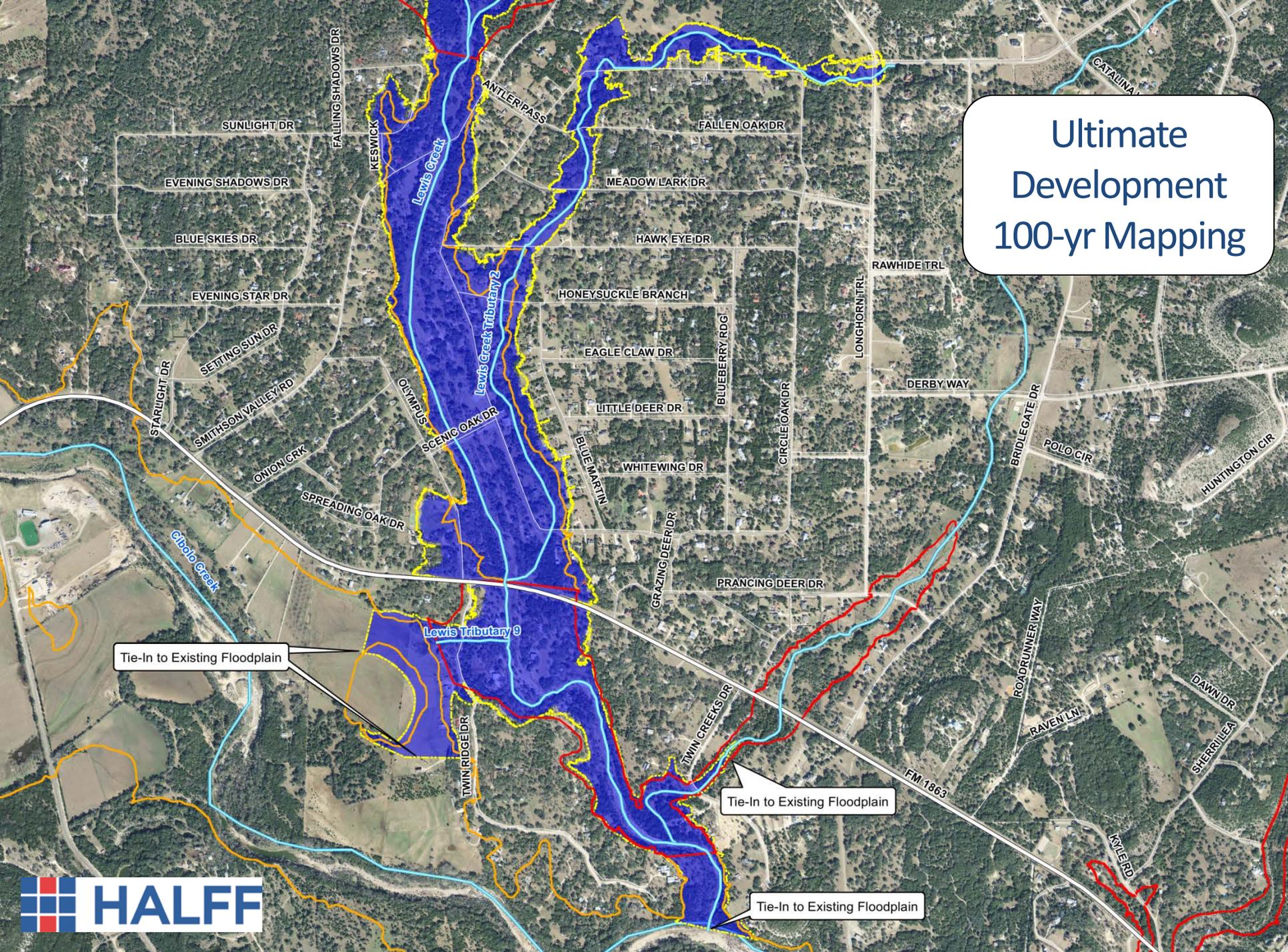


Tie-In to Existing Floodplain

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