# INSTINCt

## The INfluence of a Signal OpTImiser oN Route Choices

Urie Bezuidenhout MSc.(Eng.)
(PhD Candidate -Univ. of Auckland)

Supervisors Dr P Ranjitkar, Dr J Wang

IPENZ 2011, Auckland

# Previous Research

## (MUSIC)

## Management of traffic Using SIgnal Control

# Objectives of research

## Signal Optimisation
- Improve offset algorithm
- Active and passive techniques

## Understand
- Platoon dispersion
- Queues

## Empirical vs. Psychological
- Visual perception
- Steering changes
- Velocity changes

## Route Choices

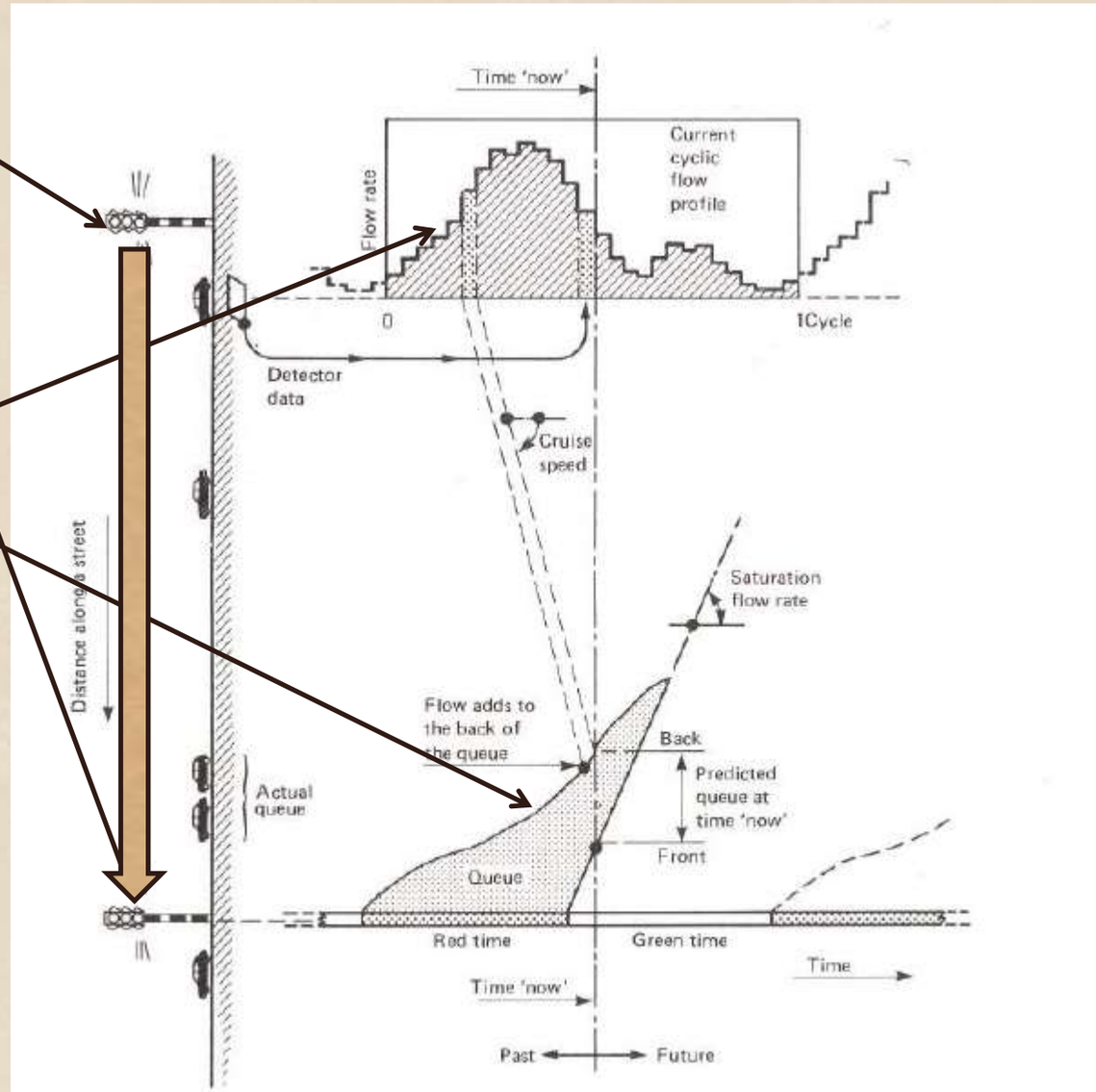


Fig. 2 Principles of the SCOOT traffic model

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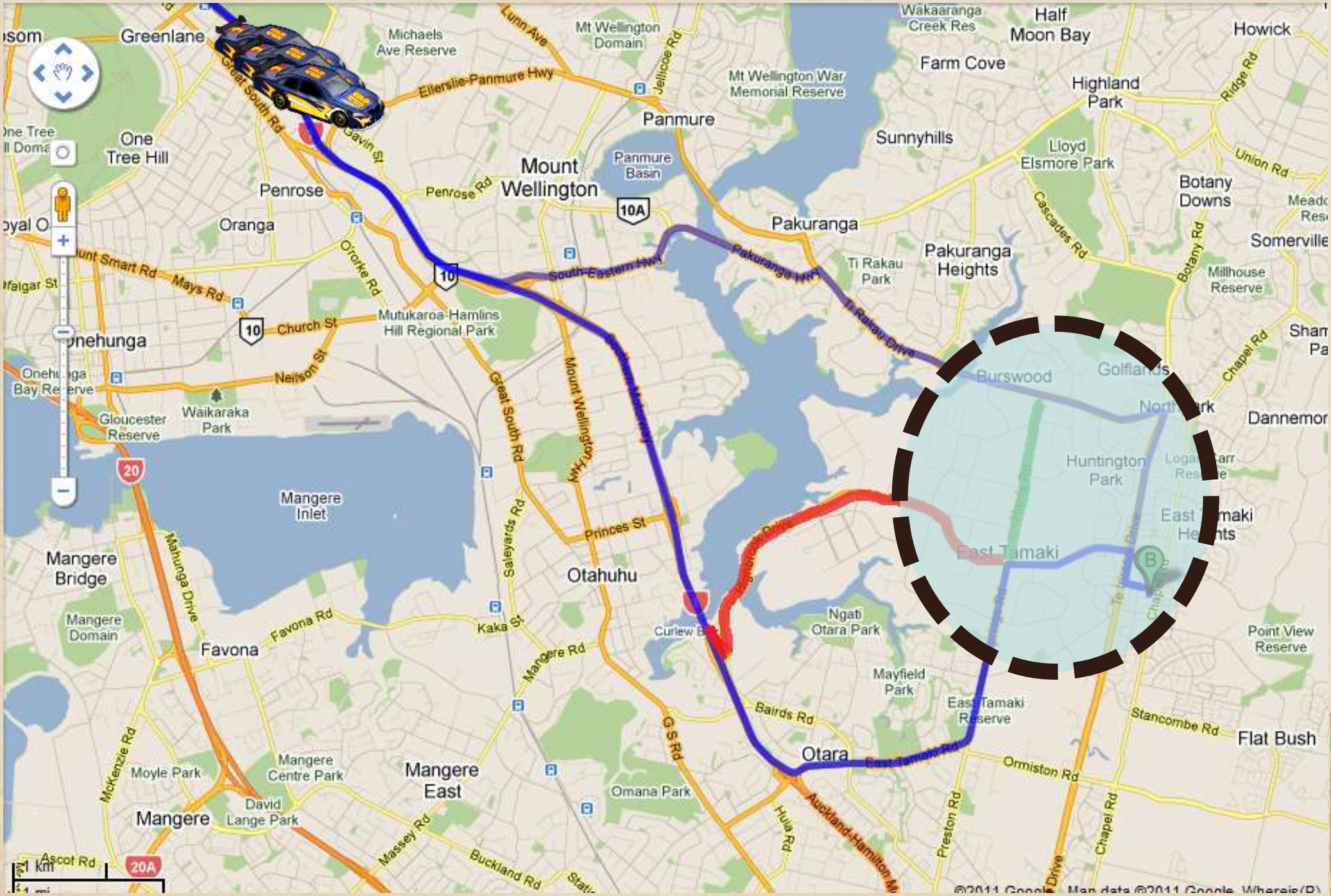
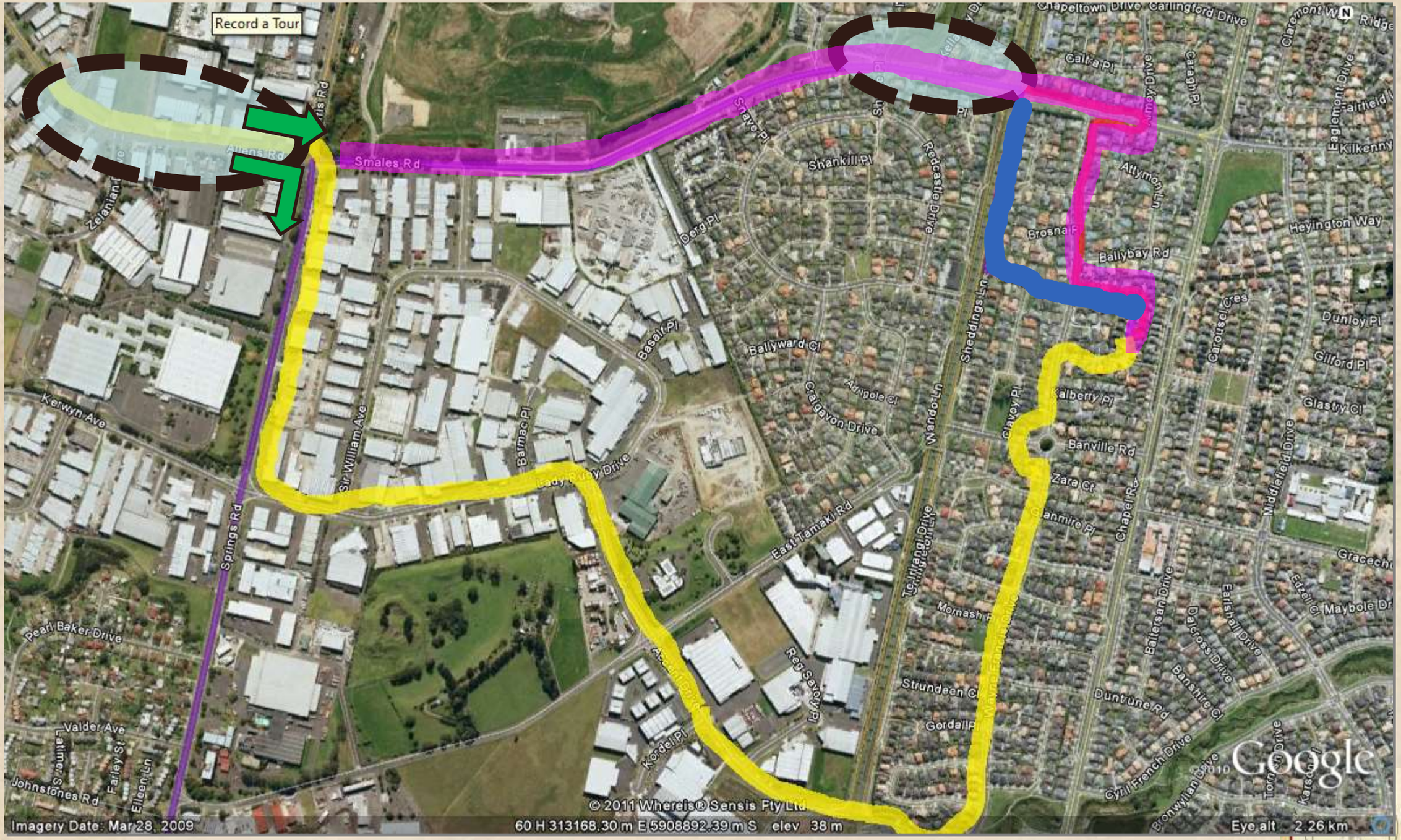
# Gross Route Choice




