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CMU(Heinz) x Honda - Final Presentation

LA28 Olympics

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Honda LA28

Mobility-as-a-Service

Node-to-Node Ride-Sharing for the 2028 Olympic Games

A detailed proposal for a sustainable, efficient, and congestion-aware mobility network utilising Honda's EV fleet and official Olympic partnership, designed to manage the high-intensity mobility surges during the LA28 Games.



The Core Challenge: Mobilising LA28

The upcoming LA28 Olympic events present a significant mobility challenge. Events are concentrated in four dense clusters across the city, predictably leading to massive surges in demand for transport. Los Angeles' public transit infrastructure is fragmented, and its roads are already notorious for congestion.

Adding to this, an influx of ride-hails and private vehicles during the Games would only exacerbate emissions and travel delays. The core problem for Honda is: how do we efficiently move thousands of attendees without pushing Los Angeles' already strained gridlock past its breaking point?

Refined Problem (Honda's Directive)

Honda's directive is clear: build a data-driven, congestion-aware mobility network leveraging Honda's EV fleet. This network must prioritise predictability, reliability, and simplicity over offering unlimited routing choices to users.

Lessons from Past Mega-Events

To develop a robust mobility strategy for LA28, we have extensively analysed the approaches taken during previous major global events. Each provided invaluable insights into managing large-scale crowd movement and mitigating congestion.

1

London 2012

Employed hub-based routing and established defined spectator corridors, effectively channelling crowds towards venues.

2

Paris 2024

Plans include "no-car zones" around venues and transit options bundled directly with event tickets to encourage public transport use.

3

Rio & Beijing

Utilised dedicated shuttle lanes and controlled access points, ensuring smooth transit for accredited vehicles and participants.

4

FIFA World Cups

Relied on centralised control systems and meticulously timed crowd egress strategies to prevent bottlenecks.

Mobility success comes from predictable nodes and managed flows, not from giving users unlimited options.



Honda LA28 Node-to-Node MaaS: Our High-Level Solution

Our proposed solution is a Shared EV Mobility Network designed specifically for LA28. This system will connect people between fixed "nodes" strategically placed near residential neighbourhoods, existing public transit hubs, and Olympic venues. This approach prioritises clarity and efficiency.

Node-to-Node Routing

Provides clarity and predictability, simplifying user journeys and optimising fleet deployment.

Dynamic Pooling

Aims for 3–4 riders per EV, significantly reducing the total number of vehicles on the road.

Exclusive Access

Leverages exclusive Olympic lane access and real-time official road closure data for efficient travel.

Fully Electric Fleet

Utilises Honda's EV fleet, directly supporting LA28's sustainability targets and reducing environmental impact.

Why This Model Is Highly Effective

The Honda LA28 Node-to-Node Mobility-as-a-Service (MaaS) model is uniquely suited to address the complex transport demands of the Olympic Games. Its effectiveness stems from several core strengths, making it a reliable and sustainable solution for urban mobility.

Predictable Demand: Olympic schedules are known well in advance, enabling highly accurate demand forecasting for efficient resource allocation.

Reduced Ambiguity: Node clustering simplifies user choices and streamlines optimal routing, minimising confusion and delays.

Simplified Pricing: Flat passes eliminate the stress and unpredictability of surge pricing, ensuring fair and transparent costs for all users.

Reduced Vehicle Count: EV pooling is projected to cut the total number of vehicles needed by approximately 60%, significantly easing road congestion.

Proven Blueprint: This model is informed by the successful transport systems of London, Paris, and FIFA events, adapting their best practices to the LA context.



These combined factors ensure a highly efficient, user-friendly, and environmentally responsible transport system for LA28.



Honda B2B Olympic Mobility Solution

Transforming LA28 mobility infrastructure through innovative, sustainable transportation partnerships that serve the world's largest sporting event.

