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Darwin Living Lab

Formation Workshop Report - 7th and 8th March, 2019

Workshop organised by CSIRO in Collaboration with the
Department of the Chief Minister, Northern Territory Government

NORTHERN TERRITORY GOVERNMENT

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Cover Photo: Darwin Water Front (by Tim Muster)

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Acknowledgments

CSIRO and the NT Department of the Chief Minister (DCM) would like to thank all workshops participants for contributing their time and enthusiasm.

Abbreviations

DLL – Darwin Living Lab

ToC – Theory of change

1 Introduction

1.1 Background and Context

This report summarises the approach and outputs from a stakeholder workshop held in Darwin on the 7th and 8th of March 2019, which had the purpose of mapping out a vison for the Darwin Living Lab and a pathway for how stakeholders can work together to achieve that vision. This workshop built on insights from the Darwin Urban Living Lab Inception workshop (27th March 2018) and ongoing discussions between the Commonwealth Department of Infrastructure, Regional Development and Cities, Northern Territory Department of the Chief Minister, City of Darwin, and CSIRO, which led to the development of a collaborative proposal for a Darwin Living Lab focussed on:

- Heat Mitigation and Cooling
- Smart Cities, and
- Tropical Urban Design.

Agreement was reached under the Darwin City Deal, where Commonwealth, Northern Territory and Local Government will partner in the CSIRO-led Darwin Living Laboratory (DLL). The virtual laboratory will operate as a collaboration hub, using the latest science to test, monitor and evaluate improvements in Darwin's liveability, sustainability and resilience. It will test the effectiveness of heat mitigation measures to be delivered as part of the Darwin City Deal and develop evidence-based approaches to inform tropical design and future development in Darwin.

This workshop brought together key stakeholders for the DLL with the following primary objective:

> *Using a Theory of Change approach, collaboratively map out a vision of what success for the DLL would look like in 2030, and how we can get there.*

1.2 Theory of Change Overview

The concept of a Theory of Change (ToC) has been used widely in international development and project planning. ToC's are often used to develop a shared understanding of how a desired change might come about, by working backwards from a shared vision to flesh out the activities and interventions needed for that change to occur. In addition, a clear ToC narrative can help those involved reflect on the relationships between different activities and interventions, and how that might affect the achievement of the desired change, as well as challenge underlying assumptions.

The ToC also provides the basis for the development of a Monitoring, Evaluation and Learning (MEL) framework that can help to test the effectiveness of interventions in achieving the vision for Darwin and provide the data and evidence to guide identification of alternatives where needed.

1.3 Workshop Process used to develop the DLL Theory of Change

The workshop was approved by the CSIRO's Human Research Ethics Committee (#08/19). To map the impact pathways, a participatory ToC exercise was carried out with key Darwin stakeholders (Appendix C – Workshop Participants) which captured key aspects of how the DLL project could help to achieve the vision of Darwin as a 'thriving, cool capital of the north'. Appendix D outlines the workshop agenda, while the following section provides more details on the ToC process. Appendix D – Workshop Agenda

1. Building on previous workshop outputs from the DLL Inception workshop[1], the CSIRO DLL project team developed a draft partial ToC of how the project would help to achieve the vision of Darwin as a thriving, cool capital of the north, proposing long term outcomes (~2030), and the steps needed to enable that vision to be achieved. Drawing on the Inception workshop was also a means of reconnecting participants with that work.
2. Workshop participants reviewed the draft vision and long term outcomes. Participants were asked to note any outcomes missing from the draft that would be needed to achieve the vision, and who should be involved. Suggested updates were added on post-it notes to a large wall chart version.
3. Participants then worked to identify initial projects for the DLL, and for each of the potential projects identified address the following questions:
    - Who would drive it, and who else needs to be involved?
    - How does it relate to existing initiatives?
    - What is the immediate objective?
    - What does success look like, and how can we assess this?
    - How can it help achieve the vision for Darwin?
4. Working back from the long term outcomes and vision for the DLL, participants were asked to prioritise projects for the first 12 months of the DLL, which included developing the assessment criteria to evaluate projects, and identifying the next steps.
5. Participants identified who should be involved to achieve the vision, and were asked to consider in more detail the governance structures and mechanisms, including how different partners and the community should be involved, and how decisions should be made and by whom.
6. Finally, participants selected an outcome from the ToC to consider in more detail the prerequisites needed to achieve this outcome, and the underlying assumptions that are being relied upon for the desired outcome to be achieved. This information contributes to the development of a Monitoring, Evaluation and Learning (MEL) framework.

