



TRAFFIC AND TRANSPORT WORKSHOP
MARCH 25, 2010

BANDAR SERI BEGAWAN

DEVELOPMENT MASTER PLAN



traffic and transport proposals and strategies

Topics

The Baseline Transport Network, to improve current problems

Assessing how the three strategic options impact on the transport network

The Network to support the Master Plan

The underlying government proposals

The Transport results of the Study are based on the existing network plus the assumed projects;

- Green-coloured projects are in progress;
- Red-coloured are potential projects; these are supported apart for;
 - Southern Ring Road; and
 - Sungai Brunei Bridge.

These should await outcome of current Study.

Are there other major projects that the Study should be aware of?

LEGEND :

- █ PROJECT CURRENTLY IN PROGRESS
- █ POSSIBLE PROJECT



Road Widening of Lebuhraya Sultan Hassanal Bolkiah
 Indicative Start Date : July 2009
 Indicative End Date : Jan 2011

Future Planned Bridge Linkage across Sungai Kedayan

Road Widening of Jalan Kebangsaan
 Indicative Start Date : Sep 2009
 Indicative End Date : Sep 2011

Construction of New Road Linkage from Jalan Kebangsaan to Jalan Simpang 336-52
 Indicative Start Date : Jan 2009
 Indicative End Date : Jul 2010

Pusar Ulak Radial Road Realignment

Construction of Concrete Barrier along Sections of Lebuhraya Sultan Hassanal Bolkiah
 Indicative Start Date : Oct 2009
 Indicative End Date : Apr 2010

Road Widening and Traffic Light Installation along Jalan Kumbang Pasang
 Indicative Start Date : Aug 2008
 Indicative End Date : Nov 2009 (completed)

Jalan Elizabeth II Extension

Improvement and Upgrading of Existing Roads in Kg Mata-Mata and Kg Tungku
 Indicative Start Date : Nov 2008
 Indicative End Date : May 2011

Pedestrian Walkway from Gadong to BSB Down Town

Jalan Sungai Kianggeh Upgrading

Widening of Jalan Residency between Subok and BSB Down Town

Possible Southern Ring Road Connection (The need and the Location to be Reviewed)

Improvement of Jalan Residency
 Indicative Start Date : Oct 2009
 Indicative End Date : Oct 2011

Possible Bridge Connection across Sungai Brunei

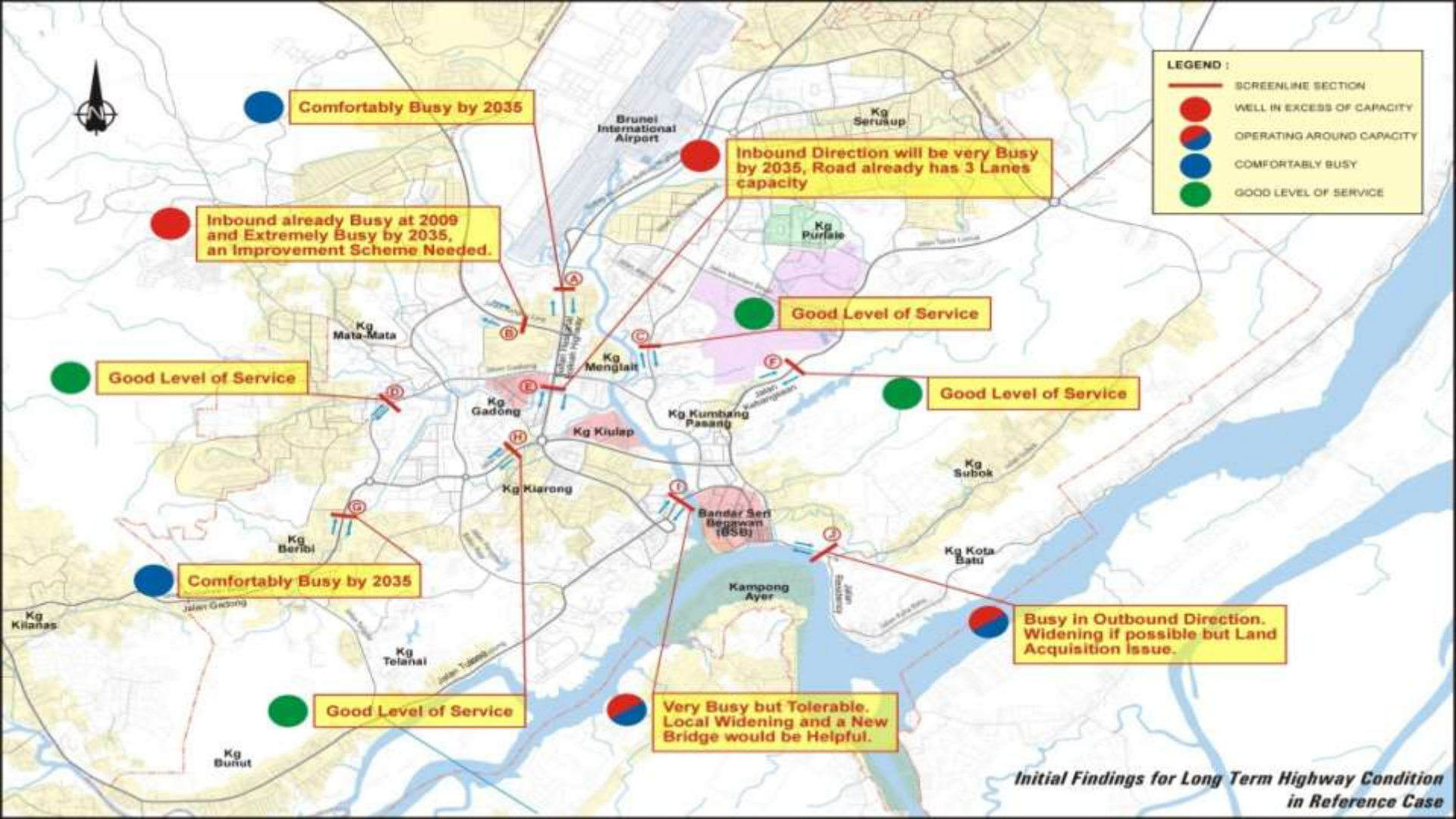
Future Planned Improvement of Footpath and Carriageway along Waterfront
 Indicative Start Date : Jan 2010 (delay)
 Indicative End Date : Sep 2010

