Tonkin+Taylor

Choosing appropriate Mass Rapid Transit alternatives to improve urban accessibility

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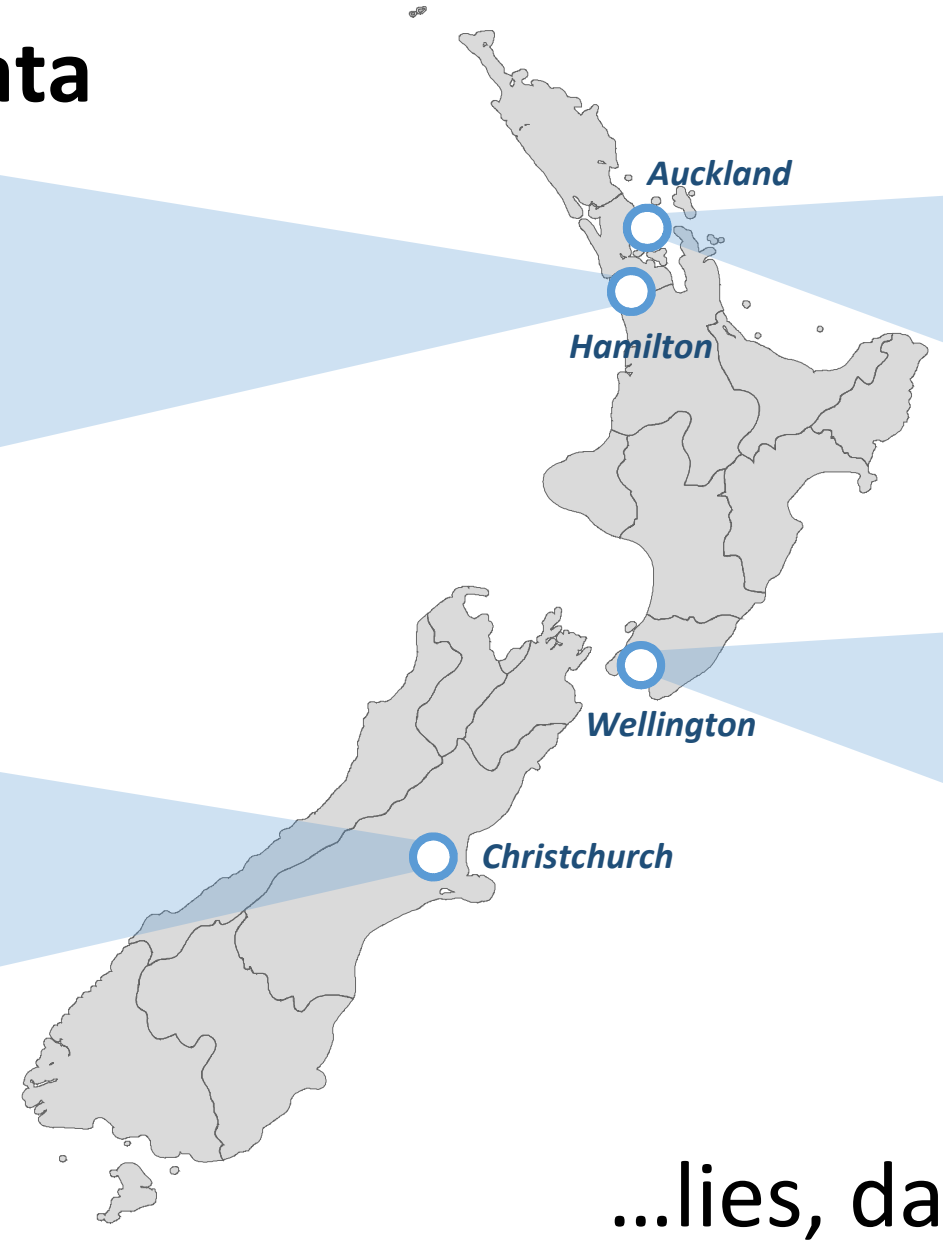
Government Policy Statement (GPS) on Land Transport

- Mass Transit & Public transport priority for cities and interregional commuting
- Auckland LRT *City centre ←→ Mt Roskill ←→ Airport*.
- Regional rail (Auckland ←→ Hamilton ←→*Tauranga)*
- Freight rail improvements (Mode neutrality)
- Reduced investment in highway projects
- Sustainable transport (e.g. electric vehicles, walking and cycling projects)
- Transport safety improvements

2013 Census Data

13.4%
Travelled by company vehicle

6.6%
Walked or jogged



12.6%
Travelled by company vehicle

9.9%
Bus, train, taxi ferry + other

7.0%
Cycled

8.0%
Whenuapai West cycled

21.0%
Walked or jogged

16.8%
Public bus

…lies, damn lies and statistics

Integrated Masterplan to 2050 - Vision, goals and objectives

granularity

VISION

Integrated, Sustainable, Accessible, Inclusive Masterplan

GOALS

Goal 1: Support economic development through improvement of infrastructure and public transport

Goal 2 : Enhance urban environment and tackle increasing congestion

Goal 3: Enhance social inclusion, provide safe , easy and convenient accessibility to sustainable transportation

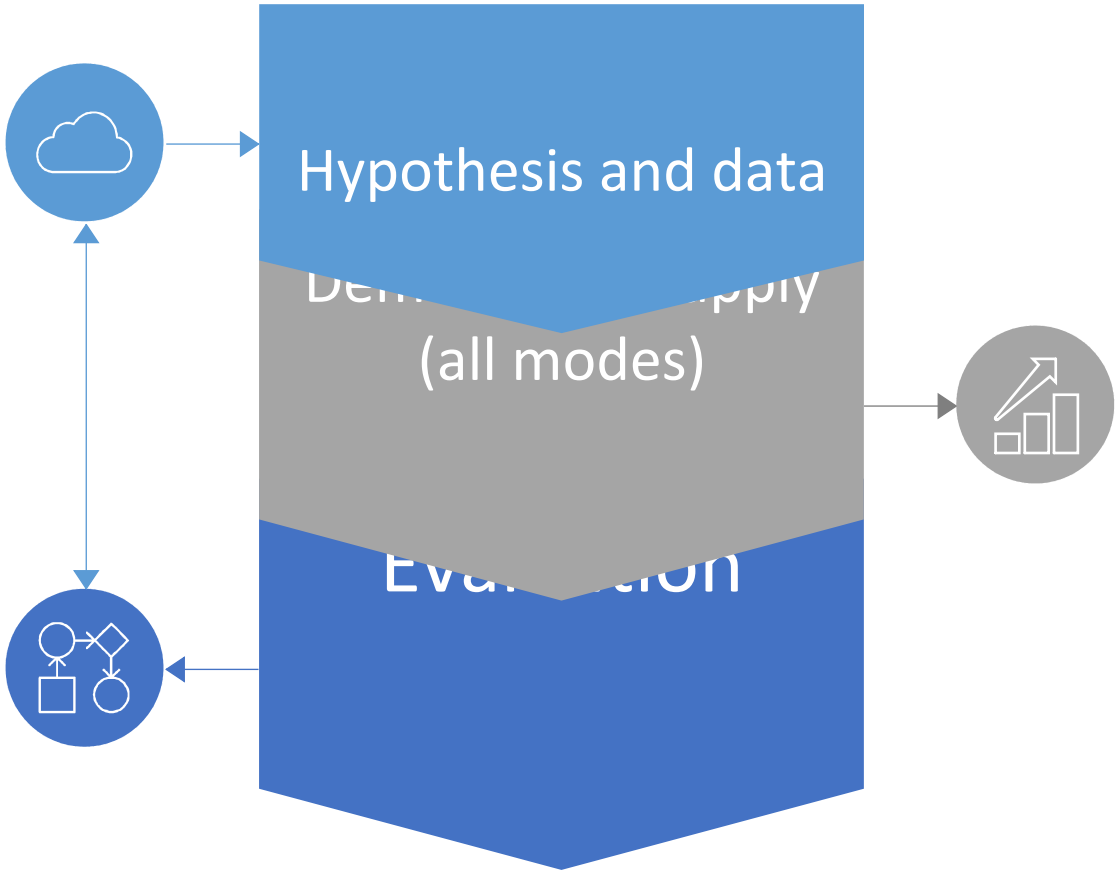
OBJECTIVES

- Mass Transit Networks
- Urban Bus network development
- Rail Network expansion
- Land Use intensification and accessibility
- Walking & cycling network
- Value Capture

OUTCOMES

1. **MRT for improved Airport/CBD accessibility**
2. **Bus priority treatments for higher frequency bus routes**
3. **Urban commuter cycle projects**
4. **Active transport mode share improvement projects**
5. **Commuter rail line extensions**

Integrated Masterplan methodology



The masterplan is undertaken in conjunction with the land-use planning, or more specifically to be integrated to the land use and development planning for the city.

The process involves:

- The development of a number of land-use and transport alternatives
- Evaluation
- Discussions with all stakeholders in order to achieve the best solution.

