

Communicating Uncertainty in Public Transport: Melbourne and Mumbai

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An Indian-Australian research partnership



Research questions

- Can we build visualisations of uncertainty distribution (specifically, public transport arrival time) that **people understand**?
- More specifically, our study investigated whether a particular **visualisation of uncertainty** information in arrival and departure times enabled commuters **make transfers with ease**.



Constraints

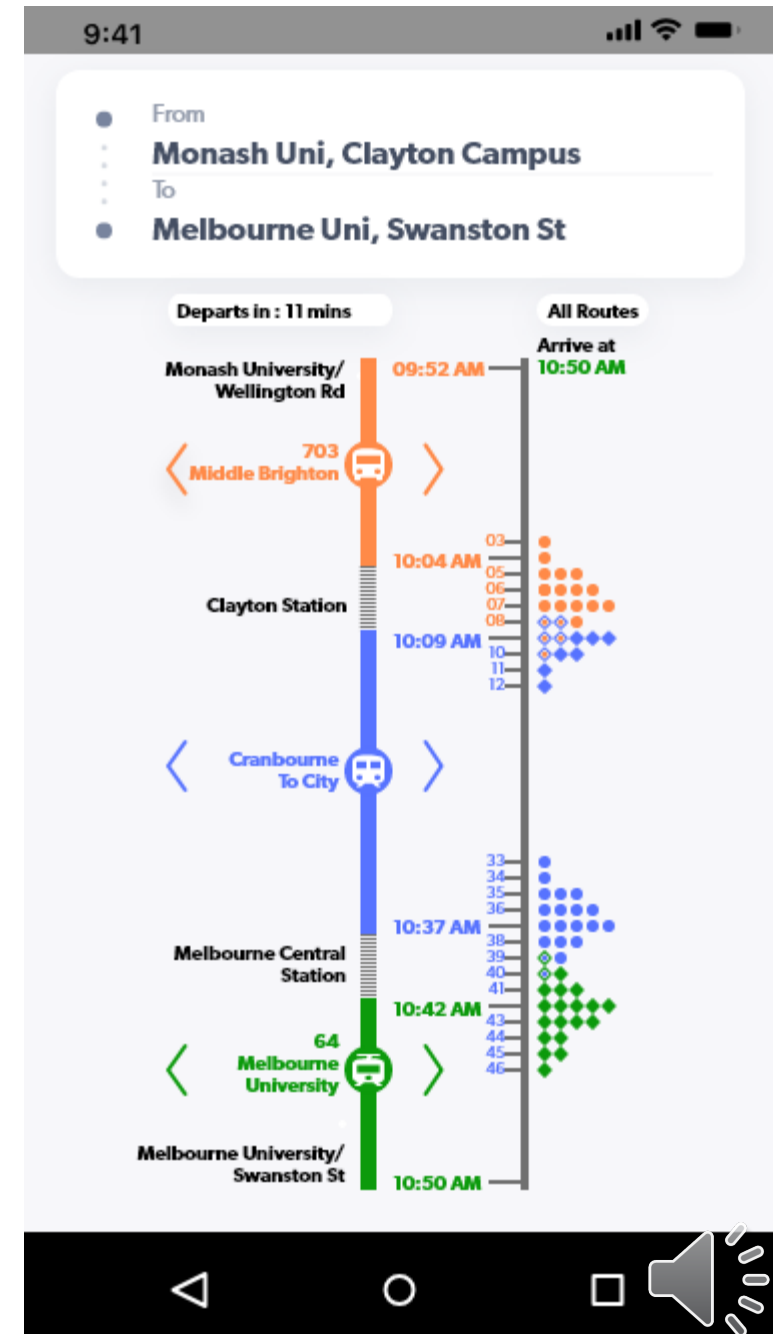
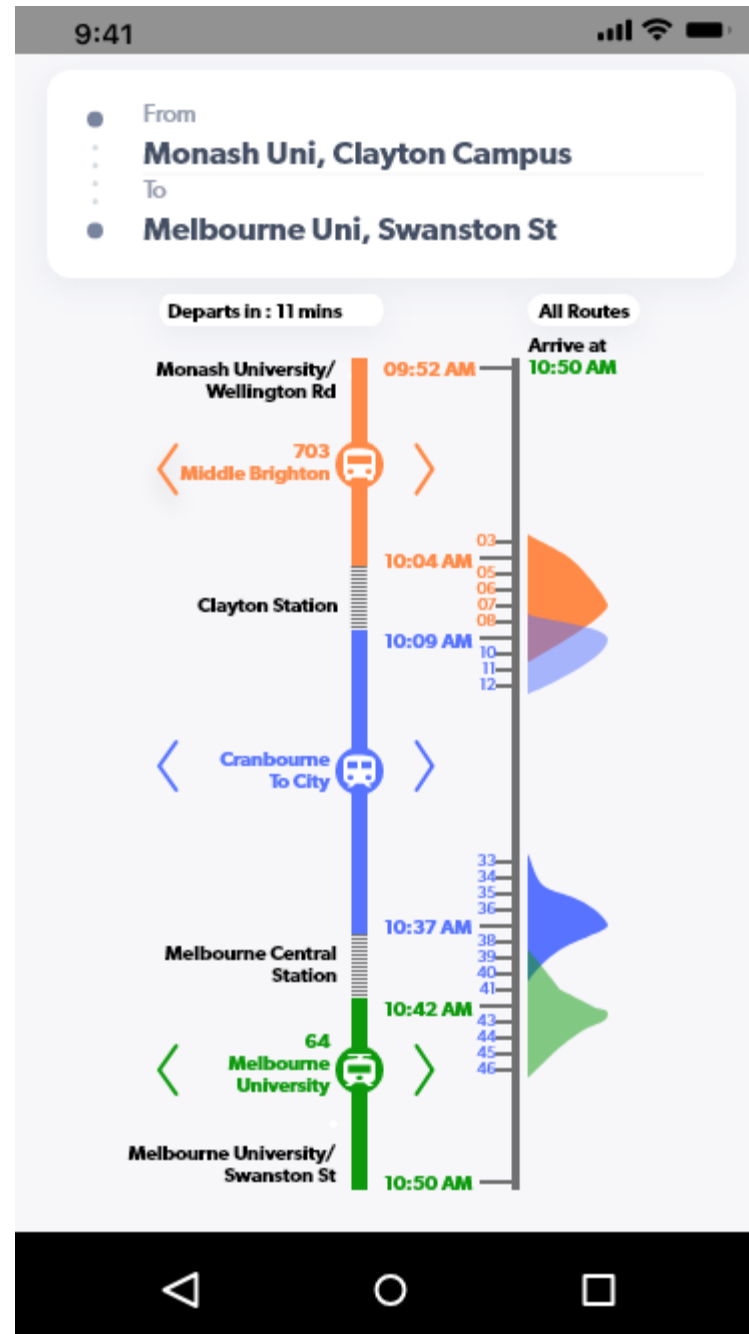
- People's understanding of uncertainty / probability.
- Small screen of mobile.
- Decision on the go.