Existing and Future Planned Road Improvement Projects around Bandar Seri Begawan (BSB) Area

need for additional highway projects

- Current Traffic assumed to grow in line with natural growth in population
- There are 10 corridors, and six are forecast to operate at a good level of service throughout the study timeframe in the Reference Baseline
- Two Corridors are tolerable but very busy, improvement measures should be developed;
 - Jalan Tutong, and;
 - Jalan Residency
- Two Corridors are exceptionally busy and major schemes required;
 - Jalan Tungku Link, and;
 - Sections of Sultan Hassanah Bolkiah Highway

Are there further projects the Consultants should consider in these areas.?



LEGEND :

- SCREENLINE SECTION
- WELL IN EXCESS OF CAPACITY
- OPERATING AROUND CAPACITY
- COMFORTABLY BUSY
- GOOD LEVEL OF SERVICE

Comfortably Busy by 2035

Inbound already Busy at 2009 and Extremely Busy by 2035, an Improvement Scheme Needed.

Inbound Direction will be very Busy by 2035, Road already has 3 Lanes capacity

Good Level of Service

Good Level of Service

Good Level of Service

Comfortably Busy by 2035

Good Level of Service

Very Busy but Tolerable. Local Widening and a New Bridge would be Helpful.

Busy in Outbound Direction. Widening if possible but Land Acquisition Issue.

Improvement of Down Town circulation

- To improve downtown circulation a proposed arrangement is shown which will include a new carriageway connecting Jalan Tutong and Jalan Sungai Kianggeh



school associated congestion

- A very high proportion of parents drive children to and from school
- Schools therefore attract a large number of vehicle trips over a short period of time
- This causes considerable congestion at critical areas, especially if the parking blocks or reduces traffic flow.
- The Schools are concentrated in certain areas as shown in diagram and often share same access and this is often directly from major corridors
- There are instances of double and treble parking.





Brunei International Airport



Congestion : Photo taken along Jalan HJ Basir, Nov 2009



Congestion : Photo taken along Jalan Kg Berangan, Jan 2010



Congestion : Photo taken along Jalan Sungai Kianggeh, Jan 2010



Conceptual Solution - Provision of proper pick up/drop off and parking facilities to solve school peak congestion.

LEGEND :

* TENTATIVE SCHOOL LOCATION WITHIN BSB AREA

(Source : Brunei/Muara Development Planning Schemes 1997)

school associated congestion (cont'ed)

Causes

- School Bus system provided by government is planned for children who have more than 7km to travel to school.
- Limited number of access points, and the access may be located on major roads
- Pedestrian access especially in outer areas may not be good, which deters walking to school
- There may be limited amount of off-street parking available adjacent to the school

school associated congestion (cont'ed)

- Encourage use of School Buses and walking through public awareness programs and discussion with Parent-Teacher Associations
- School bus systems; find out what parents require to make system attractive and acceptable, and safe; possibly “bus mums” or “bus aunties”.
- Ensure adequate pedestrian facilities in school catchment area
- Improved off-street Parking arrangement; several schemes are shown.
- Staggered Hours for schools may be difficult to implement; however it may be possible to reduce other traffic flow with staggered “office hours”.
- Planning of any new site for schools to take full account of parking and access issues.



overnight parking issues

- Better plan the overnight Parking for Kg Ayer by using empty off street parking spaces. Use spaces in Yayasan Shopping Complex and multi-storey car parks linked to reduced fare for water-taxi or for supermarket purchase, and other charging mechanisms to encourage use of off-street facilities



Implement a modern public transport system

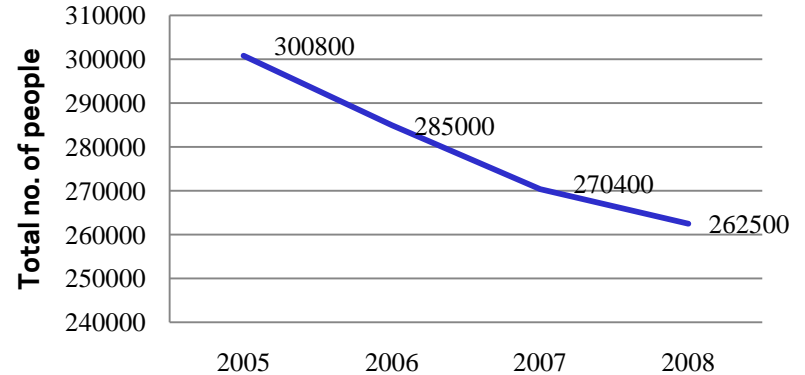
Usage declining because;

- existing service levels are low quality
- route structure is not in line with the recent land use development, route defined 15 years ago;
- Low frequency, poor coverage; alternative of car is very attractive
- Carries a very low percentage of travel, less than about 1%;

Opportunities and Issues

- How should an improved system be funded whilst maintaining affordable fares?
- Many opportunities to use technology to provide better system; ie Passenger information, vehicle monitoring, modern ticketing system
- How can the market be built-up?

Public Bus Ridership per month



modern public transport system (cont'ed)

- As a long term “project”, Government to encourage the use of public transport;
 - short term target of, say 5% of total travel
 - in longer term, much higher, say 20%
 - the explanation is to produce a sustainable transport system and to avoid future congestion issues.
- Government to review funding principals, ie fare box plus advertising revenue versus “assistance”.
- The provision of terminal facilities to be reviewed, together with an adjacent terminal for “external” services, as these services should interact;
- Possible provision of terminals is a regional terminal with Cross Borneo services at Rimba, with good connections to Down Town District Terminal with link to ferries and Water Taxis and other surface transport.