Record a Tour
Smales Rd
Shankill Pl
Redcastle Drive
Attymon Ln
Ballybay Rd
Heyington Way
Dunloy Pl
Gilford Pl
Glasty Cl
Carlingford Drive
Caltra Pl
Caragh Pl
Eaglemont Drive
Kilkenny
Carousel Cres
Sheddings Ln
Ballyward Cl
Calgevon Drive
Banville Rd
Zara Ct
Glanmire Pl
Chapel Rd
Middlefield Drive
Springs Rd
Sir William Ave
Barmac Pl
Basal Pl
Lady Cody Drive
East Tamaki Rd
Te Hiringi Drive
Reg Savory Pl
Kordel Pl
Dunrune Rd
Strundeen Cl
Gordale Pl
Baltersan Drive
Dalcross Drive
Banshire Cl
Cyril French Drive
Kerwyn Ave
Pearl Baker Drive
Valder Ave
Johnstones Rd
Latimer St
Farley St
Eileen Ln
© 2011 Whereis® Sensis Pty Ltd
Imagery Date: Mar 28, 2009
60 H 313168.30 m E 5908892.39 m S elev 38 m
Eye alt 2.26 km
Google

# Signal Approach

# Models-Predictions-Forecasts

| | |
|---|---|
| Engineers | vehicles ~ infer driver behaviour |
| Economists | money ~ derive choices. |
| Geographers | historical data ~ how we travel |
| Psychologists | simulation ~ how we could react |
| Mathematicians | ideal world ~ how we should react |