Quantile Dot Plots & Density Plots

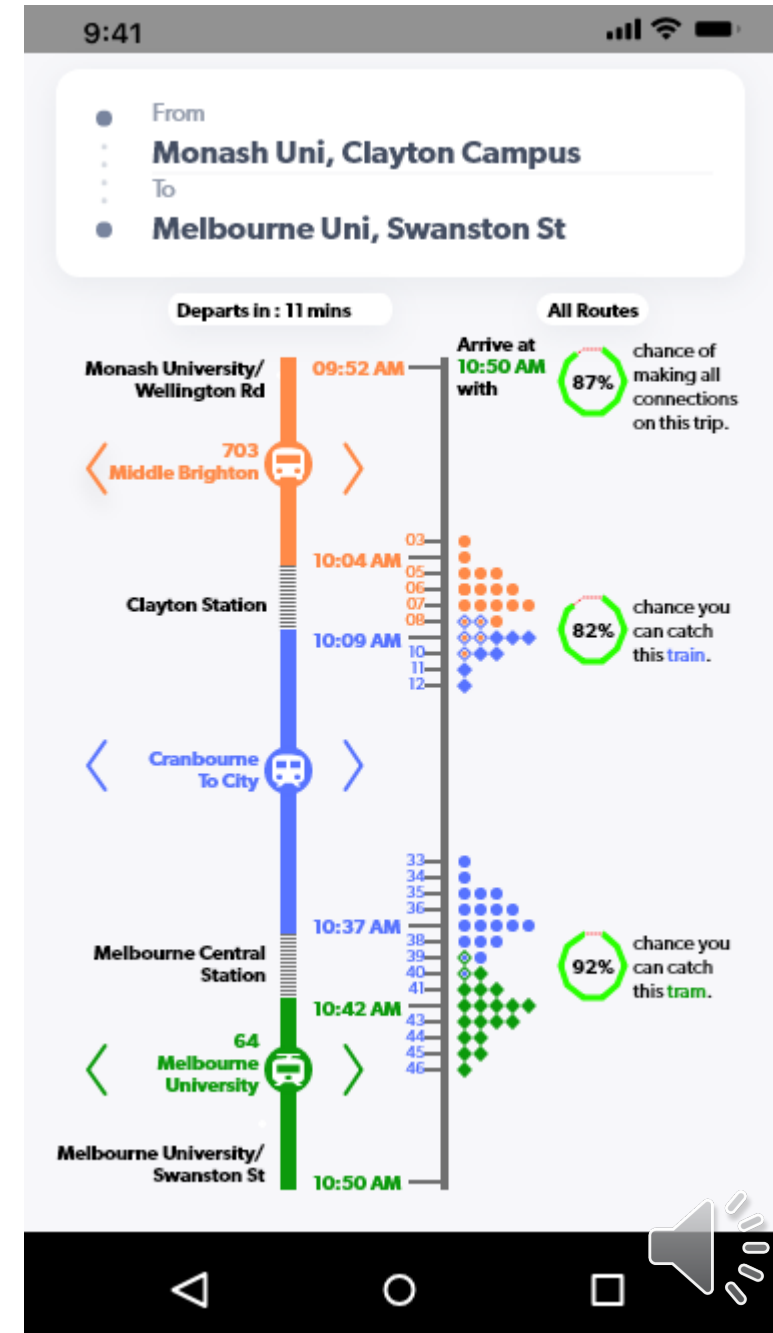
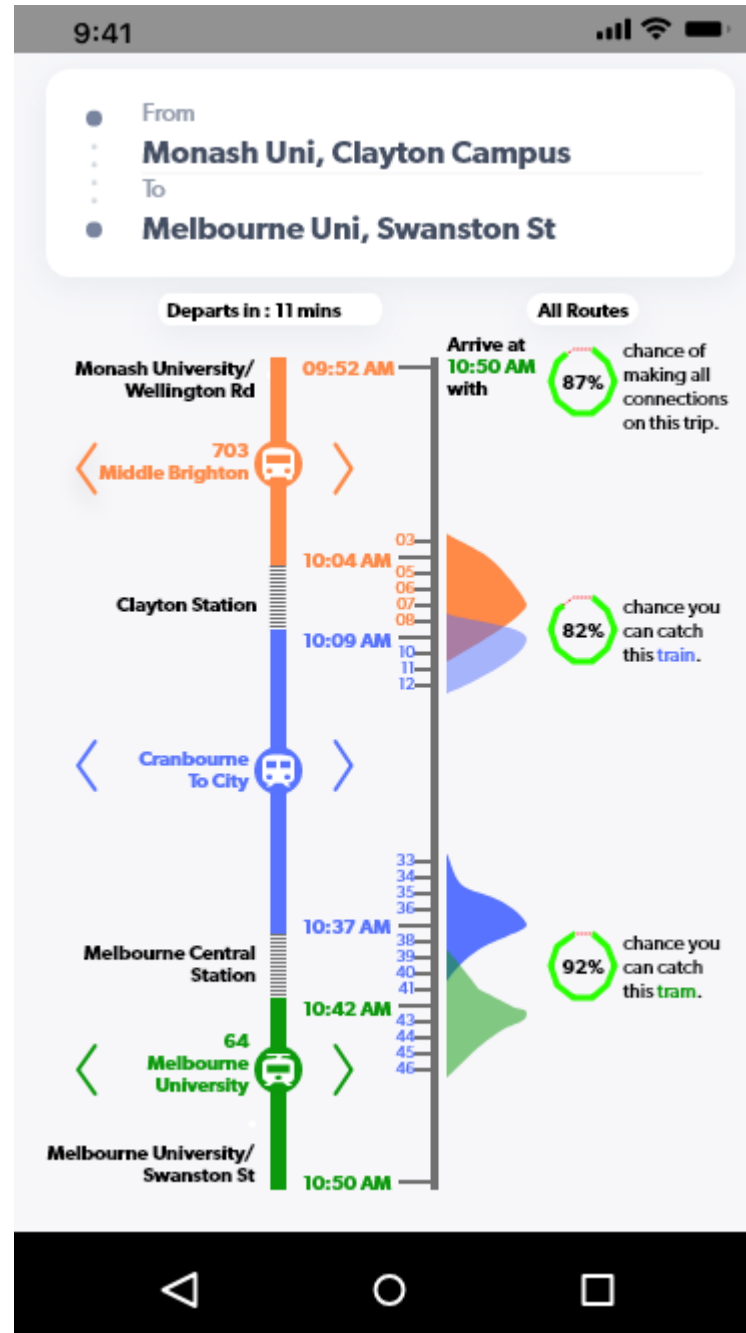
- Discrete Vs Continuous
- Numeracy Ability Vs Spatial Ability

