Comment – UrbanTech Plus

Comment
UrbanTech Plus is pleased to contribute to this inquiry with a submission that offers a delivery-ready solution for improving construction productivity across Queensland. Our submission includes: A proposed 10D Digital Twin Platform originally scoped for Brisbane 2032 A detailed Addendum directly mapping to the Commission's Terms of Reference Recommendations on modular housing, procurement reform, digital workflows, and NEC-style outcome-based contracting We believe the same platform that supports Olympic infrastructure can be applied statewide to housing, regional development, and skills reform. We welcome any opportunity to discuss pilot partnerships or implementation pathways.

Digital Twin Platform Submission for Brisbane 2032

Delivering Games Infrastructure and a Legacy for Queensland

Addressing all Dimensions

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Submitted to:
Queensland Productivity Commission
Construction Sector Productivity Inquiry
Date: 22 May 2025

Contents

Executive Summary

Brisbane 2032: A Transformative Opportunity

The Brisbane 2032 Olympic and Paralympic Games represent not just a sporting event but a pivotal moment to reshape urban development and community engagement. With a projected budget of $7.1 billion for venues at stake, history warns us that traditional planning often leads to budget overruns, delays, and missed opportunities. Brisbane faces high costs, dispersed venues, and a new stadium requirement. Without innovative strategies, we risk escalating costs, eroding public trust, and failing to meet our sustainability goals.

To address these pressing challenges, the 10D Digital Twin Platform integrates Building Information Modelling (BIM), Geospatial Information Systems (GIS), real-time analytics, and Digital Enablement (DE). This innovative platform not only ensures cost control and sustainability but also positions Brisbane as a global leader in innovation, delivering long-term benefits for our community and beyond.

Key Benefits:

- **Cost Efficiency**: Savings of up to 30% on design (est. $210M), 20% on construction (est. $710M), and 15% on operations (es.t $106M per annum).
- **Sustainability**: Achieves up to 20% carbon reduction and 90% recycling of construction waste.
- **Legacy Creation**: Drives $700 million in annual tourism growth and converts infrastructure into 2,000 affordable housing units.
- **Operational Excellence**: Streamlines coordination, reduces delays, and ensures compliance with International Olympic Committee (IOC) sustainability requirements.
- **Community Engagement**: Promotes transparency and public trust.
- **TOR Alignment:** The 10D Digital Twin Platform not only mitigates risks but aligns seamlessly with ToR objectives, ensuring deliverability, sustainability, and long-term legacy alignment.

Why Now? Delaying digitisation until after Los Angeles 2028 would increase costs and risks. Retrofitting systems costs 3-4 times more than early integration. Brisbane's adoption of the 10D Platform ensures:

- Early savings during planning and construction.
- Risk mitigation through predictive analytics.
- Operational readiness years ahead, following Sydney 2000 and London 2012's successes.

Call to Action: The $1.5 million Proof of Concept in 2025 represents just 0.02% of the Games budget.

Early adoption by The Games Independent Infrastructure and Coordination Authority (the Authority) secures readiness, carbon neutrality, and a lasting Queensland legacy. Acting now establishes Brisbane as a global leader in sustainability and innovation.

Let's make Brisbane 2032 a transformative success story.

Introduction

Brisbane 2032: Redefining Olympic Games Delivery

Brisbane 2032 represents a historic opportunity to redefine the delivery of the Olympic Games. Yet, traditional planning methods, even those endorsed by the IOC, have repeatedly led to significant budget overruns and inefficiencies. For instance, the Rio 2016 Games saw a staggering 368 percent budget overrun, while Tokyo 2020 exceeded its budget by 111 percent. Furthermore, the Paris 2024 Games face critical challenges, including the marginalization of vulnerable communities, as outlined in the Paris Report, highlighting the risks of outdated approaches.

Brisbane's unique challenges, such as the construction of a new stadium and Australia's historically high infrastructure costs, demand that the Brisbane 2032 Committee leverage innovative planning tools and the expertise of suppliers. Learning from the experiences of Paris, Milan Cortina Winter Olympics (2026), and Los Angeles (2028), which are currently in planning, is essential. Unlike Paris, which benefited from existing infrastructure, Brisbane risks repeating the failures of past Games, such as budget overruns, unplanned expenditures, and poor legacy, without proactive measures.

Problem Statement

As a remote, mid-sized first-time host requiring a new stadium, Brisbane faces unique challenges. Without adopting advanced planning tools, the risks of failure are significant, as historical data demonstrates:

1. **Budget Overruns:**

London 2012	**A 267% budget overrun due to fragmented early planning.**
Rio 2016	**A 368% overrun from severe inefficiencies and underinvestment.**
Tokyo 2020	**A 111% overrun, highlighting the need for better risk management.**
Paris 2024:	**Achieved a lower 17% overrun due to a streamlined approach and reliance on existing infrastructure.**

   Brisbane's situation is fundamentally different. Unlike Paris, Brisbane must deliver large-scale projects such as constructing a new stadium.

2. **Operational Inefficiencies**: Brisbane's geographic dispersion and infrastructure gaps demand cohesive planning tools. Fragmented systems will exacerbate delays, increase costs and create risks during execution.

