FAST / Report P2B Flood Map Services

TxDOT RTI Project 0-7095-01
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Contents

Introduction

Task 2 of the Flood Assessment System for TxDOT (FAST) comprises four Subtasks: Subtask 2.1 Flood Map Development, Subtask 2.2 Flood Map Delivery, Subtask 2.3 Field Mapping, Subtask 2.4 Flood Emergency Response Exercises.

The TxDOT Project Management Team (TPMT) has instructed the FAST project team to pause effort on Subtasks 2.3 and 2.4 until substantial progress has been made on Subtasks 2.1 and 2.2 dealing with Flood Map Development and Delivery. This report documents progress on those Subtasks

Flood Map Development

The flood maps being produced have three components:

- *Flooded roads* – a web map showing road lines highlighted in red when they are forecast to be inundated;
- *Bridge warnings* – a web map showing bridge points, linked to a graphic showing the water level forecast and visualization of the possibility of impacting the low chord of the bridge;
- *Flood inundation extent* – a web map showing inundation extent around streams and rivers as polygons;

The mechanism and methodology of the bridge warnings has been described extensively in Section 5 of Report TMFY24 Research Update[1] and is not discussed further in this report, which focusses on road flooding and flood inundation extent.

Three Processing Steps

There are three data processing steps needed to produce flood map services, as shown in Figure 1.

1. *Road Elevation Model* – OpenStreetMap lines are combined with LIDAR points to create a Digital Surface Model of the road pavement surface;
2. *Road Flood Maps* – road lines, Digital Surface Model, Digital Elevation Model and a library of Flood Inundation Maps are combined to determine the Height Above Nearest Drainage (HAND) of each road line, and a corrected library of Flood Inundation Maps that allows for the correct road elevation at bridges;
3. *Flood Map Services* – the discharge in each stream reach is converted to a stage height using a stream rating curve, and the appropriate flooded road lines and inundation maps are selected and displayed as web maps.

[1] Flood Assessment System for TxDOT: Update on Research in FY24, Tech. Memo FY24RU1, August 2024. TMFY24RU1Project0_7095_01.pdf

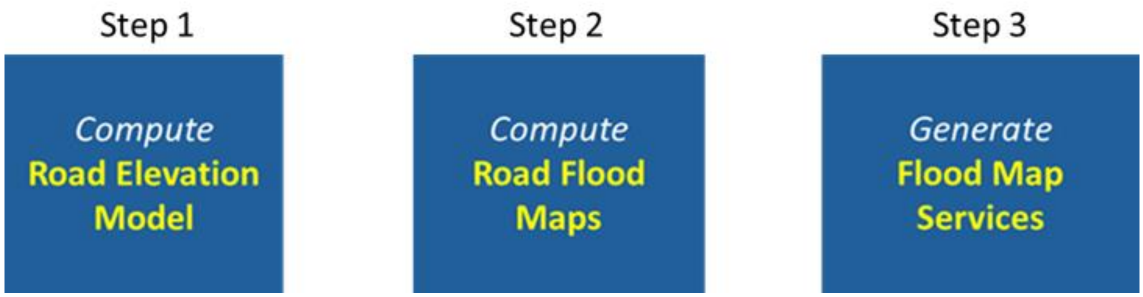


Figure 1. Steps in FAST data processing

Step 1. Road Elevation Model

Inputs for a TxDOT District: OpenStreetMap lines, and all TxGIO LIDAR data collections having some coverage of the District.

Outputs for TxDOT District: LIDAR point clouds within a buffer distance of the OpenStreetMap lines (8 m buffer distance for connector roads, 5m buffer distance for residential roads. Digital Surface Model at 3m resolution for the road LIDAR point cloud zone around the OpenStreetMap line.

Example

An example drawn from the Canyon Maintenance Section of the Amarillo District is used to describe the data processing workflow. Figure 2 shows the intersection of a principal highway, US Highway 60, with Hunsley Rd or FM 3331, which is an overpass. Highway 60 has two frontage roads, Canyon Dr on the Southbound side and Frontage Rd on the Northbound side. Both Highway 60 and FM 3331 cross Palo Duro Creek.

Figure 2. Intersection of FM 3331 and US Highway 60 which cross Palo Duro Creek in Canyon, Texas

Figure 3 shows the bare-earth Digital Elevation Model of this area, as is normally used for floodplain mapping. It is apparent that the bridges on Highway 60 and FM 3331 over Palo Duro Creek have been removed, and also that the overpass of FM 3331 over Highway 60 has been removed. In order to restore the roads over these structures at their correct elevations, the LIDAR points lying within a buffer zone around the OpenStreetMap lines are selected. The buffer width is 5m for residential roads and 8m for connector roads, which makes the standard road width 10m in residential areas and 16m for connector roads. This collection of points is the Road Elevation Model for this set of streets and roads.

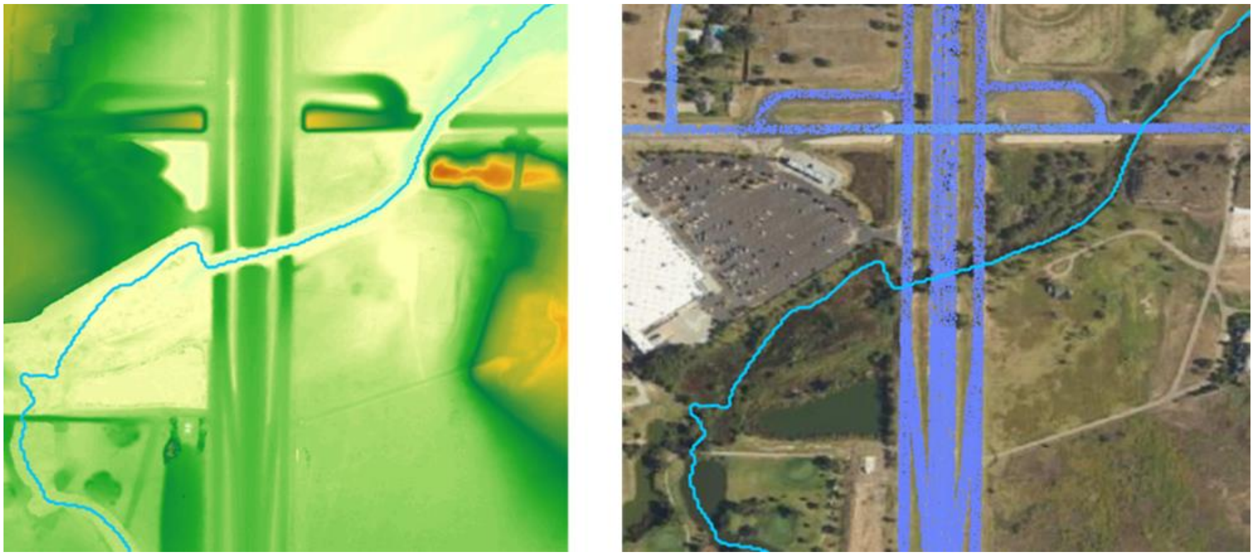


Figure 3. Bare-earth Digital Elevation model and Road Elevation Model as a LIDAR point cloud

Figure 4 shows the LIDAR point cloud interpolated to form a 3m Digital Surface Model of the road surface elevation. Comparing Figures 3 and 4, it can be seen that the bridges have been restored over Palo Duro Creek, and that the FM 3331 overpass over Highway 60 is now at the correct elevation.