Integrated Masterplan

Historically, disjointed transport and urban planning practices in developing cities mean that relatively little effort is put into designing communities integrated with transport systems.

Land use change

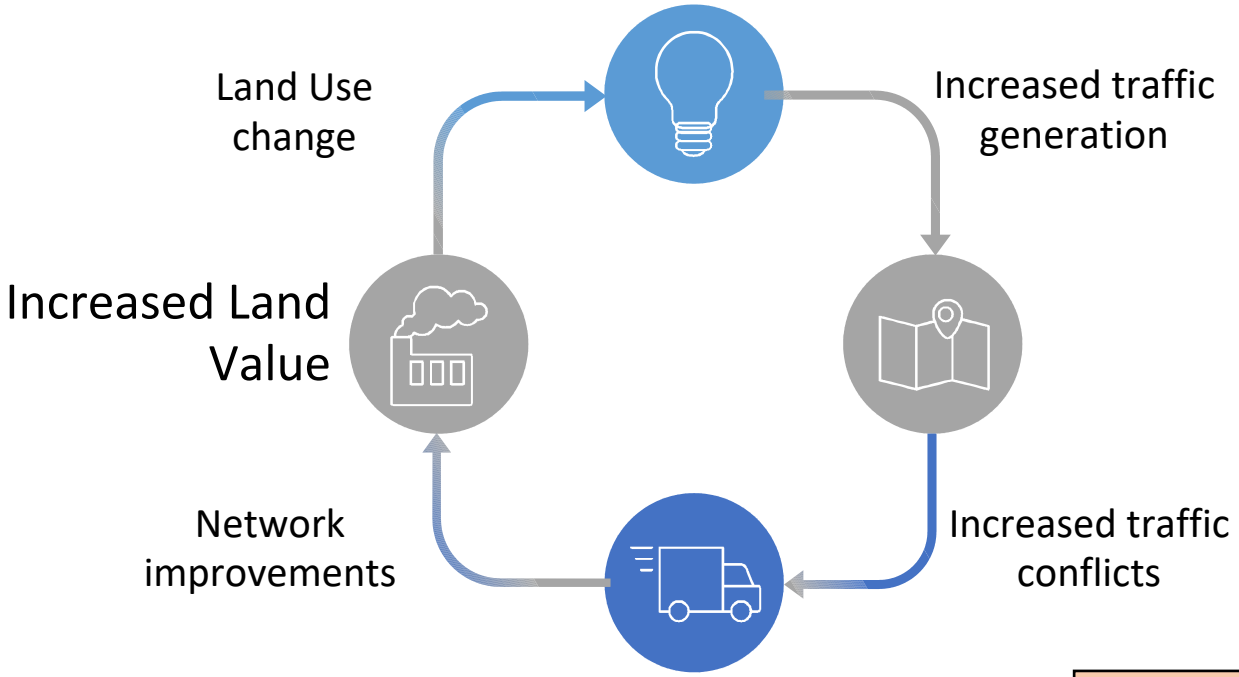
Increased traffic generation
Increasing traffic conflicts

Level of Service

Improvement in service

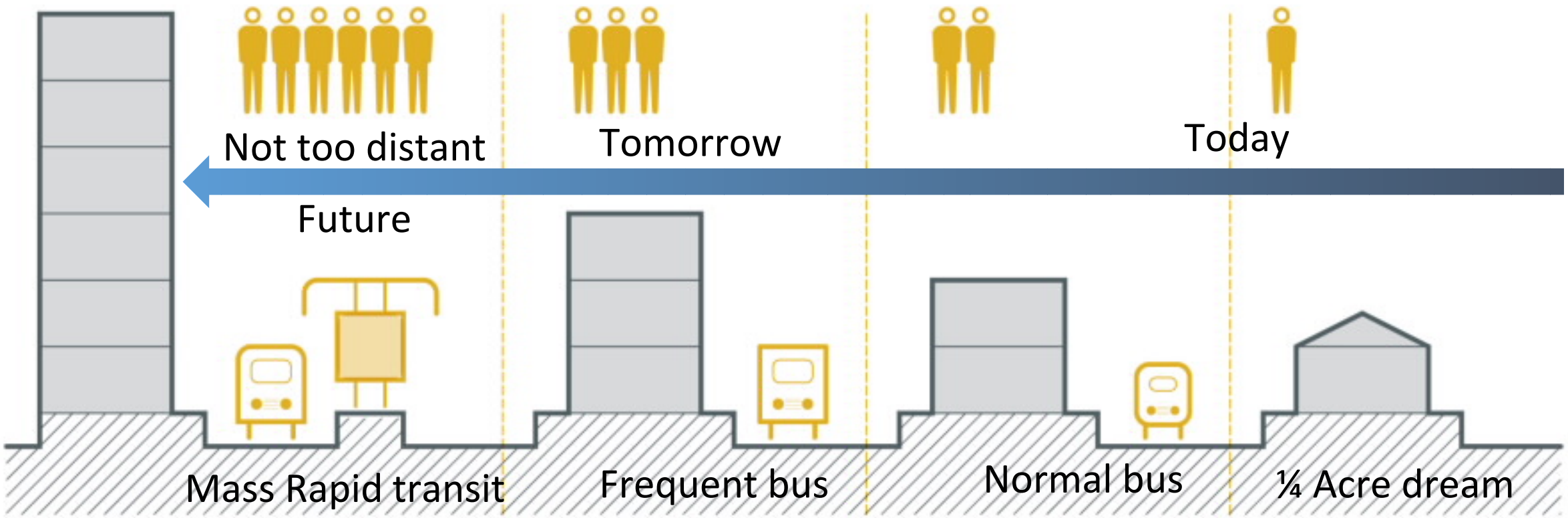
Land Value

Increasing land value

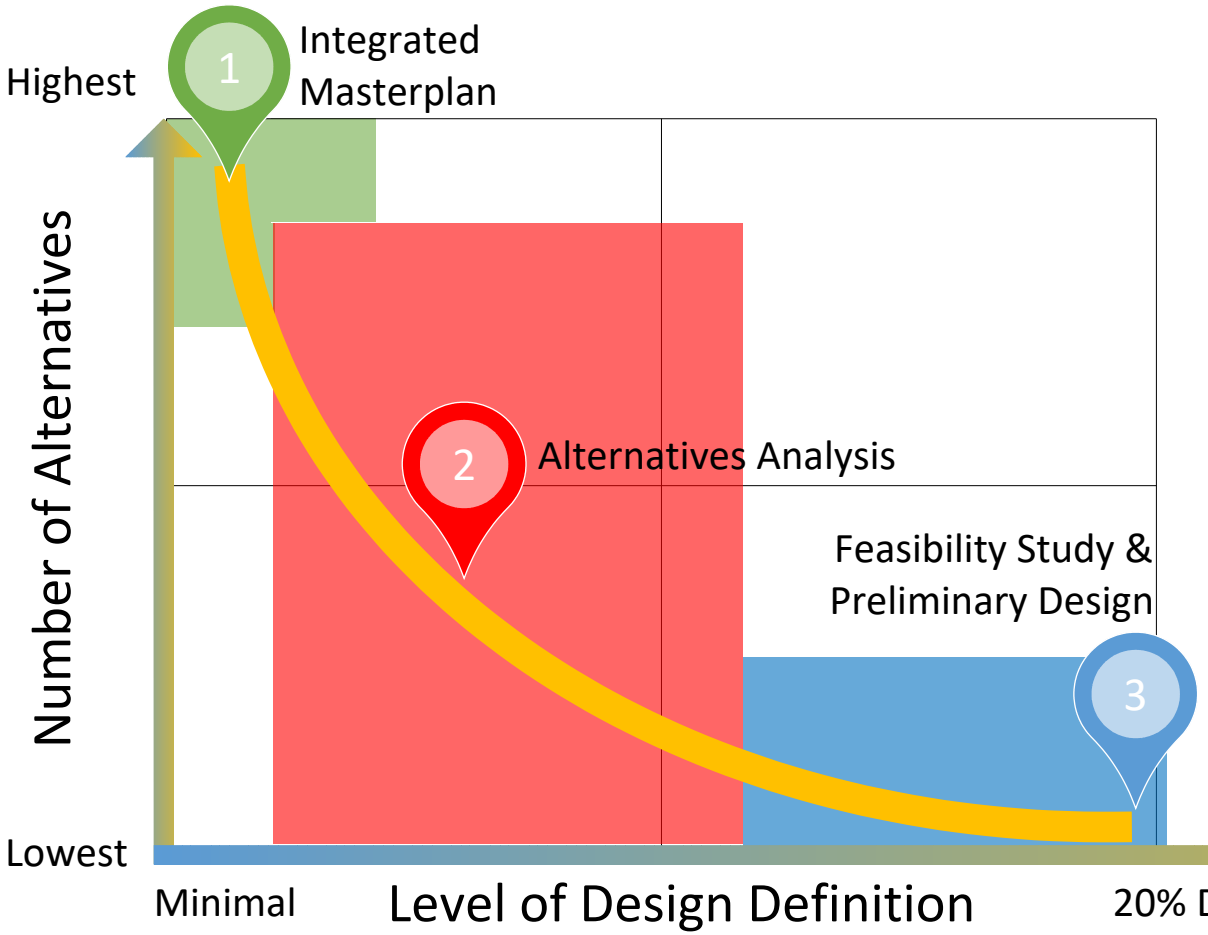


LAND USE AND TRANSPORTATION CYCLE

Integrated Masterplan & urban mobility



Alternatives Analysis – Start Point



Holistic Approach an interconnected whole that is part of a larger system.

