AQRP Monthly Technical Report

PROJECT TITLE	Integrated Airborne-Mobile Ground Observations and Inventory for Enhanced VOC Source Attribution and Ozone Precursor Mapping in Texas	**PROJECT #**	26-029
PROJECT PARTICIPANTS	Pawel Misztal, Lea Hildebrandt Ruiz, Yue Zhang, Nathan Malarich, Munkhbayar Baasandorj	**DATE SUBMITTED**	06/10/2026
REPORTING PERIOD	**From:** 5/11/2026 **To:** 6/10/2026	**REPORT #**	2

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task for reporting period

Task 1: The TexAQS 2026 mobile field campaign launched on schedule. The team completed the first week of measurements in the Dallas–Fort Worth (DFW) metropolitan area from May 29 to June 4, 2026, and is currently in the second week of the campaign in Houston (June 6 – June 10, ongoing). Measurements in San Antonio and Austin will begin on Friday, June 12, 2026.

Dallas–Fort Worth (May 29 – June 4, 2026). The team completed a seven-day mobile measurement deployment in the DFW area, with each mobile platform covering 10 planned routes. A temporary base location supported overnight charging, instrument checks, data backup, and daily route preparation. En route from Austin to Dallas on May 29, the team also fingerprinted industrial facilities in the Waxahachie area. The primary field activity coordinated mobile sampling with the TAMU team, in which the UT and TAMU mobile platforms sampled the same route while driving in opposite directions. This paired route design was intended to improve spatial coverage, support cross-platform comparison, capture upwind and downwind gradients, and evaluate the repeatability of VOC and trace gas observations along the selected corridors. The mobile routes targeted source-relevant environments including data center and airport areas. The team also conducted co-sampling with TAMU near the location where the NOAA P-3 performed upwind spiral profiles, providing an opportunity to compare mobile ground-based observations with aircraft-supported regional measurements. In addition, the team visited a TCEQ monitoring station and conducted co-location sampling to compare the mobile measurements with fixed-site monitoring observations.

Figures 1 and 2 show the cumulative GPS density of completed driving routes in DFW and Houston, respectively, along with the corresponding NOAA aircraft spiral sites. Figures 3 and 4 summarize the daily timelines and hourly sampling distribution across the two cities. The team continues to follow the planning approach described in the approved Work Plan, with at least 20 repeats of the tracks in each metropolitan region (10 per mobile lab) and two approximately 3-hour drives per day. Industrial sources, waste management sources, and data centers remain the focal sources, in addition to airport areas in DFW and the ship channel corridor in Houston. CAMS

auto-GC and VOC canister locations have been used as collocation opportunities throughout the campaign.

The campaign schedule remains available at the following link. The first drive coincided with the first NOAA research flight in Dallas on May 30. Two research flights in Dallas overlapped with mobile labs. Houston driving is currently underway during the second week, with San Antonio and Austin to follow on Friday, June 12. Stationary measurements continue in Houston throughout the campaign, led by Yue Zhang, James Flynn, and NOAA through a ground supersite with 20+ instruments, including 4 mass spectrometers to provide comprehensive quantification of both gas and particle phase species. The UT HR-ToF-AMS and UT Picarro HCHO/CH4 instruments are deployed at the supersite as part of this project. Other ground data may be shared with TCEQ and the mobile measurement team upon request with the supersite PI. Collocated drives are also being conducted with the TCEQ mobile lab team. The UT van is also sampling at the Pleasantville community location to provide upwind/downwind comparison with the supersite.

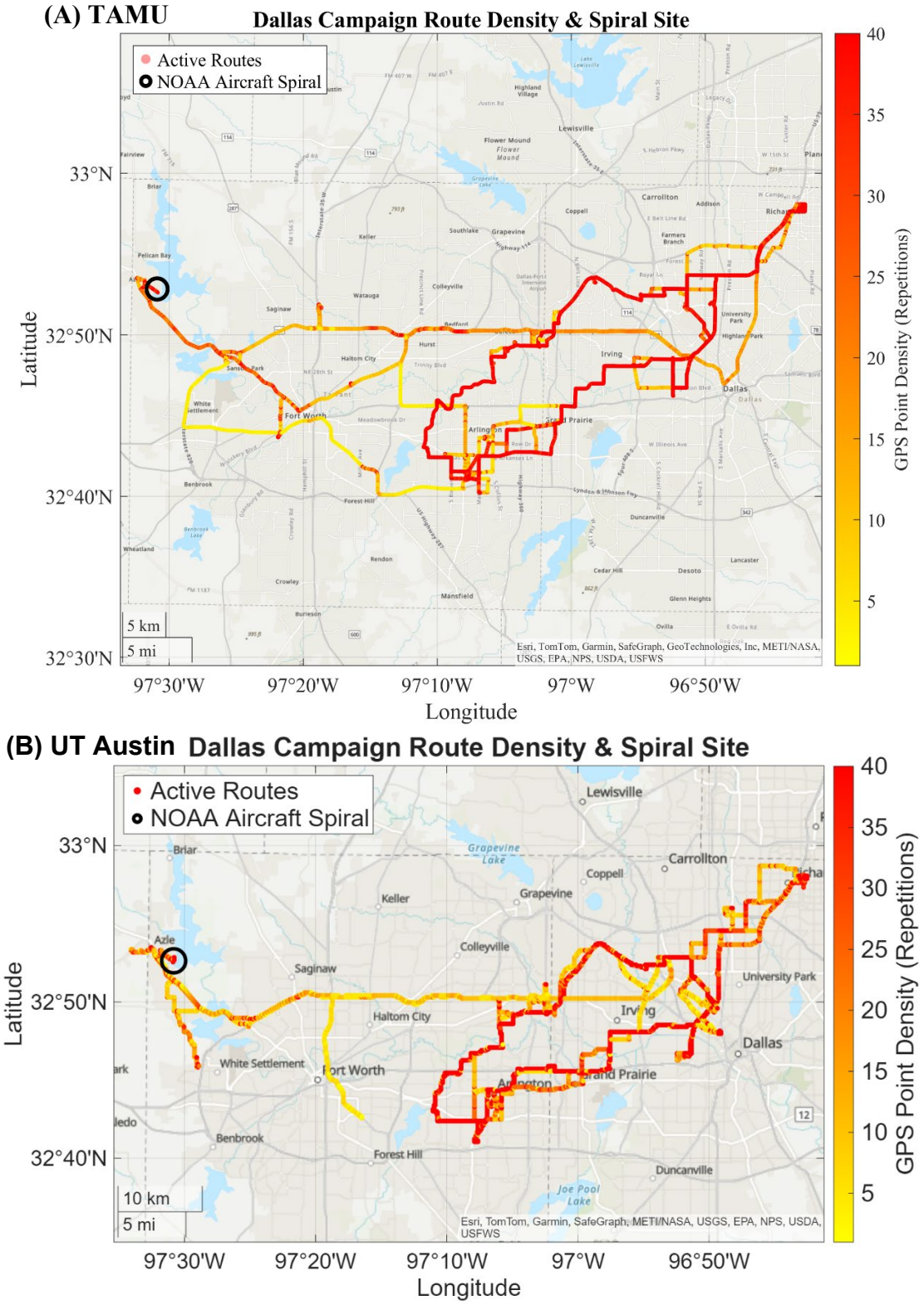

Figure 1. *Completed mobile sampling route density in the Dallas–Fort Worth metropolitan area (May 29 – June 4, 2026), aggregated from the (A)TAMU and (B) UT Austin mobile platforms. Color scale indicates GPS point density (repetitions). Individual UT daily tracks are shown in the Appendix. The black circle marks the NOAA aircraft spiral site near Azle, TX, where ground collocation with the airborne platform was performed.*

