NSW Land and Housing Corporation

Waterloo State Significant Precinct

Summary of Baseline Investigations

August 2018

NSW GOVERNMENT

Communities Plus

Introduction – see separate slide pack

Robert Sullivan

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Baseline studies into – see separate slide pack

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Waterloo Estate Redevelopment
NSW Land and Housing Corporation

Sustainability

Baseline Study conducted by Aecom

Sustainability

Study Requirements

Ecologically Sustainable Development (ESD)

- ESD principles will be incorporated, including energy and water performance benchmarks and compliance with a nationally recognised rating system.
- Integrated waste water management strategy, including consideration of a precinct-scale recycled water scheme.
- Options to achieve a least 50% renewable energy.
- Waste management strategies to achieve the NSW Government's Waste Avoidance and Resource Recovery Strategy 2007.

Climate Change Mitigation and Adaptation

- Sustainability assessment reflecting the directions outlined in the 'NSW Climate Change Policy Framework'
- Options for achieving both net zero buildings and a net zero precinct
- Climate change adaptation

Sustainability

Brief

- Address strategies to achieve project based targets for:
  - carbon reduction
  - drinking water management
  - energy reduction and on-site generation
  - biodiversity enhancement
  - response to climate change
  - waste reduction
  - renewable materials
  - performance rating systems.

- Identify broader precinct and local area sustainability opportunities

- Identify how the baseline data and City of Sydney sustainability policies will be addressed

Sustainability

Methodology:

- Review all existing studies, strategies and plans relevant to sustainability
- Undertake a preliminary assessment against the following sustainability rating systems:
  - City of Sydney sustainability requirements
  - Other systems such as BASIX, NABERS, NCOS
- Utilise the Green Star ‘Communities’ rating tool
- Baseline evidence for input into computer modeling tool
- Assess existing building environmental performance (including energy and water)

Sustainability

The Green Star Communities is proposed to be selected as the rating tool because it:

- is created specifically for Australia and covers brownfield and greenfield application
- is supported by the City of Sydney and government policy
- provides a quantitative evidence based evaluation
- will remain relevant though the required renewal cycle
- is strong on Social and Economic sustainability factors
- is broadly applied by industry across Australia and New Zealand (over 70 projects registered)
- goes through a process of independent verification

Green Star Communities Themes

Sustainability–climate change

Considerations

- Power loss through extreme weather events
- Evacuation of people with limited physical, mental or linguistic capacity in extreme events
- Increased rainfall causing flooding and utility failures
- Blackouts and reduced network capacities due to increased energy use
- Increased heat stress events causing health impacts
- Air conditioning increasing energy and living costs
- Increased demand on air conditioned public spaces
- Extreme heat impacting health of elderly and vulnerable tenants

Initiatives

Potential sustainability initiatives for Waterloo include:

- Building form, orientation and shading
- Photovoltaic cells (PV)
- Peak Shifting and Micro Grid networks
- Recycled water
- Rainwater Harvesting

Building Form, Orientation and Shading

- Building orientation and form can have significant long term energy consumption impacts
- Floor plate depth and cross ventilation potential
- Alignment with prevailing winds
- Overshadowing can work for or against energy
- Managing wind impacts and public domain shading

Solar Photovoltaics

- Spaces for potential locations for solar PV - rooftops, podiums and open public
- Potential resilience and peak shifting benefits
- Modelling has shown around 7% of annual energy consumption could be achieved through on site PV at around 30% of roof area
- Can be achieved at a building scale (depending on over shading) or networked within a Micro Grid
- Is considered to be cost effective.

Peak Shifting

- Battery storage allows peak demand to be spread across lower demand periods, reducing base load demand
- Will need to be considered in overall utilities servicing strategy

Micro Grid

- A separate, distribution network which operates in front of the traditional network, which could be privately owned or owned by the community
- Opportunity to integrate smart grid / demand management / storage and alternative supply and transition over time
- Depending on ownership, may drive energy efficiency across the network
- Ability to centralise offsets of energy supply or power purchase agreements

Rainwater Harvesting

- Collection of rainwater from public domain for reuse, such as irrigation of plants and landscaping
- Can be in passive or active forms
- Can also provide flooding, microclimate and amenity benefits
- May not be drought tolerant in dry conditions
- Can primarily be a public domain initiative under Council control

Recycled Water

- Can involve a number of smaller package water treatment plants to suit staging and growth
- Potential resilience benefits, increased drought tolerance
- Feasibility of cost & carbon per litre comparison to potable water, and consideration of affordability impact required
- Technology continuously improving and costs reducing
- Typically requires a private utility operator

Discussion – 20 minutes

- Are there points from the presentation you would like to discuss further?
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Summary & Close

