

Research Activities Management Portal

RAMP

“ *Your Interface to ScooterLab Data and Research Activities* ”

<https://scooterlab.utsa.edu/ramp>

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ScooterLab Workshop 2026

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What is RAMP

RAMP is the bridge between ScooterLab's sensor-rich e-scooter testbed and your research.



SCOOTERLAB

ScooterLab operates a fleet of instrumented e-scooters in San Antonio, collecting rich sensor data: GPS, IMU, video, audio, and more, providing access to real-world trips.

RAMP

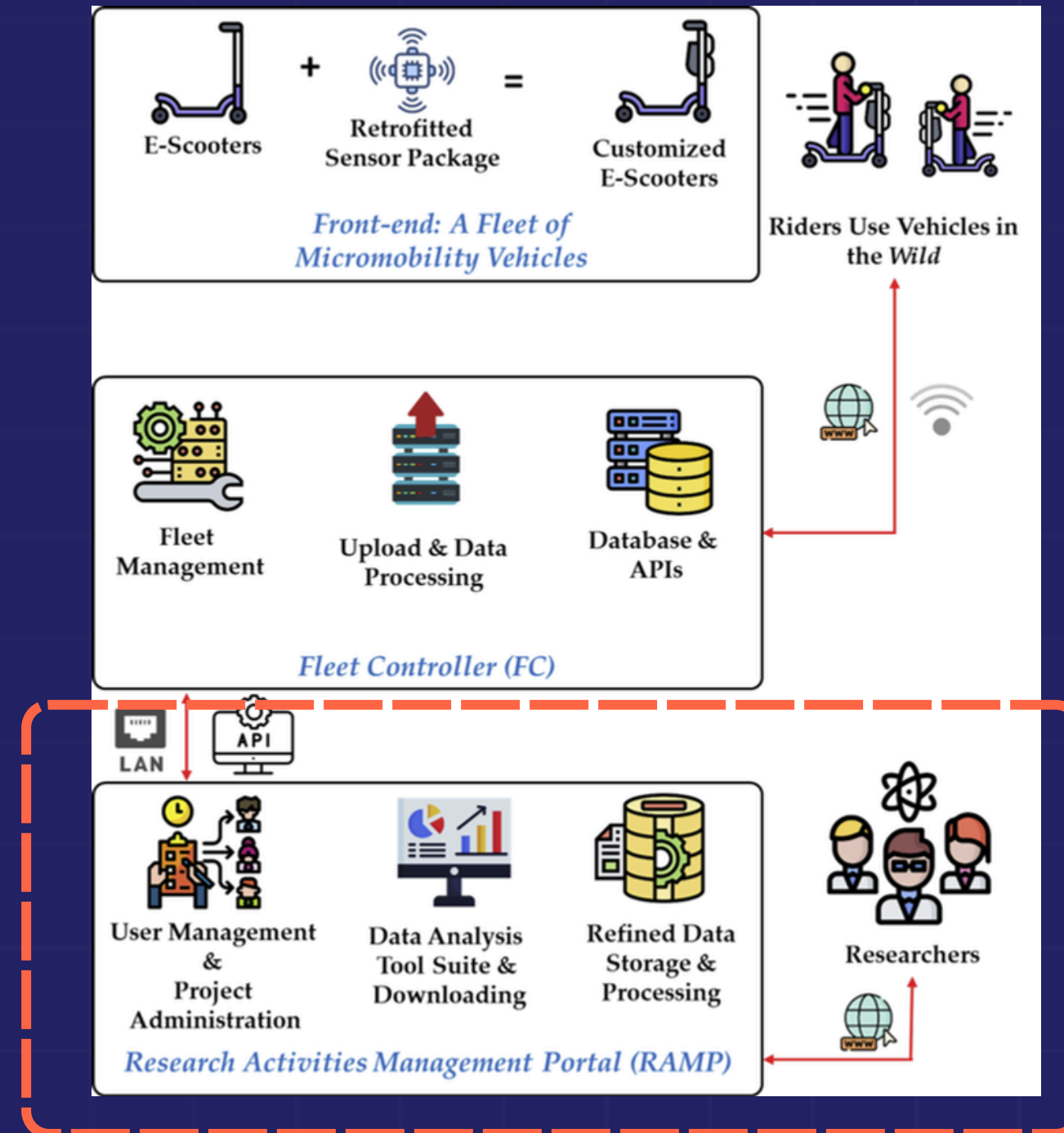
RAMP is the web portal that provides researchers secure, structured access to the Scooterlab data, with tools to filter, visualize, preview, and export exactly what they need.

YOUR RESEARCH

Whether you study transportation, safety, urban mobility, or human factors, RAMP turns raw scooter data into publication-ready datasets, with no infrastructure setup required.

RAMP Infrastructure

- **Back-end:** PHP (Laravel) · JavaScript frontend
- **Compute:** 4× Nvidia L40S GPUs (46GB VRAM each)
- **Storage:** 15 TB · 2 TB RAM · Dual Intel Xeon Platinum

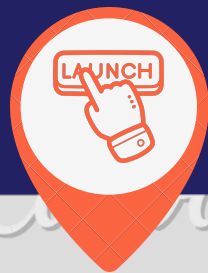


Our Journey

2024 July

RAMP – Soft Launch

One project
Map tool and
administration



2025 May

RAMP Launched

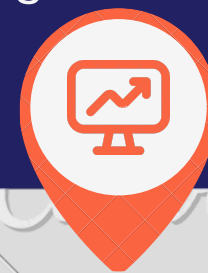
5 early adopter teams
Stats tool, data
downloading v1.0



2025–2026

Expanded capabilities

7 collaborator teams
Dashboard analytics,
improved stats and Map
tools, refined data
packaging



Today

Maturing Platform

A complete research data
pipeline for ScooterLab
collaborators



RAMP at a Glance

Dashboard Insights

- At-a-glance daily data collection summaries
- Accumulated trip counts & total trip distances
- Sensor specifications

Interactive Data Visualization

- Map & Stats tools with granular filtering
- Plot individual trip metrics; export charts as PDF

Video & Audio Playback

- In-browser playback
- Download individual media files
- Seamlessly integrated into Map & Stats tools



Data Filtering

- Filter data by scooter fleet, spatiotemporal, and data properties

Data Export

- Mass download with same filters as visualization and data selection
- Select specific data streams; choose CSV or JSON
- Auto-packaged ZIP with README (fields, specs, structure)