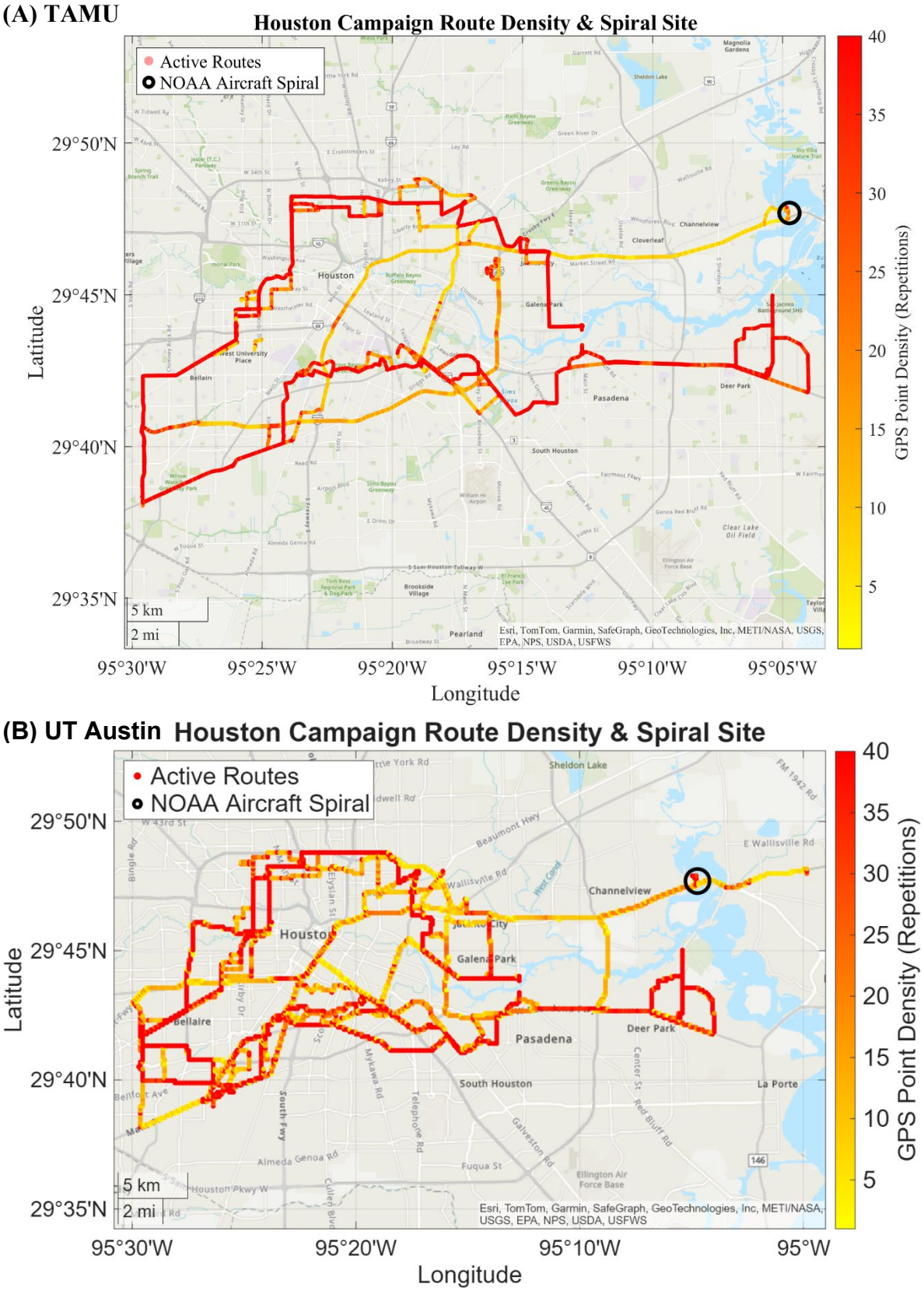

Figure 2. *Mobile sampling route density in the Houston metropolitan area as of June 10, 2026 (campaign ongoing), aggregated from the (A) TAMU and (B) UT Austin mobile platforms. The black circle marks the NOAA aircraft spiral site east of Houston.*

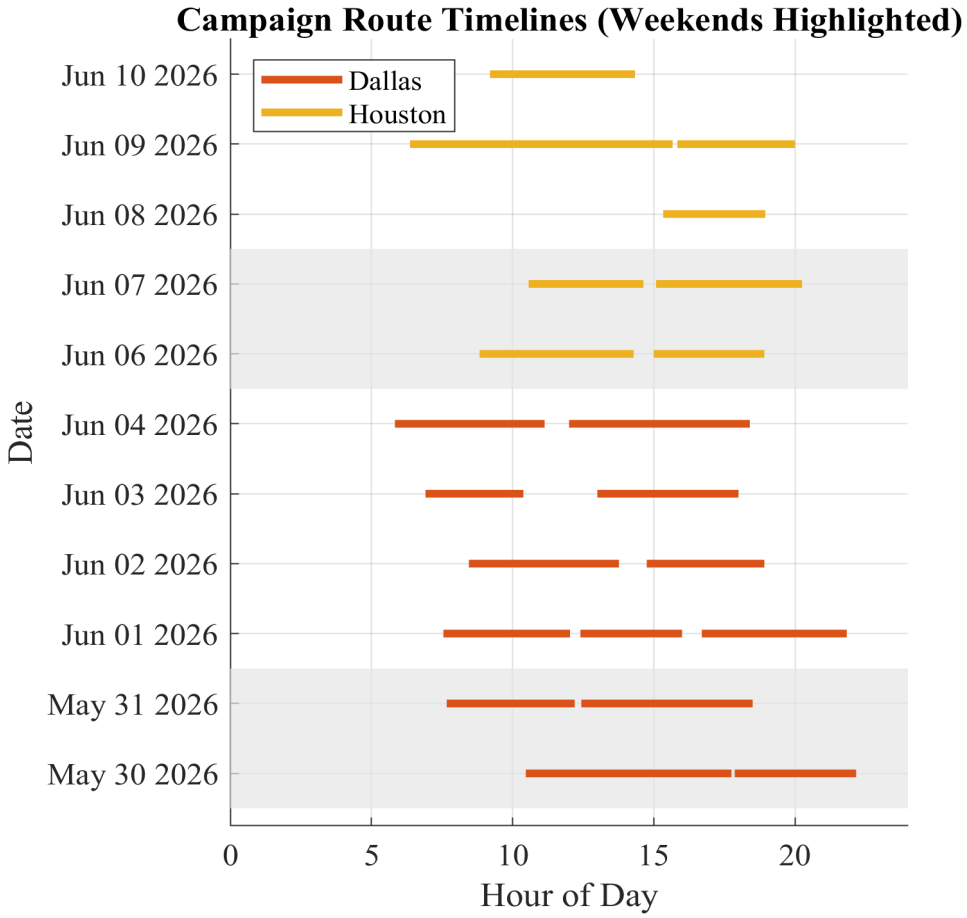

Figure 3. *Campaign route timelines by day for Dallas (May 30 – June 4) and Houston (June 6 – June 10, ongoing). Each bar shows the time-of-day window for one driving session. Weekend days are highlighted. The UT team executed comparable timelines.*

