

# USING GIS TO UPDATE A FIELD SERVICES PRICING MODEL

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# THE CHALLENGE

- Since 1992 TxDOT has had to comply with USEPA NPDES requirements
  - Map and Inspect Outfalls
  - Along TxDOT Roadways (79,000 miles)
  - In Urbanized Areas

# WHAT IS AN OUTFALL?

- The point of a conveyance at which a discharge enters waters of the U.S.



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# HOW MANY OUTFALLS DOES TXDOT THINK THEY HAVE?

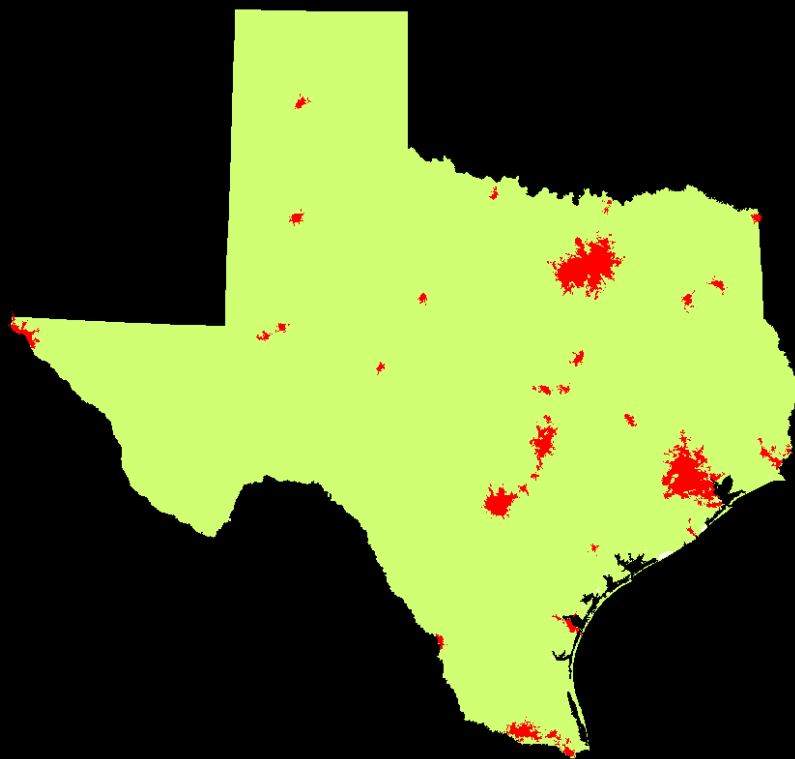
- 1 stream crossing every 2,000 feet X
  - 4 outfalls per crossing =
  - 10.5 outfalls per mile

79,000 miles of roads X 10.5 = 829,500 outfalls

Fortunately only urbanized areas need to be mapped



# WHERE ARE THE URBANIZED AREAS?



# FORT WORTH STUDY AREA

- 212 miles of TxDOT roads within city limits
- 559 estimated stream crossings
- 2,236 estimated outfalls

