Charge & Rebalancing Auto-creation Experiment Plan

Author: Colin, Dounan, Ben
Reviewers: Julian, Dounan, Charlie, Pranav, ZZ
Rebalance Supporting Docs: Rebalance PRD, Subregion Constraint Mini-PRD, Rollout Tracker, Juicer Rebalance Auto-Creation Early Insights & Suggestions
Charge Supporting Docs: Getting Charge Task Creation Right

Charge Tasks

Summary

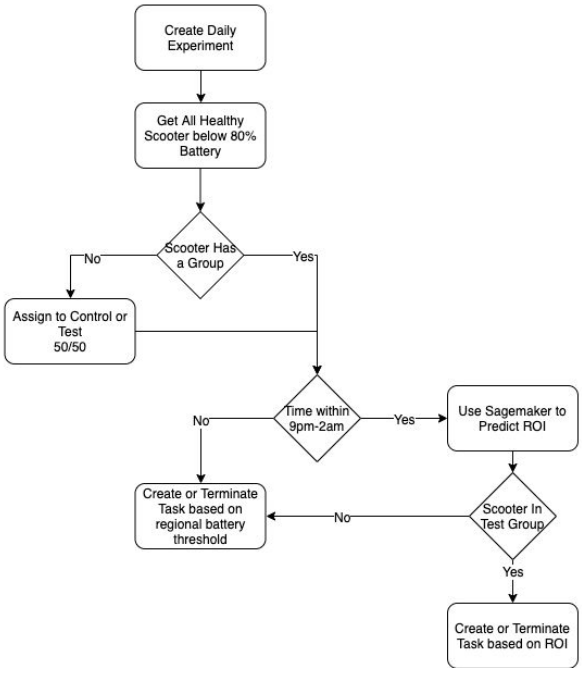
In mid-November, we made global cuts to battery thresholds that resulted in a decrease in charge tasks created by approximately **24%**. Total cost as a percentage of revenue decreased by **10%.** This cut was fixed at a market-wide battery threshold (ie all scooters @ 25%).

We also built a model that looks at the DSRVD of scooters if no task is created and compares it to whether a charge task was completed and created. If moving the scooter had a higher DSRVD - cost of move than leaving it where it was, a charge task would get created.

Experiment Plan

Auto-creation will be tested using a daily A/B randomized test created nightly. We limit the experiment to tasks created in the nighttime (9pm-2am).

Charge Task nightly randomization logic:



50-50 split for control/test groups
Testing period: 3 weeks

Global Go Live Metrics

- Stat sig positive impact on profitability in the experiment group
- Juicer charge cost per trip change < operating costs per trip change
    - Operating costs are defined here.

Metrics to Monitor

- Primary
    - Juicer Cost as % of revenue
    - Revenue generated per Juicer charge task
    - Trips per Charge
- Secondary
    - % Trip starts <40% battery
    - Collected battery level 95% percentile
    - Charge Task Collection Rate
    - Total Available Charge Tasks
    - OOW decay rate

Rebalance Tasks

Summary

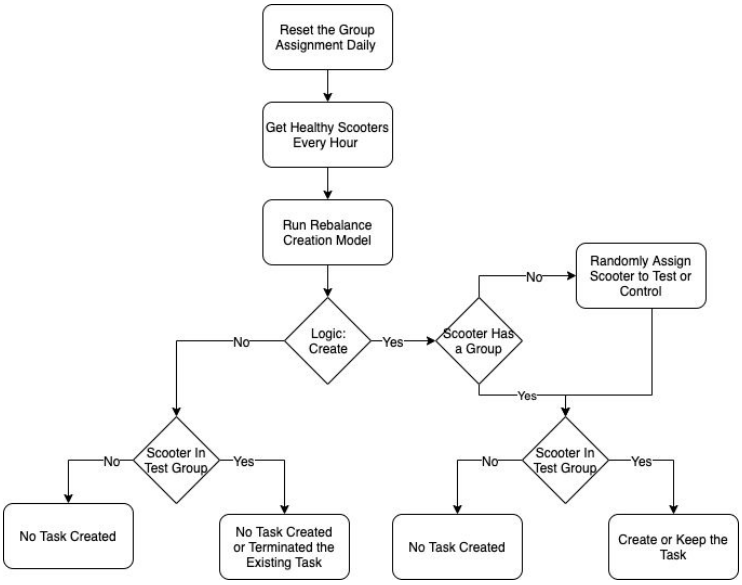
We rolled out rebalancing v1 auto-creation logic in late-October. This logic took the bottom 10% of DSTVD scooters and then created move tasks on them every hour. Initially, the test was neutral to slightly positive in areas with no subregional equity zones constraints **(0 to 10%)** gain in net DSRVD. For markets that had equity zone constraints, the results were negative **(-20%).**