- **Quantile Dot Plots:** Kay, Matthew, et al. "When (ish) is my bus?: User-centered visualizations of uncertainty in everyday, mobile predictive systems." *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 2016.



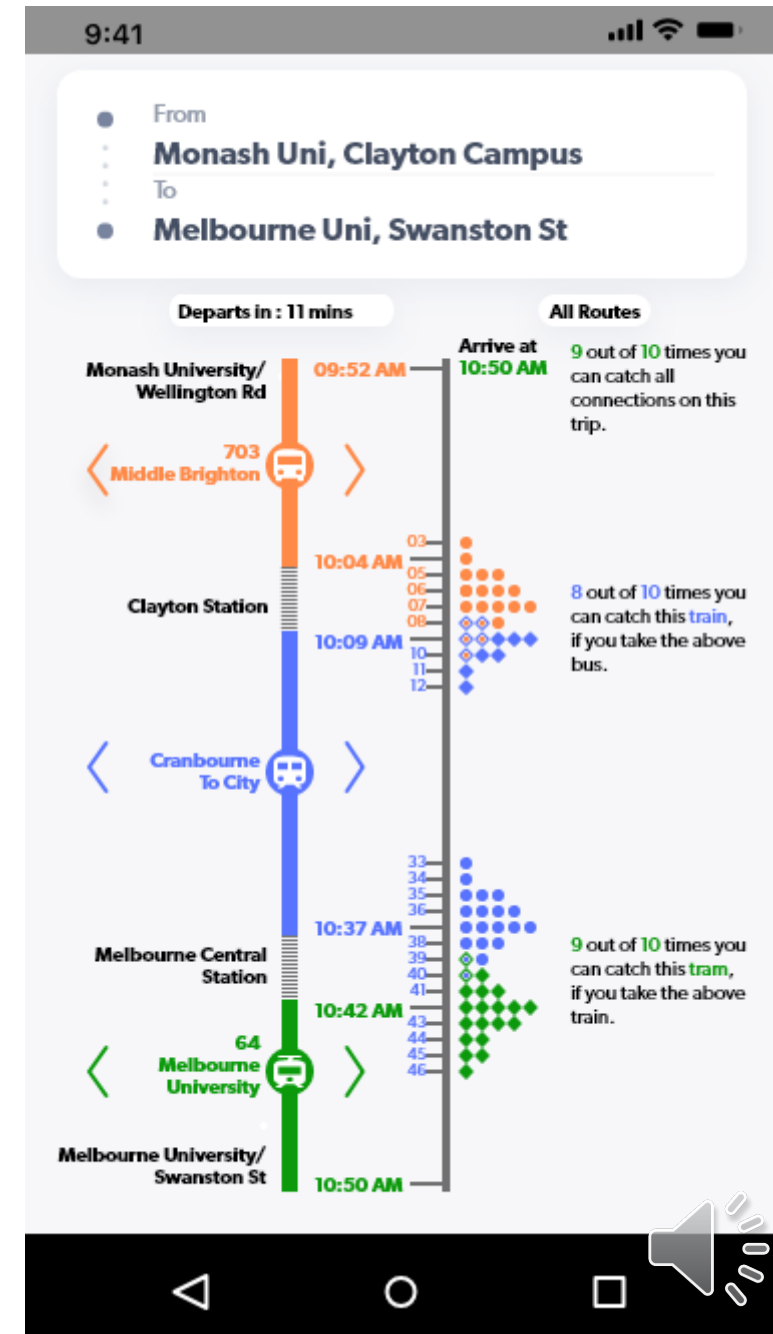
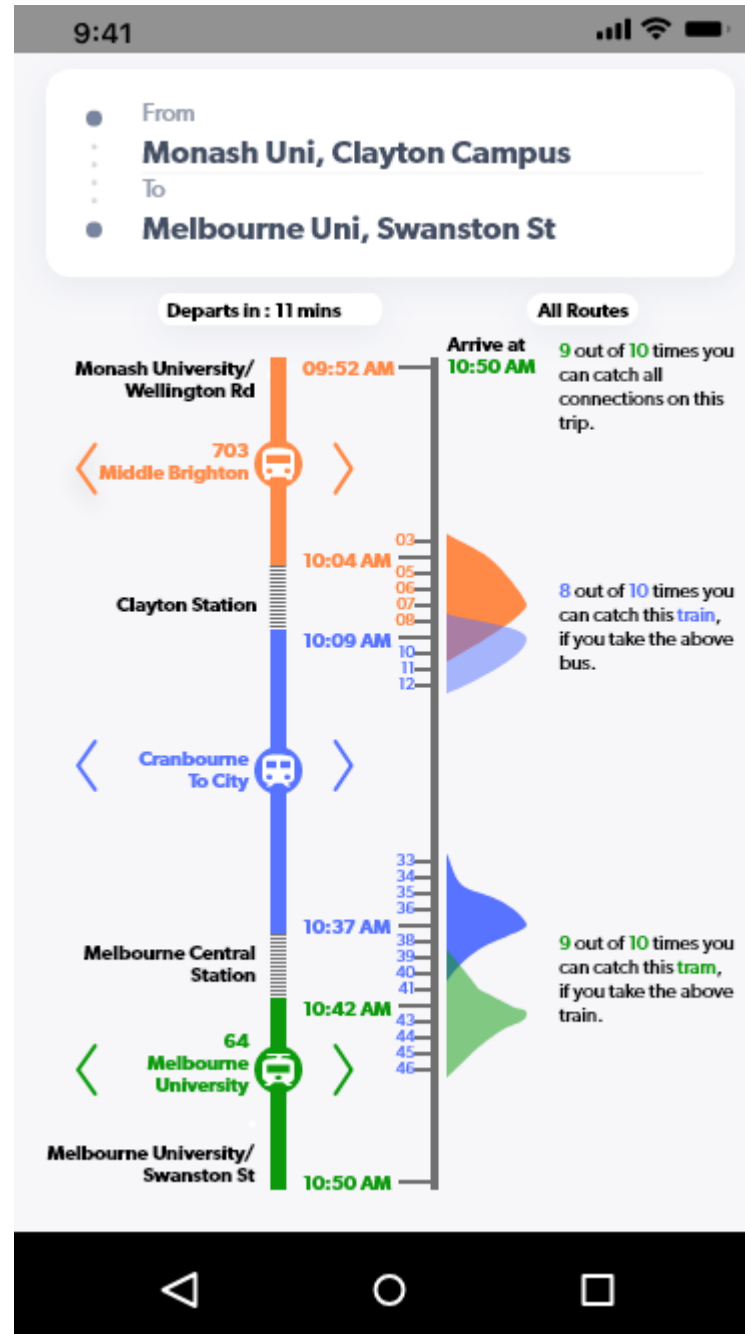
Quantile Dot Plots & Density Plots

- With probability represented as **percentage** with Text.
- Conditional Probability.