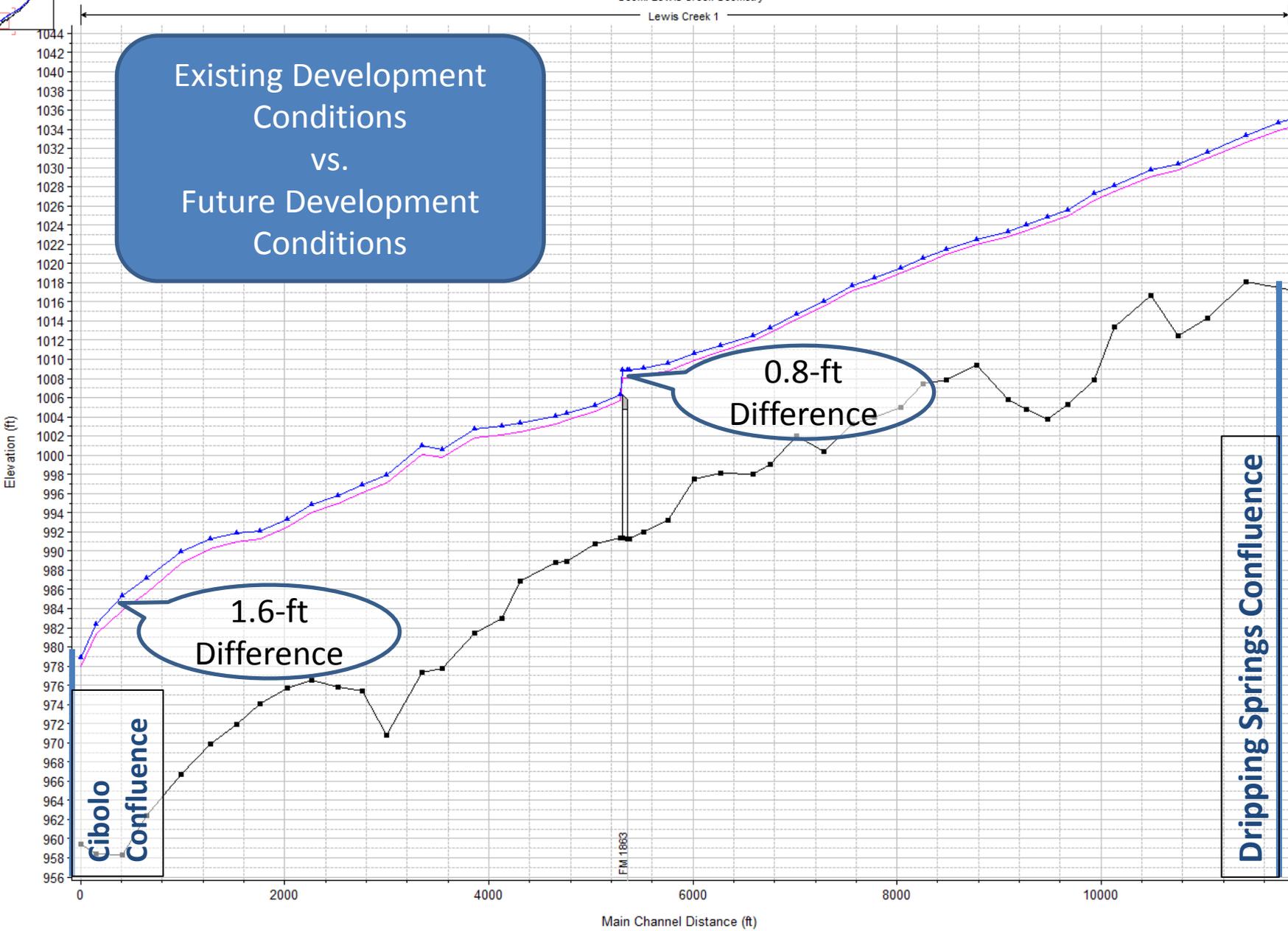
Ultimate Development 100-yr Mapping