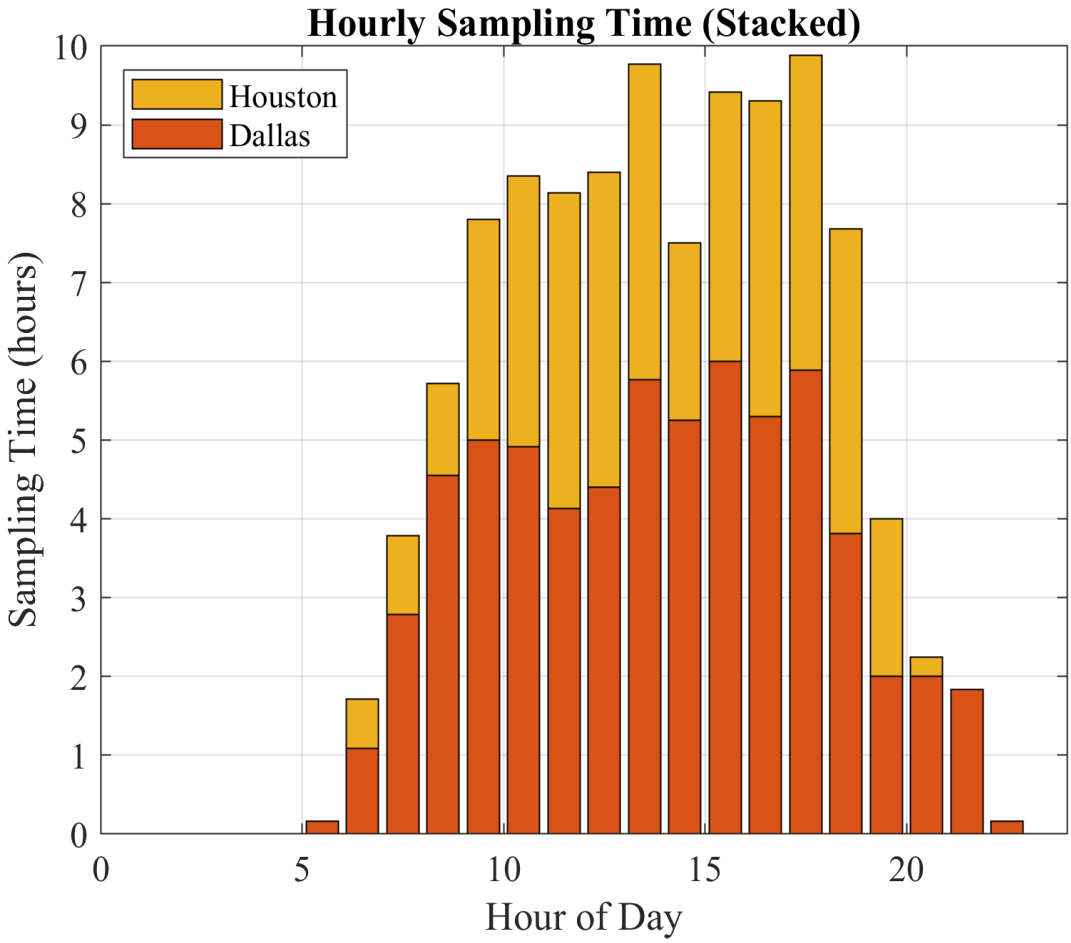

Figure 4. *Stacked hourly sampling time across Dallas and Houston (ongoing) deployments based on TAMU tracker. Sampling activity spans approximately 06:00–20:00 local time with peak activity between 13:00 and 18:00. UT Austin sampling time was comparable.*

The Dallas–Fort Worth deployment is complete. The Houston deployment is currently underway during the second week. Measurements in San Antonio and Austin will begin on Friday, June 12, 2026. Austin drives will overlap with the final aircraft passes on June 13 and 14 and will target data centers, EV and semiconductor manufacturing, wastewater, and other sources in southeast Austin. Figures 5 and 6 illustrate ground–air collocation activities with the NOAA P-3, Figure 7 shows the UT and TAMU mobile platforms during joint operations, and Figures 8-10 show platform staging and community engagement during the Houston week.

Figure 5. *NOAA P-3 aircraft overhead during the May 30, 2026 collocation near Azle, TX. UT and TAMU mobile platforms were co-located at the ground during the aircraft's spiral profile.*

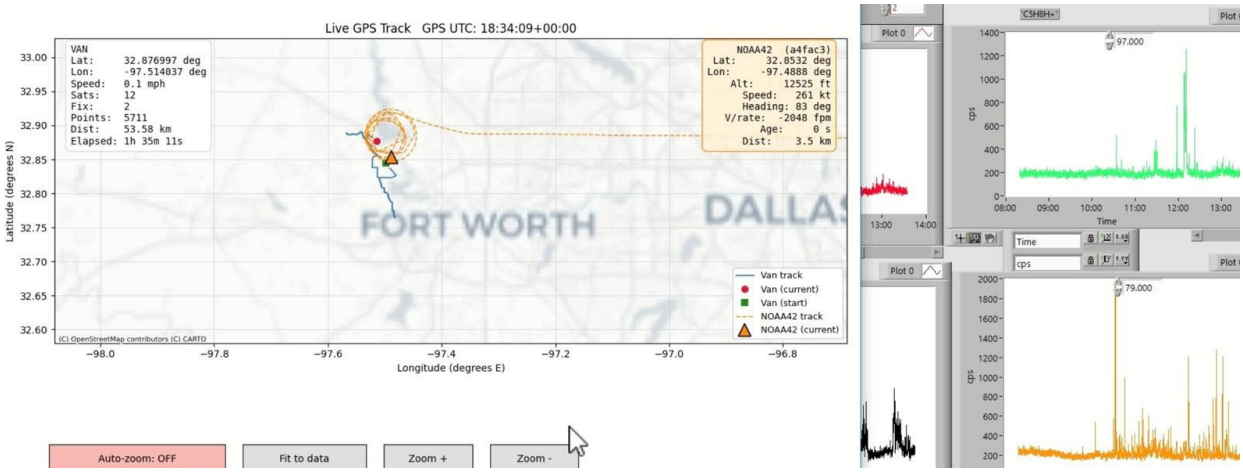

Figure 6. *Live GPS tracking interface showing the UT Sniffer Van trajectory (blue) and the NOAA P-3 track (orange, with current position triangle) during a collocation on May 30, 2026 near Fort Worth. Right panels show example real-time PTR-TOF-MS time series for selected ions.*