Integrated Tutorials

- Step-by-step guides linked within the portal

RAMP Summary

5

Projects

7 17

Teams Users

12

Dataset
Downloads

250+

Queries

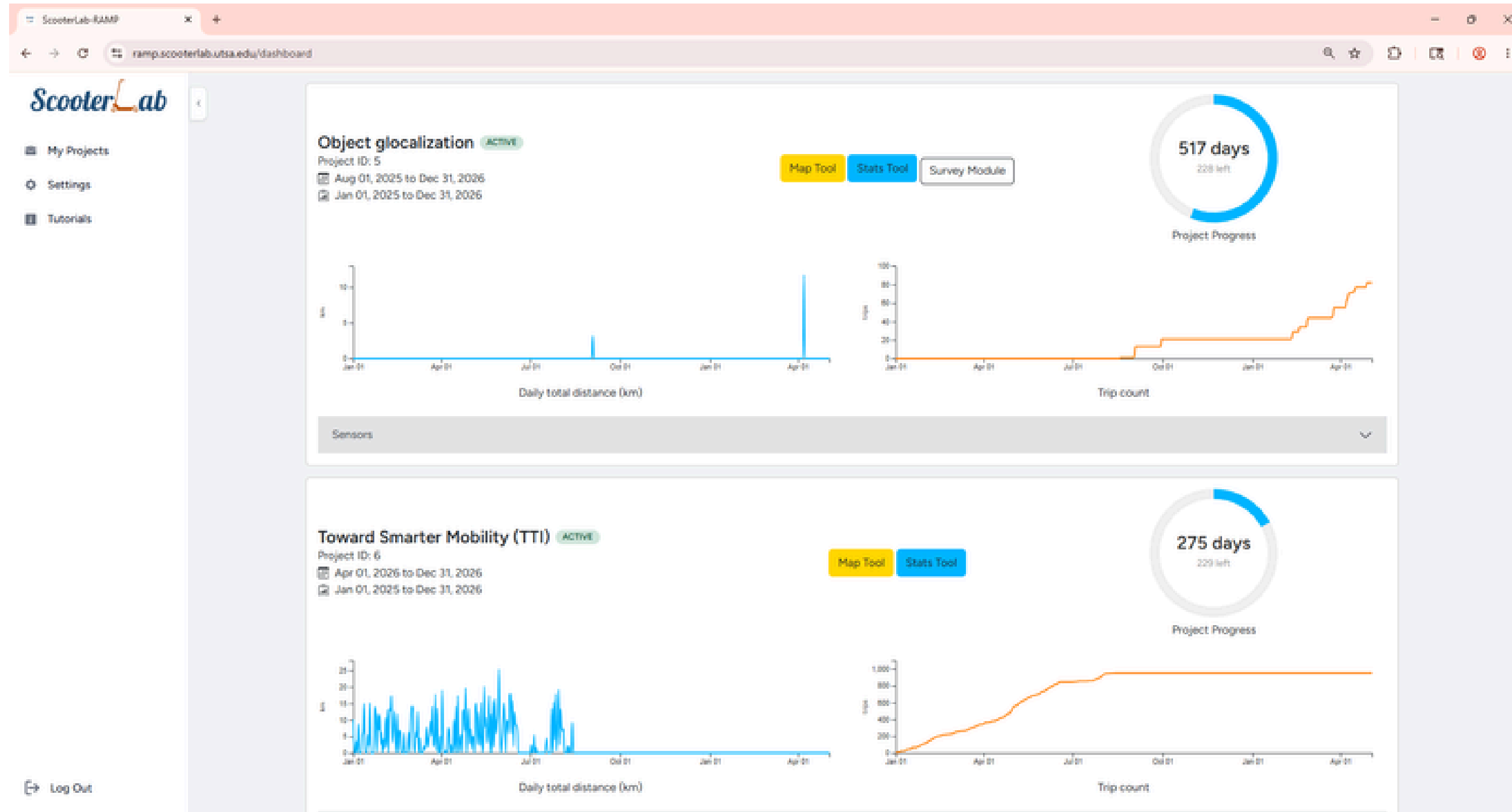
RAMP Features



<https://ramp.scooterlab.utsa.edu>



RAMP Dashboard



Uploading Survey

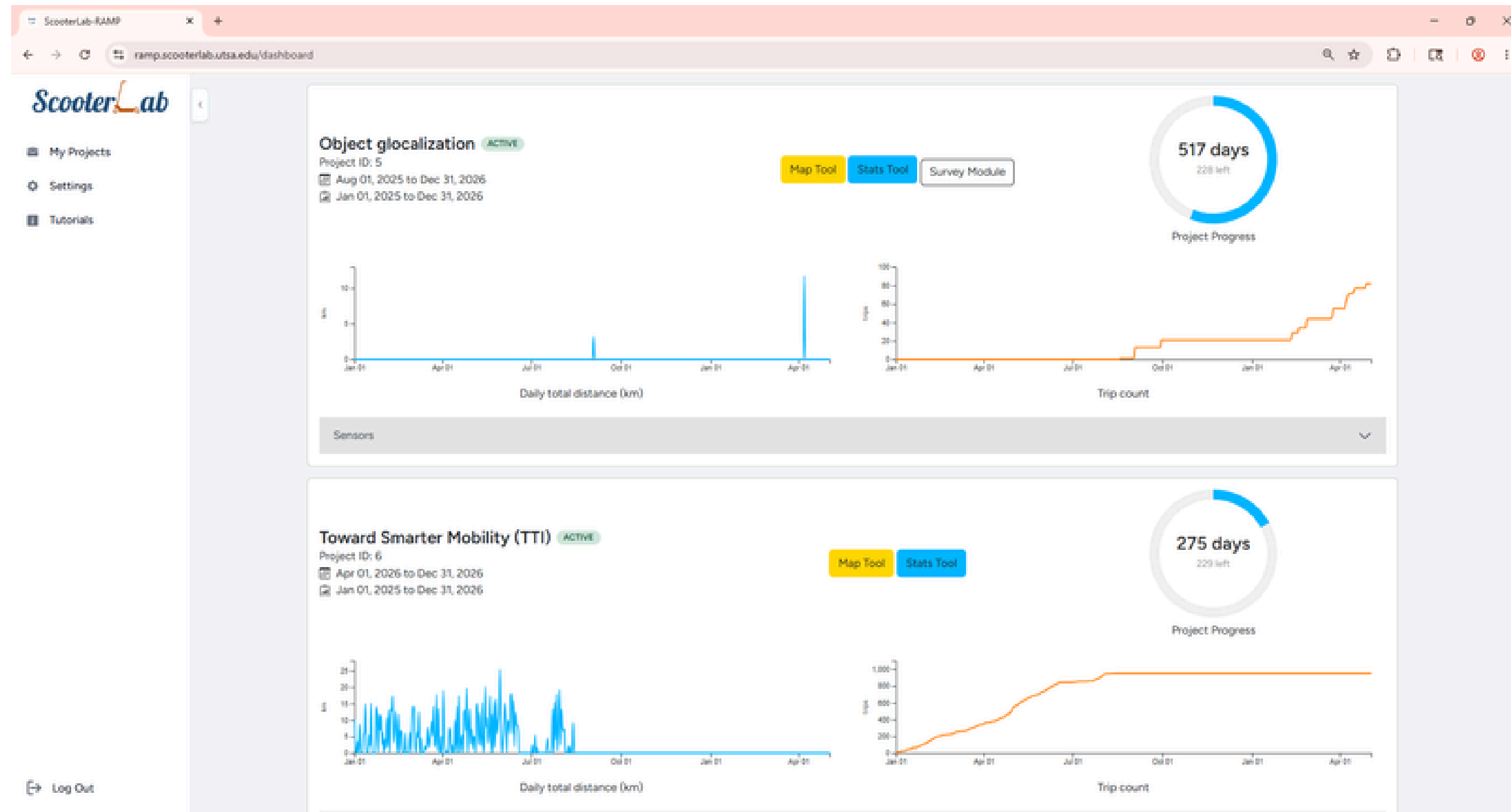
The screenshot shows a web browser window with the URL `ramp.scooterlab.utsa.edu/projects/5/survey`. The page title is "Survey Module - Object globalization". The ScooterLab logo is in the top left. A sidebar on the left contains "My Projects", "Settings", and "Tutorials". The main content area has two sections:

- Upload Survey Questionnaire**:
 - A text input field for "Survey Frequency".
 - A section for "Survey Questionnaire (PDF)" with a sub-label "Upload Questionnaire". It includes a "Choose File" button and the text "No file chosen".
 - A green "UPLOAD QUESTIONNAIRE" button.
- Questionnaire History**:
 - A table with columns: "Version", "Status", "Survey Frequency", "Uploaded At", and "Action".
 - The table body is empty, with a message "No survey questionnaire history found." centered below the header.

RAMP Tutorials

The screenshot displays a web browser window with the URL `ramp.scooterlab.utsa.edu/tutorials`. The page header includes the ScooterLab logo and a 'Tutorials' tab. A sidebar on the left lists 'My Projects', 'Settings', and 'Tutorials'. The main content area features a video player titled 'Introduction to RAMP' with a play button overlay. The video player shows a progress bar at 0:01 / 0:33 and a 'YouTube' logo in the bottom right corner. Below the video player, the text 'Introduction to RAMP 1 OF 4' is visible. In the bottom left corner of the page, there is a 'Log Out' button.