Next Study Session

Traffic and Transport

Baseline Study conducted by Jacobs

Ron Meyer
Project Director
Waterloo Estate Redevelopment
NSW Land and Housing Corporation

Transport

Study Requirements

- Performance of the existing and future networks
- Current travel preferences and the split between driving, walking, cycling and public transport
- Travel and access needs of different users
- Initiatives of the Metro station, WestConnex etc
- Existing and potential trip generation by mode and purpose
- Total growth within the surrounding area based on approved and planned projects
- Impact of additional travel demands
- Benchmark travel behaviour and trip generation for all travel modes on developments of similar scale and context
- Traffic model to determine the road network improvements required to support the proposal
- Role and requirements for car share schemes
- Car parking rates to reduce private vehicle travel demand
- Systems for connecting the Metro station and surrounding community
- Staging plan including construction traffic impacts and trigger points for delivery of infrastructure
- Travel plan detailing all modes of transport and reducing car use

Transport

Brief

- Produce a baseline model of existing land use, transport systems and travel patterns
- Predictions of the future demand between the different transport modes (e.g. car, taxi, Uber, bus, train, Metro, bicycle, walking) for subsequent transport modelling
- Estimate the demand for additional vehicles on the surrounding road network and the impact.
- Develop a parking policy and travel demand management system

Traffic & Transport

Methodology

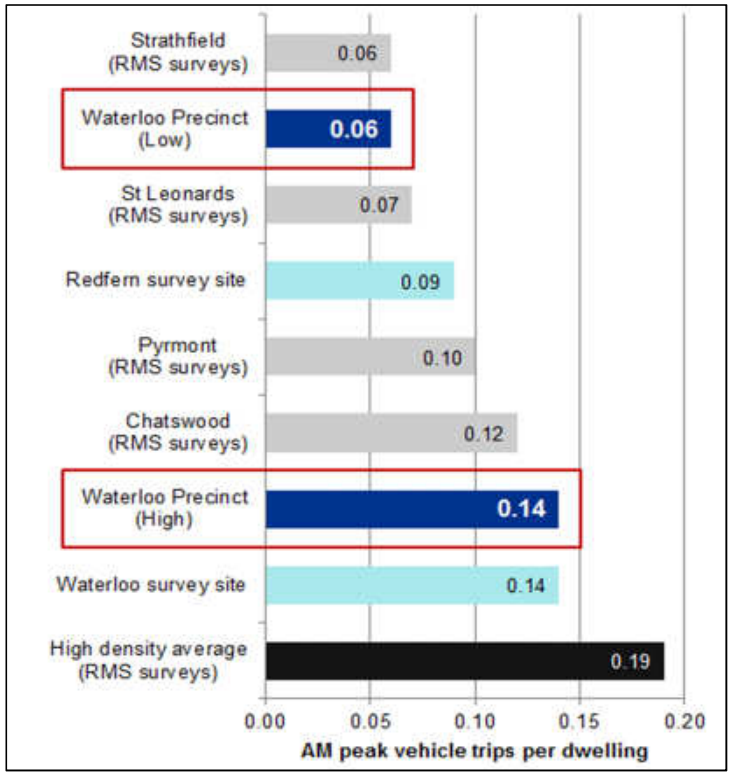
- Review existing information, including census data
- Install traffic counters to survey the am and pm peak periods on a typical weekday
- Compare these surveys to existing traffic models and validate
- Review the capacity of the surrounding road network using validated existing models
- Compliance to RMS and City of Sydney requirements and environmental capacity
- The data is collected and used to identify proposed traffic generation rates
- Use traffic and trip counts and computer modelling to understand the capacity of the existing road network and estimate the potential road network impact
- Use computer modelling software (SIDRA or LINSIG) to evaluate the performance of up to 10 critical intersections at the start and completion for the preferred master plan

Traffic & Transport

Considerations

- Proximity to existing Sydney Trains Network and future Metro station will provide excellent rail access to the Sydney area and create an opportunity to support low private vehicle demand in the precinct
- The new Metro station creates an opportunity to improve public transport services to the surrounding subregions by enhancing bus connections and investigating options to improve connections to the Southern Sydney Employment Lands
- Proximity of arterial roads (e.g. Botany Road) will require careful management of risk of through traffic impacting / infiltrating into the precinct to ensure local streets are safe and priority for pedestrians
- There is potential for active transport (such as cycling) to play a significant role in short and medium distance trips
- Parking for residential retail and community uses could be reduced to below the legislated maximum parking rates permitted in Sydney LEP 2012 (SLEP 2012).
- A greater level of trip self-containment could be achieved in Waterloo Precinct by providing more opportunities to work, shop, and engage in recreational pursuits in and around the Precinct.