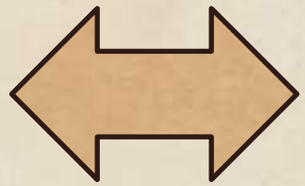
# Psycogineering

## Psychology +cognition + Engineering

Stimuli
Visual perception
Cognition
Sensorimotor action
Feedback

Control
Signal Control

Behavioural Model
Eye fixations
Saccades
Gaze tracking

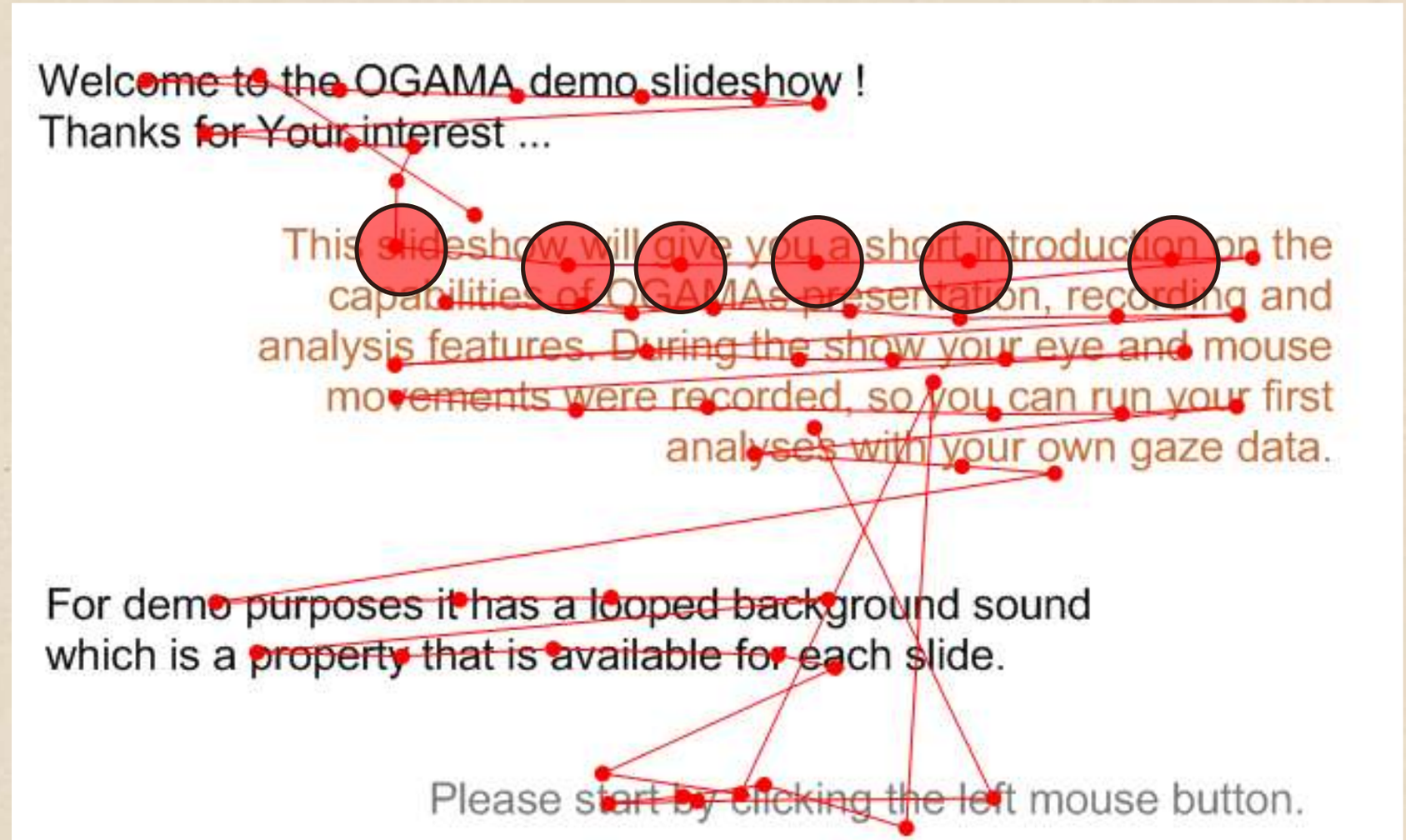


Behavioural Model
Queue Dispersion
Platoon Dispersion
Queue Formation

# Perception

| | |
|---|---|
| Visual sensation → | sensorimotor system |
| Eye Fixations → | to perceive and remember |
| Eye Saccades → | memory blanking |
| No Visual Memory → | spatial and object encoding |