3. **Missed Legacy Opportunities**: Without innovative planning, Brisbane risks under-delivering long-term benefits, including affordable housing, regional development and sustainable infrastructure.

   A **10D Digital Twin Platform** unifies planning and operational data into a single source of truth. This enables predictive risk management, cost optimisation with digital streamlined project delivery. By adopting this platform, Brisbane secures its legacy goals and mitigates the financial and reputational risks of traditional approaches whilst being able to measure carbon properly.

The Solution: 10D Digital Twin Platform

What is the 10D Digital Twin Platform?

The 10D Digital Twin Platform is a transformative approach, integrating existing technologies to unify workflows and deliver measurable outcomes. It extends out beyond 3D digital models to offer a holistic framework for sustainable, cost-effective and efficient project delivery.

Key Dimensions:

The following dimensions cover ALL the Brisbane 2032 requirements:

Dimension	**Focus**
3D (Spatial)	Virtual modelling for precise planning.
4D (Time)	Real-time progress tracking and scheduling.
5D (Cost)	Accurate cost forecasting and proactive control.
6D (Carbon Tracking)	Monitoring to meet Net Zero goals.
7D (Facilities Management)	Operational sustainability and maintenance.
8D (Risk & Safety)	Mitigation of risks and enhanced safety.
9D (Lean Construction)	Waste reduction and efficient practices.
10D (Industrialised Construction)	Prefabrication to reduce timelines.

Specific Benefits of the Platform

The 10D Digital Twin Platform delivers measurable value across multiple areas:

- **Cost Efficiency:** Saves up to 30% on design, 20% on construction, and 15% on operations, reducing Brisbane's projected infrastructure costs by millions.
- **Sustainability:** Achieves Net Zero targets with 20% carbon reductions and 90% construction waste recycling.
- **Legacy Creation:** Establishes a lasting digital asset for planning, tourism, and economic growth, integrating First Nations heritage and supporting regional communities**.**
- **Operational Excellence:** Enhances coordination, reduces delays, and ensures efficient project delivery, enabling seamless execution of Brisbane 2032.
- **Community Engagement:** Builds transparency and trust by involving the public in decision making, ensuring alignment with community needs.

- **Efficient planning:** International teams will be able to plan and see virtual venues, training and accommodation without the need to travel.

Enhanced Risk Management and Planning

1. Enhancing Proactive Measures

- Allocate 10% of the project budget as a contingency to address unexpected delays and resource needs.
- Utilise digital twin simulations to predict and mitigate potential disruptions, including adverse weather impacts and logistical bottlenecks based on events and weather data inputs in real time as the days count down.
- Implement Lean Construction practices (9D) to optimise material use, minimise waste and prevent supply chain disruptions.
- Leverage offsite modular construction workflows (10D) to accelerate project timelines and mitigate risks related to labour shortages and weather constraints, whilst delivering economic benefits to all in South-East Queensland.

2. Assisting Governance Frameworks

- Establish a governance committee with representatives from key stakeholders, including First Nations leaders, community groups and private sector partners so that they can view the simplicity of 10D as a platform and "buy in" early.
- Conduct monthly governance meetings to monitor project progress, address risk mitigation strategies and update compliance objectives easily.
- Develop escalation procedures to address unresolved issues promptly and ensure accountability within each dimension with the flow on effects easily measured for each escalation.
- Engage local TAFEs and regional businesses within governance discussions to align workforce development goals with project timelines and risks.

3. Easy enablement of Risk Mitigation Frameworks

- Hold regular agile reviews using the platform's 10D view to identify and resolve risks with all stakeholders.
- Monitor compliance with financial, regulatory and sustainability objectives using real-time dashboards that will deliver a secure, stable data lake that all government departments and future stakeholders can access as legacy.
- Easily orchestrated regular and quarterly audits for private sector contributions to ensure alignment with project milestones and goals.

4. Case Studies for 10D Platform Approach

- HS2 High Speed Rail Project (UK): Saved £1M/km via early clash detection with digital twins.

- Marina Bay Sands (Singapore): Streamlined operations and reduced delays by integrating digital twins for stakeholder alignment, highlighting how multi-stakeholder collaboration can optimise Brisbane's Games planning.

10D Proof of Concept

Utilising Best of Breed Digital Intelligence

Achieving Brisbane 2032's ambitious vision requires a phased, strategic approach, starting with a focused Proof of Concept (PoC) leveraging existing assets. Using the Townsville ***Queensland Country Bank Stadium BIM model as a foundation***, we can define the steps needed to meet the previous Olympic Games venue management standards and scale to a comprehensive 3D digital twin platform suitable for Brisbane 2032.

Globally, 3D digital twin technology has proven its value in managing complex projects from inception. For instance, both the High-Speed Rail (HS2) project in the UK and Helsinki's Kalasatama Smart District reduced design cycles by up to 30%, allowing for identification of potential clashes and easy testing of traffic flows and energy use. Brisbane's Phase 1 Proof of Concept can similarly test and refine infrastructure plans, ensuring optimal resource allocation and ensure all stakeholders have access to key data easily for timely work phases and delivery.