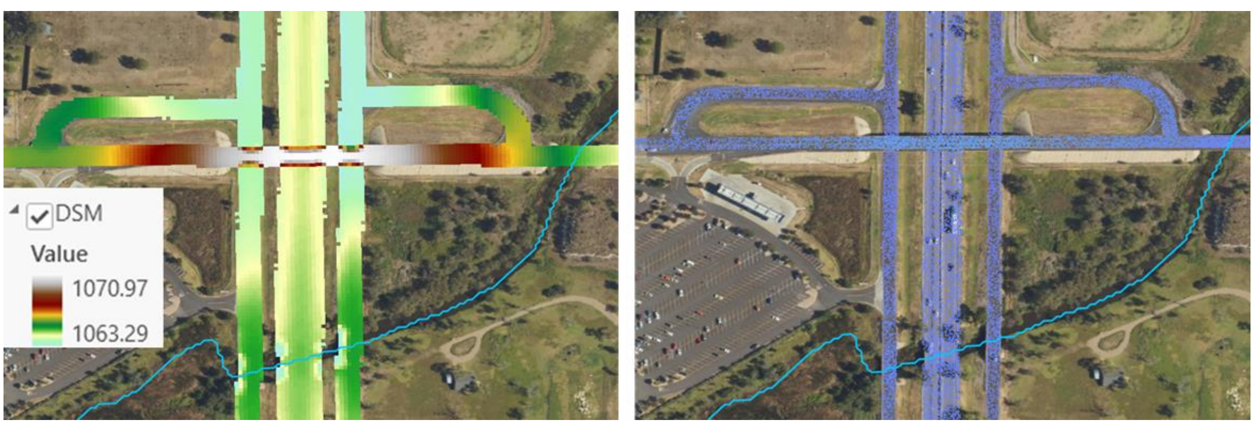


Figure 4. Road Elevation Model as a 3m Digital Surface Model and as a LIDAR point cloud

The Road Elevation Model is stored as a LIDAR point cloud and as a 3m raster with separate datasets for each Maintenance Section of each TxDOT District at: Road Elevation Model data for TxDOT districts The Road Elevation Models were computed by Maintenance Section because of the size of each file and the amount of computation involved in developing it. They were first produced as LIDAR point cloud files and then converted to Digital Surface Models (DSMs) with 3m cell spacing, consistent with the HAND raster used for flood inundation mapping. It is straightforward in GIS to mosaic the Digital Surface

Models for each Maintenance Section into a Digital Surface Model for the District. All subsequent steps in the data processing sequence were done for each District as a whole.

Progress to Date

Between 9 May and 29 May 2025, Road Elevation Models were computed for 199 Maintenance Section Areas in 18 TxDOT Districts, covering a total of 346,619 miles of roads, as shown in Figures 5 and 6. The Amarillo, Atlanta and Tyler Districts had been processed prior to May 9, but some imperfections were found in the alignment of the road line work and the Digital Surface Models produced from them, so corrections were made to the processing method and those three Districts were processed again. Five of the six Metropolitan Districts have been processed: Austin, Dallas, Fort Worth, Houston, and San Antonio. Metropolitan Districs are those with more than 1 million in population. The Pharr District is the only Metropolitan District that remains to be completed. There wasn't any special difficulty in dealing with the Metropolitan Districts other than the large number of road miles involved, which was maximized at 37,489 miles in the Houston District. This increased the processing time to complete the District.

The total road length in the TxDOT Roadway Inventory is 347,113 miles, so it can be said that a length of OpenStreetMap roads equivalent to the state-wide TxDOT Roadway Inventory, both On-System and Off-System, has been processed. For comparison, the RIVAL project which provides vehicle-based LIDAR coverage of the principal road system of the state, covers about 100,000 miles of roads. The total length of OpenStreetMap roads for the state is 469,087 miles, so about three-quarters of the total road length has now been processed.

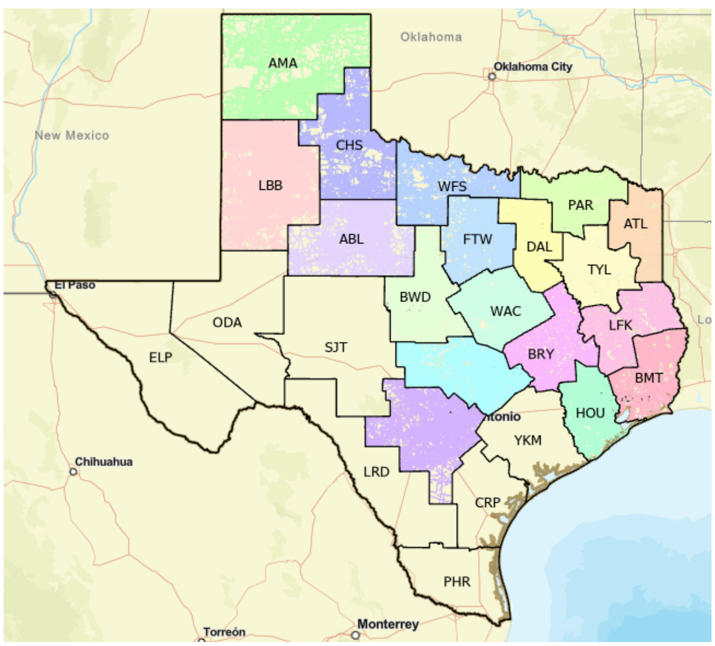
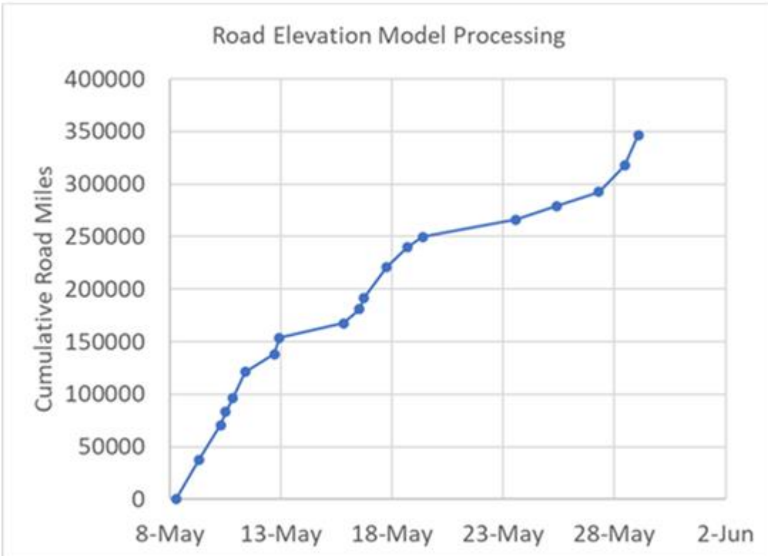


Figure 5. TxDOT Districts with completed Road Elevation Models as of 30 May 2025.