# Fixation and Saccades

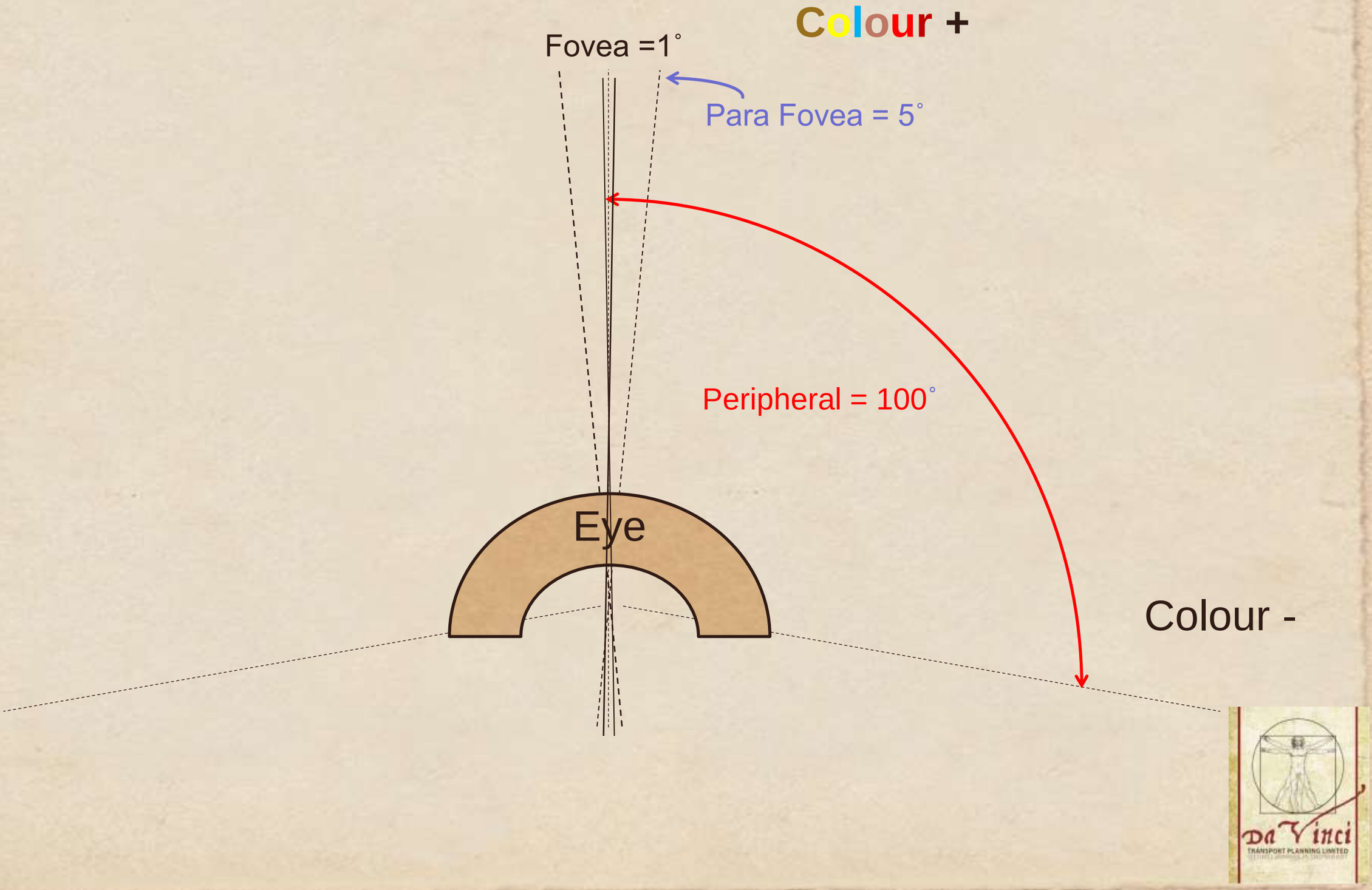


# Eye Tracking

Fixation → path and tracking

Gaze saliency → scan path and duration

# Physiology

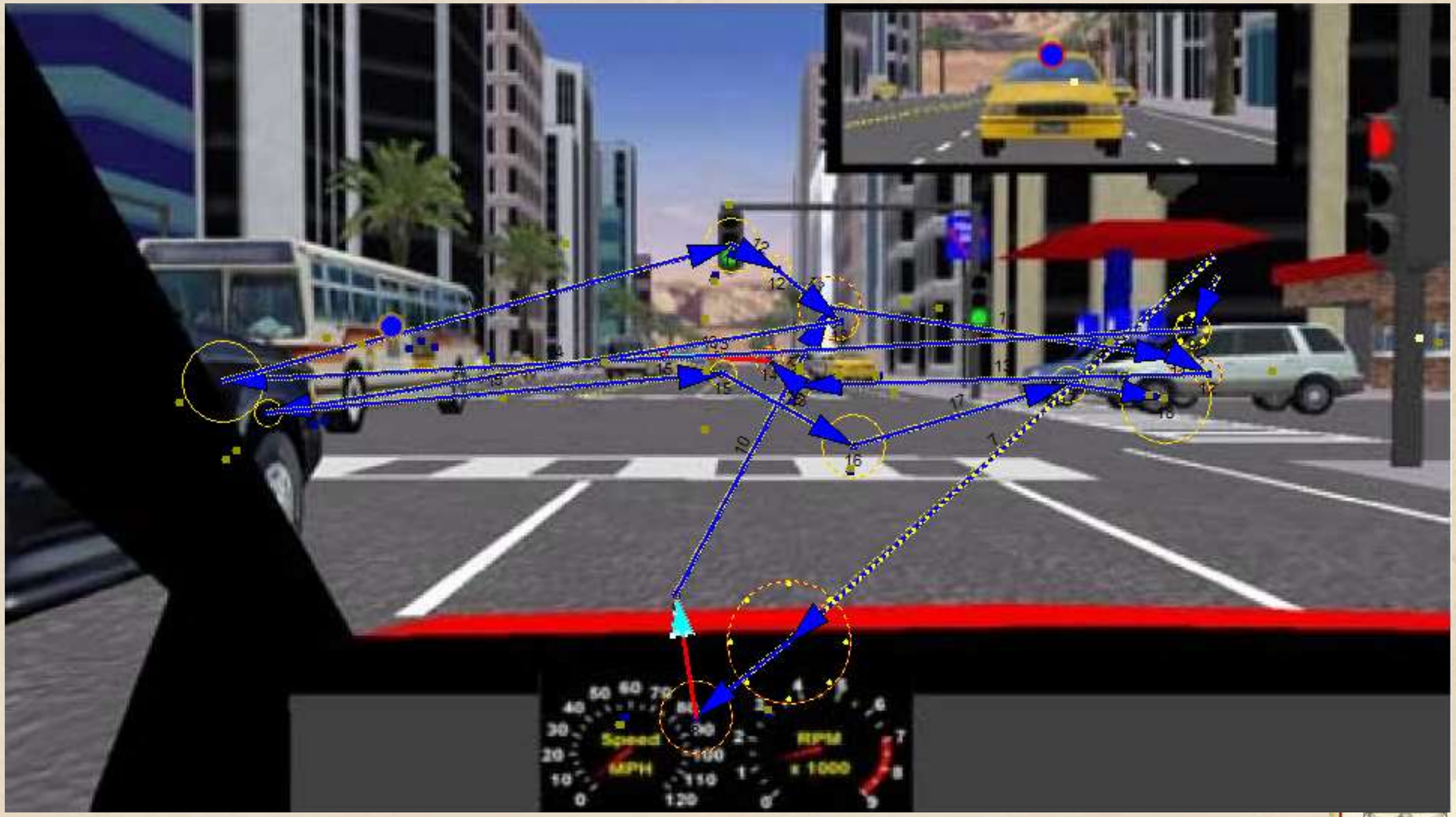