Figure 7. *UT and TAMU mobile platforms during joint operations in the Dallas–Fort Worth area, including the UT Sniffer Van and the UT TexAQS trailer.*

Figure 8. *UT, TAMU, and TCEQ mobile platforms staged together during the Houston week of the campaign. Platforms shown include the TAMU Cybertruck-towed trailer, UT Sniffer Van, and TCEQ mobile van.*

Figure 9. *UT, TAMU, and University of Houston mobile platforms staged together during the Houston week of the campaign. Platforms shown include the TAMU Cybertruck-towed trailer, UT Sniffer Van, and UH Van.*

Figure 10. *Community engagement event during the Houston week of the campaign. Visiting students viewed the UT Sniffer Van and TexAQS trailer and received an introduction to real-time air quality measurements and the TexAQS 2026 campaign.*

Preliminary Analysis

Preliminary inspection of real-time PTR-TOF-MS data in DFW indicated enhancements in compounds tentatively identified as propylene glycol, acetone, and benzene during downwind driving passes of a data center facility in northeast Dallas (Figure 11). These observations are preliminary and pending quality assurance, mass calibration, and background subtraction, and will be evaluated against TAMU data and the aircraft observations during the full data workup.

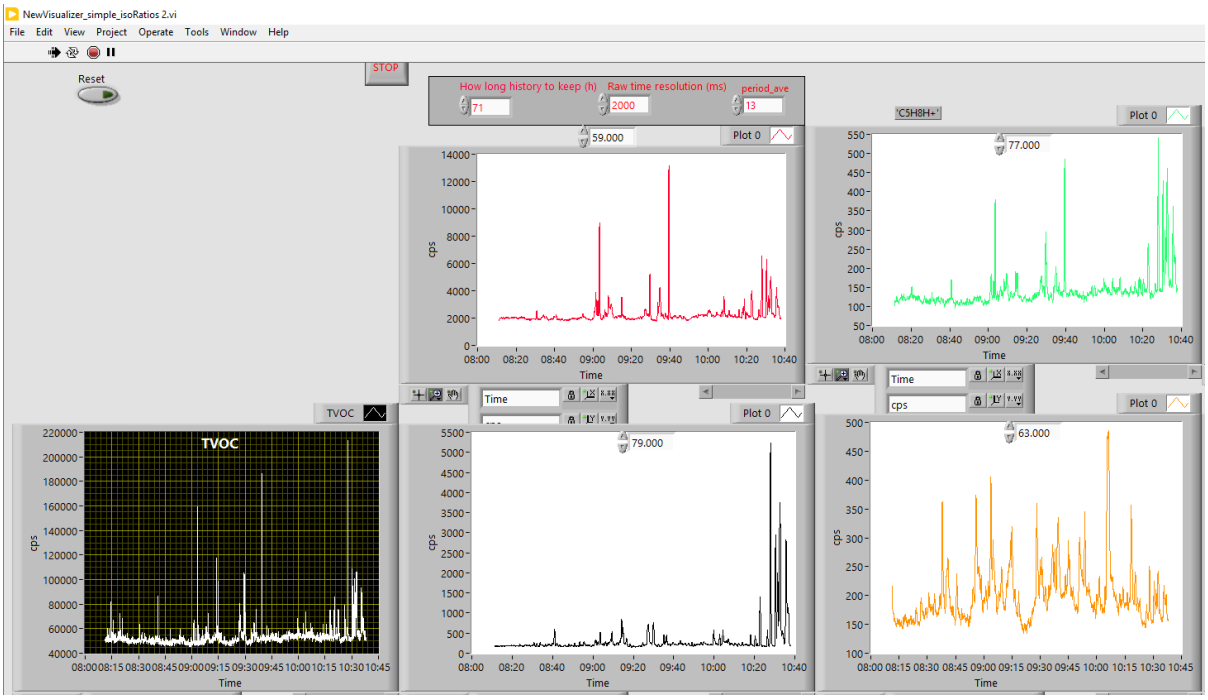

Figure 11. *Example of real-time PTR-TOF-MS measurements during a representative sampling pass at a data center facility in northeast Dallas (10:20 – 10:40). Time series show selected ion signals; enhancements in compounds tentatively identified as acetone (59), propylene glycol (77), ethylene glycol (63) and benzene (79) were observed during downwind passes.*

Data Collected

Dallas summary: total drive distance 1,140.91 miles, total drive time 52.25 hours across the UT mobile platform. Documented collocations during the Dallas deployment are listed below. Houston driving and collocation logs continue to accumulate and will be reported in the next MTR after the Houston week is complete.

Collocation	Date / Time (local)
NOAA aircraft spiral, Azle, TX (32.877026°N, 97.514020°W)	2026-05-30 13:28; 2026-06-03 13:57
TCEQ monitoring site near UTA (32.72620°N, 97.10858°W)	2026-05-31 09:52–10:12 2026-06-01 08:11–08:21 2026-06-02 08:00–08:28 (with TAMU) 2026-06-04 10:05–10:55 (with TAMU)

Figure 12. *Stationary collocation at the TCEQ monitoring site near the University of Texas at Arlington (32.72611°N, 97.10833°W). The UT Sniffer Van and the TAMU Cybertruck-towed trailer were co-located alongside the TCEQ CAMS shelter under ambient conditions.*

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

None

Goals and Anticipated Issues for the Succeeding Reporting Period

The team will complete the remaining Houston driving days this week and transition to San Antonio and Austin on Friday, June 12, 2026. Austin drives will overlap with the final aircraft passes on June 13 and 14. Concentric driving patterns optimized for paired upwind/downwind sampling will continue. Stationary measurements will continue at the Houston supersite throughout the campaign. After the field phase concludes, the team will begin post-campaign data processing, mass calibration, and intercomparison with the TAMU, UH, and NOAA datasets. KML files of the planned routes remain available in this folder. Any suggestions from TCEQ are welcome.

Detailed Analysis of the Progress of the Task Order to Date

The field campaign is on schedule. The Dallas–Fort Worth deployment is complete, Houston is in progress, and San Antonio and Austin will follow on June 12 through the end of the campaign.

Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.

☐Yes ☒ No

Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?

☐ **Yes** ☒ **No**

Do you have any bibliographic publications (ie: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.

☐ **Yes** ☒ **No**

Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).

☐ **Yes** ☒ **No**

Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.

☐ **Yes** ☒ **No**

Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.

☐ **Yes** ☒ **No**

Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.

