# South West Metro Light Rail Investigation Presentations

Speakers:

- James MacIntosh, *Luti Consulting*
- Scott Elaurant, *Jacobs*
- Evan Jones, *Acuitus*

Held at the Cockburn Health and Community Facility on Thursday, 27 April 2017

# What is the value created by integrated land use and transportation projects, and how can this value be shared?

# Value Capture – The Possibilities Are Endless…

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## What Value Are We Capturing?
## How Is This Value Created?

# Background

The CRCSI and NSW TfNSW provided funding support for LUTI Consulting's Joint Project with Mecone Planning

The project has culminated in an econometric model of the willingness to pay for urban transit and urban renewal in Sydney

This is the largest study of its kind in Australia, and has been released as a free document available for online download. [www.luticonsulting.com.au](http://www.luticonsulting.com.au)

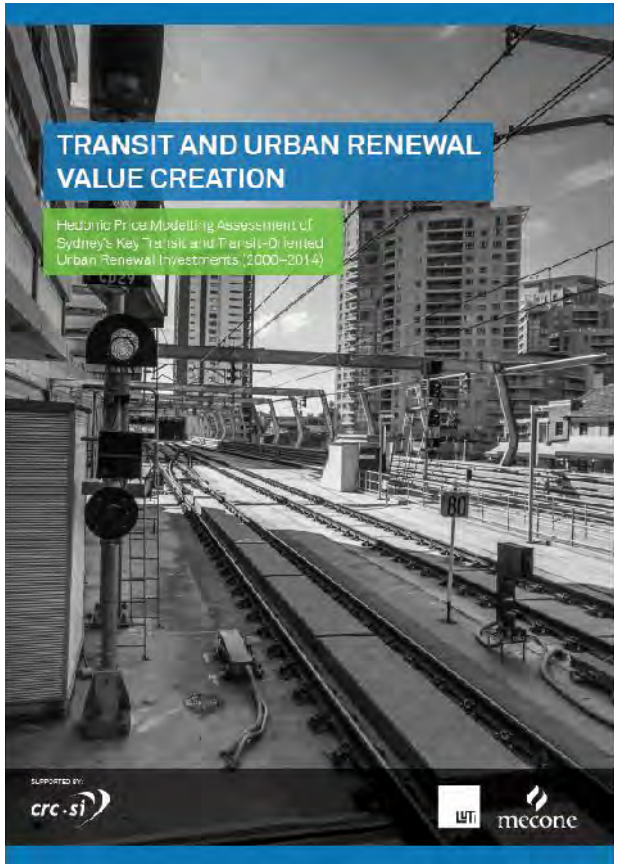
The report has been peer reviewed by the following agencies:
<u>Commonwealth Government</u>

- The Department of Infrastructure and Regional Development
- Bureau of Infrastructure, Transport and Regional Economics

<u>NSW Government</u>

- Transport for New South Wales
- Department of Premier and Cabinet
- NSW Treasury

Advice received from these agencies is that the report is appropriate for release.

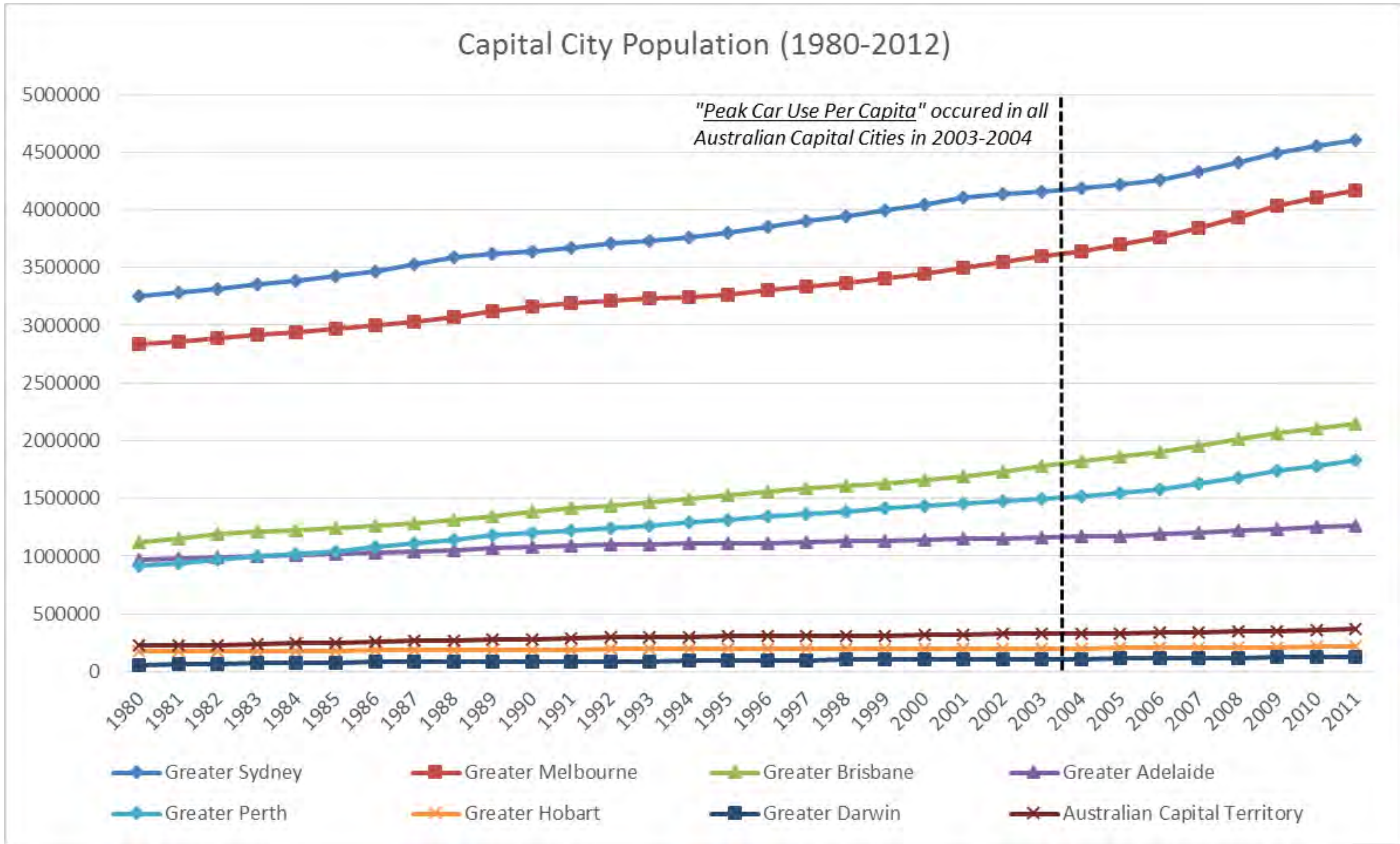


# Agenda for today

1. Why focus on land use and transportation system integration?
2. How does integration impact a city's urban efficiency and productive growth?
3. How do cities value the access to transit and urban regeneration? And, how is this value created?
4. How can this value creation be shared?
5. Learnings from Projects in NSW and WA.

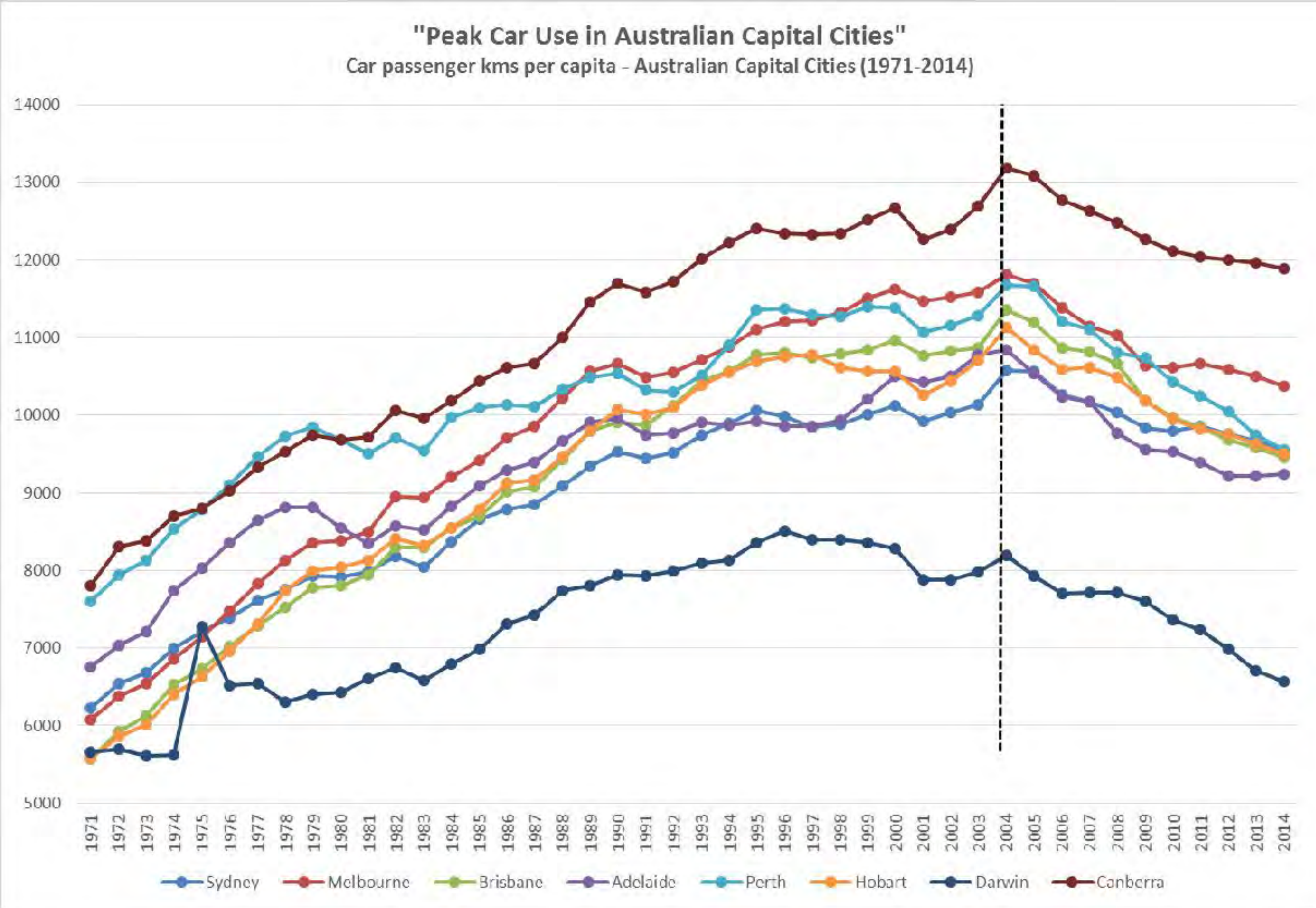
# Why do we need to focus on land use and transit integration?

## Capital City Population (BITRE, 2015)



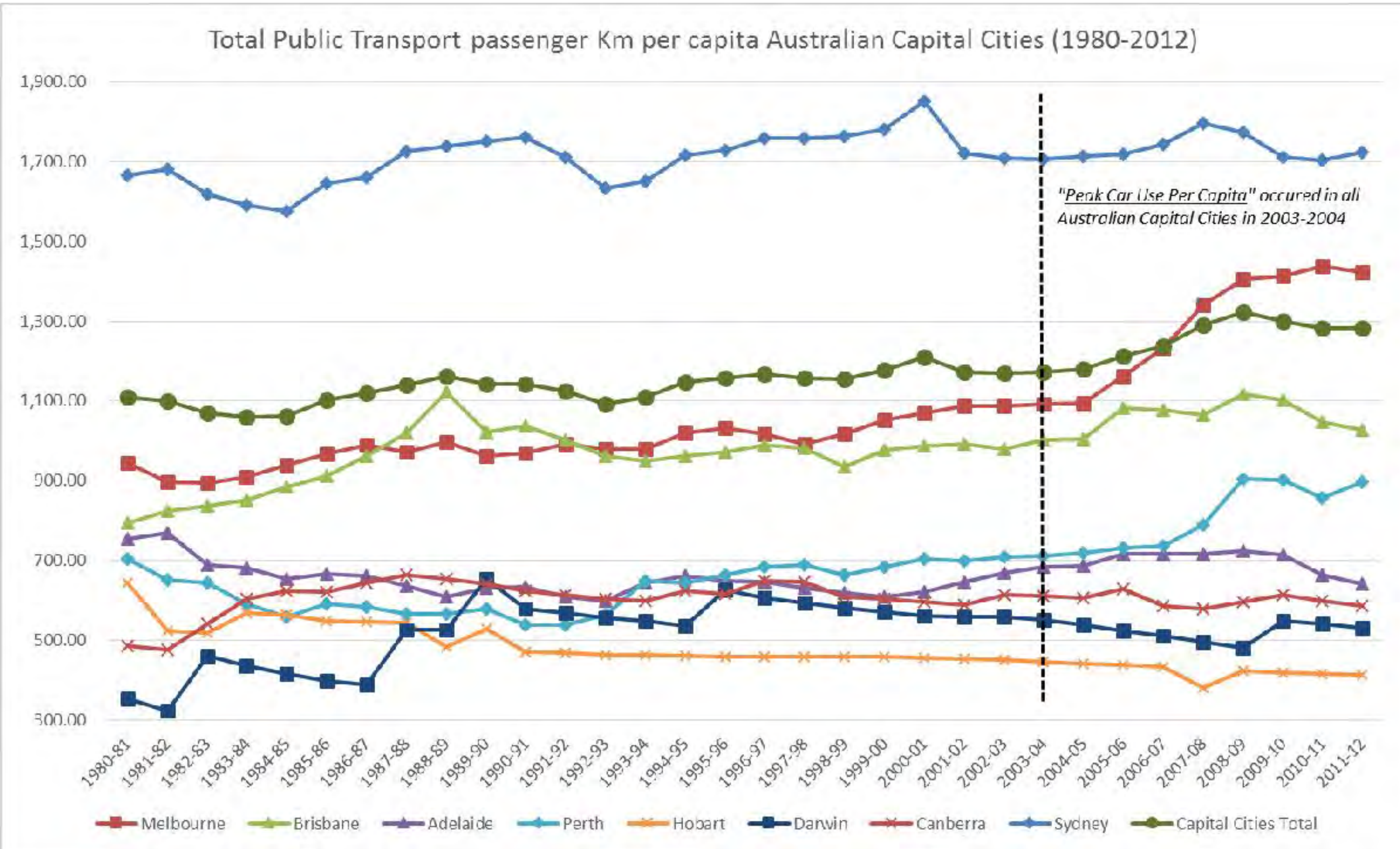

| | (2004-11) |
|---|---|
| Sydney | 10% |
| Melbourne | 14% |
| Brisbane | 18% |
| Adelaide | 8% |
| Perth | 21% |
| Hobart | 7% |
| Darwin | 18% |
| ACT | 12% |
| Capital City Ave | 14% |

# Why do we need to focus on land use and transit integration?
# Car Use per Capita (BITRE, 2015)




| | (2004-14) |
|---|---|
| Sydney | -10% |
| Melbourne | -12% |
| Brisbane | -17% |
| Adelaide | -15% |
| Perth | -18% |
| Hobart | -15% |
| Darwin | -20% |
| Canberra | -10% |
| Capital City Ave | -14% |

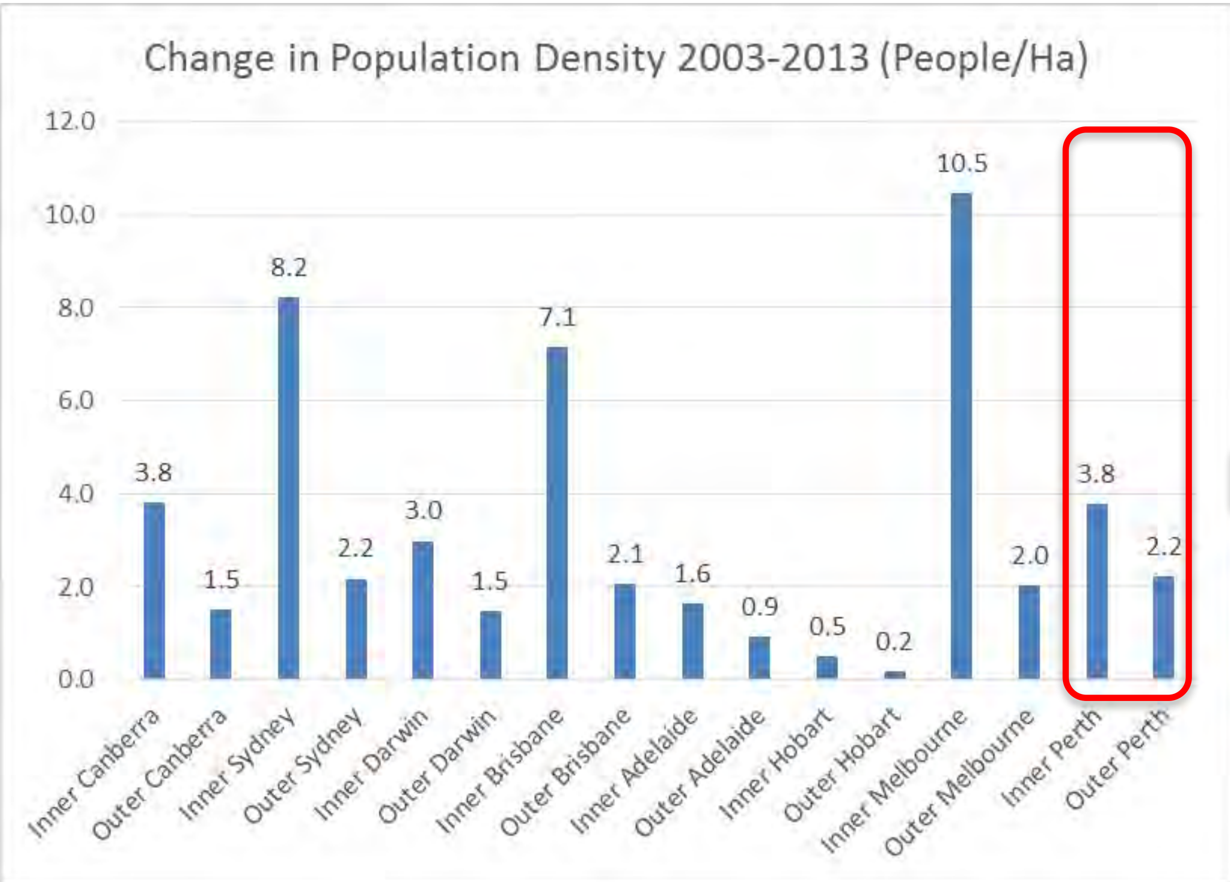
# Why do we need to focus on land use and transit integration?
# PT Use per Capita (BITRE, 2015)




| | (2004-12) |
|---|---|
| Sydney | 1% |
| Melbourne | 30% |
| Brisbane | 2% |
| Adelaide | -6% |
| Perth | 26% |
| Hobart | -7% |
| Darwin | -4% |
| Canberra | -4% |
| Capital City Ave | 9% |

# Why do we need to focus on land use and transit integration?

## PT Use per Capita (BITRE, 2015)




| | City Population 2004-11 | Car Use/ Capita 2004–14 | PT Use / Capita 2004-12 |
|---|---|---|---|
| Sydney | 10% | -10% | 1% |
| Melbourne | 14% | -12% | 30% |
| Brisbane | 18% | -17% | 2% |
| Adelaide | 8% | -15% | -6% |
| Perth | 21% | -18% | 26% |
| Hobart | 7% | -15% | -7% |
| Darwin | 18% | -20% | -4% |
| Canberra | 12% | -10% | -4% |
| Capital Cities Total | 14% | -14% | 9% |

# How does Land Use and Transportation System Integration impact a city's urban efficiency and productive growth?

*Transit creates value in the transport system*

- City's rail transport system 20 times more spatially efficient than car modes.
- Transit systems can be highly competitive with cars in terms of time & cost
- Investment in transit:
  - Increases transit service capacity and quality
  - Avoids the cost of provision of additional road capacity
  - Lower car parking infrastructure requirements
  - Reduces transport based externalities

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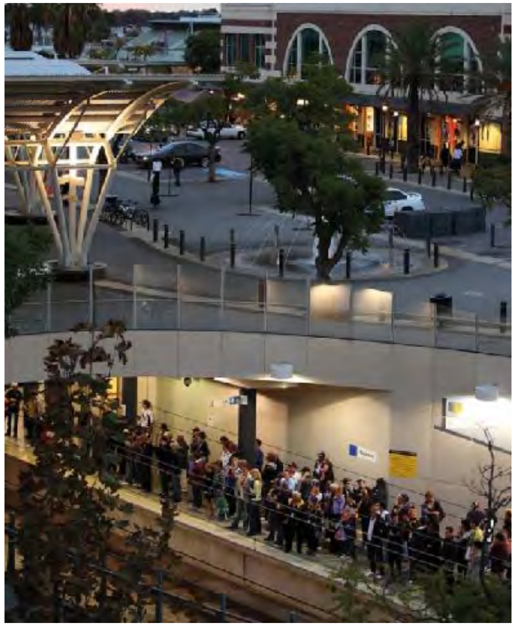
### *Transit integration creates value in the urban land markets*



- Transit based re-urbanisation has city shaping benefits
  - More spatially efficient urban form, Higher Density, and Mixed Use,…
  - Increases metropolitan economic activity
- Investment in transit increases financial and economic value for the benefitting land catchments
  - Land market "Willingness to Pay" for increased integrated land use and transportation, results in an uplift in land value

**Public Sector Investment in Transit**

↓

**Phase 1**
Transit Unlocks Development Capacity

↓

**Phase 2**
Change Zone to Highest and Best Use for Transit

↓

**Phase 3**
Increase Development Density Commensurate with Forecast Transit Dependent Development

↓

**Phase 4**
Transit Accessibility Monetized into Benefiting Land Catchments

↓

**Private Sector Investment in Urban Development**

# How do cities value the access to transit, and urban regeneration? And, how is this value created?

## Transit Unlocks Development Capacity

The investment in transit unlocks capacity for increased development

**Analysis Methods**

- LUTI Consulting's Transit Induced Development Capacity Model

## Change of Zoning to Highest & Best Use

The investment in transit enables the benefiting land markets to be rezoned to their highest and best use with respect to the transit mode

**Analysis Methods**

- Hedonic Price Modelling
- Strategic Land Use Planning
- Property Market Demand Analysis

## Increasing the Development Density

The investment in transit unlocks capacity for increased development in the benefiting catchments up to the level determined in Phase 1

**Analysis Methods**

- Hedonic Price Modelling
- Land Development Planning
- Property Market Analysis

## Monetization of Transit Accessibility Benefit

The increase in accessibility created by the investment in transit leads to increased Willingness to Pay in the benefiting land catchments

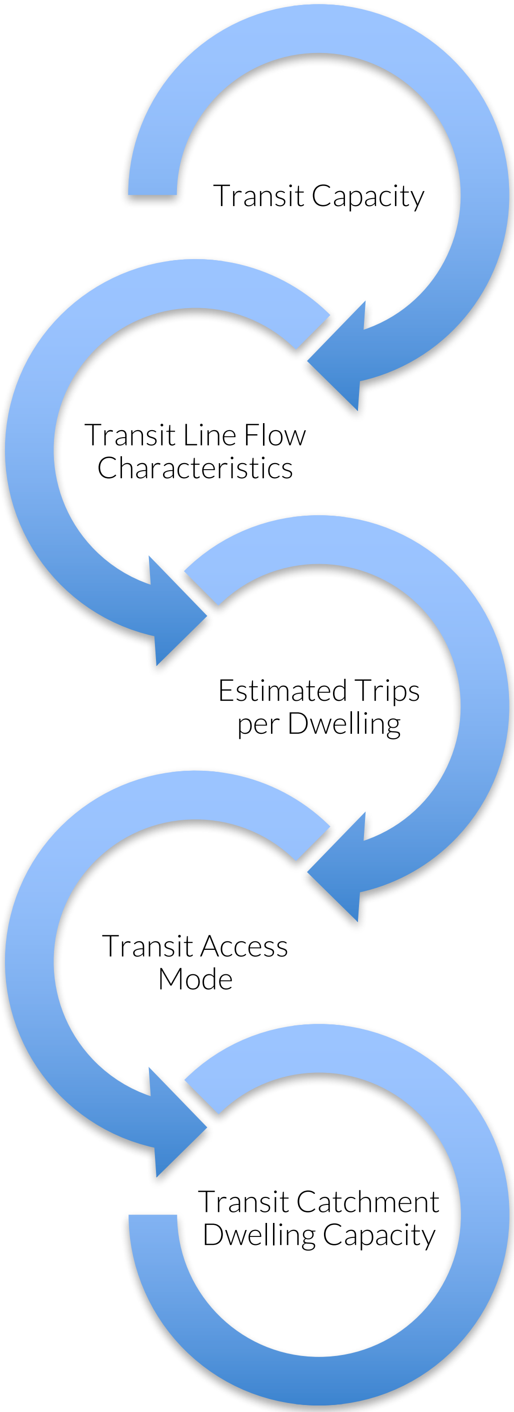
**Analysis Methods**

- Hedonic Price Modelling

# Phase 1 – Transit Unlocks Development Capacity

Theoretical Framework

LUTI Consulting's
Transit Induced Development
Capacity Model (TIDCM)



# Phase 2 – Change of Catchment Zoning to Highest and Best Use

Light Industrial Zoned Land

# Phase 2 – Change of Catchment Zoning to Highest and Best Use

Light Industrial Zoned Land

Mixed Use Zoned Land

# Phase 3 – Increasing forecast development density

- Property market-derived demand for development intensity induced by an infrastructure investment creates value.
- Project induced incremental increases in Floor Space Ratio (FSR) commensurate with the amount unlocked in Phase 1 creates significant change in land value

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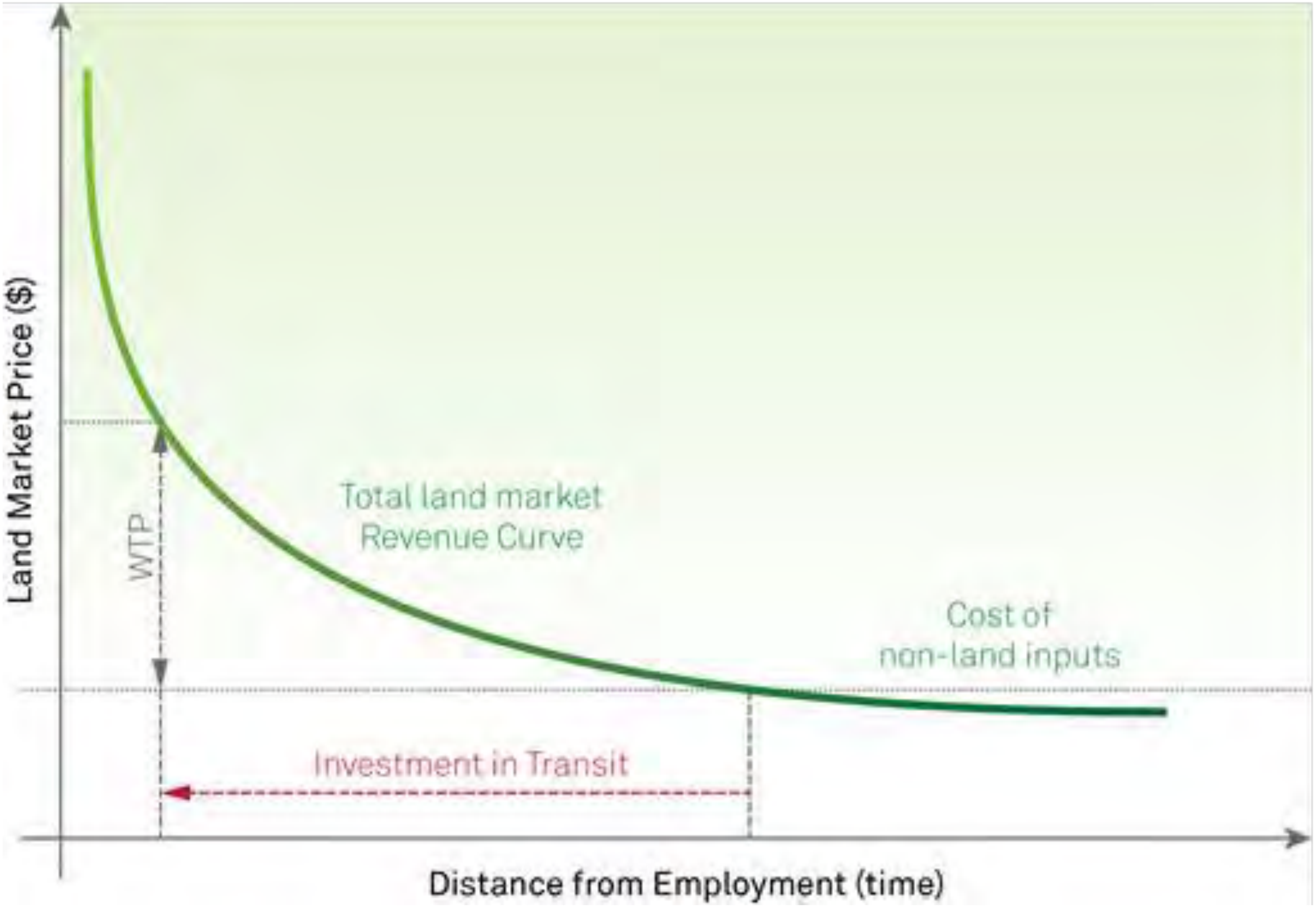
FSR 0.5

FSR 4

# Phase 4 - Monetisation of Transit Accessibility



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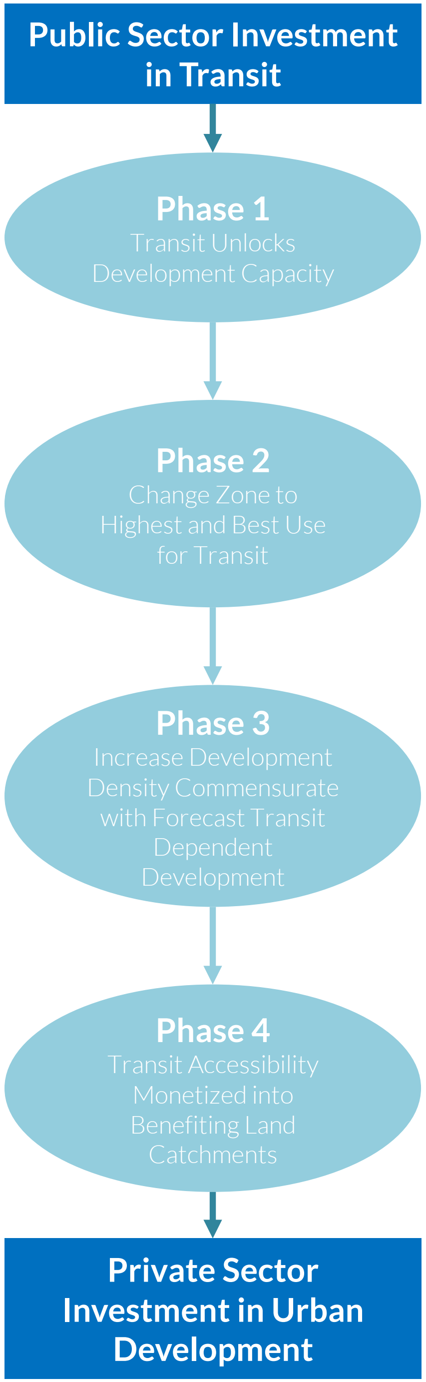