1 **Integrated Masterplan:** Conceptualise a public transport system that is easy and convenient to use, fast, safe, clean & affordable

2 **Alternatives Analysis:** Project identification step; bridging the gap between policy-oriented strategic planning and the preparation of specific investments in new rapid transit capacity.

3 **Feasibility Study & Preliminary Design:** A preferred solution test and design scenario

Why Alternatives Analysis should be the basis for Mode Decisions

- No magic “silver bullet”
  - Each situation a unique combination of factors
  - Usually more than one “feasible” alternative
- Detailed, reliable information on costs, benefits, impacts needed to make good decisions on far-reaching investments

What is Mass Rapid Transit (MRT)

- Highest performance and quality transport mode
  - Majority of service on a dedicated transitway
  - Permanent and substantial stations / terminals
  - Permanent integrated system by design
  - Unique identity and quality image

Mass Rapid Transit

- **Mode options**

Monorail, Kuala Lumpur

Guideway Transit, Singapore

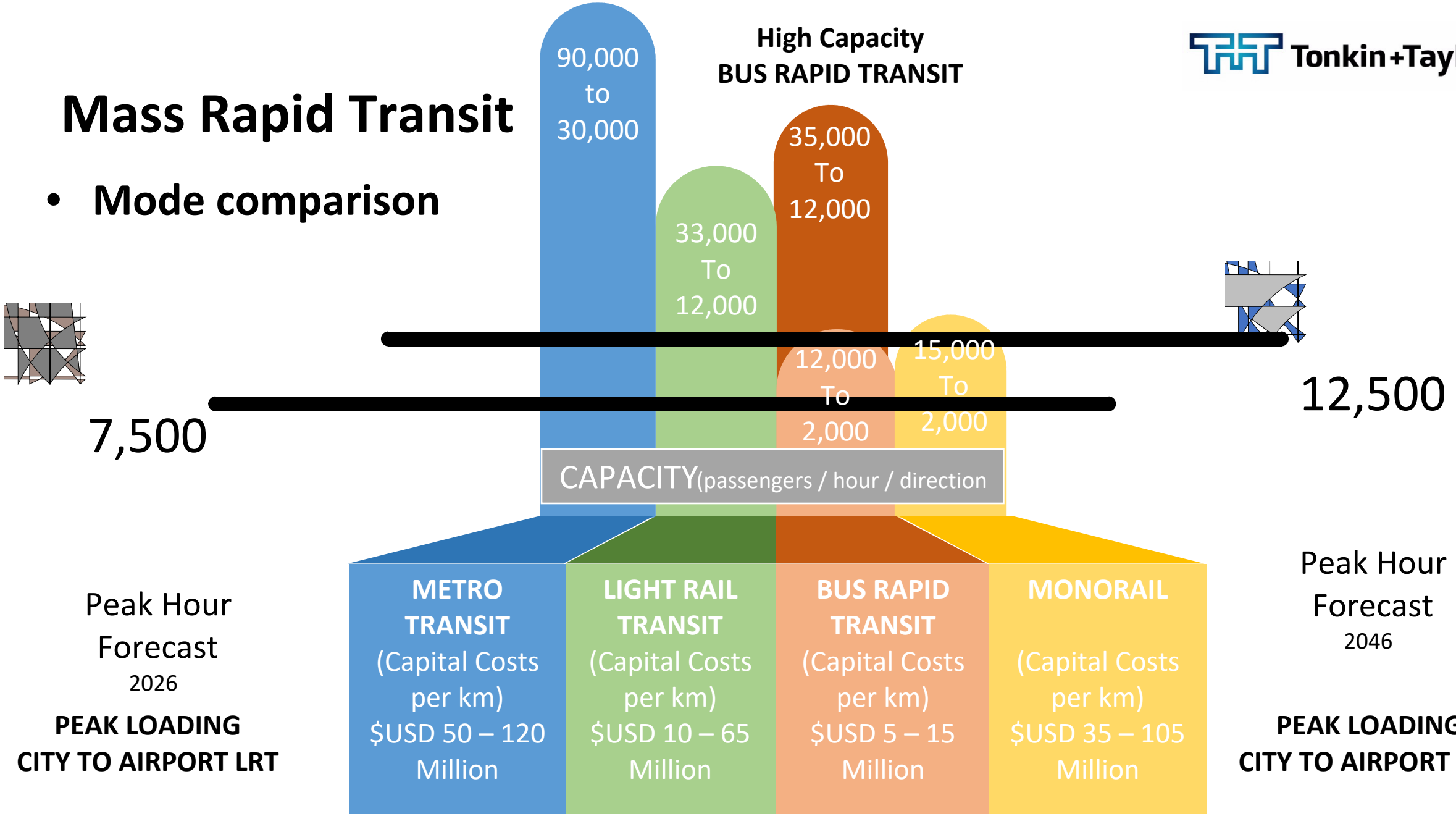
SkyTrain METRO, Bangkok

Light Rail Transit, Strasbourg

Bus Rapid Transit, Bogota

Mass Rapid Transit

- **Mode comparison**



Peak Hour Forecast 2026

PEAK LOADING CITY TO AIRPORT LRT

Peak Hour Forecast 2046

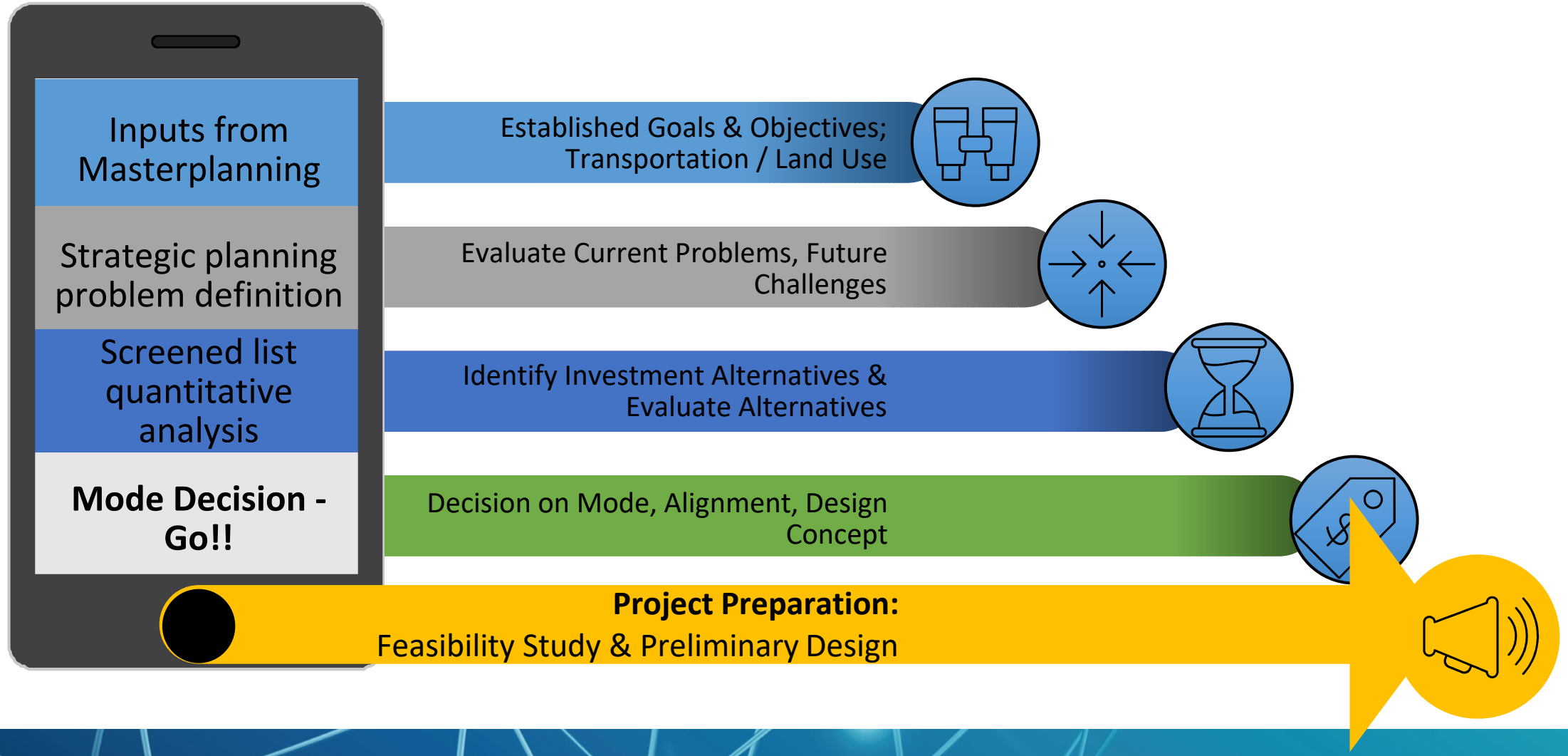
PEAK LOADING CITY TO AIRPORT LRT

Selection of a Specific Mass Rapid Transit Mode

Factors Impacting selection:

- Strategic goals, objectives
  - Transport
  - Land use
  - Social, environment, economic
- Current / future multi-modal transport network size, condition, performance
- Current and future land use patterns
- Available rights-of-way
- Costs, benefits, impacts
- Financial resources, current & future needs

Alternatives Analysis Process



Alternatives Analysis - best practice

1

Develop and implement a formal communications process

2

Establish goals, objectives, evaluation process and criteria

3

Understand the process and causes of problems

4

Consider the right alternatives (multi-modal)

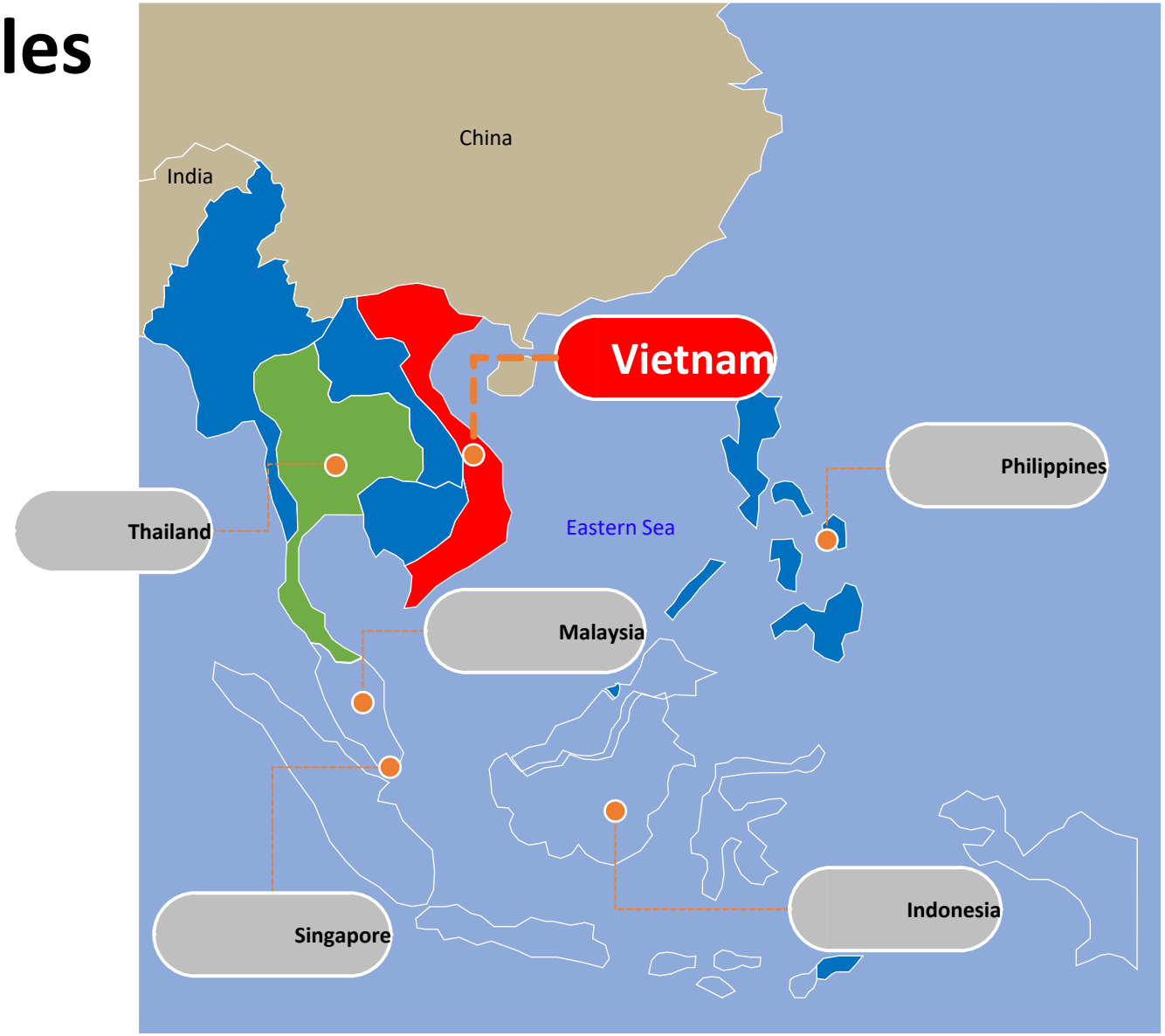
5

Develop decision support information