LEGEND :

----- BSB BOUNDARY

Regional and Cross-Borneo Public Transport Interchange

Public Bus to/from Down Town Interchange

The Down Town Terminal and the Regional Terminal

LEGEND :

- Red double-headed arrow: EXISTING PUBLIC BUS ROUTINGS
- Green double-headed arrow: FUTURE PUBLIC BUS ROUTINGS

District Down Town Bus Interchange

Potential Down Town District Public Transport Interchange (PTI) - Multi-Mode Interchange

Water Taxis to Kampong Ayer

Taxis and Private Cars

Additional Bus Serving from the Potential Main Interchange at Rimba

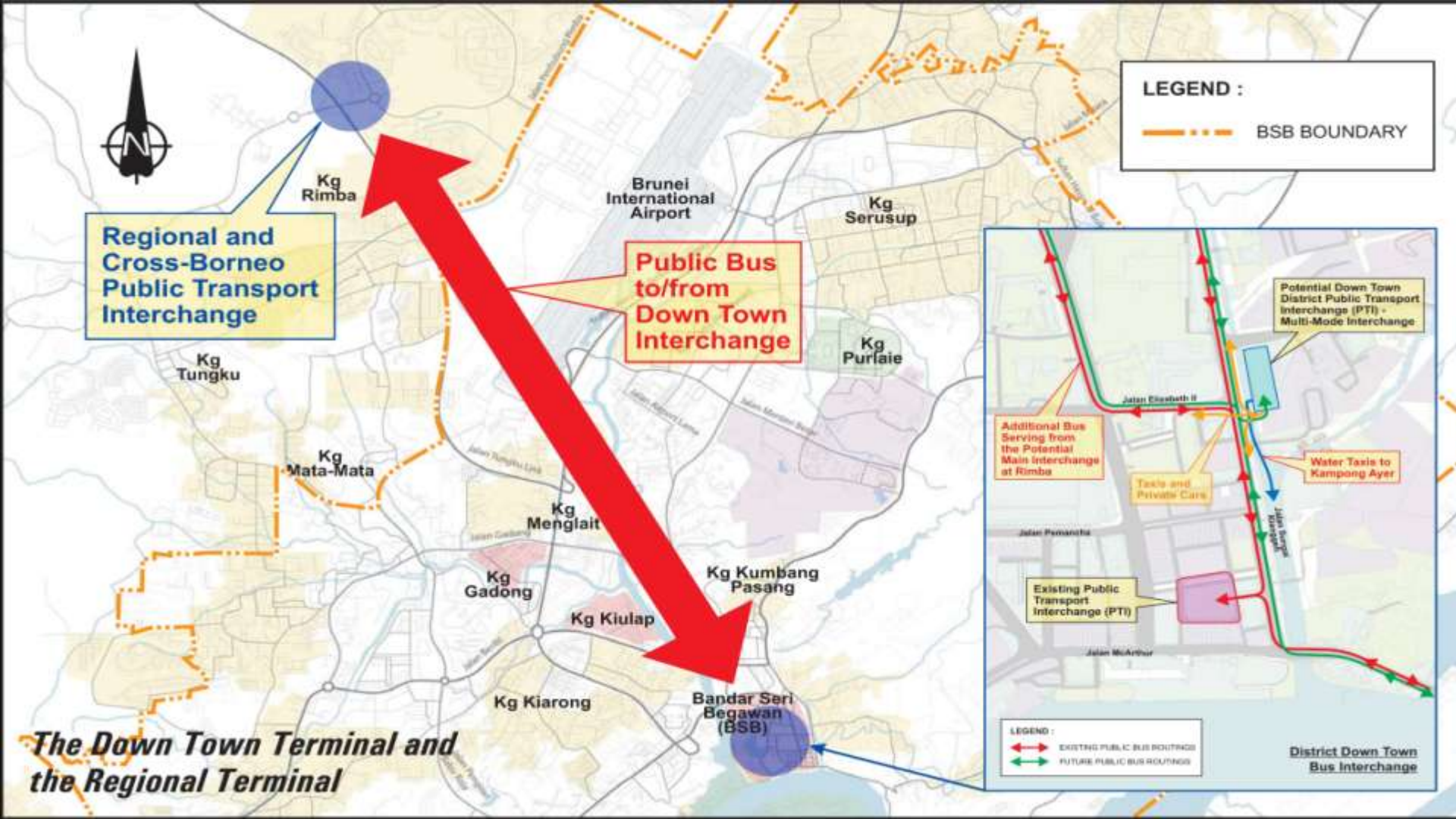
Existing Public Transport Interchange (PTI)

Jalan Elisabeth II

Jalan Pemanah

Jalan McArthur

Jalan Sultan Sa'ud bin Abdulaziz



modern public transport system (cont'ed)

- The “Tender system” is reasonable but should emphasize development of routes to reflect “demand”.
- The Ticketing system should be more distance based, and permit card based systems to give discounts bus-bus transfer required (Trunk-feeder)
- Passenger Information system to be developed, using Internet and other media
- Technology to be used for vehicle monitoring to ensure compliance with schedules
- Service structure to provide more frequent and wider coverage
- Vehicle standards to be improved in terms of cleanliness and also emissions



modern public transport system (cont'ed)

- Short-medium term would be bus-based; buses give flexible routing and are relatively cheap
- Medium to long term can consider alternatives, such as people-movers, travelators and possibly LRT
- The timing and selection of technology will depend on the success of public transport attracting market share, and the development pattern of the land use strategy

Proposal	5 years	10 years	25 years	Beyond
Provide bus shelters/ improve PTI, improve service coverage				
High Class Airport Bus Service for Tourists				
Improved Buses				
Install bus Lanes and advance bus lines				
Real Time Information and internet				
Network Enhancements				
People Mover systems				

additional travel modes - taxis

Taxis; make better use of existing vehicles, and provide for the planned increase in tourism and business visitors.