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**Analysis Methods**
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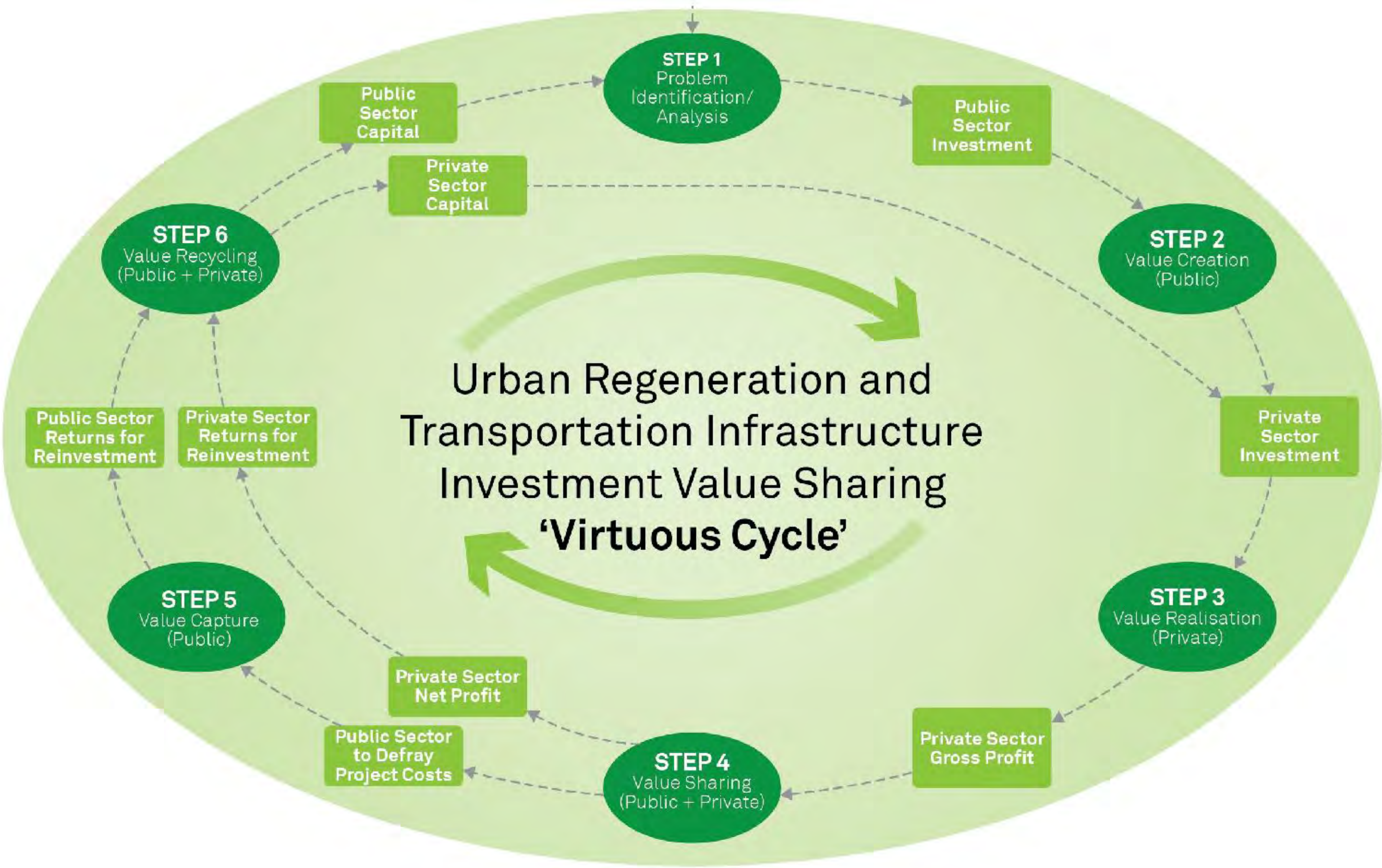
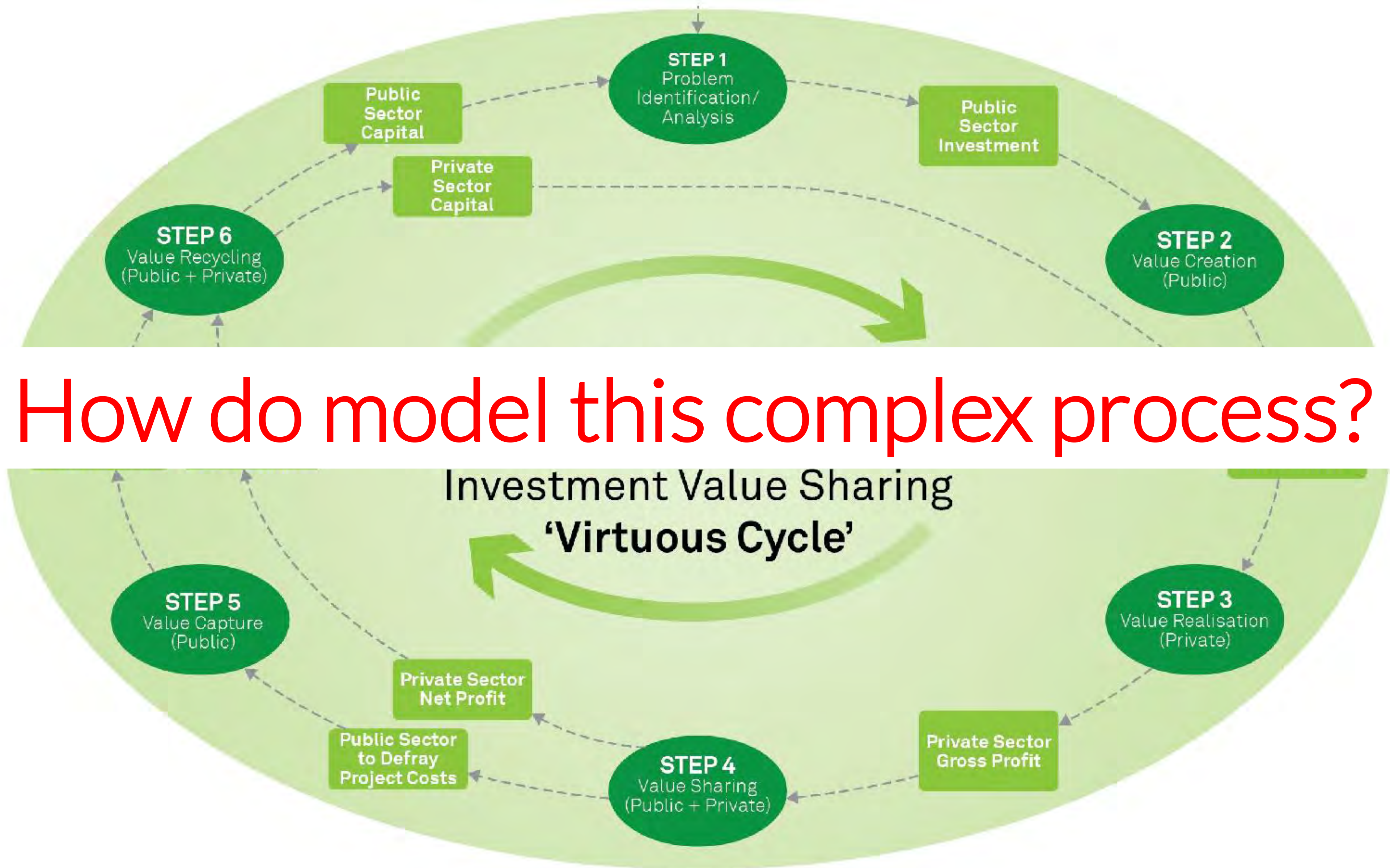
# Virtuous Cycle of Value Creation and Sharing



# Virtuous Cycle of Value Creation and Sharing




How do model this complex process?

# Value Creation and Sharing Modelling Process

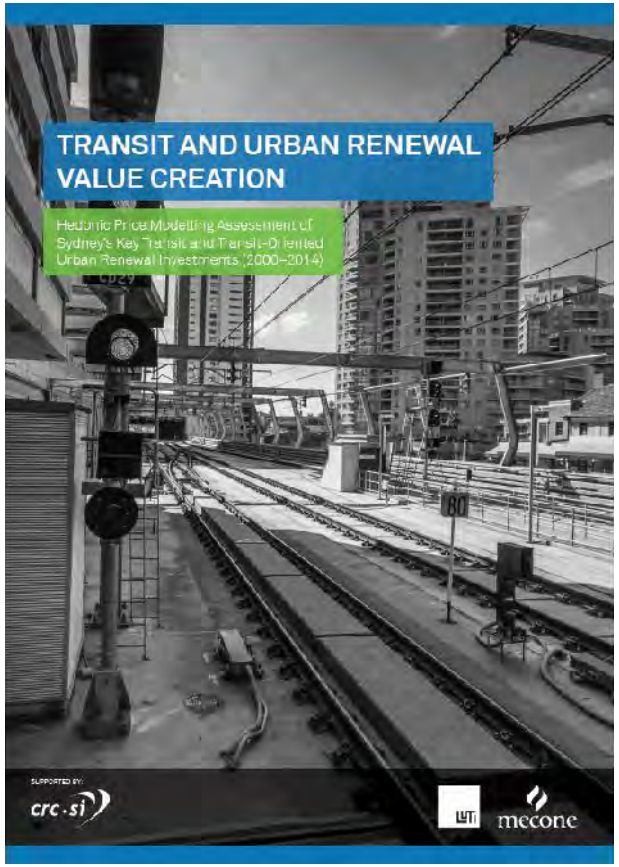
<u>Four Stage Modelling Process:</u>

Step 1 – Land Market Spatial Modelling

Step 2 – Hedonic Price Modelling

Step 3 – Property Market Analysis

Step 4 – Financial Modelling



# Value Creation and Sharing Modelling Process

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Step 2 – Hedonic Price Modelling

Step 3 – Property Market Analysis

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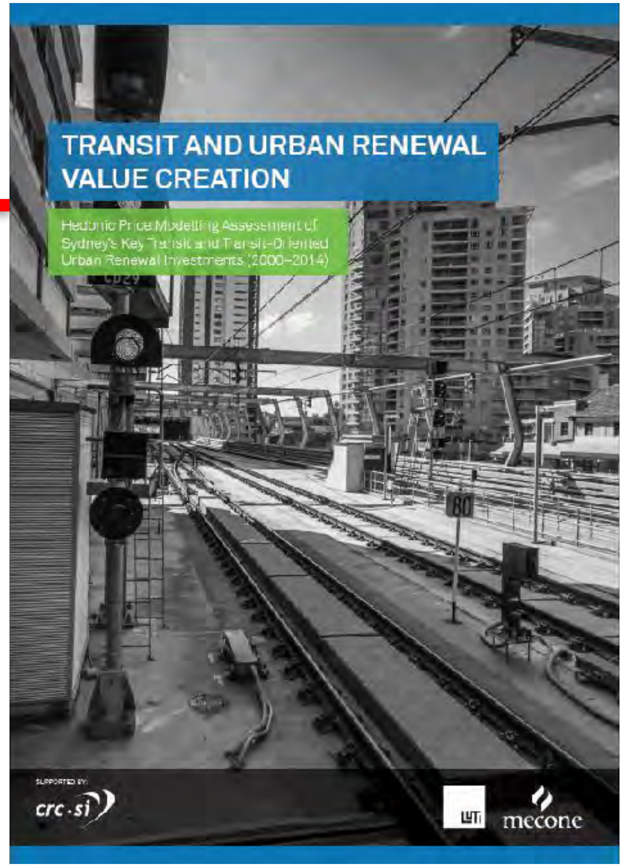
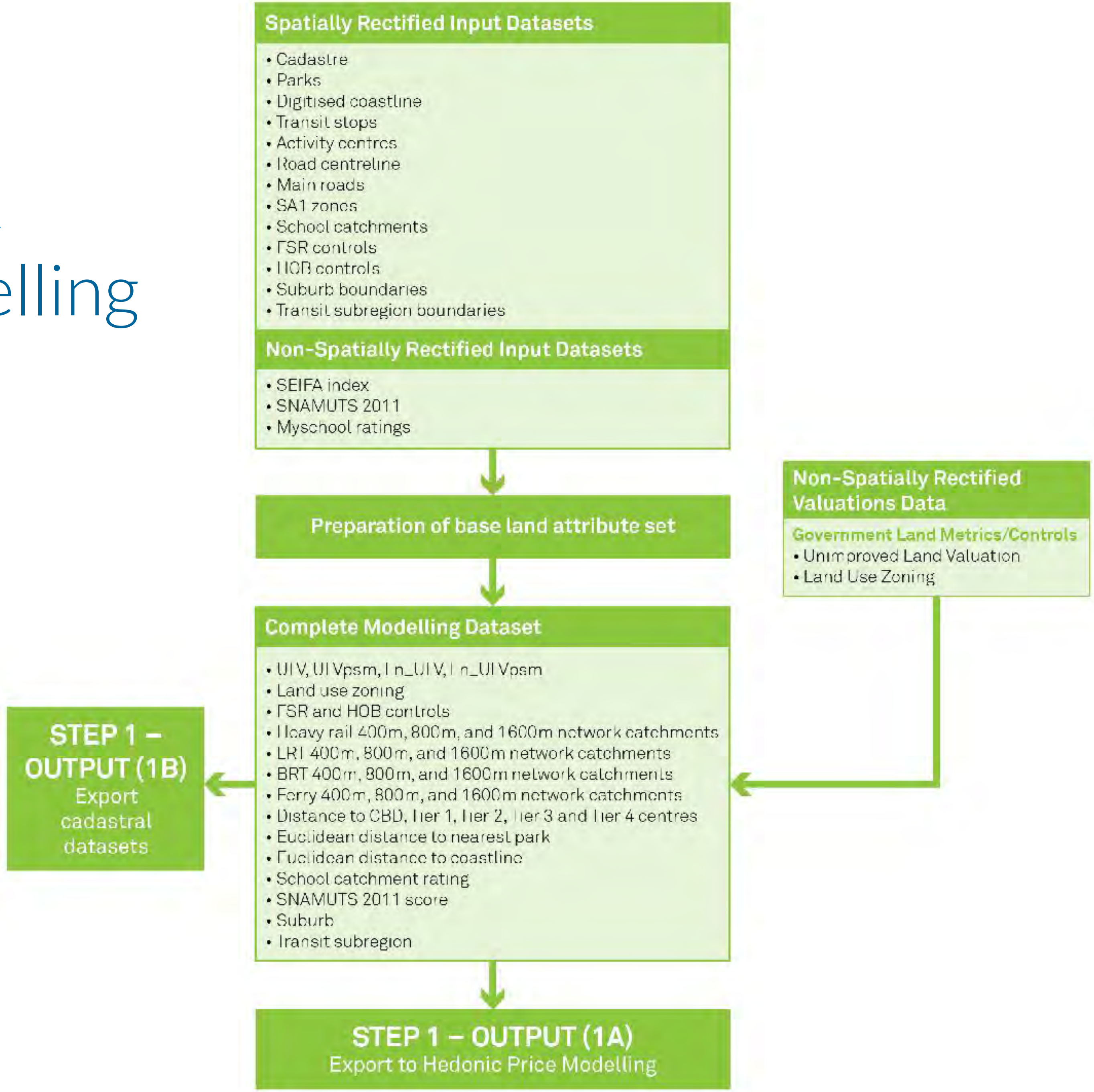


# Step 1 - Land Market Spatial Modelling

| Data Set | Data Source |
|---|---|
| Property Shapefile | NSW Government - Land and Property Information |
| CBD & Major Activity Centres | NSW Government - Department of Planning and Environment |
| Coastline | Custom made using ABS digital boundary data |
| Zoning used for valuation | NSW Government - Land and Property Information NSW Government - Department of Planning |
| Unimproved Land Value | NSW Government - Land and Property Information |
| Strata Count | NSW Government - Land and Property Information |
| Heritage Controls | NSW Government - Department of Planning and Environment |
| Height of Building | NSW Government - Department of Planning and Environment |
| Floor Space Ratio (FSR) Controls | NSW Government - Department of Planning and Environment |
| Strata Indicator and Strata Counts | NSW Government - Land and Property Information |
| Parks | NSW Government - Department of Planning and Environment |
| Employment density | NSW Government - Department of Planning and Environment |
| Transportation Infrastructure | NSW Government - Department of Planning and Environment, Custom made (station entry points) |
| School Catchments | NSW Government – Department of Education MySchool - http://www.myschool.edu.au/ |
| Socio-Economic Indexes for Areas (SEIFA), 2011 | Australian Bureau of Statistics (ABS) - Census data |
| Suburbs | Australian Bureau of Statistics (ABS) |
| LGAs | Australian Bureau of Statistics (ABS) |
| Spatial Network Analysis for Multi-Modal Urban Transport Systems | RMIT/Curtin University |

# Step 1
# Land Market Spatial Modelling



# Step 2 – Hedonic Price Modelling

*Parametric Land Price Equation with Year and Year-Transit Catchment Interactions*

$$ln(ulvpsm) = \alpha + \beta_a lnA_a + \beta_t T_t + \beta_l L_l + \beta_s S_s + \beta_y Y_y + \beta_{ty} TY + \mu$$

Where:

- A is a vector of continuous variable land attributes (e.g. distance to CBD and FSR),
- T is a vector of transport and transit-related dichotomous variables (e.g. within 400 m of a heavy rail station and 100 m of a major road corridor),
- L is a vector of dichotomous land use variables (e.g. A – Residential or M – Mixed Use),
- S is a vector of dichotomous variables indicating the land parcel's suburb,
- Y is a vector of dichotomous year variables spanning 2001 to 2014 with the year 2000 providing the base year for comparison, and
- TY represents a vector of interaction terms between valuation year and transit mode.

# Step 2 – Hedonic Price Modelling

## STEP 1 – OUTPUT (1A)

Export from Land Market Spatial Modelling

## Step 2A – Cross Sectional Model

Ln_ulvpsm ~ log(area) + log(fsr) + log(distcoast) + log(distpark) + log(dist_cbd) + log(distctr2) + hrail_0_400 + hrail_4_800 + hrail_8_1600 + hrail400seifa_int + hrail800seifa_int + hrail1600seifa_int – lrt_0_400 – lrt_4_800 + lrt_8_1600 + lrt400seifa_int + lrt800seifa_int + lrt1600seifa_int + brt_0_400 + brt_4_800 + brt_8_1600 + brt400seifa_int + brt800seifa_int + brt1600seifa_int + ferry_0_400 + ferry_4_800 + ferry_8_1600 + ferry400seifa_int + ferry800seifa_int + ferry1600seifa_int + main_road_0_100 + main_road_1_200 + log(snamuts11) + log(seifa_per) + log(high_school_rating) + heritage + strata + zoning + suburb + constant

## STEP 2A – OUTPUT (2A)

Catchment Zoning and FSR variable estimates for entry into Financial Model

## Step 2B – Panel Data Analysis Model (2000–2014)

Ln_ulvpsm ~ log(area) + log(fsr) + log(distcoast) + log(distpark) + log(dist_cbd) – log(distctr2) + hrail_0_400 + hrail_4_800 + hrail_8_1600 + hrail400seifa_int + hrail800seifa_int + hrail1600seifa_int + year2001 + year2002 + year2003 + year2004 – year2005 + year2006 + year2007 – year2008 + year2009 + year2010 + year2011 + year2012 + year2013 + year2014 – hrail400myear2001 + hrail400myear2002 + hrail400myear2003 + hrail400myear2004 + hrail400myear2005 + hrail400myear2006 + hrail400myear2007 + hrail400myear2008 + hrail400myear2009 + hrail400myear2010 + hrail400myear2011 + hrail400myear2012 + hrail400myear2013 + hrail400myear2014 + hrail800myear2001 + hrail800myear2002 + hrail800myear2003 + hrail800myear2004 + hrail800myear2005 + hrail800myear2006 + hrail800myear2007 + hrail800myear2008 + hrail800myear2009 + hrail800myear2010 + hrail800myear2011 + hrail800myear2012 + hrail800myear2013 + hrail800myear2014 + hrail1600myear2001+ hrail1600myear2002 + hrail1600myear2003 – hrail1600myear2004 + hrail1600myear2005 + hrail1600myear2006 + hrail1600myear2007 + hrail1600myear2008 – hrail1600myear2009 + hrail1600myear2010 + hrail1600myear2011 + hrail1600myear2012 + hrail1600myear2013 + hrail1600myear2014 + lrt400myear2001 + lrt400myear2002 + lrt400myear2003 – lrt400myear2004 + lrt400myear2005 + lrt400myear2006 + lrt400myear2007 + lrt400myear2008 – lrt400myear2009 – lrt400myear2010 + lrt400myear2011 + lrt400myear2012 + lrt400myear2013 + lrt400myear2014 – lrt800myear2001 + lrt800myear2002 + lrt800myear2003 + lrt800myear2004 + lrt800myear2005 + lrt800myear2006 lrt800myear2007 – lrt800myear2008 + lrt800myear2009 + lrt800myear2010 + lrt800myear2011 + lrt800myear2012 – lrt800myear2013 – lrt800myear2014 + lrt1600myear2001+ lrt1600myear2002 + lrt1600myear2003 + lrt1600myear2004 + lrt1600myear2005 + lrt1600myear2006 + lrt1600myear2007 + lrt1600myear2008 + lrt1600myear2009 + lrt1600myear2010 + lrt1600myear2011 + lrt1600myear2012 + lrt1600myear2013 + lrt1600myear2014 + brt400myear2001 – brt400myear2002 + brt400myear2003 – brt400myear2004 + brt400myear2005 – brt400myear2006 + brt400myear2007 + brt400myear2008 + brt400myear2009 + brt400myear2010 + brt400myear2011 + brt400myear2012 – brt400myear2013 + brt400myear2014 – brt800myear2001 + brt800myear2002 – brt800myear2003 + brt800myear2004 + brt800myear2005 + brt800myear2006 + brt800myear2007 + brt800myear2008 + brt800myear2009 + brt800myear2010 + brt800myear2011 + brt800myear2012 + brt800myear2013 + brt800myear2014 + brt1600myear2001+ brt1600myear2002 + brt1600myear2003 + brt1600myear2004 + brt1600myear2005 – brt1600myear2006 + brt1600myear2007 + brt1600myear2008 – brt1600myear2009 – brt1600myear2010 + brt1600myear2011 + brt1600myear2012 + brt1600myear2013 + brt1600myear2014 + ferry400myear2001 + ferry400myear2002 + ferry400myear2003 + ferry400myear2004 – ferry400myear2005 + ferry400myear2006 – ferry400myear2007 + ferry400myear2008 + ferry400myear2009 – ferry400myear2010 + ferry400myear2011 – ferry400myear2012 + ferry400myear2013 + ferry400myear2014 – ferry800myear2001 + ferry800myear2002 – ferry800myear2003 + ferry800myear2004 + ferry800myear2005 – ferry800myear2006 + ferry800myear2007 – ferry800myear2008 + ferry800myear2009 + ferry800myear2010 – ferry800myear2011 + ferry800myear2012 – ferry800myear2013 + ferry800myear2014 + ferry1600myear2001+ ferry1600myear2002 + ferry1600myear2003 – ferry1600myear2004 + ferry1600myear2005 + ferry1600myear2006 + ferry1600myear2007 + ferry1600myear2008 + ferry1600myear2009 + ferry1600myear2010 + ferry1600myear2011 + ferry1600myear2012 – ferry1600myear2013 + ferry1600myear2014 + main_road_0_100 + main_road_1_200 + log(snamuts11) + log(seifa_per) + log(high_school_catchment) + heritage – strata + zoning + suburb + constantStep 2B -

## STEP 2B – OUTPUT (2B)

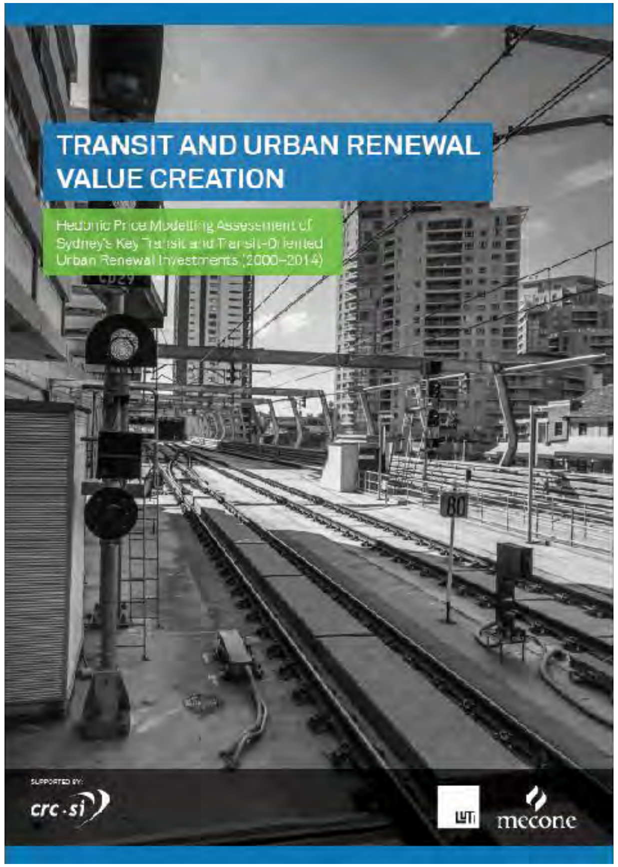
Catchment Accessibility variable estimates for entry into Financial Model

## STEP 2B – OUTPUT (2C)

Land Market Escalation Rate estimates for entry into Financial Model

# What existing evidence of land value uplift around transportation infrastructure can we cite, and how does this relate to the Sydney?

1. Sydney, NSW Metropolitan Model (2000-2014)
    a) Airport Link
    b) Epping to Chatswood
    c) Inner West LRT
    d) Dulwich Hill Extension to the LRT
    e) Parramatta to Liverpool BRT
    f) Parramatta to Rouse Hill BRT
    g) Green Square
    h) Central Park
    i) Main Roads
2. Perth, WA Metropolitan Model (2000-2012)
    a) Mandurah Rail Line
    b) Joondalup Rail Line
    c) Fremantle Rail Line
    d) Midland Rail Line
    e) Armadale Rail Line
3. South East Queensland Regional Model (2000 – 2015)
    a) Gold Coast Rapid Transit
    b) Morten Bay Rail Link
    c) Springfield line
    d) Northern and Eastern Busways



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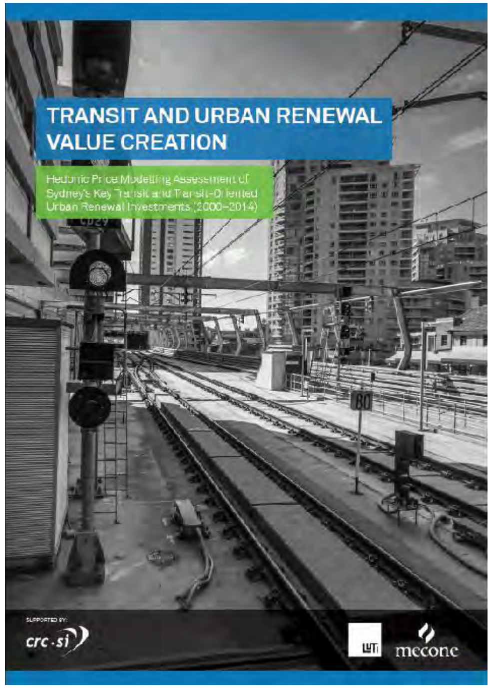
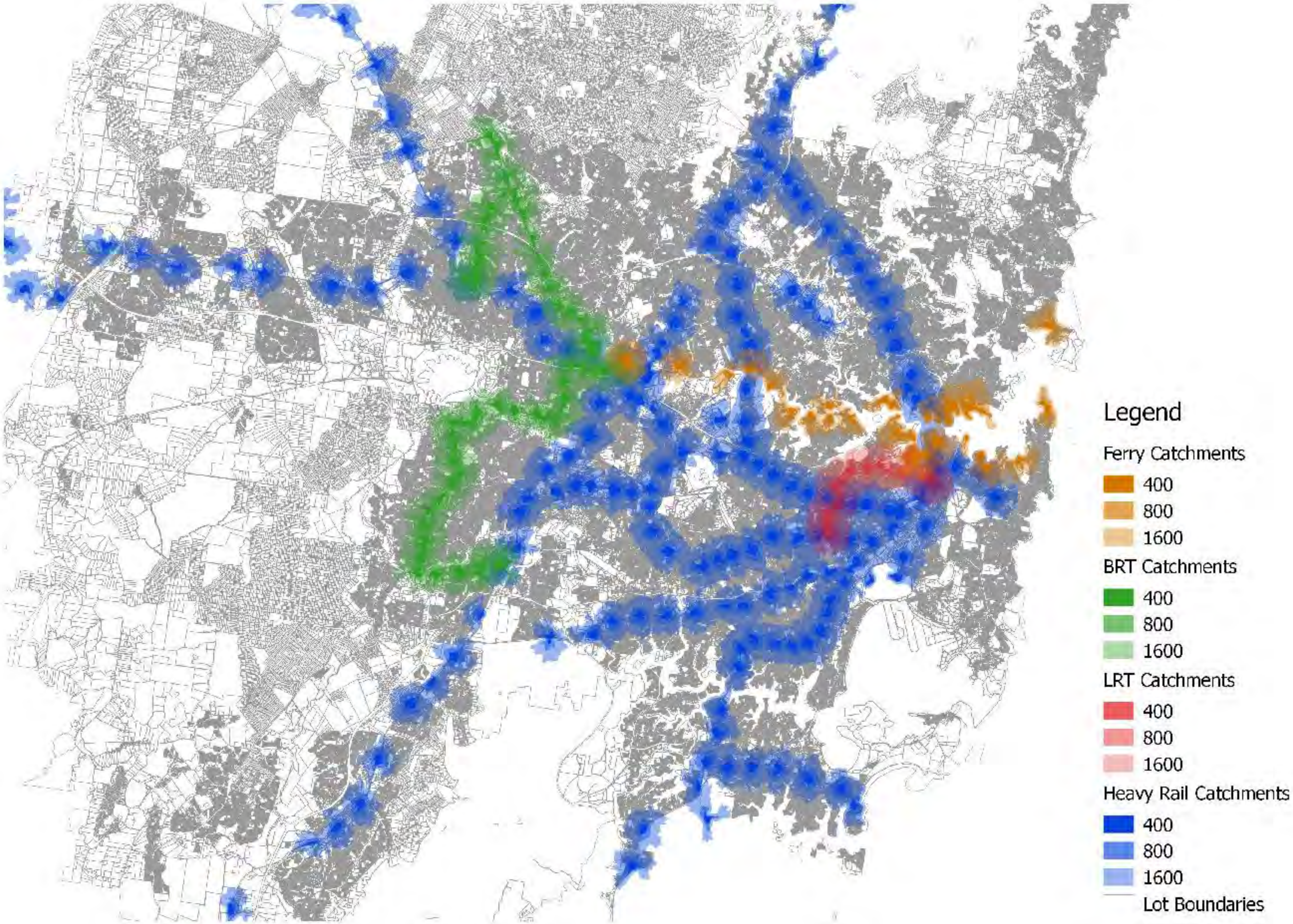