☐ **Yes** ☒ **No**

Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.

None

Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?

☒ **Yes** ☐ **No**

Submitted to AQRP by
Pawel Misztal

Appendix: UT Mobile Platform Daily Route Tracks (Dallas–Fort Worth)

The following figures show the GPS driving track recorded by the UT mobile platform for each sampling session conducted in the Dallas–Fort Worth area between May 30 and June 4, 2026. Routes 1–10 represent the primary planned sampling sessions; supplementary sessions cover additional coverage outside the primary routes.

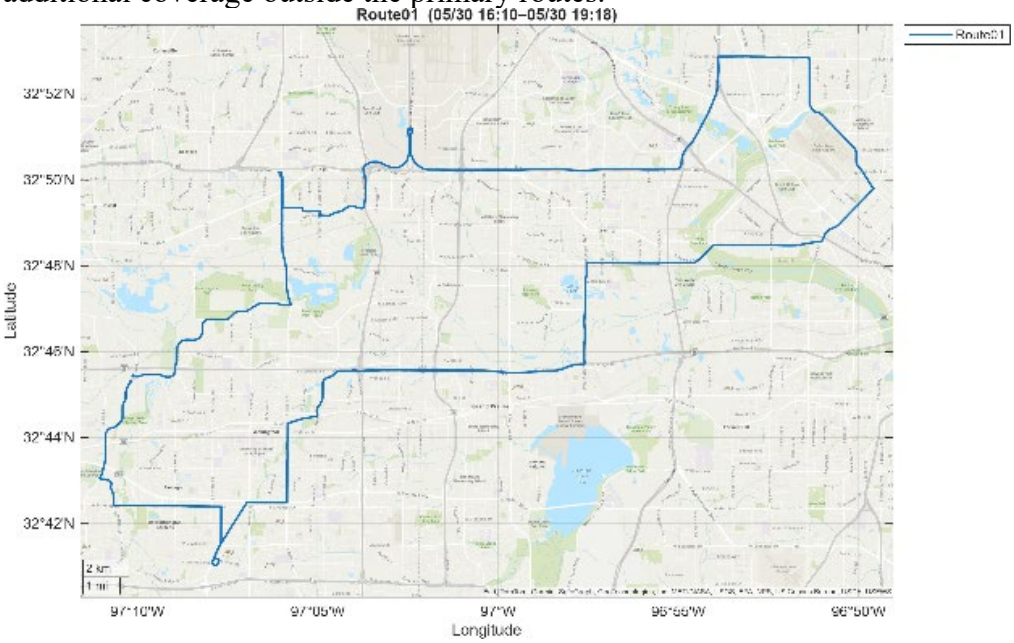

Figure A1. *GPS driving track for Route 01 (05/30 16:10 – 05/30 19:18) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

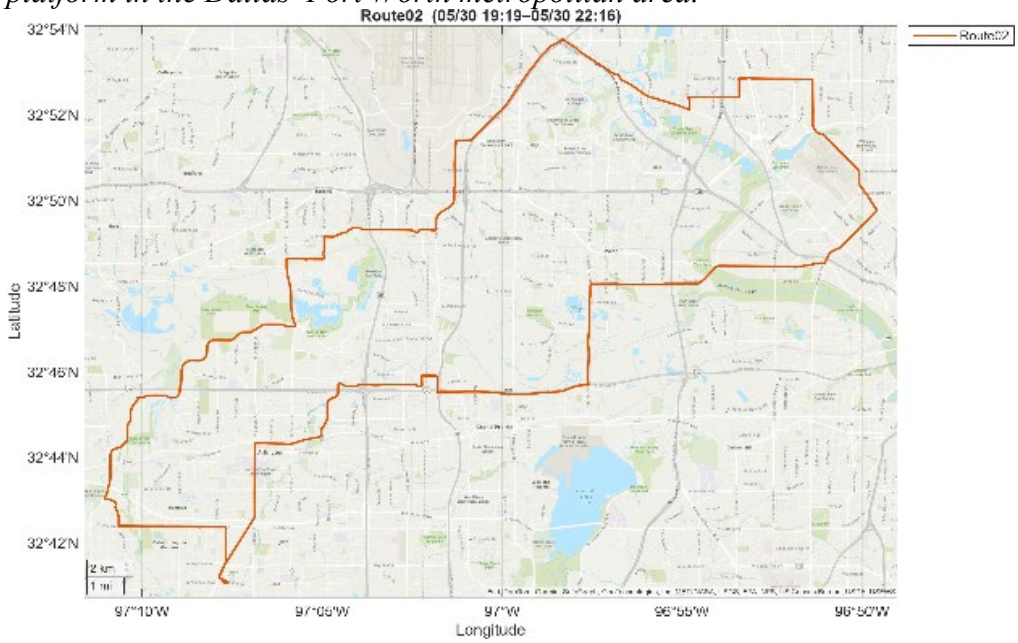

Figure A2. *GPS driving track for Route 02 (05/30 19:18 – 05/30 22:13) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

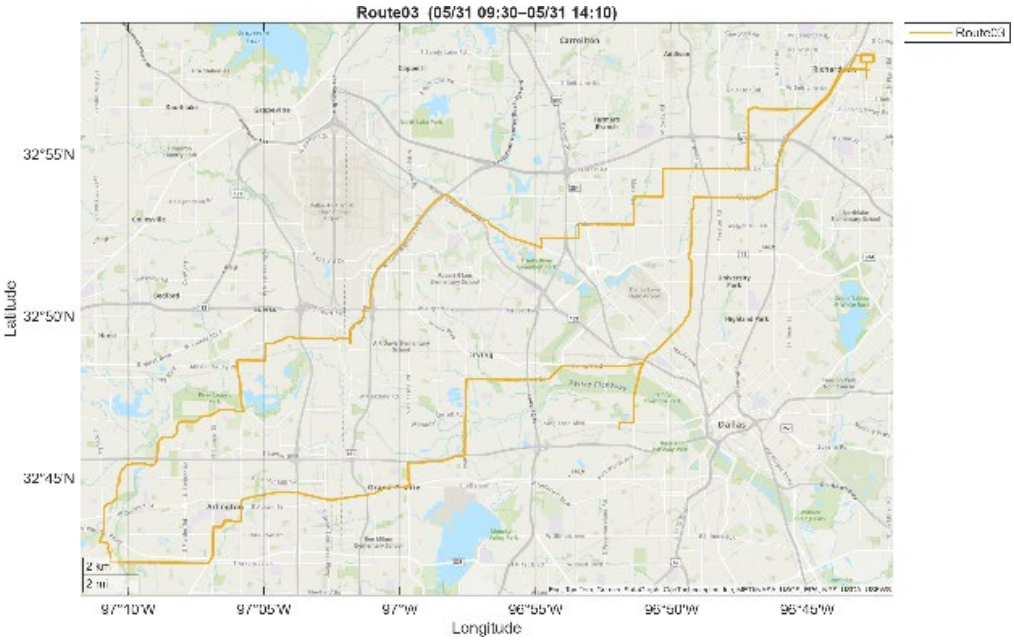

Figure A3. *GPS driving track for Route 03 (05/31 07:42 – 05/31 11:55) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