[1] Workshop held in Darwin, 27th March, 2018

7. Once the workshop had been completed, the CSIRO project team reflected on the ToC process. CSIRO then suggested an initial project concept for each major theme that surfaced through the workshop process.

2 Theory of Change Narratives

2.1 Narratives from the DLL Theory of Change

The vision and long term outcomes have been incorporated into a draft overarching Theory of Change for the DLL (see Appendix B for ToC developed in the workshop). Figure 1 provides a summary version of the ToC that highlights anticipated outcomes, which includes those explored in the impact pathways in the following section.

Darwin Vision 2030

Darwin is the thriving, cool capital of Northern Australia, which is now a globally renowned tourist destination due its highly attractive green, tropical setting and design aesthetic. The community has better health outcomes due to effective urban cooling through climate appropriate and technologically advanced urban design. Expertise in place-based design for the savanna tropics contributes to a more diversified economy.

Long Term Outcomes (2030)

- Darwin is a world leader in tropical design and is exporting this unique design expertise to other tropical cities, particularly in Asia, driving growth and employment opportunities.
- Urban design principles are delivering to Darwin's unique climate and sense of place.
- Darwin CBD is a more attractive destination and has greater vibrancy, including students into the city, with greater connectivity across the CBD and surrounding urban centres.
- Darwin's urban form has been re-configured to provide thermal comfort, both in buildings and public open space, with the improved design providing the Darwin community with the cooling benefits needed for a savanna tropical climate with distinct wet and dry seasons.
- Heat mitigation has reduced the health impacts from heat stress and encouraged greater use of outdoor spaces, playgrounds and sporting facilities, including active commuting.

Conditions for achieving the goals

There are a series of pre-requisites to achieving the goals:

(i) Iterative approach to identifying priority actions for the DLL based on emerging information.
(ii) There is an evidence-based approach for developing Darwin-specific urban design principles, where approaches and materials are tested locally.
(iii) There is improved, integrated governance of Darwin to deliver liveability outcomes, which includes bi-partisan support.
(iv) Appropriate incentives and financial mechanisms are in place to enable and incentivise climate-appropriate design in new buildings and modifications.
(v) Measurement strategy is in place that provides for active learning about changing risks and continuous updating of messaging.