The experiment was at a scooter level where 70% of the scooters in the bottom 10% of DSRVD had a task created and the remain 30% did not have a task created.

V2 auto-creation logic instead looks at each task as well as what hotspots are available. It compares the DSRVD of the scooter plus the cost of transporting the scooter to the DSRVD of hotspots available.

Experiment Plan

Auto-creation will be tested using a daily A/B randomized test. The model will run and determine whether a rebalance task should be created. If the model determines whether a task should or should not be created based on the comparison in DSRVD at the 2 locations + cost of rebalancing. Map here.



Split is 30% Control, 70% Test

Note, a key component to this experiment is whether ops has visibility to complete the tasks. If a scooter is in the experiment group and is rebalanced by ops and has a positive impact on DSRVD, the cost component is not measured. Therefore for all of the test markets, we will need to instruct ops to not complete these tasks.

Global Go Live Metrics

- Stat sig positive gain of experiment group compared to control group
- Stat-sig positive impact to net DSRVD
- Increase in Juicer rebalance cost per trip < operating costs per trip
    - Note, if equity zone markets are not profitable, we will exclude from GA rollout

Rollout Plan

We will split regions into four groups for the experiment:

- 8-10 markets will test charge task auto-creation **(Week of 12/9)**
- 8-10 markets will test rebalance task auto-creation **(Week of 12/16)**
- All other regions will be unchanged until global testing.

Market Selection

We want to make sure we have adequate diversity to see how both models perform across various market subtypes. Each group will need at least 2 of the following categories:

- High TVD (3+)
- Low TVD (<2)

- GR constrained equity zones
- No campus markets (out for winter break)

Charge Task Only	Rebalance Only	Category
Austin	Charlotte	Equity Zone
Santiago	~~Tel Aviv~~	Equity Zone
Indianapolis	Hamburg	Low TVD
Dallas	Malmo	Low TVD
Brisbane	Oakland (On Hold)	High TVD
Berlin	Cincinnati	High TVD
Dresden	Lexington	Random
Madrid	Poznan	Random
OKC	Salt Lake City	Random
*Tel Aviv	*Lisbon	

*Switching Tel Aviv from rebalancing to Charge Task

Rollout Item	Due Date	Task Type	Status
Select markets	12/6	All	In Progress
Expected budget	12/6	Rebalance	
Share experiment plan & go/no-go logic with Wayne	12/10	All	
Turn off ops visibility of auto-created rebalance tasks	12/11	Rebalance	
Complete charge task experiment dashboard	12/12	Charge	
Go Live with Charge Task Experiment Markets	12/12	Charge	
Go Live with Rebalance Task + Combined Experiment Markets	12/19	All	

Charge Task Experiment Readout	1/6	Charge	
Rebalance Experiment Readout	1/6	Rebalance	

Appendix

Current Markets Live:

Manual Rebalance Task Creation

- Washington DC
- Baltimore
- Atlanta
- Portland
- Phoenix

V1 Automated Rebalance Task Creation

- ~~Austin~~ (Model results)
- ~~Auckland~~ (Market Closure)
- Christchurch
- Miami
- Budapest