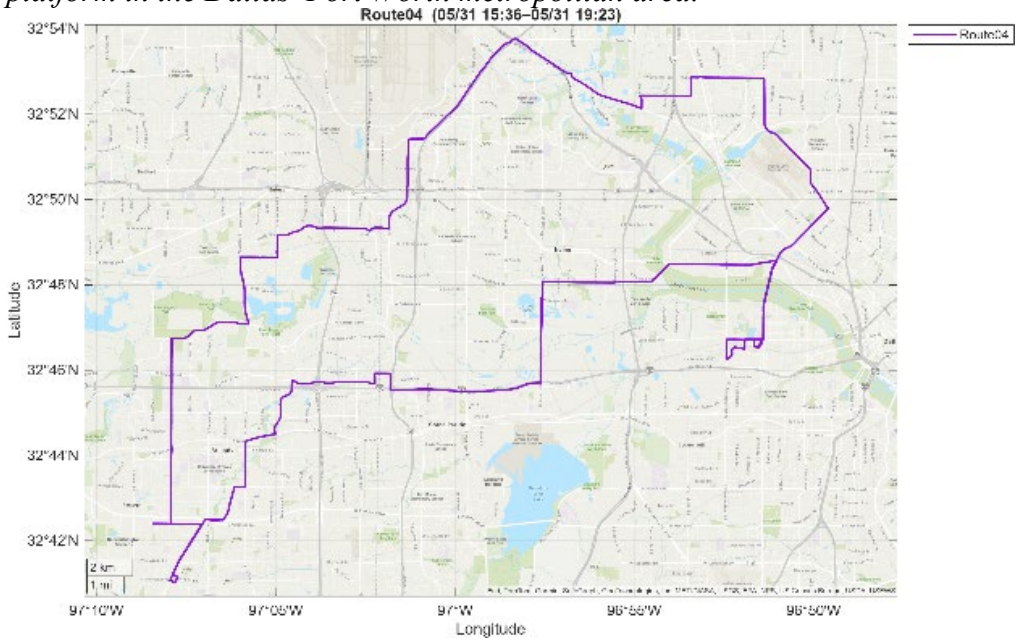

Figure A4. *GPS driving track for Route 04 (05/31 11:55 – 05/31 18:40) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

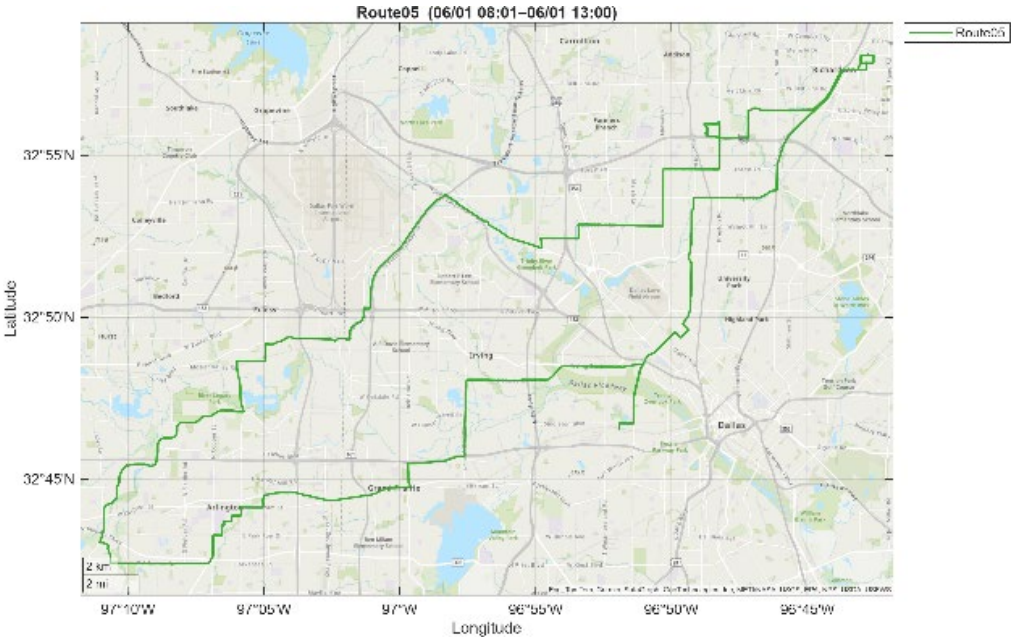

Figure A5. *GPS driving track for Route 05 (06/01 07:39 – 06/01 12:30) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

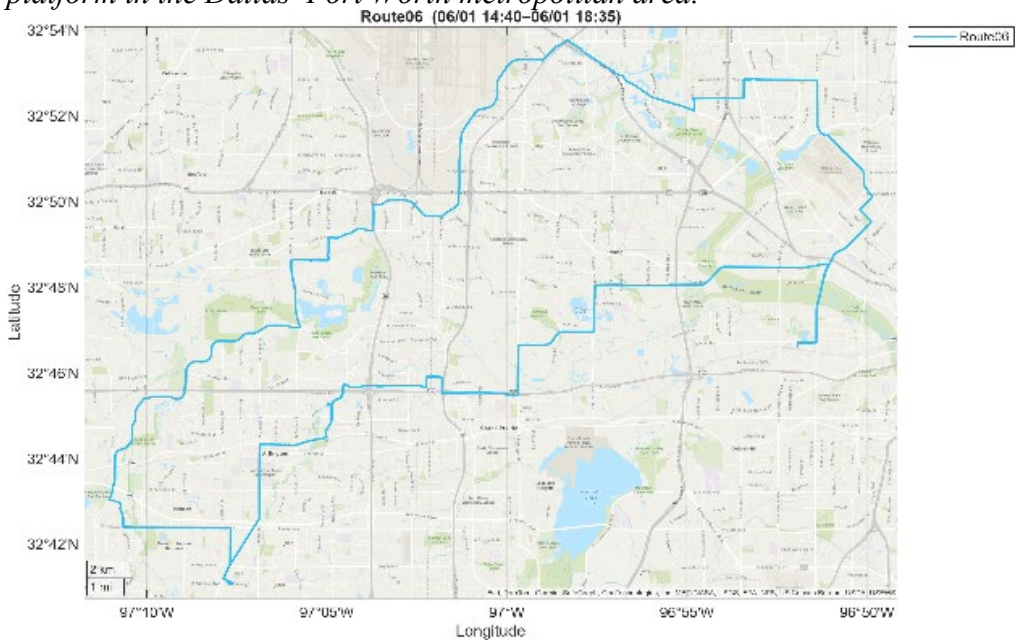

Figure A6. *GPS driving track for Route 06 (06/01 12:30 – 06/01 22:00) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

