

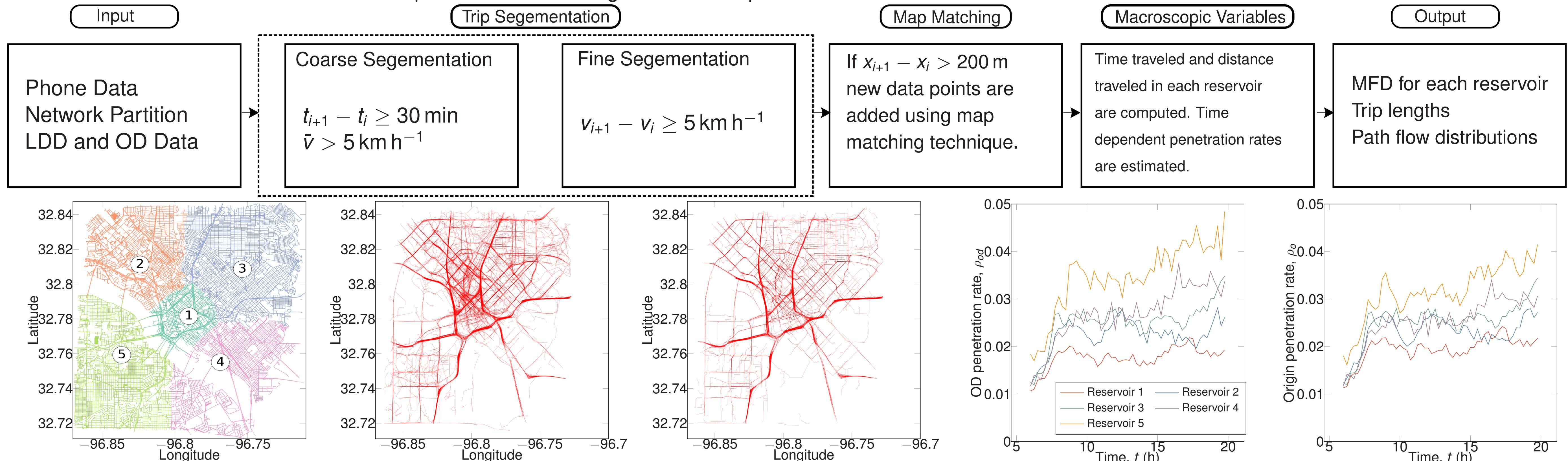
# Calibration of MFD Models using Mobile Phone Data

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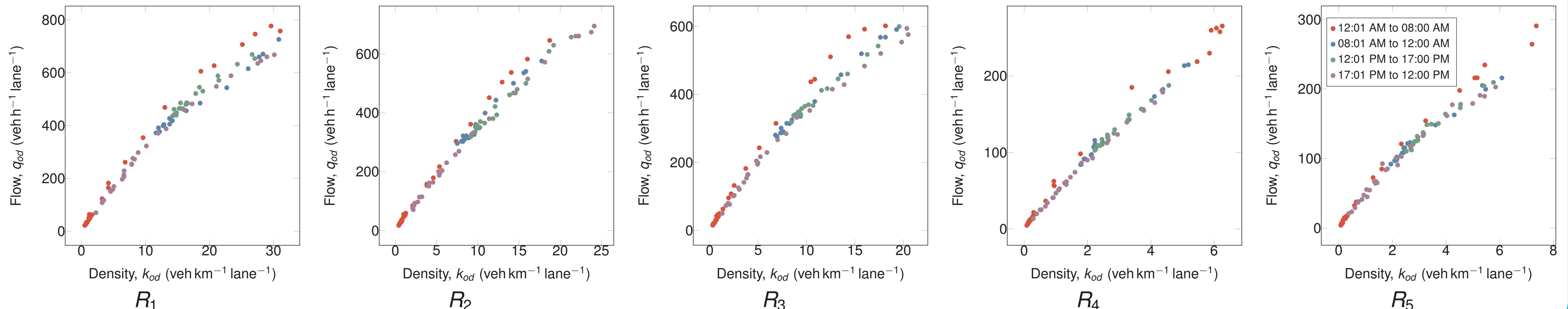
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## Objectives & Framework

In this paper, a methodological framework to calibrate MFD models based on the Location Based Services (LBS) data is proposed for the city of Dallas, TX. The LBS data is complemented by Loop Detector Data (LDD) and OD matrix data from the Dallas city council (NCTCOG). Given the partition of the urban network, the present framework yields MFDs, major regional paths and their corresponding trip length distributions, time dependent path flow distributions. In addition, it is possible to verify how far the network is from UE or BRUE equilibrium states using this massive phone data.