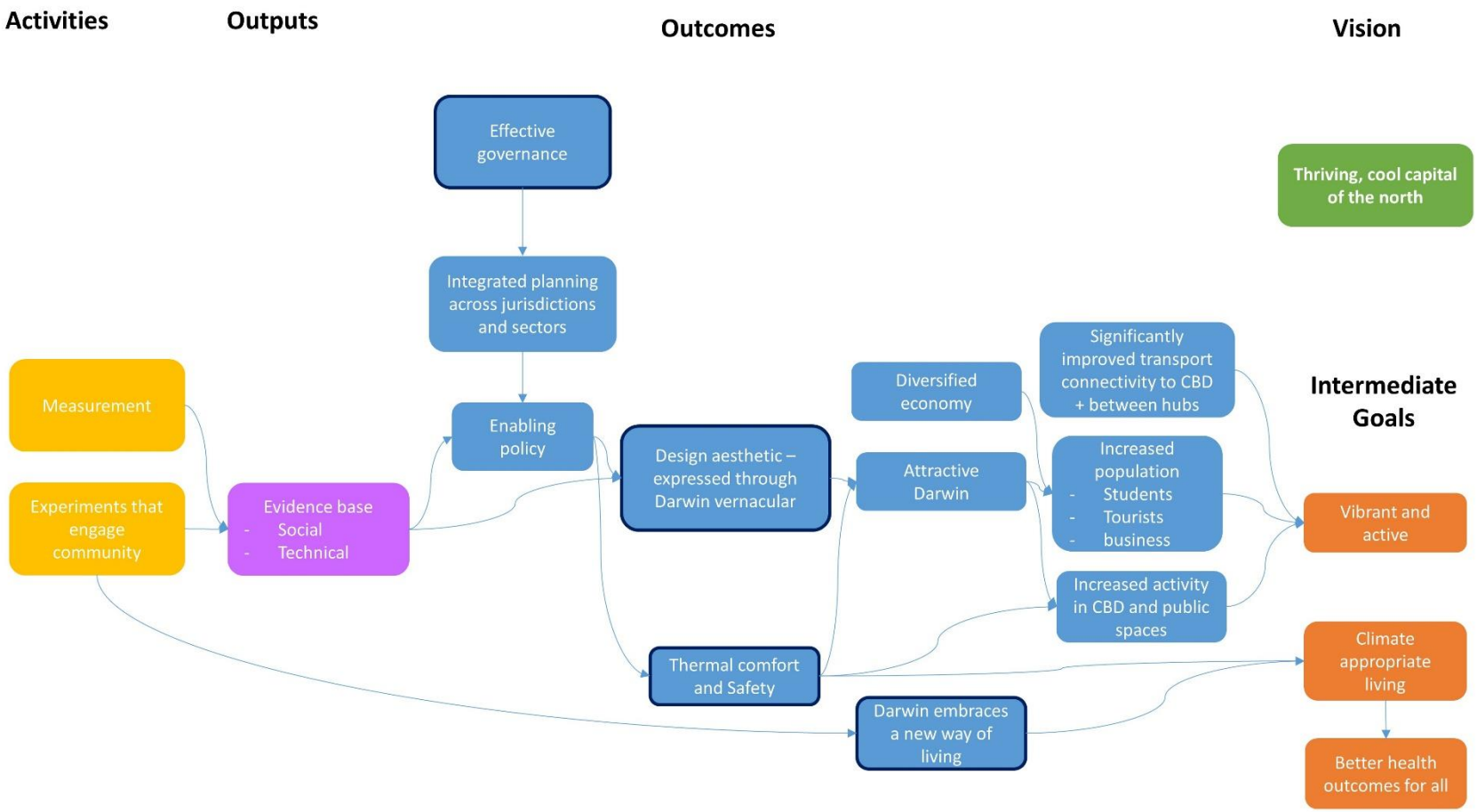


Figure 1: Summarised Theory of Change for DLL

Note: Impact pathways have been developed for the Outcomes with darker outlines.

2.2 Impact Pathways

Impact pathways are the possible sets of inter-dependent activities, outputs and outcomes identified at a point in time, which workshop participants perceive will contribute to the realisation of the longer-term outcomes and goals. They intersect and overlap at key points, where activities or outputs contribute to more than one impact pathway. Each pathway makes a partial contribution to achieve the outcomes, and overall vision for the DLL.

The following two pathways – *Social Outcomes* and *Integrated Governance* – were identified as critical prerequisites for the DLL ToC. They represent the initial efforts by workshop participants to 'unpack' some of the assumptions around how the vision for the DLL can be achieved. Exploring these assumptions provides a basis for the development of a MEL framework by highlighting potential indicators that can be used to track progress of the DLL toward longer-term outcomes. They will be supplemented by others in time, as the ToC is further developed and those involved in the DLL continue to experience and reflect on how to realise the intent of the DLL.