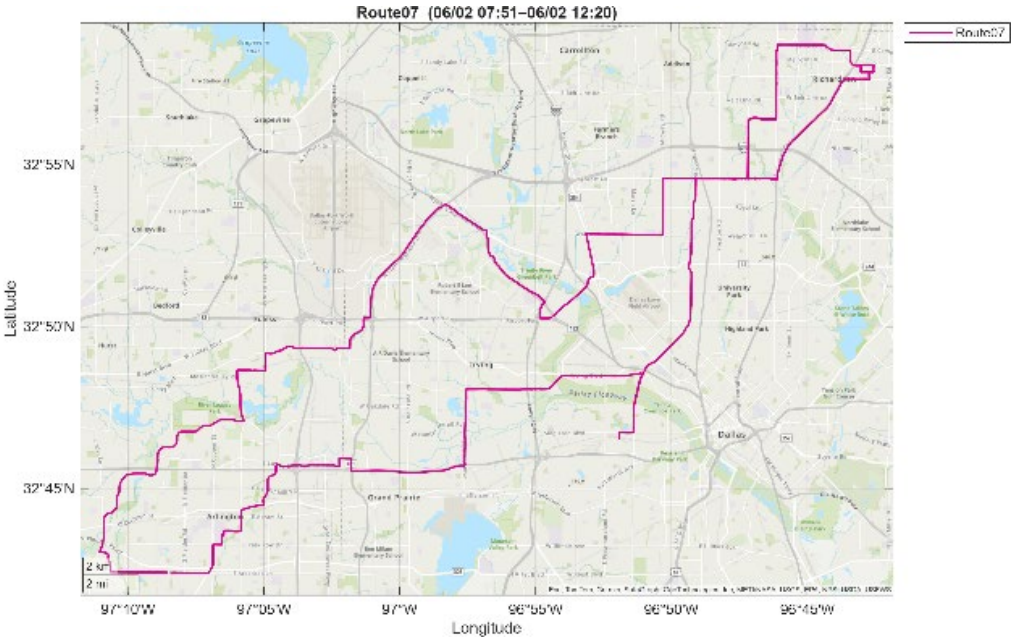

Figure A7. *GPS driving track for Route 07 (06/02 08:35 – 06/02 13:39) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

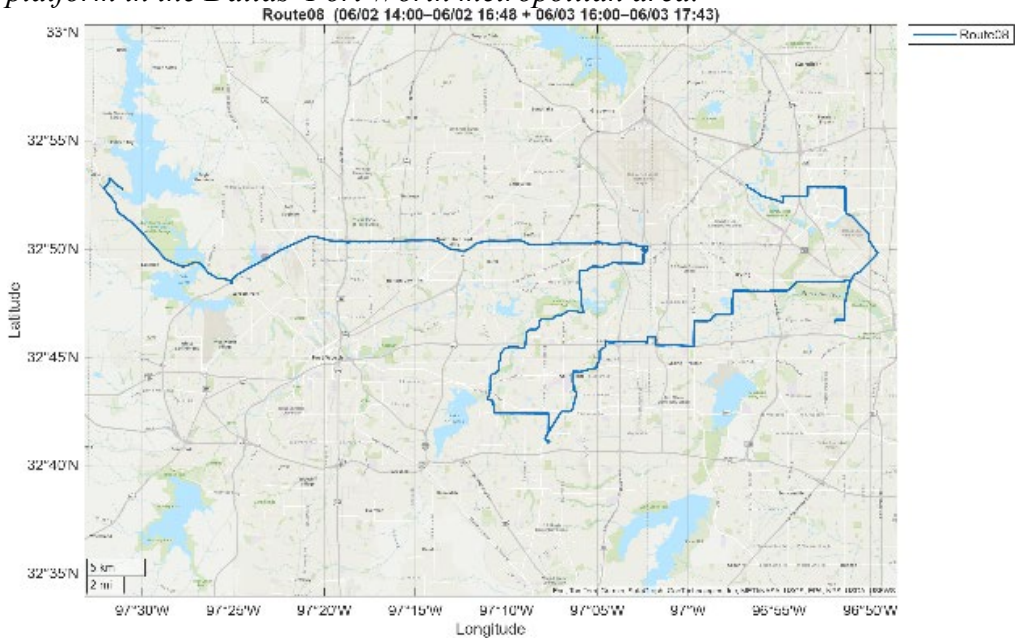

Figure A8. *GPS driving track for Route 08 (06/02 14:50 – 06/02 18:54) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

Figure A9. *GPS driving track for Route 09 (06/03 07:00 – 06/03 17:55) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

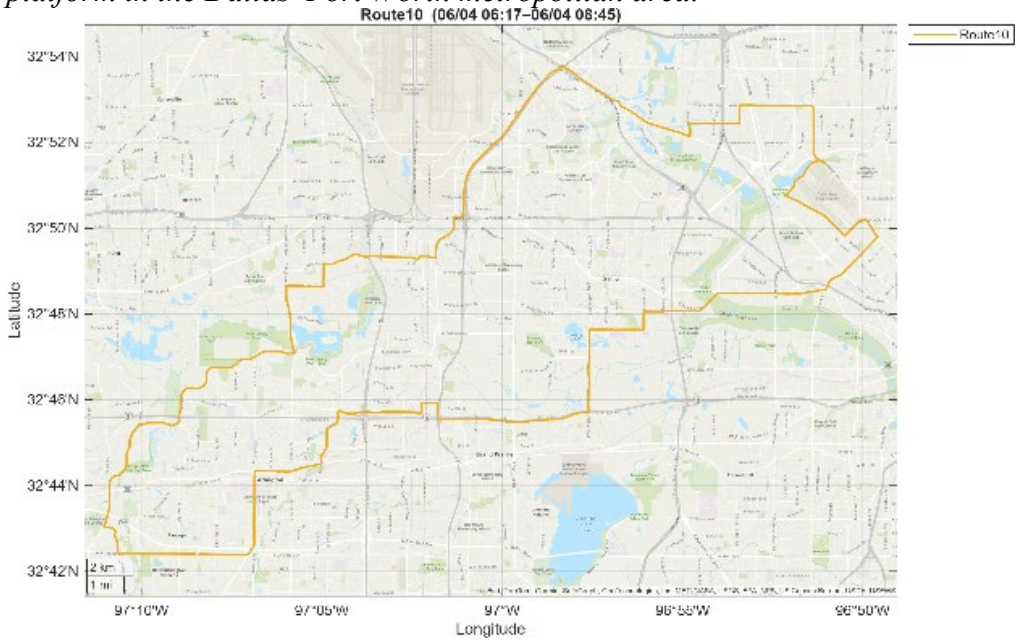

Figure A10. *GPS driving track for Route 10 (06/04 05:50 – 06/04 18:18) of the UT mobile platform in the Dallas–Fort Worth metropolitan area.*

Figure A11. *GPS driving track for a supplementary measurement session (Supplementary 1) of the UT mobile platform, performed to expand spatial coverage or revisit areas of interest identified during the main campaign.*