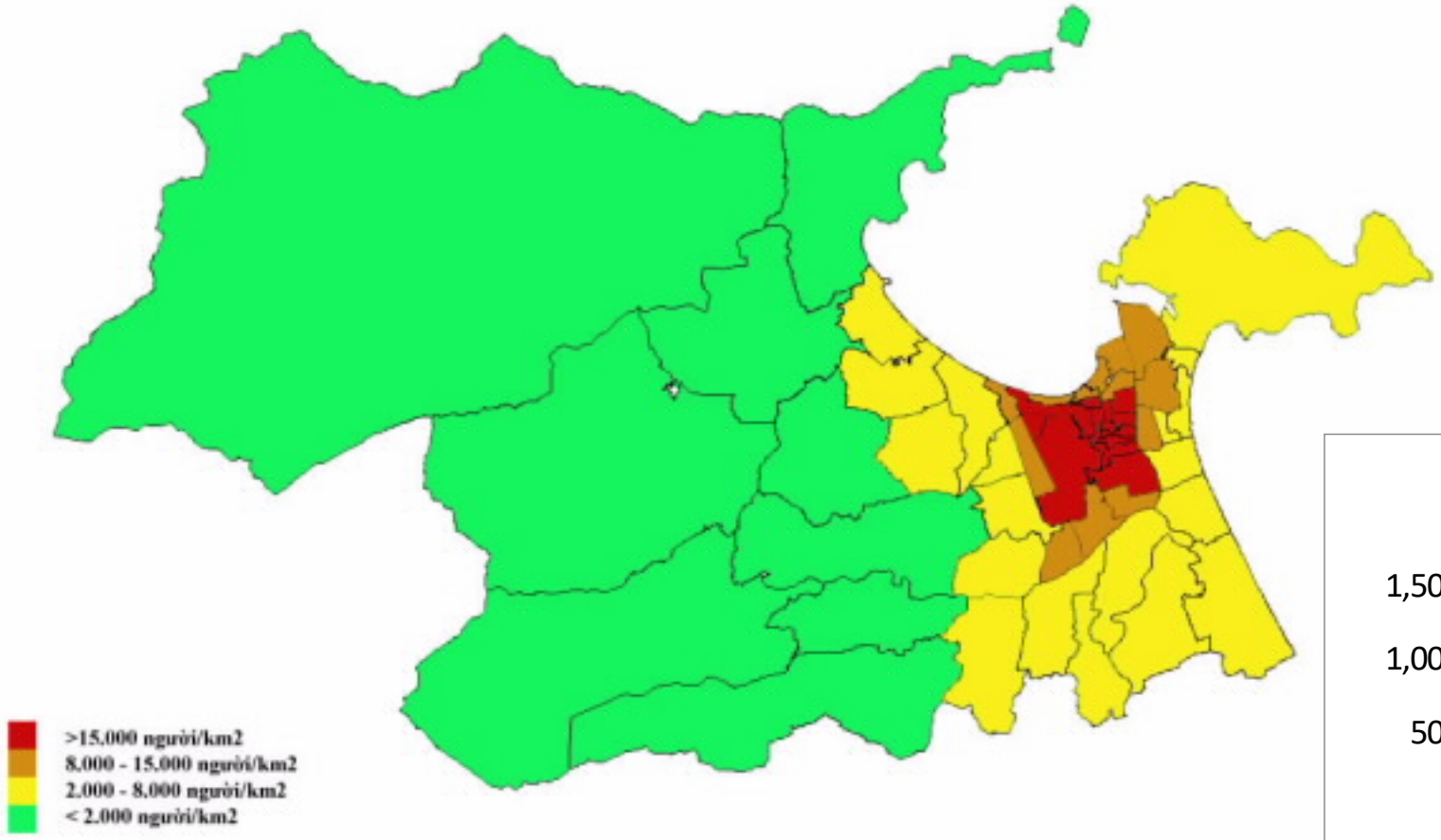
6

“Make the case” for the selected alternative

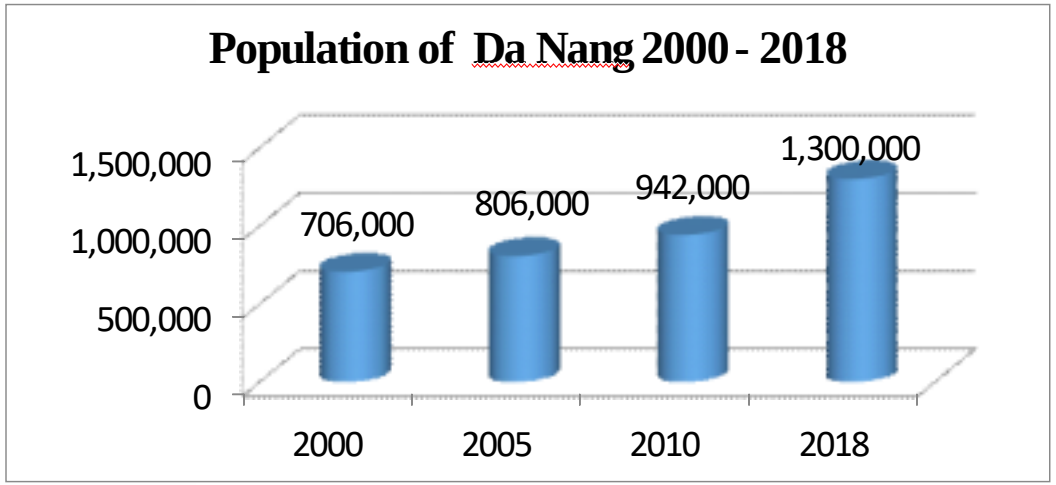
Vietnam Examples



Da Nang 2030 – 2050 transport masterplan



Dramatic urbanisation…

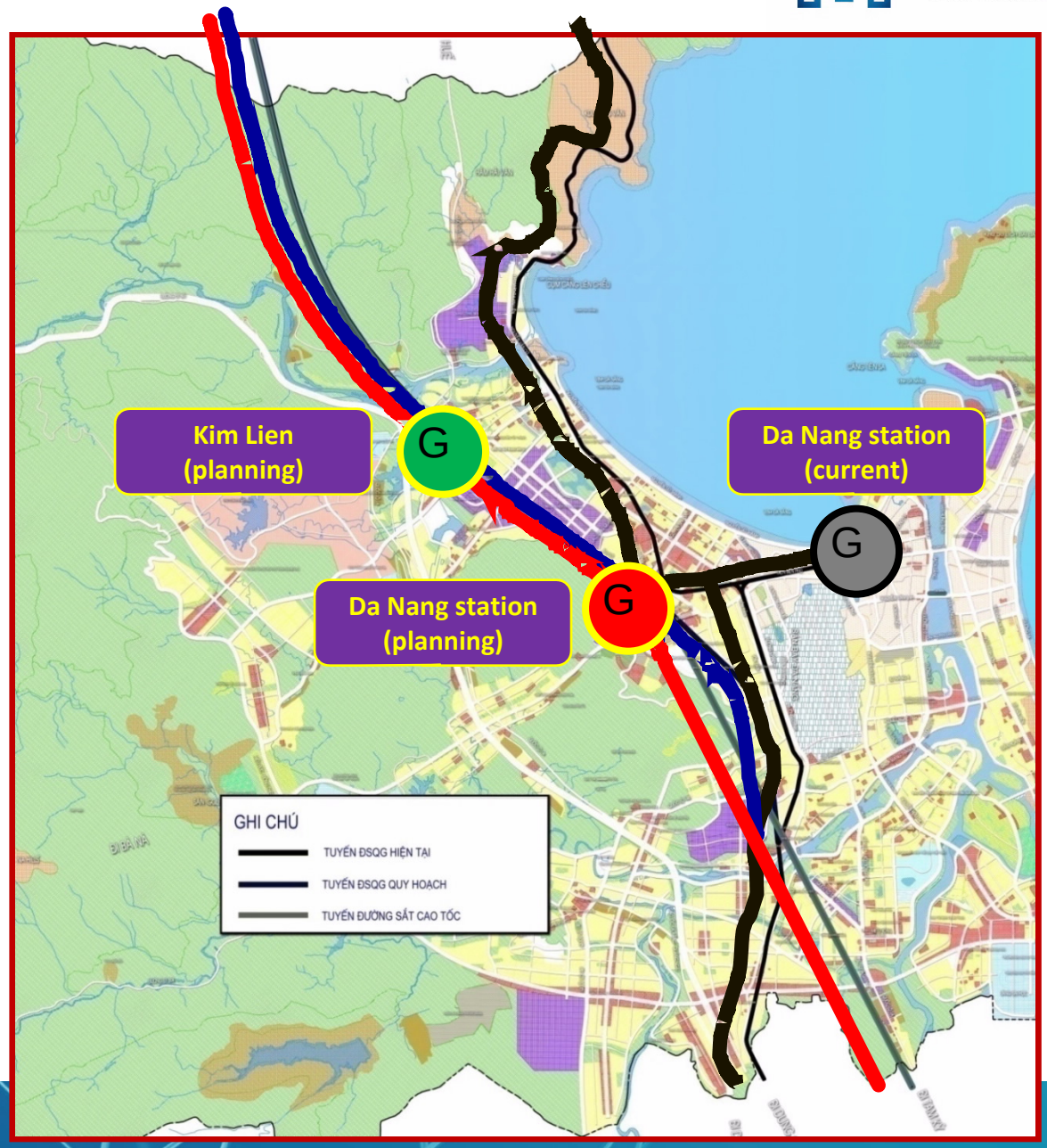


Rail Development

1 Current railway network

2 Railway according to the Decision of P.M 1436/QĐ-TTg

3 Future Express rail network

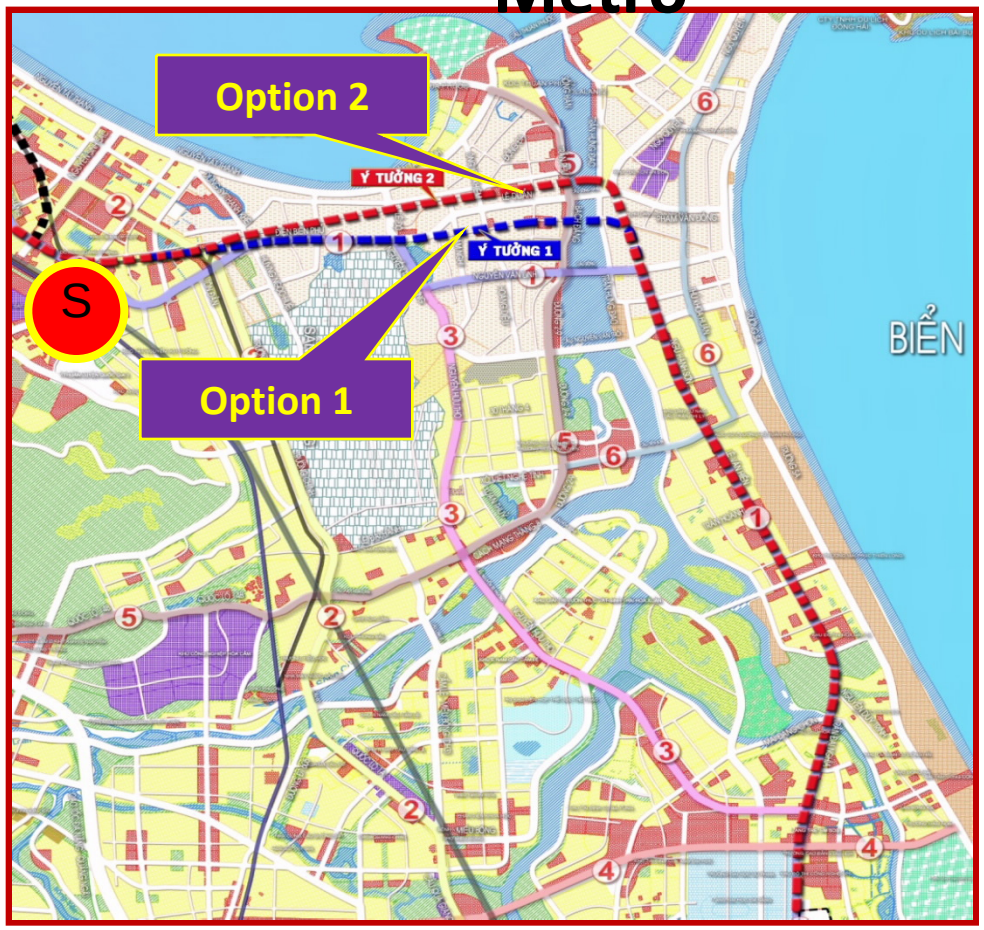


Tram & Metro – Future Vision

LRT / Tram

Tramway Line: Da Nang station (new) – Hai Van – Chan May Lang Co travel zone.

Metro



Option 1: Da Nang station (new) – Hung Vuong – the University village.

Option 2: Da Nang station (new) – Quang Trung – the University village.