Strategic B2B Framework

Our comprehensive approach addresses mobility at every level of the Olympic ecosystem, from organizing committees to corporate partners.

01

B2B Market Overview

Key stakeholders and payment drivers

02

B2B Segments & Use Cases

Targeted solutions for diverse needs

03

Pricing & Revenue Model

Conservative financial projections

04

Cost Structure Analysis

Realistic operational economics

05

Sustainability Alignment

UN SDG integration for Honda

06

Institutional Impact

Measurable congestion & emissions reduction

07

Honda's Competitive Advantage

Why Honda wins this market

B2B Market Opportunity & Solutions

Four Primary B2B Customers

LA28 Olympic Organizing Committee

Problem: Managing 1.8M spectators across 30+ venues safely and efficiently.

Solution: Dedicated EV fleets with smart routing algorithms and predetermined routes.

Large Event Venues

Problem: Parking overflow and neighborhood disruption.

Solution: Node-based shuttle systems with dynamic capacity management.

Transit Authorities & City of LA

Problem: Last-mile connectivity gaps to Metro stations during peak Olympic traffic.

Solution: MaaS integration with existing transit infrastructure.

Universities & Corporate Partners

Problem: Guest frustration and negative brand impact from transportation delays.

Solution: Branded hotel-to-venue shuttle services integrated into hospitality programs.

Why They Will Pay

- Congestion control at critical nodes
- Secure & predictable transport
- Sustainability targets & ESG reporting
- Public safety & crowd flow management
- Brand reputation protection

1.8M

Spectators

Expected attendees across all Olympic events

100K+

Staff and Athletes

Personnel requiring coordinated transport

20+

Venues

Facilities across Greater Los Angeles

Key B2B Segments & Their Needs

Each segment faces unique mobility challenges that Honda's integrated EV platform addresses through customized solutions.

Segment	Their Problem	Honda's Solution
LA28 Organizers	Massive arrivals/departures, safety, PR management	Dedicated EV fleets with smart routing algorithms
Venue Operators	Parking overflow & neighborhood disruption	Node-based shuttle systems with dynamic capacity
Transit Authorities	Broken last-mile connectivity to Metro stations	MaaS integration with existing transit infrastructure
Sponsors & Hotels	Guest frustration & negative brand impact	Branded hotel-to-venue shuttle services

- No other rideshare company can offer this level of official, integrated, and branded mobility solution at the infrastructure scale required for LA28.

B2B Pricing & Revenue Model

Conservative, market-validated pricing across three primary revenue streams demonstrates both realism and significant upside potential.

1

Per-Venue Contracts

\$1.2M - \$2.5M per major venue for the 3-month Olympic period

Includes:

- Fleet allocation (100–300 EVs per venue)
- Drivers, charging infrastructure & maintenance
- Dedicated routes & priority lanes
- Real-time dashboard & analytics platform

10 major venues @ \$1.8M average = \$18 million

2

City / Metro Partnership

\$5 – \$7 million flat Olympic mobility partnership with municipal authorities

Includes:

- System-wide integration with Metro LA
- Real-time congestion monitoring & mitigation
- CO₂ tracking for city sustainability reporting
- Post-Olympics urban planning data

1 main city contract (midpoint) = \$5 million

3

Corporate / Campus Subscriptions

\$35,000/month per campus or corporate partner

Target Clients:

- Universities hosting Olympic events
- Media partner campuses
- Olympic village complexes
- Major corporate sponsors

15 campuses × 3 months = \$1.5 million

UN SDG & Corporate Sustainability Alignment

Direct integration with Honda's ESG reporting framework and global sustainability commitments creates measurable impact across four critical UN Sustainable Development Goals.



SDG 11 – Sustainable Cities

Decongests venues and urban zones through intelligent routing and dedicated mobility infrastructure, reducing traffic by an estimated 30-40% in Olympic corridors.



SDG 12 – Responsible Consumption

Shared EV fleet model eliminates thousands of private vehicle trips, promoting efficient resource utilization and reducing per-capita transportation footprint.