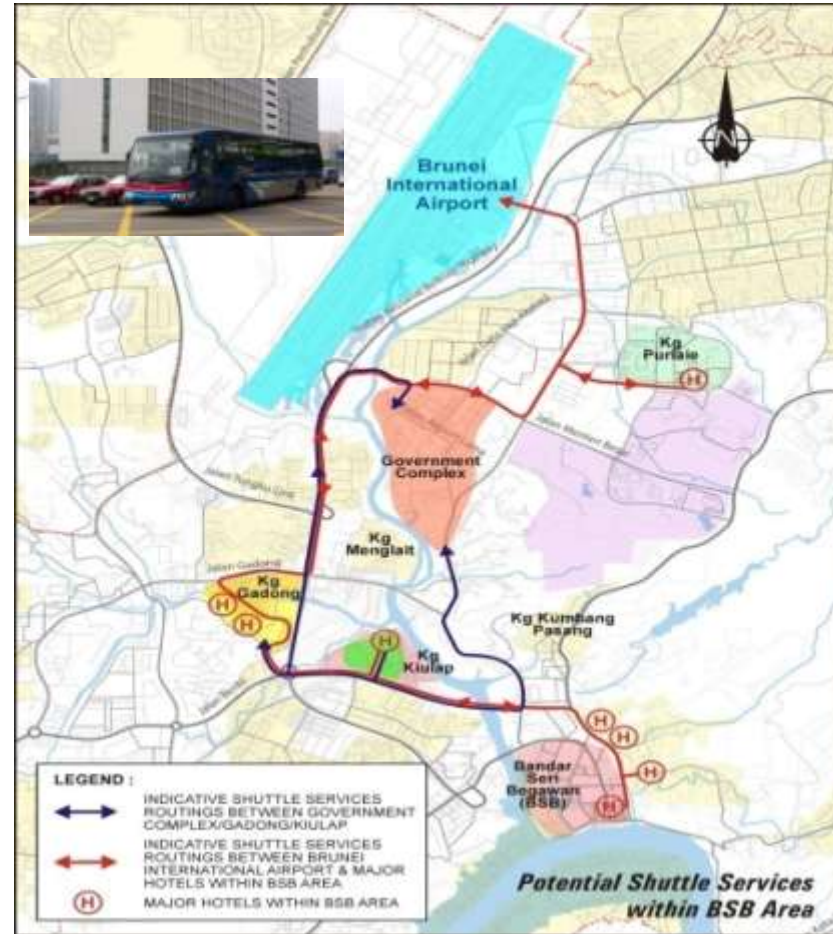
- Standardised reasonably priced fares with meters or zoning system
- Central Area Taxi rank to have a “call” button
- Develop Booking systems, Internet and Telephone.
- Develop public complaint Hotline
- Develop Community Taxi system in outer areas.



additional travel modes - shuttles

Shuttle Services; there are areas of concentration of activity which could support shuttle services;

- Consider a shuttle at lunch time between the Government offices and Gadong; this would investigate demand, set-up a pilot scheme and if successful set up a full scale scheme
- Consider a residential shuttle from outlying areas.



additional travel modes- water-based transport

There are opportunities to provide water-based transport for local travel and to support tourism

- Provision of services to be a mixture of regular ferry services and continuation of the existing water-taxis
- Introduce regulations for ferries and water taxis, covering operational issues of safety, fares and appearance
- Provide safe jetties with service information;
- Develop Walkways and local transport services centred on the jetties;
- Extend services to Gadong, the Hospital, the Airport and other locations.
- Provision of some routes may require dredging.

LEGEND :

- REGULAR FERRY/WATER TAXI ROUTINGS
- INDICATIVE FERRY/WATER TAXI JETTY

Ferry Timetable

Route	Origin	Destination	Frequency
1	Central Water Transport Terminus	Kampung Ayer	5 mins
2	Central Water Transport Terminus	Gadong	10-15 mins
3	Central Water Transport Terminus	Brunei International Airport	30 mins

Note : Local Transport System at Jetties



Potential Linkage to Brunei International Airport

Central Water Transport Terminus

Water Taxi Service will be maintained between BSB Down Town and Kampong Ayer

Potential Ferry / Water Taxi Services



alternative vehicle types and fuels

Electric Cars

- E-Cars are a solution as mainly flat terrain
- This is a potential long term solution to pollution and the petrol-diesel engines
- Sites for charging points, charging mainly overnight at home.

Public Transport

- Alternative power sources for buses to be encouraged
- Promote Rail-based transport when appropriate