Leveraging Existing Assets

Phase 1 defines requirements for a 10D platform MVP and establishes a legacy platform through a Proof of Concept. It will validate key aspects of Brisbane's digital twin strategy for stadiums. Using the 3D BIM model of Townsville's Queensland Country Bank Stadium, the project aims to provide insights for resource allocation and scalability. These phases will yield lessons learned to improve outcomes for planners and stakeholders while capturing essential carbon measurement data.

Digital Twin Creation:

- **Utilise advanced technology to convert 2D legacy data into 3D models**, ensuring spatial accuracy and testing workflows for broader applications, previously only used for Paris 2024.
- **Integrate unstructured data** (e.g., images, emails, operational documentation) into a comprehensive asset view to assess data integration needs, a capability not available before Paris 2024.
- **Incorporate GIS data** to represent above and belowground systems, supporting foundational analysis for Brisbane's infrastructure and providing long-term digital assets and tools for state and local government agencies.

Enhanced Scenario Modelling and Profiling:

- Map planned changes against the 'as-is' digital twin to identify design clashes and refine workflows.
- Simulate retrofitting challenges in older venues, using insights gained from Paris 2024.
- Leverage findings from Townsville's PoC to identify enhancements for Brisbane and inform use cases for Southeast Queensland's Digital Twin as a secure data lake and platform.

The PoC will utilise expertise from the Official Olympic Partner for GIS Mapping and Digital Twin

Software, OnePlan, 2D to 3D experts WiseBIM and local engineering and construction designers Site DE from Cross River Rail. It will also incorporate the Deep Space data intelligence platform to refine and align with Olympic standards, aiming for a world-class showcase and best-in-breed benchmark results.

Legacy and Tourism Opportunities

Brisbane 2032 represents not just a chance to deliver a transformative Olympic Games but also an opportunity to reposition the city as a global tourism hub. Unlike Paris, which benefits from being a top tourist destination, Brisbane must leverage the Games to enhance its international profile becoming a world city. Key initiatives include:

- **Digital Twin Applications for Tourism:** Utilise AR/VR tools to create immersive experiences showcasing Brisbane's unique culture, heritage and natural attractions, encouraging post Games tourism growth.
- **Infrastructure Integration:** Align transport, accommodation and entertainment facilities with tourism goals, ensuring Brisbane becomes a gateway to Queensland's iconic destinations such as the Gold Coast, Sunshine Coast and Great Barrier Reef.
- **Global Benchmarking:** By showcasing Brisbane's innovative use of technology and sustainability in delivering the Games, the city can attract international attention as a premier destination for future events and eco-tourism.

Timing & Milestones

Brisbane's Digital Twin strategy will be executed in four carefully planned phases to ensure timely delivery, scalability, and alignment with the IOC's requirements. Each phase includes defined milestones that build towards delivering a Games-ready platform while leaving a sustainable legacy.

Phase 1: Proof of Concept (Q3/Q4 2025) $1.5M

- **Objective:** Deliver a Minimum Viable Product (MVP) to validate scalability and workflows.
- **Milestones:**
    - Integrate BIM, GIS, and DE for Townsville's Queensland Country Bank Stadium.
    - Test 2D-to-3D conversions on a legacy venue delivering an approach, tools and modernised data set to demonstrate the plug-in platform legacy value of 10D.

Phase 2: Brisbane-Wide Implementation (Q1 2026 – Q3 2027) $3.2M

- **Objective:** Digitise Brisbane's venues and critical infrastructure to meet IOC standards and scale digital tools for city-wide impact as each venue is revealed.
- **Milestones:**
    - Digitise all venues with the IOC's venue management standards. ○ Embed predictive analytics for transport and operational workflows.
    - Launch AR/VR tourism tools to position Brisbane as a premier tourist gateway.

Phase 3: Regional Scaling (Q3 2027 – Q4 2029) $5.8M

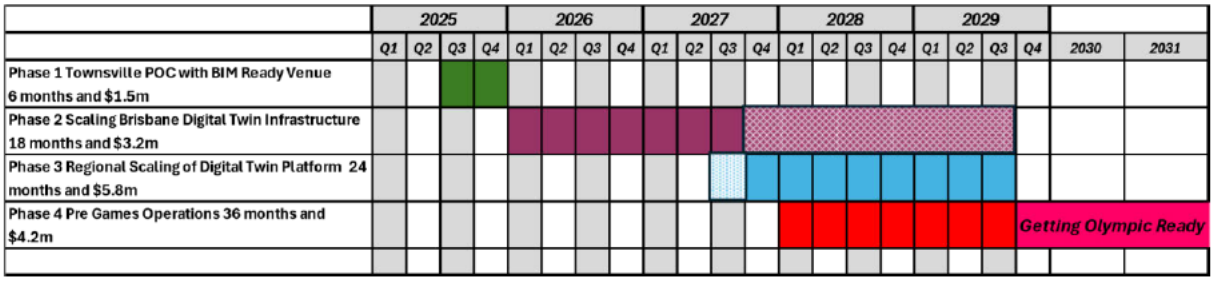
- **Objective:** Extend the platform to regional hubs, addressing their unique needs and boosting tourism and resilience.
- **Milestones:**
  - Deploy digital twin solutions for Cairns, Mackay, and Rockhampton. o Integrate AR/VR tools to enhance regional tourism.
  - Strengthen regional councils' disaster resilience through predictive modelling.