Date	Name	Length Miles
5/9/2025	Houston	37489
5/10/2025	Dallas	33226
5/10/2025	Paris	12572
5/10/2025	Wichita Falls	13471
5/11/2025	Fort Worth	24387
5/12/2025	Abilene	17097
5/12/2025	Childress	15229
5/15/2025	Tyler	14078
5/16/2025	Beaumont	13292
5/16/2025	Lufkin	11055
5/17/2025	Lubbock	29355
5/18/2025	Amarillo	18568
5/19/2025	Atlanta	10092
5/23/2025	Waco	16222
5/25/2025	Brownwood	13053
5/27/2025	Bryan	13291
5/28/2025	Austin	25046
5/29/2025	San Antonio	29094
	Total	**346619**

Figure 6. Time line for Road Elevation Model processing in TxDOT Districts.

Step 2. Road Flood Maps

Inputs for a TxDOT District: Digital Surface Model for roads (3m raster), bare-earth Digital Elevation Model (3m raster), Height Above Nearest Drainage (HAND) (3m raster), OpenStreetMap lines with a single feature for each intersection to intersection, Flood Inundation Map polygons at 1-foot elevations of stage-height, rating curves relating discharge to stage height for each stream reach. The present HAND flood inundation mapping at 1-foot increments was produced in a previous project funded by TDEM at a cost of several hundred thousand dollars. Recomputing these maps at a six-inch interval by the same process used earlier will be even more expensive because of doubling the number of maps being produced. Hence, although the Flood Decision Support Toolbox uses six-inch increments for its flood maps, the 1-foot interval has been retained for FAST.

Outputs for a TxDOT District: Healed HAND raster reflecting correct road elevations when the road passes over a bridge, corrected and trimmed Flood Inundation Map polygons, a threshold discharge for each road line for it to be inundated. At the request of the TxDOT Project Management Team, the flood map output shows only the extent of the road flooding within the flood inundation polygon.

Example

The next step in the process is to assess the vulnerability of the road system to flooding. This is done using the Height Above Nearest Drainage, as shown in Figure 7. The state of Texas has an area of 696,241 km^2, and a mesh of cells of size 3m is laid over the state, so the state encompasses about 77 billion of these cells. For each cell on the landscape, the flow path is traced to the nearest stream channel, and the vertical difference noted between the point of origin (P_1) and the point where the drainage path reaches the stream (P_2) is noted. In the example shown, P_1 has elevation 1069.54m and P_2 has elevation 1061.44m, so the Height Above Nearest Drainage (HAND) of point P_1 = 1069.54 – 1061.44

= 8.10m. This HAND value is computed for all 77 billion surface terrain points in the state to the location where the drainage from that point reaches the nearest stream.

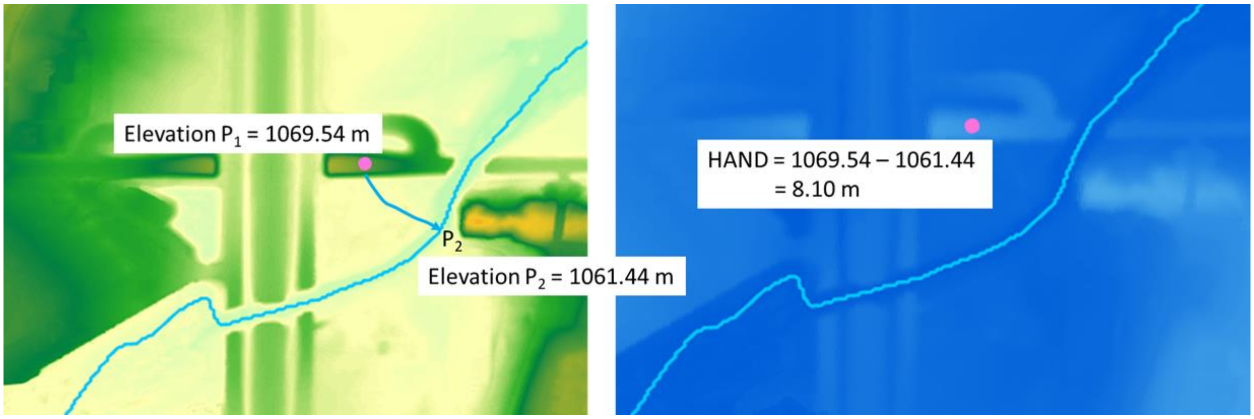


Figure 7. Height Above Nearest Drainage for a point on FM 3331

Point P_1 is on the approach to the overpass of FM 3331 going over Highway 60 and is elevated above Palo Duro Creek, but it is apparent by inspection that the omission of the bridges in the bare-earth Digital Elevation Model means that the HAND values at the bridge locations are close to zero. In order to correct this deficiency, a "Healed HAND" raster is computed using Equation (1) and illustrated in Figure 8.