Pathway 1 Effective Integrated Governance Model

Outcome Integrated governance (government and private sectors) model that is effective

(i) A collaborative approach to developing and agreeing on DLL implementation plan, and how this plan should be reviewed on a regular basis.
(ii) Transparent and independent decision-making, with common understanding and trust built through ensuring all information is accessible by all interested partners.
(iii) Individuals who are interested in ongoing DLL participation are involved in collaborative activities that build trust and provides opportunities for shared learning.
(iv) Enabled by policy and investment changes and systems for ongoing learning, which ensures priorities and actions evolve as new knowledge emerges.

Pre-conditions

The DLL co-creates a clear value proposition for each partner organisation to be involved in the DLL, which includes ensuring that outcomes are aligned with their organisation's incentives. This value proposition will provide organisations with confidence to plan for staff involvement in the DLL.

The DLL includes a number of people from each of the key partner organisations in order to manage any risks associated with staff turnover, and subsequent loss of implicit knowledge of DLL vision and process. There is also the need for an effective on-boarding process for new staff that move into contributing to the DLL, which ensures the transfer of knowledge and clarity of DLL ToC to achieve the vision.

Pathway 2 Desired Social Outcomes

Outcome Darwin community embraces a new way of living

(i) There is a strong sense of place, which embraces Darwin's unique cultural heritage, natural environment and climate. This is achieved through collectively developing and sharing information and knowledge with the community, which supports a new way of living that embraces Darwin's distinctive character.

(ii) A strong sense of community, which embraces diversity and ensures improved liveability outcomes across the city. The DLL activities consider the needs of different population groups, and how they can be engaged, to enable an inclusive and equitable approach.
(iii) Improved thermal comfort and safety in Darwin's public places, and a more inclusive environment encourages more people to use public open space which contributes to a greater sense of vibrancy in Darwin.
(iv) It becomes 'cool' to buy and live in a green building.

Pre-conditions

Community education and feedback campaign that helps to build shared understanding around Darwin's unique challenges and potential approaches to address these challenges. This will include the use of social media and other platforms. There will be the need for local showcases and trials of tropical urban design, and information exchange with 'sister' cities with climates similar to Darwin that are facing liveability challenges. The communication can help to engage and build knowledge of opportunities for improved liveability through heat mitigation and tropical urban design.

There is the need to identify and activate potential agents of change that help deliver the vision for Darwin. This includes involving youth and other population groups and providing incentives such as industry awards to encourage innovation.

2.3 Potential Priority Projects

The workshop participants were asked to work back from the long-term outcomes and vision to identify priority projects for the next 12 months that could help Darwin move towards the vision. The priority projects identified during the workshop are listed in Appendix E – Initial Project Ideas. Following the workshop the CSIRO project team reviewed these initial ideas and the ToC to draft the following priority projects for the first 12 months of the DLL. This included identifying assessment criteria to evaluate the project outcomes relative to ToC. The following are summaries of the draft priority projects, which will be refined based on feedback from DLL partners.

2.3.1 Adaptation Pathways – Building Community Resilience to Extreme Heat

This proposed project will complement the research that has already been undertaken by UNSW[2], expanding the focus beyond the Darwin CBD and bringing a stronger people focus by developing an understanding of how vulnerability to extreme heat varies across the city and between different population cohorts. This includes investigating the adaptive capacity of vulnerable population groups to mitigate their exposure to extreme heat.

The vulnerability analysis, undertaken in collaboration with partners, will map priority areas across the City of Darwin for remedial action to reduce peak land surface temperatures and will help to identify adaptation options that reduce inequity in vulnerability to extreme heat events. Adaptation options will likely include modification of the physical environment through urban

[2] See: https://darwincitydeal.nt.gov.au/greening-and-cooling

greening and engineering options, but importantly, will also focus on the social dimensions such as the role of human behaviour and the value of social capital as a protective factor.