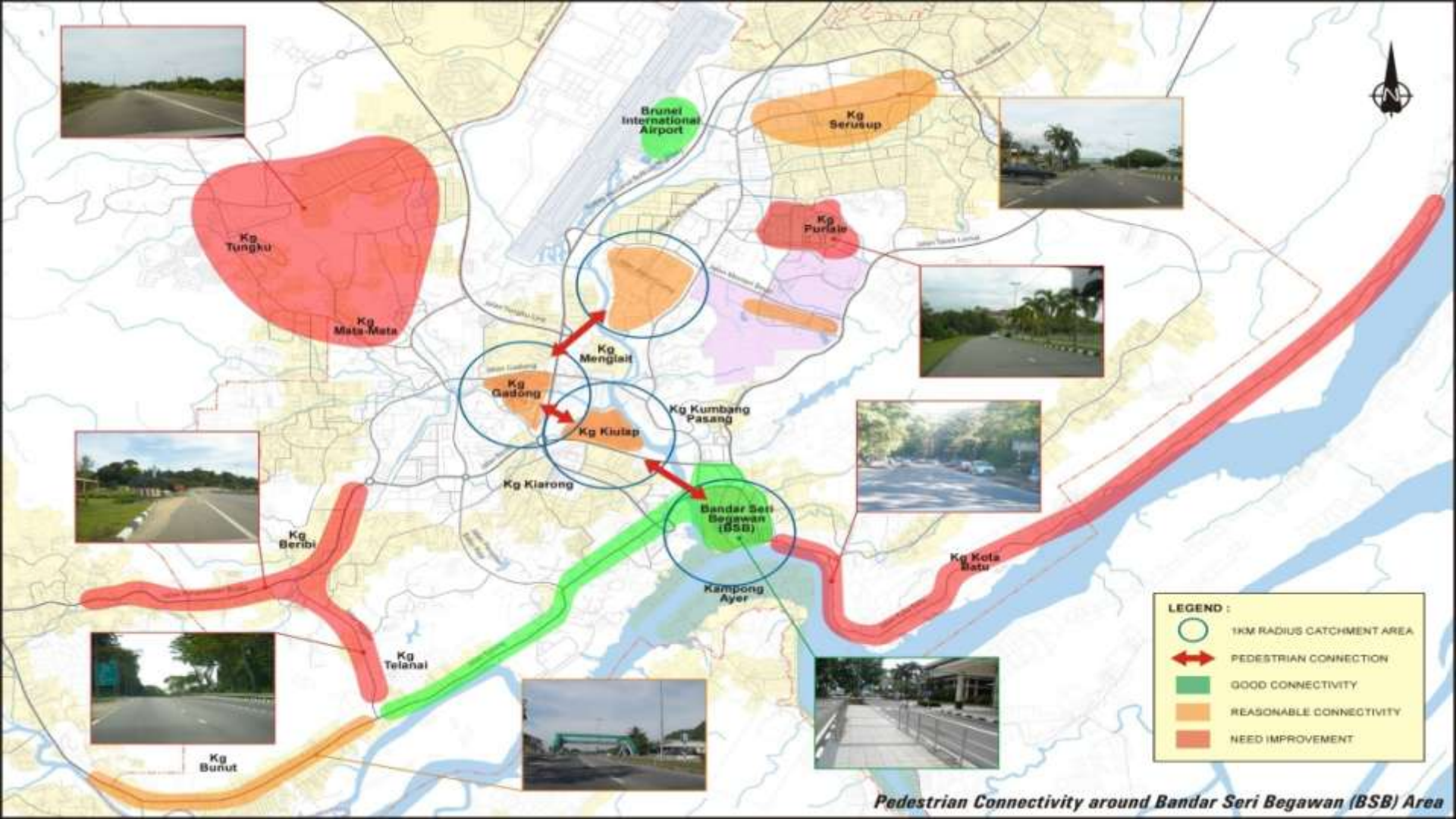


non-motorised transport

Objective is to provide better connectivity between blocks and buildings, and key nodes, for pedestrians and possibly cyclists, and tourists.

- More comprehensive review of pedestrian facilities and design of footpaths;
- To be more user-friendly; shelter-shade, more gentle drop-kerb
- Pedestrian access and linkage to be part of development planning
- Provision of car free zones
- Promote walkways with shade-greening, sitting-out areas in key areas such as along Waterfront and Sungai-Kedayan





LEGEND :

	1KM RADIUS CATCHMENT AREA
	PEDESTRIAN CONNECTION
	GOOD CONNECTIVITY
	REASONABLE CONNECTIVITY
	NEED IMPROVEMENT

Pedestrian Connectivity around Bandar Seri Begawan (BSB) Area

recreational and tourist provision

- Provide adequate Parking facilities for Tour buses;
 - For Downtown area provide long term parking and “holding area” for coaches at north of DownTown;
 - Provide reserved lay-bys for drop-off and pick-up at the important tourist sites
- Provide Cycling routes and rental facilities and toilet facilities along Widened Promenades
- Provide Jogging tracks at the Promenades and at parks



summary of baseline

These proposals, together with the government measures are targetted at providing;

- A highway system which provides sufficient capacity to accommodate traffic demand
- Makes better use of capacity through management of demand where appropriate
- Encourages use of public transport
- Recognises the importance of pedestrians
- Uses Technology and Information systems to assist the public.

Vitalisation Areas

5A – Serusup

- Mixed Development
- Access generally direct from main road and little secondary network, because of land-ownership issues
- schools appear to have adequate parking



Vitalisation Areas

5B – Subok

- Development sites with direct access to main road, so similar land ownership issue
- Schools access from main road, with absence of good pedestrian access



Vitalisation Areas

5C – Jalan Tutong

- One of few areas where light industrial and heavy vehicles seen
- Ribbon development and absence of secondary network
- Footbridge to school and bus stop, but generally poor pedestrian facilities



Vitalisation Areas

5D – Beribi

- About 50 4-storey blocks as shown, in isolated area without buses, but all with cars.
- Shuttle bus or residential coach to link to Gadong would give alternative access provision.