Transportation Research Part A

Can value capture work in a car dependent city? Willingness to pay for transit access in Perth, Western Australia

# Metropolitan Sydney Willingness to Pay Transit Model - Transit



# Phase 1 – Monetization of Heavy Rail Accessibility Benefit
## (Metropolitan Sydney Model)


~ 5% Uplift in land value

# Phase 1 – Monetization of Proximity Benefit to Main Roads

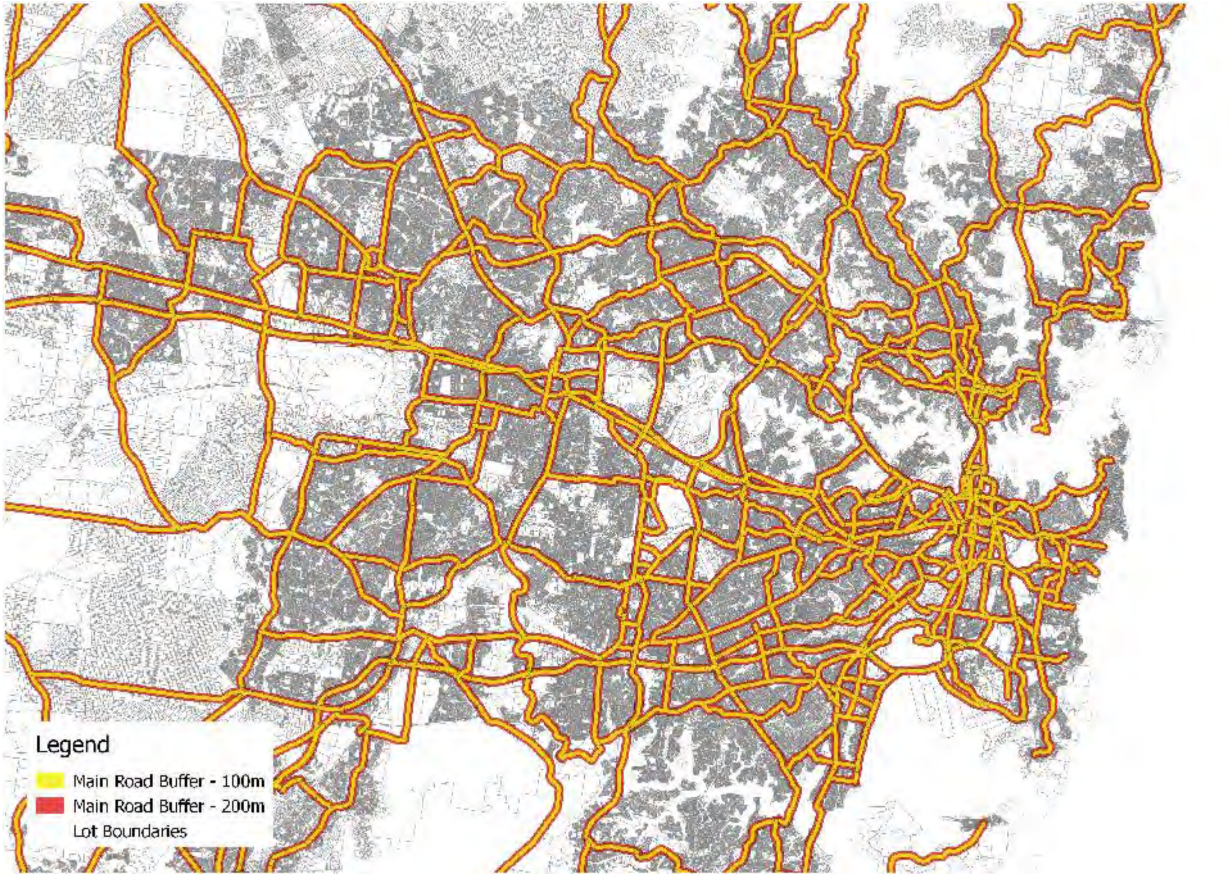

~ - 8-9% Down Lift in land value

# Phase 1 – Monetization of Proximity Benefit to RMS Roads

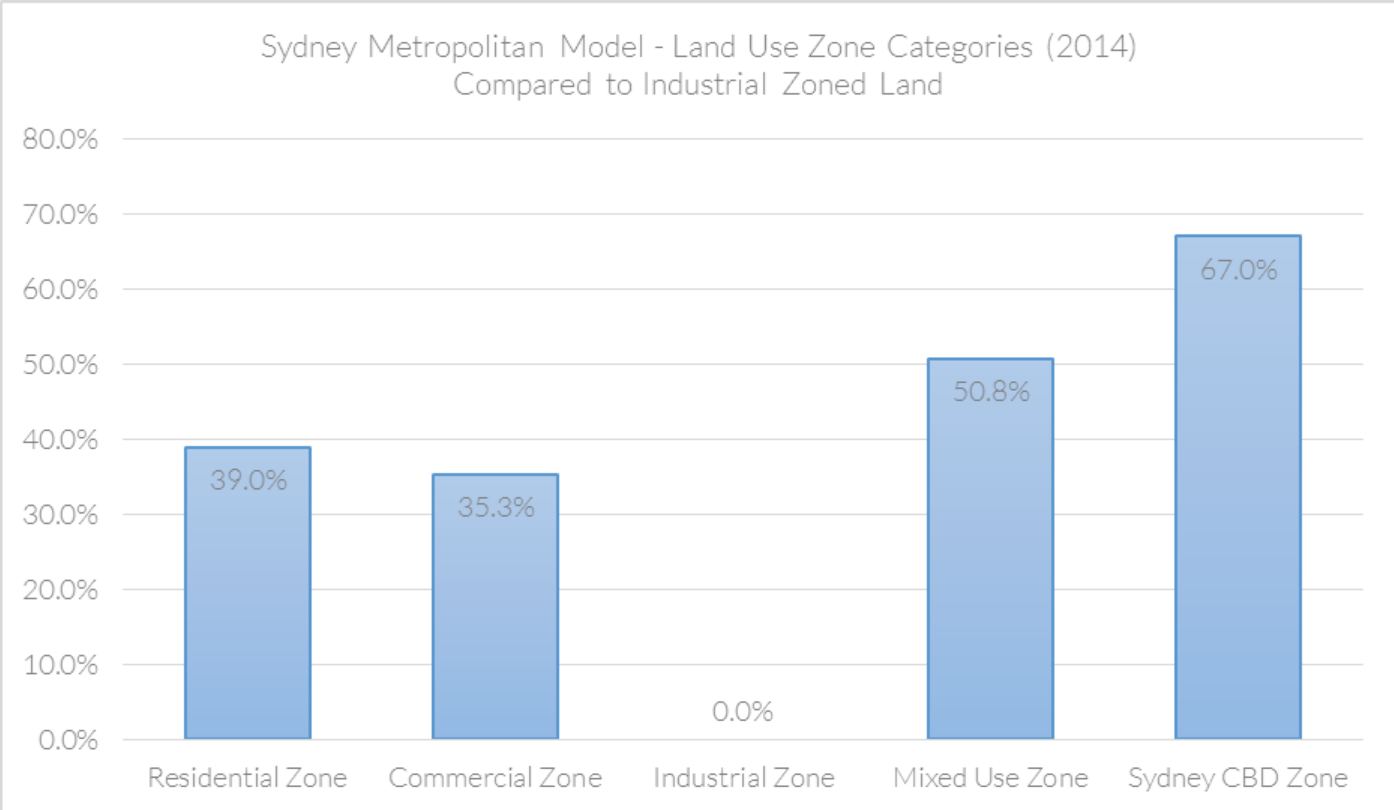
Proximity to the RMS Road Network (2015)

| | | Uplift | Sig |
|---|---|---|---|
| Freeway | 0_100 | -6.8% | *** |
| Freeway | 100_200 | -0.9% | *** |
| Freeway | 200_400 | 0.3% | . |
| Main Road | 0_100 | -7.2% | *** |
| Main Road | 100_200 | -0.1% | |
| Second Road | 0_100 | -5.2% | *** |
| Second Road | 1_200 | 0.0% | |

*Adjusted R-squared: 0.8884*
*Signifiance. codes:*
*0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1*



# Phase 2 - Monetization of Change of Zoning to its "Highest and Best Use" (Metropolitan Sydney Model)




Using the previous example:
Industrial Zoned Land Use going to Mixed Use Zoned Land

~ 50.8% Uplift in land value

# Phase 3 - Monetization of FSR enabled by increased catchment accessibility (Metropolitan Sydney Model)

- Value created by increasing the Floor Space Ratio in the land markets surrounding a transit station to its highest and best use, where FSR has a land value elasticity of 0.238
- This can be interpreted as a 1% increase in FSR leads to a 0.238% in land value

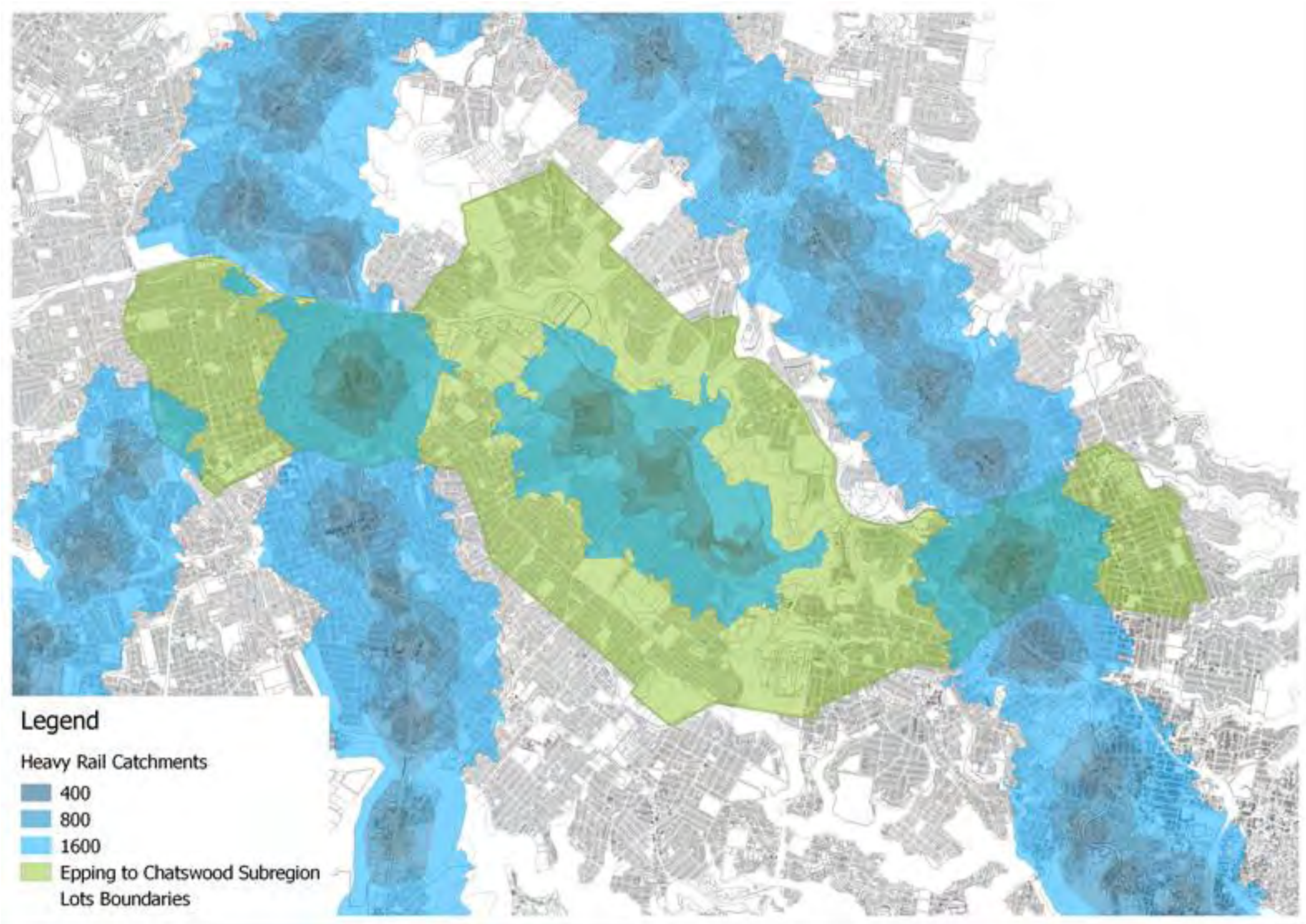
Using the previous example:
Initial FSR 0.5 going to an intervention FSR of 4

~ 214% Uplift in land value

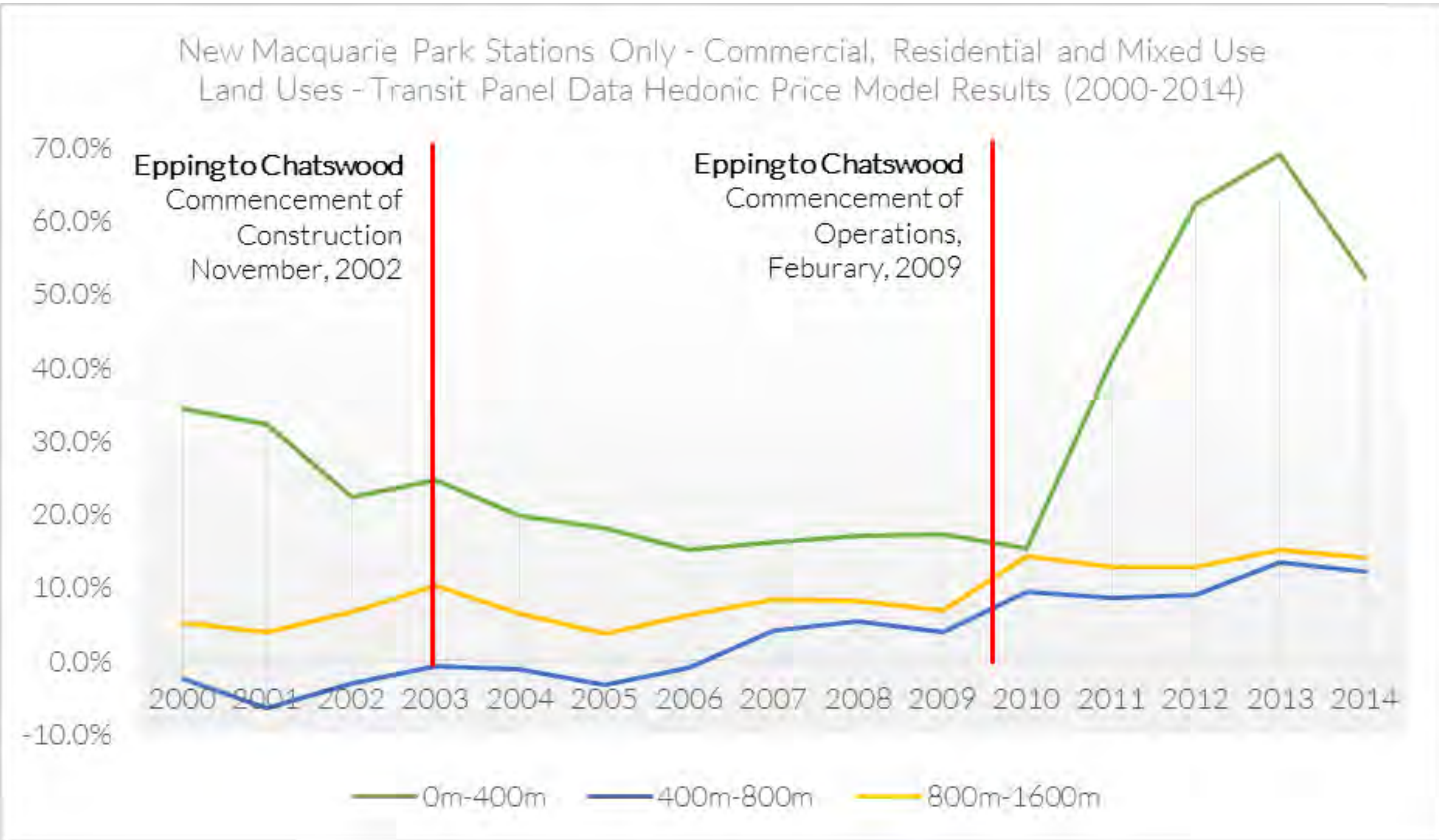
# Metropolitan Sydney – Uplift Values

1. Accessibility Based Land Value Uplift (%) = 5.1%    All Land Uses
2. Change of Zoning (Ind. To MU) Based Land Value Uplift (%) = 50.8%
3. FSR Based Land Value Uplift (%) (0.5 to 4) =214%

# The Epping to Chatswood Rail Line

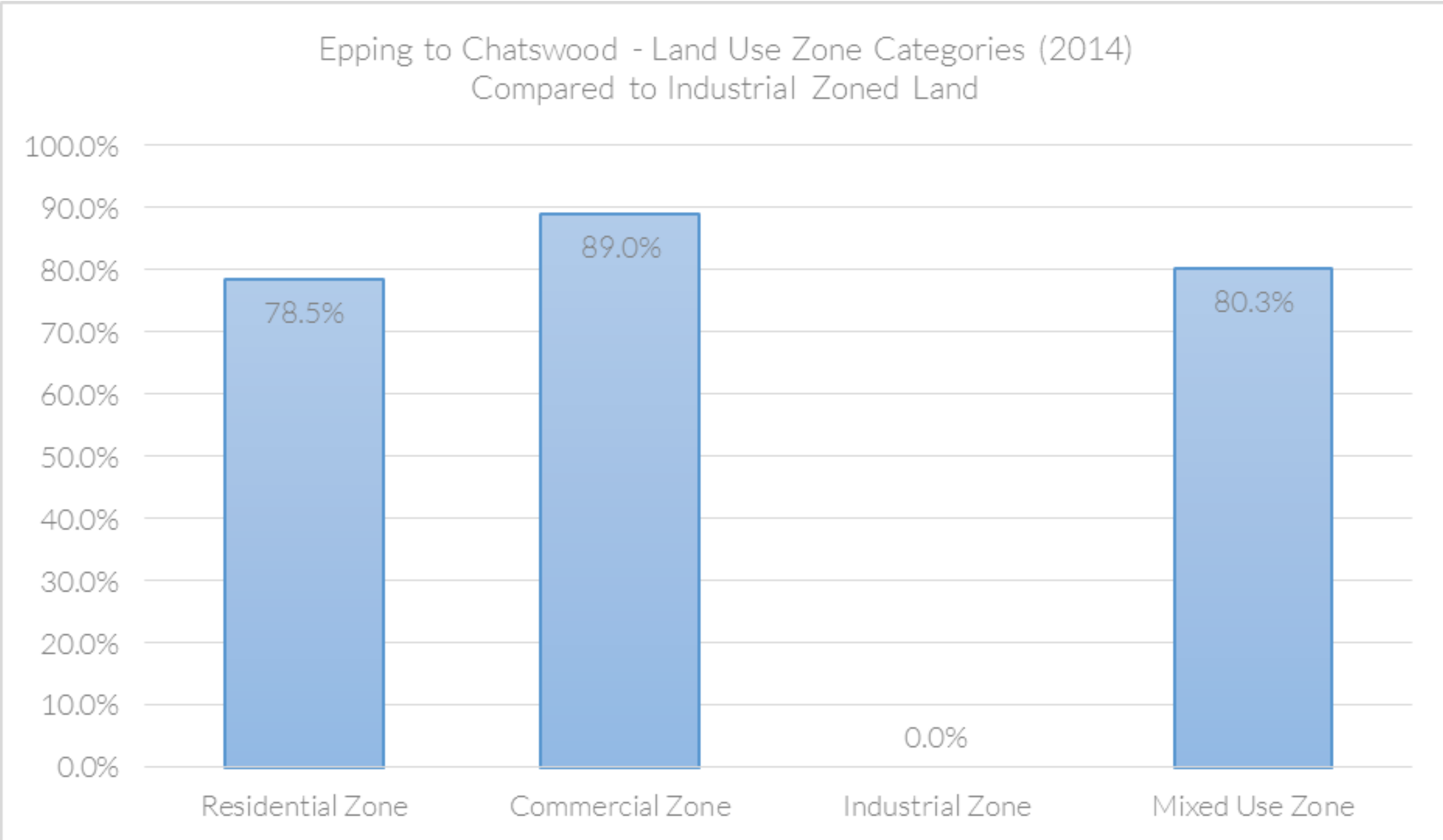


# Phase 1 – Monetization of Accessibility Benefit Residential and Mixed Use (Epping to Chatswood Rail Line)




~ 50.1% Uplift in Residential and Mixed Use land value

# Phase 2 – Monetization of Change of Zoning to its “Highest and Best Use” (Epping to Chatswood Rail Line)




Using the previous example:
Industrial Zoned Land Use going to Mixed Use Zoned Land

~ 80.3% Uplift in land value

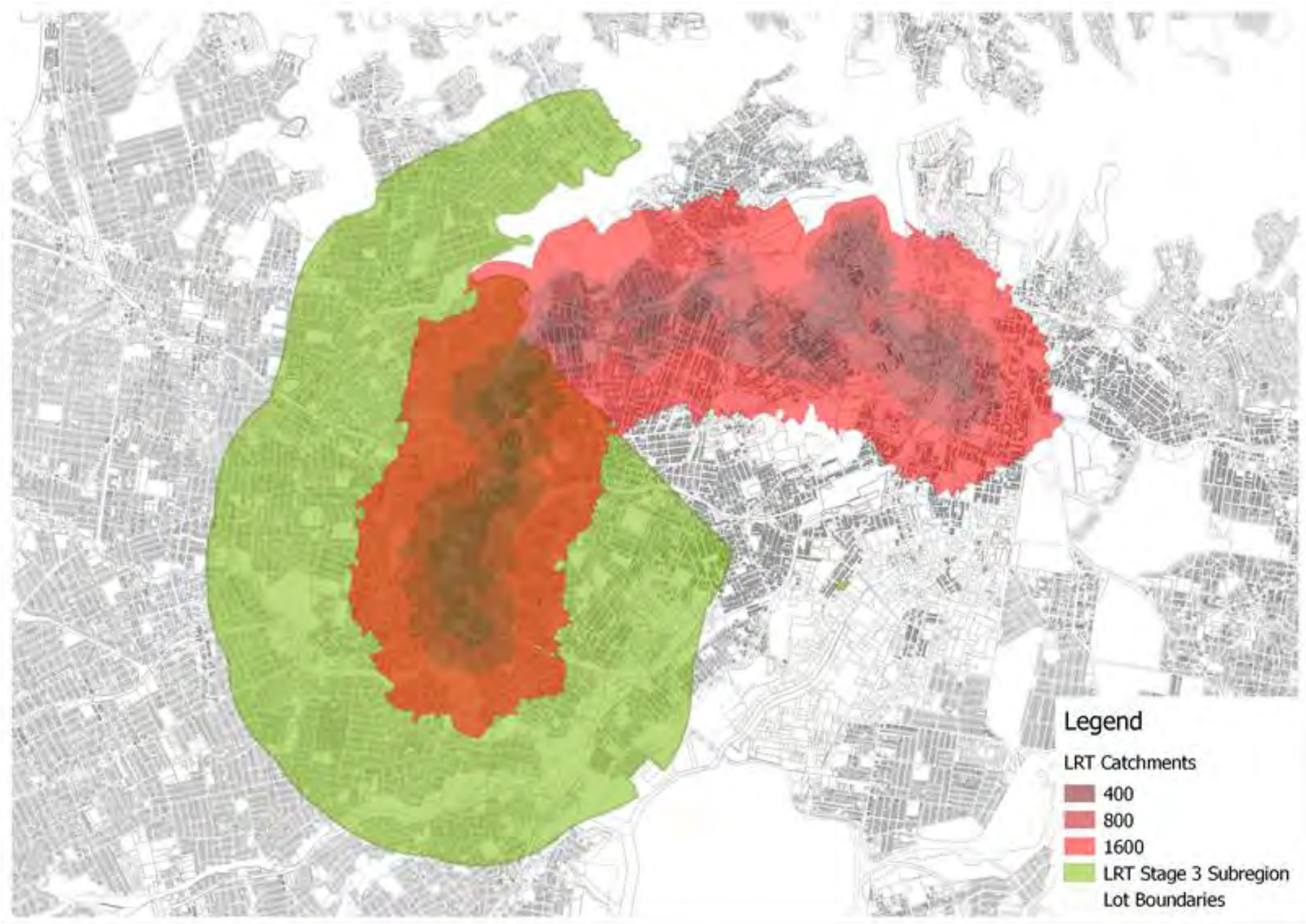
# The Epping to Chatswood Rail Line – Uplift Values

1. Accessibility Based Land Value Uplift (%) = 9.4% All Land Uses
   = 50.1% Residential and Mixed Use

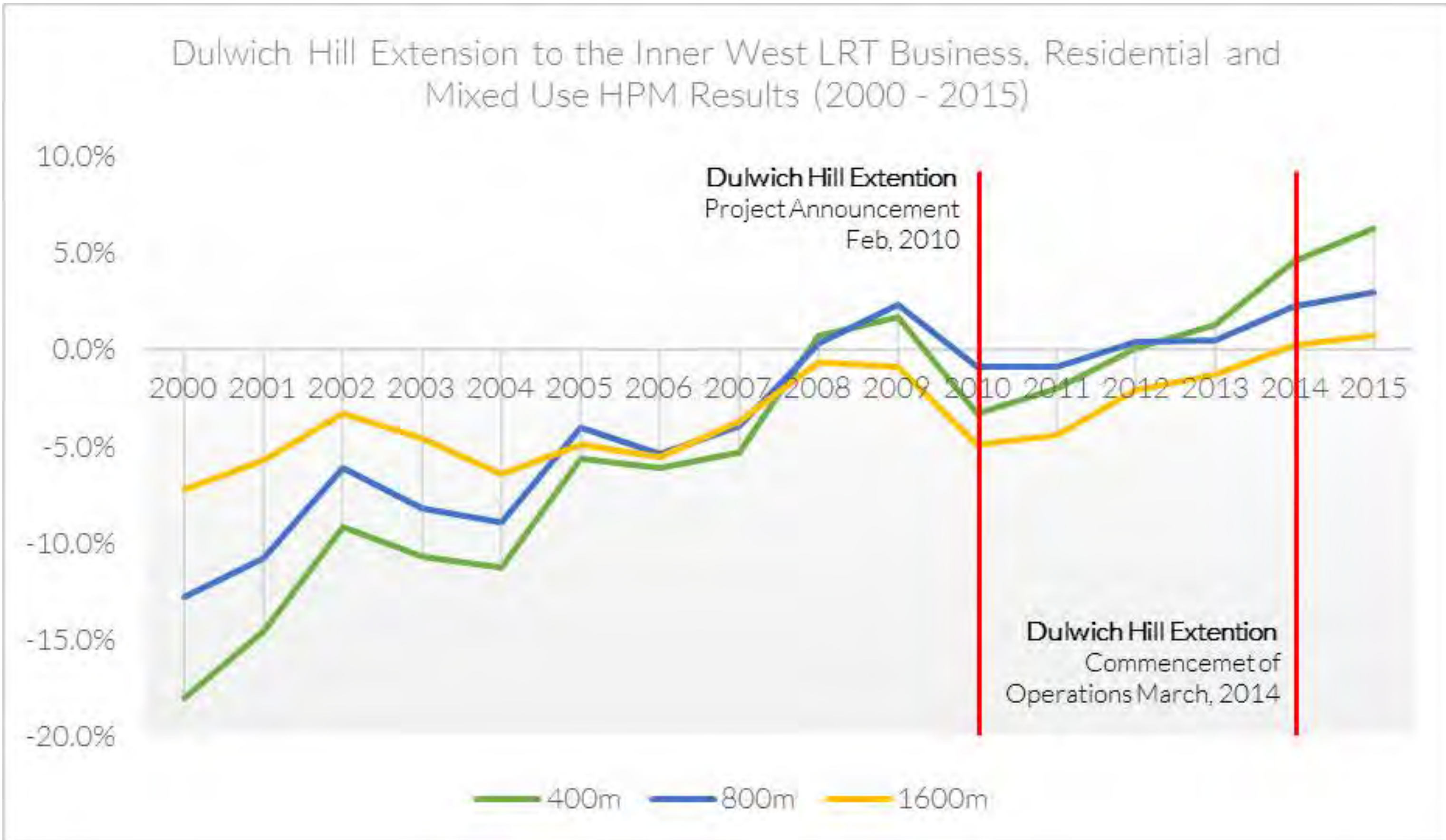
2. Change of Zoning (Ind. To MU) Based Land Value Uplift (%) = 80.3%

3. FSR Based Land Value Uplift (%) (0.55 to 4) =125.3%

# Dulwich Hill Extension to the Inner West LRT

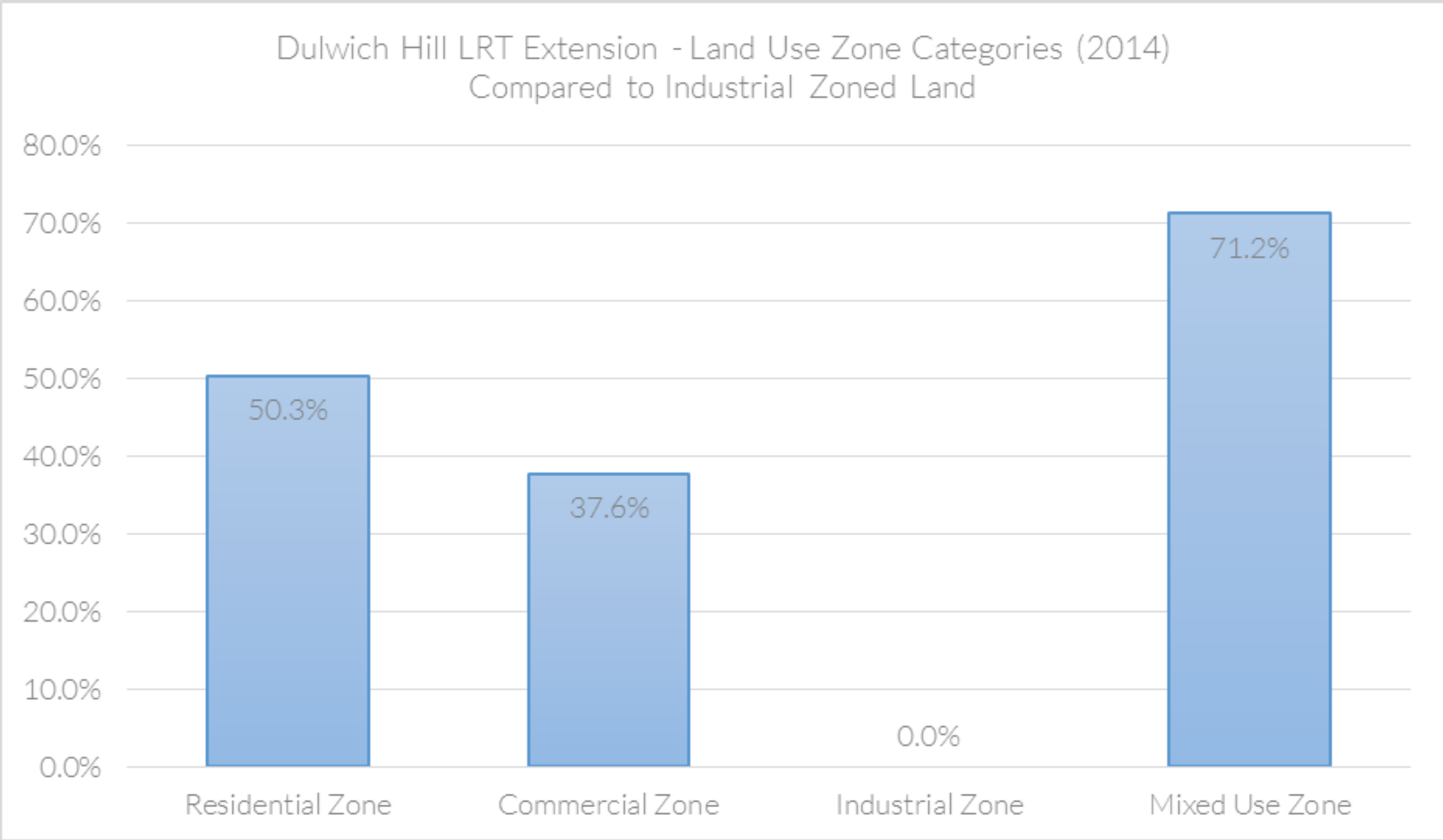


# Phase 1 – Monetization of Accessibility Benefit Residential and Mixed Use (Dulwich Hill Extension to the Inner West LRT)