# Foveal vision

# Limitations

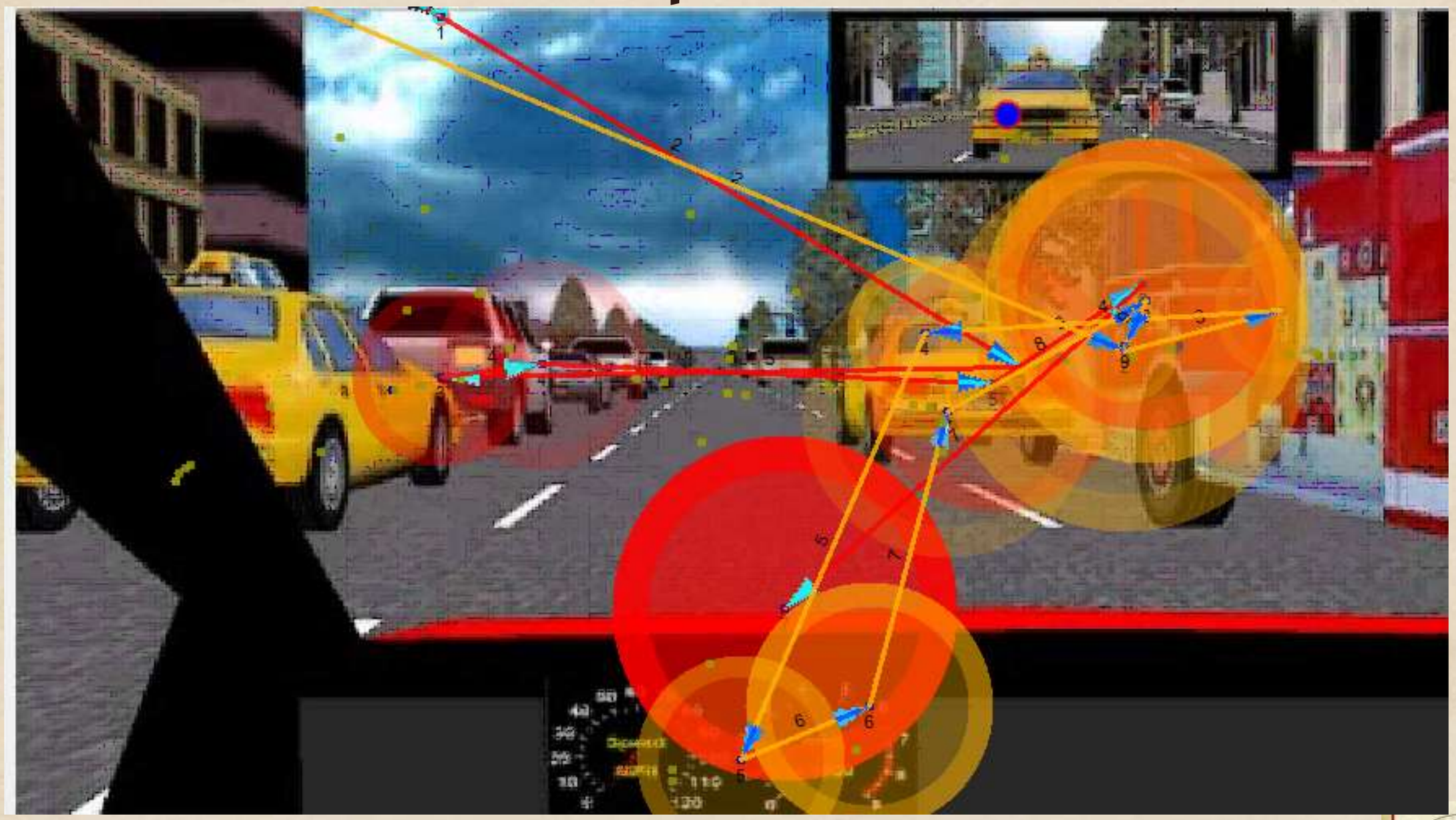
# Change Blindness

# Scan paths



# Saliency

# Comparisons



# Data collection

## Instrumented Vehicle

## Simulated

# Traficon Video Detection