Bus Rapid Transit Network

Route 1: Bau Tram Lake – Nguyen Luong Bang – Ton Duc Thang – Dien Bien Phu – Nguyen Tri Phuong – Nguyen Van Linh – Rong bridge – Ngo Quyen – Ngu Hanh Son – University Village (new).

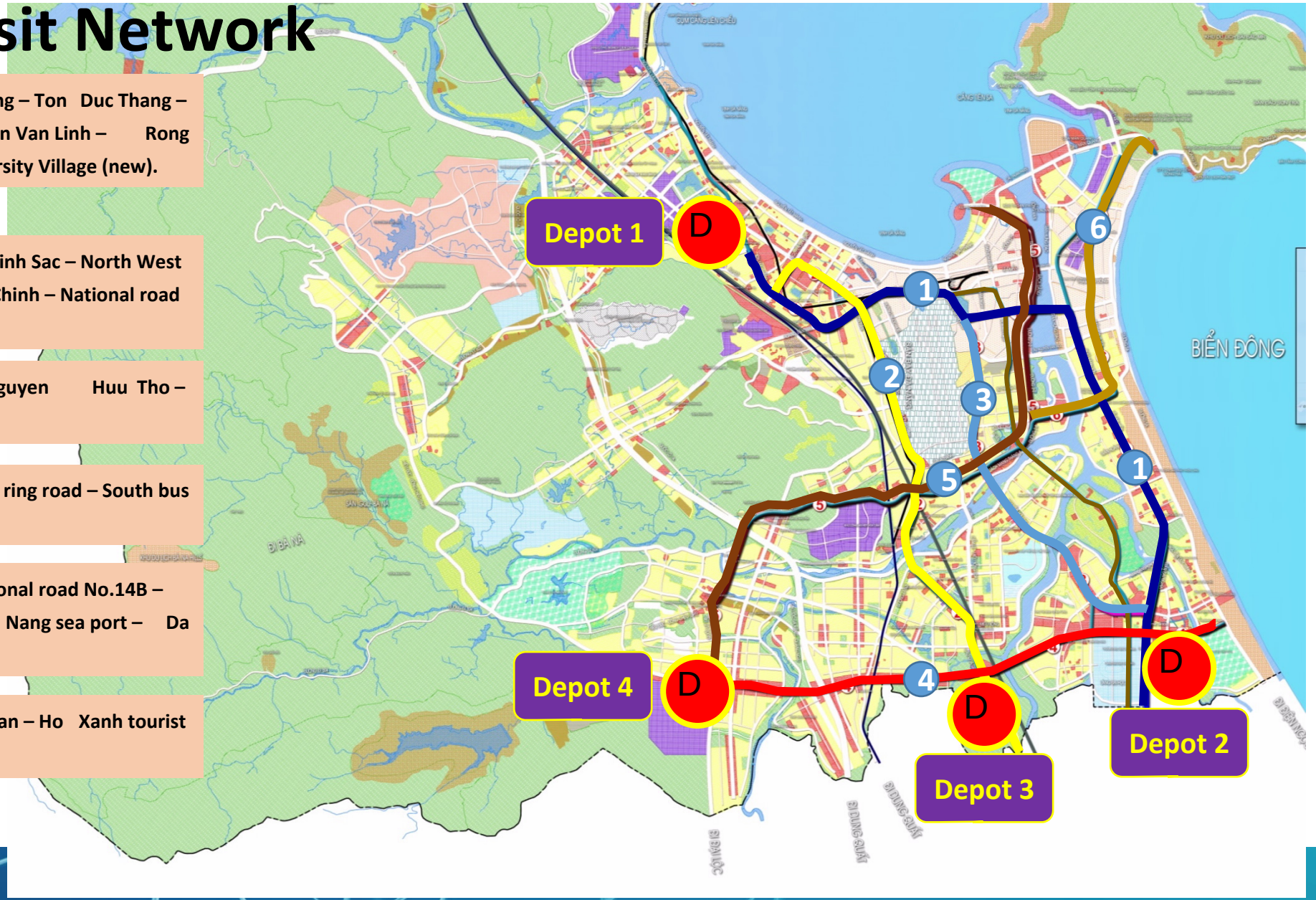
Route 2: Da Nang station (new) – Nguyen Sinh Sac – North West urban street – Hue intersection – Truong Chinh – National road No.1A – South bus station

Route 3: 29/3 Park – Nguyen Tri Phuong – Nguyen Huu Tho – University Village (new).

Route 4: Hoa Khuong industrial zone – South ring road – South bus station – University Village (new)

Route 5: Hoa Khuong industrial zone – National road No.14B – August revolution – 2/9 – Bach Dang – Da Nang sea port – Da Phuoc urban area – 3/2 – Tran Phu.

Route 6: Tuyen Son bridge – Thu Khoa Huan – Ho Xanh tourist service zone.



Bus Rapid Transit (BRT) examples

MEXICO CITY

Bus Rapid Transit (BRT) examples

BOGOTA, COLUMBIA

Bus Rapid Transit (BRT) examples

AHMEDABAD, INDIA

Bus Rapid Transit (BRT) examples

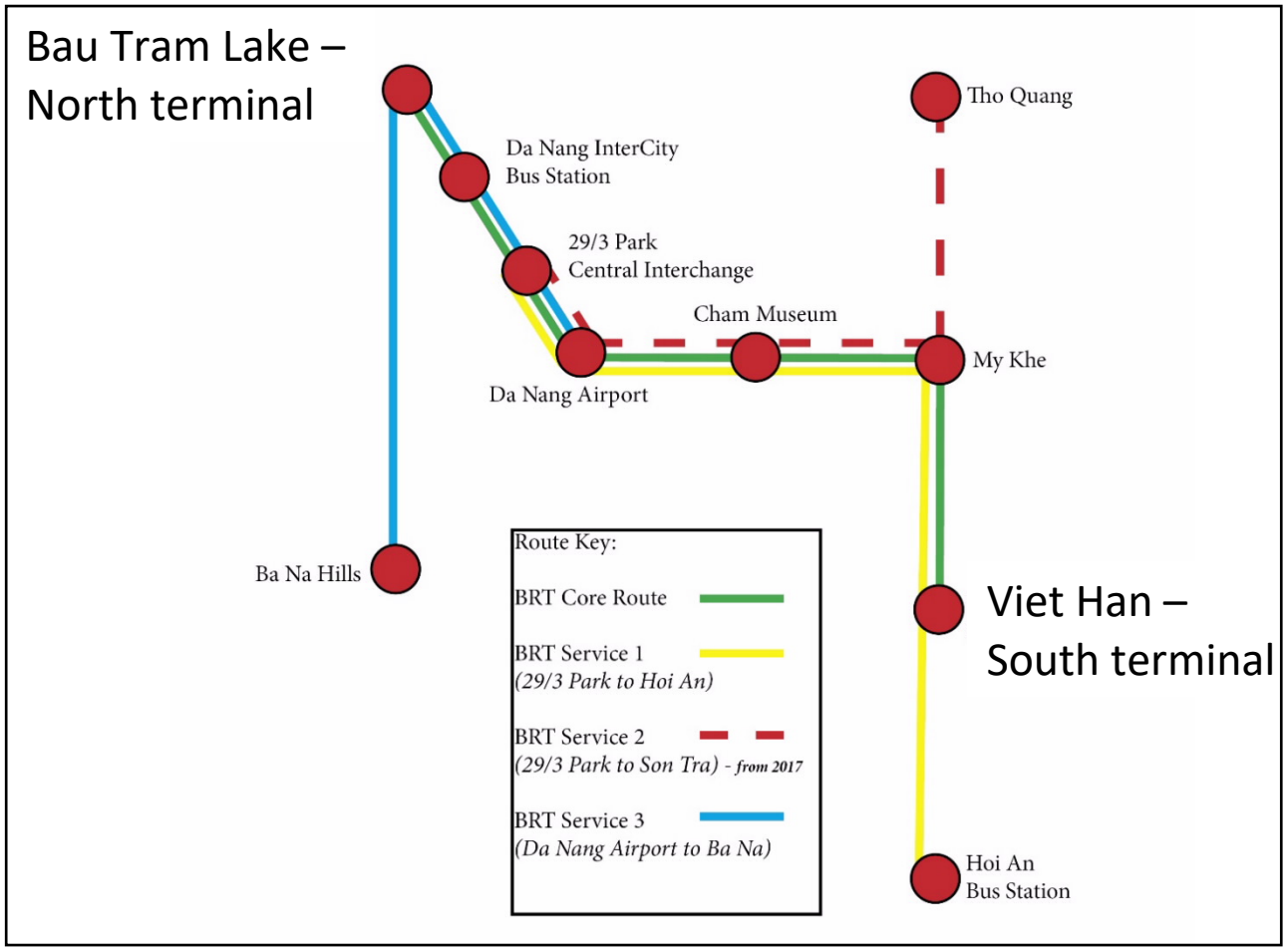
PEREIRA, COLUMBIA

Bus Rapid Transit (BRT) examples

PERIERA, COLOMBIA

Da Nang - Final Networks and designs

- The core BRT route is 24.9 km long
- 37 BRT stations and 2 termini points (Bau Tram Lake – North; & Viet Han College - South)
- Dedicated lanes: 13.0km, Mixed traffic lanes: 10.7 km - **fully dedicated by 2020**
- 2 additional BRT service routes (Hoi An and Ba Na)
- BRT operates daily from 05.00 to 21.00; peak service hours 07:00 to 09:00 and 16:00 to 18:00.



