



NZ Planning Institute Conference

# Interweaving Public Transport and Land Use for Urban Transformation

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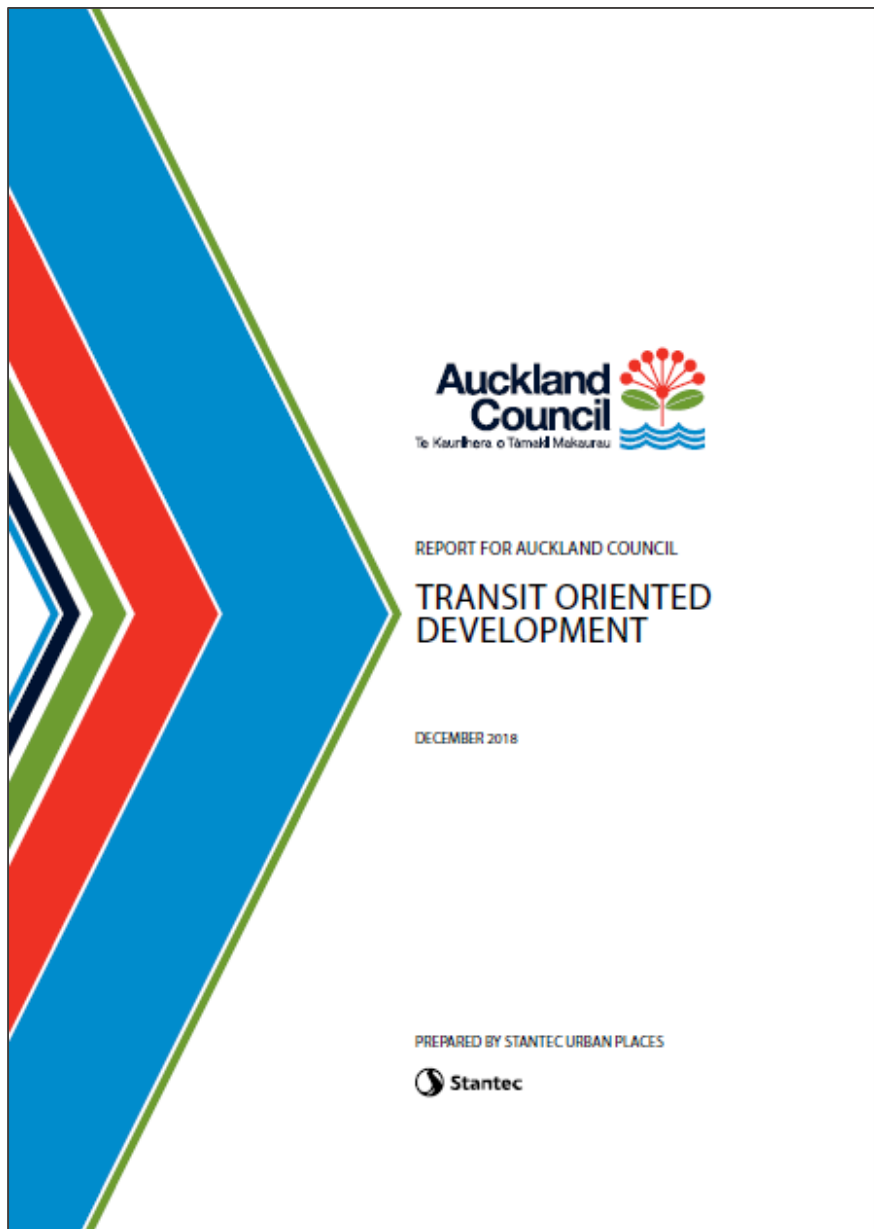






# Agenda

1. Genesis
2. What is TOD?
3. Urban Form Influences
4. Case Studies
5. Implementation Strategies
6. Key Lessons



# Genesis

In 2018, Stantec Urban Places produced a Transit Oriented Development (TOD) topic paper for Auckland Council to assist in their thinking about spatial planning for light rail.

Auckland Council has kindly agreed that the findings can be shared to stimulate a conversation about the role TOD could play in communities across Aotearoa.

This presentation summarises the key findings from this work.