Traffic & Transport



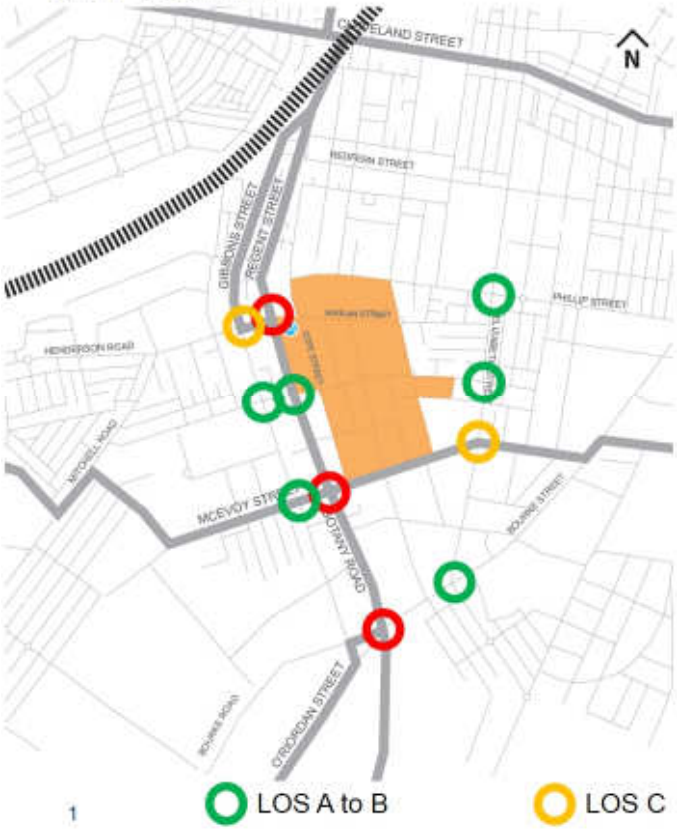
420 trips per hour (forecast)

980 trips per hour (forecast)

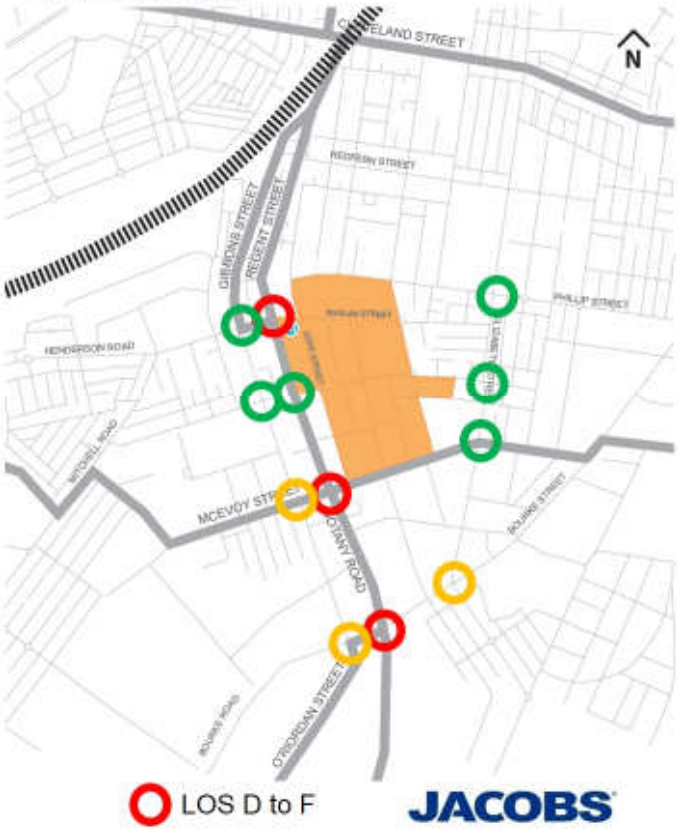
- Waterloo and similar suburbs have a low car share mode that is typical of:
  - Areas with high quality, high volume transport links
  - proximity to the Sydney CBD
  - Extent of social housing which has differing periods of car use throughout the day
- Traffic generation is forecast to be consistent with high non-car mode shares - between 0.06 to 0.14 for residential peak hour generation
- It is proposed a car parking ratio of 0.5 cars/dwellings is used for the redevelopment