Uplift in Residential and Mixed Use land value
~ 9.5% (0_400m)
~ 3.8% (400m_800m)
~ 5.6% (800m_1600m)

# Phase 2 – Monetization of Change of Zoning to its "Highest and Best Use" (Dulwich Hill Extension to the Inner West LRT)




Using the previous example:
Industrial Zoned Land Use going to Mixed Use Zoned Land

~ 71.2% Uplift in land value

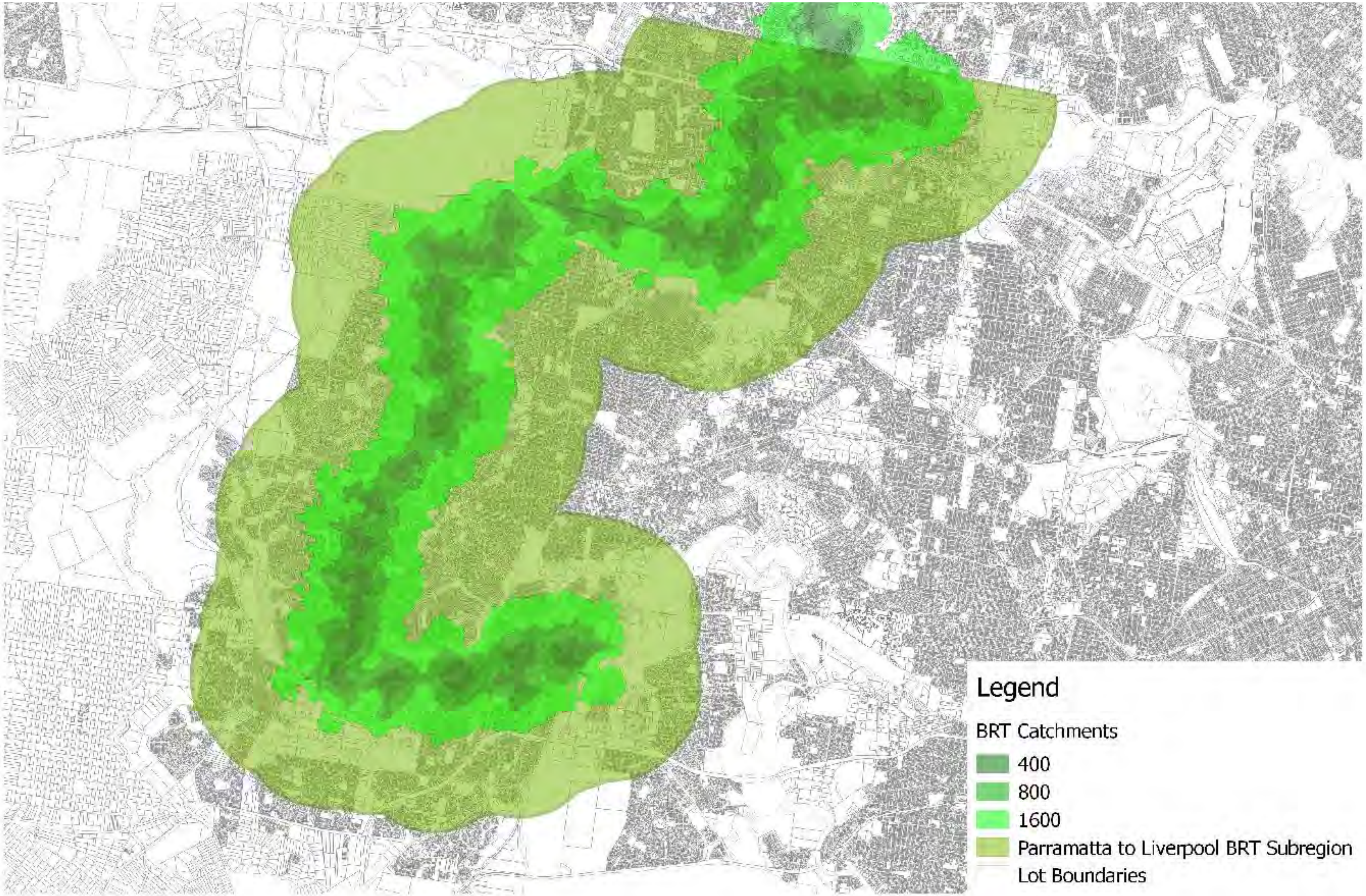
# Dulwich Hill Extension to the Inner West LRT – Uplift Values

1. Accessibility Based Land Value Uplift (%) = 9.5%

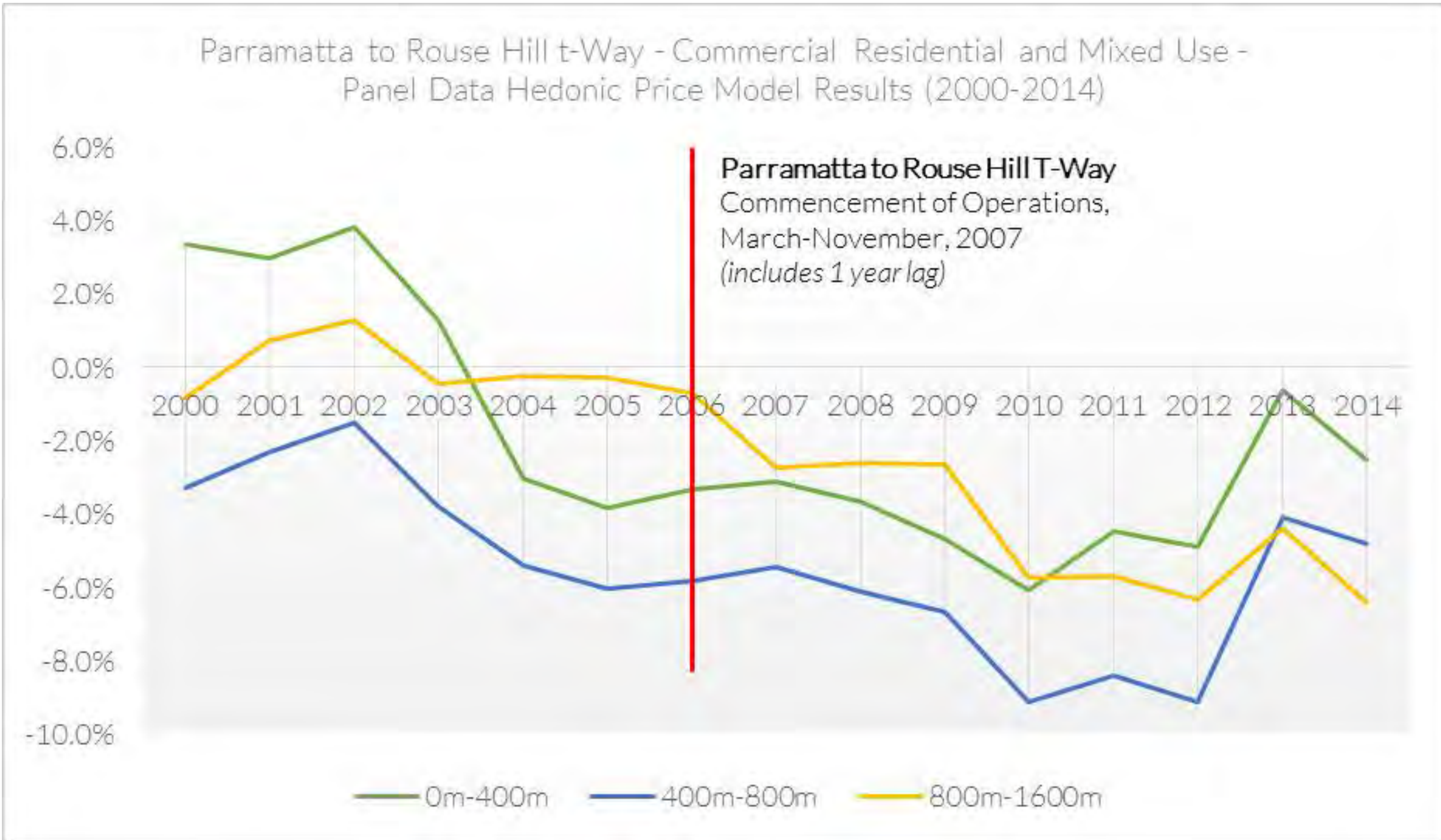
2. Change of Zoning (Ind. To MU) Based Land Value Uplift (%) = 88.9%

3. FSR Based Land Value Uplift (%) (0.65 to 4) =103.2%

# The Parramatta to Liverpool T-Way Bus Rapid Transit

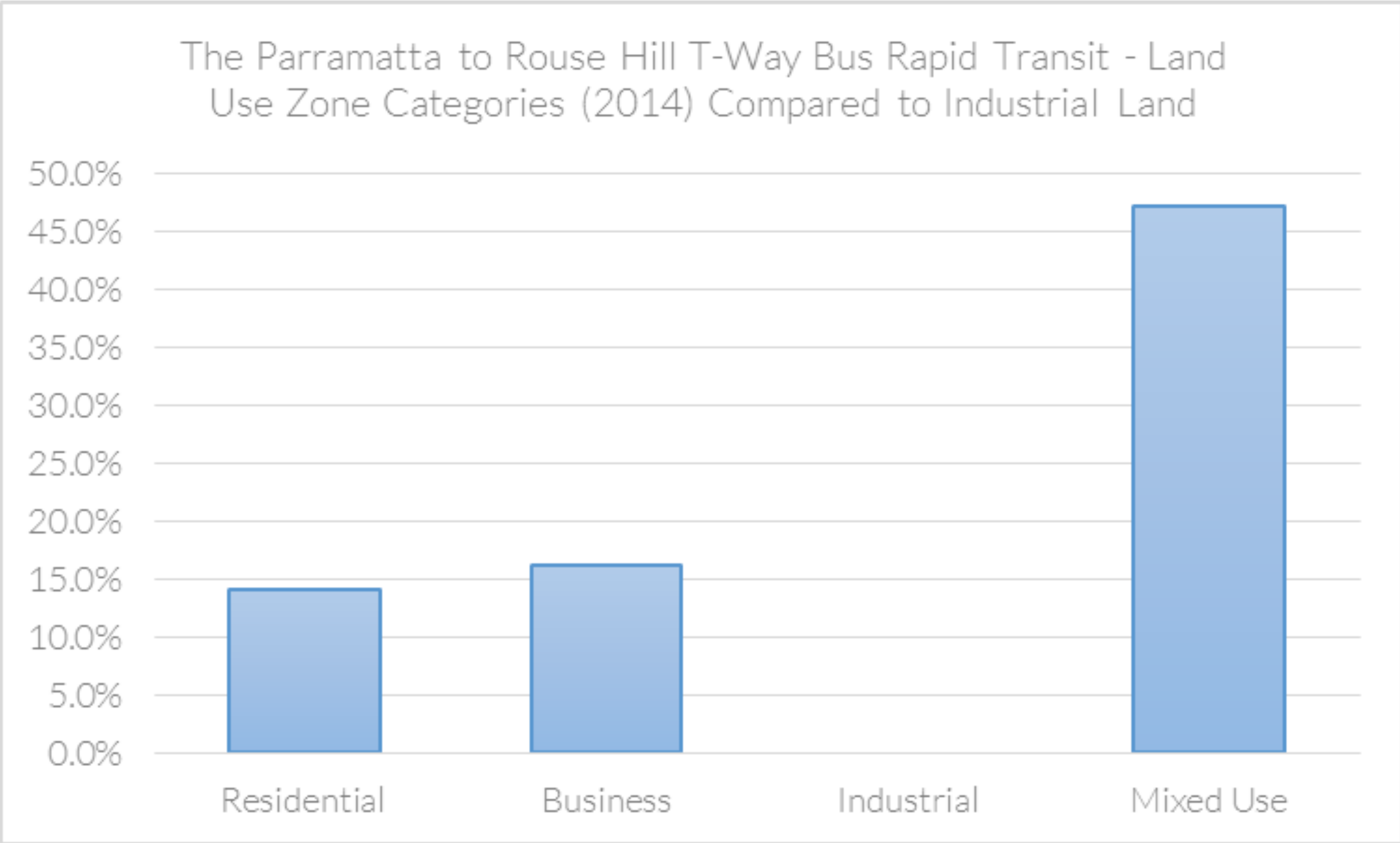


# Phase 1 – Monetization of Accessibility Benefit Residential and Mixed Use (The Parramatta to Rouse Hill T-Way Bus Rapid Transit)




Inconclusive uplift in land value

# Phase 2 – Monetization of Change of Zoning to its "Highest and Best Use" (The Parramatta to Rouse Hill T-Way Bus Rapid Transit)




Using the previous example:
Industrial Zoned Land Use going to Mixed Use Zoned Land

~ 41.7% Uplift in land value

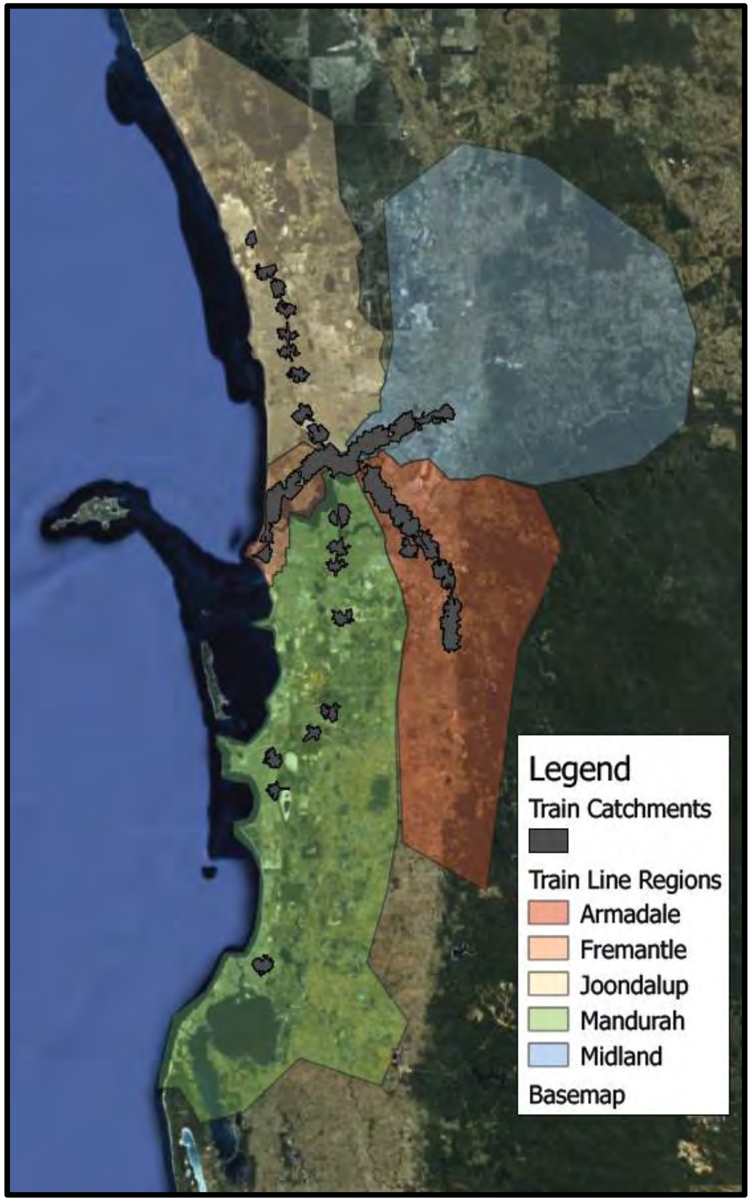
# The Parramatta to Rouse Hill T-Way Bus Rapid Transit – Uplift Values

1. Accessibility Based Land Value Uplift (%) = Inconclusive

2. Change of Zoning (Ind. To MU) Based Land Value Uplift (%) = 41.7%

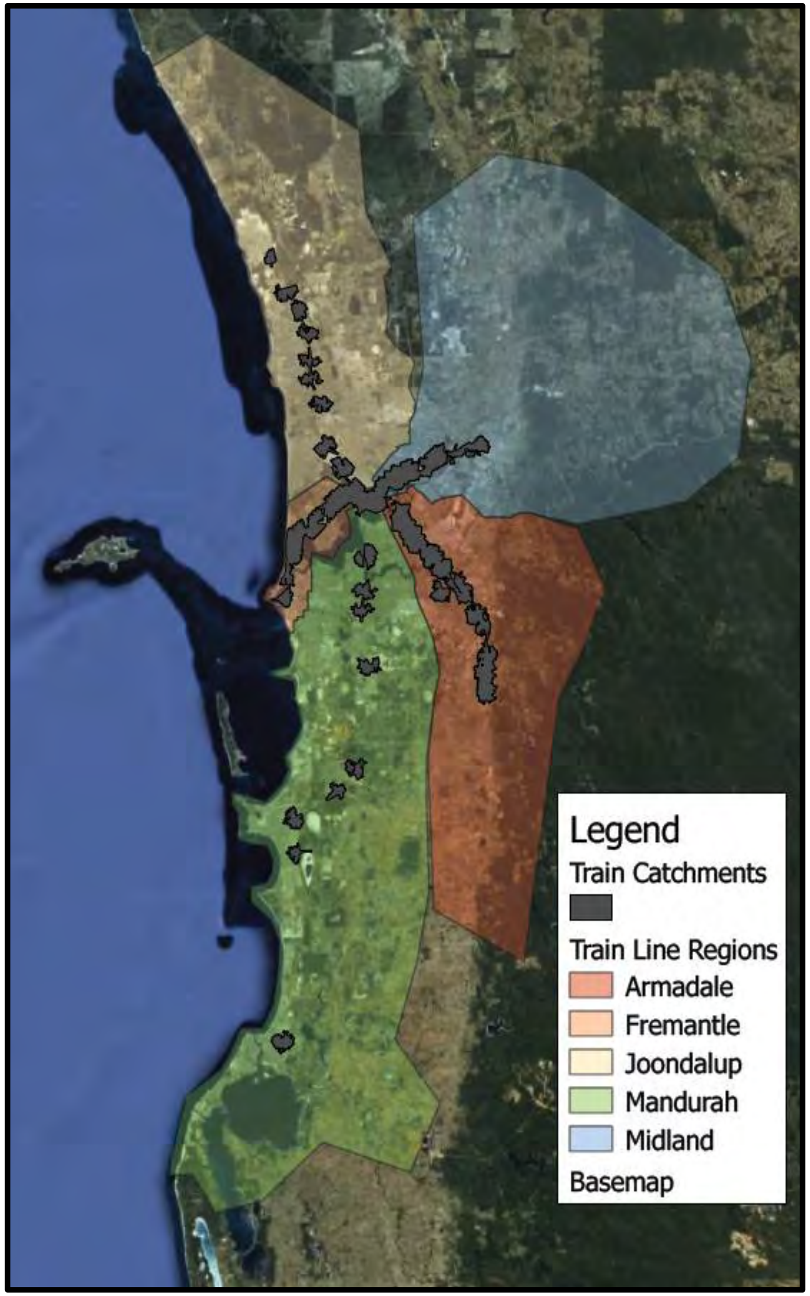
3. FSR Based Land Value Uplift (%) (0.65 to 4) = 132%

# The Mandurah Rail Line - Perth, Western Australia

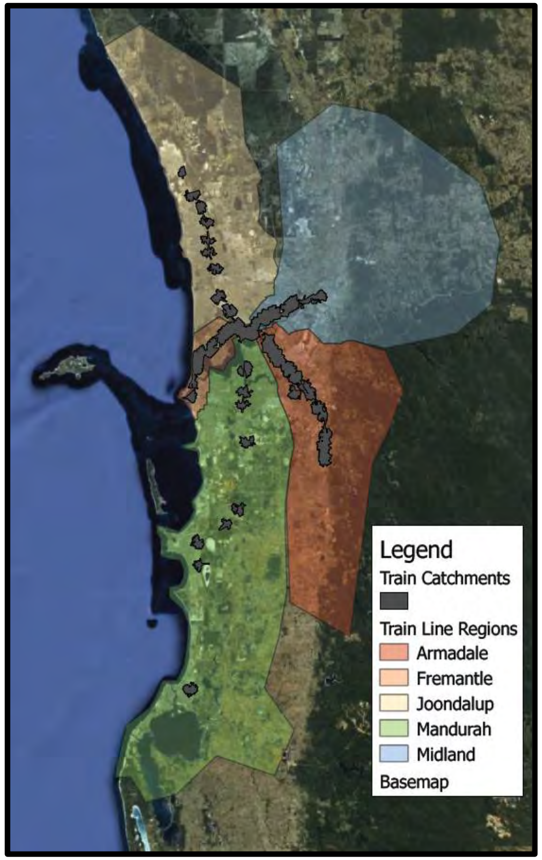
# Metropolitan Region Perth - Econometric Model – (2000-2012)

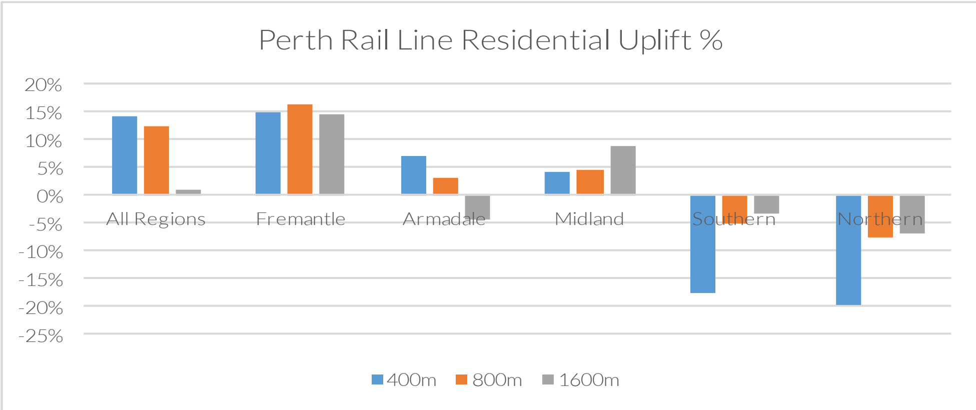
| Perth Metro Model – Descriptive Stats | |
|---|---|
| *Variables* | *Average Values* |
| Land Value/m$^2$ (no view) (AUD$ 2011) | $590.69 |
| Number of Land Parcels | 462476 |
| 400m train catchment | (1.2%) |
| 800m train catchment | (3.5%) |
| 1600m train catchment | (11.1%) |
| 0-100m Hwy # of parcels | (3.9%) |
| 100-200m Hwy # of parcels | (5.7%) |
| 200-400m Hwy # of parcels | (5.7%) |
| Dist. to freeway onramp | 8.63 |
| PT Accessibility (SNAMUTS) | 6.62 |
| Dist. to CBD | 17.422 |
| Dist. to secondary centre 2 | 4.80 |
| Lot Area (m$^2$) | 1746 |
| Residential Density (R-Code) | 20.98 |
| # of Dwellings within 1600m | 4680 |
| H. School rating | 5.52 |
| Socio Economic Index For Areas (SEIFA) | 58.641 |
| Dist. to water (km) | 3.17 |



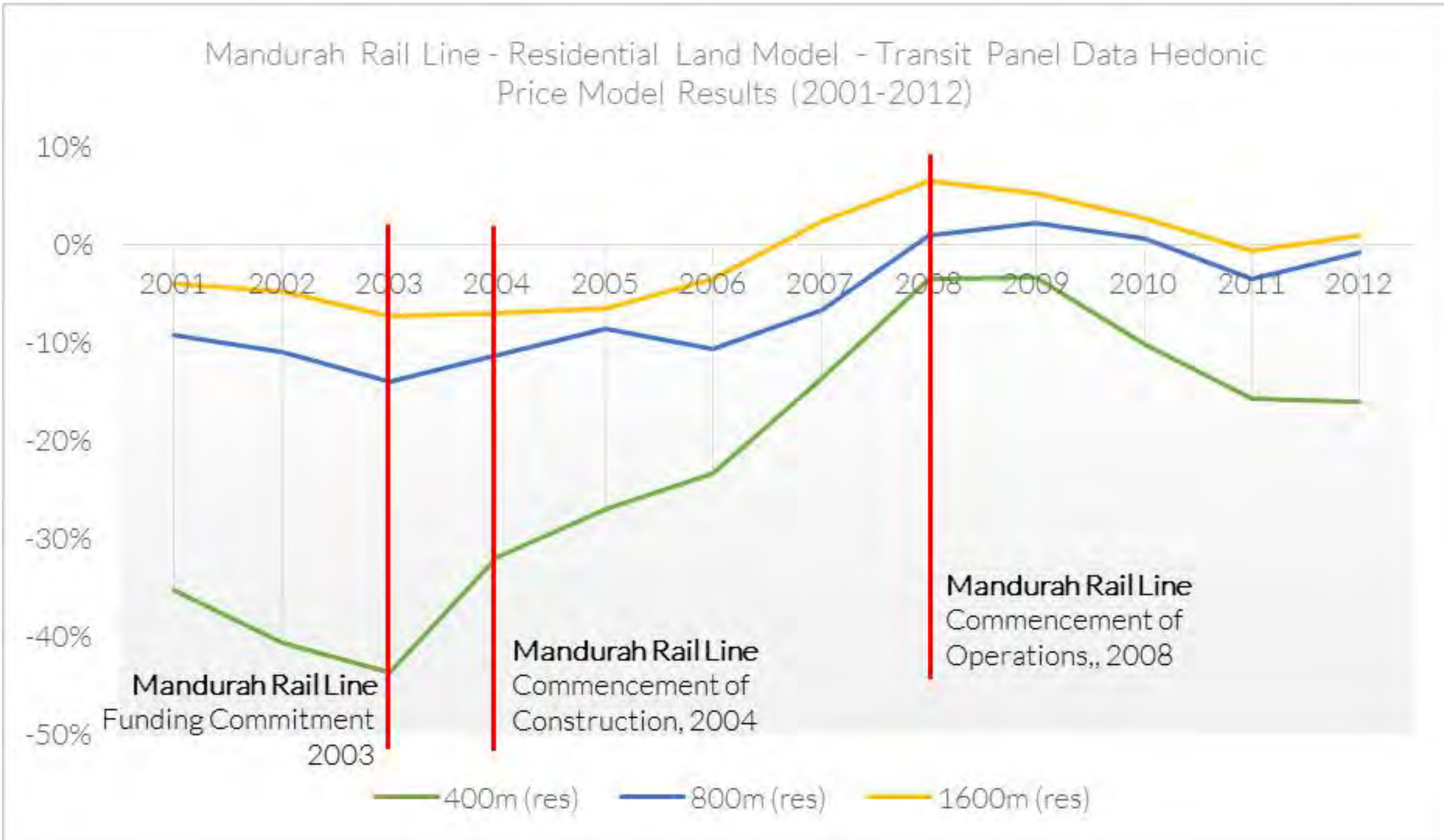
# Metro Region Perth - Econometric Model Results – Cross Sectional Model (2012)

| | Residential | Commercial | Industrial |
|---|---|---|---|
| Constant | 8.270 | -1.544 | -5.861 |
| Area ($m^2$) | -0.601 | -0.445 | -0.311 |
| R-Code | 0.016 | - | - |
| 400m train catchment | 14.2% | 28.2% | -1.9% |
| 800m train catchment | 12.3% | 21.3% | 0.6% |
| 1600m train catchment | 1.1% | 15.6% | -8.9% |
| SNAMUTS score | 0.002 | 0.043 | 0.012 |
| Socio Economic Index For Areas (SEIFA) | 0.246 | 0.090 | |
| Senior high school rating | 0.052 | | |
| Distance to water | -0.155 | -0.134 | |
| Dwellings within 1600m | 0.139 | -0.670 | 0.207 |
| Distance to CBD | -0.029 | - | |
| Distance to secondary centre | -0.030 | - | |
| 0 – 100m of a highway | -7.0% | 7.8% | 7.8% |
| 100 – 200m of a highway | 0.4% | -0.1% | -1.4% |
| Distance to nearest freeway onramp | 3.0% | -11.2% | 2.6% |
| Effective Job Density | - | 1.922 | 1.38 |
| | | | |
| Adjusted R-Squared | 0.860 | 0.814 | 0.786 |
| No. of Land Parcels | 462,476 | 6322 | 8243 |



# Phase 1 – Monetization of Accessibility Benefit Residential and Mixed Use (The Mandurah Rail Line - Perth, Western Australia )