2.3.2 'Your Tropical City' – An Interactive Guide to Tropical Design in Darwin

A major challenge identified in workshops has been defining what 'tropical design' means in the Darwin context. A tropical design guide for Darwin will need to resolve a number of important questions such as:

- What are the elements that define tropical living in Darwin that need to be reinforced?
- What housing and designs best respond to the Darwin climate and surrounding environment?
- Is there a Darwin style of garden and landscaping and how might this differ in the public and private realm?
- What is the role for water and how can it be managed most efficiently?
- How can tropical design increase community understanding and care for the indigenous cultural and historical heritage of Darwin?
- Are there local materials that could be used more consistently?
- How does a tropical aesthetic translate from low to high densities and residential to commercial? and,
- What are the codes and regulations that define the boundaries for tropical design in Darwin?

Your Tropical City is a proposal for a dynamic website that provides information about tropical design in Darwin through fact sheets on key topics, case studies on best practice, and links to other useful material. Your Tropical City could be highly interactive and collaborative, with the opportunity for registered users to add comments, rate content, submit brief case studies, add new links, and perhaps create a personal profile? It will provide the means for those who are shaping the built environment of Darwin to access the latest information and to share ideas.

2.3.3 Learning Together – Scoping a Framework for Monitoring, Evaluation and Learning

The ToC workshop has provided a basis for scoping a proposed framework for monitoring, evaluation and learning of the DLL. A framework needs to be developed in the initial stages of the project to ensure that data collection and baseline performance measures are assessing the desired outcomes to achieve the vision. It also needs to ensure there is a process to share information among projects and partners in the DLL, which can be used for continual improvement through adjustment to strategies and activities as required to move towards the vison for Darwin.

The MEL framework will measure improvements in liveability, sustainability and resilience. This will build on existing frameworks such as the Australian Government's National Cities Performance Framework, approaches to measuring resilience developed by the 100 Resilient Cities initiative, through to engaging with RMIT University and their indicator approaches for measuring urban

liveability. The framework will help measure the performance of Darwin as well as progress of the DLL towards the long term outcomes identified in the ToC workshop.