Phase 4: Games Operational Readiness (Q1 2028 – 2031) $4.2M

- **Objective:** Ensure seamless Games-time operations and finalise the platform for post-Games legacy use.
- **Milestones:**
  - Prepare transport systems for peak Games usage using predictive tools.
  - Finalise IOC reporting requirements with advanced analytics.
  - Achieve full operational readiness by mid-2029.

Why Timing Matters:

- Phase 1 (AUD $1.5M) avoids compounding risks and delays, setting the foundation for smooth delivery and long-term benefits.



The above timeline outlines the sequential and overlapping phases of the Brisbane 2032 Digital Twin implementation, showing the alignment of deliverables with key milestones and operational goal.

Project Phase	Cost	Details
Phase 1: Proof of Concept	$1.5 m	Initial development and testing of the 10D Digital Twin Platform.
Phase 2: Brisbane-Wide Implementation	$3.2 m	Scaling the digital twin technology to all relevant Olympic venues and infrastructure.
Phase 3: Regional Scaling	$5.8 m	Extending the platform to regional hubs, addressing unique local needs.
Phase 4: Games Operational Readiness	$4.2 m	Finalising systems for Games-time operations and ensuring full readiness.
Total Estimated Investment	$14.7 m	

Phase 1: Proof of Concept (Q3/Q4 2025)

- **Objective:** Validate platform scalability using Townsville's BIM-ready venue and explore 2Dto-3D conversion workflows on a second legacy venue.
- **Actions:**
    - Integrate BIM, GIS, and DE for Townsville Queensland Country Bank Stadium.
    - Test legacy venue digitisation by converting a second venue from 2D to 3D, addressing challenges with unstructured data integration.
    - Engage local stakeholders and First Nations communities to ensure inclusive planning. •

      Budget: $1.5M
- **Deliverables:**
    - MVP operational within six months.
    - Proven workflows for 2D-to-3D conversion applicable to future legacy venues.
    - $1M savings identified for future phases through early clash detection and streamlined planning.

Phase 2: Brisbane-Wide Implementation (Q1 2026 – Q3 2027)

Digitise all Brisbane and SE QLD venues and critical infrastructure, scaling the digital twin platform to meet IOC standards and support city-wide operations while positioning Brisbane as a premier tourist destination.

Actions:

- Align all venues with OnePlan's venue management standards to ensure full compliance with IOC requirements.
- Embed predictive analytics into transport and operational workflows, enabling real-time decision-making and proactive issue resolution.
- Integrate tourism-focused digital applications, including AR/VR experiences, to promote Brisbane's cultural, historical, and natural assets as part of the Games experience.
- Develop partnerships with airlines, travel agencies, and tourism operators to include Brisbane in regional travel packages, highlighting it as a destination worth exploring.
- Expand training programs to include upskilling of local and regional participants, ensuring readiness for future phases and leaving a legacy of skilled workers. **Budget: $3.2M**

Deliverables:

- $20–30M annual cost savings through optimised workflows and predictive analytics.
- 100% IOC compliance for Brisbane venues.
- Workforce trained for seamless integration of regional scaling in Phase 3.
- Increase in post-Games tourism revenue by positioning Brisbane as a gateway to Queensland destinations and a standalone city of interest.

Phase 3: Regional Scaling (Q3 2027–Q4 2029)

- **Objective:**
  Extend the platform to regional hubs (Cairns, Mackay, Rockhampton), integrating tailored solutions for diverse regional needs.
- **Actions:**
  - Deploy tailored digital twin solutions for regional councils to support local infrastructure management and future urban planning.
  - Integrate AR/VR capabilities to enhance regional tourism offerings, driving cultural and economic growth.
  - Develop predictive tools for regional disaster resilience, ensuring faster recovery and safeguarding communities. • **Budget: $5.8M**
- **Deliverables:**
  - $700M in annual tourism growth, with increased visitation to regional hubs. ○ Enhanced disaster resilience, reducing response times and improving recovery efforts.
  - Digital twin adoption for 80% of Queensland councils, supporting long-term regional development.

Phase 4: Games Operational Readiness (Q1 2028 – 2031)

- **Objective:**
  Achieve seamless venue and transport coordination, ensuring Brisbane is fully prepared for Games-time operations.
- **Actions:**
  - Integrate OnePlan's real-time event management system for coordinated transport and venue management during the Games.
  - Prepare transport systems for peak Games usage by implementing predictive modelling tools to minimise disruption risks.
  - Finalise IOC reporting requirements using advanced analytics from the digital twin platform to ensure full compliance. • **Budget: $4.2M**
- **Deliverables:**
  - Full operational readiness by mid-2029, ensuring Games delivery aligns with Brisbane's vision and IOC requirements.
  - Predictive tools reduce disruption risks by 20%.
  - Legacy-ready digital twin systems, transitioning to post-Games community and infrastructure use.