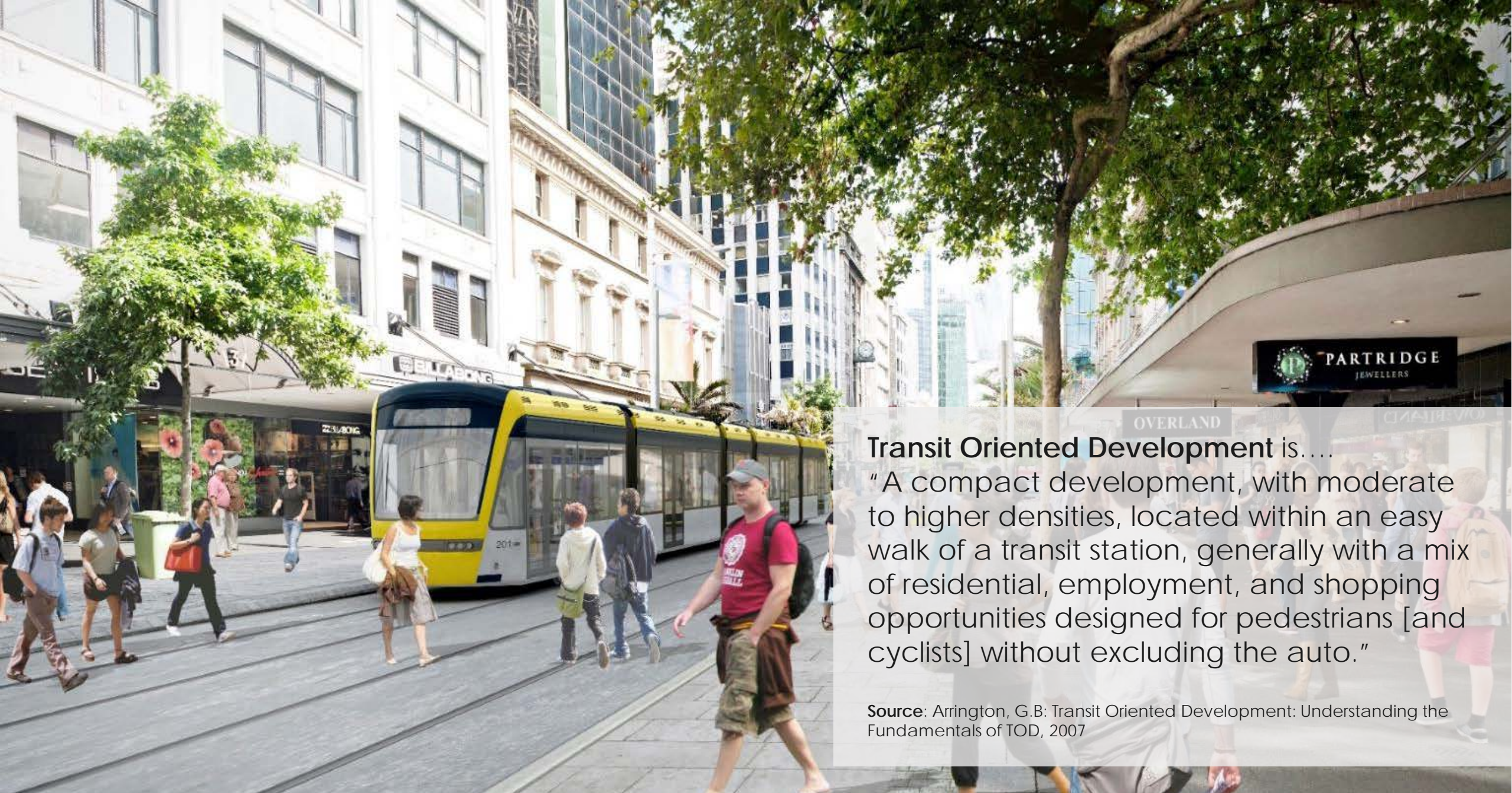


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# WHAT IS TOD?

