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Designing towards the leverage points in an open innovation project for digital urban transport interventions

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Designing towards the leverage points in an open innovation project for digital urban transport interventions

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Partner Organisations

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GRIMSHAW
NSW Transport for NSW
CITY OF SYDNEY
ARUP
Project Summary:
Australian public transport environments are challenged to cope with growth in population. This research investigates a complementary approach to transport infrastructure expansion – and its associated costs, disruption, energy use, and implementation periods – through the use of responsive digital information to facilitate improved passenger flow and to offer a better customer experience.

The study objectives are:
• to investigate related research and projects in the area;
• to research user and other stakeholder requirements; to design, deploy and evaluate prototypes in real locations; and
• to develop spatial and architectural integration of digital technologies and their application in public transport environments.
Sydney’s transport pressure

More people using public transport

City on narrow peninsula

Only two harbour crossings

New growth areas

Projected population growth

2014
4.3 million
(7.5m NSW)
59.4% in
NSW Dept of Planning

2031
5.9 million
(9.2m NSW)
63.5% in Sydney
NSW Dept of Planning

Image Credit: http://blog.dimmi.com.au

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Three stations in the city were our planned locations for intervention

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The variety in our stakeholder group made deciding on a path challenging.
This was our understanding of what we should be doing
We began with an exploratory participatory process

‘Situation Mapping’

Prioritisation workshop

06 Bus stop of the future

WHY

QUESTIONS

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Bus stops

KASANE, Botswana  
OSLO, Norway

Image Credit: Tim Tompson

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Sydney’s bus stop
Functional Decomposition of a bus stop


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We developed our understanding through the use of mock-ups

Mock-up round one

Mock-up round two

Mock-up round three

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Mock-up round one
Light Festival Display

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Image Credit: Sean Bryan
Mock-up round one
Light Festival Display

PROJECT LEARNING:

• May not be perceived to be improving customer experience
• Importance of advertising based business model managing stakeholders.
Mock-up round two

Digital display

Image Credit: Vinicius Falavigna

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PROJECT LEARNING:

• Under advertising centric contracts the ‘timetable information’ could only take up the space allocated for the timetable.
• The information would block sight of the advertisement for passengers and drivers approaching from some directions
• Prefer to test ‘offline’ was seen as a more attractive alternative for most stakeholders
Mock-up round three

The bus stop of the future

Image Credit: Estelle Rehayem, Xiaolu Li, Clement Yoong

Image Credit: Evan Fan, Mani Hunjan, Gene Jin

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PROJECT LEARNING:

- Stakeholders seem to like what looked more like existing bus stops as was likely to meet more 'real' criteria
- Stakeholders held onto small ideas eg. 'water bubbler'
- Clear impressions of stakeholder organisational strategies ‘eg. being seen to be sustainable - bicycle use’
- As discussion was to select a bus stop to build, more emphasis was put on safety/construction standards of rep. orgs, eg ‘70% transparent, Disability standards’
Customer Value Chain Analysis
CVCA

Image Credit: Tim Tompson


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Project learning came directly from stakeholders & indirectly

**Examples**

**Primary stakeholder perspectives**
- Alignment with existing strategies (eg. bicycle use, sustainability agendas)
- Accessibility principles
- Not conflicting with existing projects (eg wayfinding)
- Risk aversion linked to previous experiences of the organisations

**Secondary stakeholder perspectives**
- DDA (Disability Discrimination Act) Standards
- Construction standards
- Road regulations about screens in driver line of sight
- Advertiser perspective
- Customers perspectives
- Department of Premiers Office
- Potential media representation
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Leverage Points to Intervene in a System

12. Constants, parameters, numbers (such as subsidies, taxes, standards)
11. The size of buffers and other stabilizing stocks, relative to their flows
10. Structure of material stocks and flows (such as transport network, population age structures)
9. Length of delays, relative to the rate of system changes
8. Strength of negative feedback loops, relative to the effect they are trying to correct against
7. Gain around driving positive feedback loops
6. Structure of information flow (who does and does not have access to what kinds of information)
5. Rules of the system (such as incentives, punishment, constraints)
4. Power to add, change, evolve, or self-organize system structure
3. Goal of the system
2. Mindset or paradigm that the system — its goals, structure, rules, delays, parameters — arises from
1. Power to transcend paradigms

Meadows, D., 1999, Leverage points, Places to Intervene in a System. Hartland, Vermont, USA: The Sustainability Institute
Sydney’s bus stop

The Rules of the System
(Such as incentives, punishments, constraints)

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POSSIBLE DESIGN INTERVENTIONS

- Demonstrate value of change to contract creating bodies to modify existing or future contracts
- Demonstrate safety of screens near roads etc.
Sydney’s bus stop

Power to add, change, evolve, or self-organize system structure

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Sydney’s bus stop

Power to add, change, evolve, or self-organize system structure

POSSIBLE DESIGN INTERVENTIONS

• Work with Advertisers
• Apply more pressure through our prototyping for them to change/or propose changes themselves
• Work with potential future contract holders
LEVERAGE POINT

3

Sydney’s bus stop

The goal of the system

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Sydney’s bus stop
The goal of the system

POSSIBLE DESIGN INTERVENTIONS

• Demonstrate that alternative business models are possible
• Challenge assumptions about advertising model.
• Student challenges - find $X per day/per stop new revenue ideas
• Having frequent conversations about the priority of transport information

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Sydney’s bus stop

The paradigm out of which the system arises

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Sydney’s bus stop

The paradigm out of which the system arises

Indoor ARC Responsive Transport Environments
UNSW BEIL Transport Interchange of the Future

WHAT IF A BUS STOP WAS...

POSSIBLE DESIGN INTERVENTIONS

• Challenge assumptions of stakeholders on which the advertising model lies.
The goal of the system

Power to add, change, evolve, or self-organize system structure

The Rules of the System
(Such as incentives, punishments, constraints)
Key Lessons

- Areas of pedestrian movement/waiting areas are heavily contested - stakeholders vie for foot traffic, attention and dollars.
- The space is necessarily regulated - these can be changed over time by proving a case.
- The built environment intersects many systems - political, social, economic, service, information.
- Participatory approach did aid progress in a very ill defined project.
- Failures did lead to important system learning.
- Understand your agency at each leverage point - find where can you be most affective.
- Be strategic about what you are designing/creating arguments for and why.

How would this apply in the station environment?

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THANKS

Responsive Transport Environments

EncircleRTE

responsive. transport. org

MORE INFORMATION

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