Governance and Stakeholder Roles

To ensure accountability, transparency, and efficient oversight, the 10D Digital Twin Platform will be supported by a robust governance framework that aligns with Brisbane 2032's objectives.

Governance Framework

- Establish a multi-stakeholder governance board including representatives from:
  - Brisbane City Council
  - Regional councils (e.g., Townsville, Cairns, Rockhampton)
  - First Nations communities
  - Private sector partners
  - IOC representatives
- Assign clear roles and responsibilities for decision-making and implementation oversight.
- Define clear roles with subcommittees for sustainability, infrastructure, and workforce oversight.

Accountability Mechanisms

- Conduct quarterly reviews to ensure milestones are met.
- Implement a transparent reporting system with public dashboards for tracking progress, sustainability metrics, and financial performance.
- Introduce independent auditing to validate compliance with IOC standards and Brisbane's legacy objectives.

Stakeholder Alignment

- Host bi-annual workshops to align goals and address challenges.
- Establish regular feedback loops with regional councils and First Nations communities to ensure their objectives are reflected in project outcomes.
- Provide training programs for stakeholder representatives to build capacity and ensure informed participation.

This governance structure ensures all stakeholders remain engaged, aligned, and accountable throughout the Games delivery and legacy phases.

Private Sector Collaboration

Collaborating with industry leaders for planning, construction, event and venue management.

Opportunities for Co-Development

- **Technology Providers:** Collaborate on software enhancements locally without international software or platform licensing costs to reduce operational costs and improve system functionality.
- **Construction Firms:** Develop Public-Private Partnerships (PPPs) to incentivise investments in sustainable infrastructure, focusing on modular construction and advanced materials. Work with Universities to develop new products and methods.

- **Tourism and Retail:** Create AR/VR experiences that promote regional tourism growth and highlight Brisbane's cultural heritage. Partner with First Nations technology companies.
- **Workforce Development:** Partner with local businesses and educational institutions (e.g., TAFEs) to establish apprenticeship programs, addressing labour shortages and preparing the workforce for Games-related needs.

Funding Mechanisms

- **Private-Sector Funding:** Establish shared-revenue models that lower public sector costs while ensuring investor returns over the long term.
- **Public-Private Partnerships (PPPs):** Attract private investment by offering structured agreements that align with Brisbane's sustainability and legacy goals, balancing shared risks and rewards.

Case Study Inspiration

- **London 2012:** Demonstrated effective private-public collaboration in East London's strategic property development, highlighting mutual benefits while achieving Olympic goals.
- **Vancouver 2010:** The Canada Line project showcased how PPPs can expedite essential infrastructure development for both the Games and future community use.
- **Barcelona 1992:** Facilitated long-term urban renewal and waterfront regeneration through structured public-private partnerships.
- **Sydney 2000 and Tokyo 2020:** Examples of transforming Olympic infrastructure into lasting community assets, with Sydney's Olympic Village becoming the vibrant suburb of Newington, and Tokyo enhancing smart city capabilities through technology partnerships.

Conclusion: These historical precedents underline the diverse advantages of well-structured partnerships, including risk-sharing, accelerated project delivery, innovative design and operations, and sustainable legacy outcomes that extend well beyond the Olympic period. By adopting similar strategies, future host cities like Brisbane can achieve superior results in infrastructure delivery, urban regeneration, and social impact.

Legacy Outcomes

Economic Growth

- **Drive an additional $500 million in annual tourism** revenue by repositioning Brisbane as a premier global destination.
- **1M annual visitors post-Games** via marketing and improved transport.
- **Leverage the success of Brisbane 2032** to position the city as a host for other major international events.
- **Generate 2,500 new tourism-related job opportunities**, with 20% allocated to First Nations and regional communities, fostering inclusive economic development.

Sustainability

- **Achieve a 20% reduction in transport-related emissions** by leveraging smart infrastructure and sustainable practices.
- **Ensure 90% recycling** or reuse of construction materials, minimising environmental impact and supporting a circular economy.
- **Measure for reduced embodied carbon in venue construction by 25%**, contributing significantly to Queensland's Net Zero commitments.

Community Development

- **Transform Games villages into 2,000 affordable housing units**, addressing critical regional housing shortages and enhancing social equity.
- **Expand digital twin adoption to 90% of Queensland councils**, enabling long-term benefits in infrastructure management and planning.
- **Strengthen disaster resilience through predictive modelling**, ensuring faster recovery and safeguarding Queensland communities from future risks.

Cultural Impact

- **Showcase First Nations narratives** in venues to celebrate Queensland's heritage.
- **Feature Queensland's unique natural assets**, such as the Great Barrier Reef and Daintree Rainforest, through tailored AR/VR campaigns to attract and retain international visitors.
- **Establish long-term cultural events or festivals** inspired by the Games to reinforce Brisbane's global relevance and maintain international engagement.
- **Use AR/VR tools to promote and preserve First Nations stories**, fostering deeper cultural understanding while boosting tourism growth.