Stantec, 2016, Douglas Station, Miami





### **Transit Oriented Development is....**

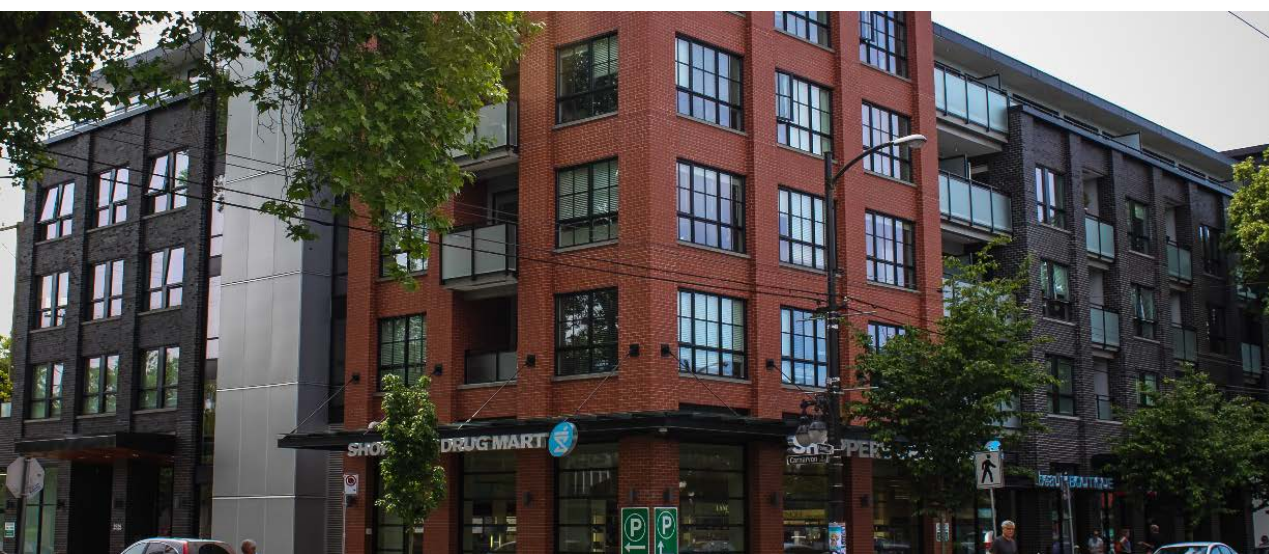
"A compact development, with moderate to higher densities, located within an easy walk of a transit station, generally with a mix of residential, employment, and shopping opportunities designed for pedestrians [and cyclists] without excluding the auto."

**Source:** Arrington, G.B: Transit Oriented Development: Understanding the Fundamentals of TOD, 2007



WHAT IS TOD?

## Density



- 400m is optimal range for high-density development.
- Beyond 400m, modal shift to public transport drops off significantly.



WHAT IS TOD?

# Diversity



- Land use diversity supports:
  - Transport efficiency
  - Sense of place
- Mix of some or all of:
  - Institutional
  - Employment
  - Retail and Service
  - Residential Uses



WHAT IS TOD?

## Design



- High-quality design is key to success and should address:
  - Buildings
  - Public spaces
  - Streets
  - Public transport infrastructure
- TOD-supportive design includes:
  - Ground-floor active edges
  - Hidden parking
  - Multi-modal streets
  - Public plazas and parks



WHAT IS TOD?

## Benefits of TOD

### PUBLIC TRANSPORT BENEFITS

- › Public transport use within TOD areas consistently exceeds urban averages.
- › Increased farebox recovery creates a virtuous circle.

### HEALTH & SAFETY BENEFITS

- › Fewer car-related injuries due to fewer car trips.
- › The “eyes on the street” effect of active, walkable streets.
- › Increases in walking and cycling in TODs.

### ENVIRONMENTAL BENEFITS

- › Transport-related GHG emission reductions.
- › Up to 45% car use reductions compared to conventional development.
- › Less energy use overall, (transport shifts/building energy efficiency).

### LIVABILITY BENEFITS

- › Increases in social interaction through placemaking and quality public realm.
- › Significantly reduced car ownership costs.
- › Convenience of walking for daily tasks.



WHAT IS TOD?

## TOD versus TAD

### TRANSIT ORIENTED DEVELOPMENT (TOD)

TOD is a compact development, with moderate to higher densities, located within an easy walk of a transit station with a mix of residential, employment and shopping opportunities.

### TRANSIT ADJACENT DEVELOPMENT (TAD)

TAD typically consists of development near a public transport station or stop that does not prioritise the station as a point of focus, instead allowing car access to dominate the needs of pedestrians, cyclists and public transport users.







Stantec. 2014. Charlesview Mixed-use Development.

# 2

## URBAN FORM CHARACTERISTICS INFLUENCING REDEVELOPMENT ACTIVITY



# Light Rail Transit

## LIGHT RAIL CORRIDOR

- A poorly chosen corridor or poor land use integration will limit TOD opportunities.
- Costs and travel time often have an outsize role in corridor selection which can mean missed opportunities for TOD.
- Rail freight and motorway corridors can repel redevelopment.

## LIGHT RAIL TRACK DESIGN

- TOD benefits greatly when pedestrians and cyclists can cross track easily and prevents LRT from dividing communities.
- Street-running LRT without grade separation or guard fencing is the most pedestrian-friendly but requires LRT vehicles to travel more slowly.

## LIGHT RAIL STATION DESIGN

- Design of the station and surrounding area will strongly influence development.
- Stations should integrate with the public realm.
- Station scale should match the expected level of use.
- Station spacing should be contextual and generally closer than heavy rail.