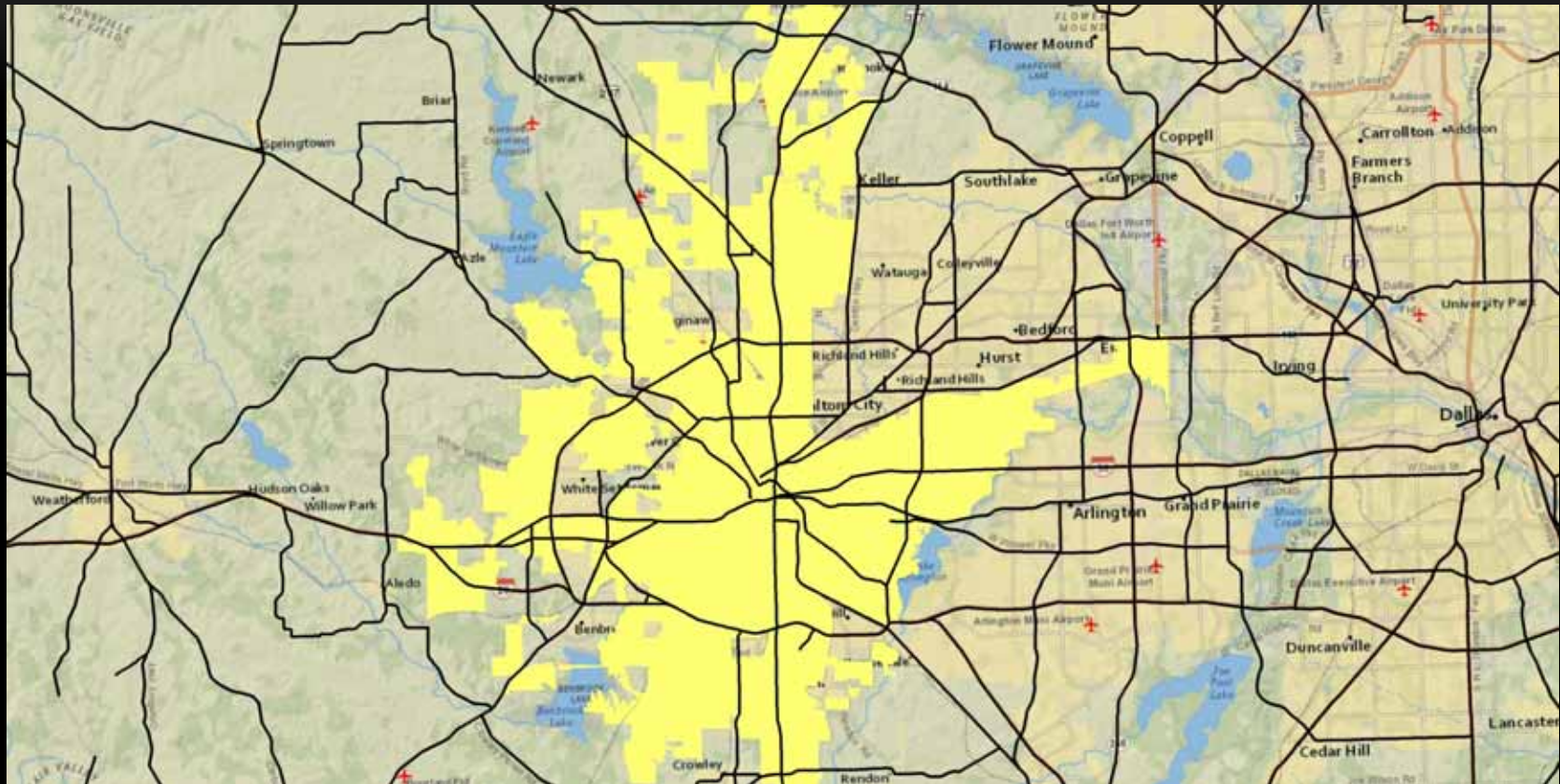


# FORT WORTH STUDY AREA

## TXDOT ROADS

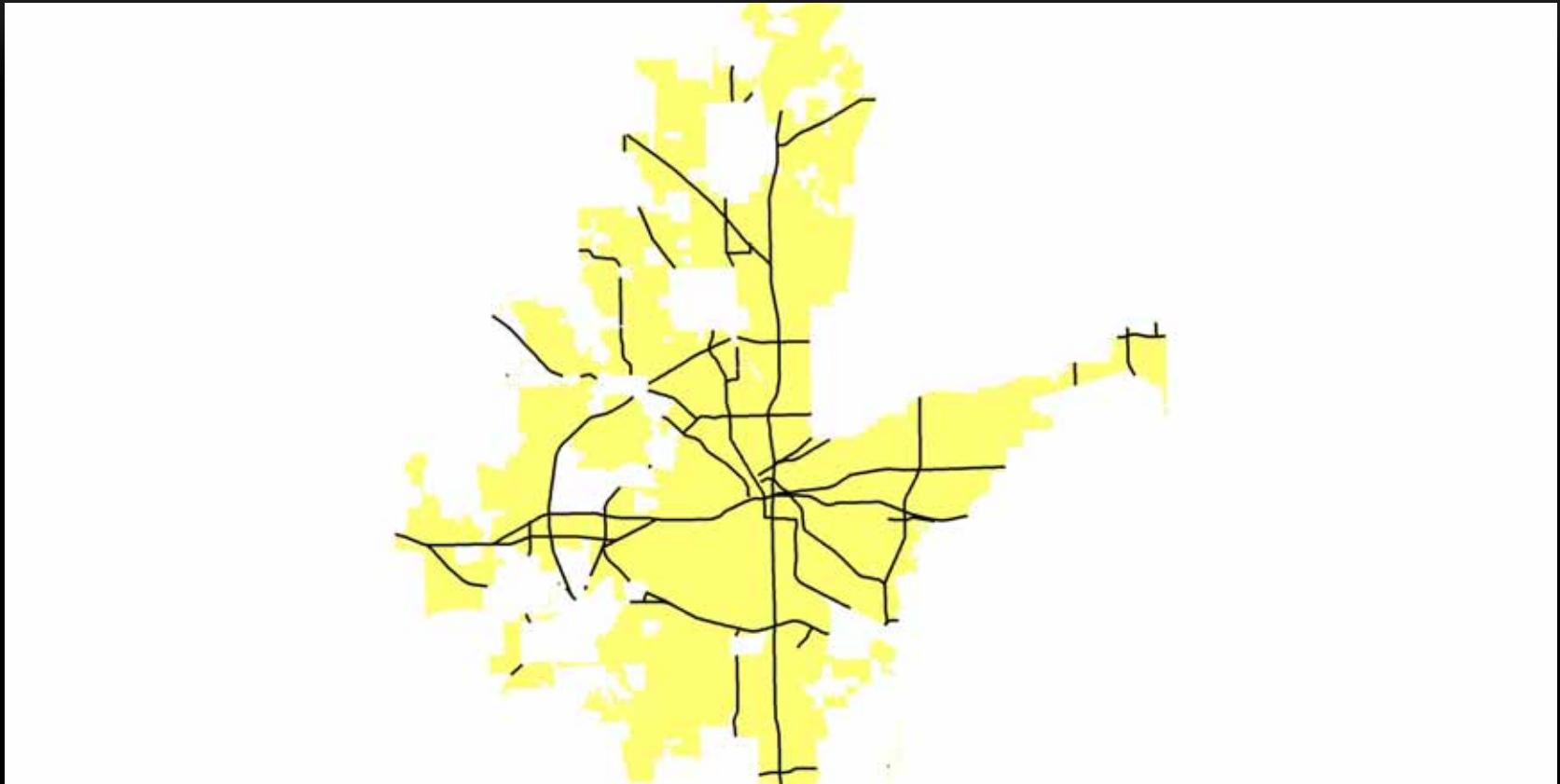


# FORT WORTH STUDY AREA CITY LIMITS

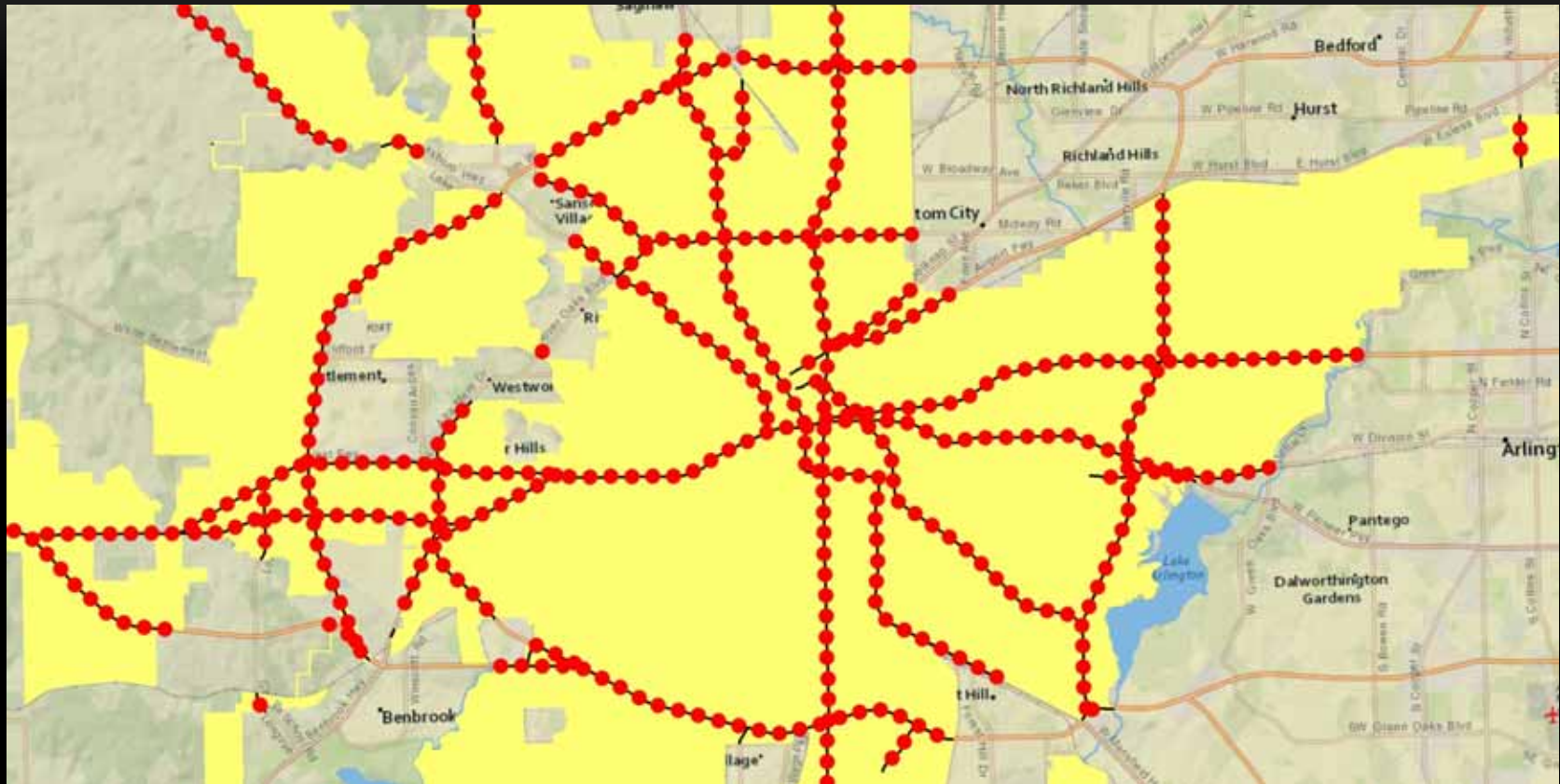


