

DRIVING LOW CARBON TRANSITIONS AT A PRECINCT SCALE

CASE STUDY: SYDNEY'S BROADWAY PRECINCT



KEY POINTS

- Existing precincts have embedded systems, behaviours and technologies which are often very fragmented and inefficient.
- For our cities to successfully transition to a low carbon future, we need to address these challenges to identify a pathway to low carbon living.
- Using Sydney's Broadway Precinct as a demonstration site, our project sought to better understand the nature of existing precincts and identify the challenges and opportunities.
- The research focussed on the economic, stakeholder, governance and technological considerations to identify transition pathways to towards low carbon energy and water efficiencies.

THE OPPORTUNITY / CHALLENGE

Our existing urban form provides significant challenges and barriers to enabling a low carbon transition. Reducing carbon emissions and enhancing energy and water efficiency at a city scale will require a consideration of how we manage the existing urban form and the actions we take to effect change to low carbon behaviours and technologies. A city scale transition is incredibly complex due to the physical, social, economic and environmental scales; the challenge within this research is to focus how we break this challenge down into manageable scales.

Our research focused on how transition at a precinct scale provides a local context and governance structures that empower and unite communities by including them in decision-making processes. Precincts are characterised by physical proximity, diverse uses and similar key stakeholders, regulatory context, governance frameworks and service infrastructure. However, they are inherently complex and characterised by multilayered interactions between institutions, people, regulatory, financial and policy frameworks, and technological systems like water and energy. For example, the rapid pace of technology makes it difficult to assess long term investment strategies. The lack of open space can inhibit onsite capture and storage of water and renewable energy.



CRC for Low Carbon Living

The CRC for Low Carbon Living (CRCLCL) is a national research and innovation hub that seeks to enable a globally competitive low carbon built environment sector is supported by the Commonwealth Government's Cooperative Research Centres programme.

With a focus on collaborative innovation, the CRCLCL brings together property, planning, engineering and policy organisations with leading Australian researchers. It develops new social, technological and policy tools for facilitating the development of low carbon products and services to reduce greenhouse gas emissions in the built environment. For more information visit www.lowcarbonlivingcrc.com.au/

Precincts provide a unique opportunity for flexible, dynamic and local responses. Stakeholders can benefit from economies of scale to access technological innovations. The role of precincts has been recognised by the Australian government's National Carbon Offset Standard for Precincts which provides guidance for measuring, reducing, offsetting and reporting of operational emissions.



SYDNEY'S BROADWAY PRECINCT

This Sydney CBD precinct is broadly bound by Harris, Wattle, Mary Ann and O'Connor Streets. The study brought together a range of stakeholders including Brookfield, City of Sydney, University of Technology Sydney and NSW TAFE. Between them, these stakeholders hold a range of assets of different ages and uses including retail, educational, residential and commercial.

The Broadway case study provided a detailed set of baseline information in relation to governance, stakeholder value, and infrastructure and utility consumption. However, it did not consider embedded energy in materials, waste or transport.

OUR RESEARCH AND RESULTS

We explored and detailed the economic, stakeholder, governance, and technical barriers and drivers to transforming precincts to a low carbon and water future in the context of Broadway and lessons learned from a review of case studies and best practice. We identified the following barriers and opportunities:

Barriers

- Diverse stakeholders with wide-ranging levels of knowledge, values, social and local engagement.
- Varied asset mix with different maintenance and renewal strategies and timing.
- Political uncertainty around carbon and energy futures and associated investment risk.
- Challenges in integrating technology or solutions across multiple buildings.
- Fragmented governance and regulatory impediments.
- Rapidly developing technologies and economic models creating investment risk.