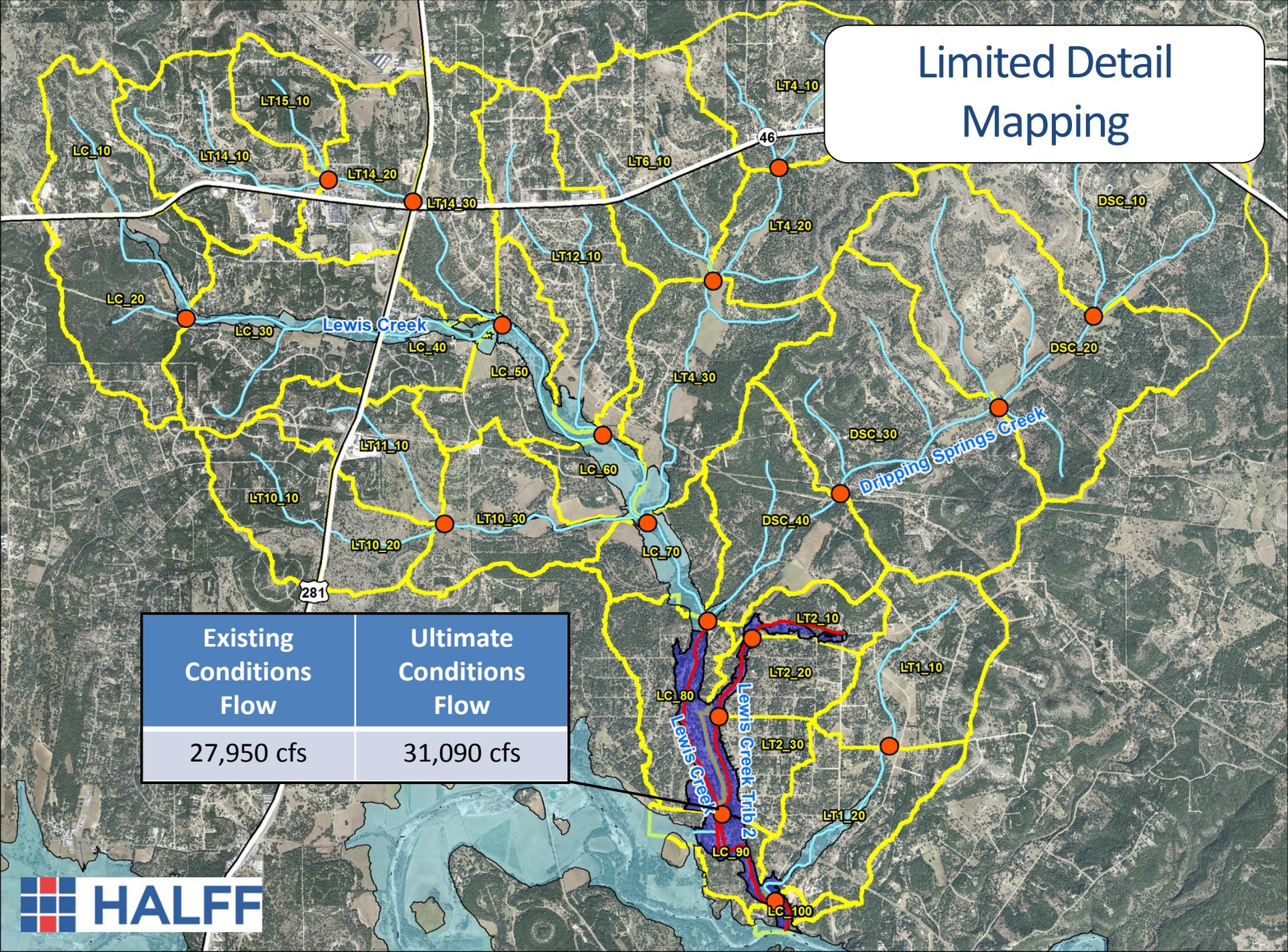
Lewis Creek Plan: Lewis Creek Various Flows
Geom: Lewis Creek Geometry
Lewis Creek 1

Legend	
WS 100-YR FC	(Blue line with triangles)
WS 100-YR EC	(Pink line with squares)
Ground	(Black line with squares)

Existing Development Conditions vs. Future Development Conditions



Limited Detail Mapping



Existing Conditions Flow	Ultimate Conditions Flow
27,950 cfs	31,090 cfs



Lewis Creek Study

What this means to you:

- Hydrologic and Hydraulic models for regulating development
 - Able to identify potential impacts from future developments
 - Preliminary Mapping for the rest of Lewis Creek
 - Help landowners identify flood hazard risk on property
- Results can be used for identification of potential flood mitigation projects

Already accomplished

- City Council adopted the models as “Best Available Data” for regulatory use.