SDG 13 – Climate Action

Achieves 65%+ CO₂ emission reduction compared to traditional Olympic transport, with verified carbon accounting for corporate disclosure requirements.



SDG 9 – Innovation & Infrastructure

Smart mobility infrastructure serves as proof-of-concept for future urban deployments, demonstrating scalable solutions for sustainable city development.



This alignment gives Honda verifiable metrics for ESG reporting, sustainability disclosures, and global brand positioning — precisely what corporate stakeholders and institutional investors demand.

Why Honda Wins This Market

Honda's unique combination of automotive heritage, EV innovation, and brand reputation creates an unmatched competitive position for Olympic-scale mobility partnerships.



Brand Credibility

75+ years of automotive excellence and reliability positions Honda as a trusted infrastructure partner, not just a tech startup



EV Technology Leadership

Proven EV fleet capabilities and charging infrastructure expertise ensure operational excellence at Olympic scale



Global Presence

International recognition and established relationships with Olympic committees and municipal authorities worldwide



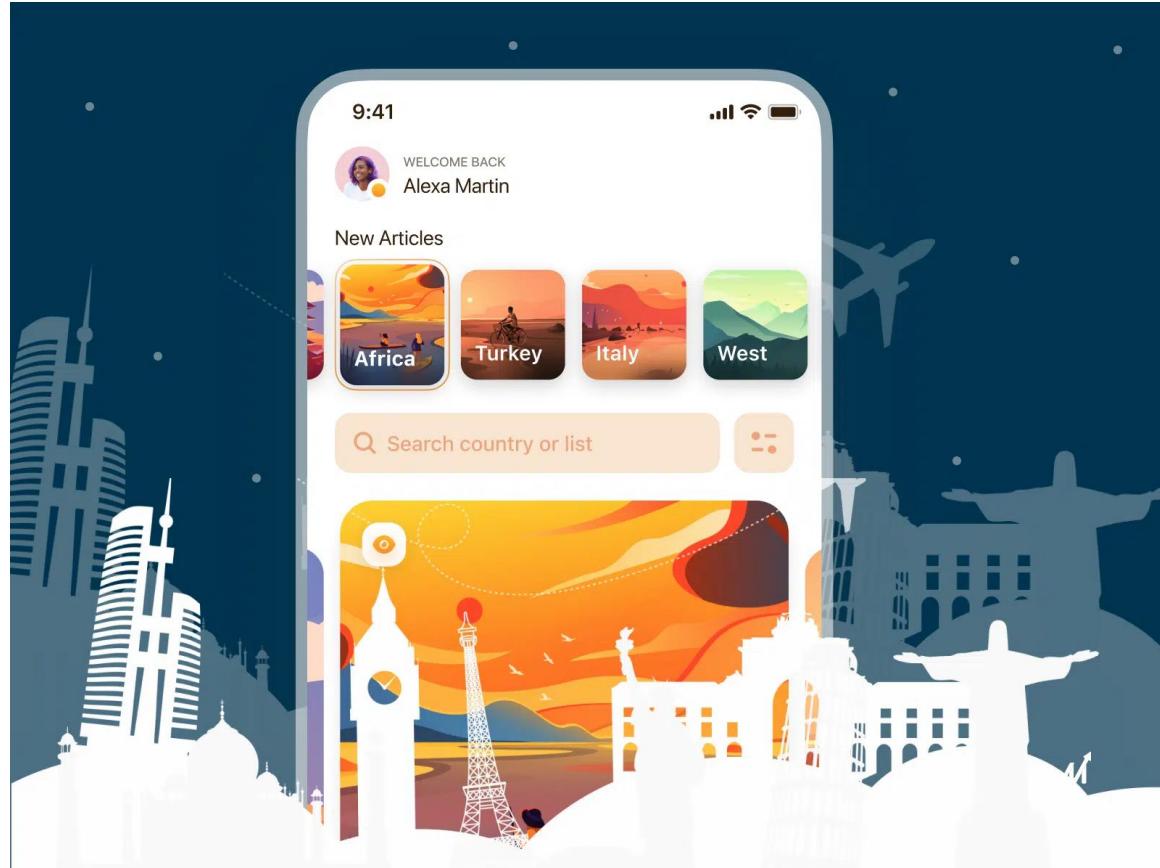
Institutional Trust

Corporate governance and financial stability that B2B clients require for multi-million dollar contracts