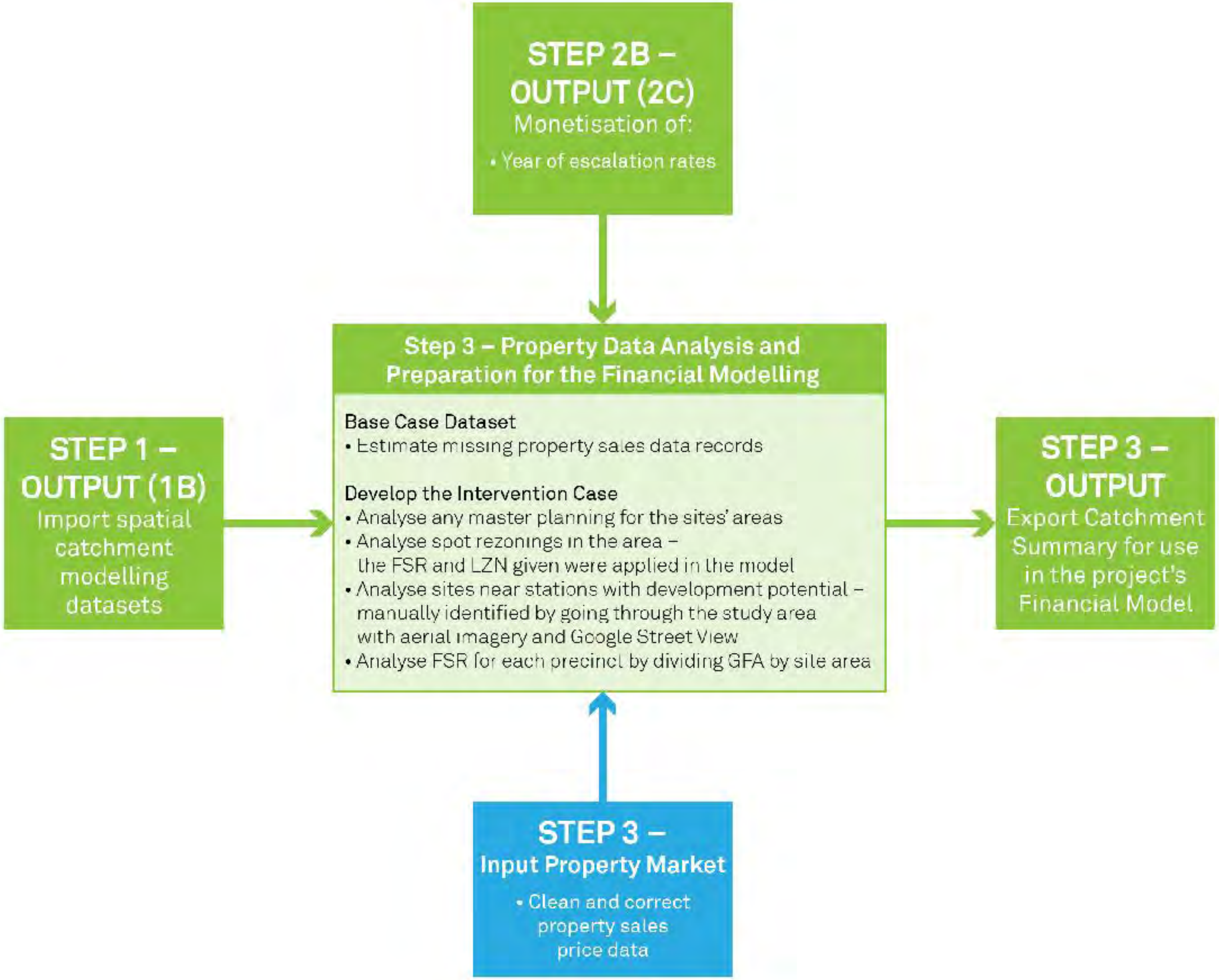



Uplift in Residential and Mixed Use land value
~ 30% (0_400m)
~ 13% (400m_800m)
~ 8% (800m_1600m)

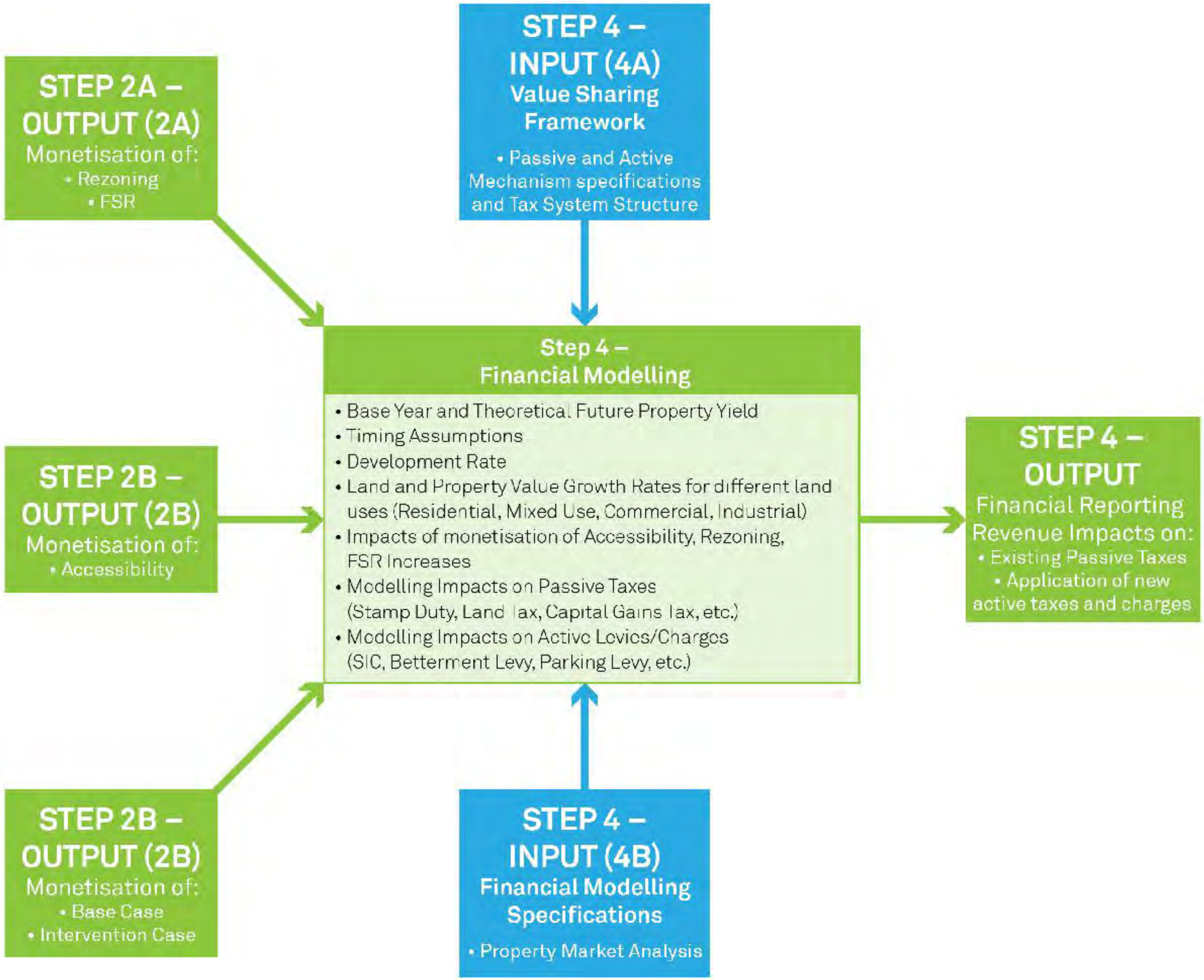
# The Mandurah Rail Line - Perth, Western Australia – Uplift Values

1. Accessibility Based Land Value Uplift (%) = ~30%
2. Change of Zoning (Ind. To MU) Based Land Value Uplift (%) = Not Modelled
3. R-code Based Land Value Uplift (%) (R20 to R100) = 44.8%

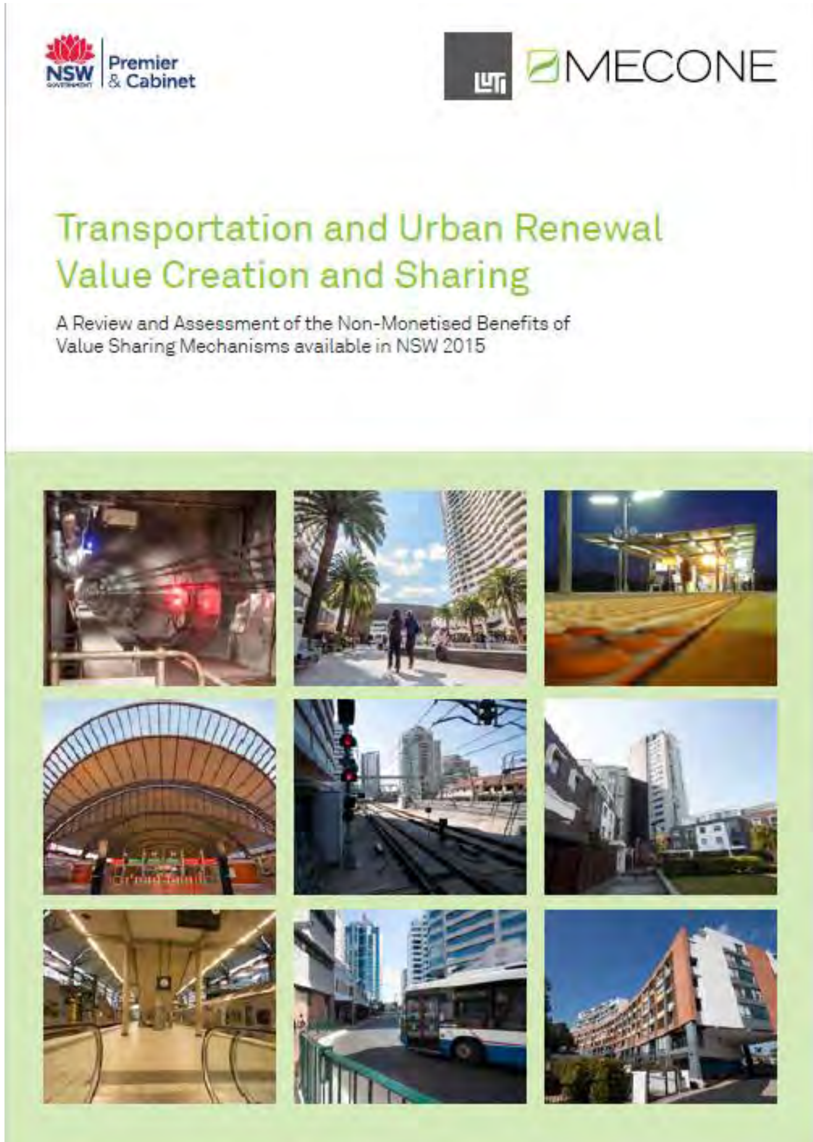
# Step 3 - Property Data Analysis and Preparation for the Financial Modelling



# Step 4 - Financial Modelling



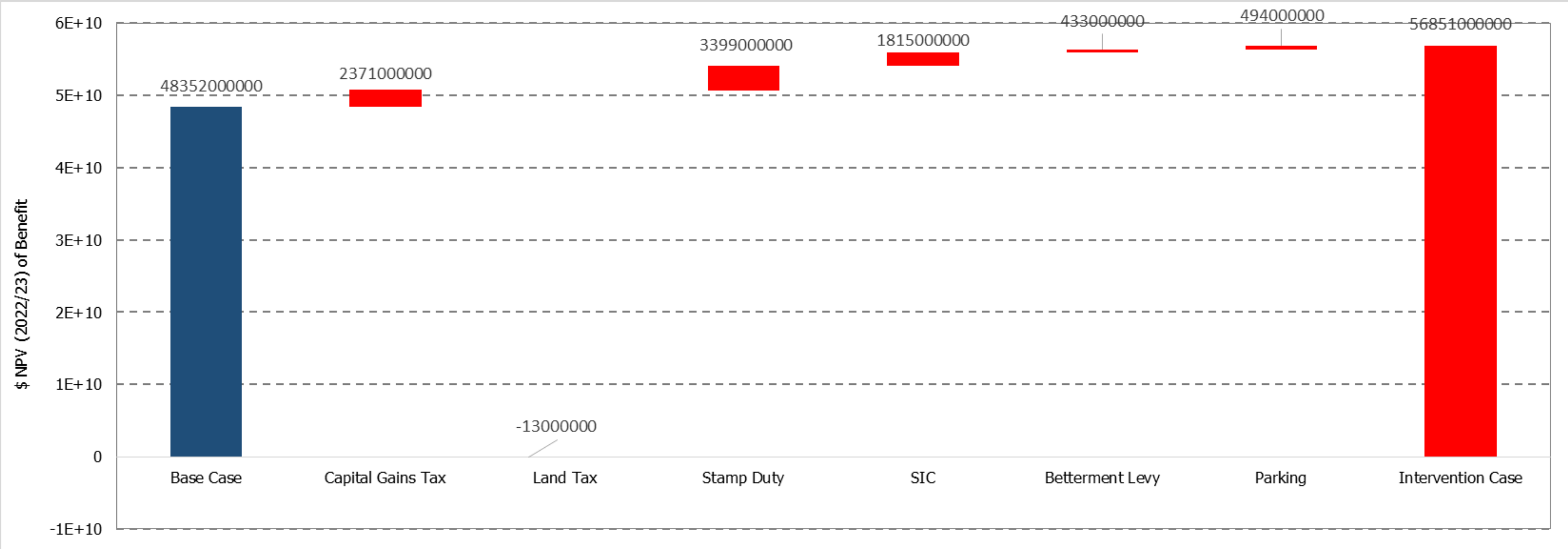
# Step 4 – Value Sharing Mechanisms



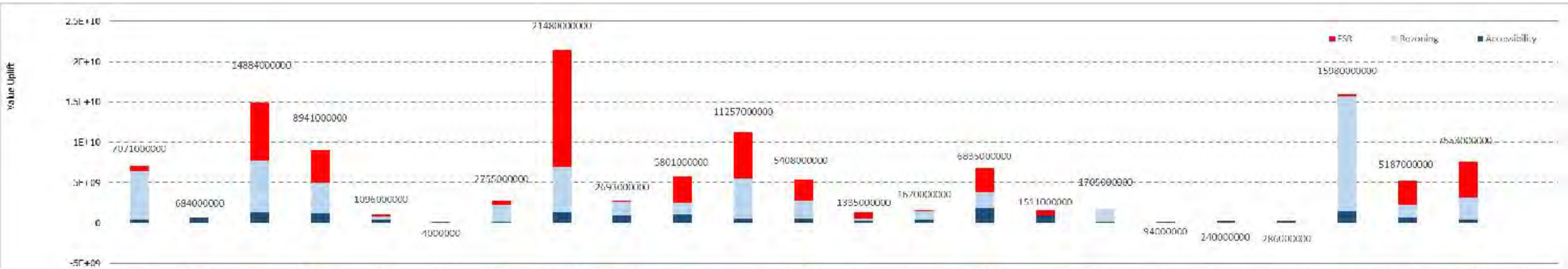
# Step 4 – Value Sharing Mechanisms

| Value Creation Category | | | | | | |
|---|---|---|---|---|---|---|
| | Induced increases in property values and ad valorem taxes | Increase in economic activity and productivity and economic taxes | Increases in service provision and service fees | Asset utilisation | Stakeholder contributions | Other funding opportunities |
| Mechanisms to share in the value created by integrated transportation an urban regeneration projects. | • Stamp duty<br>• Capital gains tax<br>• Land tax | • Income tax<br>• Payroll tax<br>• Business rate levy | • Tolls<br>• Fares (incl. premium fares)<br>• Transport based levies | • Advertising<br>• Surplus property disposal<br>• Over site development | • Land holders<br>• Business operators<br>• Property developers<br>• Special interest groups<br>• Government | • Special infrastructure contributions<br>• Special assessment districts<br>• Sale of assets<br>• Extension of concessions<br>• Parking space levies<br>• Park and ride fees |

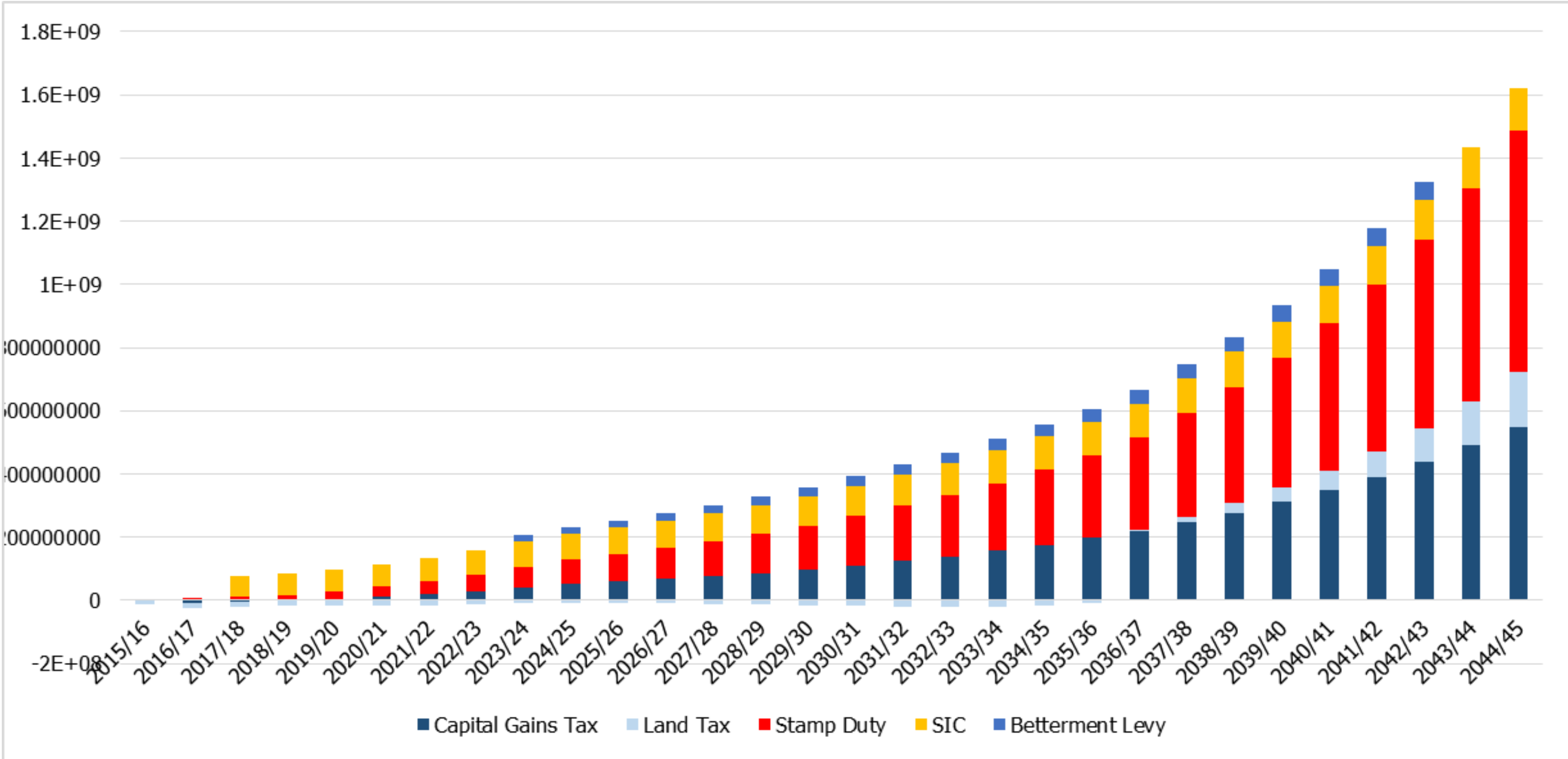
# Step 4 Outputs - Financial Modelling Example



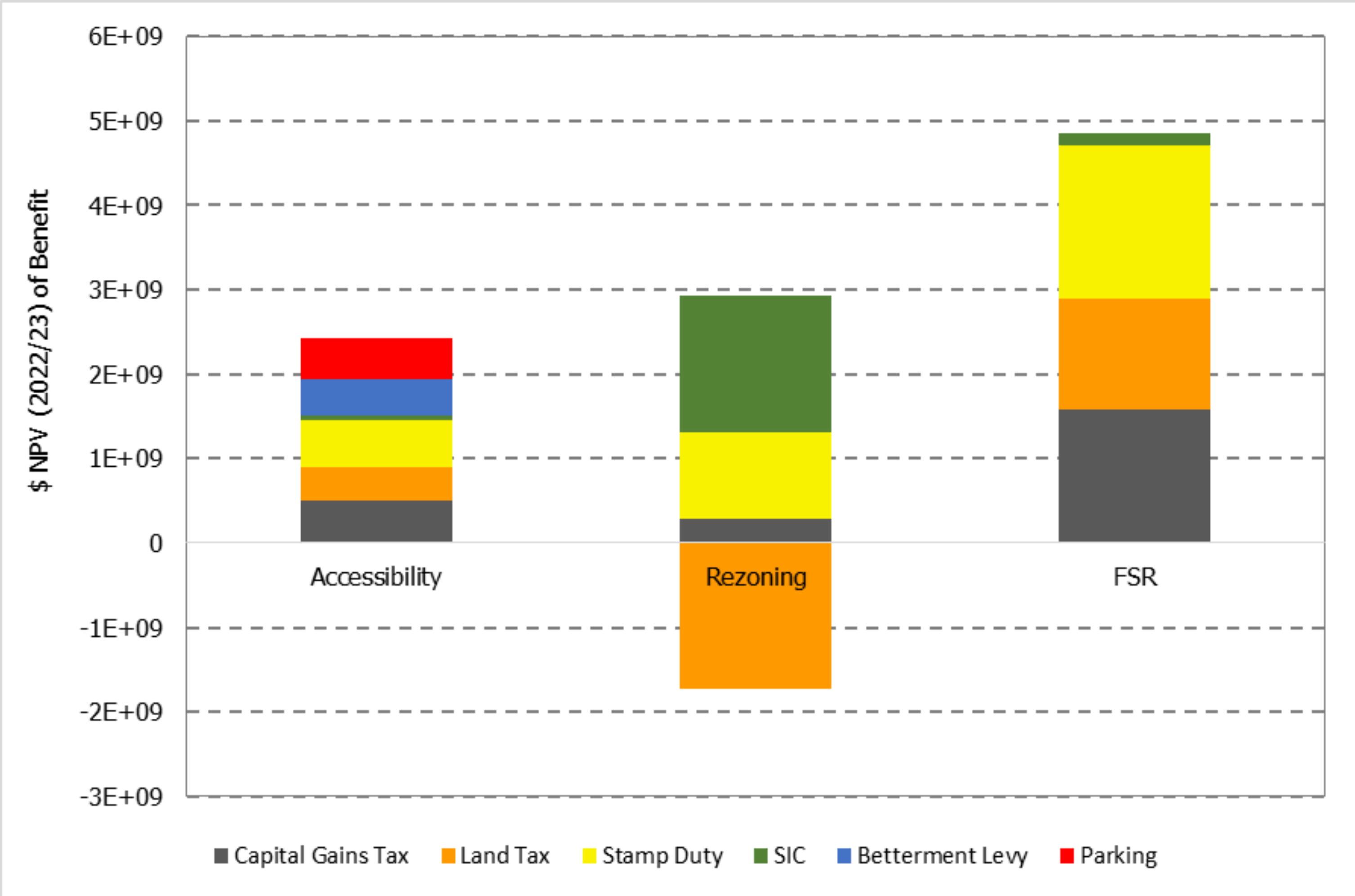

| NPV | Base Case | Capital Gains Tax | Land Tax | Stamp Duty | SIC | Betterment Levy | Parking | Intervention Case |
|---|---|---|---|---|---|---|---|---|
| Base | **48,352,000,000** | 48,352,000,000 | 50,723,000,000 | 50,710,000,000 | 54,109,000,000 | 55,924,000,000 | 56,357,000,000 | **0** |
| Post Intervention | **0** | 2,371,000,000 | - 13,000,000 | 3,399,000,000 | 1,815,000,000 | 433,000,000 | 494,000,000 | **56,851,000,000** |
| **Benefit** | **-** | **2,371,000,000** | **- 13,000,000** | **3,399,000,000** | **1,815,000,000** | **433,000,000** | **494,000,000** | **8,499,000,000** |



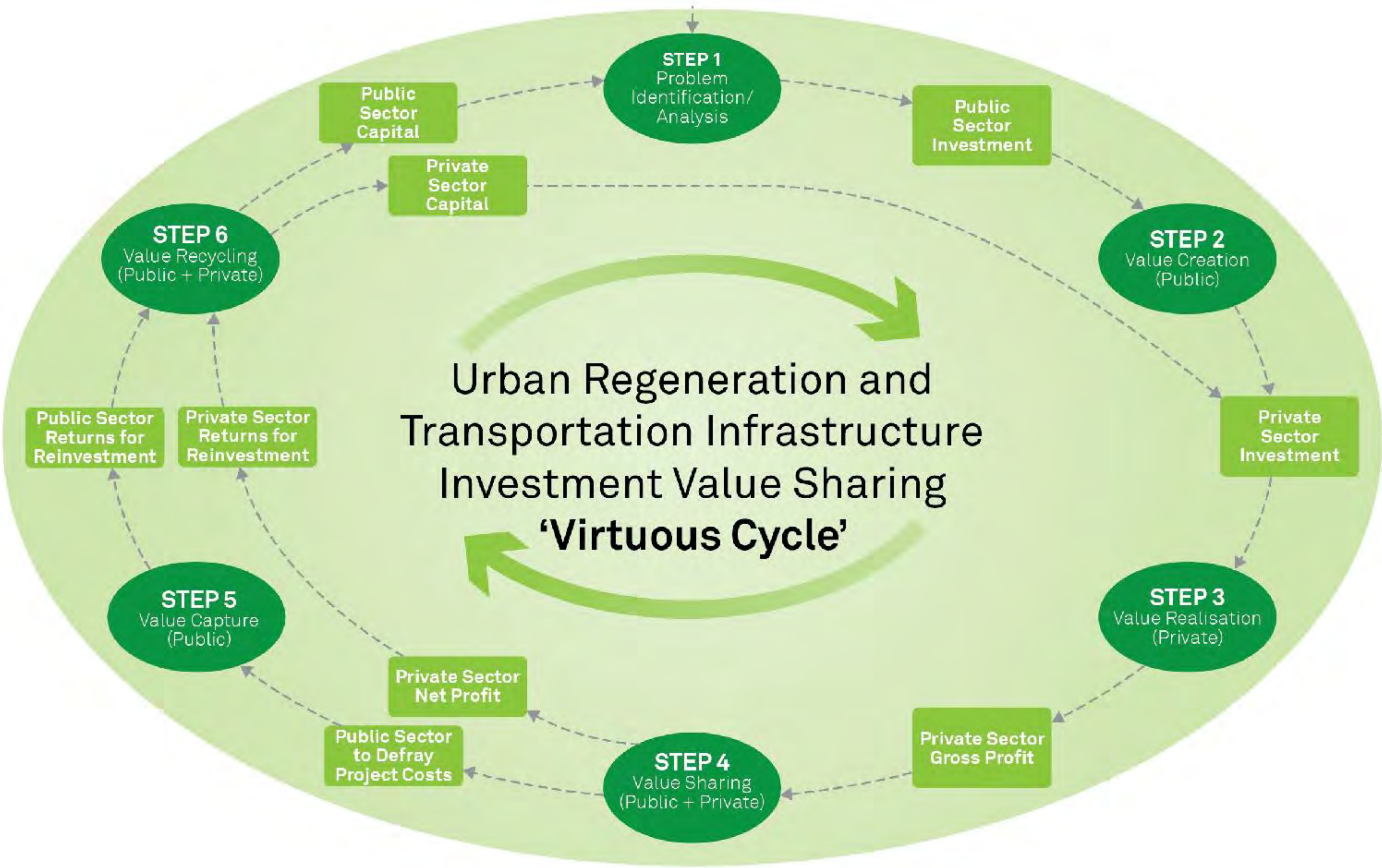
# Step 4 Outputs - Financial Modelling Example (Mechanisms Cash flow)



# Step 4 Outputs - Financial Modelling Example (Uplift Factor)



# Virtuous Cycle of Value Creation and Sharing

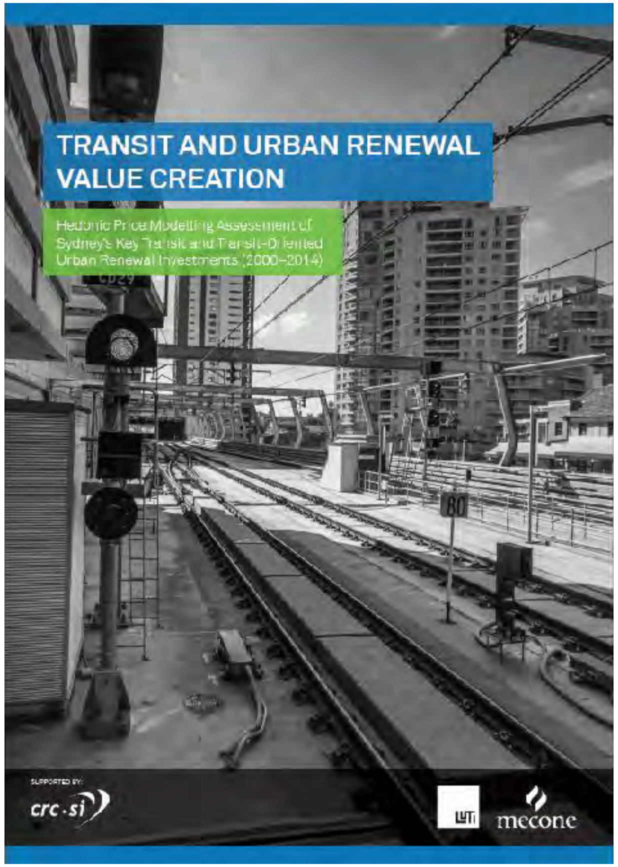


## Value Capture – The Possibilities Are Endless…


# Beware of the Hype…
# Explore the Reality.

# Thank you.

For more information on our projects experience, consulting advisory services and to download the report:
www.luticonsulting.com.au




# Planning and Design for Light Rail - an Integrated Systems Approach

Scott Elaurant April 2017

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# Overview

1. Defining Public Transport modes
2. LRT and BRT: What has Changed?
3. Performance of LRT & BRT
4. Integrated PT Systems
5. LRT Planning practice – key features
6. LRT Design practice – key features
7. Social and economic impacts of LRT
8. Summary and Conclusions

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# 1. Definition – Tram

(US “Streetcars”)

- Street running rail
- Shared traffic
- Walk up access
- Low floor since 1990
- Size increasing (up to 24m)
- 1000-3000 pass/hr/dir


24m Tram (Melbourne)


20m Tram (Portland)

# 1. Definition – Street Running Light Rail Transit (LRT)

French "Nouveax Tramway"

- Large vehicle (30+m)
- Low floor since 1990
- Exclusive lanes
- Signal priority
- Integrated platforms
- 3000-12000 pass/hr/dir

Gold Coast

Strasbourg

# 1. Definition – Grade Separated Light Rail Transit (LRT)

US/Canadian model

- Large vehicle (30+m)
- Low floor since 2000
- Separate corridor
- Overpass or boom gates
- Boarding platforms
- 3000-18000 pass/hr/dir

Seattle

Sydney SW

# 1. Definition – Bus Rapid Transit (BRT)

- BRT term applied to different concepts

Distinguishing factors:

- Degree of priority
- Surface or grade separated
- Station design


Auckland Northern Busway

# 1. Definition – Bus Rapid Transit (BRT)

Bus Lanes (LRT):

- Cheapest option
- Improved speed and reliability
- Stops limit to 30 buses/hr
- 1500 pass/hr/dir

# 1. Definition – Bus Rapid Transit (BRT)

Surface Busway

- Exclusive lanes
- Stops with platforms
- 50 buses/hr if no passing lanes at stops
- 100 buses/hr if passing lanes at stops
- 3000 pass/hr/dir
- (ABS 5000 pass/hr/dir)


Nantes Ligne 4

# 1. Definition – Bus Rapid Transit (BRT)

Grade Separated Busway

- Free flow for buses
- Stops with platforms
- 300 buses/hr if passing lanes at stops
- 18000 pass/hr/dir
- 30,000+ pass/hr/dir only in South American busways with very high crowding

Brisbane SE Busway

# 2. LRT and BRT – What is changing?

# 2. Recent Developments - LRT

Wireless Power

- APS (inground) – Alstom
- Costly, full performance
- Battery
- Super-capacitor
- 500-700m stop spacing
- Performance improving
- Cost declining

Kaohsuing (Taiwan)

## 2. Recent Developments - LRT

High Speed LRVs

- Advanced bogie designs
- Low floor 80 km/hr
- Low floor, bogie 100 km/hr
- Tram trains to 130 km/hr

Ottawa (Confederation Line)

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# 2. Recent Developments - LRT

Larger LRVs

- Modular and coupled LRVs
- Allows very high capacity
- Expansion from 30m to 45m common


Istanbul (60m x 2 min headway = 13,500 pass/hr/dir)

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# 2. Recent Developments - LRT

Rubber Tyred LRVs

- Guide rail, track & overhead power
- Translohr proven reliable
- Good performance
- Gradients to 13%
- High cost
- Small footprint
- Lower capacity
- Niche vehicle


Paris T5 (180 pass/unit)

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# 2. Recent Developments - BRT

Large buses

- Double articulated
- Capacity 150+/bus
- Capacity limit is still stop capacity


Curitiba Busway (24m Volvo bus)

# 2. Recent Developments - BRT

## Advanced buses (ABS)

- “Tram style bus”
- “Rubber tyred tram”
- Multiple doors
- Capacity 150 – 180/bus
- High boarding capacity


Mettis busway, Metz (24m Van Hool bus)

# 2. Recent Developments - BRT

## Electric buses

- Battery, capacitor options
- Range increasing rapidly
- Charging time reducing
- Charging stations more economic
- Bus Capex +30% higher
- Bus Opex much lower
- Great potential for feeder bus routes?