Government support for BaseLine

Particular actions which will be required from Government are;

- Support on actions to mitigate the school parking issue, with public awareness programmes, and if the schemes require land for alternative access or to provide for off street parking;
- As regards long term highway issues, either support for specific widening projects or support for actions to reduce vehicular travel demand;
- As regards Public Transport, a decision as to the general market share it should aim to achieve, ie 5% of demand in short to medium term, and 15% to 20% in longer term; also the funding principles and assistance which may apply to public transport;
- Address the land ownership issues and their interaction with transport access and parking provision.

implications for alternative landuse options

Spare highway capacity is limited

Need to encourage public transport usage,
which is easier with a linear corridor-like
development pattern

Have a balance in residential population and
jobs to reduce traffic demand

An optimal balance of land uses can reduce
demand for more local access (roads)

implications for alternatives

Distributed Centres



Concentrated Nodes



Riverfront Corridor



- High
- Medium
- Low

Need to encourage public transport usage, which is easier with a linear corridor-like development pattern



Have a balance in residential population and jobs to reduce traffic demand



An optimal balance of land uses can reduce demand for more local access (roads)



To Support the Future Master Plan

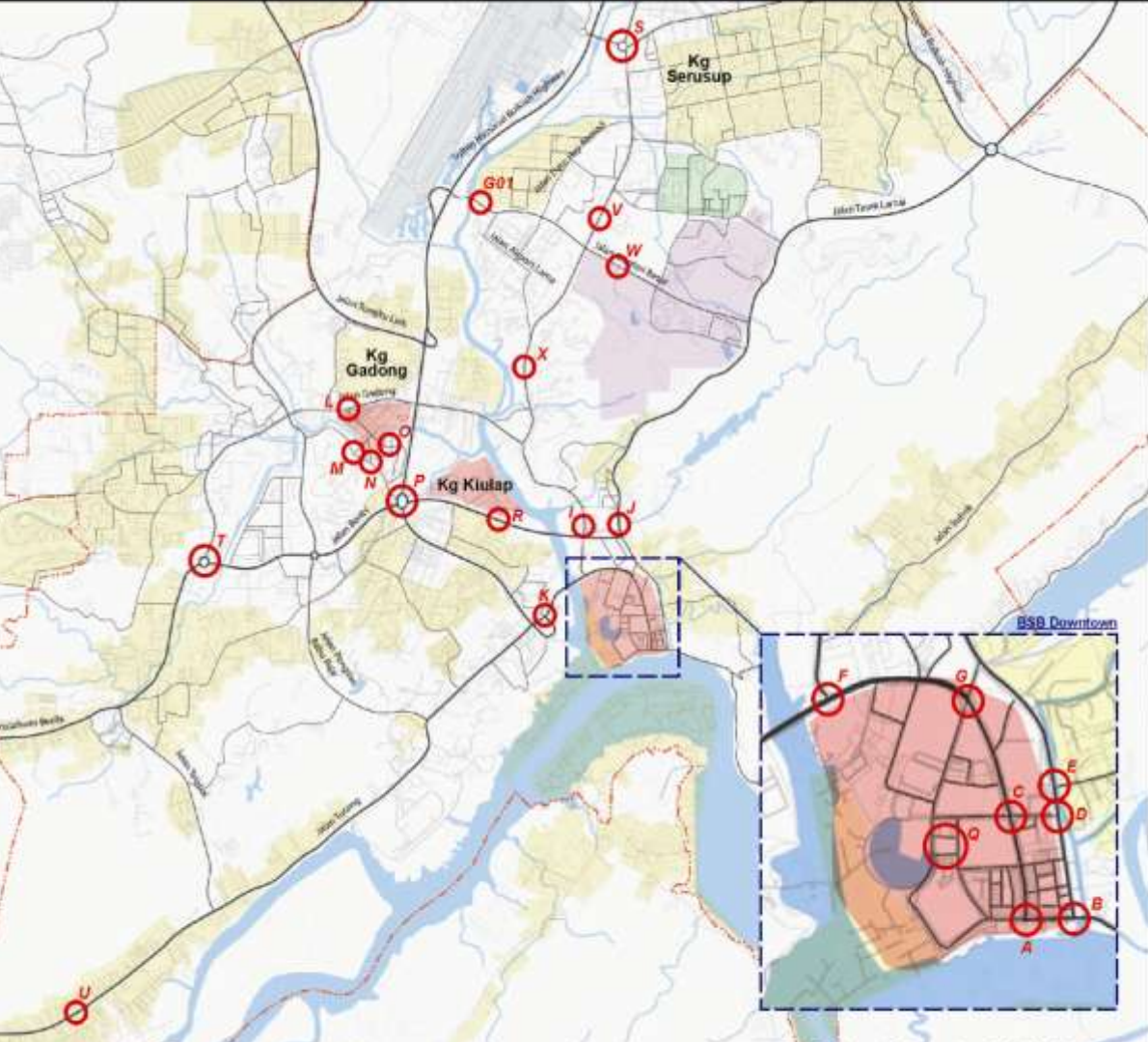
Assess future Demands

Carried out Traffic Surveys to give more detail and cross check on earlier data

Assessed Traffic growth based on the GFA growth;