RAMP Dashboard



Map Tool - Loading

Spoter Lab

Batch 4/55
0 trips loaded

Processing batches: 1/55 (2%) - 0 trips found

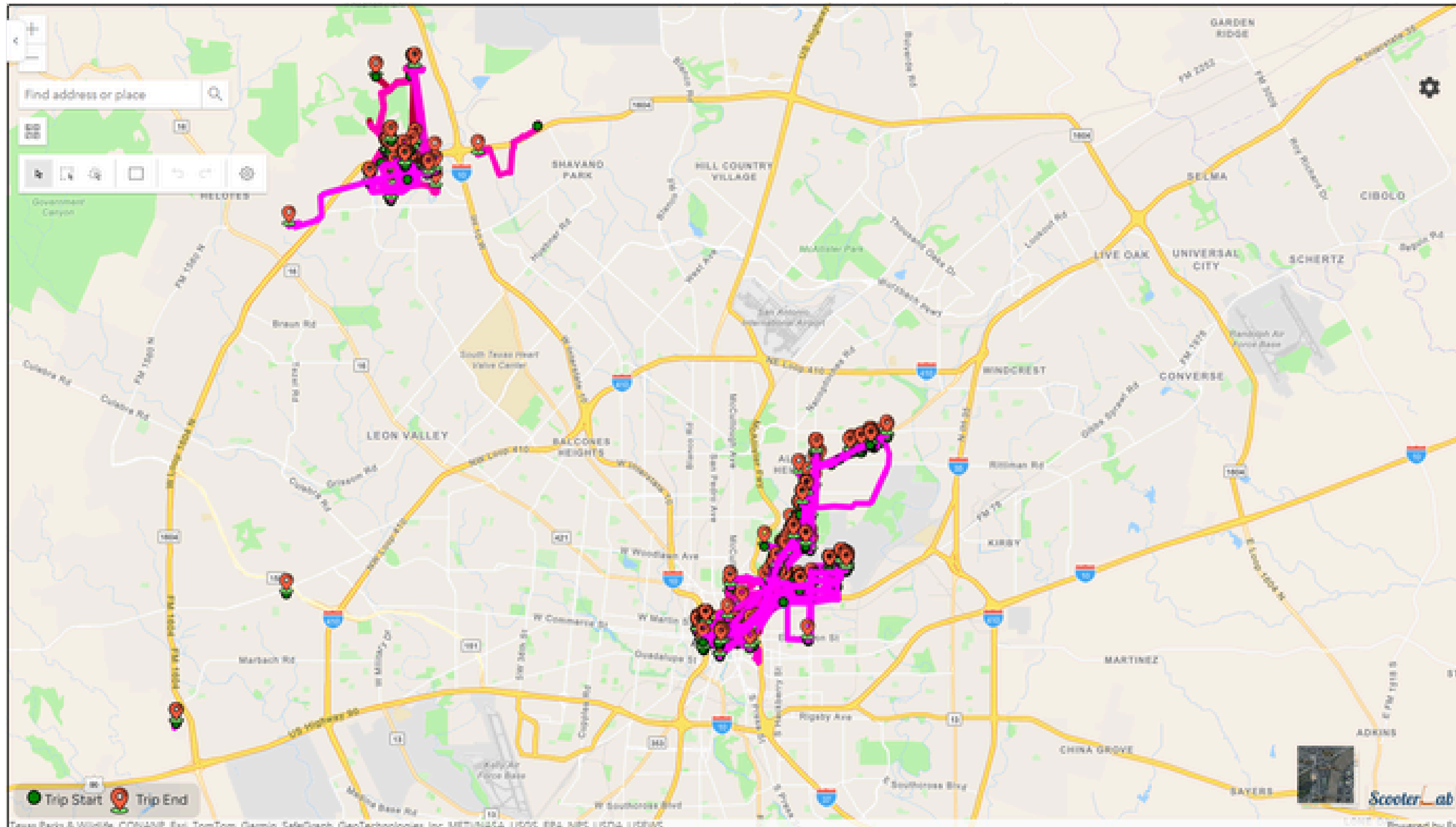
Processing batches: 2/55 (4%) - 0 trips found

Processing batches: 3/55 (5%) - 0 trips found

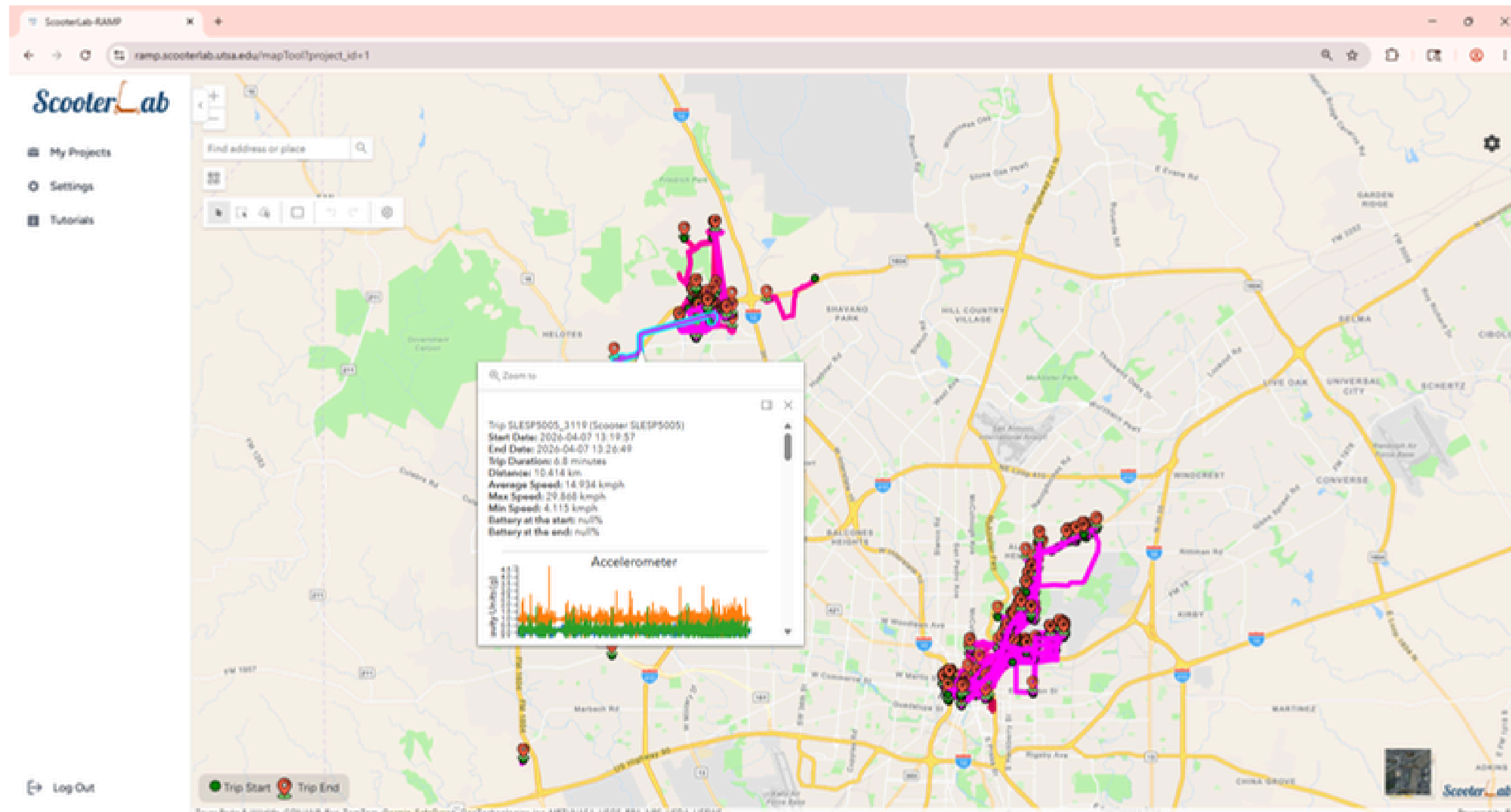
Processing batches: 4/55 (7%) - 0 trips found