The Strategic Advantage

While rideshare competitors offer consumer convenience, Honda delivers enterprise-grade infrastructure that cities, venues, and corporate partners can build their Olympic strategies around. This B2B approach transforms mobility from a tactical service into a strategic asset — creating lasting value beyond LA28 and establishing Honda as the preferred partner for future mega-events worldwide.

Honda doesn't just move people. We build the mobility infrastructure that powers the world's greatest events.



Honda B2C Olympic Mobility Solution

Transforming LA28 mobility infrastructure through innovative, sustainable transportation partnerships that serve the world's largest sporting event.

Five Key User Segments



Tourists

Unfamiliar with LA transit, need multi-language support and venue navigation



Local Residents

Balance daily life with Games, avoid road closures and congestion



Daily Commuters

Must reach work on time through high-impact zones



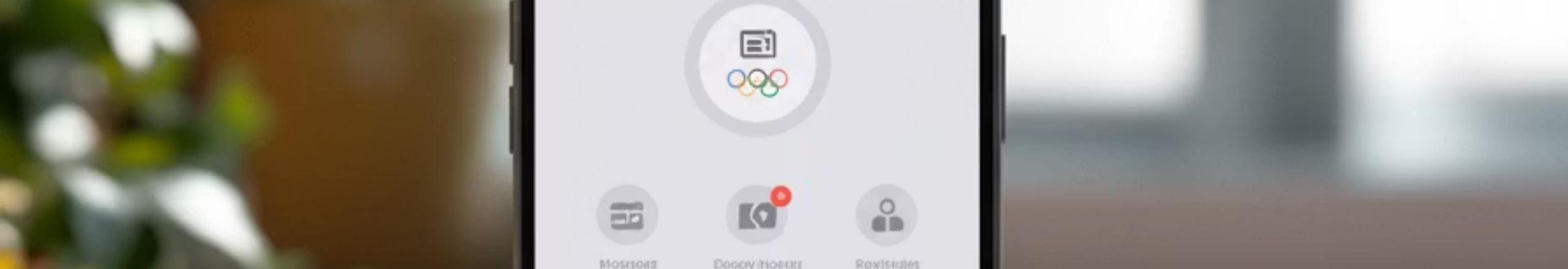
Event Staff

Early/late shifts beyond transit hours, workforce shuttles



Athletes

Secure, prioritized transport with schedule integration



B2C Pricing Strategy for MaaS Users

Our flexible pricing tiers are designed to cater to diverse user needs while ensuring accessibility and driving adoption of the MaaS platform.



Standard Day Pass

Limited rides for 24 hours. Integrated seamlessly with Olympic event tickets for convenience.

\$8



Premium Access

Priority boarding, dedicated express routes, and real-time optimized navigation to avoid congestion.

\$25



Week-Long Explorer

All Premium features for 7 days, plus exclusive discounts at partner attractions and venues.

\$50

Honda B2C Financial Projection

\$32.4M

Total Revenue

30-day Olympics period from ticket bundles with daily/weekly passes.