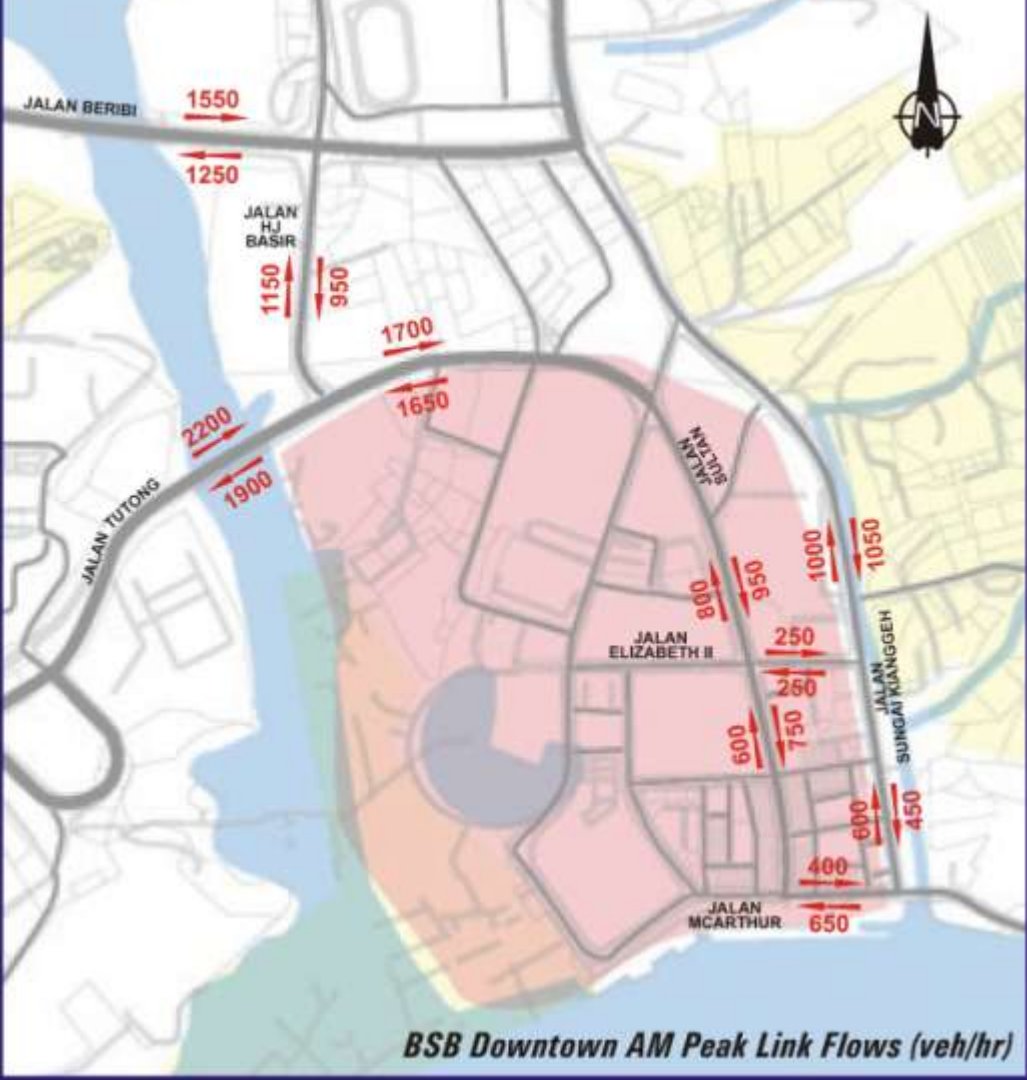
- Growth depends on area, but in range 30% to 75%
- these are preliminary findings

Intersection Count Locations



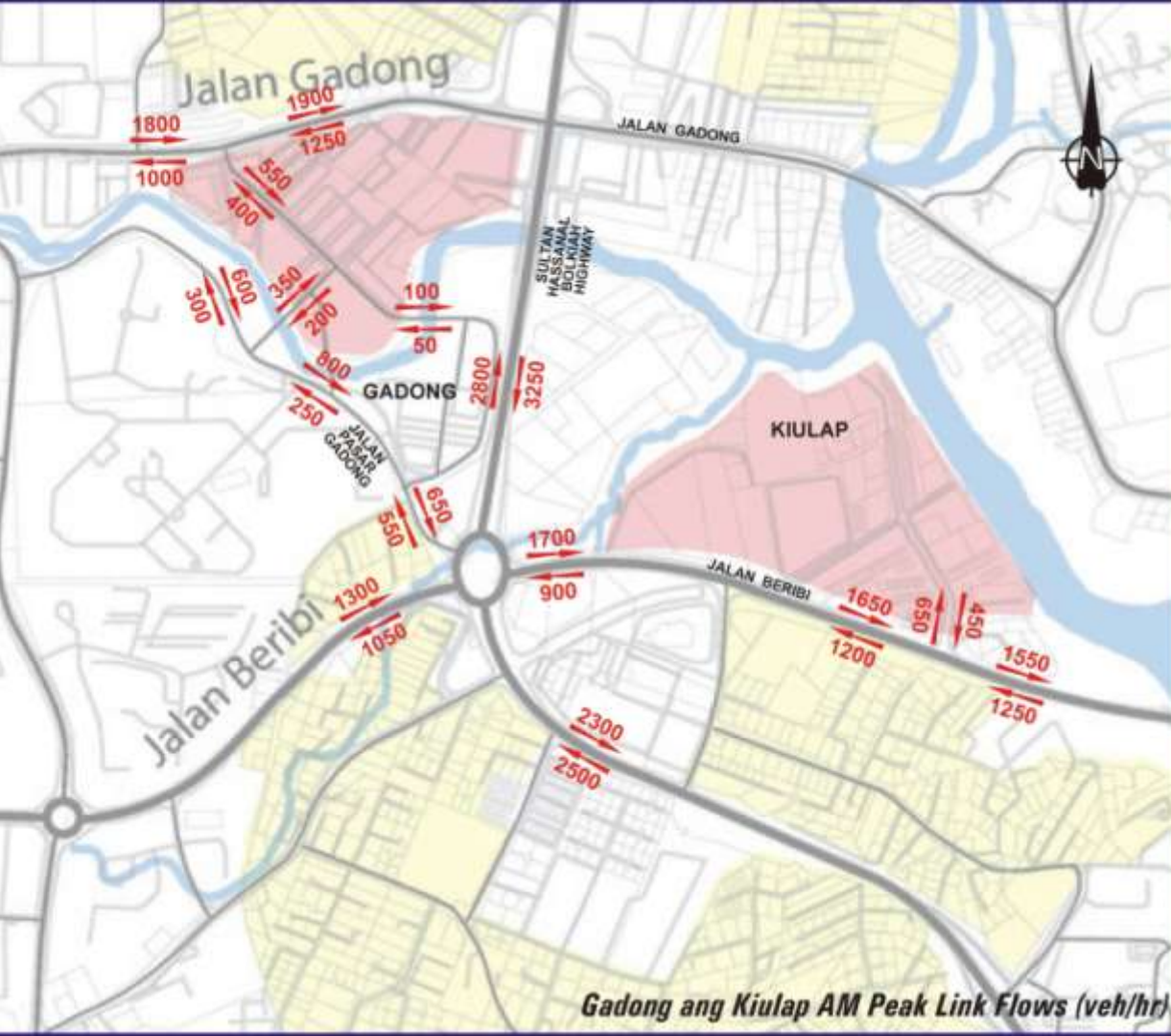
Downtown Link flows

- BSB Downtown Link Flows (veh/hr)



Gadong-Kiulap

- Gadong ang Kiulap Link Flows (veh/hr)



The public transport corridor

A major north-south corridor will provide the spine of the new landuse, and public transport must play a prominent role.