Geneva Bus charging station

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# 3. LRT vs BRT Australasian Cost comparison

| System | Year | Cost | Length | Unit Cost 2015 $/km |
|---|---|---|---|---|
| South East Transit | 2000 | $520M | 16.5 km | $28M |
| Liverpool Parramatta T-Way | 2003 | $346M | 30 km | $9M |
| Northern Busway Auckland | 2008 | $294M NZ | 7.4 km | $25M |
| Inner Northern Busway | 2008 | $493M | 4.5 km | $70M |
| Eastern Busway | 2011 | $692M | 4.2 km | $91M |
| Glenelg Tram, Adelaide | 2009 | $154M | 4.4 km | $19M |
| Sydney Dulwich Hill LRT | 2014 | $179M | 5.6 km | $16M |
| Gold Coast Light Rail | 2014 | $953M | 13 km | $37M |
| Sydney SE LRT | 2017 | $2100M | 12.1 km | $88M |
| Capital Metro Canberra LRT | 2019 | $698M | 12 km | $29M |

# 3. LRT vs BRT - Summary Comparison

| Parameter | Tram | LRT | | BRT | | |
|---|---|---|---|---|---|---|
| | Street | Street LRT | G/S LRT | Bus Lane | Surface BRT | G/S BRT |
| Line Capacity (/hr) | 3,000 | 12,000 | 18,000 | 1500 | 3,000 | 18,000 |
| Terminal Capacity | Medium | High | High | Low | Low | Medium |
| Average Speed | 15-20 | 20-25 | 30-40 | 15-20 | 15-20 | 40-50 |
| Pass. Attraction | ++ | +++ | ++ | + | + | ++ |
| Cost | Medium | Medium | High | Low | Medium | High |
| Space/footprint | Low | Low | Low | Low | Medium | High |
| Amenity | High | High | Medium | Low | Low | Low |
| Redevelopment | High | High | Medium | Low | Low | Low |

# 4. PT Integration – Right Mode for Right Role

BRT and LRT should complement, not compete

- LRT on high density urban corridors
- LRT on routes with redevelopment potential
- Buses as feeders to high frequency LRT corridors
- BRT on greenfield corridors
- BRT on corridors with spread demand

# 4. PT Integration – connectivity

Well designed systems feature LRT & bus integration at stops;

Integrated ticketing;

Compatible service times.



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# 5. LRT Key planning principles

What makes a successful LRT?

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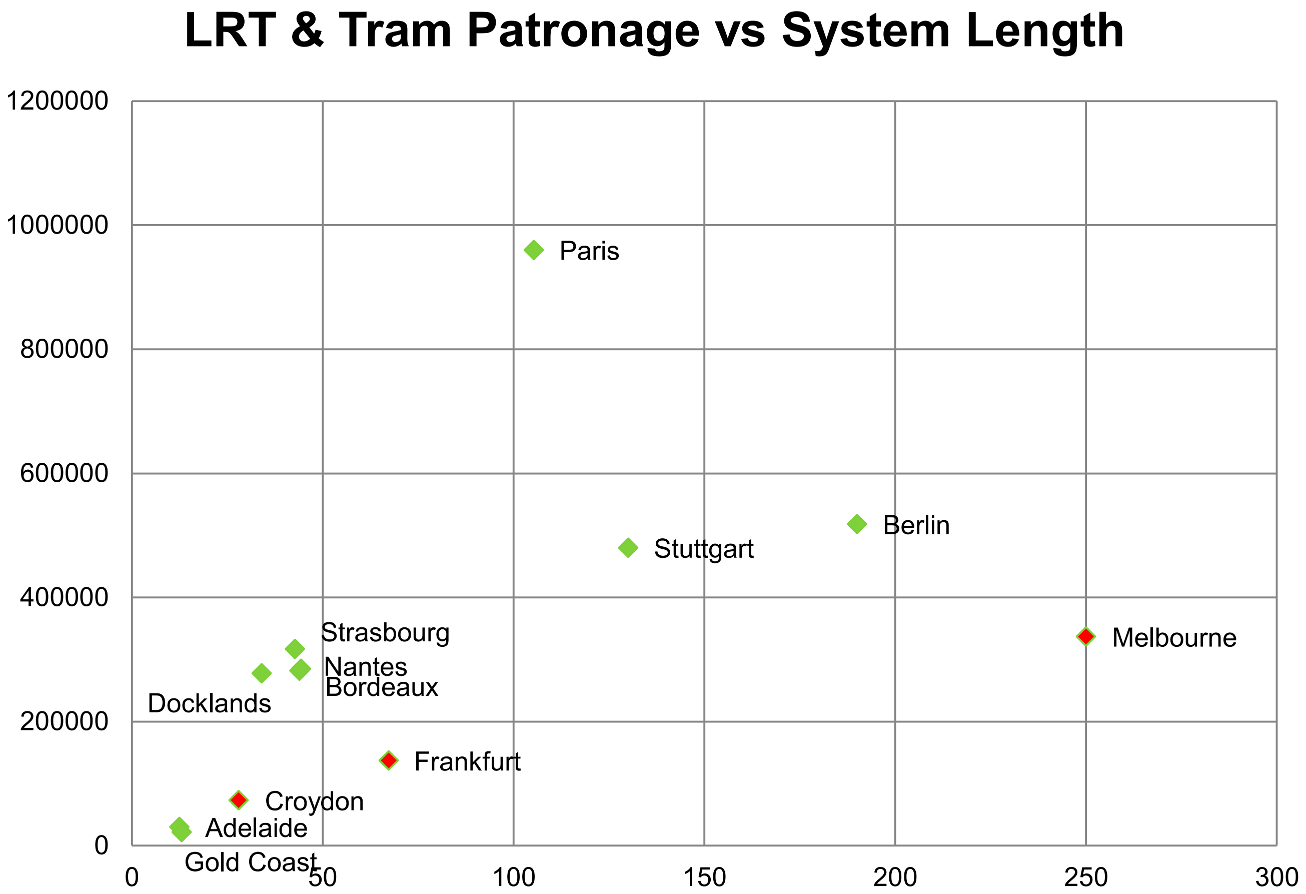
## 5. Summary of LRT Systems Visited

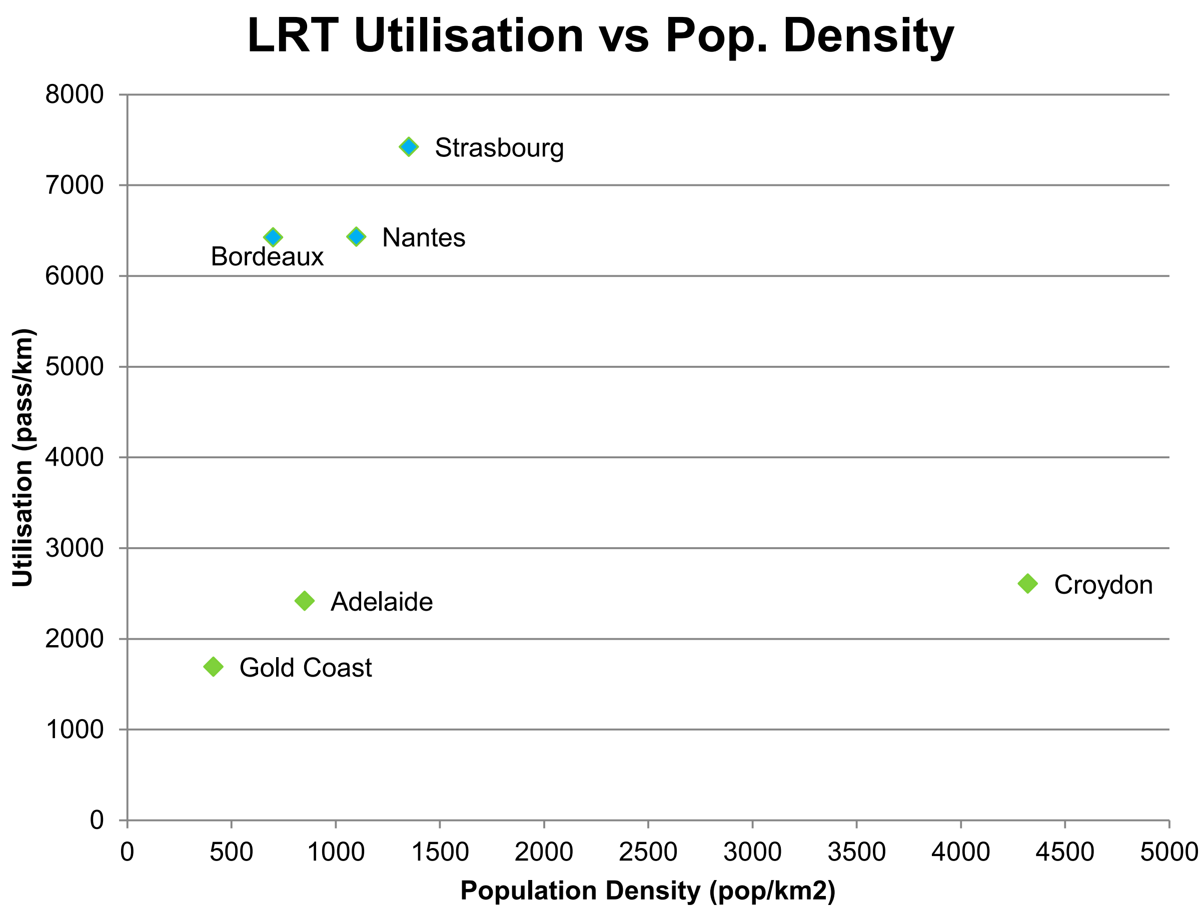
| System | Length | Lines | Stops | Pass/day | City Popn. |
|---|---|---|---|---|---|
| Croydon TramLink | 28 km | 4 | 39 | 73,000 | 300,000(B) |
| Docklands LRT | 34 km | 7 | 45 | 278,000 | 8,500,000 |
| Paris Tramways (T1-T8) | 105 km | 9 | 186 | 960,000 | 12,000,000 |
| Nantes LRT | 41 km | 3 | 82 | 285,000 | 700,000 |
| Bordeaux LRT | 59 km | 3 | 111 | 282,000 | 1,100,000 |
| Strasbourg LRT | 43 km | 6 | 75 | 317,000 | 800,000 |
| Berlin Strassenbahn | 192 km | 22 | 398 | 518,000 | 5,800,000 |
| Frankfurt Stadtbahn | 67 km | 10 | 136 | 137,000 | 2,500,000 |
| Stuttgart Stadtbahn | 130 km | 15 | 203 | 480,000 | 2,700,000 |

# 5. LRT Performance higher than tram systems




LRT (segregated) systems more utilised than Tram (shared) systems

# 5. LRT Context – French Systems performed best




French LRT systems out-perform those in other countries, even allowing for population density

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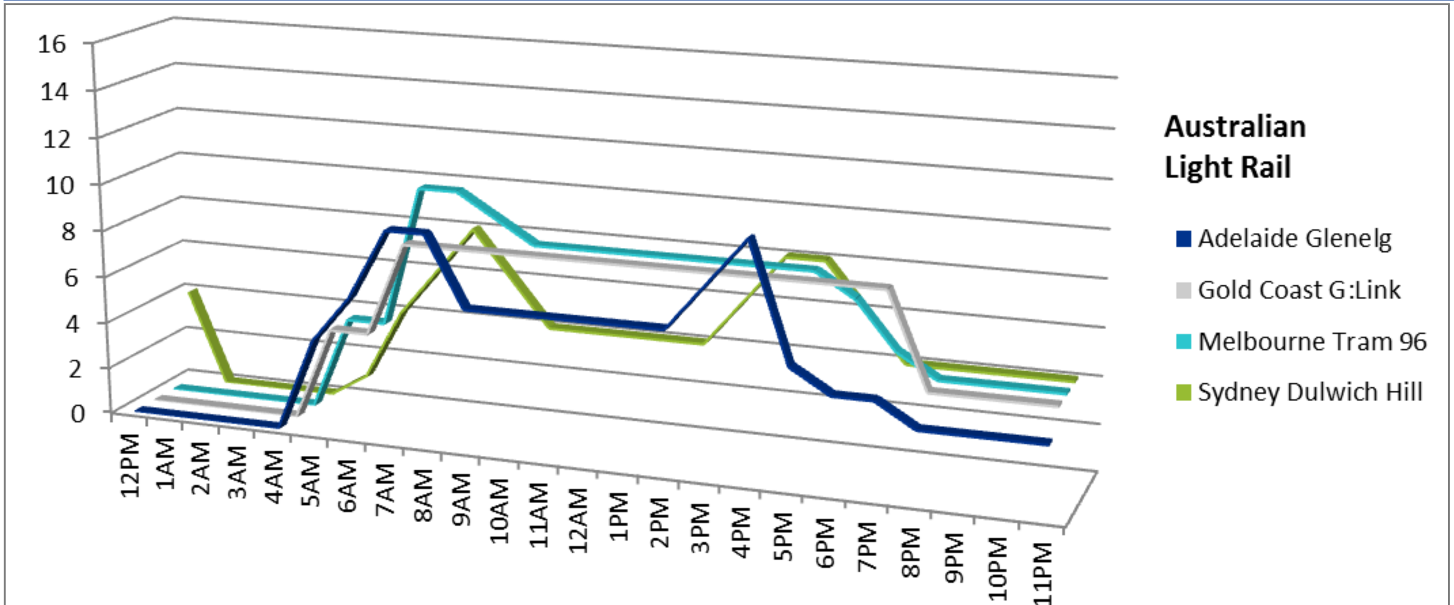
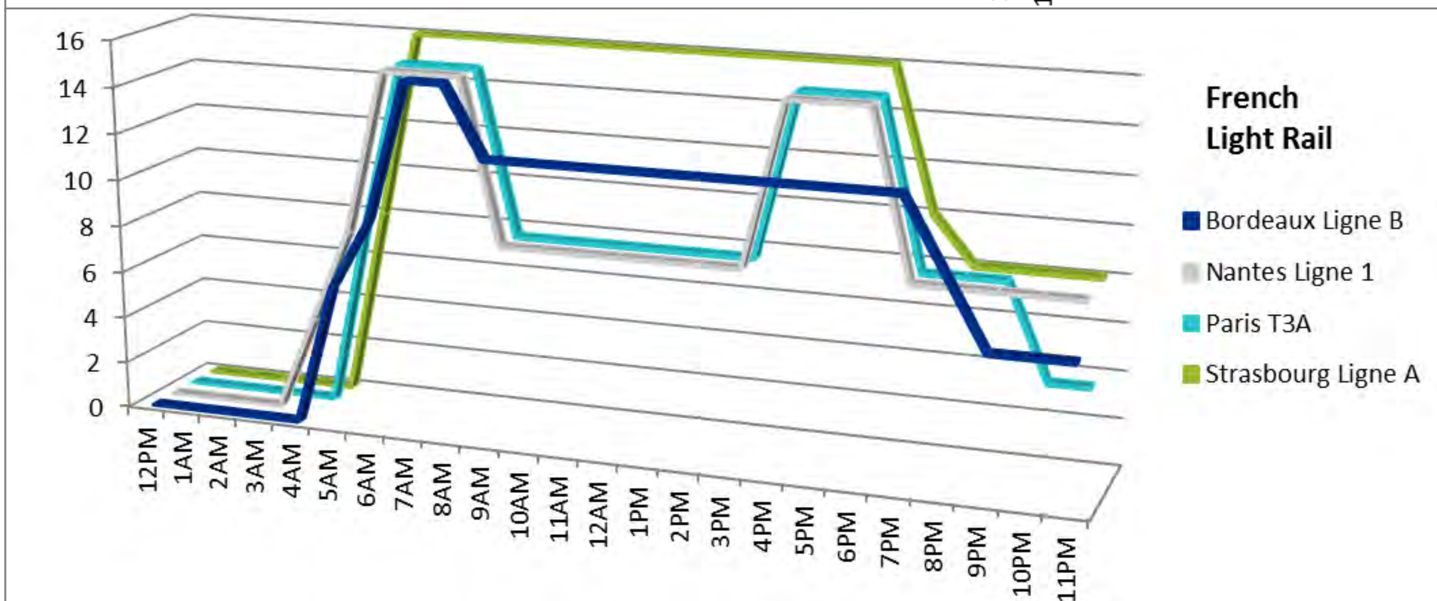
# 5. Population Density is medium, not high

Bordeaux, Merignac suburb; LRT line under construction centre-left (Google Maps)

# 5. Operate *high* level of service throughout day

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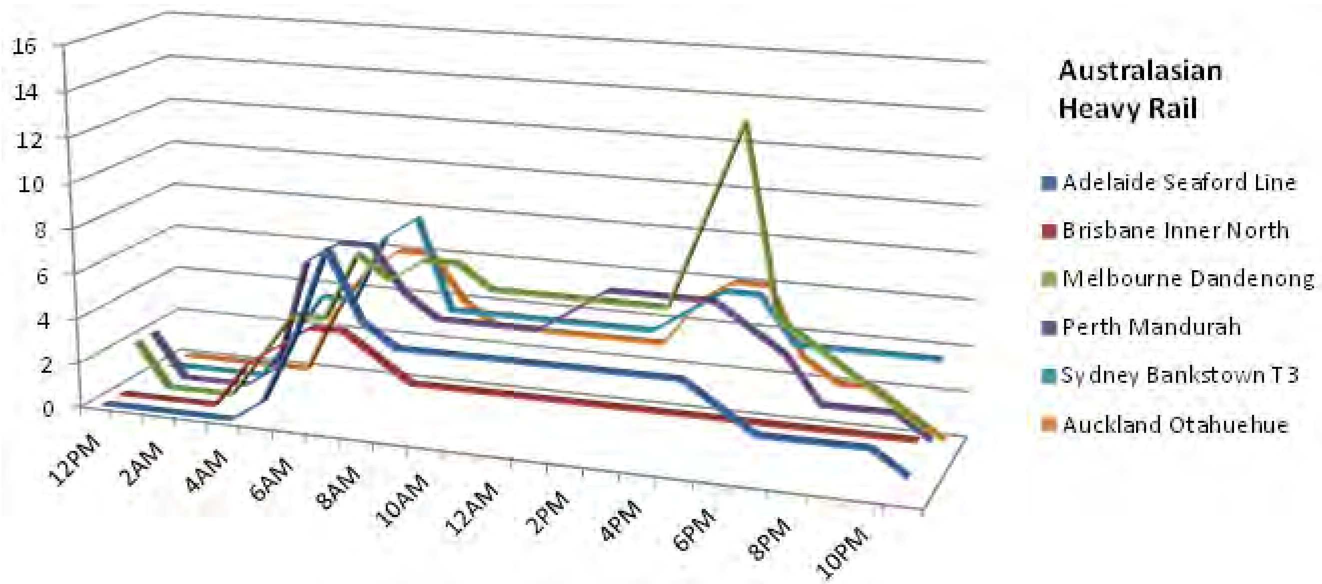
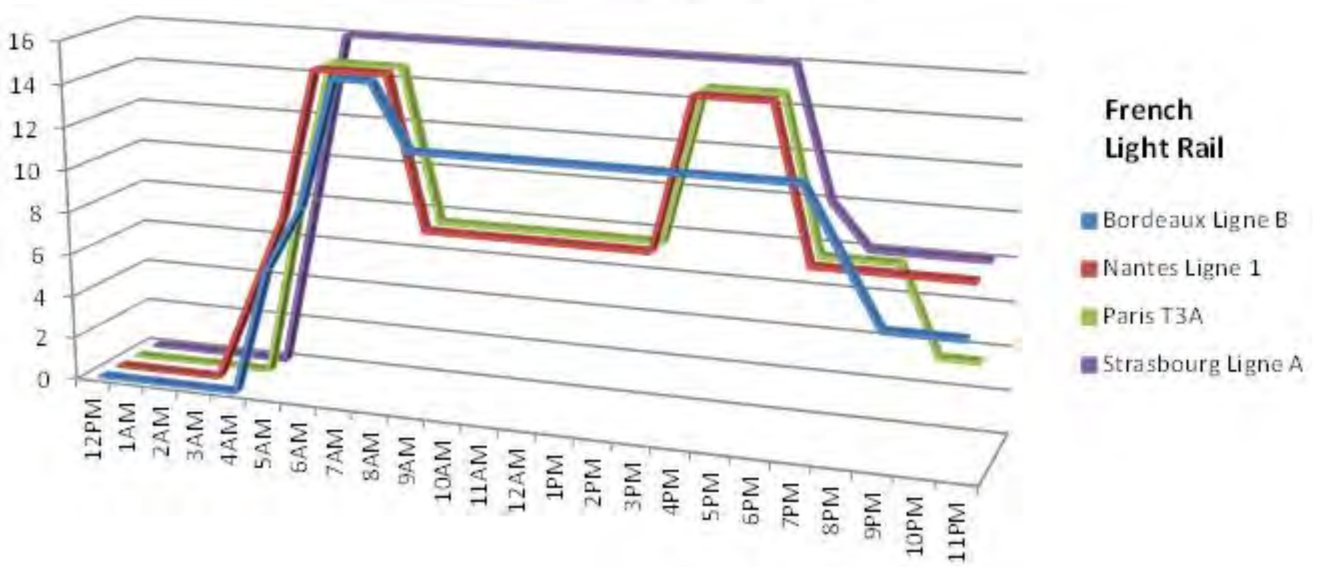
# 5. Level of service higher than any Australasian rail line

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# 5. Operations – average speed is *high*

| City | Length (km) | Stops | Stop Spacing (m) | Corridor | Signal Priority | Avg. Speed (km/hr) |
|---|---|---|---|---|---|---|
| Bordeaux | 44 | 90 | 488 | Segregated | Yes; Pre-emption | 23 km/hr |
| Nantes | 44 | 83 | 534 | Segregated | Yes; Pre-emption | 21 km/hr |
| Paris | 105 | 186 | 566 | Segregated | Yes; Pre-emption | 20 km/hr |
| Strasbourg | 43 | 75 | 573 | Segregated | Yes | 18 km/hr |
| Adelaide | 15 | 22 | 681 | Segregated | No | 17 km/hr |
| Gold Coast | 13 | 16 | 813 | Segregated | Yes; Pre-emption | 23 km/hr |
| Melbourne | 250 | 1763 | 142 | Shared | No | 16 km/hr |
| Sydney | 13 | 23 | 565 | Segregated | Yes | 23 km/hr |

# 5. Result: Capacity and patronage are high

| City & Line | Frequency (LRVs/hr) | Vehicle (pass/veh) | | Line Capacity (Pass/hr/dir) | 2015 Patronage (pass/day) |
|---|---|---|---|---|---|
| | | Length (m) | Capacity | | |
| Bordeaux B | 15 | 45m | 310 | 4550 | 52,000 |
| Nantes 1 | 30 | 36m | 250 | 7500 | 114,000 |
| Paris T3A | 30 | 45m | 310 | 9100 | 210,000 |
| Strasbourg A | 20 | 45m | 310 | 6200 | 80,000 |
| Adelaide | 10 | 33m | 200 | 2000 | 30,000 |
| Gold Coast | 8 | 45m | 310 | 2480 | 23,000 |
| Melbourne 109 | 15 | 23m | 150 (C Class) | 2250 | 43,000 |
| Melbourne 96 | 15 | 33m | 210 (C2/E) | 3150 | 42,000 |
| Sydney | 8 | 33m | 200 | 1600 | 18000 |

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# 5. Planning: Insertion into key centres

LRT runs directly into centres.

Connects to:

- Hospitals
- Universities
- Retail & office centres

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# 6. LRT Key Design Features

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# 6 New philosophy for traffic and road design

- Planning street running LRT requires different approach to normal traffic modelling and road design paradigm
- Long term focus is for LRT to take demand growth
- Design for existing traffic demand only, possibly reduced by LRT diversion. *Do not design for car traffic growth.*
- Maintain traffic connectivity and accessibility to fronting buildings
- Ensure LRT can maintain uninterrupted flow at signals
- Key issue is signal phasing to achieve LRT priority/pre-emption
- Has been implemented in arterial roads with 50,000+ veh/day (Strasbourg), achieving traffic reductions of up to 40% (Paris)

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# 6.1 Segregated track

**<u>No</u>** sharing with traffic:

- Safer system
- LRT more reliable
- LRT higher frequency
- Allows long vehicles
- Higher capacity

# 6.2 Segregated Track – limited parking

Parking & traffic

- Car parking for private cars removed adjacent to LRT track
- Car parking separate from LRT
- CV parking only in CBDs
- CVs permit controlled with police enforcement



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# 6.3 Design: Signal Priority

LRV has priority at signals – only stops for pedestrians

- Predictive logic: Signal dwell time <4% of travel time
- Paris: LRT average 20 km/hr; Metro 25 km/hr (Transdev)

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# 6.4 Platforms integrated into streetscapes

- Good accessibility & high boarding capacity
- Minimal impact on amenity


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# 6.5 Amenity uplift

- Make LRT corridors attractive walking environments
- High quality paving
- Grass track
- Street trees

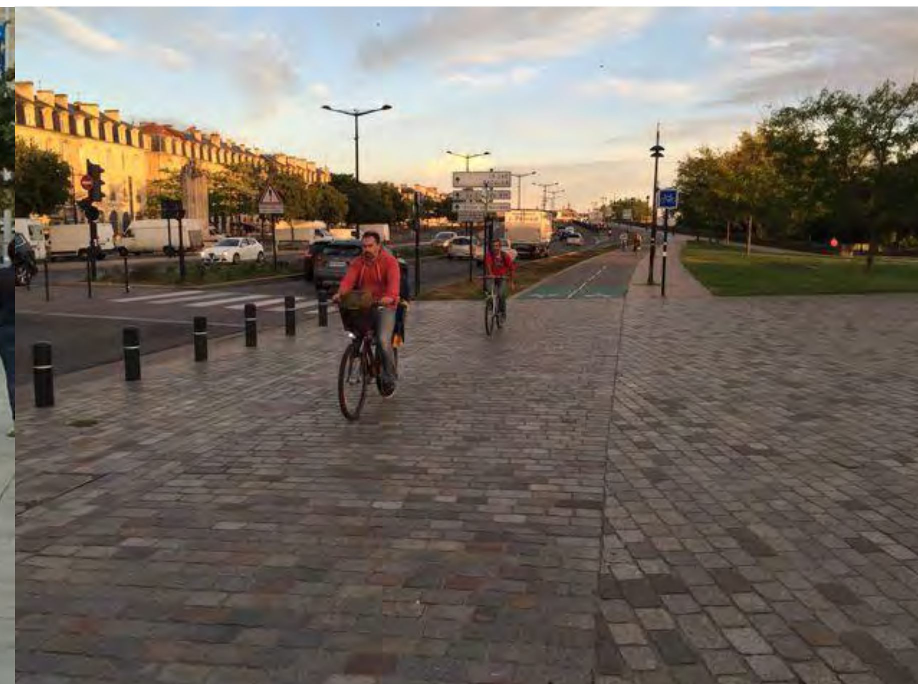
JACOBS

# 6.6 Active Transport - pedestrians

- Paving colour & texture contrast used to guide pedestrians
- Cobblestones deter pedestrians


# 6.7 Active Transport - cycling

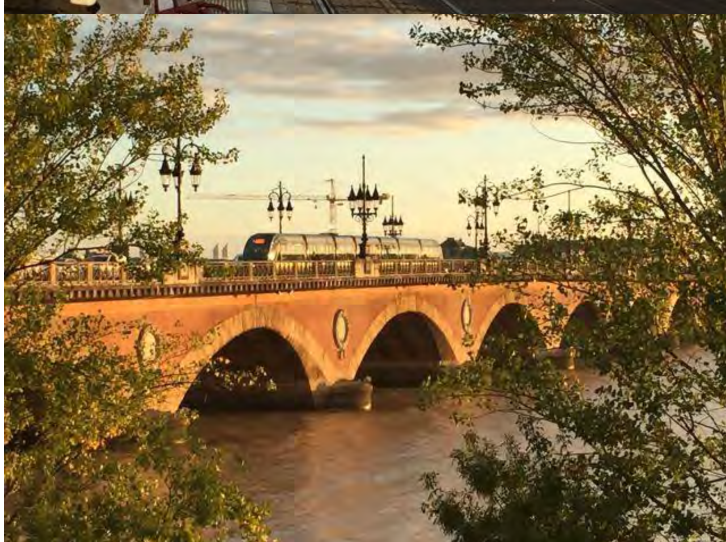
- Dedicated cycle lane if possible
- Encourage LRT/bike trips
- No cycling on LRT tracks



# 6.8 Urban Design – very high quality

Best examples look superb

Can become iconic features for city



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# 6.9 Reduced road space for traffic: Typical Cross Sections

- CBD/Main Street

Arterial Road

- Sub-Arterial Road

Collector Street

# 6.10 New Road Regulations

- New French Street Use Code (traffic regulations) in 2008
- Better defines right of way rules for trams & other road users

| **Classification** | **Pedestrian Area** | **Pedestrian Priority Zone** | **30 km/hr Zone** | **Urban Area** | **70 Section** |
|---|---|---|---|---|---|
| Speed Limit | 5 to 10 km/hr | 20 km/hr | 30 km/hr | 50 km/hr | 70 km/hr |
| Functional balance local life/traffic | 5/95 | 20/80 | 50/50 | 80/20 | 95/5 |
| LRT Priority? | Yes | Yes | Yes | Yes | Yes |
| Priority Rule | Pedestrians, PT, service vehicles only; cars banned | Cars permitted; Priority for pedestrians | Cars permitted, Priority as signed | Cars permitted, Priority as signed | Cars permitted, Priority as signed |
| Traffic Management | Through traffic prohibited | Through traffic discouraged | Through traffic permitted | Through traffic permitted | Through traffic permitted |
| % of road network | 0-10% | 2-15% | 60-90% | 10-40% | 0-5% |
| Austroads Equivalent | Pedestrian mall | Shared Zone | Traffic calmed street | Local road | Arterial road |

# 7 Social and Economics Impacts

- LRT encourages containment
- LRT tends to encourage increased economic activity:
- Higher amenity
- More foot traffic
- Facilitates higher density
- Higher turnover, rental
- Some shops forced out by higher rentals
- Example: Strasbourg


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# 7 Wider Economic Benefits (Adelaide example)

- Benefits calculated for productivity increase (Δdensity)
- Move to More Productive Jobs (M2MPJ) shown but not recommended (no constraint)
- Assume 30 year analysis, 15 year development effect
- Employment benefit >> capital cost of project
- Property uplift benefit not statistically proven

| Area of Benefit | High Case | Middle Case | Low Case |
|---|---|---|---|
| All Zones <400m of Tram | $332 Million | $224 Million | $111 Million |
| Zones < 400m of Tram excluding zones adjacent to North Terrace. | $372 Million | $172 Million | $85 Million |

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# 7 Funding and value capture

- Occurs in UK and USA
- Portland and Denver LRT partly funded by value capture
- Hypothecates excess land tax revenue to project
- Maximum % of project funded = 30%
- Typical funding contribution 15-20%
- French use dedicated “versement” (payroll) tax instead.