## What Light Rail Transit Is Not

LRT is not the same as the trams that ran in New Zealand cities until the 1950s and 1960s. Some key differences are:

Speed	Heritage tram – Maximum speed 20km/h
	Modern light rail vehicle– Up to 100km/h (but runs at the prevailing speed limit on street)
Capacity	Heritage tram – 50-100 passengers per car (typically single-car operation)
	Modern light rail – 200-300 passengers per car (typically multi-car operation)
Corridor	Heritage tram – on-street running in mixed traffic
	Modern light rail – dedicated corridor or on-street separated from other traffic.
Stop Spacing	Heritage tram – typically every 400 metres.
	Modern light rail – typically every 800 metres to 2km, depending on context.





## Bus Rapid Transit

Some key differences between LRT and Bus Rapid Transit (BRT) are:

### 1. Flexibility:

LRT – exclusively runs in fixed corridors

BRT – can run in fixed corridors and on-street in mixed traffic. Can be re-routed around disruptions.

### 2. Capacity:

LRT – 200-300 passengers per car (typically multi-car operation)

BRT – 70 per single decker bus;

100 per double-decker bus;

up to 200 per articulated bus;

250 per bi-articulated bus

LRT or BRT can both foster TOD, however perceptions influence mode choice and a more positive reputation for mode and quality of service may influence use.





# Existing Density and Land Use Diversity / Local Transport Conditions

## EXISTING DENSITY AND LAND USE DIVERSITY

- Some locations such as CBDs are already very transit oriented, reflecting significant density and land use diversity.
- TOD in low density residential areas may take a long time to gain momentum.
- Infrastructure needs to be in place for TOD to act as a catalyst for further intensification of land uses.
- Existing social infrastructure such as libraries, community centres and medical centres provide strong anchors.

## LOCAL TRANSPORT CONDITIONS

- Pre-WW II neighbourhoods typically reflect grid layouts.
- Post-WW II neighbourhoods tend toward more hierarchical and disconnected patterns.
- The connectivity of the local road network influences walking and cycling, plus ability to provide feeder public transport to a PT station.
- Station areas with a connected street grid offer more pedestrian friendly environments that increase the station's 5- to 10- minute walk catchment.

## CONNECTED VS. NONCONNECTED





# Property Conditions: Ownership Patterns and Parcel Sizes

## OWNERSHIP PATTERNS

- **TOD potential fall into three broad categories:**
  - Public ownership
  - Corporate ownership
  - Individual ownership
- **Greatest opportunity:**
  - Housing NZ sites
  - Council-owned properties in station areas
  - Commercial sites with ageing buildings
  - Ageing apartment or townhouse sites in single ownership
- **Least opportunity:**
  - Areas of fragmented individual ownership
  - Areas of recent auto-oriented development or reinvestment

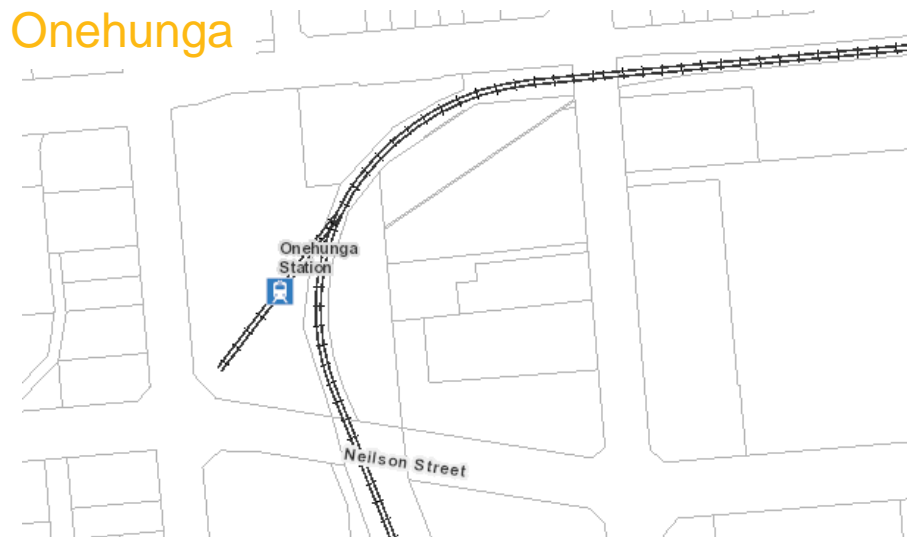
## PARCEL SIZES

- Larger land parcels have greater redevelopment opportunities than smaller ones.
- Where a lack of consolidated ownership is present some local governments have acquired parcels to facilitate development.
- Zoning incentives in areas of small-holdings can encourage property acquisition and amalgamation by providing bonuses that allow increased height, FAR, or parcel coverage.