Healed HAND = Original HAND + Digital Surface Model – Digital Elevation Model (1)

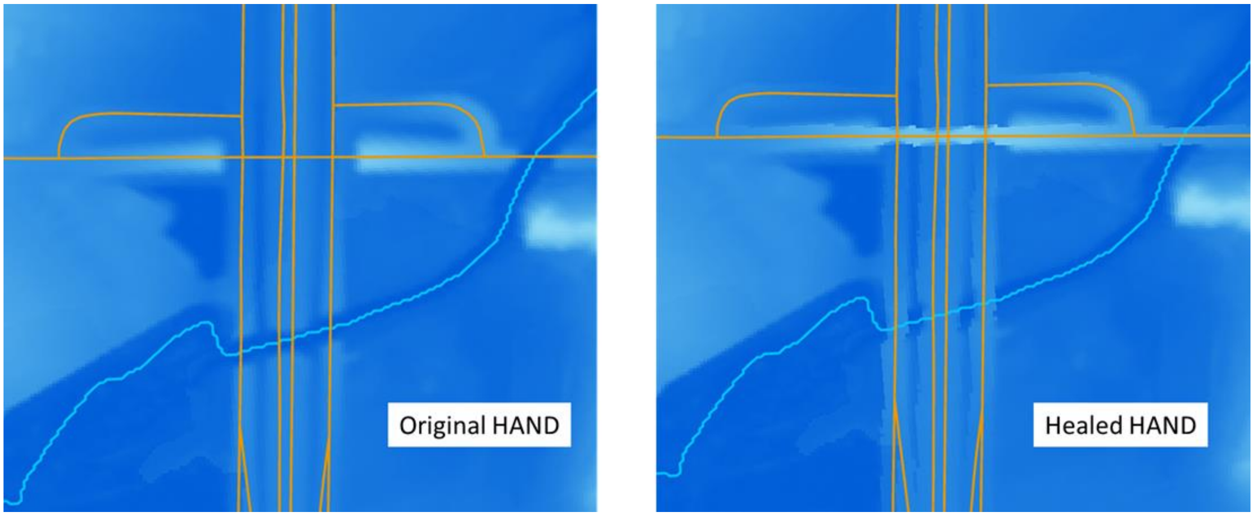


Figure 8 Healing the Height Above Nearest Drainage for Missing Bridge Structures

What this means is that everywhere that bridge structures were removed in the bare-earth Digital Elevation Model, an increment is added to the HAND value which is the difference in elevation between the Digital Surface Model and the Digital Elevation Model. By comparing the left and right sides of Figure 8, it can be seen that Highway 60 and FM 3331 no longer slump into Palo Duro Creek when they cross it, and that the correct elevation of the overpass of FM 3331 over Highway 60 has been restored.

This Healed HAND raster is used to adjust a library of precomputed Flood Inundation Maps whose contour lines shown in Figure 9 represent inundation extent for 1-foot increments of stage height in the

Palo Duro Creek. For a given discharge, a rating curve is used to convert discharge to stage height and select the appropriate inundation extent, shown in blue in Figure 9.

Figure 9. Flood inundation mapping for Palo Duro Creek

The final step in these computations is that road network is clipped by the extent of the inundation polygons and the inundated roads are highlight in red in Figure 10. It may be noted that both the main lanes of Highway 60 are flood free while both of the frontage roads are inundated. FM 3331 is flood free over the length of highway illustrated.

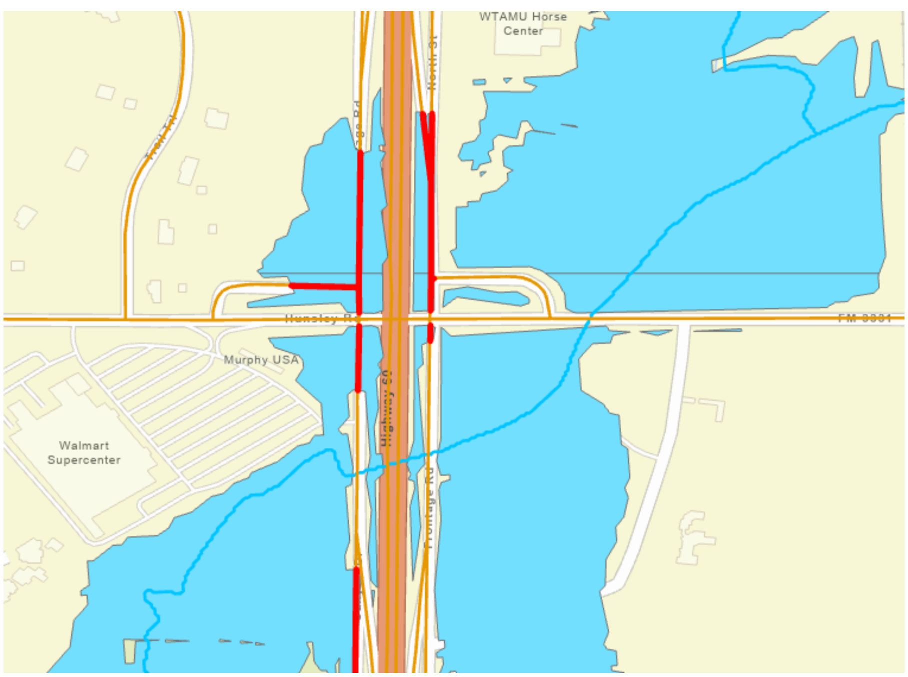


Figure 10. Flooded roads map with red lines showing inundated roads.

Progress to Date

Road flood maps for 14 Districts have been created as of 30 May, as shown in Figure 11. The input flood inundation polygon data needed to complete the Lufkin and Beaumont Districts was recently received and those two Districts will be completed shortly. The total length of rivers for which road flood maps have been processed is 88,352 miles.

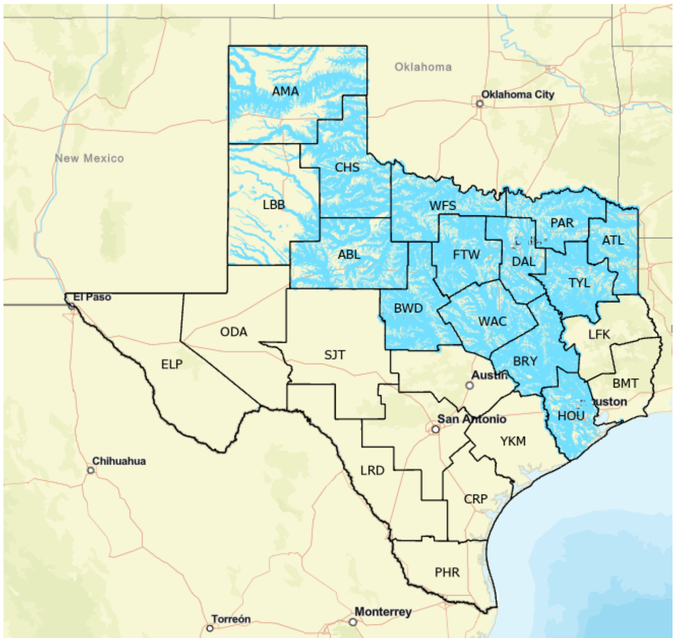


Figure 11. Progress with Flood Inundation Map development

Step 3. Flood Map Services

Inputs for a TxDOT District: Bridge points, flooded road lines, flood inundation polygons stored in a relational database. A set of discharge values one for each stream reach, either fixed values (a Static map), or forecast values (a dynamic map)

Outputs for a TxDOT District: GeoJSON files for web display of the resulting bridge warnings, flooded road segments and inundation map polygons.