# 8. Conclusions for LRT & BRT Planning

LRT and BRT:

- Surface BRT has lower cost and capacity than Surface LRT
- Grade separated BRT (Busway) similar cost and capacity to grade separated LRT
- LRT attracts higher passenger mode share than BRT
- LRT causes more redevelopment than BRT
- Advanced buses have improved BRT capacity, but terminal capacity remains as constraint on BRT system capacity
- Advent of electric buses promises to reduce operating cost for feeder bus routes to LRT based PT spine

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# 8. Conclusions for LRT Planning & Design

LRT Planning and Design (based on current French practice)

- Street running LRT now highly efficient in segregated track/lanes
- Advances in LRVs have >> accessibility and capacity
- Advances in signal priority & control systems >> speed, reliability
- Critical to focus LRT in key demand corridors; plan for uplift
- Must be willing to reduce roadspace to fit in with segregated track
- Investment in improved urban design increases patronage
- LRT must be integrated with feeder buses, walking and cycling

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# Light Rail Planning
# Planning and Design for Light Rail

Scott Elaurant

April 2017

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# The Entrepreneur Rail Model:
## Is urban rail now a market that can pay for itslelf through land development?

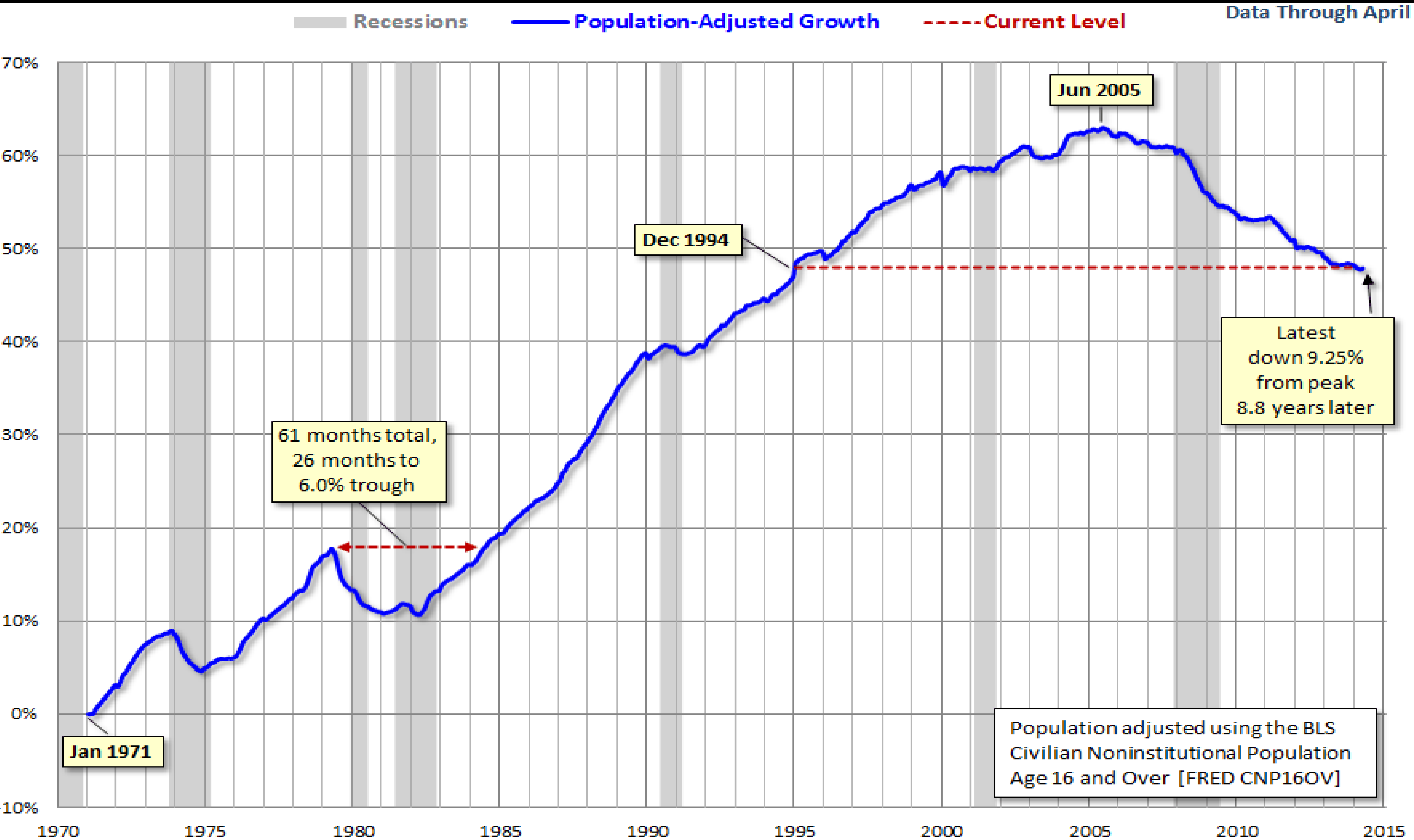
By
Peter Newman
Professor of Sustainability
CUSP, Curtin University, Australia

# Why urban rail is now a market…

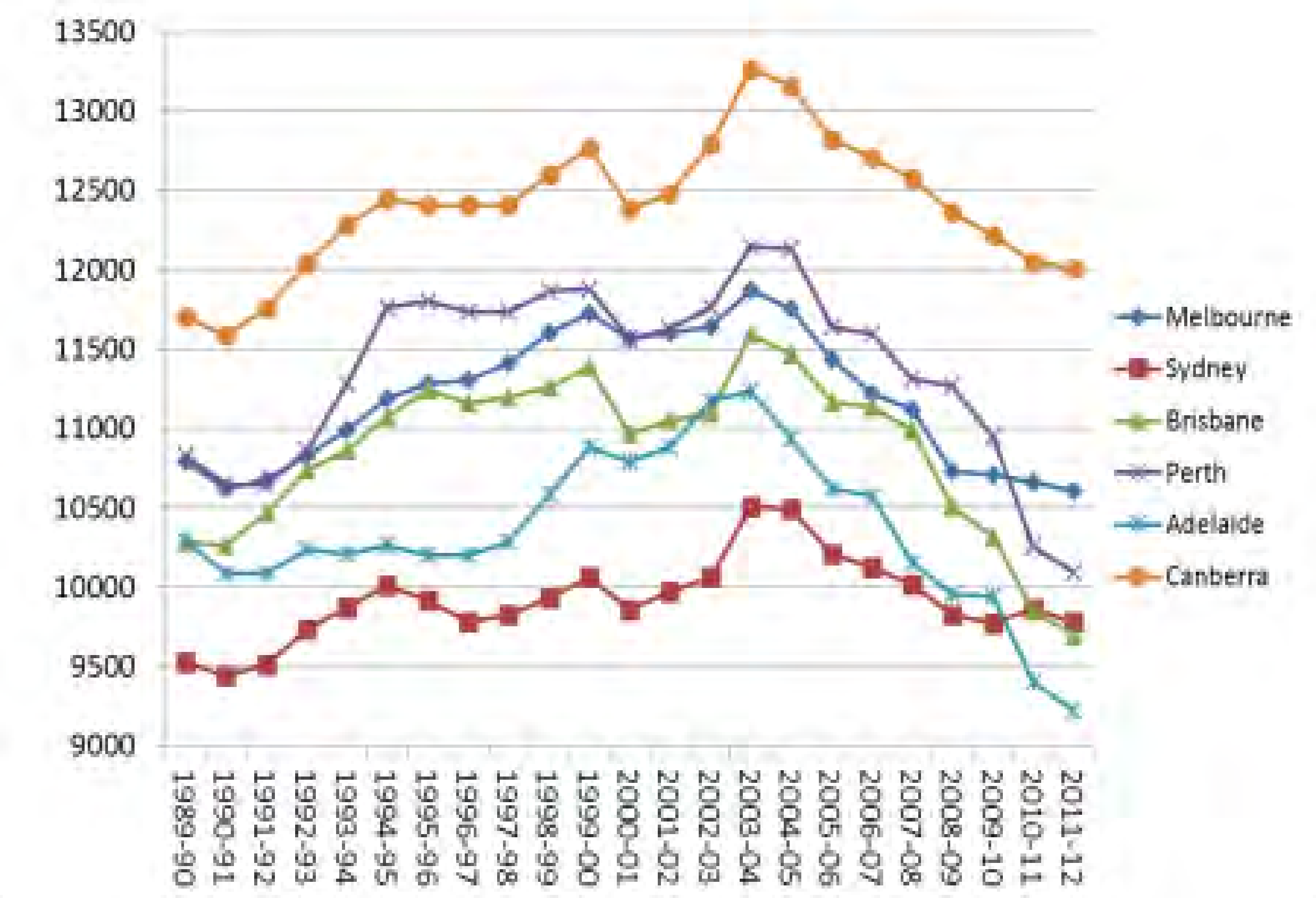
Peak car, traffic speeds, sprawl, gasoline and car-based urban economies….

# 1. Peak car

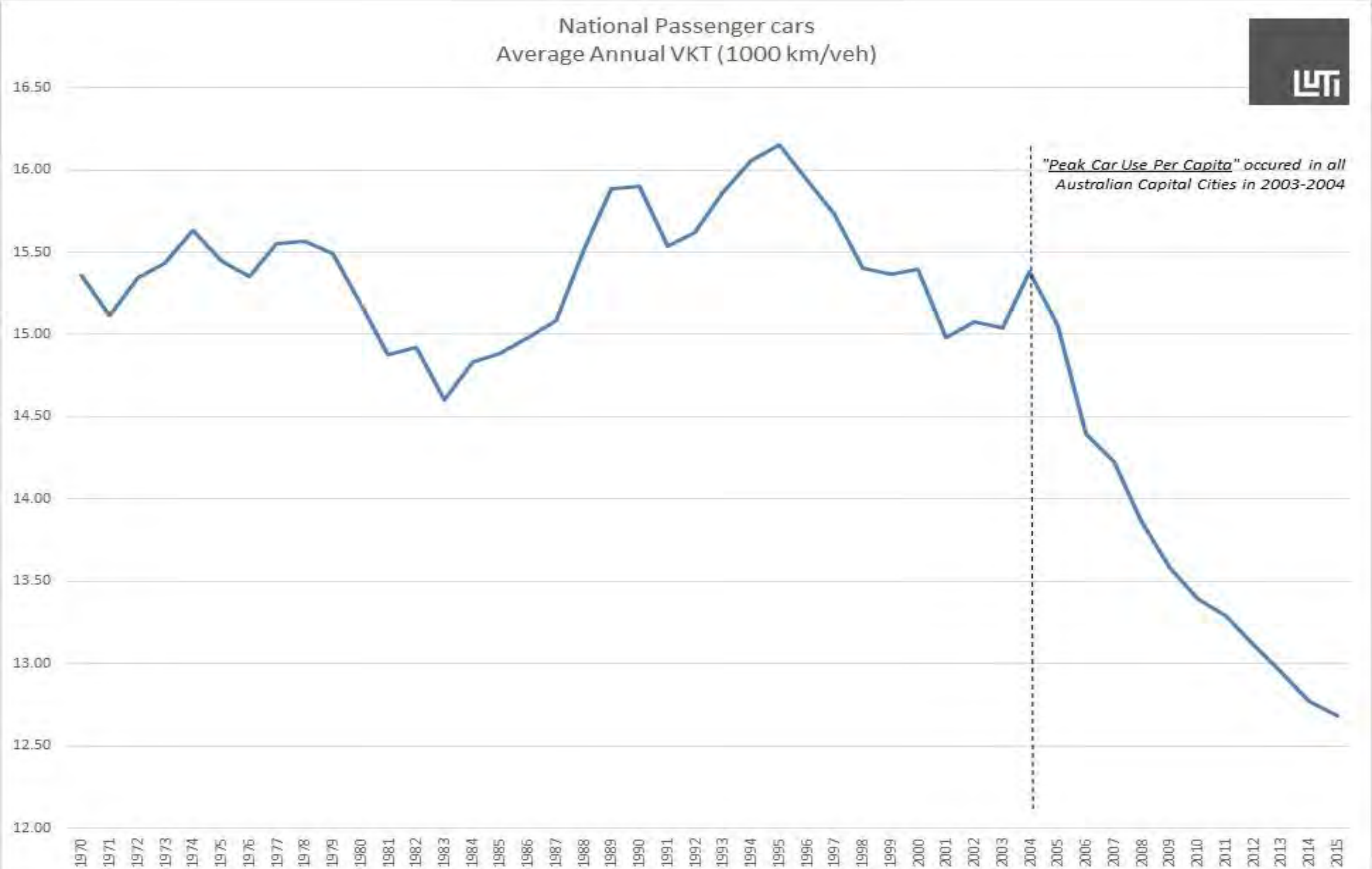
# THE USA **IS DRIVING LESS**



# AUSTRALIA **IS DRIVING LESS**



# VKT per Vehicle fell off a cliff....



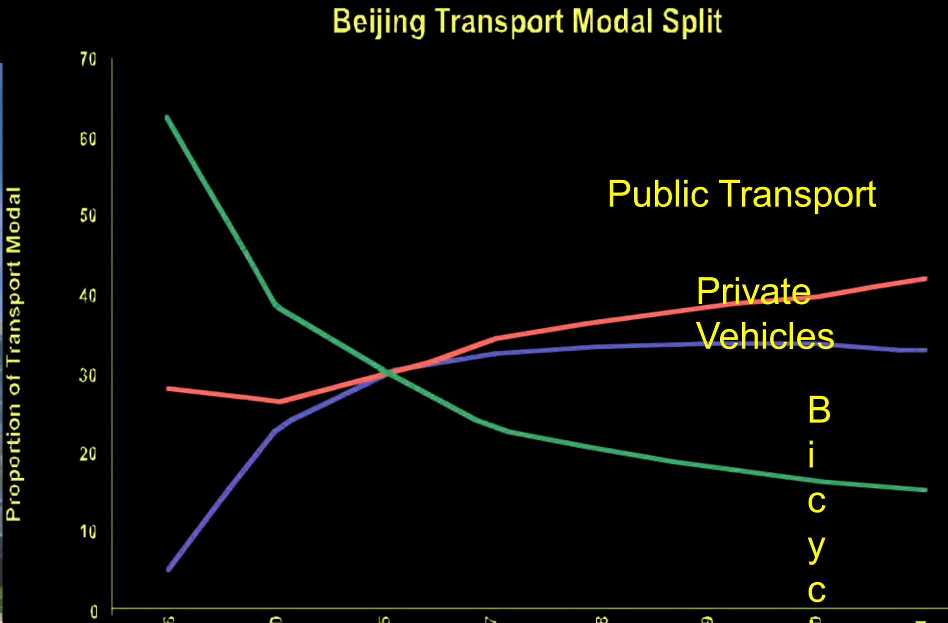
# 2. Peak traffic speeds

# Rail outstripping traffic speeds…

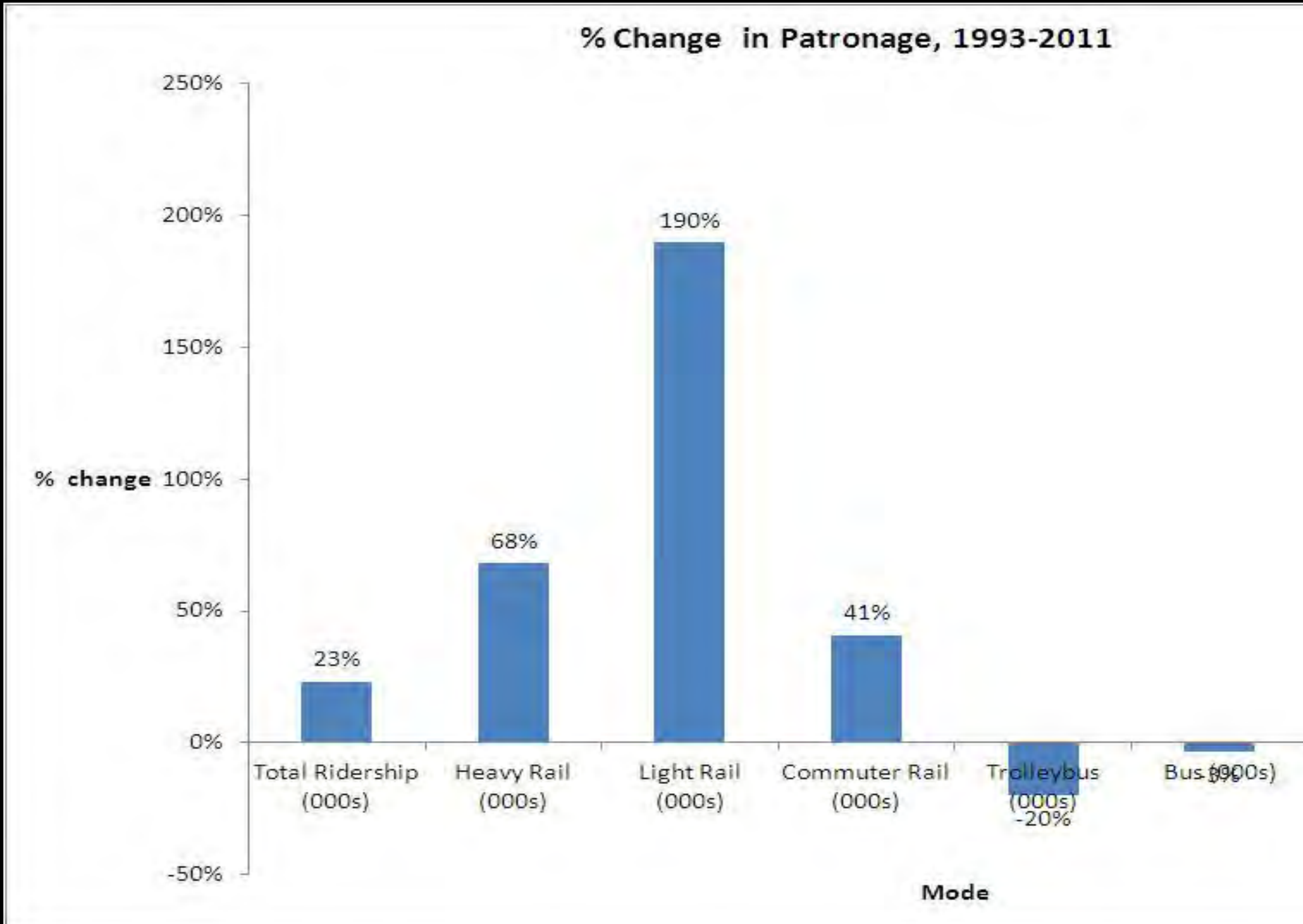
| COMPARATIVE SPEEDS IN GLOBAL CITIES | 1960 | 1970 | 1980 | 1990 | 1995 | 2005 |
|---|---|---|---|---|---|---|
| **Ratio of overall public transport system speed to road speed** | | | | | | |
| American cities | 0.46 | 0.48 | 0.55 | 0.50 | 0.55 | 0.54 |
| Canadian cities | 0.54 | 0.54 | 0.52 | 0.58 | 0.56 | 0.55 |
| Australian cities | 0.56 | 0.56 | 0.63 | 0.64 | 0.75 | 0.75 |
| European cities | 0.72 | 0.70 | 0.82 | 0.91 | 0.81 | 0.90 |
| Asian cities | - | 0.77 | 0.84 | 0.79 | 0.86 | 0.86 |
| **Global average for all cities** | **0.55** | **0.58** | **0.66** | **0.66** | **0.71** | **0.70** |
| | | | | | | |
| **Ratio of metro/suburban rail speed to road speed** | | | | | | |
| American cities | - | 0.93 | 0.99 | 0.89 | 0.96 | 0.95 |
| Canadian cities | - | - | 0.73 | 0.92 | 0.85 | 0.89 |
| Australian cities | 0.72 | 0.68 | 0.89 | 0.81 | 1.06 | 1.08 |
| European cities | 1.07 | 0.80 | 1.22 | 1.25 | 1.15 | 1.28 |
| Asian cities | - | 1.40 | 1.53 | 1.60 | 1.54 | 1.52 |
| **Global average for all cities** | **0.88** | **1.05** | **1.07** | **1.11** | **1.12** | **1.13** |

# Global growth now in rail …

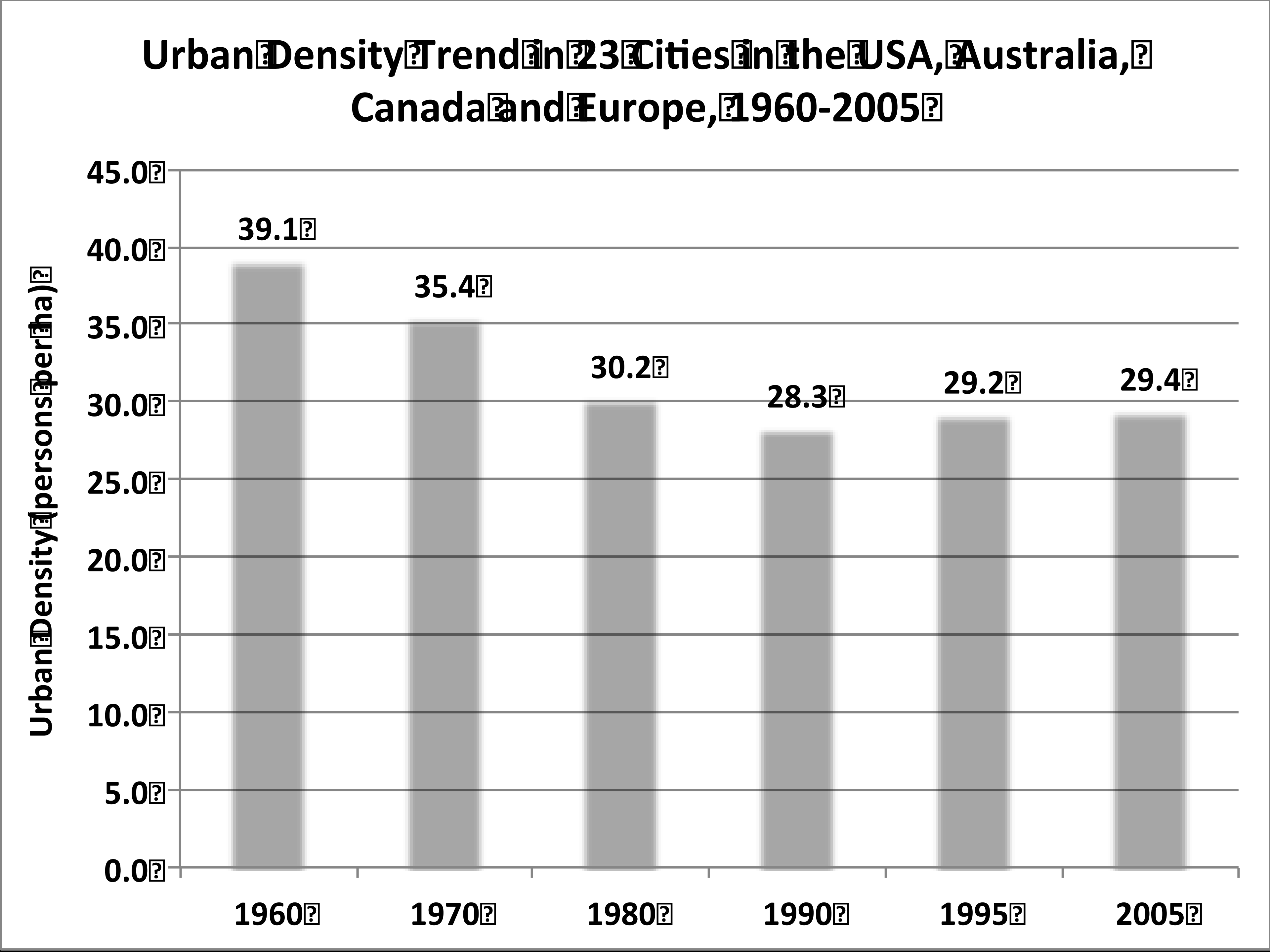
- 82 Chinese cities building metros and high speed rail between cities Shanghai 8m passengers/day
- 51 Indian cities building metros Any city over 1m.
- Middle east cities building rail for first time



# America goes for rail....esp LRT not buses

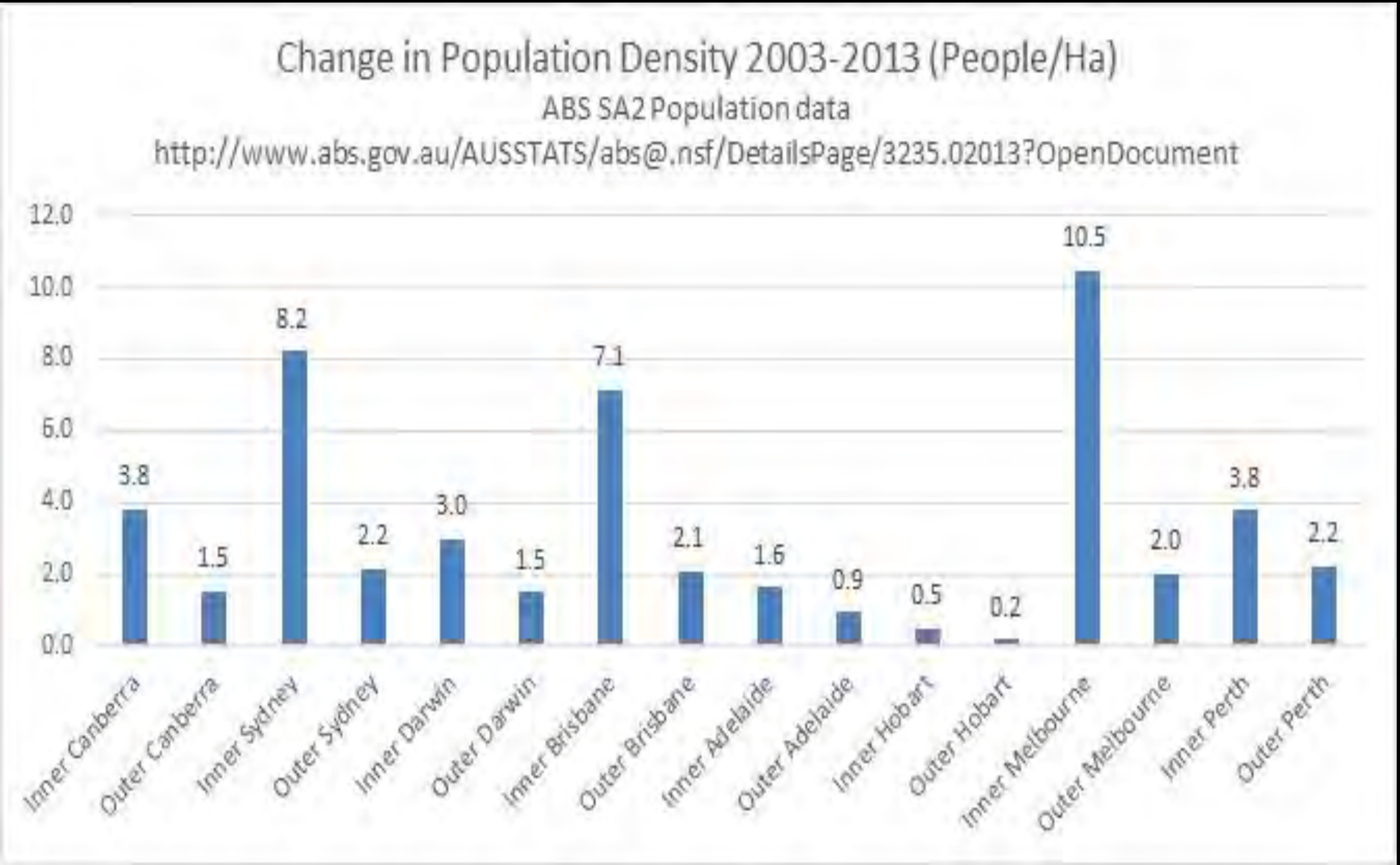


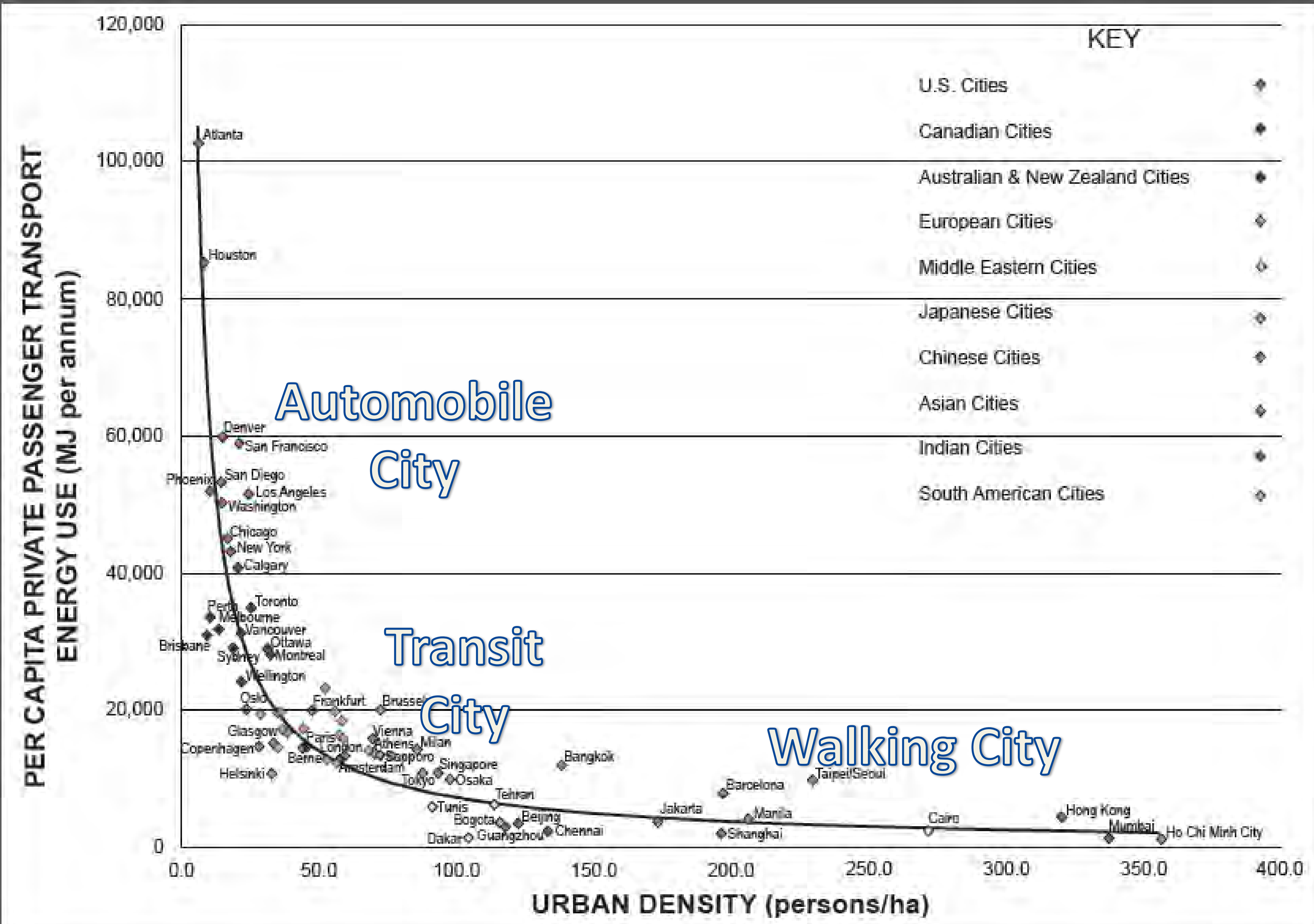
# 3. Peak sprawl



Urban Density Trend in 23 Cities in the USA, Australia, Canada and Europe, 1960-2005
Urban Density (persons per ha)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
39.1
35.4
30.2
28.3
29.2
29.4
1960
1970
1980
1990
1995
2005

