Tableau Public Hands-On: Traffic Accident Geospatial Hotspot Analysis

Objective

To use Tableau Public's web authoring features to create an interactive geospatial dashboard showing where traffic accidents occur most often, with filters by weather, road type, and time.

You Will Need

- A Google Account
- Access to Tableau Public website: https://public.tableau.com/app/discover
- A Google Sheet with your accident data (we'll create it together)

STEP 1 - Prepare Your Google Sheet

1. Open Google Sheets
    - Go to https://sheets.google.com
    - Click Blank Spreadsheet
2. Add headers in row 1:
   AccidentID | Date | Time | Latitude | Longitude | RoadType | Weather | Severity
3. Enter 20-25 sample rows.

   Example data: [Use Excel Sheet or Google sheets]
4. Rename the sheet tab (bottom-left corner) to "Accidents"
5. Click File -> Share -> Share with others

- Click "Copy link"
- Make sure access is "Anyone with the link" -> "Viewer"

Done! Your dataset is ready.

STEP 2 - Open Tableau Public (Web Authoring)

- Go to https://public.tableau.com
- Click Sign In (top-right corner)
- Sign in with your Google account
- Once inside, click Create -> Web Authoring (top-right button)
- A new blank Tableau web workbook opens.

STEP 3 - Connect Tableau to Google Sheets

- On the left side panel, click Google Sheets
- If prompted, click Sign in with Google
- Choose the account where your sheet is saved
- A list of your Google Sheets will appear
- Select your Traffic Accident sheet
- It will show a list of sheets/tabs - click the one named "Accidents"

Tableau loads the data in a preview grid. No need to do anything else here - Tableau auto-detects your columns.

STEP 4 - Create Your Geospatial Map

1. Go to the bottom and click "Sheet 1" (This opens a new worksheet.)

2. From the left-side Data panel:

- Drag Longitude to the Columns shelf (top area)
- Drag Latitude to the Rows shelf
- You'll see a world map appear.

3. If you only see one point:

- On top menu -> Analysis -> Uncheck Aggregate Measures
- Now each row (accident) becomes its own point.

4. On the left panel:

- Drag AccidentID to Marks -> Detail
- Drag Severity to Color

You should now see multiple colored points on the map.

5. Change from points to heatmap:

- On the Marks dropdown (small dropdown that says "Automatic" or "Circle"), click it -> choose Density
- Now you'll see red/orange heat zones where accidents cluster.

This is your geospatial hotspot visualization.

STEP 5 - Add Filters for Interactivity

You'll make the map filterable by RoadType, Weather, and Time.

1. Drag these fields one by one to the Filters shelf (top-right):

- RoadType
- Weather
- Time

2. For each:

- When filter window pops up -> select All -> click OK

3. Now, right-click each filter on the Filters shelf -> click Show Filter

Filters will appear on the right side of the map.

You can now select "Highway" or "Rain" and the map updates.

STEP 6 - Create Supporting Sheets

Sheet: "Accidents by RoadType"

- Click the New Sheet (+) at the bottom.
- From left side:
- Drag RoadType -> Rows
- Drag AccidentID -> Columns
- Click dropdown on SUM(AccidentID) -> choose Measure -> Count
- Click Show Me (top-right) -> choose Bar Chart
- Drag Severity -> Color (in Marks card)
- Click Sort icon (toolbar) to sort bars descending.

Shows most dangerous road types.

Sheet: "Accidents Over Time"

- Click New Sheet (+) again.
- Drag Date -> Columns
- Drag AccidentID -> Rows
- Convert AccidentID to Count
- In Show Me -> choose Line Chart

You now have a timeline of accidents.

Sheet: "Summary"

We'll create simple KPIs.

- New Sheet -> rename to Total Accidents
- Drag AccidentID -> Text (Marks card)
- Change aggregation to Count
- Click title and type: Total Accidents

Repeat this by duplicating:

- Right-click tab -> Duplicate Sheet
- Change data field to:
- AVG(Severity) -> rename title "Average Severity"
- Weather (most frequent) -> rename "Common Weather"

These will be your KPI cards.

STEP 7 - Build the Dashboard

- Click New Dashboard (+) at bottom.
- From left panel, drag:
- Total Accidents
- Average Severity
- Common Weather
  -> Place them at the top row horizontally.
- Drag your Map sheet below the KPIs (center).
- On right side of dashboard -> drag filters for RoadType, Weather, and Time.
- Below map, drag:
- Accidents Over Time
- Accidents by RoadType
- Arrange neatly.
- Add a Text box (left panel -> Objects -> Text) at the top: "Traffic Accident Geospatial Hotspot Analysis"

You now have a full, interactive dashboard.

STEP 8 - Apply Filters to All Sheets

So every chart updates together:

- On dashboard -> click small dropdown on each filter (triangle icon)
- Choose Apply to Worksheets -> All Using This Data Source

When you select "Rain," all visuals update - map, bars, line chart, KPIs.

STEP 9 - Format the Dashboard

- Click Map -> Map Layers -> enable:
  - Street Names
  - Country Borders
- From top -> Map -> Background -> Dark (for contrast)
- Format:
  - Titles in bold
  - Center text for KPIs
  - Resize sheets to fit nicely

STEP 10 - Publish Your Dashboard

- Top-left corner -> File -> Save to Tableau Public
- Give name: "Traffic Accident Geospatial Hotspot Analysis Dashboard"
- Click Save
- It will open in your browser -> shareable link generated.

You now have a publicly hosted, fully interactive geospatial dashboard.

What You've Learned

Concept	What You Did
Tableau Architecture	Used Tableau Public (Server + Data Engine on cloud)
Connecting Data	Linked Google Sheets as live data source
Geospatial Visualization	Plotted lat/long points on an interactive map
Hotspot Analysis	Used Density map for accident clusters

Concept	What You Did
Filtering & Interaction	Added multi-sheet filters, highlights, tooltips
Dashboarding	Combined map, charts, and KPIs
Publishing	Shared interactive dashboard via Tableau Public

Key Insights You Can Derive

- Hotspot Zones: Red clusters on map show accident-prone regions.
- Weather Impact: More severe accidents in rain/fog.
- Road Type: City streets see frequent but less severe accidents.
- Time Patterns: Morning and evening peaks.