Example

Flood map services have been developed for the Amarillo District. This map contains a static flood inundation extent drawn on 8700 miles of streams and rivers, and identifies flooded road segments shown in red on 18,600 miles of roads. It may be noted that while the Amarillo District is only one of 25 TxDOT Districts, its land area is twice as large as the state of New Jersey! An example of the web display is shown in Figure 12.

The listing of the GeoJSON output files for the Amarillo District is shown in Figure 13. These were computed with a single discharge value of 4200 cfs applied to every reach. This is too much flow for upstream reaches, but the point of the static map is to determine the computation time needed to generate the web map files for this District, which turned out to be 2 ½ minutes. This is sufficiently small that it can be achieved repeatedly in a forecasting system with hourly updates.

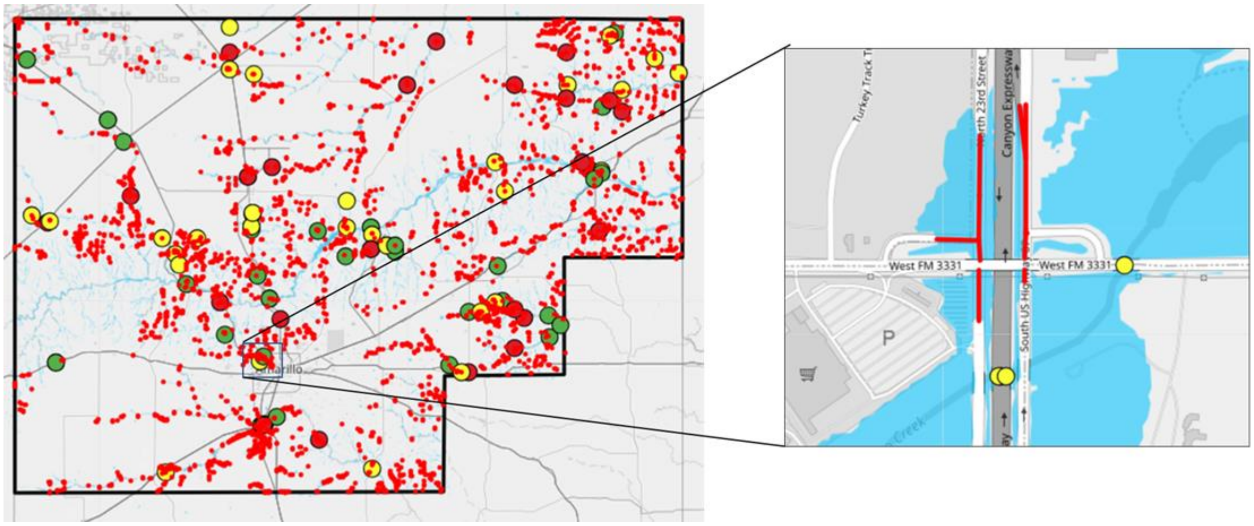


Figure 12. Flood mapping and bridge warnings in the Amarillo District

Static Data Layers (Entire AMA District)

https://fast-ama-static-hand.s3.us-east-1.amazonaws.com/bridge_warning_pnts.geojson Copy

https://fast-ama-static-hand.s3.us-east-1.amazonaws.com/flood_road_nav_ln.geojson Copy

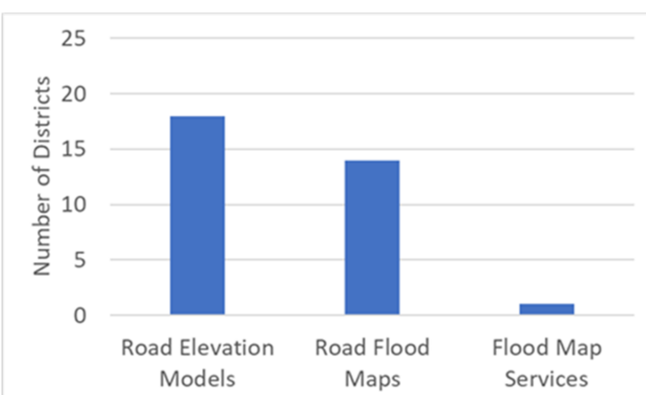
https://fast-ama-static-hand.s3.us-east-1.amazonaws.com/flood_road_trim_ln.geojson Copy

https://fast-ama-static-hand.s3.us-east-1.amazonaws.com/flood_ar.geojson Copy

Figure 13. GeoJSON output files for the Amarillo District.

Progress to Date

As of 30 May 2025, Road Elevation Models have been computed for 18 Districts, Road Flood Maps for 14 Districts, and Flood Map Services for one District.



1. Road Elevation Models	Abilene, Amarillo, Atlanta, Austin, Bryan, Beaumont, Brownwood, Childress, Dallas, Fort Worth, Houston, Lubbock, Lufkin, Paris, San Antonio, Tyler, Waco, Wichita Falls
2. Road Flood Maps	Abilene, Amarillo, Atlanta, Brownwood, Bryan, Childress, Dallas, Fort Worth, Houston, Lubbock, Paris, Tyler, Waco, Wichita Falls
3. Flood Map Services	Amarillo

Figure 14. FAST data processing progress as of 30 May 2025.

Flood Map Delivery

The University of Texas has developed a prototype system for identifying transportation and bridges impacted by river flooding. The system is currently configured to ingest real-time, continuously updated hydrologic forecast data from the National Water Model (NWM) [https://water.noaa.gov/about/nwm]. It processes the short-range (18 hour) forecast to generate and disseminate geospatial flood impact warnings in GeoJSON format. This portion of the report defines the schema specifications for the GeoJSON layers produced by the system.

Data Derivation

Every hour, short-range streamflow forecasts are retrieved from the National Water Model repository. These forecasts are ingested into a database, where automated calculations identify which bridges and roads are likely to flood within the next 18 hours. The results are then continuously written to GeoJSON files, which are updated on a public file server for access by applications such as ArcGIS, QGIS, and web platforms.