3 Summary and next steps for Darwin Living Lab

3.1 Summary

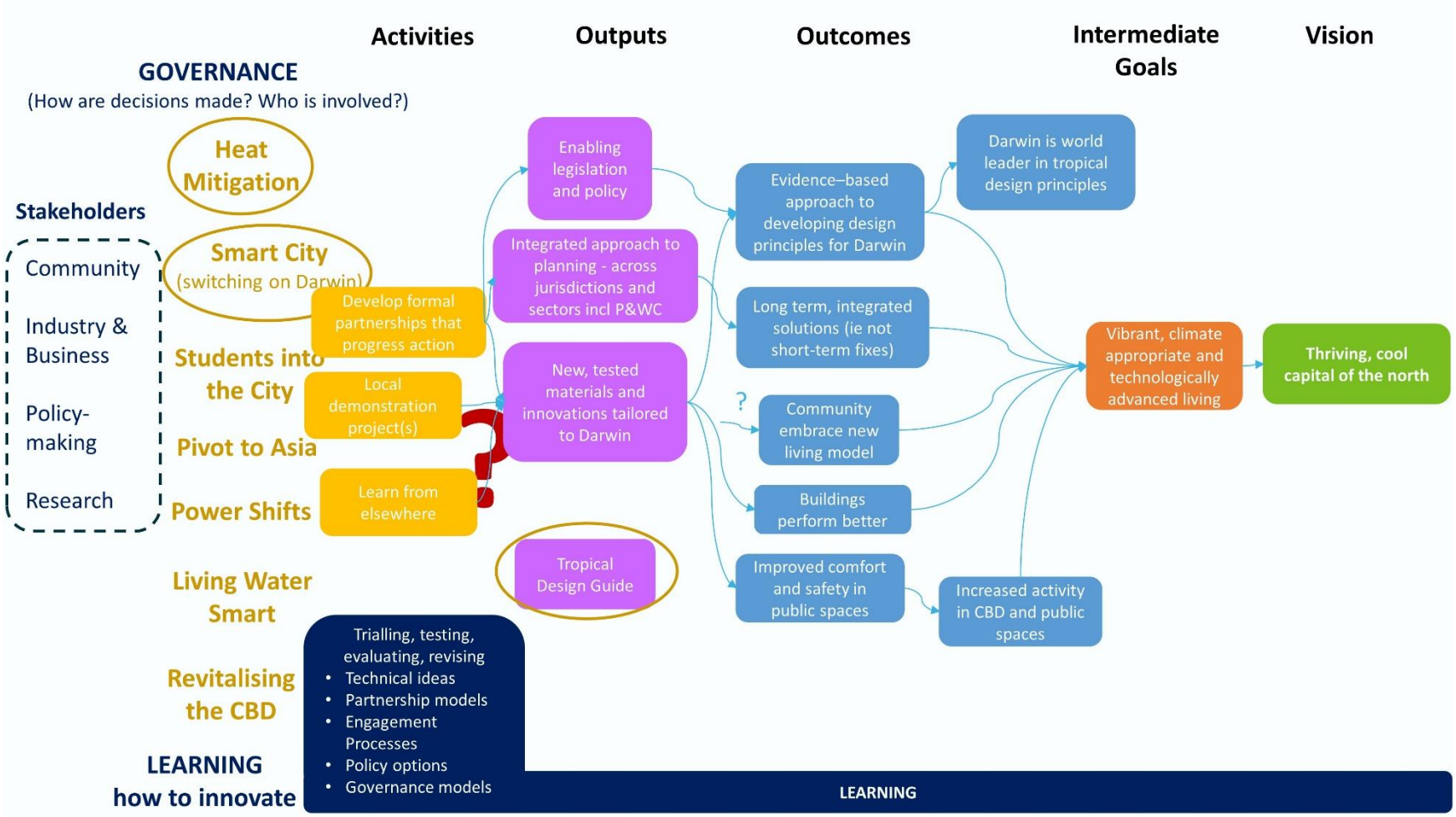
The workshop process has provided a first draft of the ToC for how the DLL will contribute to Darwin becoming the thriving, cool capital of Northern Australia. There are still gaps that require further information and/or validation with a wider group of potential partners. The workshop highlighted some of the organisations and sectors that participants indicated should be involved in the DLL, which included: industry and business groups, developers, architects, defence, police and Larrakia Nation organisations. It was also highlighted that the DLL should broaden the involvement of the community, including involving school-aged children and senior citizens. The pathways to achieving the vision were developed based on workshop discussions. There is the need to further flesh out the ToC to better connect the DLL project activities to the near-term goals and to clarify the near and mid-term influence pathways.