Trip Start Trip End

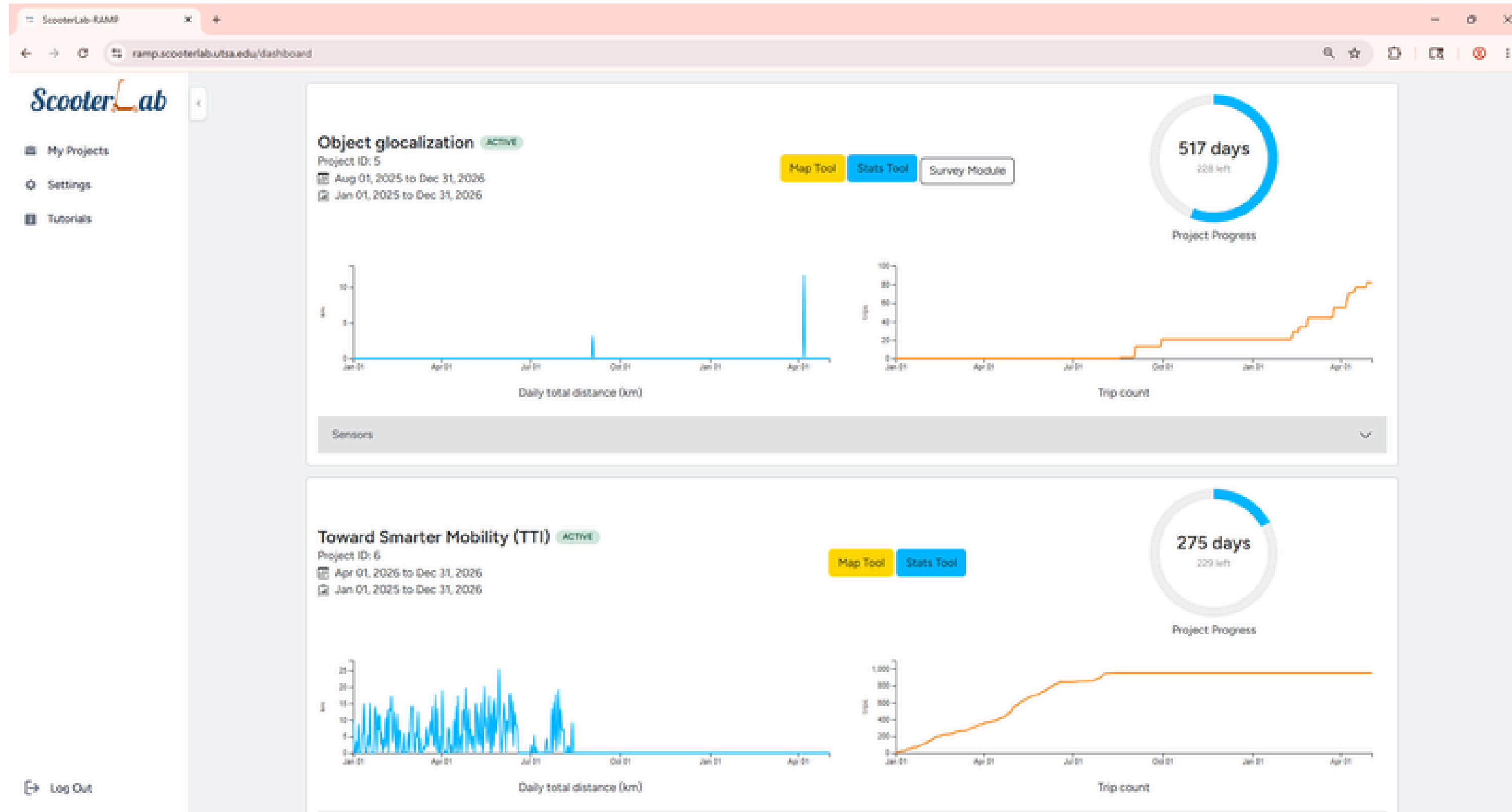
Map Tool



Map Tool - Trip



RAMP Dashboard



Stats Tool - Loading

The screenshot displays a web dashboard titled "Scooter Trip Data Dashboard (Project ID: 1)". The interface includes a settings gear icon in the top right corner. Below the title, there are three tabs: "Sensor Stats" (which is active), "Scooter Stats", and "Project Summary".

On the left side, there is a "Select Columns" section with a list of data fields, each accompanied by a checked checkbox: Trip ID, Scooter ID, Start Time, End Time, Trip Distance, Avg Speed, Max Speed, Min Speed, Battery Start, and Battery End. To the right of this list is a "Records per page:" dropdown menu set to "100".

The main content area is a large grey rectangle with a circular loading spinner in the center, indicating that the data is still being fetched. The spinner is a thin blue arc on a grey circle.

On the right side, under the "Visualization" heading, there are two dropdown menus labeled "Scooter ID:" and "Trip ID:". Below these are two blue buttons: "Plot" and "Download Charts".

Stats Tool

ScooterLab

My Projects
Settings
Tutorials

Scooter Trip Data Dashboard [Project ID: 5]

Records per page: 100

Search Columns: Trip ID, Scooter ID, Start Time, End Time, Trip Distance, Avg Speed, Max Speed, Min Speed, Battery Start, Battery End

S. No.	Trip ID	Scooter ID	Start Time	End Time	Trip Distance	Avg Speed	Max Speed	Min Speed	Battery Start	Battery End
1	SLESP5005_3089	SLESP5005	2026-04-16 11:36:59	2026-04-16 11:41:44		0			1	1
2	SLESP5005_3090	SLESP5005	2026-04-16 12:02:31	2026-04-16 12:13:10		0			1	1
3	SLESP5005_3091	SLESP5005	2025-09-03 08:57:32	2025-09-03 09:04:53		0				
4	SLESP5005_3092	SLESP5005	2025-09-03 11:14:46	2025-09-03 11:15:22	0.082	9.521	19.042	1.774		
5	SLESP5005_3095	SLESP5005	2026-02-11 16:37:15	2026-02-11 16:39:11		0				
6	SLESP5005_3096	SLESP5005	2026-02-26 15:25:58	2026-02-26 15:27:33		0				
7	SLESP5005_3097	SLESP5005	2026-02-18 19:46:04	2026-02-26 12:04:45		0				
8	SLESP5005_3098	SLESP5005	2026-02-11 12:33:32	2026-02-11 16:30:30		0				
9	SLESP5005_3099	SLESP5005	2025-09-03 14:42:00	2025-09-09 12:07:14		0				
10	SLESP5005_3101	SLESP5005	2026-03-25 14:55:19	2026-03-25 14:58:39		0				
11	SLESP5005_3102	SLESP5005	2025-09-30 19:31:51	2025-09-30 19:32:39		0				
12	SLESP5005_3106	SLESP5005	2026-04-07 13:15:19	2026-04-07 13:17:54	0.161	13.289	26.577	4.266		
13	SLESP5005_3107	SLESP5005	2026-02-18 16:41:53	2026-02-18 16:49:49		0				
14	SLESP5005_3109	SLESP5005	2026-02-26 12:27:59	2026-02-26 12:28:14		0				
15	SLESP5005_3111	SLESP5005	2026-03-25 15:35:46	2026-03-25 15:37:18		0				
16	SLESP5005_3112	SLESP5005	2025-09-30 16:24:43	2025-09-30 16:28:34		0				
17	SLESP5005_3113	SLESP5005	2026-04-07 15:28:35	2026-04-07 15:29:21		0				
18	SLESP5005_3114	SLESP5005	2026-02-18 16:40:44	2026-02-18 16:41:15		0				
19	SLESP5005_3116	SLESP5005	2026-02-18 16:52:49	2026-02-18 16:57:53		0				
20	SLESP5005_3117	SLESP5005	2025-09-30 16:23:40	2025-09-30 16:24:42		0				
21	SLESP5005_3118	SLESP5005	2026-04-09 13:29:25	2026-04-09 13:29:53		0			76	76
22	SLESP5005_3119	SLESP5005	2026-04-07 13:19:57	2026-04-07 13:26:49	10.434	14.934	29.868	4.115		
23	SLESP5005_3123	SLESP5005	2026-04-09 14:01:36	2026-04-09 14:08:37		0			67	67
24	SLESP5005_3125	SLESP5005	2025-09-03 11:32:11	2025-09-03 11:32:23	0.007	3.687	7.373	4.273		
25	SLESP5005_3126	SLESP5005	2025-09-30 16:33:46	2025-09-30 16:36:13		0				
26	SLESP5005_3127	SLESP5005	2026-04-09 13:46:57	2026-04-09 13:47:24		0			75	75

Log Out

Sensor Stats | Scooter Stats | Project Summary

Visualization

Scooter ID: SLESP5005 | Trip ID: SLESP5005_3089

Accelerometer
 Gyroscope
 Magnetometer
 Orientation
 Humidity
 Illumination status
 Pressure
 Temperature
 Altitude
 Audio
 MillimeterWave
 Video

Plot | Download Charts

Download Meta data (.json)

Temperature

Time

Video frame rate: 10

Stats Tool - Filtering

Scooter Trip Data Dashboard [Project ID: 1]

Records per page:

Select Columns:

Trip ID
 Scooter ID
 Start Time
 End Time
 Trip Distance
 Avg Speed
 Max Speed
 Min Speed
 Battery Start
 Battery End

S. No.	Trip ID	Scooter ID	Start Time	End Time	Trip Distance	Avg Speed	Max Speed	Min Speed	Battery Start	Battery End
1	SLES001_1512	SLES001	2024-08-14 15:43:47	2024-08-14 15:48:20	0.052	4.321	8.6	0.062	100	100
2	SLES001_1523	SLES001	2024-08-30 19:52:14	2024-08-30 19:52:30	0.102	2.054	3.946	0.162		
3	SLES001_1525	SLES001	2024-09-11 18:17:38	2024-09-11 18:27:26	2.101	15.024	29.775	0.273	100	98
4	SLES001_1553	SLES001	2024-09-18 09:52:13	2024-09-18 10:03:27	1.645	14.735	29.301	0.169	64.124	56.869
5	SLES001_1653	SLES001	2024-09-16 18:23:35	2024-09-16 18:29:38	0.387	14.264	28.405	0.124	100	96.248
6	SLES001_1678	SLES001	2024-09-09 10:42:56	2024-09-09 13:08:23	0.012	21.876	23.293	20.459	36.745	75.621
7	SLES001_1684	SLES001	2024-08-25 19:36:02	2024-08-25 19:37:02	0.138	7.687	14.982	0.392	36.497	36.497
8	SLES001_1696	SLES001	2024-08-20 17:44:48	2024-08-20 17:51:43	1.736	14.365	28.69	0.04	44.869	44.745
9	SLES001_1705	SLES001	2024-08-30 19:30:24	2024-08-30 19:35:01	0.584	8.746	17.401	0.092	33.497	33.497
10	SLES001_1713	SLES001	2024-08-29 08:38:21	2024-08-29 08:47:22	1.822	11.65	23.239	0.062	42.869	37.524
11	SLES001_1760	SLES001	2024-08-23 22:20:00	2024-08-23 22:29:45	1.801	13.523	26.985	0.062	43.497	36.621
12	SLES001_1813	SLES001	2024-09-11 10:30:25	2024-09-11 10:43:01	1.732	13.858	27.226	0.491	67.373	58.373
13	SLES001_1884	SLES001	2024-09-17 10:30:41	2024-09-17 10:57:03	3.56	15.003	29.96	0.046	88.497	79.373
14	SLES001_1891	SLES001	2024-08-19 19:45:29	2024-08-19 19:53:14	1.506	10.056	20.071	0.04	49.621	47
15	SLES001_1929	SLES001	2024-08-21 18:52:37	2024-08-21 19:08:14	0.412	11.922	23.843	0.04	19.373	17.497
16	SLES001_1936	SLES001	2024-08-19	2024-08-19	0.166	7.607	13.601	0.416	48.869	48.869

Sensor Stats | Scooter Stats | Project Summary

Filters & Download [Project ID: 1]

Acc
 Max
 Hur
 Pre
 Alt
 Ma

Select Data to Include
13 attributes selected

Start Time: End Time:

Select Scooters

Temperature:

Pressure:
 Humidity:
 Light:
 Acceleration:
 Gyroscope:

Stats Tool - Data Download

Scooter Trip Data Dashboard [Project ID: 1]

Sensor Stats | Scooter Stats | Project Summary

Select Columns: Trip ID Scooter ID Start Time End Time Trip Distance Avg Speed Max Speed Min Speed Battery Start Battery End

Records per page: 100

S. No.	Trip ID	Scooter ID	Start Time	End Time	Trip Distance	Avg Speed	Max Speed	Min Speed	Battery Start	Battery End
1	SLES001_1512	SLES001	2024-08-14 15:43:47	2024-08-14 15:48:20	0.052	4.331	8.6	0.062	100	100
2	SLES001_1523	SLES001	2024-08-30 19:52:14	2024-08-30 19:52:30	0.102	2.054	3.946	0.162		
3	SLES001_1525	SLES001	2024-09-11 18:17:38	2024-09-11 18:27:26	2.101	15.024	29.775	0.273	100	98
4	SLES001_1553	SLES001	2024-09-18 09:52:13	2024-09-18 10:03:27	1.645	14.735	29.301	0.169	64.124	56.809
5	SLES001_1653	SLES001	2024-09-16 18:23:35	2024-09-16 18:29:38	0.387	14.264	28.405	0.124	100	96.248
6	SLES001_1678	SLES001	2024-09-09 10:42:56	2024-09-09 13:08:23	0.012	21.876	23.293	20.459	36.745	75.621
7	SLES001_1684	SLES001	2024-08-25 19:36:02	2024-08-25 19:37:02	0.138	7.687	14.982	0.392	36.497	36.497
8	SLES001_1696	SLES001	2024-08-20 17:44:48	2024-08-20 17:51:43	1.736	14.365	28.69	0.04	44.869	44.745
9	SLES001_1705	SLES001	2024-08-30 19:30:24	2024-08-30 19:35:01	0.584	8.746	17.401	0.092	33.497	33.497
10	SLES001_1713	SLES001	2024-08-29 08:38:21	2024-08-29 08:47:22	1.822	11.65	23.239	0.062	42.869	37.124
11	SLES001_1760	SLES001	2024-08-23 22:20:00	2024-08-23 22:29:45	1.801	13.523	26.985	0.062	43.497	36.621
12	SLES001_1813	SLES001	2024-09-11 10:30:25	2024-09-11 10:43:01	1.732	13.858	27.226	0.491	67.373	58.373
13	SLES001_1884	SLES001	2024-09-17 10:30:41	2024-09-17 10:57:03	3.56	15.003	29.96	0.046	88.497	79.373
14	SLES001_1891	SLES001	2024-08-19 19:45:29	2024-08-19 19:53:14	1.506	10.056	20.071	0.04	49.621	47
15	SLES001_1929	SLES001	2024-08-21 18:52:37	2024-08-21 19:08:14	0.412	11.922	23.843	0.04	19.373	17.497
16	SLES001_1939	SLES001	2024-08-19 19:24:59	2024-08-19 19:25:53	0.196	7.007	13.593	0.421	49.869	49.869

Filters & Download [Project ID: 1]

Download JSON | Download CSV

Select Data to Include (3 attributes selected) Select All

Location & Positioning

GPS (Latitude, Longitude, GPS Time)

Include Altitude

Include Track Angle

Motion Sensors

Orientation (Pitch, Roll, Yaw)

Accelerometer (X, Y, Z)

Gyroscope (X, Y, Z)

Magnetometer (X, Y, Z)

Environmental

Humidity

Pressure

Plot

TripSync Tool - Coming in Fall

The screenshot displays the TripSync Tool web interface. At the top, the browser address bar shows the URL `172.20.215.102/tripsync/`. The page title is "RAMP - TripSync Tool".

On the left side, there are two "Choose File" buttons for uploading data. The first is for a CSV file: `data-2025-09-03-12-31-23.360005-Scoter-SLE9002.csv`. The second is for an MP4 video file: `data-2025-09-03-12-31-23.360005-Scoter-SLE9002.mp4`. Below these is a "Fit map to trip" button and a status bar showing video details: "Video: 185.41s | Frame: 1656 | Unix: 1756820850 | Local: 9/3/2025, 12:34:09 PM | Δ to GPS: -0.39s".

Two line graphs are displayed: "Altitude vs Time" (y-axis: Altitude [ft], x-axis: Time) and "Interpolated BLE Speed vs Time" (y-axis: BLE Speed [ft/s], x-axis: Time). Both graphs show data points over a time period from approximately 12:34:00 to 12:35:00.

On the right side, a video player shows a street scene with a crosswalk, traffic lights, and a building. The video progress is at 2:45 / 6:37.

At the bottom, a map shows a blue route overlaid on a street grid. The route starts near the intersection of South Main Street and South Santa Rosa Street, moves east along South Santa Rosa Street, then north along Santa Rosa Street, and finally east along Santa Rosa Street towards the intersection with East Main Street.