Call to Action

Why Change?

Traditional Olympic planning methods, which separate three years of planning from four years of execution, are inefficient and risky. Past examples like Rio 2016 (368% over budget) and Tokyo 2020 (111% over budget) highlight these dangers. Brisbane's unique challenges, including the construction of a new stadium, demand a smarter, integrated approach that modernises planning, reduces costs, and ensures a transformative digital legacy.

Why Now?

Delaying digitisation until after LA28 introduces unnecessary risks and costs:

- Retrofitting systems later can cost three to four times more than early integration.
- Long lead times for critical projects, such as new stadiums, necessitate early optimisation.
- Successful examples from Sydney 2000 and London 2012 demonstrate that operational readiness three years in advance ensures seamless execution and cost control.

Why This?

The 10D Digital Twin Platform is a proven solution:

- Global digital platform projects have achieved up to 30% savings in design, 20% in construction efficiencies, and 15% in operational cost reductions.
- It integrates BIM, GIS, and real-time analytics, enabling predictive risk management and optimisation while providing a single point of truth for all stakeholders.
- It aligns with the IOC's 'New Norm framework,' positioning Brisbane as a leader in sustainable Games delivery.

Funding Justification

- Phase 1 requires only $1.5 million, less than 0.02% of the Games budget, with immediate returns and valuable planning and event management insights.
- Early adoption minimises retrofit costs and offers ongoing savings across all project phases, estimated at up to 30% on design (approximately $210M), 20% on construction (approximately $710M), and 15% on operations (approximately $106M annually).

The Risk of Waiting

Delaying action risks higher costs, rushed timelines, and missed opportunities for optimisation. Brisbane must act now to lead innovation and ensure readiness.

Final CTA

Approving Phase 1 of the 10D Digital Twin Platform today will prepare Brisbane for the 2032 Olympics, minimise risks, and deliver a legacy for Queensland. Acting now positions Brisbane as a global leader in innovation and sustainability. ***Let 's get started.***

Appendix A: Key KPIs and Milestones

Key Performance Indicators (KPIs)

Infrastructure Readiness:

- Completion of Townsville Proof of Concept (POC) by Q2 2025.
- 95% compliance with OnePlan venue management standards across Brisbane venues.
- Integration of transport predictive analytics by Q4 2027.

Sustainability Goals:

- Achieve a 20% reduction in lifecycle costs through digital twin integration.
- 100% renewable energy utilisation for major Games infrastructure.
- Carbon neutrality certification for all Games venues by Q1 2031.

Regional Inclusivity:

- 15% of Games-related workforce from First Nations communities.
- Conduct workshops in four regional hubs (Cairns, Mackay, Rockhampton, Townsville) by Q4 2026.
- Train 500 regional professionals through upskilling initiatives by Q1 2028.

Cultural and Social Impact:

- Embed First Nations storytelling in 100% of Games venues and precincts.
- Launch five major cultural tourism campaigns tied to the Games by Q3 2030.
- Achieve at least 85% satisfaction in cultural engagement metrics post-Games.

Engagement and Collaboration:

- Establish regular stakeholder workshops every quarter from Q3 2024 onward.
- Ensure 90% alignment on deliverables across all stakeholder groups by Q2 2026.
- Launch a digital platform for real-time stakeholder communication by Q1 2025.

Digital and Technological Innovation:

- Deploy 10D digital twin technology across all venues by Q4 2029.
- Implement real-time visitor engagement tools (e.g., AR tours) by Q2 2031.
- Maintain >99% uptime for all operational systems during Games-time.

Key Milestones

Phase	Budget	Key Milestones
Phase 1: Proof of Concept (Q3/Q4 2025)	$1.5M	- Townsville Proof of Concept (Q3 2025): Validate infrastructure readiness and digital twin capabilities. - Community Awareness Campaign (Q4 2025): Launch programs to highlight Games benefits and legacy objectives.
Phase 2: Brisbane-Wide Implementation (Q1 2026 – Q3 2027)	$3.2M	- Regional Workshops (Q2 2026): Conduct community engagement and align regional planning. - Sustainable Transport Infrastructure (Q3 2027): Begin implementation of smart transport infrastructure.
Phase 3: Regional Scaling (Q3 2027 – Q4 2029)	$5.8M	- Games-Wide Digital Twin Integration (Q4 2029): Deploy and integrate 10D digital twin platforms across venues and precincts. - Digital Twin Pilot for Affordable Housing (Q3 2028): Optimise planning for affordable housing projects.
Phase 4: Games Operational Readiness (Q1 2028 – 2031)	$4.2M	- Sustainability Certification (Q1 2031): Achieve carbon neutrality for all Games infrastructure. - Games-Time Readiness Review (Q2 2031): Conduct final operational testing and readiness confirmation. - Post-Games Legacy Activation Plan (Q4 2031): Finalise and activate the legacy strategy for long-term benefits.