## Dominion Road



## Onehunga







Stantec: 2010, South LRT Extension

# 3

## TOD CASE STUDIES



## New Lynn, Auckland – New Zealand

### BACKGROUND

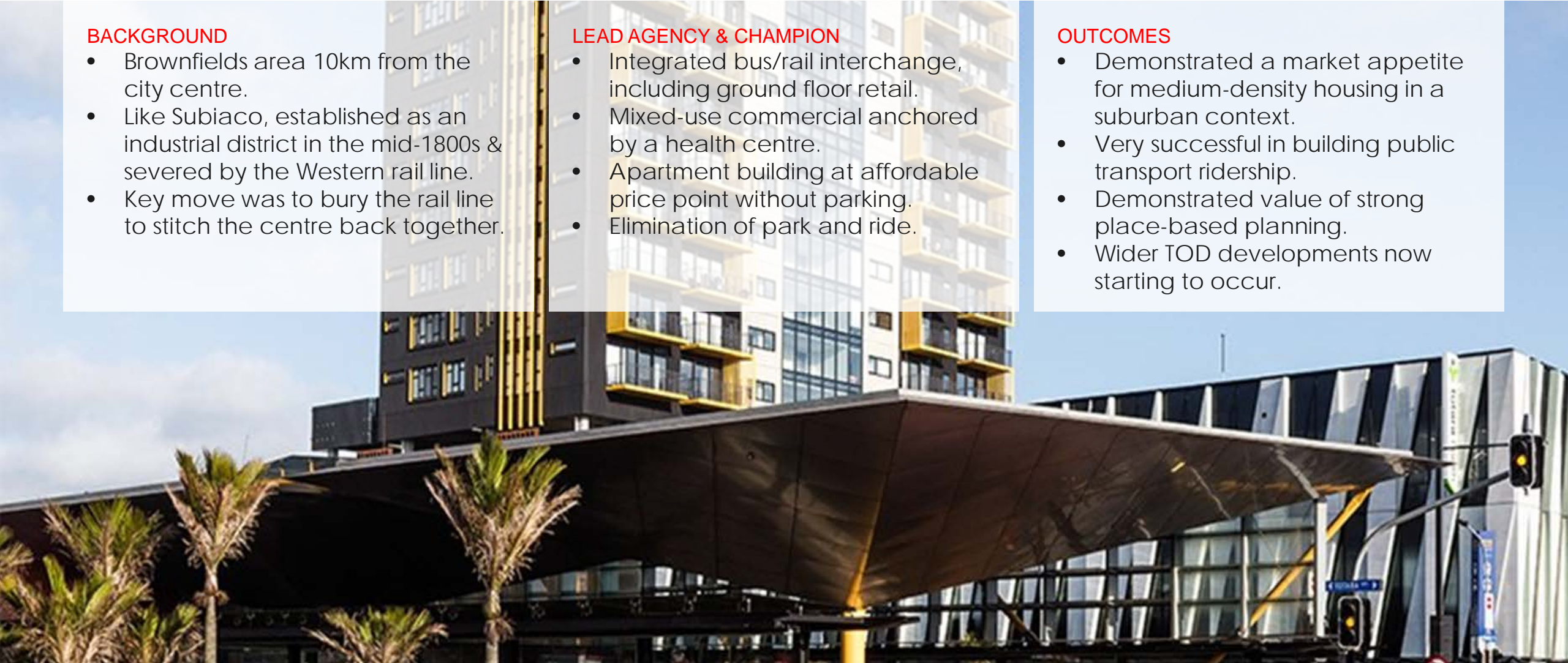
- Brownfields area 10km from the city centre.
- Like Subiaco, established as an industrial district in the mid-1800s & severed by the Western rail line.
- Key move was to bury the rail line to stitch the centre back together.

### LEAD AGENCY & CHAMPION

- Integrated bus/rail interchange, including ground floor retail.
- Mixed-use commercial anchored by a health centre.
- Apartment building at affordable price point without parking.
- Elimination of park and ride.

### OUTCOMES

- Demonstrated a market appetite for medium-density housing in a suburban context.
- Very successful in building public transport ridership.
- Demonstrated value of strong place-based planning.
- Wider TOD developments now starting to occur.





## Hobsonville Point, Auckland – New Zealand

### BACKGROUND

- Master planned greenfields/ brownfields TOD on the former Hobsonville Air Force base.
- Delivered by HLC, a subsidiary of Housing New Zealand.
- Site specific plan change by Waitakere City Council.

### KEY ELEMENTS

- Local retail centre with apartments above (photo below).
- Schools and local bus & ferry service to downtown Auckland when first residents moved in.
- Placemaking element of community building.

### OUTCOMES

- Introduced mass-market builders to doing medium density at scale.
- 60% of kids walk or cycle to school
- Driven by balance of public values and market interests.
- Average density 50+ dwelling net/ha.