TripSeg Tool - Coming in Fall

RAMP - TripSeg Tool

Upload Trip CSV: data-2025...E5002.csv

Video file: data-2025...5002.mp4

Segment Count:

Video: 162.0% | Frame: 1620 | Unix: 1759820846 | Local: 8/3/2025, 12:34:06 PM | Δ to GPS: 0.0%

ID	Start (Lat, Lon)	End (Lat, Lon)	Le
1	29.421522, -98.502713	29.421610, -98.502592	
2	29.421610, -98.502592	29.423733, -98.501873	
3	29.423733, -98.501873	29.423530, -98.499990	
4	29.423530, -98.499990	29.422940, -98.497237	
5	29.422940, -98.497237	29.424057, -98.495692	

Add Column

Column Name:

Type:

Orientation data

• Yaw • Pitch • Roll

Orientation

Time

Accelerometer data

• X • Y • Z

Accelerometer

Time

Legend: ● Start ● End ● Segment Split Point

Campus Rider Safety Analysis

“Is the current UTSA campus infrastructure ready for coexisting pedestrians and micromobility users?”

Why?

- Shared zones on campus create friction between pedestrians and scooter riders
- Near-miss events and conflicts are hard to quantify without spatial data
- Infrastructure decisions (signage, path widths, speeds) need evidence-based input
- ScooterLab’s testbed provides a controlled, real-world environment to study this

Existing: Cameras

RGB video from the standard ScooterLab sensor array

New: Low-cost LiDAR

An additional depth sensor was installed for this study to capture point cloud data

Study Area

UT San Antonio main campus

Campus Rider Safety Analysis

How RAMP enabled a pedestrian – micromobility conflict study on the UTSA campus



New Sensor Setup

- Choose an inexpensive LiDAR Sensor (LD19)
- Mount it on the scooter
- Sensor calibration

Data Collection

- Choosing routes
- Design data collection plan

Data Download

- Verify data using a pilot data collection
- Stats tool for quick verification
- Full data collection

Data Analysis

- Analyzing data using tables, plots, etc

Results

- Answers to the research questions

RAMP in Action

From field collection to research-ready data in three steps

Locate Trips on Map

Filter rides to UTSA campus area and target data collection dates. Visually confirm the scooter routes that pass through shared pedestrian zones.

Step 01



Preview Camera & LiDAR

Open individual trips to preview synced camera video and verify LiDAR data streams are present. Confirm data quality before committing to a full download.

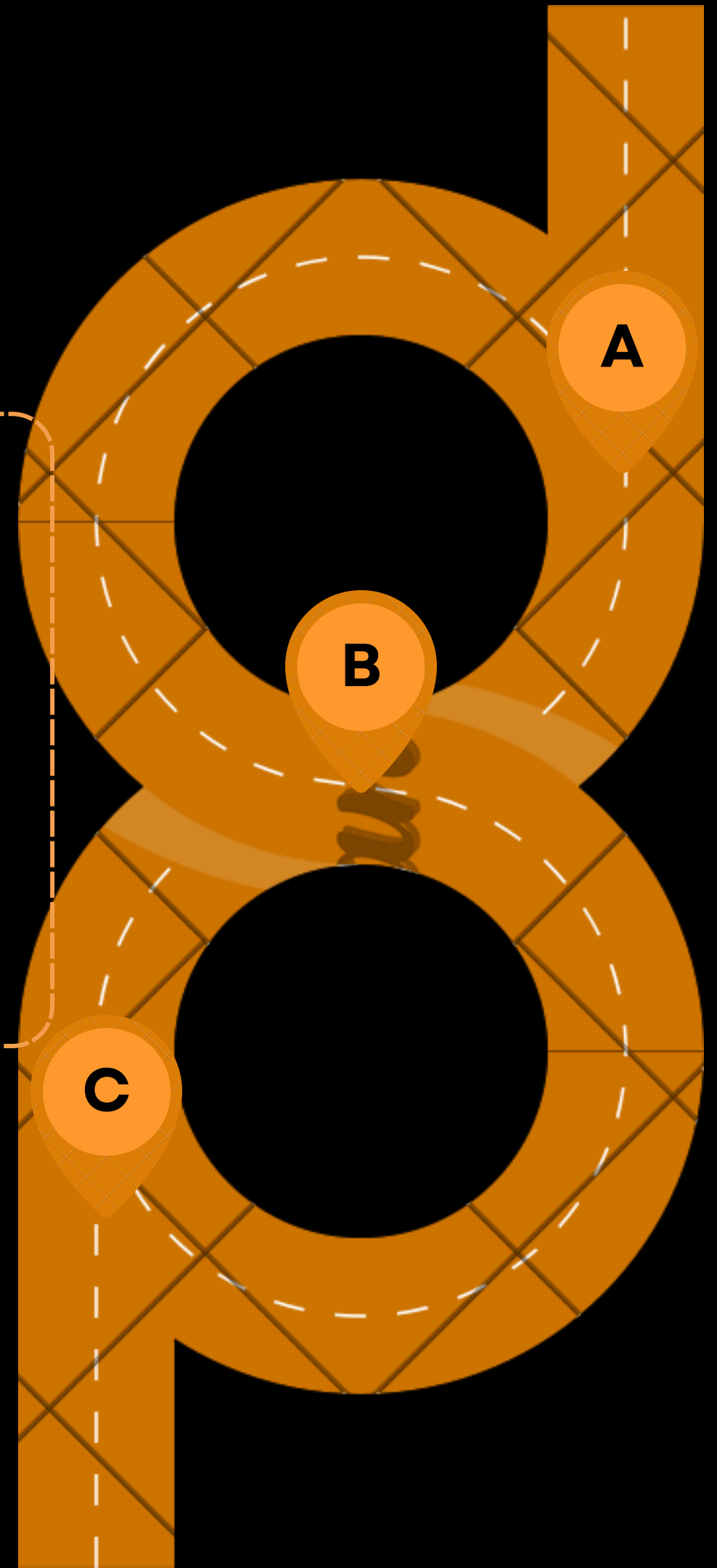
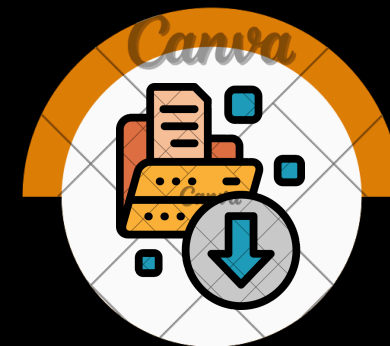
Step 02



Mass Data Download

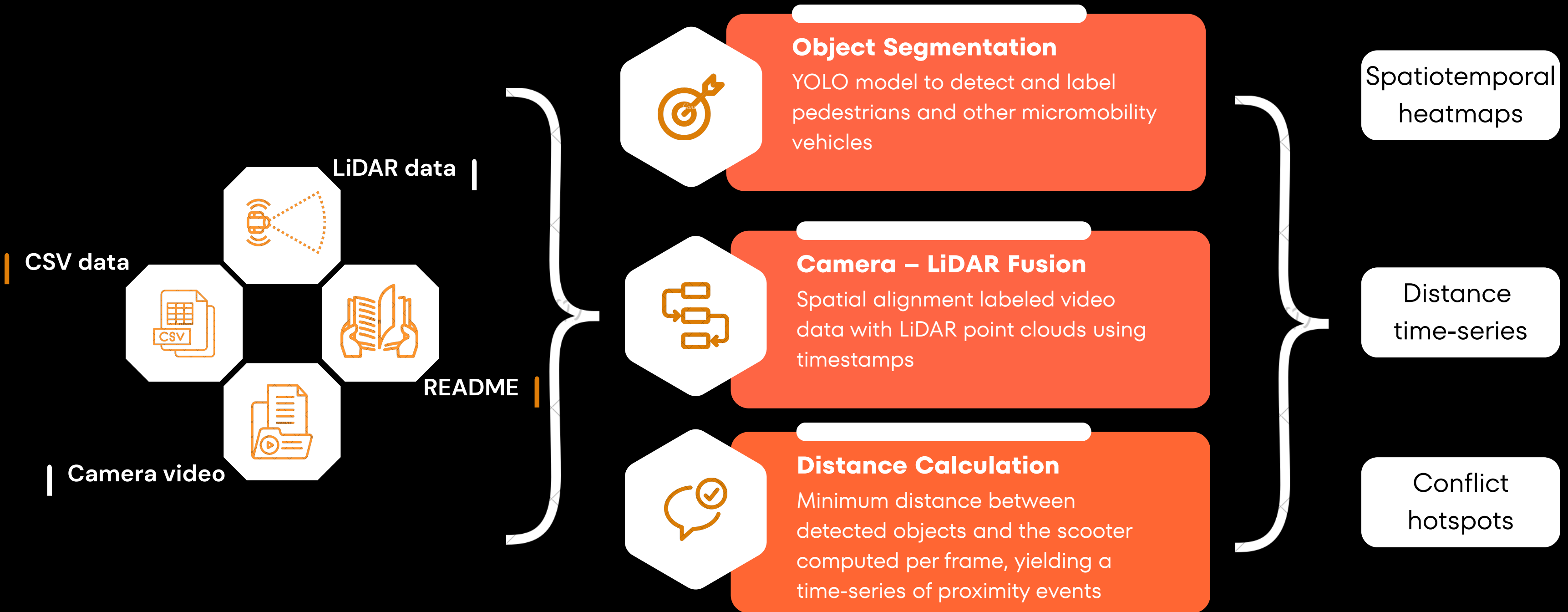
Select camera and LiDAR data streams only. Apply campus area filter. RAMP packages a ZIP with CSV metadata, video files, and LiDAR files, including a README.