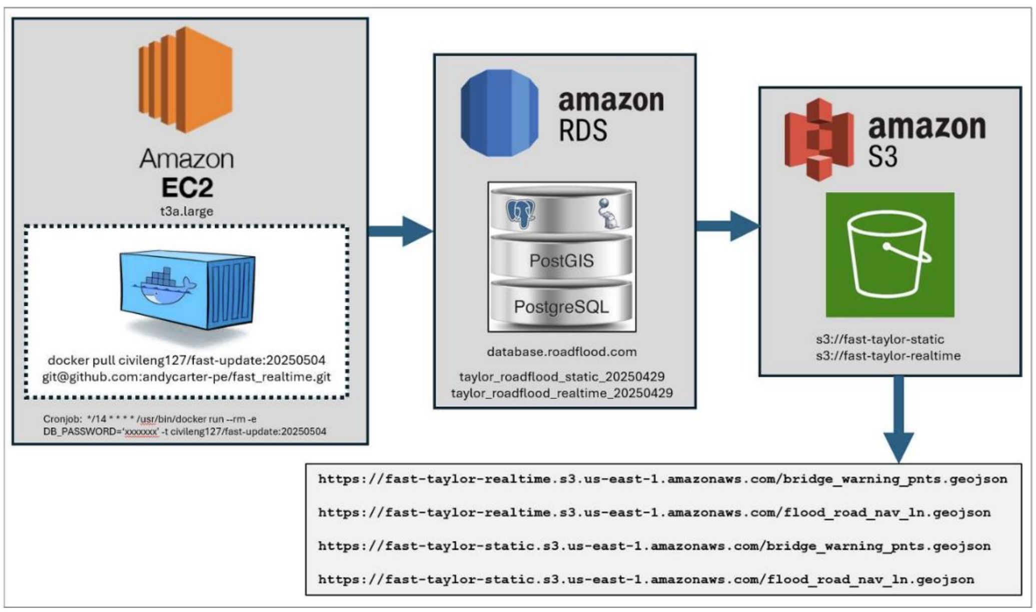


Figure 15. FAST Real-time data flow

Data Configurations

A "real-time" operational pilot of the FAST system was deployed for the HUC-12 watershed 120702050405, which encompasses the city of Taylor, Texas. This documentation includes two versions of the FAST pilot layers. The first set comprises the "real-time" layers, which are based on the latest streamflow forecasts from the National Water Model (NWM). These forecasts typically lag behind the actual time by approximately two to three hours. For example, if the current time is 10:30 AM, the most recent forecast data may be from 8:00 AM. This delay is referred to as the "simulation age."

Due to the relatively small size of the pilot area (around 55 square miles), in the absence of forecasted rainfall, the real-time data may not include any bridge or road flood warnings. To address this and provide a consistent demonstration, the University of Texas has also produced a "static" version of the FAST layers. In this version, a peak streamflow of 4,200 cubic feet per second is uniformly applied to all forecasted streams in the watershed. These static layers are intended to illustrate the expected data structure and outputs during a flooding event.

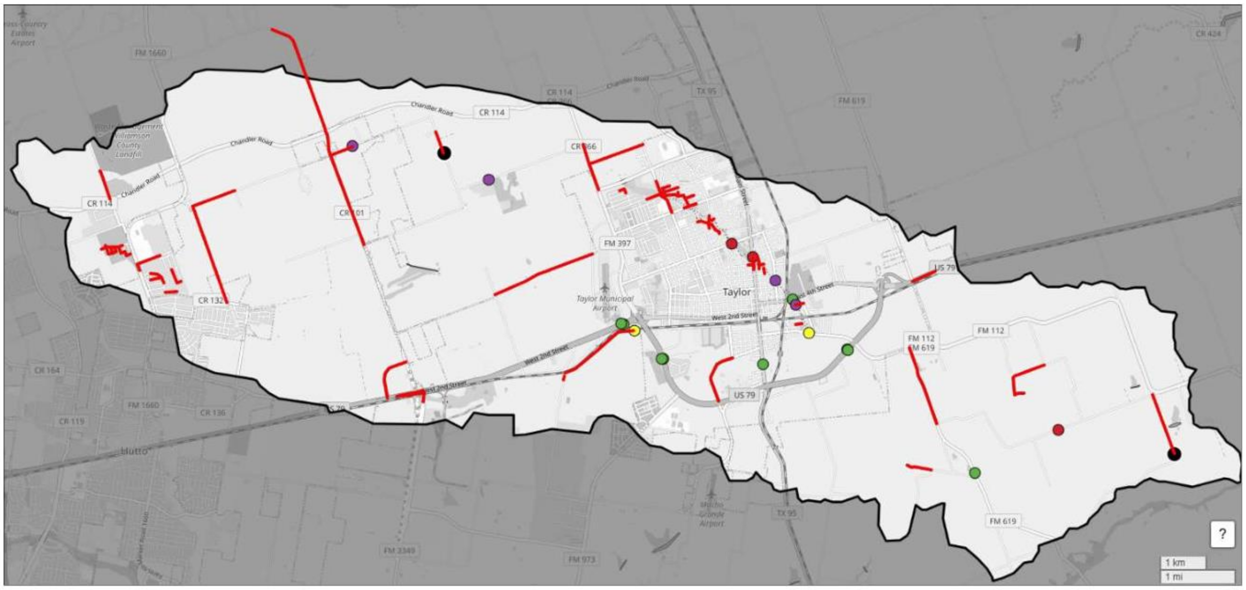


Figure 16. FAST 'Static' – 'bridge_warning_pnts ' and 'flood_road_nav_ln' for Taylor pilot area

Forecast Window

Both the bridge warnings and flooded road lines represent the most severe flooding anticipated within the current 18-hour forecast window. As new forecasts are issued each hour, these warning layers are updated to reflect the most extreme flooding expected in an updated and advanced forecast period.

Bridge Warning Points

https://fast-taylor-realtime.s3.us-east-1.amazonaws.com/bridge_warning_pnts.geojson
https://fast-taylor-static.s3.us-east-1.amazonaws.com/bridge_warning_pnts.geojson

Example Snippet


```
{
      "id": "1",
      "type": "Feature",
      "properties": {
        "warn_class": "low",
        "BRDG_ID": “142460020403068”,
        "name": "West 2nd Street",
        "ref": "US 79",
        "nhd_name": "Mustang Creek",
        "min_dist_to_low_ch": 5.7,
        "model_run_time": "2025-05-13T10:00:00",
        "url": "https://bridges.txdot.kisters.cloud/xs/?uuid=14ea623d-57d2-4c56-90c1-
51a34ab3311d&list_wse=4.6,5.4,6.0,6.6,7.1,7.6,10.2,7.8,7.1,6.4,5.5,4.4,0.0,0.0,0.0,0.0,0.0,0.0&first_utc_time=2025-05-
13T10:00:00"
      },
      "geometry": {
        "type": "Point",
        "coordinates": [
          -97.43956782999999,
          30.566820500000063
        ]
      }
```


Figure 17. Sample Bridge Warning GeoJSON

Projection

EPSG:4326 , WGS 84 datum (World Geodetic System 1984). This is the default coordinate reference system for GeoJSON.

