Loading the Data

BEAM can be configured to output an `events.csv` file for each iteration. For now, I just picked one for testing:

```
eventsCSV = "test/39.events.csv"
```

I then loaded the .csv file, Unfortunately, `read_csv` didn't get all the data types right, so I had to set them manually:

```
coltypes <- paste0("cdcdccdddd",
                   "cddddddddc",
                   "dcccdddddc",
                   "cdcccdldcc",
                   "cccddcddc",
                   "cccc"
                   )

fullEvents <- read_csv(eventsCSV, col_types = coltypes)
```

Then I selected a few columns of interest, and added a couple more:

```
eventCols <- c("person",
               "time",
               "type",
               "mode",
               "legMode",
               "vehicleType",
               "vehicle",
               "arrivalTime",
               "departureTime",
               "departTime",
               "length",
               "numPassengers",
               "actType",
               "personalVehicleAvailable"
               )
fullEvents %<>% relocate(eventCols)

events <- fullEvents %>% select(eventCols)
events %<>% mutate(
  travelTime = arrivalTime - departureTime,
  avgSpeed = length / travelTime
)
```

TODO: I'm working on code to read in various information from the rhFleet file like shift duration, etc., but haven't done that yet. That info can be important for stats like utilization (passengers/hour/vehicle). For now, I just took the actual values:

```
rhHours <- 80000/3600 #add code to read from the file
rhNum <- 12
```

I also loaded some stats from UTA On Demand's monthly reports (the data is available in a pdf, I created the csv):

```
UTAOD <- read_csv("test/UTAODpilotinfo.csv")
UTAOD %>% my_flextable()
```

Month	Avg wkday ridership	Utilization	Avg wait time
DEC	224	1.33	9
JAN	334	2.00	11
FEB	392	2.31	12
MAR	316	1.88	11
APR	275	1.52	10
MAY	105	0.07	8
JUN	162	1.10	9
JUL	155	1.10	9
AUG	193	1.50	12
SEP	214	1.60	12
OCT	200	1.70	13
NOV	169	1.70	13

Analysis

A good place to start is with the event types:

```
countEvents <- events %>%
  group_by(type) %>%
  summarize(n = n())
countEvents
```

```
## # A tibble: 12 x 2
##    type                    n
##    <chr>               <int>
##  1 actend              80348
##  2 actstart            80163
##  3 arrival             80163
##  4 departure           86162
##  5 LeavingParkingEvent 68019
##  6 ModeChoice          81239
##  7 ParkingEvent        68016
##  8 PathTraversal      536014
##  9 PersonEntersVehicle 158062
## 10 PersonLeavesVehicle 152060
## 11 Replanning            890
## 12 ReserveRideHail      1224
```

Many of these are self-explanatory, but here is what I've gathered so far:

- `actstart`/`actend` list the person, time, and type of event
- `arrival`/`departure` list the person, time, and "legmode"
    - `legmode` according to the BEAM documentation is the overall trip mode, either realized (`arrival`) or to be attempted (`departure`)
-