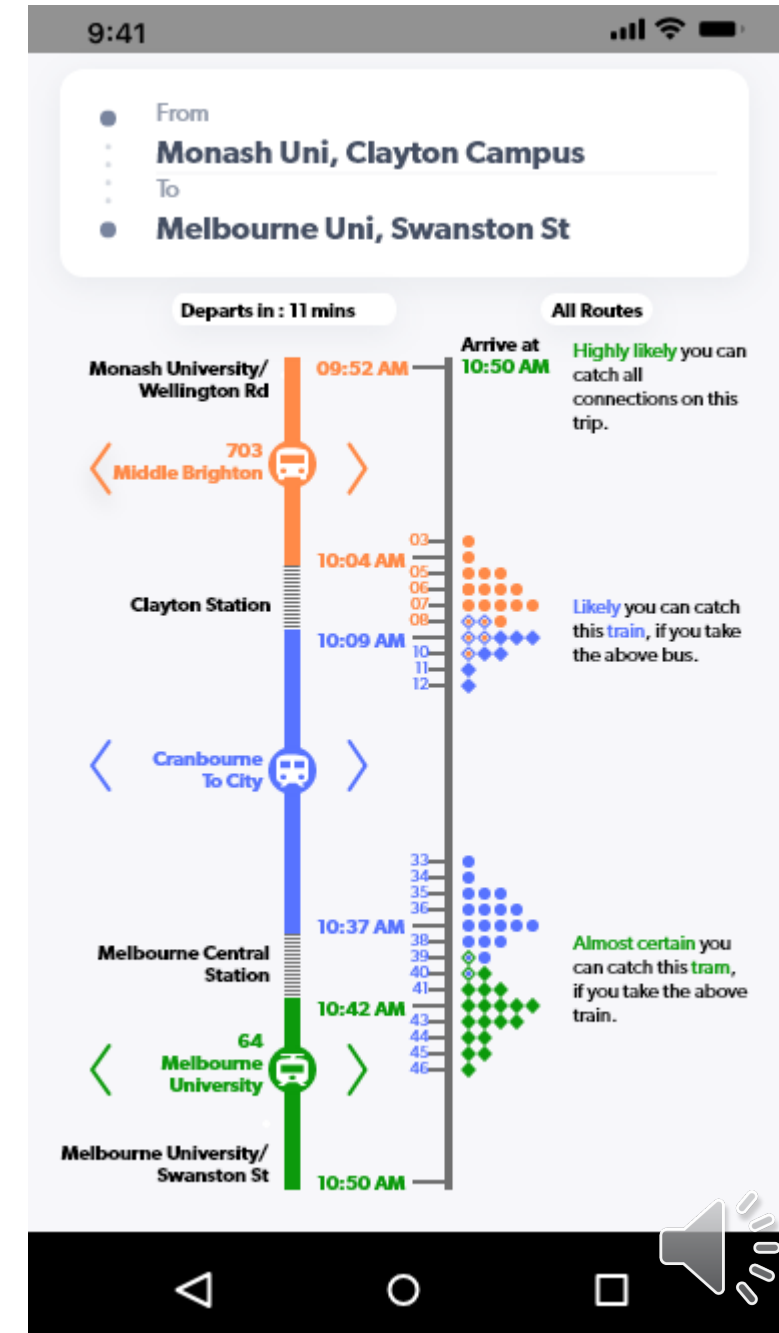
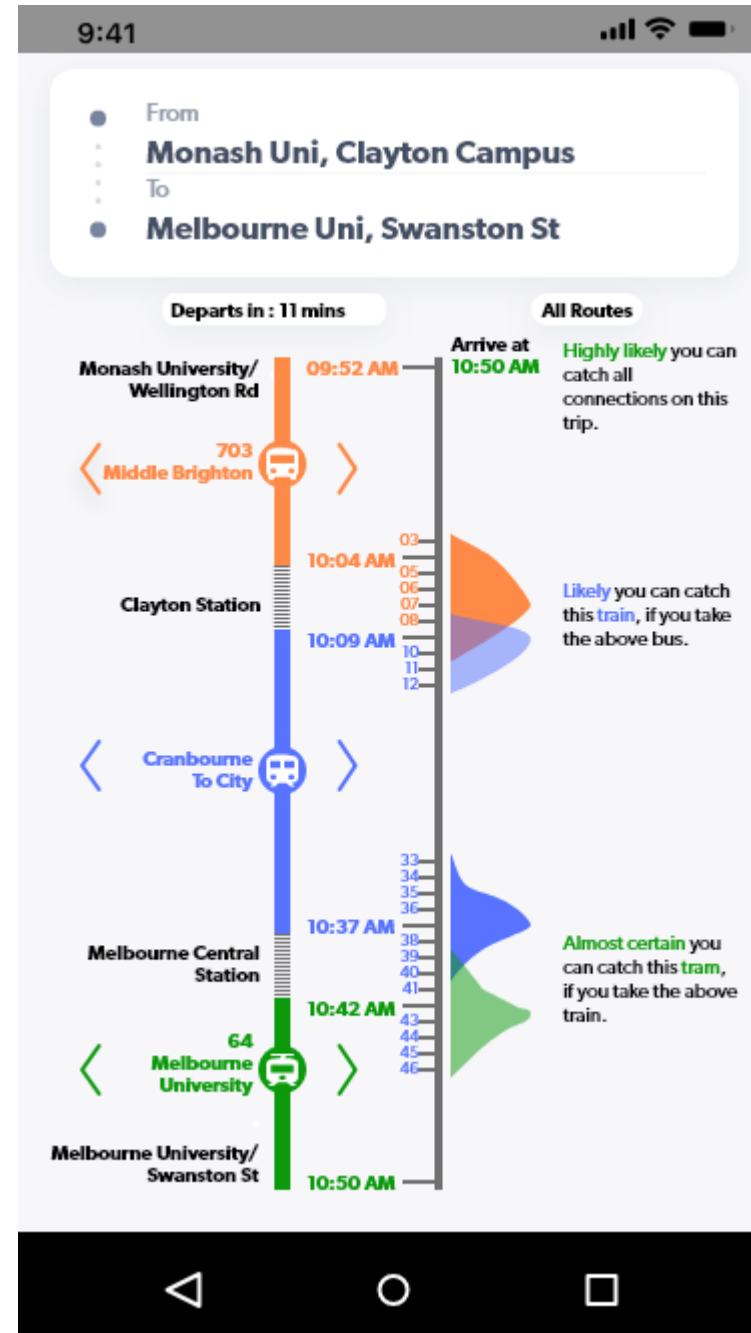
Quantile Dot Plots & Density Plots