Data Schema

Attribute Name	Type	Description	Example
warn_class	string	warning classification level (see additional detail below)	"low"
BRDG_ID	string	National Bridge Inventory (NBI) identifier	"142460020403068"
name	string	name of OpenStreetMap road over bridge	"West 2nd Street"
ref	string	route reference name of OpenStreetMap road over bridge	"US 79"
nhd_name	string	Name of the stream from the National Hydrography Dataset (NHD)	"Mustang Creek"
min_dist_to_low_ch	real	Minimum distance from bridge low chord to highest predicted water surface elevation in feet	5.7
model_run_time	string	ISO 8601 timestamp of National Water Model simulated flows (in UTC - Coordinated Universal Time)	"2025-05-13T10:00:00"
url	string	Link to bridge cross section profile (see additional detail below)	(see below)

Figure 18. 'bridge_warning_pnts' schema

warn_class: The warn_class has a domain of five (5) distinct values that include:

warn_class	description
overtopped	water surface elevation (WSEL) is over the lowest point in the bridge deck
critical	WSEL is less than 0.5 feet from minimum low chord elevation
high	WSEL is between 0.5 and 2 feet from low chord elevation
moderate	WSEL is between 2.0and 5 feet from low chord elevation
low	WSEL is greater than 5 feet from low chord elevation

url: The constructed url provides a link to the bridge cross section viewer that includes the forecasted water surface. This url includes:

1. a unique identifier bridge [14ea623d-57d2-4c56-90c1 51a34ab3311d]
2. a unique a list of computed depths for the 18 hour forecast window [4.6,5.4,6.0,6.6,7.1,7.6,10.2,7.8,7.1,6.4,5.5,4.4,0.0,0.0,0.0,0.0,0.0,0.0]
3. the first time step of the forecasted data [2025-05-13T10:00:00]

https://bridges.txdot.kisters.cloud/xs/?uuid=14ea623d-57d2-4c56-90c151a34ab3311d&list_wse=4.6,5.4,6.0,6.6,7.1,7.6,10.2,7.8,7.1,6.4,5.5,4.4,0.0,0.0,0.0,0.0,0.0,0.0&first_utc_time=2

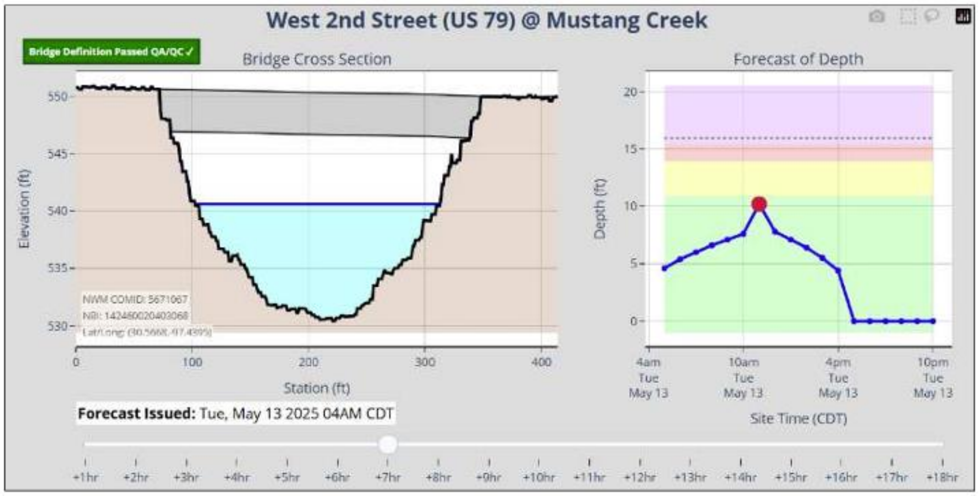


Figure 19. Sample bridge cross section view from 'url'

Recommended Symbology

It is recommended that the points be symbolized by 'warn_class'. To roughly match the color scheme in the cross-section plots, the following colors are suggested.

warn_class	hex color
overtopped	#000000
critical	#954aa2
high	#db1e2a
moderate	#faff39
low	#54b04a

Figure 20. 'bridge_warning_pnts' recommended colors

The TxDOT Project Management Team recommends using a colorblind friendly color scheme and the FAST project team will investigate this.

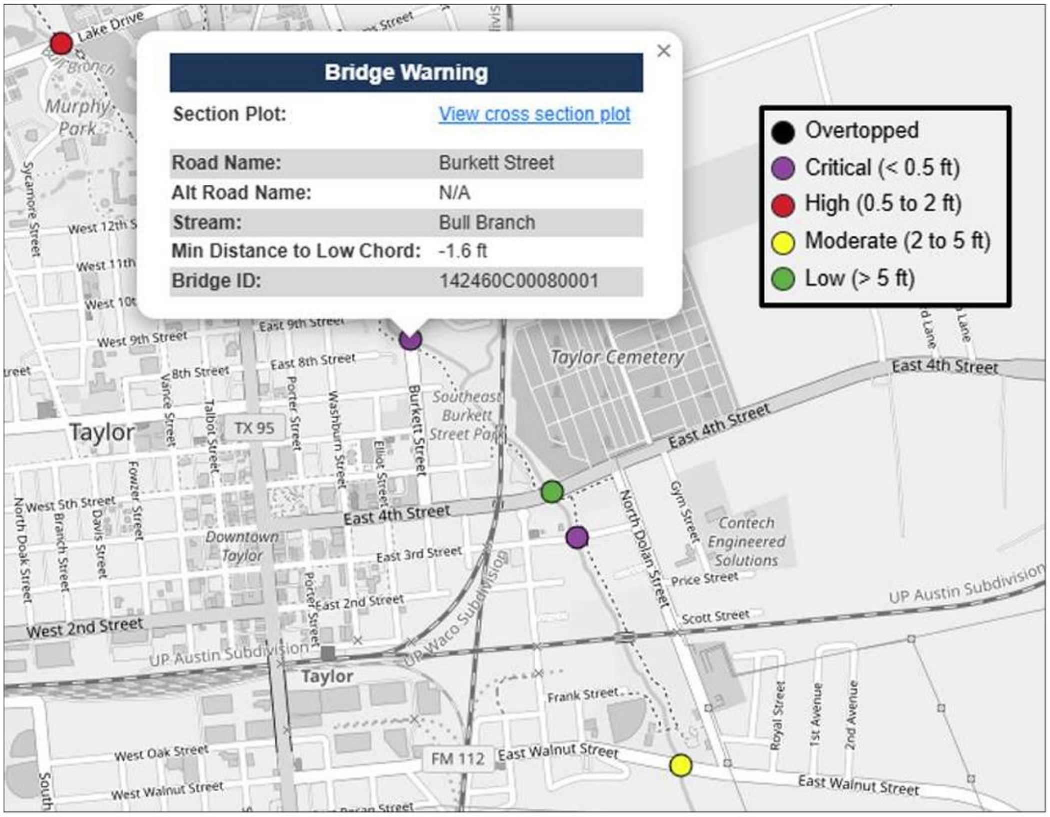


Figure 21. Sample view of 'bridge_warning_pnts' layer

Flooded Roads

https://fast-taylor-realtime.s3.us-east-1.amazonaws.com/flood_road_nav_ln.geojson
https://fast-taylor-static.s3.us-east-1.amazonaws.com/flood_road_nav_ln.geojson