\$15.6M

Net Profit

~48% operational margin enabled by high pooled occupancy, optimized driver scheduling, and large-scale EV routing efficiency

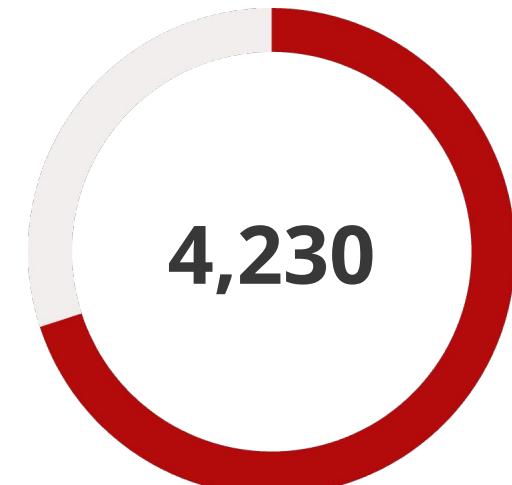
216,000

Daily Riders

67,500 trips/day at 3.2 avg occupancy across 600 pickup points

Key Operating Metrics

- 1,500 Honda EVs operating at ~80% utilization
- 67,500 trips/day delivered across 600 digital pickup points
- 600 digital pickup points ensure 3–7 min walking access for all visitors
- Localized 15–20% traffic reduction in serviced zones
- ~4,230 tons of CO₂ avoided across the event



Tons CO₂ avoided

SD Goals Aligned with B2C Approach

Our Mobility-as-a-Service (MaaS) platform and gamification strategy directly contribute to several United Nations Sustainable Development Goals, fostering a positive impact beyond the LA28 Games.



Sustainable Cities & Communities (SDG 11)

By providing efficient, accessible, and sustainable transport options, we aim to reduce traffic congestion and air pollution, making LA a healthier and more livable city.



Climate Action (SDG 13)

Our all-electric Honda fleet and incentives for eco-friendly journeys significantly lower carbon emissions, promoting a greener environment and combating climate change.



Industry, Innovation & Infrastructure (SDG 9)

The MaaS platform represents cutting-edge innovation in urban mobility, building resilient infrastructure that can be scaled and adapted for future smart city initiatives.



Why These Numbers Make Sense

Olympic Transport Precedents

London Olympics

\$2.5+ billion invested in transport infrastructure and mobility solutions

Rio Olympics

\$1.4+ billion allocated to transportation systems and services

Paris Olympics

Major transit expansion with strict car restrictions across the metropolitan area

Honda's Value Proposition

Even at **\$22M(B2B) or \$32.4M(B2C)**, this represents less than 1% of LA's projected Olympics mobility budget.

What Honda Provides:

- Complete infrastructure deployment
- Premium EV vehicle fleet
- Proprietary technology platform
- Real-time data & analytics
- Measurable sustainability outcomes
- Global brand visibility

For the scale of impact and global visibility, this is a low-risk, high-return investment that positions Honda as a mobility innovation leader.

Node Strategy: The Importance of Nodes

The node-based system is foundational to our mobility strategy for LA28. It represents a paradigm shift from traditional, chaotic door-to-door transport to a more structured and efficient network. Nodes are critical for transforming unpredictable individual requests into manageable, batchable flows, which is essential for handling Olympic-level demand.

Converts Requests Changes chaotic, individual requests into predictable, batchable flows, optimising vehicle usage.	Enables Pooling Facilitates dynamic pooling and significantly improves routing efficiency for the EV fleet.
Reduces Congestion Eliminates curbside pickups near venues, drastically reducing congestion at critical points.	Optimises Deployment Allows Honda to strategically pre-position EVs before anticipated peak surges, ensuring readiness.

Design Philosophy: Node Characteristics

For optimal functionality and user experience, all nodes must adhere to specific design principles:

Predictable: Easy to locate and consistently available.

Walkable: Located within safe, accessible pedestrian areas.

Connected: Seamlessly integrated with existing public transit.

Safe & Accessible: Well-lit, secure, and ADA-compliant.

Fleet Friendly: Designed for easy and repeated servicing by the EV fleet.