- With probability represented as **Normal Frequency** with Text.
- Information loss (Yes!)
- But helps decision making?

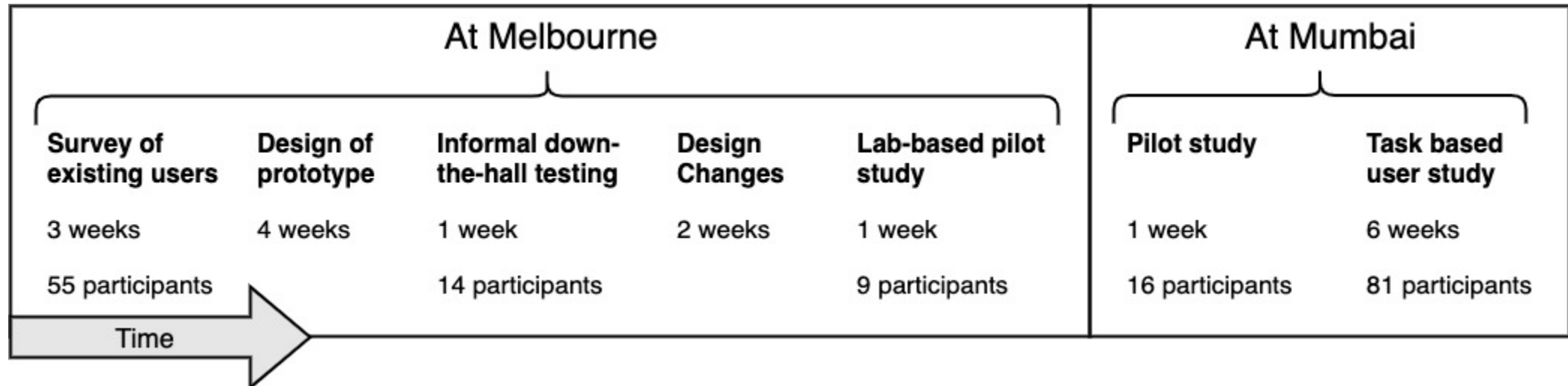


Quantile Dot Plots & Density Plots

- With probability represented as **Text with standardised WEPs** (Words of Estimated Probability).
 - Almost Certain, Highly Likely, Likely/Probable, Unlikely, Almost Certainly Not.
- Information loss (Yes!)
- But helps decision making?



Why Melbourne & Mumbai?



- We wanted to test our prototype with frequent users and first time users.
- Over 160,000 Indians visited Melbourne from April 2017 to June 2018, an increase of 21% from the previous corresponding period



Thank you

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