## Edmonton – Alberta, Canada

### EARLY APPROACH

- 1978: Edmonton opened a LRT system on repurposed rail corridor with high platform stations.
- Edmonton wanted significant redevelopment around LRT.
- Few urban design moves were made to integrate them into the urban fabric.
- LRT was well-patronised (115,000 daily pax), but TOD zoning did not provide much return.

### STRATEGIC SHIFT

- Early 2000s: Edmonton pursued strategies to increase infill development, including a reconsidering of TOD strategies.
- A more nuanced and market-driven approach was developed, resulting in the 2012 Transit Oriented Development Guidelines.
- New LRT design shifted towards new urban-style low-floor LRT lines with more focus on walking and cycling.

### OUTCOMES

- 2019: Results have been dramatic for development in TOD areas with 30,000+ new homes and 230,000m<sup>2</sup> commercial floor space consented.
- New LRT stops in market –attractive locations, whilst the improved design of the infrastructure offers greater neighbourhood integration.







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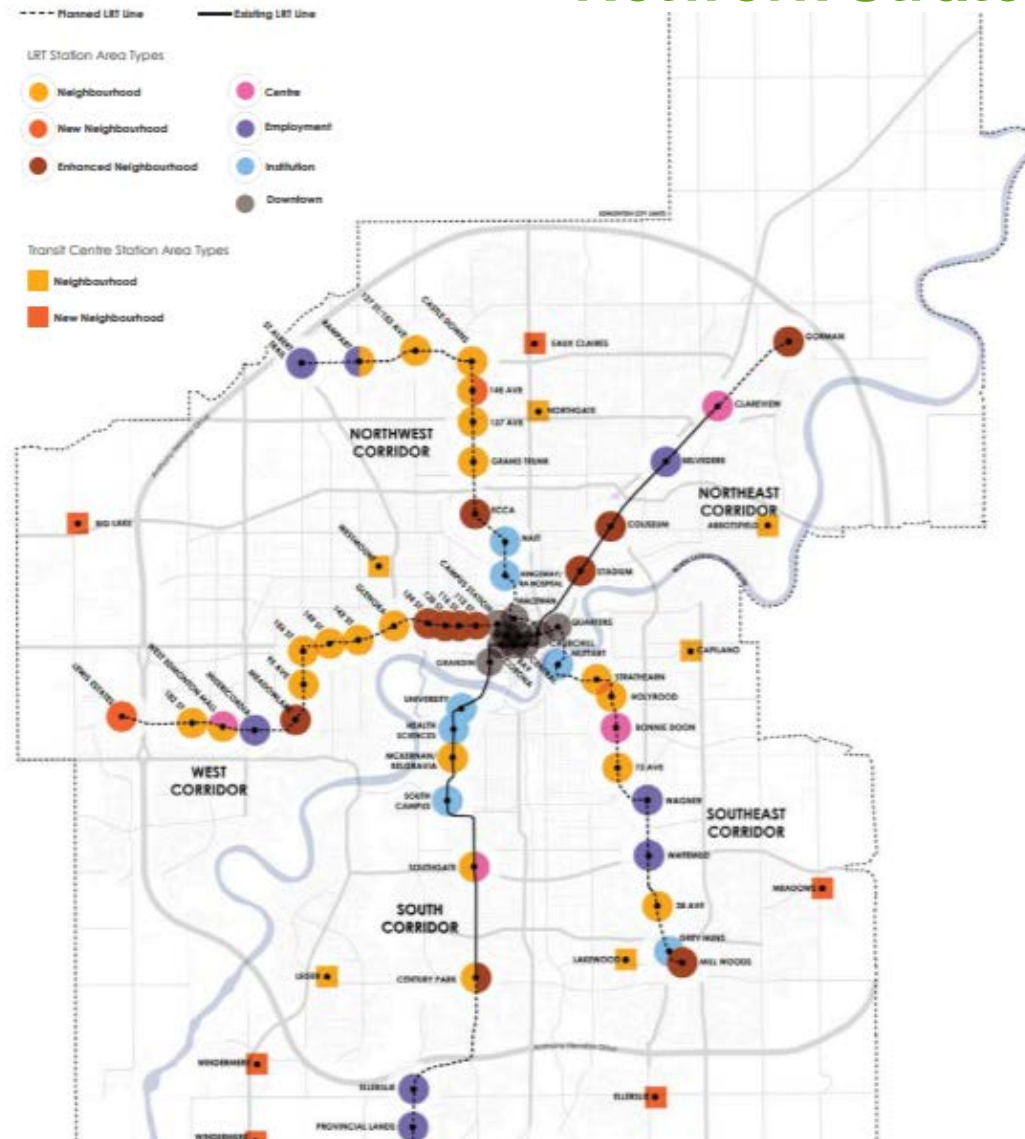
## IMPLEMENTATION STRATEGIES

Stantec, 2017, One Charlestown, Boston.