Node Strategy: Three-Tier Hierarchy

Our node network is structured into a hierarchical system of three tiers, each designed to address specific mobility needs and integrate seamlessly into the overall transport strategy. This tiered approach ensures comprehensive coverage and efficient flow management across the city.

1

Tier 1: Olympic Venue Nodes

These are the largest, highest-capacity nodes, featuring dedicated pickup and drop-off lanes. Positioned at controlled-access points near event gates, they are designed to manage massive surges of attendees before and after sessions.

2

Tier 2: Neighborhood Nodes

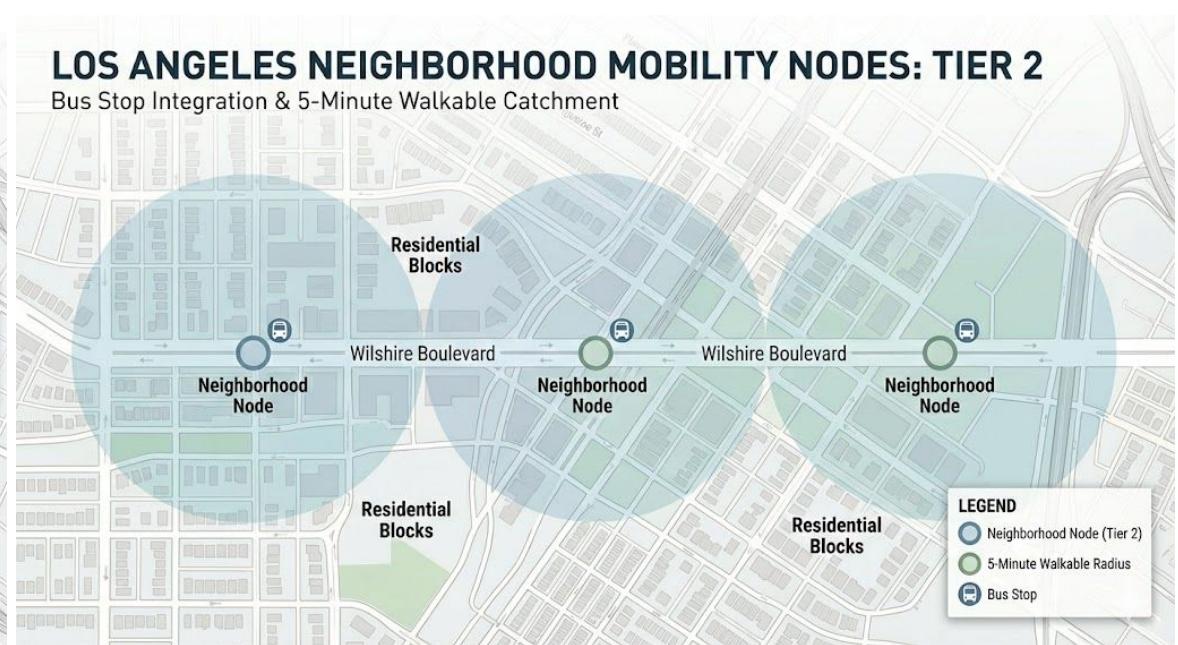
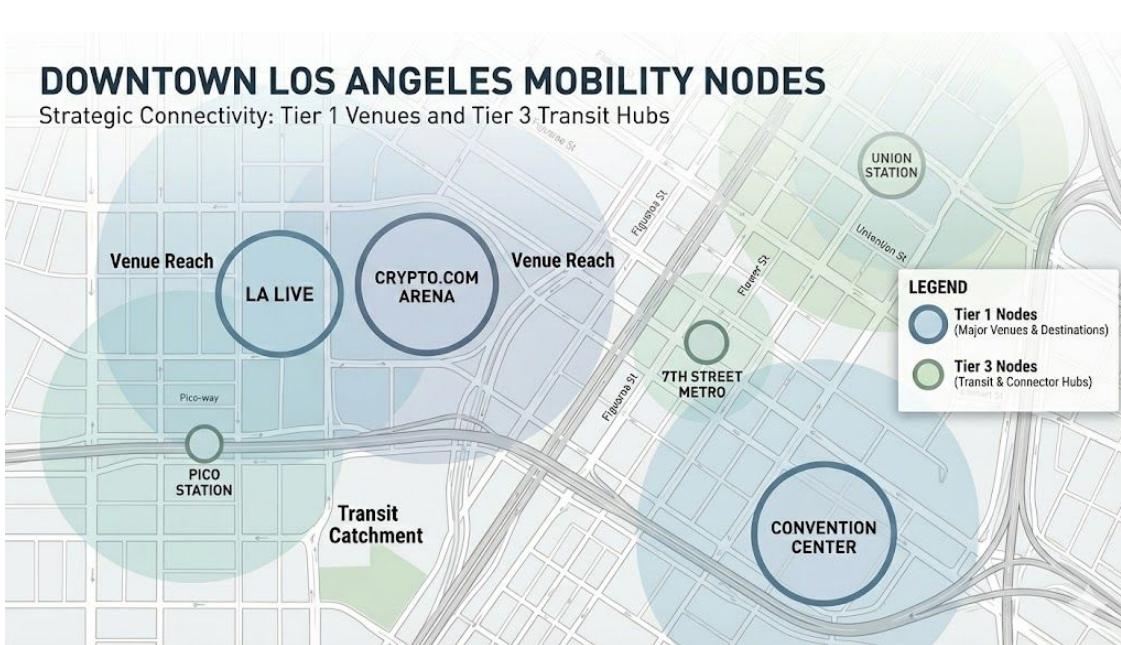
Strategically located at major arterial bus stops, these nodes provide predictable first/last-mile access for spectators and tourists. They require less infrastructure than venue nodes and emphasise high walkability in surrounding areas.