# FORT WORTH STUDY AREA

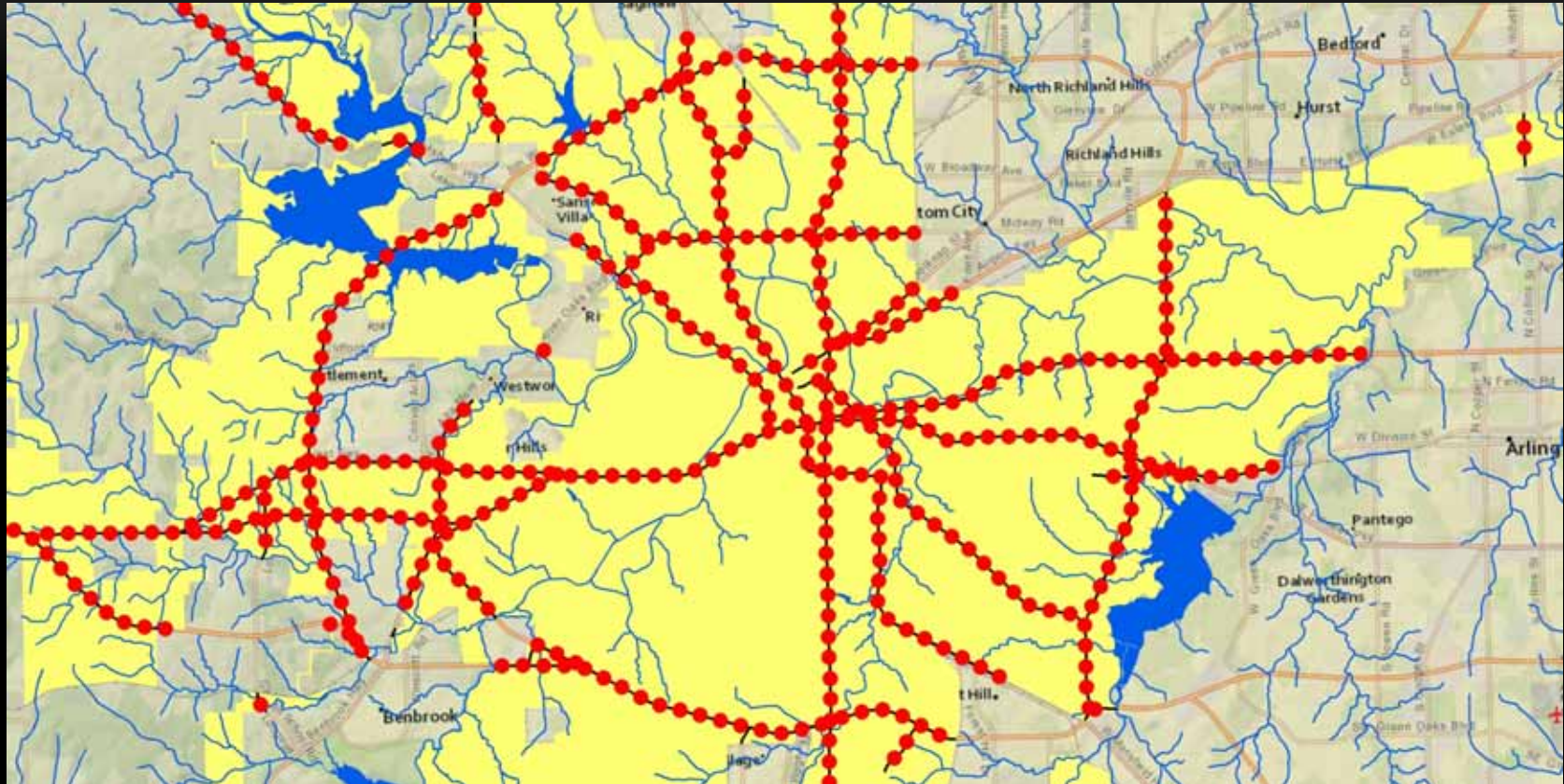
## TXDOT ROADS IN FORT WORTH



# FORT WORTH STUDY AREA FORECAST STREAM CROSSINGS

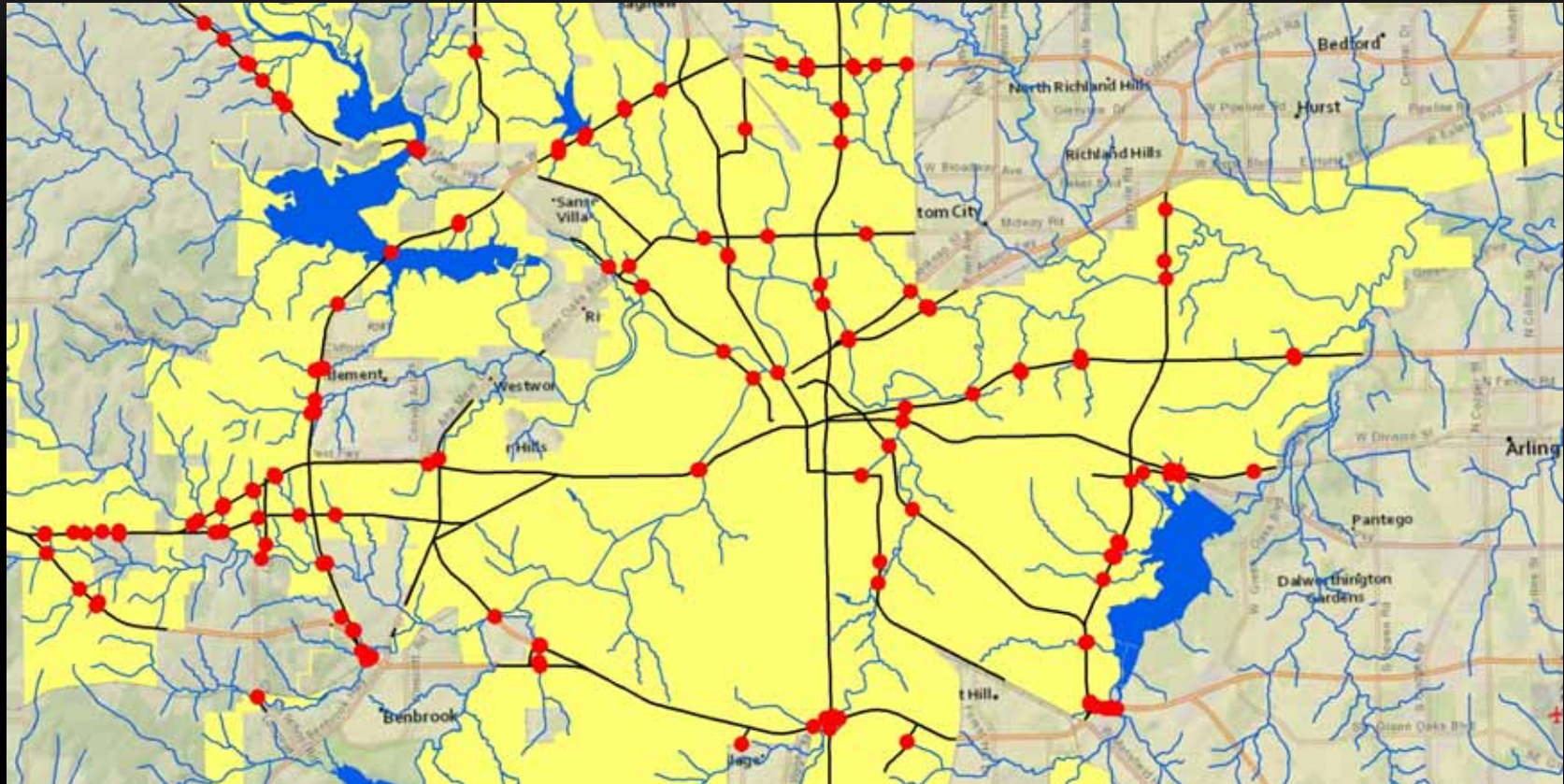