Step 03

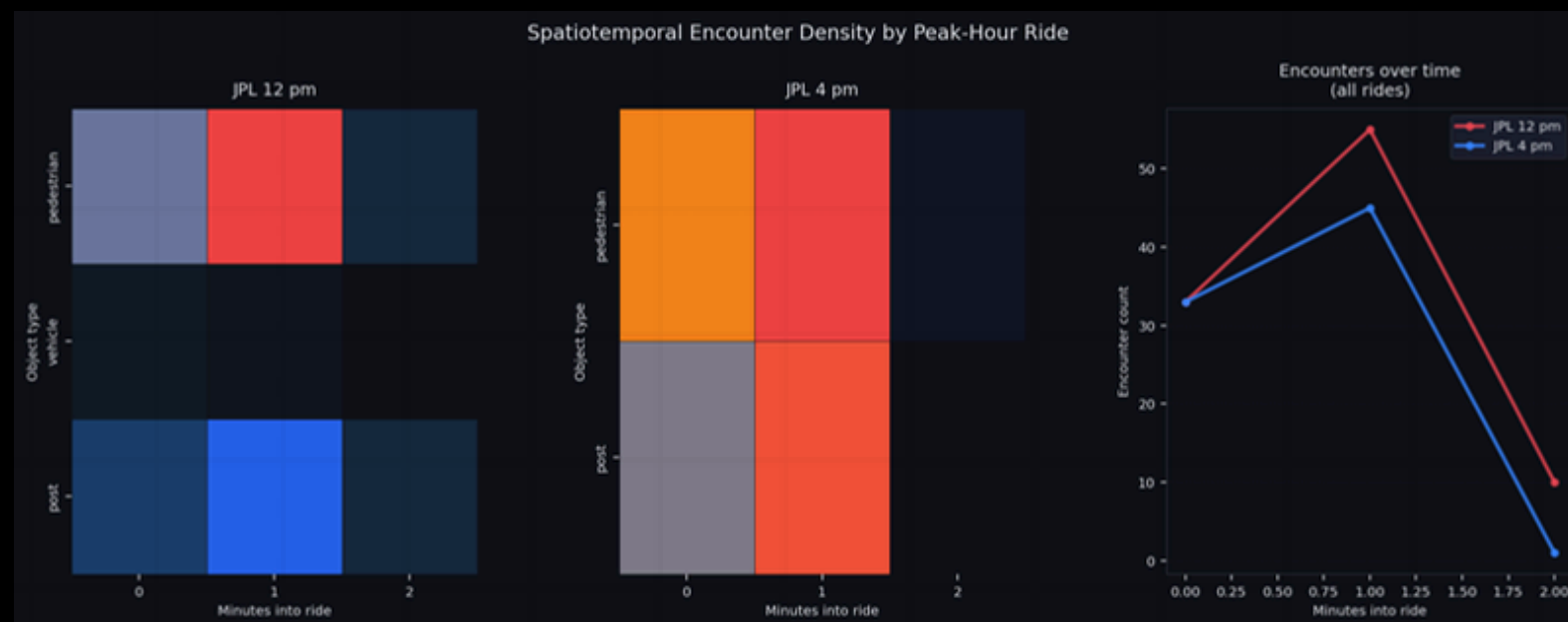
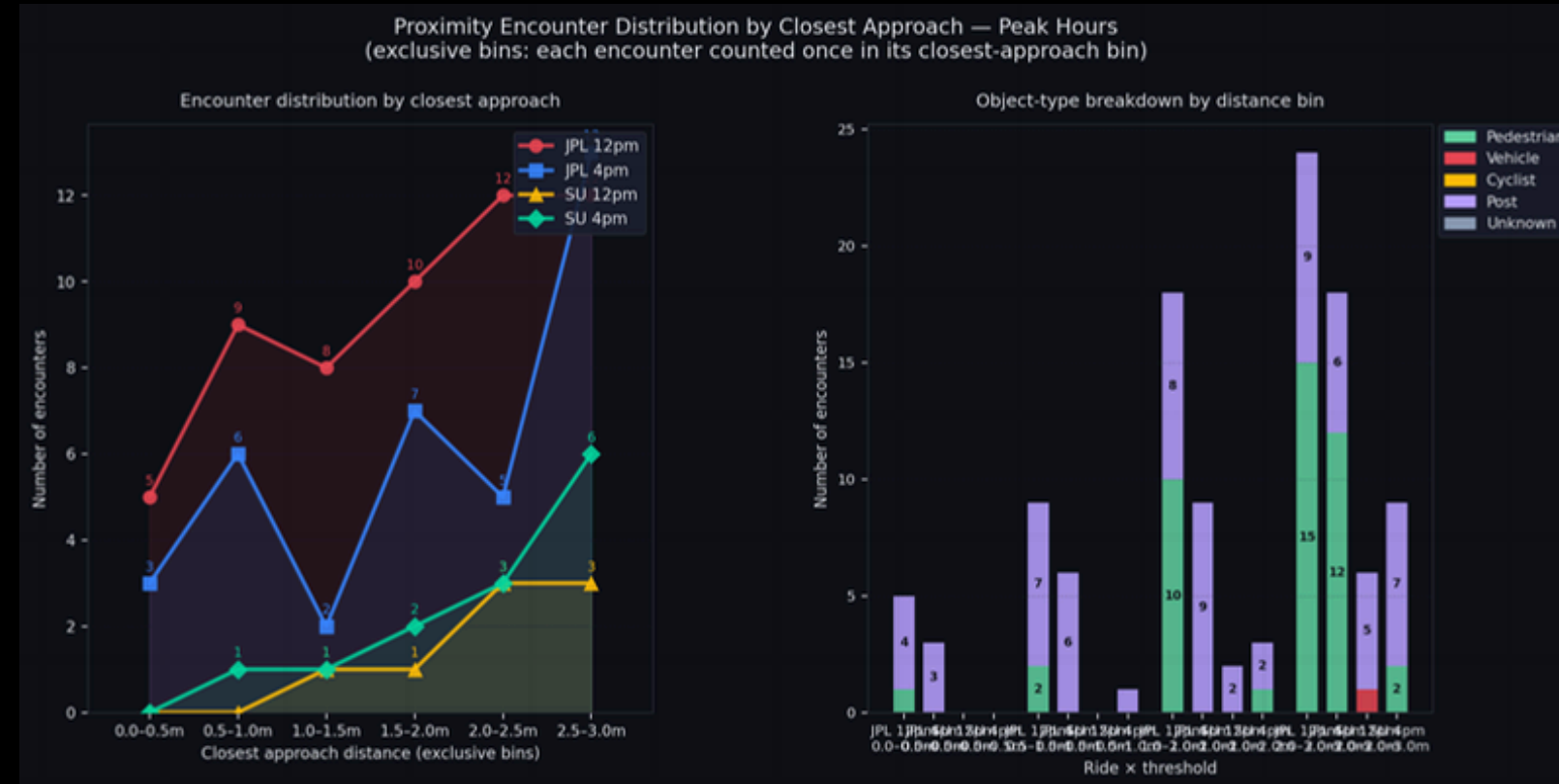
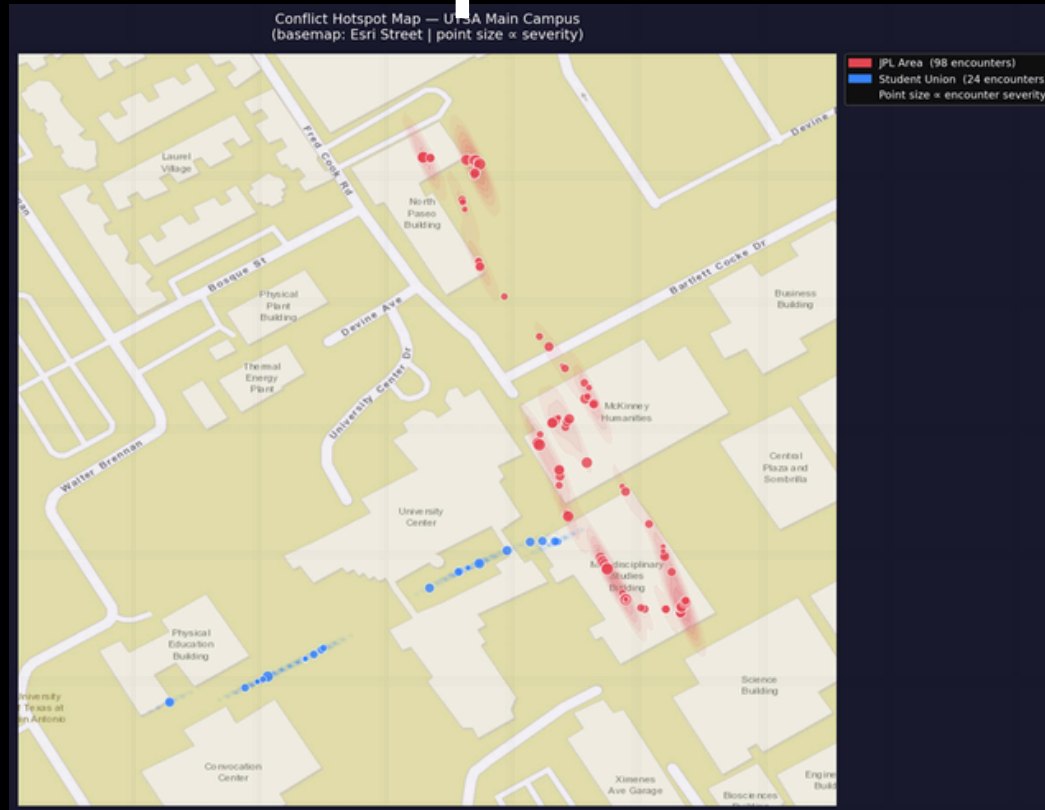