Example Snippet


```
{
  "id": "13",
  "type": "Feature",
  "properties": {
    "name": "West 2nd Street",
    "ref": "US 79",
    "fclass": "trunk",
    "model_run_time": "2025-05-10T00:00:00"
  },
  "geometry": {
    "type": "MultiLineString",
    "coordinates": [
      [
        [
          -97.48320619999998,
          30.554126800000063
        ],
        [
          -97.48463109999994,
          30.553877900000032
        ],
        [
          -97.48905099999996,
          30.553120900000067
        ]
      ]
    ]
  }
}
```


Figure 22. Sample Navigation Flooded Road Lines GeoJSON

Projection

EPSG:4326 , WGS 84 datum (World Geodetic System 1984). This is the default coordinate reference system for GeoJSON.

Data Schema

Attribute Name	Type	Description	Example
name	string	OpenStreetMap road name	"West 2nd Street"
ref	string	route reference name of OpenStreetMap road	"US 79"
fclass	string	OpenStreetMap road classification	"trunk"
model_run_time	string	ISO 8601 timestamp of National Water Model simulated flows (in UTC - Coordinated Universal Time)	"2025-05-13T10:00:00"

Figure 23. 'flood_road_nav_ln' schema

fclass: Expected fclass values = [motorway, motorway_link, primary, primary_link, residential, secondary, secondary_link, tertiary, tertiary_link, trunk, trunk_link, unclassified]

"Fclass" stands for functional class, a way to categorize roads based on their role in the transportation network. In OpenStreetMap (OSM), this classification reflects how important a road is — from highways to local streets. The terminology used in fclass follows European naming conventions, which may differ from the standard terms used in the United States. For example, a street labeled as fclass = primary in OSM might correspond to a state highway in the U.S., while fclass = trunk could represent a major U.S. route that's not fully limited access like an interstate.

Navigational Links

The flooded roads GeoJSON provided in the links represents "navigation links"—road segments derived from OpenStreetMap that have been split at intersections with other roads. These segments are used to flag locations where flooding may occur along any portion of the segment within an 18-hour short-range forecast window. Importantly, this does not indicate that the entire length of the road segment is expected to flood—only that flooding is anticipated somewhere along it. The final FAST product will show flooded roads to the extent of mapped flood inundation.

Recommended Symbology
Road segments are recommended to be shown as thick red lines. If necessary, they can be grouped by 'fclass'.

Figure 24. Sample view of 'flood_road_nav_ln' layer

Limitations and Considerations for ArcGIS Online

ArcGIS Online (AGOL) does not support empty GeoJSON files. If such a file is uploaded or referenced, AGOL may reject it or display nothing—often without a clear error message. To ensure compatibility, GeoJSON files must contain at least one valid feature, even if it's just a placeholder. To address this limitation, both layers include accommodations.

For the "bridge_warning_pnts" layer, if no bridge points are found, a dummy feature is added. This placeholder point uses a **'BRDG_ID' of -1** to indicate that it's not a real feature.


```
{
  "type": "FeatureCollection",
  "features": [
    {
      "id": "0",
      "type": "Feature",
      "properties": {
        "warn_class": "low",
        "BRDG_ID": -1,
        "name": "This placeholder when there is no flooding that allows AGOL to still load the layer",
        "ref": "",
        "nhd_name": "",
        "min_dist_to_low_ch": 100,
        "model_run_time": "2025-05-13T20:00:00",
        "url": ""
      },
      "geometry": {
        "type": "Point",
        "coordinates": [
          -97.793186,
          30.547194
        ]
      }
    }
  ]
}
```


Figure 25. 'bridge_warning_pnts' when no warning points found

For the "flood_road_nav_ln" layer, if no features are determined to flood, a single dummy line is created. This feature has a 'fclass' of 'unknown' to indicate that it is not a real feature

```
{
  "type": "FeatureCollection",
  "features": [
    {
      "id": "0",
      "type": "Feature",
      "properties": {
        "name": "This placeholder when there is no flooding that allows AGOL to still load the layer",
        "ref": "",
        "fclass": "unknown",
        "model_run_time": "2025-05-13T20:00:00"
      },
      "geometry": {
        "type": "MultiLineString",
        "coordinates": [
          [
            [
              -97.793186,
              30.547194
            ],
            [
              -97.7892304,
              30.5487087
            ]
          ]
        ]
      }
    }
  ]
}
```

Figure 28. 'flood_road_nav_ln' when no flooded roads found

Conclusion

The data processing workflow of the Flood Assessment System for TxDOT (FAST) has three steps: Road Elevation Models, Road Flood Maps, and Flood Map Services. A production process has been defined for the first two of these steps, and as of 30 May 2025, Road Flood Elevation Models have been computed for 18 Districts, encompassing about 350,000 miles of roads, and covering five of the six Metropolitan Districts (Austin, Dallas, Fort Worth, Houston and San Antonio). Data to support Road Flood Maps have been produced for 14 of the Districts for which Road Elevation Models are available, covering about 90,000 miles of rivers. About three quarters of the Road Elevation Models, and a little more than half the Road Flood Map data have been compiled so far.

A prototype Flood Map Services system has been set up for the Mustang Creek HUC8 watershed near Taylor Texas, and its outputs have been tested and adjusted with guidance from the TxDOT Project Management Committee. The methodology for Flood Map Services has been scaled to the District level for the Amarillo District, and all map products are available as web maps for a static discharge. It was found during this scaling out process to District level that the resulting computation can be performed in a reasonable time such that these maps could be updated on an hourly cycle in real-time.

The work remaining to be done to complete the state-wide FAST system is to compute the remaining Road Elevation Models and Road Flood Maps, and to create a production process for the Flood Map Services in each District. It is anticipated that these tasks can be completed in Quarter 4 of FY25, by August 2025. It should be noted that the system thus created could be called the "Base System" and it will then need a significant amount of quality control checking and improvement to eliminate known shortcomings. It is anticipated that this checking and improvement can be completed in FY26, by August 2026. That will leave five months in the project, September 2026 to January 2027 for final FAST system polishing and preparing the final project report.