Appendix B: 100 Days Terms of Reference Alignment

The Brisbane 2032 Digital Twin Platform aligns with the ToR objectives across key areas, as outlined below:

ToR Requirement	Submission Alignment	Section Reference
Infrastructure Readiness and Delivery	Townsville Proof of Concept (POC) evaluates infrastructure readiness, standardises BIM data, and aligns with OnePlan venue management standards. Scaling phases across Brisbane venues and regions ensure readiness for Games operations.	Phases 1-4
Sustainability and Legacy	Digital twin technology ensures sustainable infrastructure maintenance, operational efficiency, and lifecycle cost reductions. Predictive analytics enhance transport and venue management for long-term value and resource optimisation.	Post-Games Legacy Realisation
Regional Inclusivity	Regional hubs (e.g., Cairns, Mackay, Townsville) are included in planning and benefits distribution. Regional workshops and training initiatives foster local economic uplift, inclusivity, and workforce readiness, particularly for underrepresented groups.	Phase 3: Regional Scaling
Cultural and Social Impact	15% First Nations employment target integrated across all phases. Cultural narratives and storytelling embedded in Games precincts, infrastructure, and tourism experiences. Metrics include workforce training, cultural programming, and representation in leadership roles.	A Legacy of Inclusivity and Community Benefit

Cost and Risk Management	Risk mitigation strategies include adaptive budgeting, stakeholder engagement workshops, and resource reallocation plans. Predictive decision-making reduces project delays and budget overruns while ensuring robust financial oversight.	Risk Mitigation Strategies
Engagement and Collaboration	The stakeholder collaboration framework specifies roles for councils, industry leaders, BOCOG, IOC, NOCs, and community groups. Regional workshops and digital platforms ensure co-development of Games solutions with transparent communication.	Sustainable Urban Model
Digital and Technological Innovation	The 10D digital twin integrates real-time analytics, immersive visitor experiences, and predictive tools. This ensures innovative operational efficiency, sustainability, and global leadership in smart city innovation.	Phase 4: Pre-Games Operations

Addendum to Submission – Urban Tech Plus / 10D Digital Twin Platform

1. Purpose of this Addendum

This Addendum accompanies the original submission titled '10D Digital Twin Platform for Brisbane 2032 Infrastructure Delivery'.

While that report was created to support Olympic Games planning, the core architecture of the 10D Framework addresses exactly the same systemic barriers identified by the Queensland Productivity Commission in this inquiry - including fragmented planning, low productivity growth, rising insolvency, skills mismatches, and delivery risk.

Rather than rewrite or repackage the 10D submission, we have chosen to submit it in full, unchanged, and provide this short Addendum to explicitly map its applicability to your Terms of Reference. This avoids dilution, retains proven implementation logic, and respects the extensive work already undertaken through Queensland-based consultation, costing, and use case development.

To ensure full clarity and accountability, the following section presents a detailed mapping of the Queensland Productivity Commission's Terms of Reference to the capabilities and outcomes of the 10D Digital Twin Platform. This mapping is central to our submission and highlights how our proven solution addresses key government priorities – from improving housing delivery and managing construction costs to streamlining procurement and enhancing workforce development. By directly linking each ToR element to specific dimensions of the 10D framework, we demonstrate a comprehensive, scalable approach that is ready for immediate pilot implementation and long-term reform across Queensland's construction sector.

Note
Commercial in Confidence

This document contains proprietary concepts submitted in good faith for QPC review. It must not be published, referenced publicly, or shared beyond the Commission without the express written permission of Urban Tech Plus.

2. Alignment to Terms of Reference

QPC Terms of Reference Area	10D Dimension(s) and Capabilities	Relevant Sections in Submission
Housing supply and affordability	4D–7D (Time, Cost, Ops)	Executive Summary, Risk Management, Legacy
Construction sector trends and performance	3D, 5D, 9D	Introduction, Case Studies, Proof of Concept
Site productivity	9D, 10D	Solution Overview, Lean Construction, Modular Workflows
Regulatory, procurement, IR factors	8D (Governance)	Governance, NEC Contracts, Platform Layer
SME and regional access	8D, 10D	Regional Scaling, Stakeholder Inclusion
Labour and skills availability	6D, 9D, 10D	Legacy, Workforce Development, First Nations targets
Procurement and BPICs	8D	Procurement Reform, Outcome-Based Contracts
Innovation and investment barriers	2D–4D, 10D	Open Standards, Platform Interoperability
Short-, medium-, and long-term reform	All Dimensions	Phases 1–4, KPIs, Milestones
Local/state/federal engagement	8D	Stakeholder Governance Model

3. Additional Commentary for Statewide Application

While the original submission was developed for Brisbane 2032 infrastructure, its design deliberately addressed Queensland-wide concerns including housing supply, regional infrastructure, procurement friction, and digital coordination. The 10D Platform is scalable and modular. Key enablers such as BIM/GIS integration, outcome-based contracting, and digital workflows are equally applicable to residential and non-Olympic projects. Further, the use of existing data and unstructured asset records enables smaller councils and regional contractors to benefit without requiring costly new systems.