3.2 Suggested next steps for the DLL

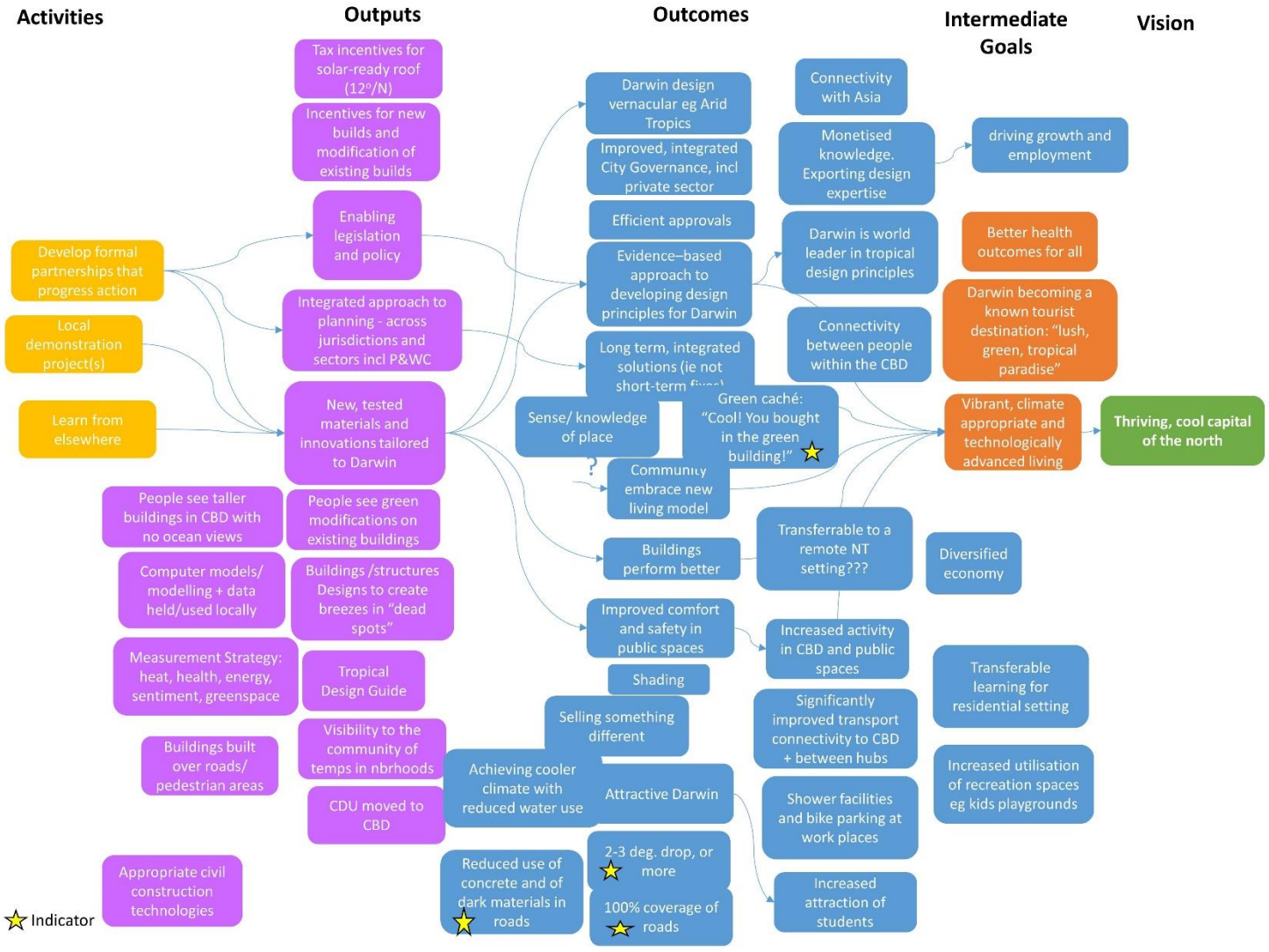
It is suggested that the DLL project team:

1. Undertake a brief, intensive session to develop **more detailed explanation and descriptions of the DLL project activities and desired shorter-term to medium-term outcomes** to help inform more detailed mapping of the necessary activities and associated pathways needed to achieve the outcomes, as well as test the current project plan.
2. To **develop the DLL Monitoring, Evaluation and Learning (MEL) framework** to underpin, guide, and inform the adaptive implementation of the DLL vision.
3. To refine, based on partner feedback, **priority project ideas** that can help activate the DLL **and** support the Darwin City Deal commitments for delivering a Heat Mitigation Strategy and Tropical Design Guidelines by the end of 2019.
4. To **revisit the DLL ToC after the annual science symposium** to update it based on what we have learned.

