Ride-hailing services are two-sided markets managed by a platform. A defining feature is decentralization: drivers are self-interested and make strategic decisions on whether to join and where to route themselves in the network. Our research is mostly motivated by the demand imbalances across the geographically dispersed network. We study how platform controls can tackle these challenges and improve system performance.

Our analysis of the NYC taxi trip data shows significant traffic flow imbalances throughout the day. For example, during the morning and evening rush hours, flows from uptown to midtown and flows in the opposite direction can be as different as 10 times. We create a web app to showcase the NYC taxi data: https://bit.ly/2y3i1ng

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Model Formulation
- We study a fluid model of a two-location network in steady state
- Platform can do demand-side admission control and supply-side repositioning control
- Drivers trade off queuing delay & driving cost by choosing repositioning probabilities
- Drivers with lower outside opportunity cost participate in the system

Takeaways: Value of Platform Controls
- More efficient use of transportation capacity
- Strategic rejection of demand may increase overall value
- Value increases with demand imbalances
- Drivers and riders benefit under normal market conditions

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