# FORT WORTH STUDY AREA FORECAST CROSSINGS & STREAMS





# FORT WORTH STUDY AREA GIS IDENTIFIED CROSSINGS



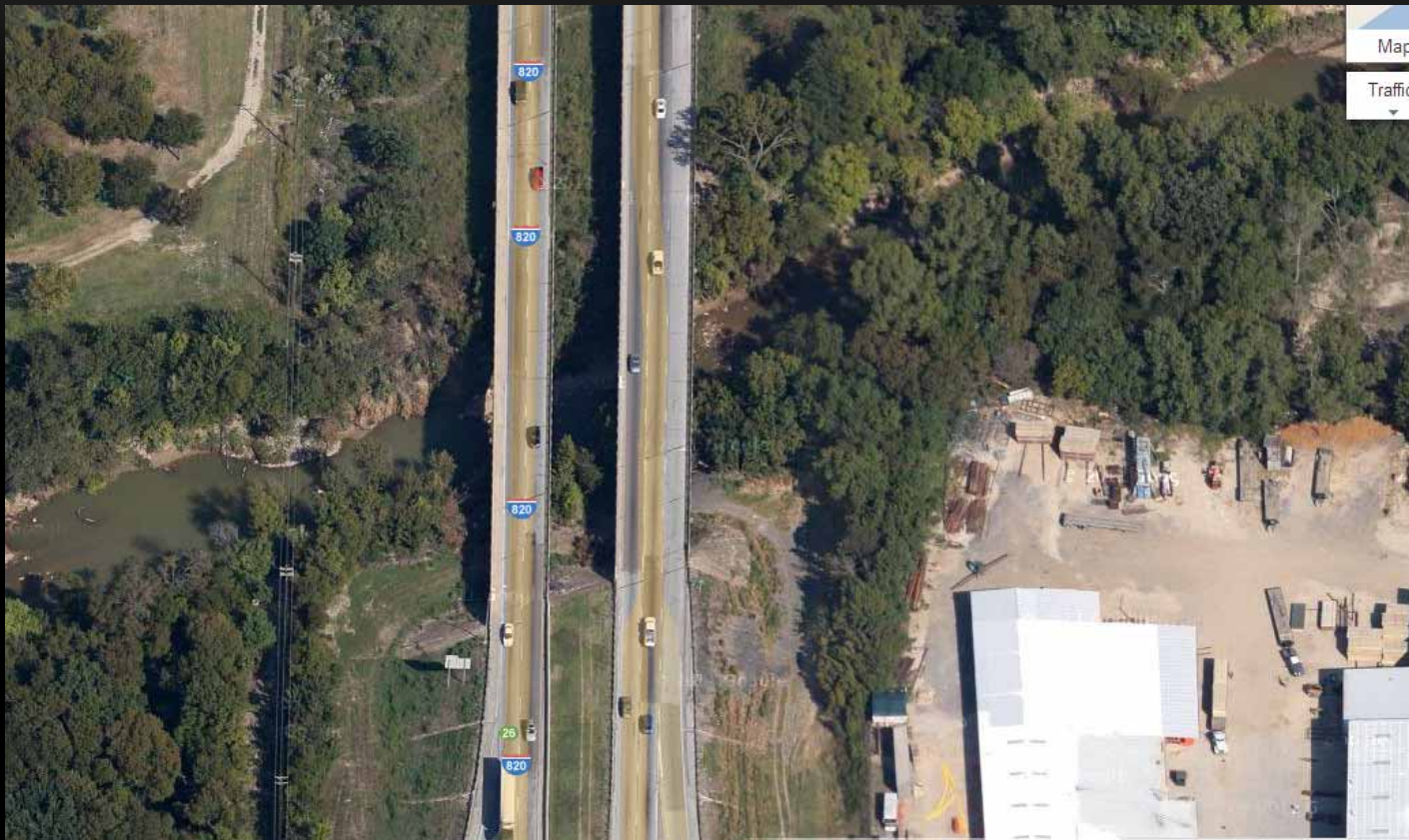
# FORT WORTH STUDY AREA

## NOT ALL CROSSINGS ARE CROSSINGS



# FORT WORTH STUDY AREA