Da Nang BRT designs

Da Nang…then and now…Vietnam style!

Hanoi BRT

- Significant project delays and delivery issues – planning started 2004
- 14.7km, 23 station BRT corridor
- World bank funded cost US$110 million
- No ITS or ticketing on the BRT
- Serious issues related to accessibility boarding at 3 stations

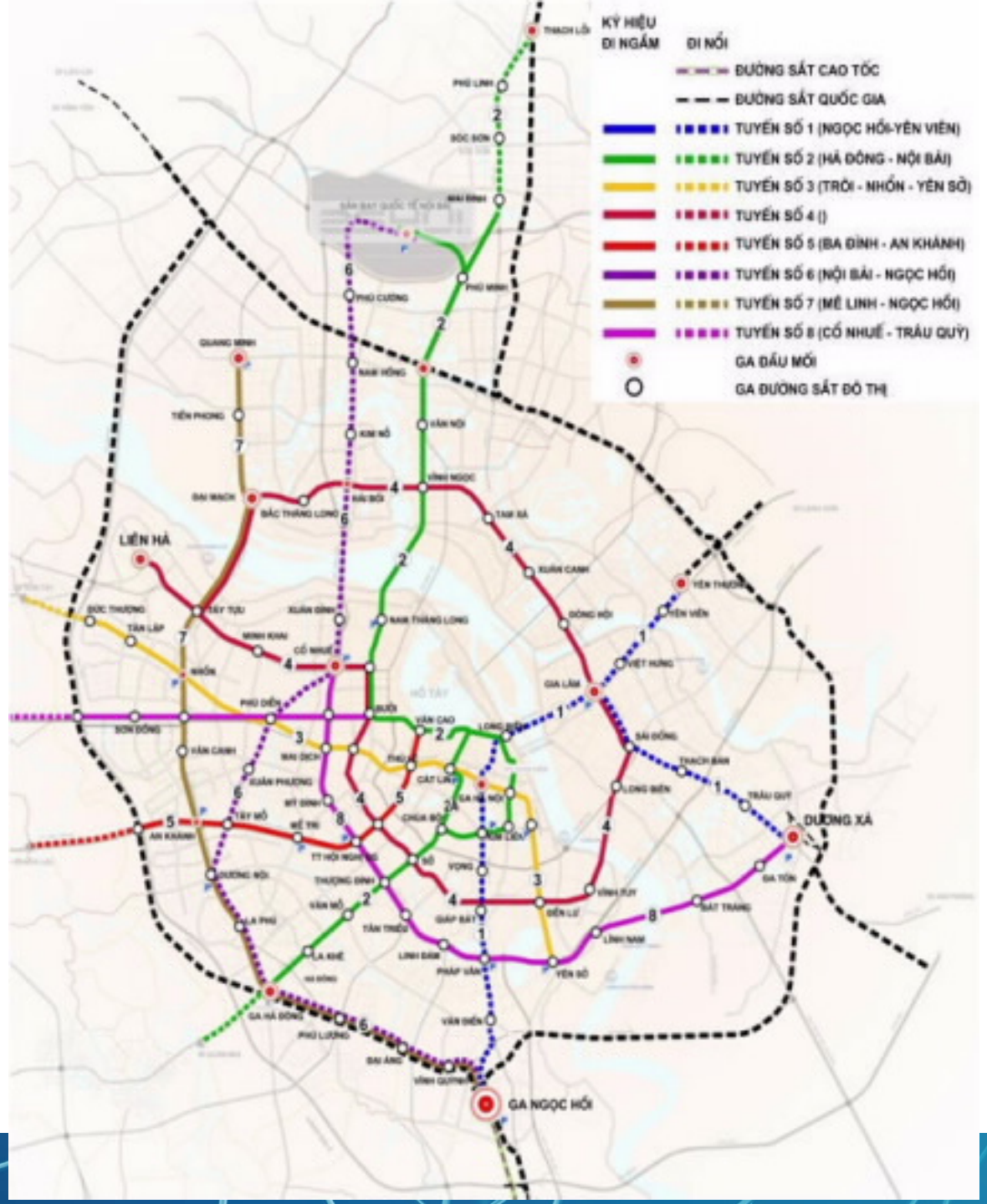
Bus Rapid Transit (BRT) examples – Stations

HÀ NỘI, VIETNAM

Hanoi BRT

- Since its debut in Dec 2016, the BRT system has received mixed reviews from local residents
- Daily ridership on the BRT has risen from 8,000 at the start to 13,000
- BRT system continues to run at half its 90-person capacity, averaging around 42.4 riders per trip – **reported in May 2017**

Hanoi METRO



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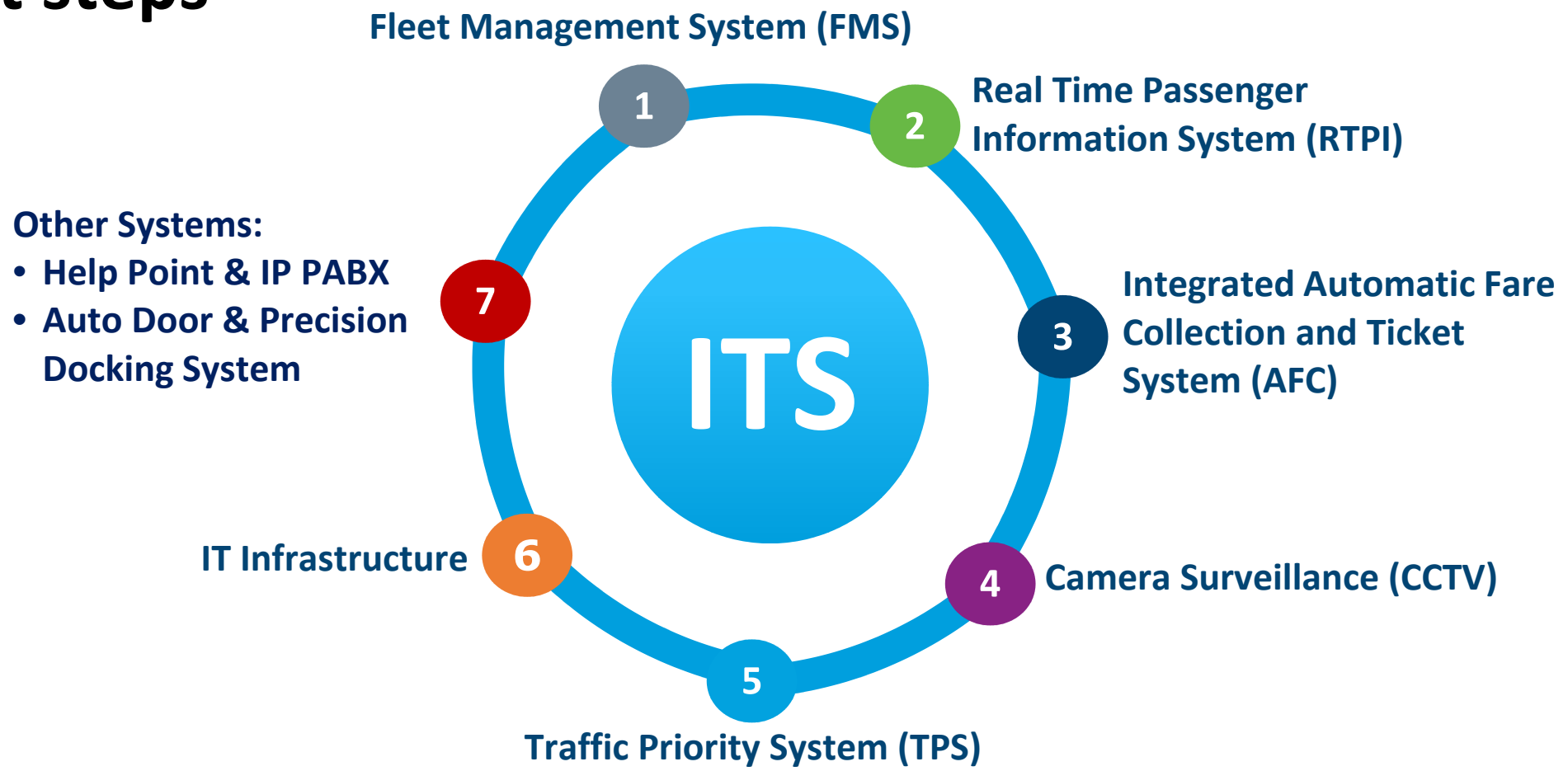
Conclusions