# Network Strategy Planning

Figure 10: Station Area Types



## OVERARCHING PLANNING FRAMEWORK

- A “one size fits all approach” to TOD will not deliver results in most station locations.
- Network-level planning signals expectations for the character of development in each station area, for both private developers and public agencies.
- Can help prioritise high opportunity areas to avoid spreading limited resources too thinly.



## Station Area Planning

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- Station area planning can provide a fine-grained look at issues and vision.
  - It can be detailed policy analysis that will influence land use, set expectations for open space, identify active transport links and outline capital projects.

### HIGH-LEVEL PLANNING

- Open-ended visioning discussions and opportunities-and-constraints analysis with communities.
- Set corridors, station area and key policy decisions like value capture and creation and density targets.

### DETAILED PLANNING

- Applies policy and implementation strategies at each station area, adapted to context.
- Drives decisions on infrastructure, community needs, parks, and open space and transport networks that will connect to and from station areas.
- Detailed planning studies should evaluate:
  - density requirements
  - best built-form solutions
  - how development relates to surrounding communities
  - connections required to encourage active transport
  - anticipated minimum and maximums



## IMPLEMENTATION STRATEGIES

# Parking

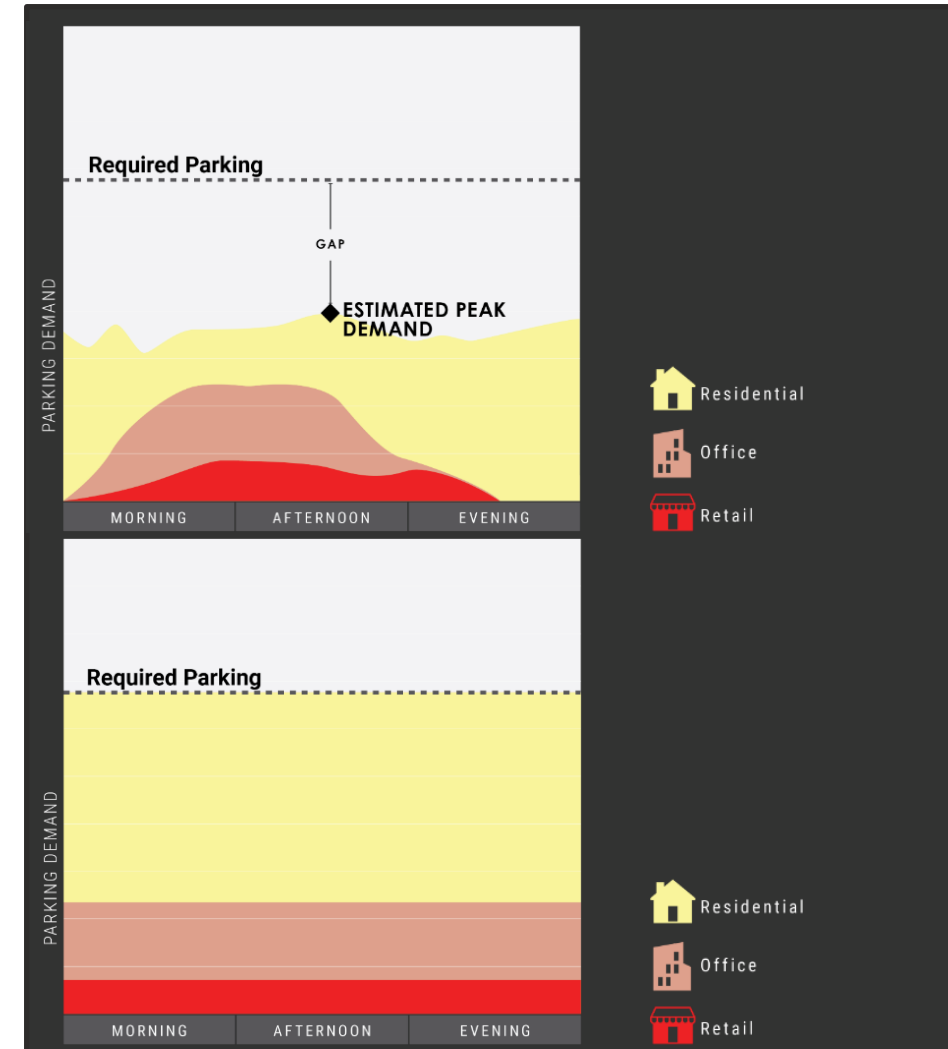
- Whilst an important component of the area's mobility network, TOD area parking can compete with the goal of a pedestrian-oriented station.
- As TOD strategies begin to bear fruit, parking should give way to other, higher-value land uses.