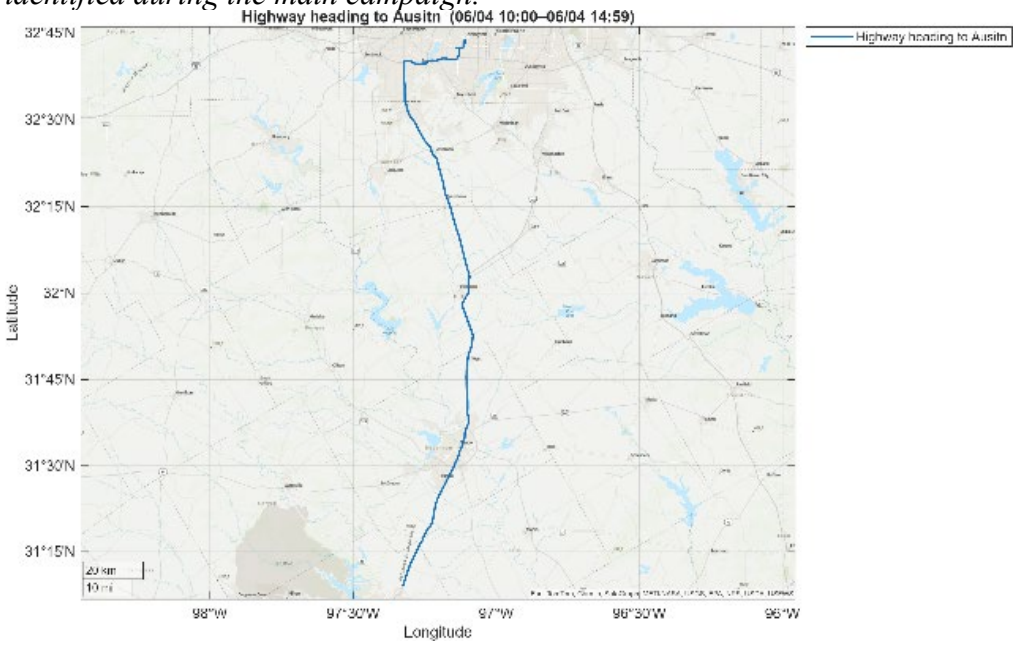

Figure A12. *GPS driving track for a supplementary measurement session (Supplementary 2) of the UT mobile platform, performed to expand spatial coverage or revisit areas of interest identified during the main campaign.*

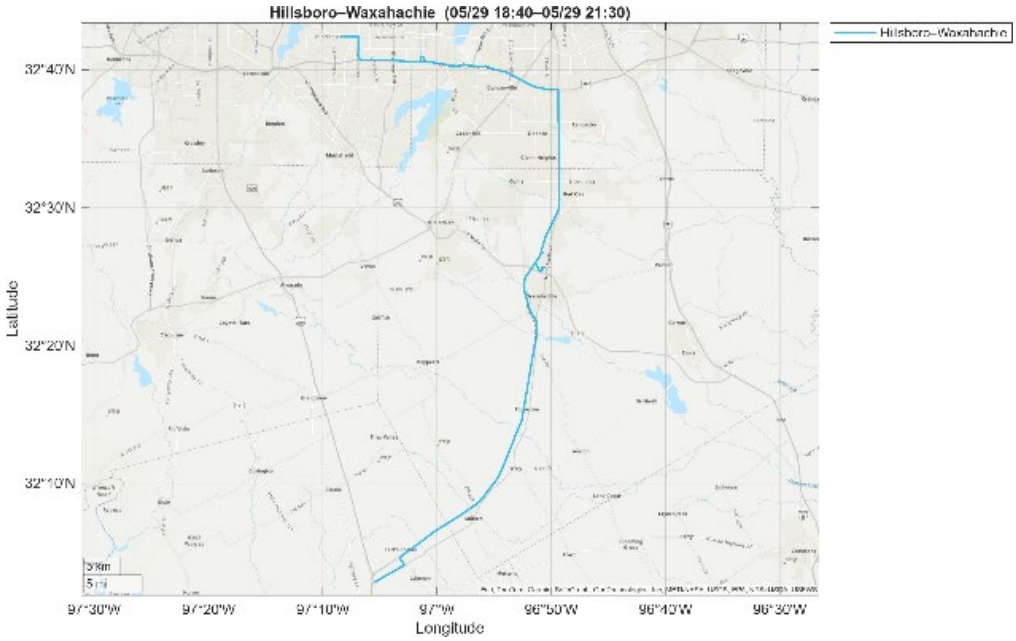

Figure A13. *GPS driving track for a supplementary measurement session (Supplementary 3) of the UT mobile platform, performed to expand spatial coverage or revisit areas of interest identified during the main campaign.*

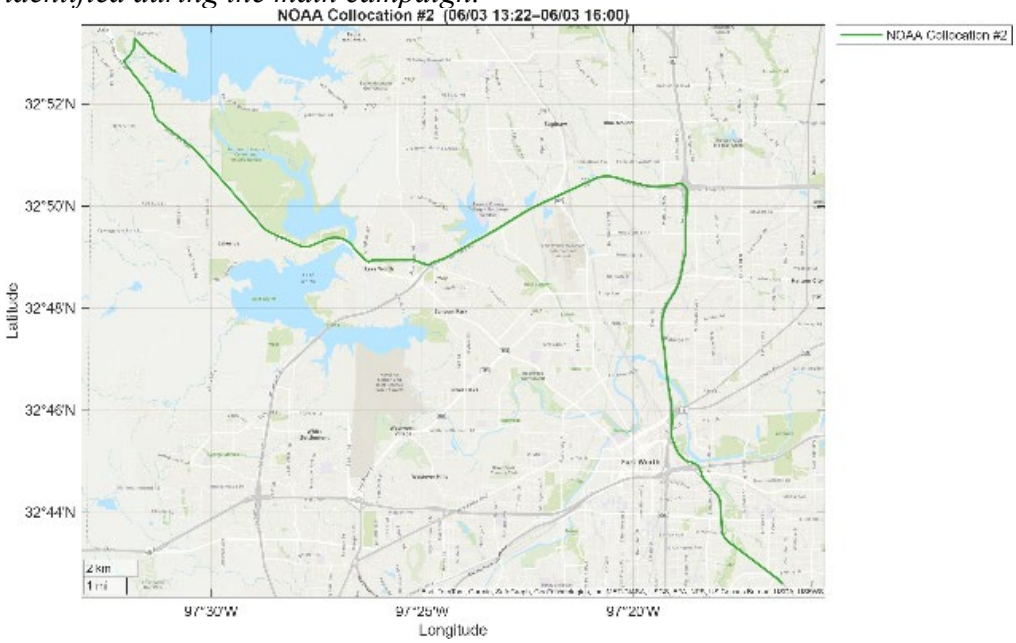

Figure A14. *GPS driving track for a supplementary measurement session (Supplementary 4) of the UT mobile platform, performed to expand spatial coverage or revisit areas of interest identified during the main campaign.*