# State Auto Safe Driving Challenge

**Background:** We have the ability to record our insureds' actual driving behaviors through physical devices and mobile applications. Currently, we use these data for setting prices on our insurance policies; however, there is also an opportunity to use them to provide near-real-time feedback to our insureds about their own driving behaviors, and to encourage them to make safer driving decisions. In addition to reducing unsafe driving behaviors, we can provide additional rate transparency to insureds (e.g., "You had 5 hard brake events in this trip. This type of driving behavior can lead to higher rates") and empower them to proactively make positive driving choices. Additionally, we can integrate third-party data (ODPS crash data) to help our drivers stay safe: for example, "Did you know that you drive through 3 dangerous intersections each morning? Try taking this alternate route and earn a Starbucks gift card."

**Challenge:** Develop a web or mobile application that allows drivers to explore their own driving data and incentivizes them to improve their driving behaviors. The specifics of how you tackle this are up to you, but it should provide compelling and useful information to drivers, and be an application that our drivers are excited to use.

**What we will provide:**

- State Auto driving data
- Ohio Department of Public Safety crash data
- NOAA weather data
- Access to Mobikit's platform and APIs
- Access to State Auto data scientists and software engineers

**Judging criteria:**

- **Functionality:** Do all implemented features function? Does the application fulfill the tasks promised?
- **Customer Impact:** Is this an application that a customer will engage with? Is it useful to drivers?
- **Technicality:** What is the level of technical sophistication in the application architecture?
- **Innovation:** How creative are the solutions designed?
- **Design:** Does the application have a cohesive look and feel?

**What will we win?** Each member of the winning team will receive a $250 cash prize (up

to 4 people / $1000).

We are providing 7 days of commercial auto telematics data from mid 2018 for teams to use. They are available for download from an S3 bucket with the following authentication:

Access Key: AKIATLJVLC6JIOIKKU53
Secret Key: E4DOYbdfYKw7OD0XE0lVvwBnvXeRtiBzb2ULSnmr

Below is a sample code snippet for a typical access pattern using Python. I've also attached a data dictionary describing all of the provided data elements. This is also available to students within the S3 bucket.

```
import boto3

ACCESS_KEY = 'AKIATLJVLC6JIOIKKU53'

SECRET_KEY = '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'

def create_boto_resource(resource: str, region: str, access_key: str,

secret_key: str) -> boto3.resource:

resource = boto3.resource(
resource,
region_name=region,
aws_access_key_id=access_key,
aws_secret_access_key=secret_key
)

return resource

s3_resource = create_boto_resource(
resource='s3',
region='us-east-1',
access_key=ACCESS_KEY,
secret_key=SECRET_KEY
)
```

```
bucket = s3_resource.Bucket('sa-str-hack-ohio')

# list objects in bucket

for obj in bucket.objects.all():

print(obj)

# download a dataset

with open('octo-sample.csv', 'wb') as
data:

bucket.download_fileobj('OCTO-STATEAUTO-1280-TRIPP-20180603-010001-000.csv', data)
```

# File Format Specification: Trip Point (TRIPP) Data

The Trip Point data file is a daily file containing detailed information of all the trips, received by all the active devices associated to open vouchers, received the previous day.

It essentially represents the logging of the vehicle detected events. Each and all points are recorded when an “event” occurs. Some events are “synchronous” (ex., one point is recorded every second while the vehicle is being driven and every 24 hours when the vehicle is parked), while other events are “asynchronous” (e.g., one point is recorded when the vehicle’s ignition key is turned on, when it is turned off, and when certain threshold values of acceleration, speed, and heading variation are exceeded).

## File characteristics

- A body containing several records of details – typically one record per point/second
- Time stamps are read by the device from the closest GSM tower.
- Time zone is always set GMT.
- Filename format:
  - `OCTO-INSURANCE-CTRCTYPE-TRIPP-YYYYMMDD-HHMISS-nnn.csv`
    - `CTRCTYPE` = the unique number identifying the program
    - `YYYY` = Year
    - `MM` = Month
    - `DD` = Day
    - `HH` = Hour
    - `MI` = Minute
    - `SS` = Second
    - `nnn` = progressive number starting from 000
    - `.csv` = file extension
  - Example: `OCTO-INSURANCECO-1234-TRIPP-20161228-013000-000.csv`

## Body records

| Field Name | Type | Format/Unit | Required? | Note |
|---|---|---|---|---|
| IMEI | String | 15 char | Y | Device Serial Number/Code |

| | | | | |
|---|---|---|---|---|
| VIN | String | 17 char | Y | Vehicle Identification Number. If detected is shown with the record type 240. Otherwise is the VIN associated to voucher on the DB as provided by the insurance company. |
| ID_Voucher | Number | | Y | Voucher number on Octo |
| ID_Trip | Number | | Y | Unique trip ID |
| Timestamp_GMT | Timestamp | `yyyy-M-d HH:mm:ss` | Y | Observation timestamp (GMT) |
| Timezone | Number | [+-]ddd minutes from GMT | Y | Offset from GMT |
| Record_Type | Number | | Y | 240 — trip start<br>159 — trip segment<br>241 — trip end |
| Lat | Float | [-]ddd.dddddd | N | Latitude |
| Lon | Float | [-]ddd.dddddd | N | Longitude |
| Bearing | Number | [0, 359] | N | Degrees |
| Num_Sat | Number | | N | Number connected satellites |
| Fix | Number | | N | Fix |
| Average_X | Number | mg | N | Average raw accelerometer data X |
| Average_Y | Number | mg | N | Average raw accelerometer data Y |
| Average_Z | Number | mg | N | Average raw accelerometer data Z |
| Readings_X_List | Number | mg | N | Raw accelerometer data X |
| Readings_Y_List | Number | mg | N | Raw accelerometer data Y |
| Readings_Z_List | Number | mg | N | Raw accelerometer data Z |
| Average_Lon | Number | mg | N | Average calibrated accelerometer longitude |

| | | | | |
|---|---|---|---|---|
| Average_Lat | Number | mg | N | Average calibrated accelerometer latitude |
| Average_Ver | Number | mg | N | Average calibrated accelerometer vertical |
| Readings_Lon_List | Number | mg | N | Calibrated accelerometer longitude |
| Readings_Lat_List | Number | mg | N | Calibrated accelerometer latitude |
| Readings_Ver_List | Number | mg | N | Calibrated accelerometer vertical |
| Engine_Coolant_Temp | Number | Celsius | N | Coolant temperature |
| Engine_Rpm | Number | | N | Not present at trip start and trip end points |
| Speed | Number | Km/h | N | Not present at trip start and trip end points |
| Mafr | Float | Grams/Sec | N | Mass Air Flow Rate |
| Road_Type | Number | [1, 5] | N | 1 — Urban<br>2 — Suburban<br>3 — Highway<br>4 — Other<br>5 — Unknown |
| Road_Speed_Limit | Number | Km/h | N | Posted speed limit |