City of Bulverde

POSSIBLE FUTURE STUDIES

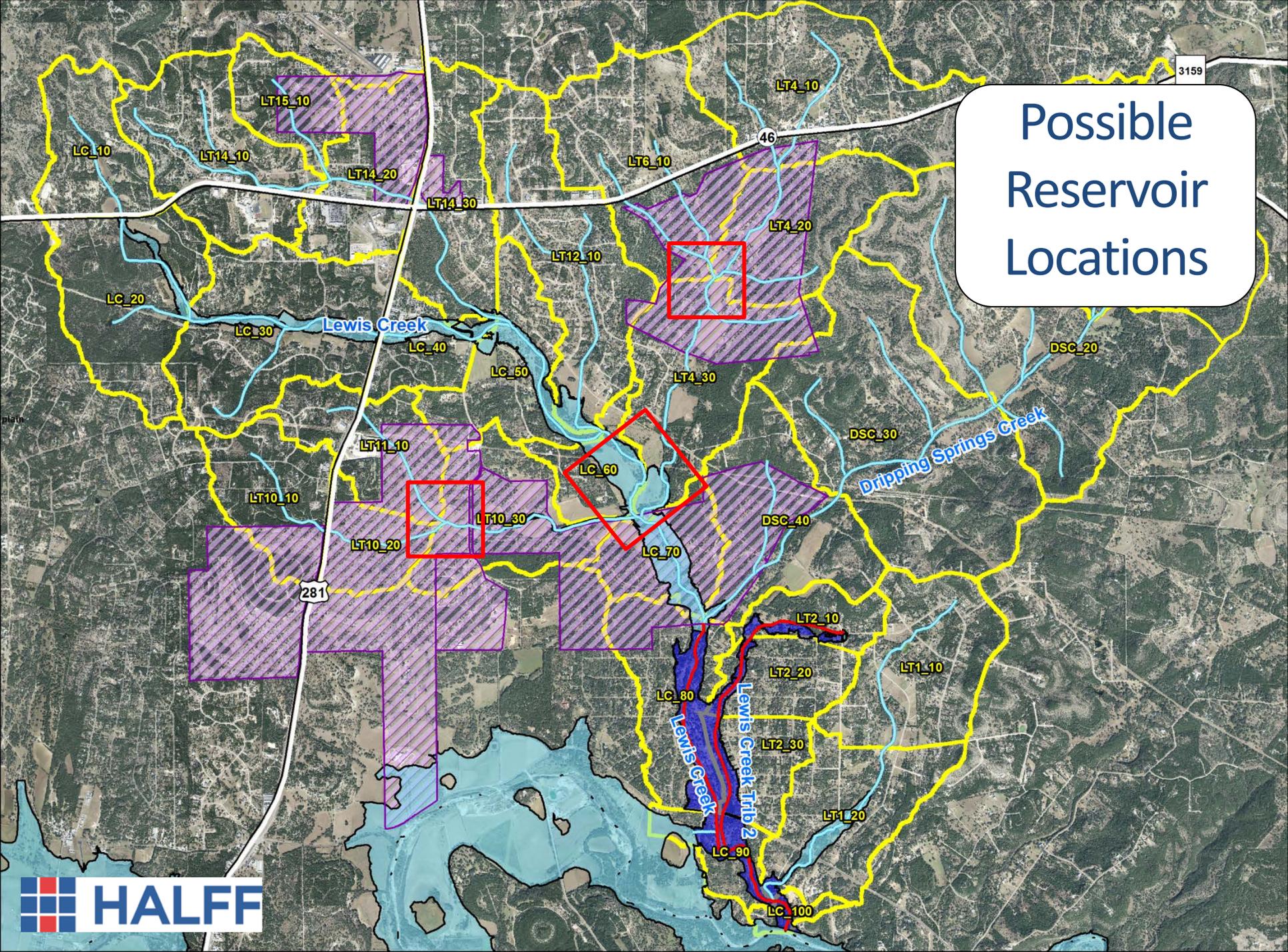


Lewis Creek Study

Possible Future studies / Next Steps

- Investigate potential flood reduction alternatives from a regional perspective.
- Identifying locations and sizes of regional detention facilities
- Identifying other flood mitigation alternatives such as
 - Drainage system improvements
 - Channel improvements
 - Multi-use facilities such as parks that may be used for detention

Possible Reservoir Locations





Next Steps

Next Steps

- Identify problem areas
- Assess and prioritize future capital improvement projects
- Design current projects to fully developed conditions