- Multiple factors need to be considered in mass rapid transit investment decision making
- Each corridor or area presents a unique combination of these factors
- There is no single, dominant Mass Rapid Transit mode
- A detailed, objective **Alternatives Analysis** following strategic planning is critical
- Effective AA's include a strong, extensive communications process
- Communications, transparency make the process work

Next Steps

- Develop the cities ITS systems and create a SMART city
- Update ticketing and technology
- Create “e-road user charges” that cause shift to public transport
- New light rail and autonomous bus vehicles
- Create new networks for mass rapid transit
- Develop first & last leg options for MaaS (Mobility as a Service)

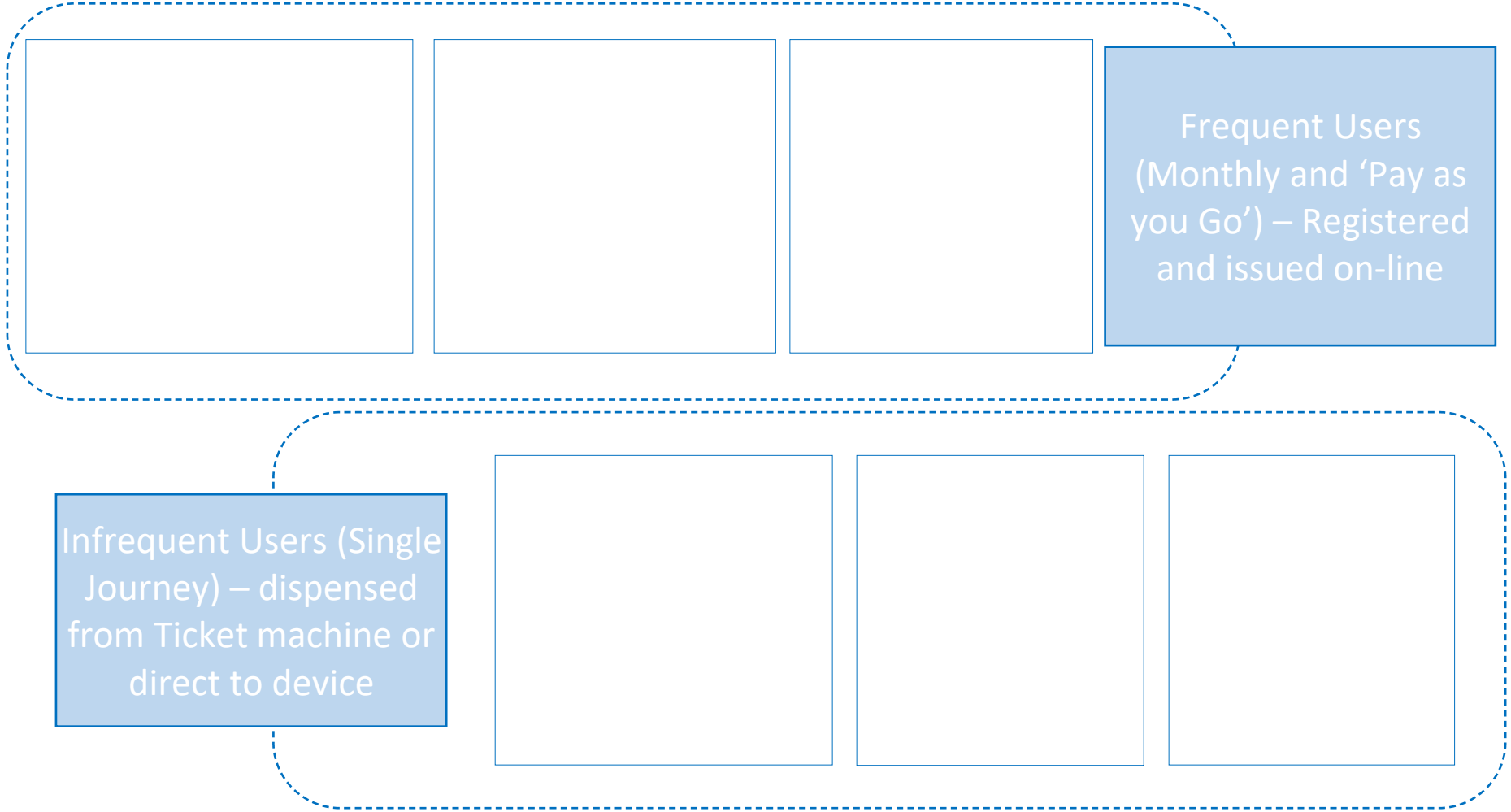
Next steps



Public Transport Intelligent Transport Systems / Integrated for all modes / Existing & future systems

Next steps

- Automatic Fare Collection (AFC) and Integrated Ticketing

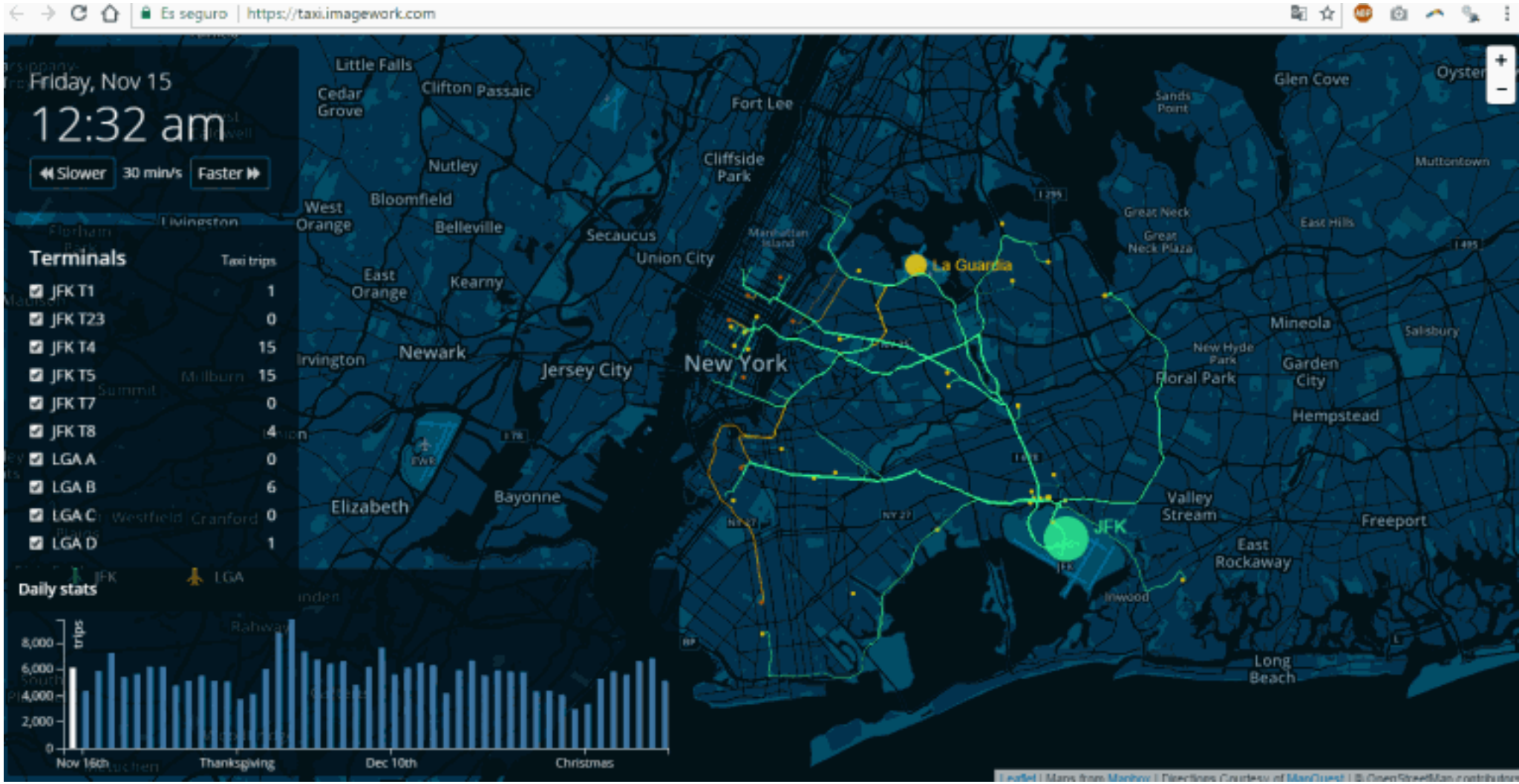


Next steps

- **E-RUC:** Electronic Road User Charging
- Norway implemented electronic urban tolling on main road corridors into Bergen (1986), Oslo (1990) and Trondheim (1991)
- London recommended congestion charging in 1964 and road pricing considered by the Greater London Council in 1973
- London implemented congestion charge in 2003

Next steps

- MaaS – “Mobility as a Service”



The taxi and private hire industry has also innovated, alongside its public transport counterparts.

Many thanks for listening…