4. Recommended Pilot Opportunities

- A regional modular housing pilot using 10D methods and industrialised workflows
- A procurement process improvement pilot using Flowingly to reduce turnaround time and compliance friction
- Skills pathway pilot with TAFE and local councils aligned to digital delivery and maintenance of built assets

5. Additional Commentary on Sector Trends and Pressures

The Queensland construction sector, particularly residential delivery, has been under increasing pressure since the COVID-19 pandemic. Construction input costs have risen sharply due to supply chain disruptions, increased global materials demand, and labour shortages. ABS data indicates multi-year highs in construction insolvency, particularly among SMEs. Workforce retention is challenged by migration patterns, skills mismatches, and burnout across site and design roles.

The 10D framework directly addresses these structural inefficiencies by enabling modular and lean delivery (9D/10D), increasing planning certainty through digital coordination (4D–5D), and reducing time lost to rework or compliance delays (8D). The integrated nature of the 10D approach allows councils, contractors, and government agencies to plan, budget, and deliver projects more predictably - essential in an environment of fiscal constraint and housing urgency.

By shifting from ad hoc workflows to platform-based digital coordination and early stakeholder alignment, productivity gains of 10–20% in project throughput and cost reliability are achievable. These gains directly counteract the trend of high overhead and margin compression that currently hampers sector competitiveness.

6. Council Alignment and Procurement Reform Pathways

Many of Queensland's current housing challenges stem from the disconnect between local delivery systems and the need for state-scale outcomes. Historically, state-delivered housing programs (such as Housing Commission projects) operated under centralised models. Today, councils are under-resourced and over-burdened with compliance, while lacking coordinated platforms for accelerated delivery.

The 10D Platform provides a scalable digital and governance layer that enables councils to deliver housing and infrastructure faster - particularly through industrialised construction methods (10D). By integrating modular construction, BIM/GIS workflows, and pre-approved typologies, councils can move beyond

speculative rezoning and planning cycles into outcome-tied delivery models.

Outcome-based contracts such as the NEC suite - already used internationally and in some Australian major projects - shift risk and focus from adversarial delivery to shared performance. Integrated with 10D workflows, NEC-style contracting can cut procurement and variation delays by up to 30%, and deliver better certainty for both the principal and suppliers.

Together, modular 10D construction and outcome-based contracts allow for a modern equivalent of coordinated public housing delivery - but within today's regulatory and fiscal frameworks. Councils can lead, provided they are equipped with the digital and contractual infrastructure to do so.

7. Why Contract Reform is Essential for Delivery Efficiency

Queensland's current infrastructure and housing delivery contracts are built on legacy models such as AS2124, AS4000, or GC21. These frameworks are typically adversarial, reactive, and risk-heavy - leading to delays, inflated costs, and high compliance overheads. This structure actively undermines productivity by misaligning incentives and discouraging innovation.

For modular construction, offsite fabrication, or data-driven workflows to work efficiently at scale, Queensland requires a new class of procurement and contract models. The NEC suite (New Engineering Contracts), already used successfully in the UK and for major IOC-aligned projects, offers a forward-looking alternative that aligns directly with the 10D Platform.

Key advantages of NEC-style contracts include:
- Collaborative risk-sharing via early warning systems
- Outcome-based milestones linked to digital workflows
- Simpler, modular language that supports SME engagement
- Proactive change management reducing claims and disputes

NEC contracts allow integration of 10D tools such as BIM, GIS, and modular assembly tracking into the legal structure of delivery. This is critical for enabling real-time decision-making, predictable cost control, and meaningful performance measurement across both state and local government portfolios.

Without new contract models, even the most advanced digital or construction techniques will stall in the face of traditional legal friction. Contract reform must be

seen not as a legal issue but as a **core enabler of productivity reform and housing supply acceleration**.

8. Federal Interface and National Policy Alignment

While this submission focuses on state-controlled levers, the 10D Platform aligns closely with Commonwealth objectives and funding programs. It supports the aims of the National Housing and Homelessness Agreement (NHHA), and presents a high-throughput, low-waste solution that could qualify for Housing Australia Future Fund (HAFF) support in public or social housing pilots.

The approach also aligns with federal infrastructure data priorities, including the National Digital Twin framework under development by CSIRO, and recommendations from Infrastructure Australia for improved lifecycle asset governance. By connecting local delivery to shared national data and contract standards, Queensland can deliver reform with federal consistency - without creating dependency or duplication.

9. Conclusion

Queensland faces a unique moment of convergence: a growing housing crisis, rising construction insolvencies, and the delivery risk associated with Brisbane 2032. These challenges demand more than incremental reform — they require a platform-based transformation of how infrastructure is planned, procured, delivered, and maintained.

The 10D Digital Twin Platform outlined in this submission provides a practical, scalable solution to the systemic issues identified by the Commission. It enables modular housing at speed, outcome-based procurement via NEC-style contracts, and integrated digital workflows that reduce time, cost, and risk.

Rather than invent new frameworks, we propose activating one that already exists — proven, adaptable, and aligned with both state and national policy objectives. UrbanTech Plus is ready to assist in piloting this model with councils, departments, or industry bodies who are prepared to lead.

We welcome further engagement and are available to support consultation, design, or implementation planning at your request.