## Calibrated Flow MFDs using OD penetration rates

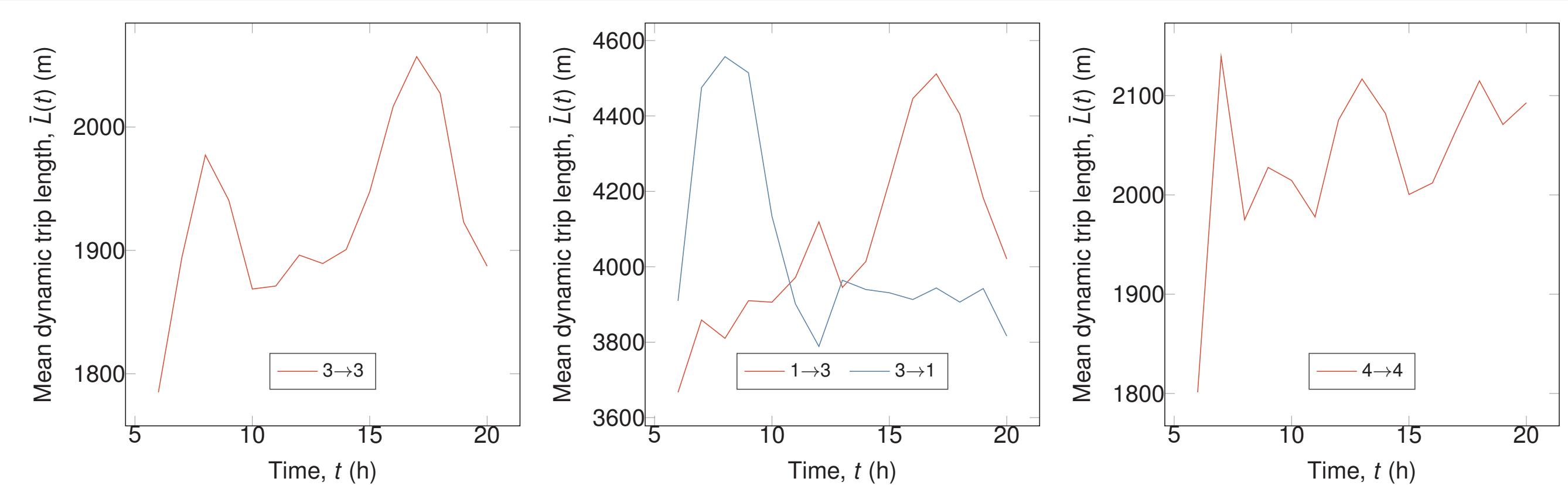


## Static Trip Length Analysis

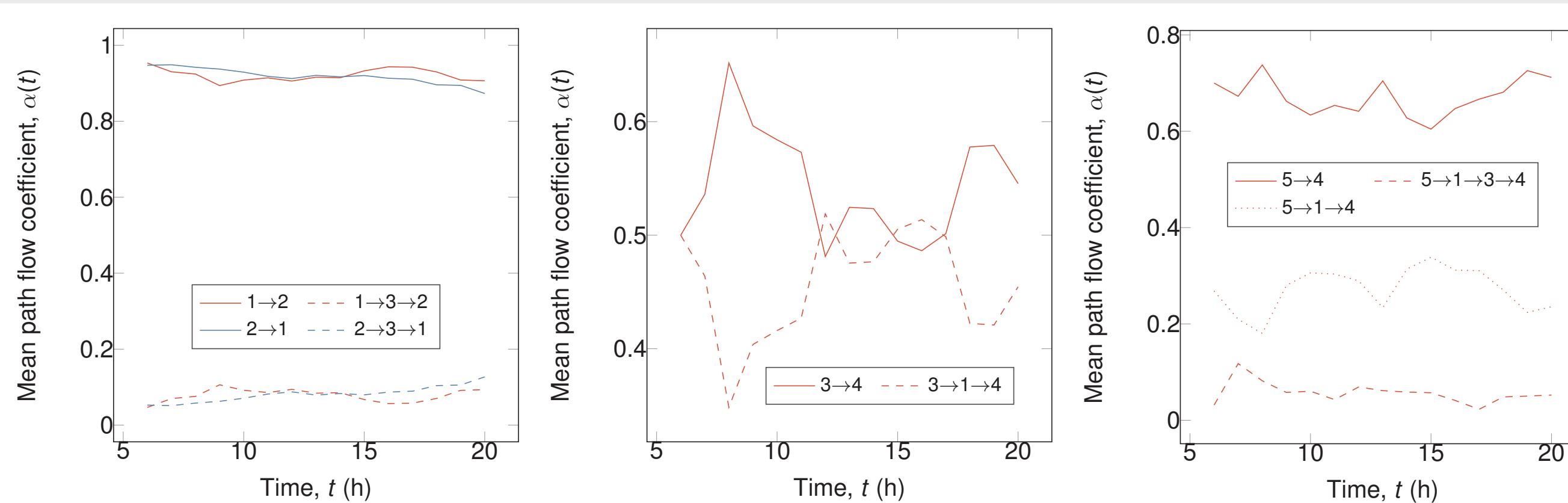
Macro-path	Avg. length per reservoir (m)	Avg. length per macro-path (m)	Rel. difference in total length
1 → 1	{1957}	{1366}	0.4331
1 → 3	{1957, 2125}	{1736, 2339}	0.001
3 → 1 → 5	{2125, 1957, 2742}	{2815, 4581, 3499}	0.3736
4 → 1 → 2	{2580, 1957, 2178}	{2961, 4546, 3138}	0.3692

Average trip lengths for selected macro-paths using constant trip length per reservoir and trip lengths estimated per macro-path.

## Dynamic Trip Length Analysis



## Dynamic Path Flow Distributions



## Conclusions

The contributions of the present framework using the Mobile Phone Data are the estimation of trip lengths and path flow distributions, which are otherwise very difficult to estimate with other types of data sources. Firstly, MFDs are calibrated using time dependent penetration rates. Realistic major macro-paths between the reservoirs can be extracted using the phone data. In addition, their distribution of lengths, confidence intervals and dynamic evolution of lengths are estimated. Path flow distributions and UE gaps, which are not observable in the reality, are also estimated.

## Acknowledgements

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