TWDB Grant Application – 2015

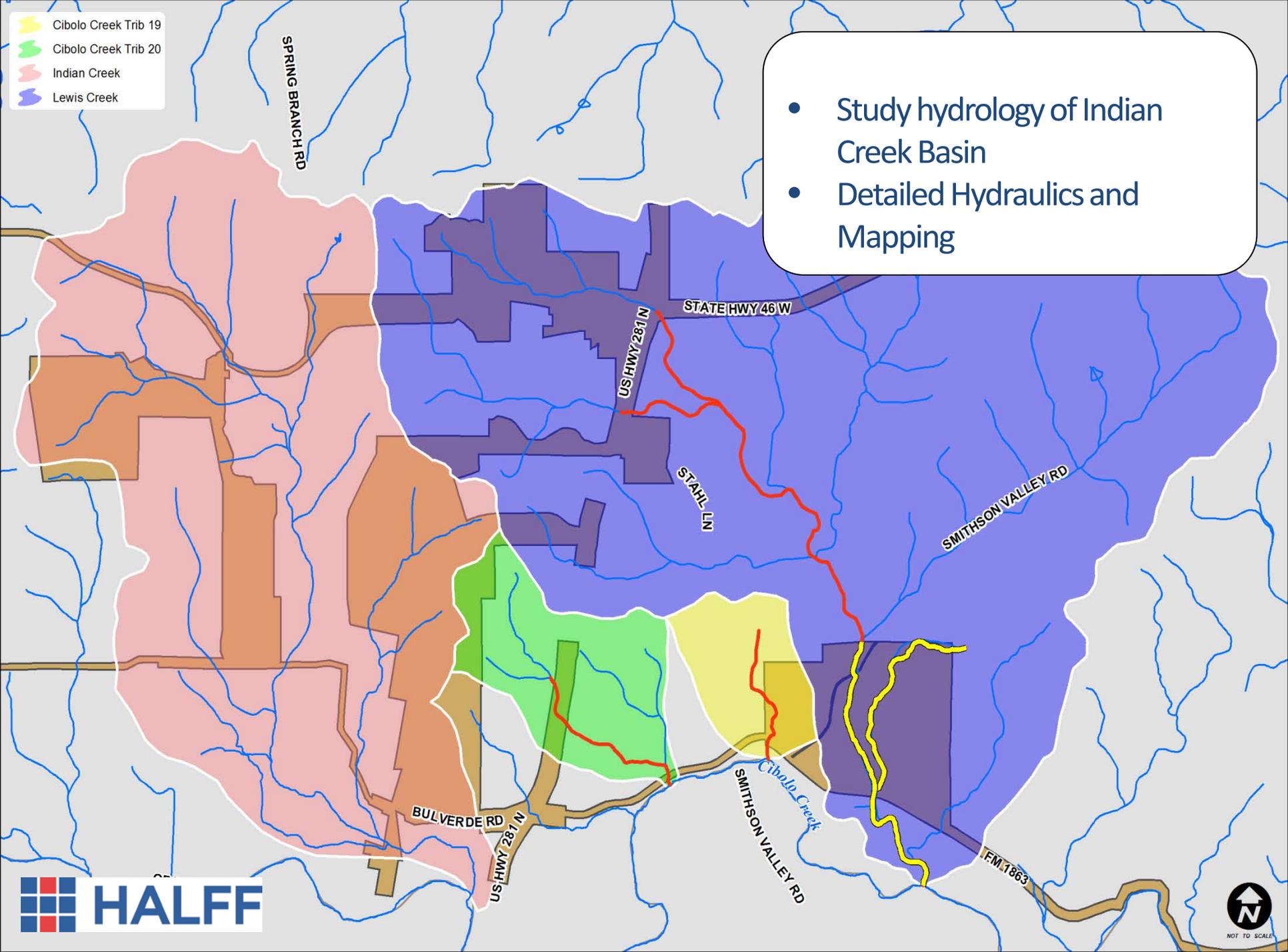
Effort already performed will show proactive approach to TWDB

Potential Scope of New Study/Grant

- Extend detailed study of Lewis Creek to US 281
- Assess the need for more detailed mapping of other areas
- Identify/model flood mitigation alternatives within the Lewis Creek watershed
- Model existing conditions hydrology of Indian Creek
- Create detailed hydraulic models and mapping of flood-prone areas of Indian Creek
- Further the efforts of the City-Wide Master Drainage Plan

- Cibolo Creek Trib 19
- Cibolo Creek Trib 20
- Indian Creek
- Lewis Creek

- Study hydrology of Indian Creek Basin
- Detailed Hydraulics and Mapping





Questions?