

# Stage Two Codebook (Coding analysis):

Coding dimensions are CAPITALIZED, and corresponding specific codes are *italic*

- Group 1: Incident basic properties
  - Location
    - LOCATION\_COUNTRY: Country Code
      - Instruction: the country acronym where incident happens.
        - For detours: code both correct destination and false destination
        - For others: country in which failure occurred
    - LOCATION\_EXACT: Defined by bounding box or GPS coordinate
      - Instructions: Long, Lat, zoom factor
      - Example: @51.6758261,-4.7028566,15.07z
    - LOCATION\_TYPE:
      - *Urban*: go to Google map and check if there are man-made artifacts.
      - *Rural*: if not urban
  - DATE\_ARTICLE:
    - date of article
  - DATE\_EVENT:
    - date of event
  - SERIOUSNESS: Extent of Damage
    - *Major-death*: threat to life, death
    - *Major-injury*: injuries
    - *Medium*: car is damaged, also environment is damaged, but no threat to life, legal issue
    - *Low*:
      - loss time, no financial cost or causality
      - Low but potential risk to life:
        - Wrong way (but not crash)
        - Stranded for a long time but no injuries
  - INCIDENT: the description to the type of incidents
    - *Stranded*
      - Get stuck in the environment, can not move but no significant damages to car / passengers
      - E.g. stranded in mud/dirt road
    - *Detour*
      - Driver has to travel significantly additional mileage due to wrong route or wrong destination.

- Crash
    - Subtypes:
      - Crash with vehicle
      - Crash with pedestrian/bike
      - Crash with environments:
        - building/wall/guardrail: usually the objects crashed with when vehicles are on narrow lane
        - Overhead bridge: the intersecting bridge that is above the road
        - Barricade: used to temporarily block the road for construction etc.
        - Water: vehicles that are plunged into water, swamp etc.
        - Roundabout
        - Bridge: the supports of the bridge
  - Wrong way
    - As long as the case involves traveling on the wrong side of the road, regardless of crashes or not
  - Trespass
    - Went to illegal/inappropriate areas e.g. private properties, military properties, geopolitical boundary etc.
- Group 2: Environmental condition:
  - TIME\_OF\_DAY: Time of day
    - Morning/Afternoon (not dark)
    - Evening/night (not dark)
  - WEATHER:
    - No
      - No severe weather or weather is not mentioned
    - Extreme:
      - if severe weather are specifically mentioned in the articles. Including snow, rain, storm, heat. etc.
  - ROAD\_SURFACE:
    - paved road
      - e.g.: street, highway)
    - dirt road
      - e.g. sand road, mud road, gravel road
    - off road
      - e.g. beach
    - road for other transportation
      - e.g. railroad or railroad crossing
- Group 3: Driver/vehicle condition:
  - VEHICLE:
    - Motorcycle

- Car
  - Truck
  - Bus
  - SPV
- DRIVER\_AGE:
- DRIVER\_NAT\_LANG:
  - Yes: the driver speaks local language
  - No: otherwise
- LOCAL: Does the driver come from local area?
  - Yes: the driver come from local area
  - No: otherwise
- DISTRACTED:
  - Yes: the article specifically mentioned that
  - No: otherwise
- CAUSE\_GIS: the technological causes that is related to the incidents
  - Geocoding:
    - incorrect association between destination and its coordinates
  - Toponym disambiguation:
    - select a similar/same toponym but refers to another destination
  - Missing or incorrect attributes:
    - attributes associated with geometry are wrong
  - Missing or incorrect geographic objects:
    - the geometry of the spatial feature is wrong, or the geometry of the feature is missing
  - Cartography/instruction:
    - problem with the audio and video instructions, including timing, levels of details and other.
  - Incorrect routing preference:
    - shortest path v.s. fastest path
  - Other: \_\_\_\_\_
- PERSISTENT:
  - Yes: GPS catastrophic incidents has happened at the same place before.
  - No: otherwise