# Australian cities coming back in....



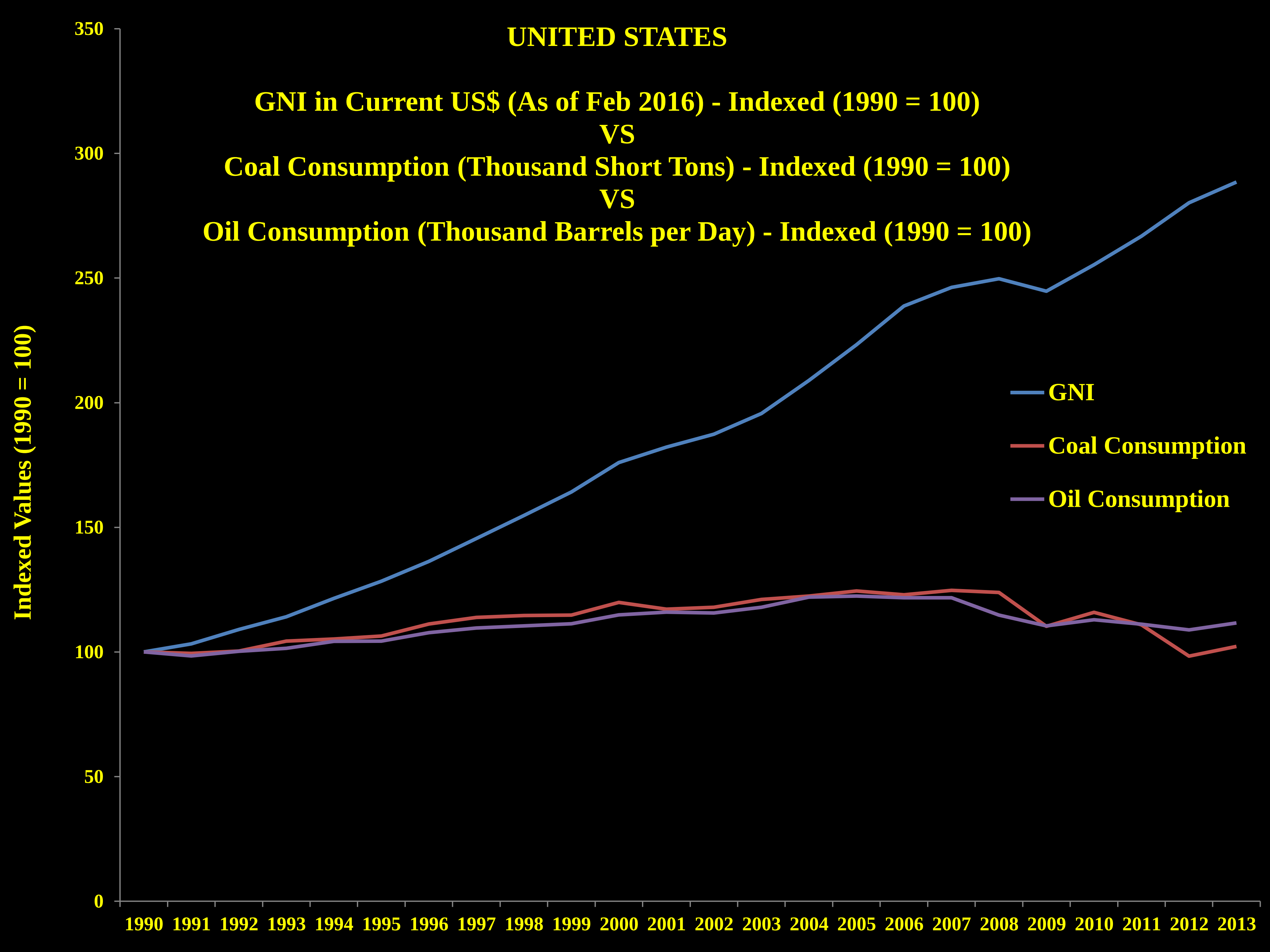


Automobile City
Transit City
Walking City
KEY
U.S. Cities
Canadian Cities
Australian & New Zealand Cities
European Cities
Middle Eastern Cities
Japanese Cities
Chinese Cities
Asian Cities
Indian Cities
South American Cities
PER CAPITA PRIVATE PASSENGER TRANSPORT ENERGY USE (MJ per annum)
URBAN DENSITY (persons/ha)
120,000
100,000
80,000
60,000
40,000
20,000
0
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
Atlanta
Houston
Denver
San Francisco
Phoenix
San Diego
Los Angeles
Washington
Chicago
New York
Calgary
Toronto
Perth
Melbourne
Vancouver
Brisbane
Ottawa
Sydney
Montreal
Wellington
Oslo
Frankfurt
Glasgow
Paris
Copenhagen
London
Vienna
Athens
Milan
Sapporo
Helsinki
Berne
Amsterdam
Singapore
Tokyo
Osaka
Bangkok
Tehran
Tunis
Bogota
Beijing
Dakar
Guangzhou
Chennai
Jakarta
Barcelona
Manila
Shanghai
Taipei/Seoul
Cairo
Hong Kong
Mumbai
Ho Chi Minh City

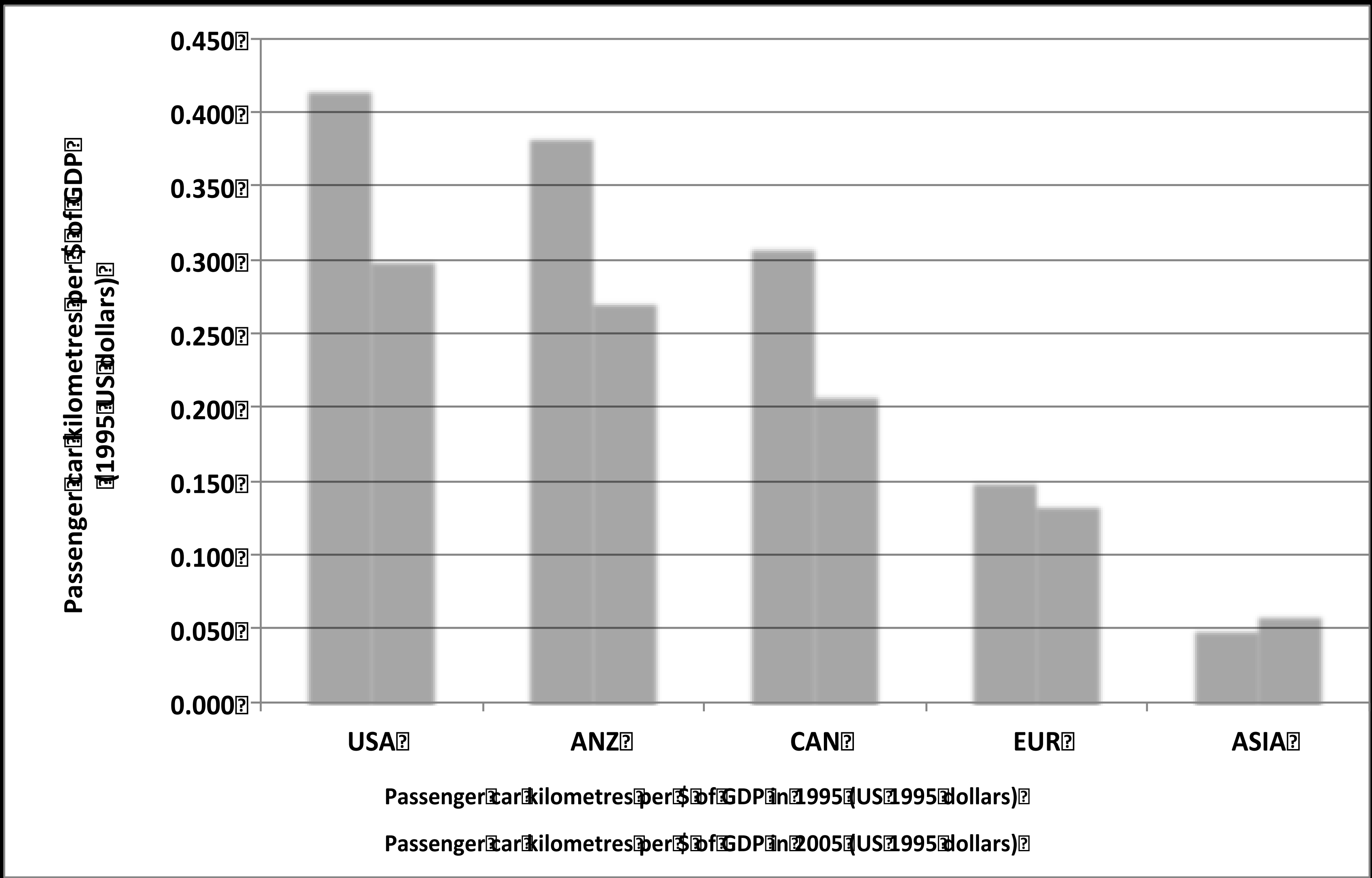
# 4. Peak gasoline

# Supply crisis leads to demand disruption...

# 5. Peak car-based wealth


UNITED STATES
GNI in Current US$ (As of Feb 2016) - Indexed (1990 = 100)
VS
Coal Consumption (Thousand Short Tons) - Indexed (1990 = 100)
VS
Oil Consumption (Thousand Barrels per Day) - Indexed (1990 = 100)
Indexed Values (1990 = 100)
0
50
100
150
200
250
300
350
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
GNI
Coal Consumption
Oil Consumption

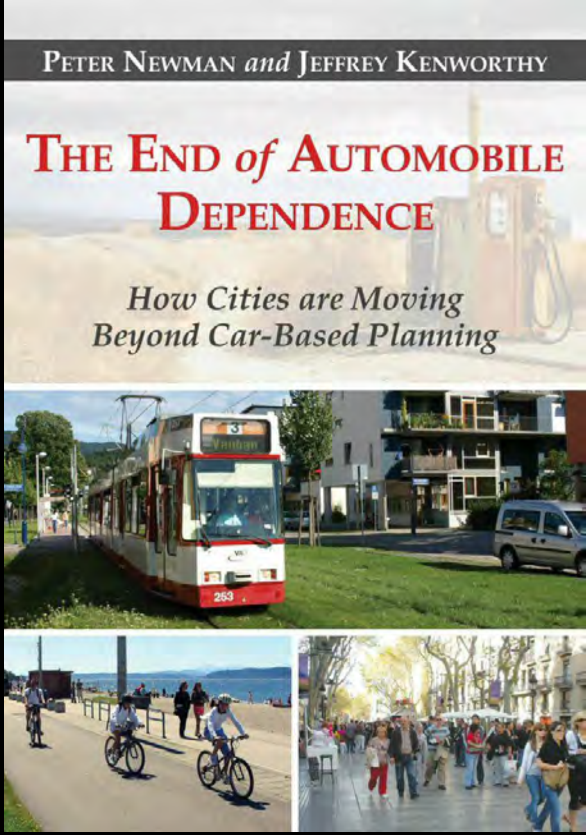
# Decoupling car use and GDP



Ed Glaiser and Richard Florida were right…

The top 6 most walkable cities in the US have 38% higher GDP.

70% of knowledge economy workers in Boston live in walkable areas.

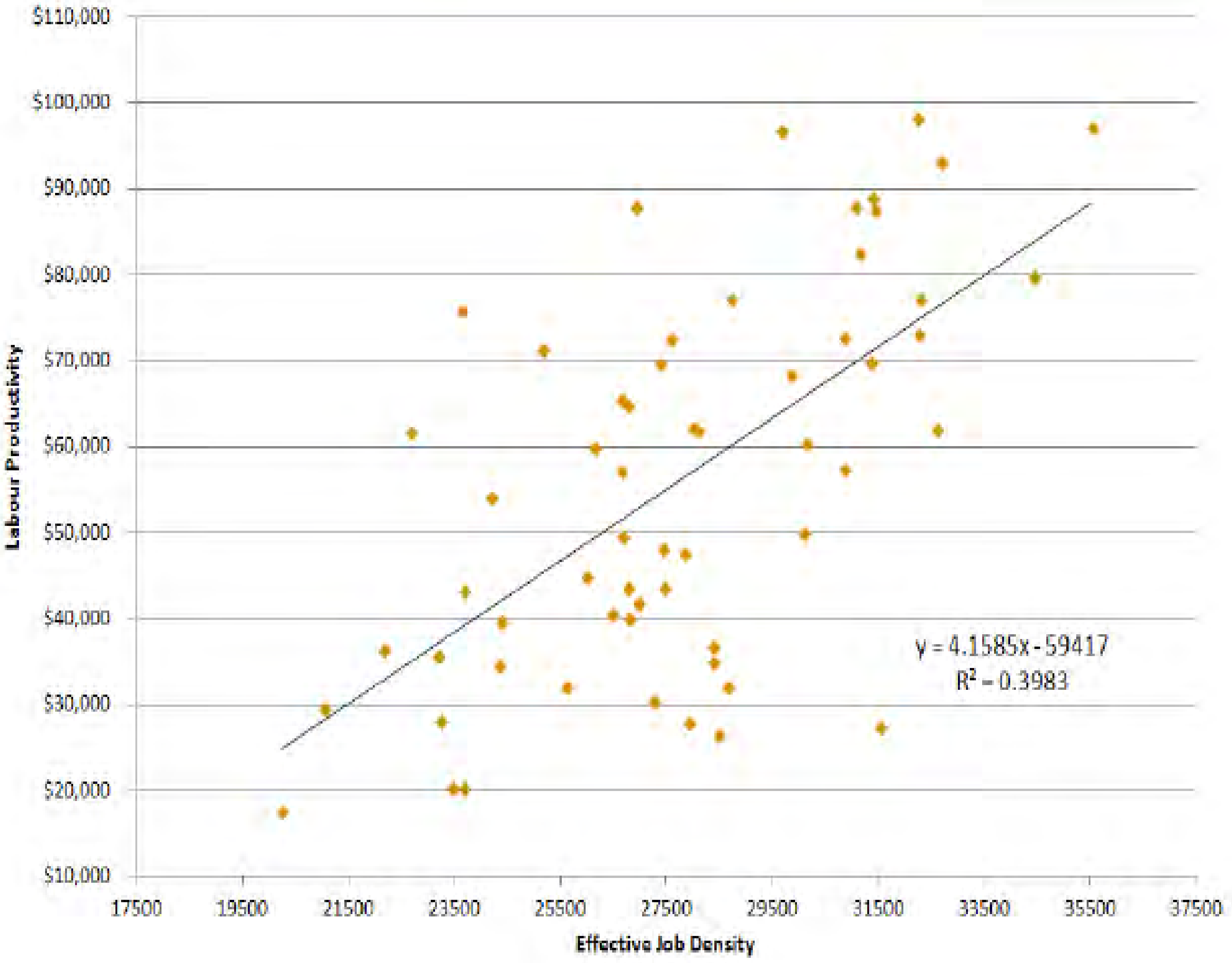


SGS Economics & Planning

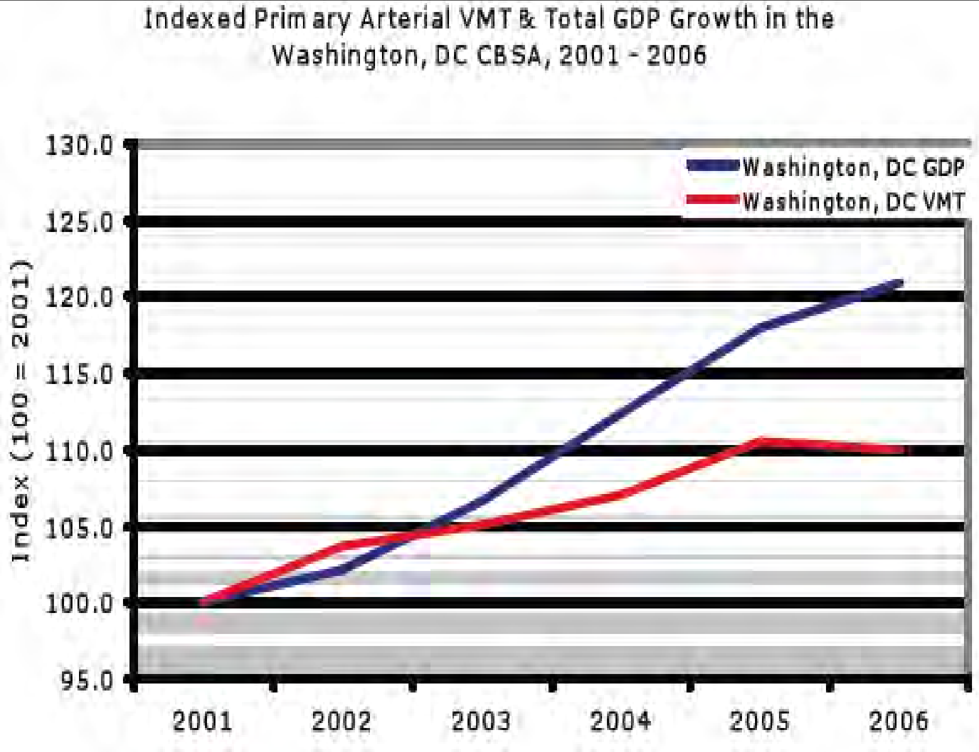
CITY OF MELBOURNE

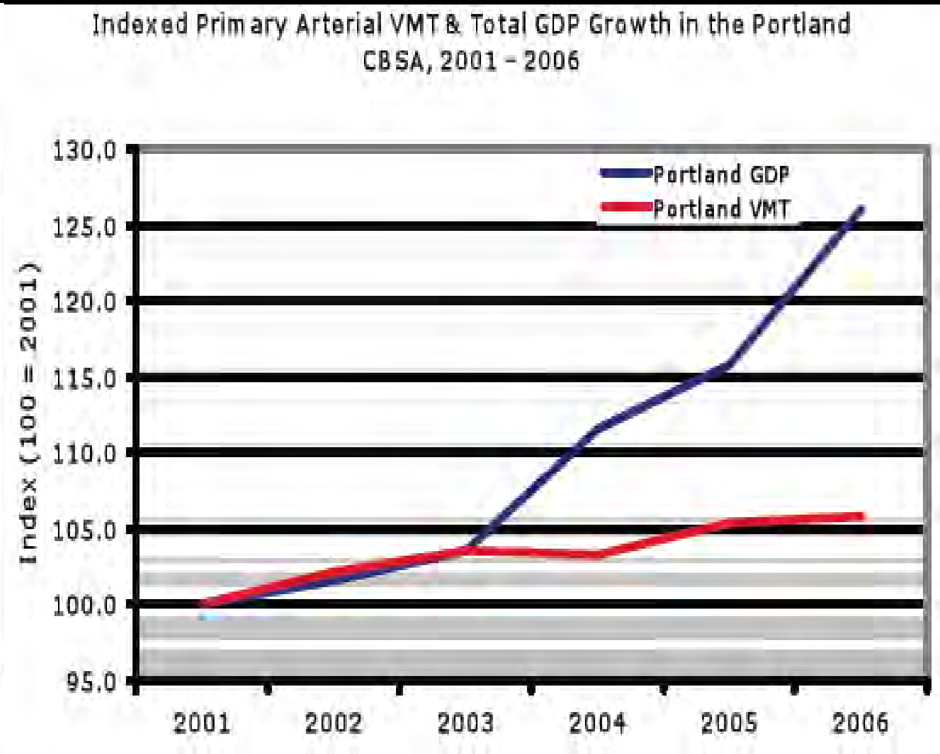
Independent insight.

# EJD and Labour productivity



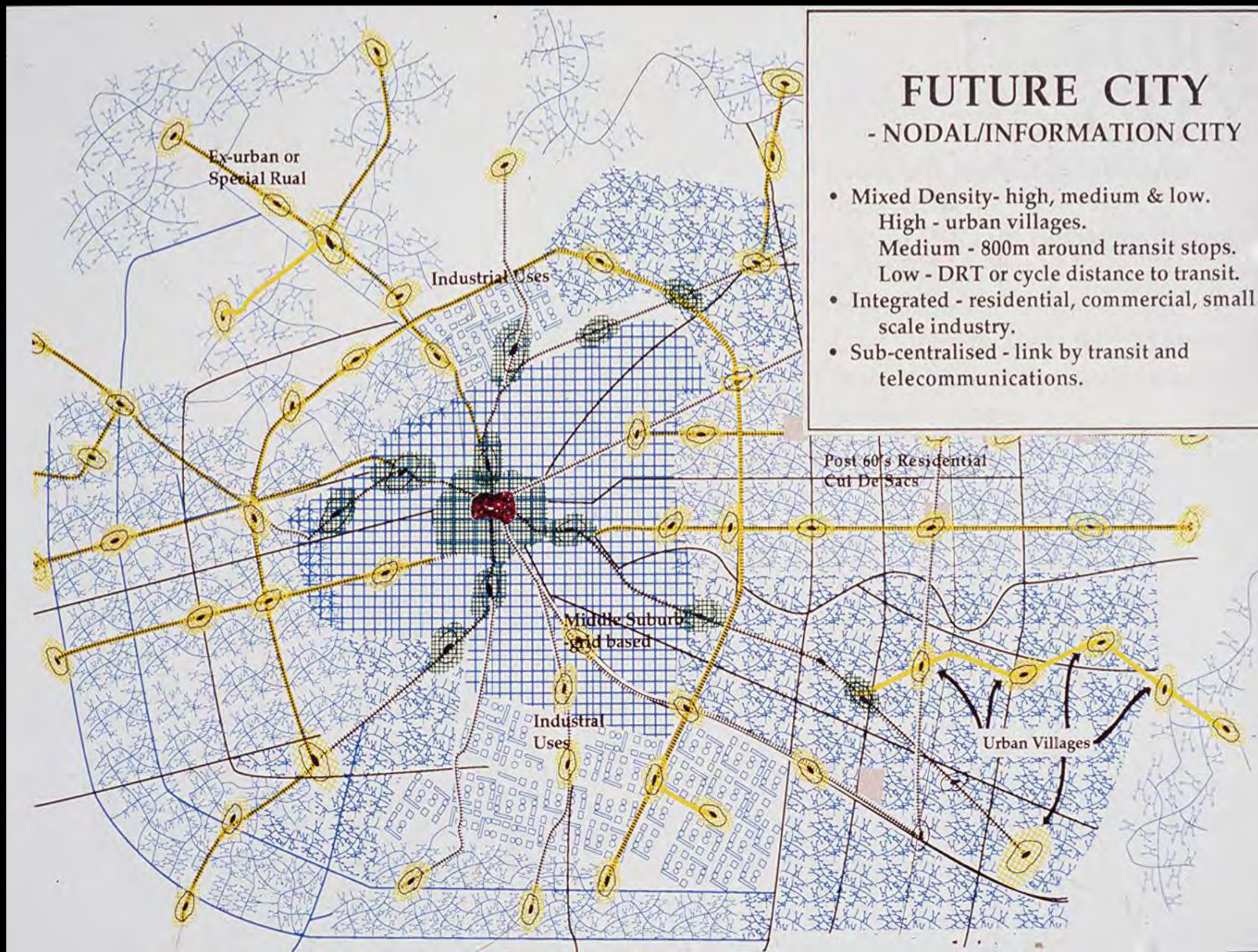
# Decoupling mostly in the cities with rail investment, eg Washington DC and Portland




Curtin University

# Every city wants to create centres for their economy...linked by quality transit



# Why is land development able to pay for urban rail…

# Perth Southern Rail…

## 130 kph speed, Carrying 8 lanes of traffic.

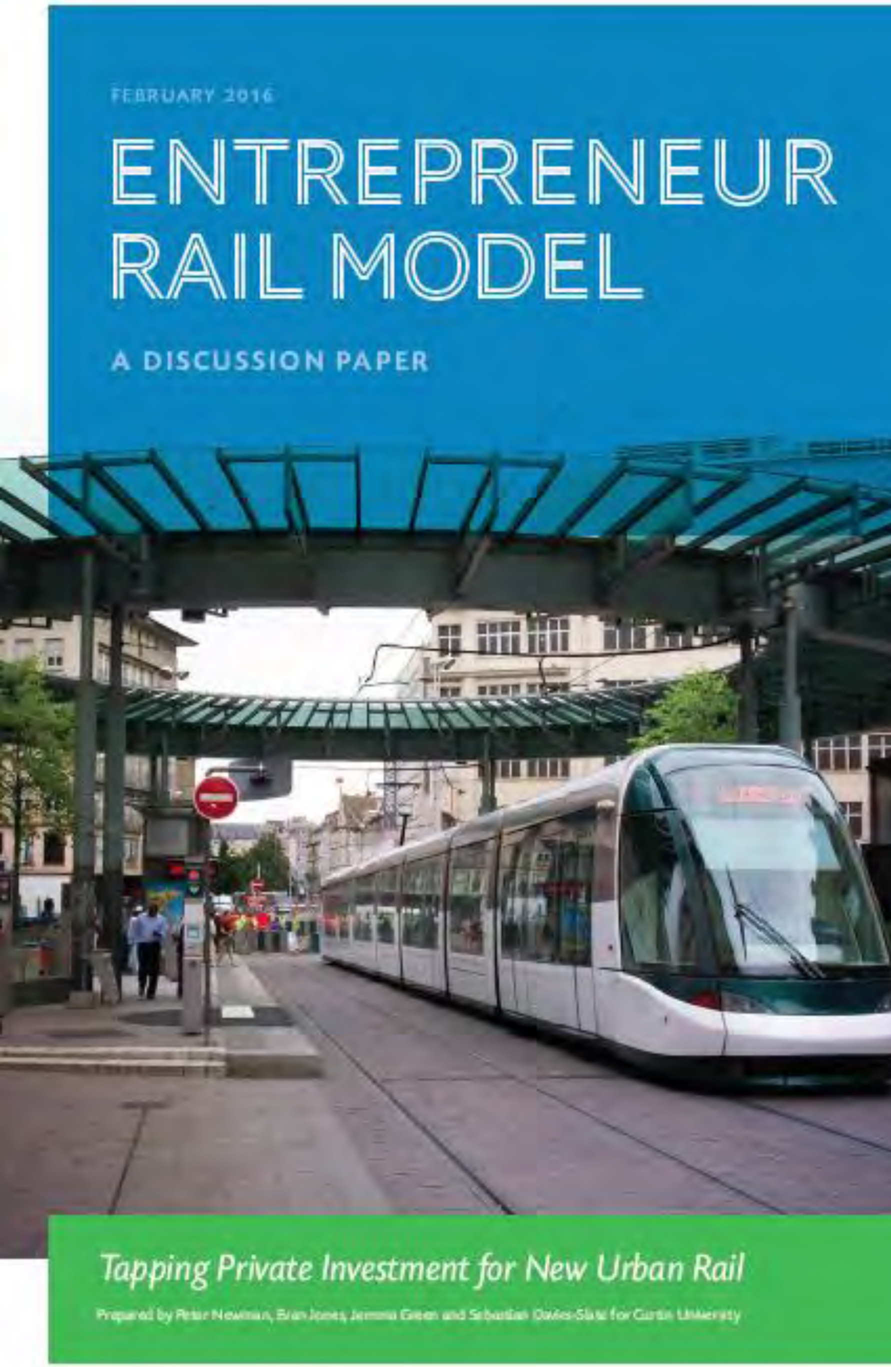
The land value near rail stations on the Southern Rail increased by 42% in 5 years….thus beginning to create transit city fabric….

CUSP modeling shows that 60-80% of the funding could have been found from value capture.

Opens the door to more private sector involvement

# How can urban rail and land development finance each other…

# Pearl District LRT paid for entirely through land development....



FEBRUARY 2016

# ENTREPRENEUR RAIL MODEL

A DISCUSSION PAPER

*Tapping Private Investment for New Urban Rail*

Prepared by Peter Newman, Evan Jones, Jemma Green and Sebastian Davies-Slate for Curtin University


East Fremantle Now and After Light Rail - Images by Cole Hendrigan

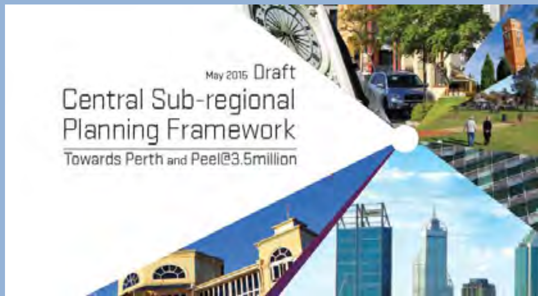
# Entrepreneur Rail Model….land first


Traditional approach


Entrepreneur approach

# How?

- Don’t define the route just a corridor.
- Call for expressions of interest from consortia that can build, own, operate and finance the rail project through land development. DBFM
- Government need to manage the procurement to enable transit system integration and land assembly.
- This is the Japanese system.




# LINKING DESIGNATED ACTIVITY CENTRES

# Stirling to Curtin: Key Development Areas


Stirling City Centre

Riverside Project

Bentley Technology Precinct

# Results…

- Unlocks lazy land assets
- Integrates land use and transit as both depend on finance
- Changes the politics of redevelopment as communities get their rail
- Enables private sector expertise in land development to drive city form and transit – as it has mostly been through history.

*Figure 4: Simplified Planning, Funds Contribution and Capital Cost Model*

# How can regional planning from local to national make it happen…

1. **Regional Plan of Land Use and Transit** – seek out three levels of funding, and then add private to make up gap based on land value capture estimates.

# How can regional planning from local to national make it happen…

**2. Structured Unsolicited Bids** – enabling a fully private proposal by setting out key guidelines and processes to enable its multi-level support and basis for obtaining finance.

# How can regional planning from local to national make it happen…

**3. City Deals** – UK started. Regional compact… Combines local and state vision and planning powers, with private funding and national risk and probity support in process development; all use land value capture to cover government investment.


THE AUSTRALIAN FINANCIAL

www.afr.com | Monday 12 October 2015 $3.80 INCLUDES GST

▶ Turnbull looks to 'get creative' on infrastructure

# PM explores radical road, rail funding

# Prime Minister


Monday 12 October 2015 AFR
The Australian Financial Review | www.afr.com

Malcolm Turnbull, right, said direct grants were not the only way to support infrastructure. PHOTO: SCOTT FLETCHER

From page 1

Turnbull explores

ment, not least because of sharply constrained federal and state budgets.

Prominent economist Saul Eslake estimates Canberra could borrow an

economy from the end of the res investment boom.

Former Infrastructure A board member and Curtin Un

Use land value....


**Urban Finance Unit**

$50 million to assist with journey of involving private sector with all levels of government in City Deal projects…