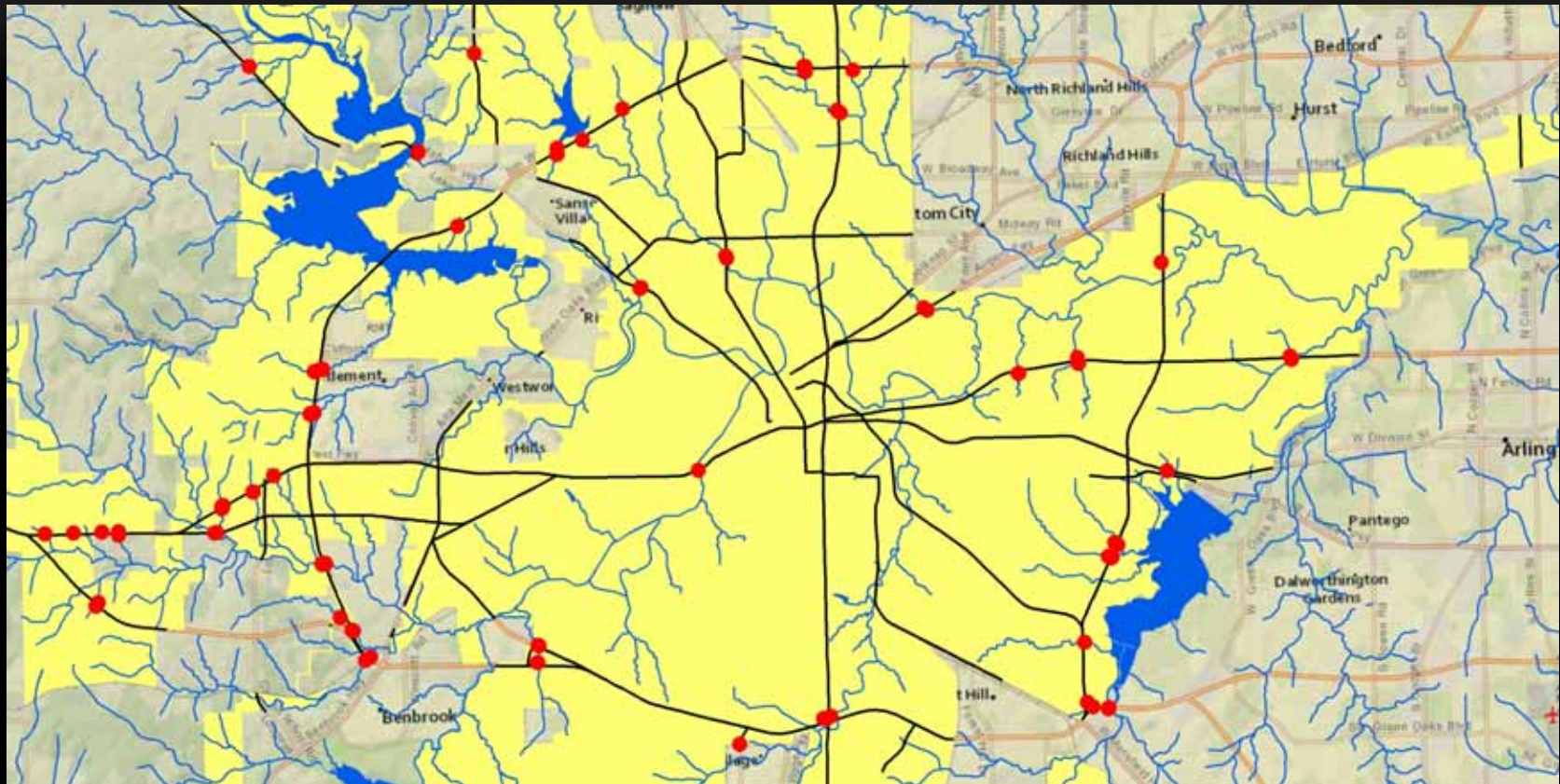
## NOT ALL CROSSINGS HAVE OUTFALLS



# FORT WORTH STUDY AREA NOT ALL CROSSINGS HAVE OUTFALLS



# FORT WORTH STUDY AREA OUTFALL LOCATIONS



# RESULTS

- 559 = Forecast number of crossings
  - 158 = GIS forecast crossings
  - 2,236 = Forecast number of outfalls
  - 155 = Field verified outfalls (55 crossings)
  - 10.5 = Forecast outfalls per mile
  - 0.73 = Field verified outfalls per mile
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- TxDOT model over predicts outfalls  
14 fold!
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# RESULTS

Analysis Zone	TxDOT Roadway Miles	Forecast outfalls	Outfalls identified during field survey	Outfalls Per Mile
Fort Worth	212	2,236	155	0.73
El Paso	200	2,110	108	0.54
Totals	412	4,346	263	0.63

# QUESTIONS?

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