Certain requirements clear;

- **Link airport to downtown**
- **Circulate downtown**
- **Provide interchange to external corridors**
- **Provide a depot further out where land is cheaper**
- **Range of Technology can be selected.**

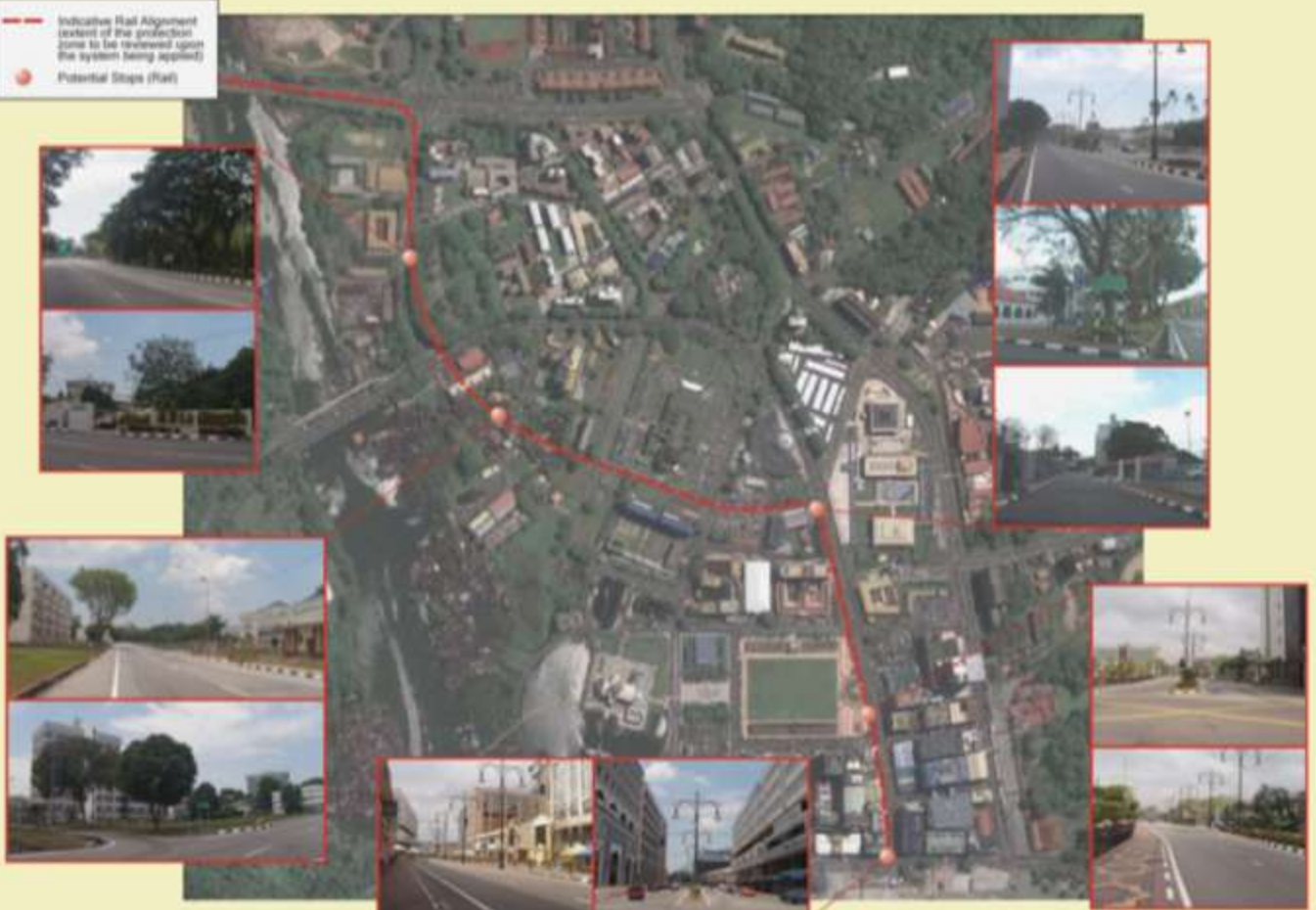
Public transport corridor Concepts



- Indicative Rail Alignment
- Interchange at the northern stations with public transport corridor and park'n'ride facilities

Indicative Road Alignment
(extent of the protection
zone to be reviewed upon
the system being applied)

Potential Stops (Red)



- Option 1
- This use the same technology for downtown as the external area

Option 1 (Downtown Two-way Option)



*Option 2 & Option 3
(Downtown Loop System)*

- Option 2 & Option 3
- These options use different technology for circulation in downtown, therefore interchange is required with the external service

Bus Options

- Bus is very flexible and can penetrate in most areas. It is less intrusive as it does not need large civil structures



Clermont - Ferrand, France



Rouen, France



Nancy, France

Light Rail Transit

- Light Rail Transit can run in streets and is compatible with downtown streetscape



Bordeaux, France



Saint-Etienne, France



Nantes, France



Mulhouse, France



Orléans, France

Elevated preferred in external area

Elevated Monorail is good for penetrating remote areas and linking separated areas but can be more intrusive



California, USA



Tokyo, Japan

Conclusion;

Findings are preliminary, but comments are welcomed, in order to assist with further development of concepts in the next phase.