Appendix A – Draft Partial Theory of Change



Appendix B – Workshop Theory of Change Output (raw)



Appendix C – Workshop Participants

Name	Position	Organisation
Laura Ling	Policy Officer	Office of Northern Australia
Dong Chen	Principal Research Scientist	CSIRO
Helen Miao	Senior Lecturer	CDU
Louise Taylor	Manager City Revitalisation	DCM
Tim Muster	Darwin Living Lab Lead, Group Leader	CSIRO
Lawrence Nield	Architect	-
Robert Cooper	CEO	Larrakia Nation Aboriginal Corporation
Sarah Whitten	Senior Advisor	PM&C
Peter Runcie	Future Communities Lead	CSIRO/Data 61
Guy Barnett	Future Cities Coordinator	CSIRO
Toby Robinson	Director, Cities	DIRDC
Andrew Klassen	Lecturer	CDU
Oliver Penman	Urban Design Manager	DIPL
Holly Pederson	Policy Officer	Office of Northern Australia
Alexandra Murray	EO, Deputy Vice Chancellor – Research and Innovation	CDU
Stuart Anderson	Research Engineer	CSIRO / Data 61
Josh Sattler	General Manager, Innovation Growth and Development Services	City of Darwin
Cindy Robson	Manager, City Planning	City of Darwin
Jude Scott	Media and Communications Manager	BOM
Chris Chilcott	Research Leader for Northern Australia	CSIRO
Rachel Williams	Team Leader, Adaptation Pathways & Societal Transitions Team	CSIRO
Michael Holmes	Director, Strategic Planning	DIPL
Kylie Climie	Senior Manager Client Services	Power and Water

Name	Position	Organisation
Doug Lesh	Senior Director, Planning and Development	DIPL
Ruth Wallace	Dean, College of Indigenous Futures, Arts and Society	CDU
Maziar Khosravi	Portfolio Manager, Innovation	City of Darwin

Appendix D – Workshop Agenda

A.1 Thursday 7th March, 8.30 -12.00

Time	Event
8.30 - 9.00	Coffee and Tea on arrival
9.00 – 9.20	Welcome and Introductions
9.20 – 10.30	Reconnecting with the Darwin Urban Living Lab • Building on the output from the Inception Workshop • Goals for the first 12 months
10.30 – 10.45	MORNING TEA
10.45 – 12.00	Identifying initial project opportunities and who could be involved • Heat Mitigation/Urban Cooling • Tropical Urban Design • Smart Cities/Switching on Darwin
12.00 – 1.00	NETWORKING LUNCH

A.2 Friday 8th March, 8.30 -12.00

Time	Event
8.30 – 9.00	Coffee and Tea on arrival
9.00 – 10.00	Prioritising projects for the first 12 months • Developing selection criteria • Selecting projects • Next steps
10.00 – 10.15	MORNING TEA
10.15 – 11.00	Governance of the Urban Living Lab • How will decisions be made, at different scales, and by whom?

11.00 – 11.30	Monitoring, Evaluation and Learning – developing a framework
11.30-11.50	Next Steps
11.50-12.00	Workshop Reflections
12.00	Workshop Close

Appendix E – Initial Project Ideas

Project Area	Link to Darwin Initiatives
Informing sensor location, potential data use and understanding sensor specification	Switching on Darwin Heat Mitigation
Linking the Heat Mitigation Strategy and the Urban Forest Strategy	Heat Mitigation Urban forest strategy Switching on Darwin
Monitoring Effects of Greening of State Square, Smith St etc.	Heat Mitigation
Monitoring the effect of Car Parking Policy Change Implementation	Heat Mitigation
Enabling wider access to / custodianship of existing data	Multiple
Understanding "Human Comfort"	Heat Mitigation
Developing a Systems View of Heat Mitigation and the interdependencies with other Initiatives	All
"Tropical" Design Guide	Tropical Design Guide
Design of monitoring research	All
Generating Out-of-the Box thinking	All
Reviewing other work in Oz and internationally	All
Heat wave forecasting	Human Health

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