Traffic & Transport

AM Peak Hour



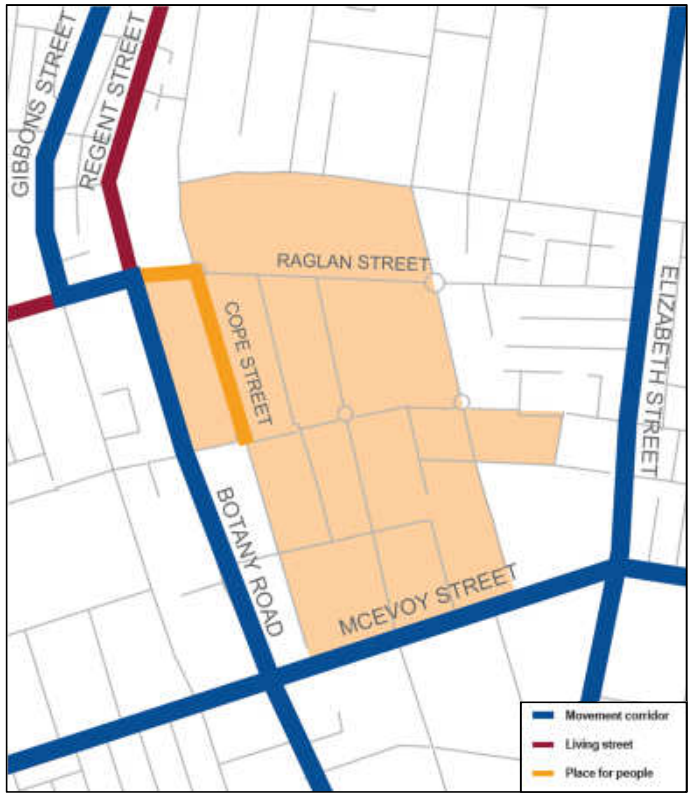
PM Peak Hour



JACOBS

A-B= High/stable traffic flows
C = Stable traffic flows with some restrictions
D-F = Limited traffic flows/congestion

Traffic & Transport



Manage risk of traffic impacting the precinct

- Precinct is bound by Botany Road and McEvoy Street - both busy arterial roads with high movement
- Potential for Cope St and Raglan St east of Cope, to give priority to pedestrians, given its proximity to the Metro Station entry
- The majority of streets within the precinct will be local
- May 2017 traffic data indicates volumes greater than 1,000 vehicles per hour during peak on sections of:
  - Botany Road
  - Elizabeth Street
  - Henderson Road
  - McEvoy Street

Discussion – 20 minutes

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Summary & Close

Next Study Session

Noise, Air and Light Pollution

Baseline Study conducted by SLR

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Noise Air & Light Pollution

Study Requirements

- Compliance to State Government policy in relation to potential water quality, air quality, noise and vibration and light pollution impacts, including cumulative impacts.
- Current and proposed future sensitive sites (eg residential buildings, schools, child care centres), and model the likely future noise, vibration and pollution scenarios using 3D diagrams.

Brief

- Identify existing noise, vibration, pollution and lighting characteristics within the Precinct
- Identify and map existing and proposed land uses that are more sensitive to pollution (e.g. residential uses, schools, child care centres, community facilities) and potential pollution sources likely to affect the Precinct.
- Prepare 3D models to show possible future noise, vibration, pollution and lighting scenarios and recommend appropriate protection measures.

Noise Air & Light Pollution

Methodology

- Install loggers at six locations to measure existing levels of noise and vibration
- Review available background air quality data from NSW Office of Environment and Heritage and weather data from the Bureau of Meteorology and NSW Office of Environment and Heritage
- Use light meters to measure existing lighting conditions around the Precinct
- Consider community inputs about existing noise, vibration, light and pollution
- Prepare maps, including 3D maps to clearly communicate the impacts of current noise, vibration, pollution and light levels, particularly from traffic on Botany Road and McEvoy Street
- Prepare a report outlining the existing noise, vibration, pollution and lighting conditions and the associated challenges, opportunities and issues to address through the master planning process

Noise Air & Light Pollution

Existing Situation

Noise & Vibration

- Noise environment is dominated by Botany Rd & McEvoy St traffic. The precinct is not effected by vibration.

Air Quality

- Vehicle emissions from Botany Rd & McEvoy St include: Carbon Monoxide (CO), Oxides of Nitrogen (NOx), Sulphur Dioxide (SO2), Particulate matter & Total Volatile Organic Compounds

- EPA public register and NPI database identify several industries in the locality as potential sources of air pollution.

Lighting

- A number of sites do not satisfy the Australian Standard. These were generally under light fixtures close to road intersections.

Noise Air & Light Pollution

Considerations

Noise & Vibration

- Obstruct line-of-sight from Botany Rd into the Estate. Shielding structures should be at least two storeys high.
- Locate public open space away from Botany Road & McEvoy Street
- Local streets should include traffic calming to reduce vehicle speed/noise

Air Quality

- No sensitive receptors (residential) should be located within a 20 m radius of Botany Road & McEvoy Street
- Landscape design and vegetation selection should optimise air quality mitigation

Lighting

- Australian Standards sets out principles that should be applied when designing outdoor light installations

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