Enablers

- Business models and governance models are innovating very quickly, often faster than the technologies.
- There is a new impetus and visions for sustainable living in the face of resource availability, cost and awareness.
- Rapidly developing technologies and practices such as peer-to-peer energy trading and offsite renewable energy.
- Declining cost of renewable technologies and energy storage in the face of rising network costs.
- Existing business models for sustainability supported by market increases in the cost of energy, water and waste.
- If a precinct is growing then addressing existing loads within the precinct may enable growth in development without needing to upgrade utilities.
- Data availability and social media is driving transparency and enabling alternative models for collective action and trade.

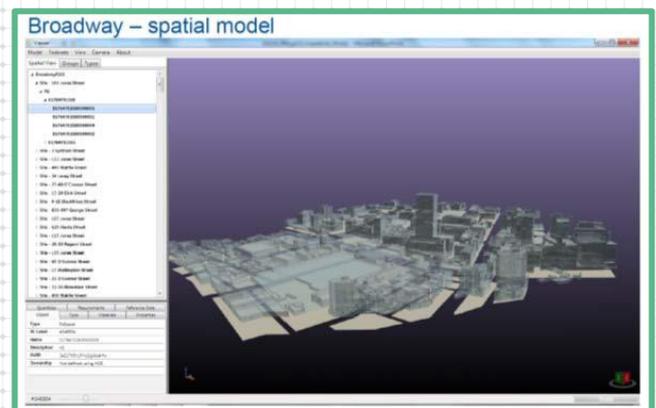
Our report provides guidance in the following areas, contextualised using Broadway:

- The need for auditing the assets and consumption within the precinct to enable strategic management of asset lifecycles and carbon intensity decisions.
- The value of effective stakeholder engagement to improve legitimacy, transparency, relevance and credibility, and to support implementation.
- The need for stakeholder education and behaviour change to ensure motivation is combined with the necessary technical, operational and economic skill set to drive the transition.
- The need to understand the economic drivers around existing assets within a precinct and ensure effective business models are developed for different stakeholder typologies or technical solutions.
- The value of establishing a baseline of the social, political, economic, technical and environmental status quo in the district together with key trends, drivers and constraints, and using this to generate alternative future energy and water scenarios to help identify preferred situations.

- The multitude of decision making processes within a precinct and understanding how these can influence the carbon outcome for the precinct.
- The governance elements that need to be in place and the role of various actors such as government and the policy instruments that can facilitate systemic change.
- Consideration of procurement pathways, including for capital, security and perceptions of risk.
- Understanding the appropriate data needs.

Our report provides a structured and comprehensive analysis of low carbon transition management actions to guide and empower precincts to reduce their carbon and water intensity. We consider the financial and stakeholder drivers and necessary technological and governance frameworks. We also identify a range of ongoing challenges and opportunities and remaining questions.

The learnings have been applied in a number of precinct redevelopments or advisory projects including The Bays Precinct in Sydney, Waterloo Estate, Bondi Junction, Old Royal Adelaide Hospital Site and Sydney Metro.



NEXT STEPS

Our work has revealed a range of future research areas that would support precinct transitions, specifically:

- Identifying the emergence of “next generation business models” based on service delivery and reducing inefficiency.
- Development of flexible governance, risk management and economic models for precinct scale.
- Identifying the relationship of the investment implications of driving parallel energy efficiency outcomes with energy supply solutions.
- Investigation into existing regulatory and corporate risk mechanisms and their influence on transition.

PROJECT TEAM

AECOM, Brookfield, City of Sydney, Flow Systems, Swinburne University, TAFE Sydney, UNSW, UTS.

PROJECT REPORT(S)

[Swinbourne, R., Hilson, D. and Yeomans, W. 2016. Empowering Broadway. Phase 1 research report. CRCLCL.](#)

AUTHOR(S)

Roger Swinbourne, Technical Director, AECOM and Daniel Hilson, Executive Manager, Flow Systems (Brookfield)

FURTHER INFORMATION

CRC For Low Carbon Living W: lowcarbonlivingcrc.com.au
E: s.summerhayes@unsw.edu.au T: +61 2 9385 0394