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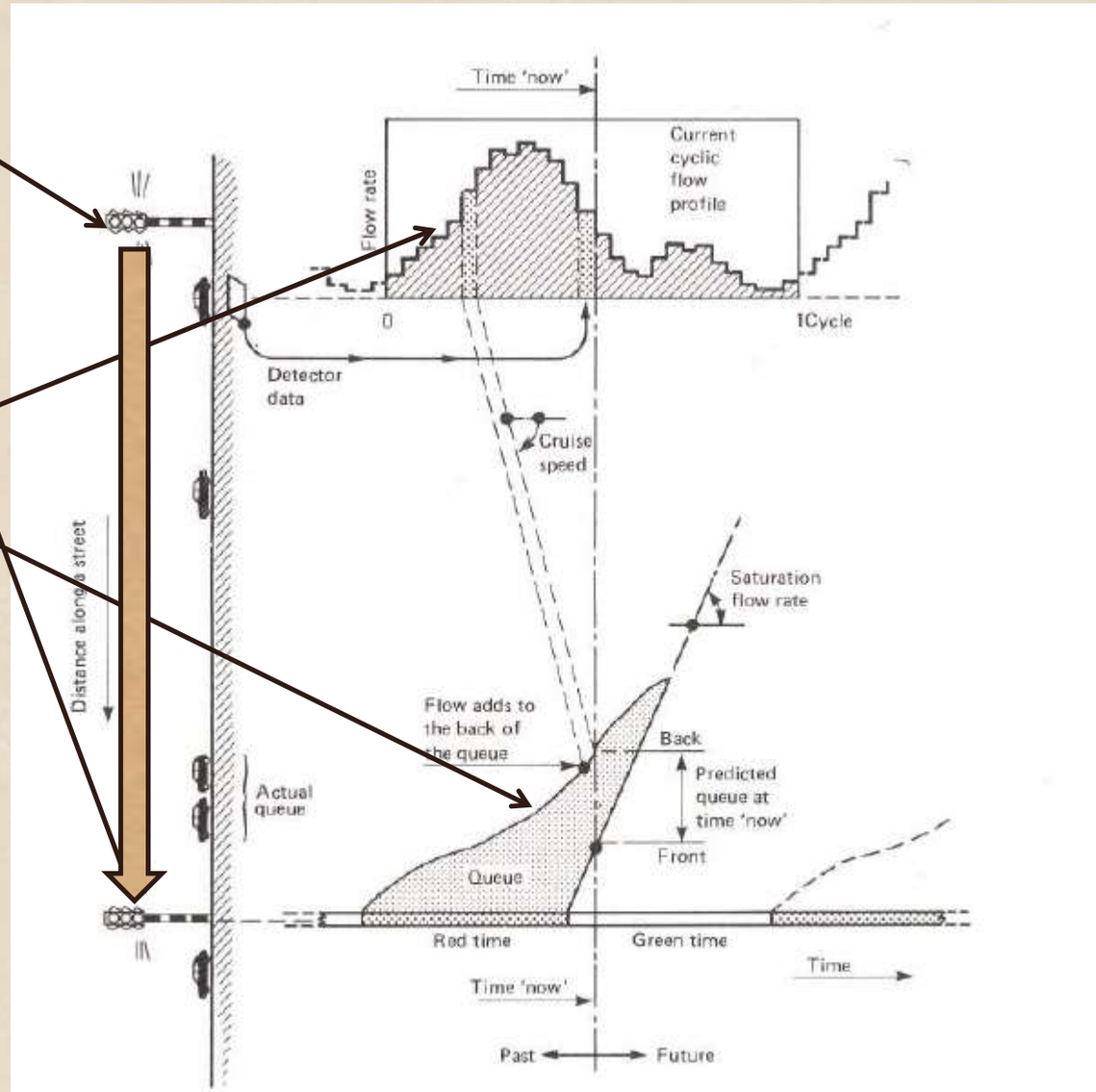


Fig. 2 Principles of the SCOOT traffic model

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# QUESTION TIME

urie@davincitransport.co.nz
+64 (0)21 367 516