Analysis Pipeline

Python scripts applied to the RAMP data package



Analysis Pipeline



Results & What RAMP Made Possible

Expected Outcomes

- High-conflict hotspots identified near the student union and main building crossings, where scooters and pedestrians share paths
- Spatiotemporal heatmaps revealed peak conflict windows
- Micromobility-to-pedestrian proximity events were more frequent in zones without dedicated lane markings

What RAMP Enabled

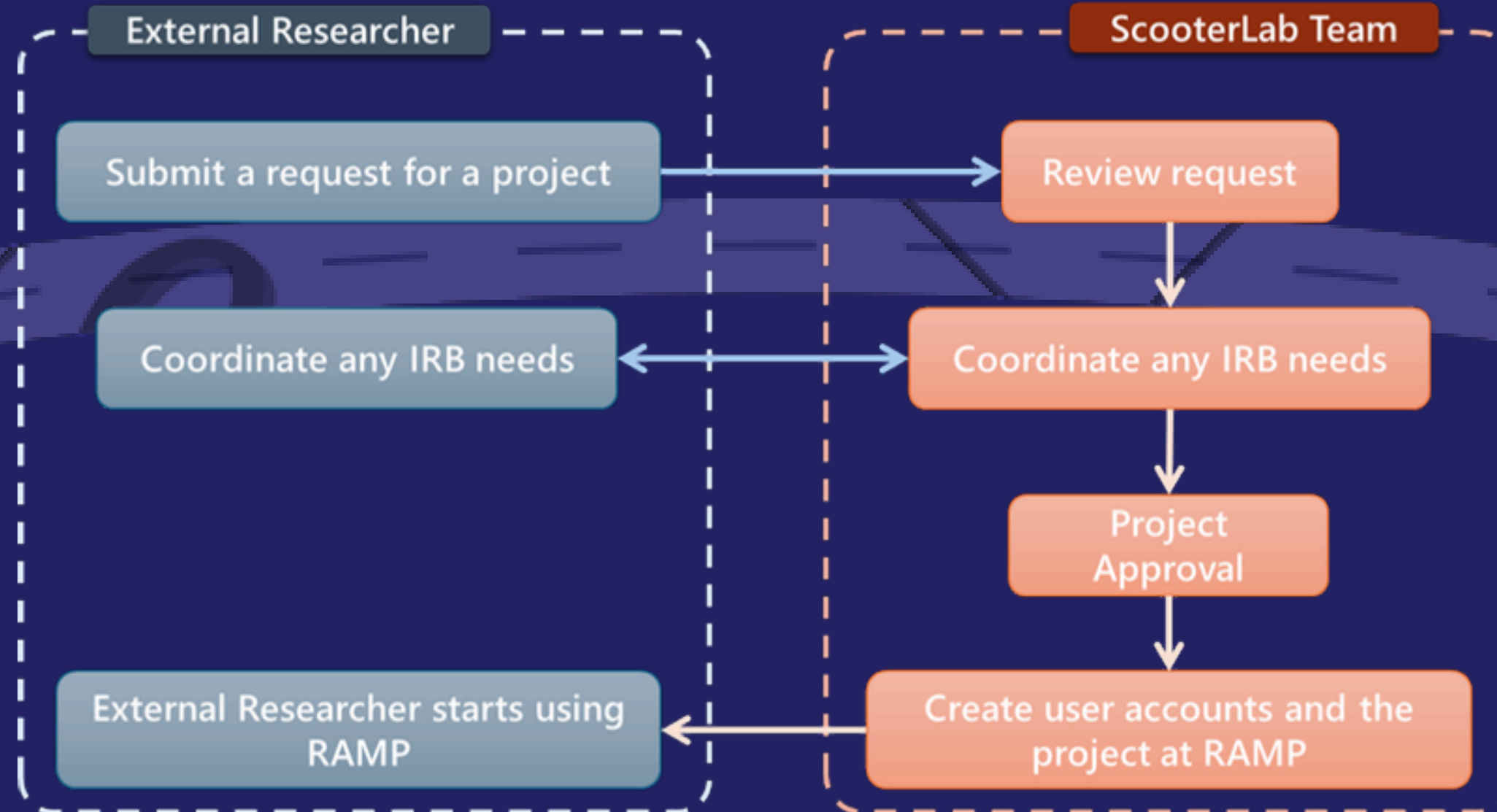
- **Find data:** Campus-area filter + mass download delivered the exact files needed, no manual digging through raw storage
- **Video preview:** In-browser playback confirmed data quality trip-by-trip before committing to the full download
- **Reproducible:** CSV structured data files made the Python analysis scripts easy to build and re-run for different campus zones

Get Involved with RAMP

Visit scooterlab.utsa.edu/forresearchers



- Project Title
- Research Objectives
- Proposed Use of the ScooterLab Platform
- Research Impact
- Timeline
- Technical Requirements
- Project Team



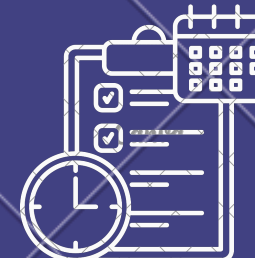
What's Next

Delivering on our roadmap and looking further ahead



In progress

- Launch TripSync and TripSeg tools
- Additional GeoJSON export formats
- Video & audio post-processing pipeline for sensor footage



Planned

- Compute Tool - let researchers leverage our 4x Nvidia L40S GPUs directly
- Expanded sensor integration from new testbed locations



Exploring

- API access for programmatic data retrieval
- Automated report generation from analysis runs

THANK YOU



Apply for a research collaboration



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