### SPACE IS VALUABLE

- Active uses generate dollars, vitality and public transport users.
- Parking supports those uses but, except in park-and-rides, generates little public transport use.
- Public transport increases the value of adjacent land and attracts more intensive forms of development. Parking revenue cannot compete.

### PARK AND RIDE

- Poses challenges to the success of TOD
- Park and ride poses challenges to the success of TOD:
  - Space consumptive
  - Should locate immediately adjacent to the station for convenience
  - Prioritises automobile access
- Park and ride needs careful consideration in conjunction with the character of the corridor and should be avoided in any station area with:
  - a strong existing pedestrian orientation
  - high potential to become pedestrian oriented with public and private investment





## Walking and Cycling

- When designed well, TOD areas create opportunities to connect the surrounding community to the station.
- TOD pedestrian and cycling networks should:
  - Create additional desire lines that are efficient, direct and redundant.
  - Connect to larger pedestrian and bicycle networks.
  - Increase in permeability as density increases closer to the station.
- Buildings in TOD areas should have multiple pedestrian entries oriented towards the street and station.
- Pedestrian routes should also be direct, well-lit, and animated by adjacent uses.
- An attractive and comprehensive pedestrian network can also facilitate a “park once” environment in addition to supporting increased public transport use.
- These considerations can be addressed through:
  - Infrastructure planning guidance
  - Design guidelines
  - Zoning





## Value Creation and Capture

- Value creation and capture (VCC) enables communities, funding organisations and government bodies to recover and reinvest increases in land values that result from major public investments.

### APPROACHES TO VALUE CREATION AND CAPTURE

- **Development-based VCC**
- Direct transit agency involvement in development delivery — the “Hong Kong” model
- Other public sector leadership of station area redevelopment
- **Taxation-based VCC**
- Uses taxes and levies to capture the uplift value of new development



TRANSIT  
INVESTMENTS



DEVELOPMENT  
INVESTMENTS



COMMUNITY  
INVESTMENTS

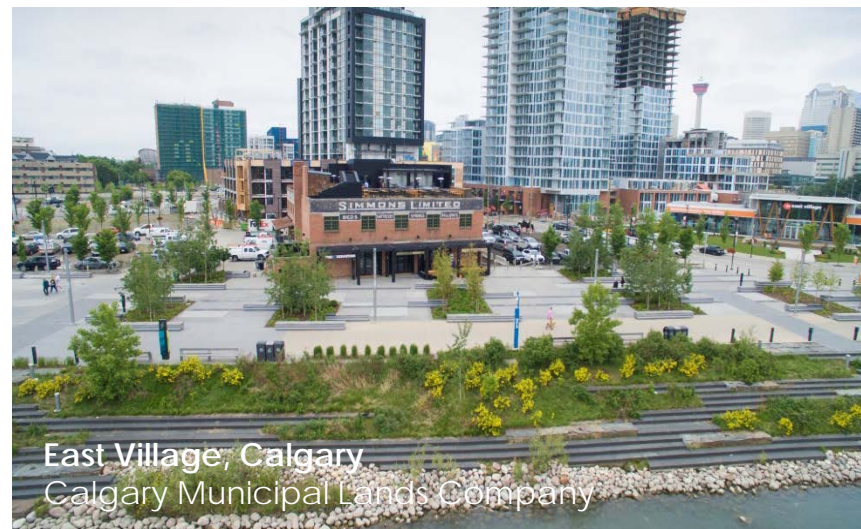


INFRASTRUCTURE  
INVESTMENTS



## Urban Development Authorities

- Urban development authorities (UDA) are quasigovernmental bodies that hold special powers to fast-track complex projects.
- UDAs succeed when they:
  - Take an entrepreneurial approach
  - Offer communities and developers a streamlined point of contact
- However, they could create new challenges, primarily regarding real or perceived loss of Council, mana whenua and community influence over decision-making.







# 5

## CONCLUSION

Stantec. 2010. Tie and ballast track at South Campus station, Edmonton.



## Key Lessons

- The easiest corridor is not always the best corridor.
- Success factors are complex.
- Density, diversity and design are all essential.
- Success requires concerted effort over long periods.

- Consider overarching network planning to set clear expectations.
- Station area plans allow agencies to prioritise and signal to the market.
- One size does not fit all: Retain leverage over the rezoning process.

- Station areas with large sites, older buildings and/or public land are better TOD opportunities.
- Urban corridors may complicate LRT design but they also offer greater opportunities for TOD.





# Thank you!

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