3

Tier 3: Connector Nodes (Transit Hubs)

These nodes are situated at major metro stations and key transfer points. They are crucial for supporting mode-shifting – allowing seamless transitions from metro to EV, and then to a venue. They play a vital role in distributing demand across the city's broader transport network.

Node Strategy: Three-Tier Hierarchy



Node Strategy: Our Node Selection Framework

Selecting the optimal locations for each node tier is a meticulous process guided by a comprehensive, data-driven framework. This framework ensures that every node contributes effectively to overall network efficiency and user experience, while also being adaptable to the dynamic nature of a major event like LA28.



Demand Density

Based on detailed analysis of hotel clusters, Airbnb hotspots, and projected viewing areas for Olympic events.



Accessibility

Evaluates factors like wide roads, safe sidewalks, ADA-compliant zones, and adequate lighting for pedestrian safety.



Operational Feasibility

Assesses space for EV queuing, and ensures no conflict with local restrictions or existing urban infrastructure.



Transit Connectivity

Prioritises proximity and seamless integration with existing bus routes or metro corridors for multimodal journeys.



Olympic Constraints

Incorporates critical data on planned road closures, one-way changes, and restricted zones provided directly by LA28 organisers.

This rigorous framework guarantees a consistent and reproducible process for optimal node placement.

Node Strategy: Tier 1 (Venue) Nodes

Tier 1 nodes are the cornerstones of our event-day mobility strategy, specifically engineered to manage the immense inbound and outbound traffic at Olympic venues. These nodes are critical for ensuring smooth transitions for thousands of attendees simultaneously.

Why Tier 1 Nodes Work

High Demand Management: They are designed to effectively handle the highest demand surges, especially when tens of thousands of people leave a venue simultaneously.

Controlled Flow: Require strictly controlled entry and exit lanes to prevent gridlock and ensure continuous vehicle movement.

Fleet Pre-Staging: Enable the pre-staging of EV fleets, allowing for synchronised departure waves and rapid dispersal of crowds.

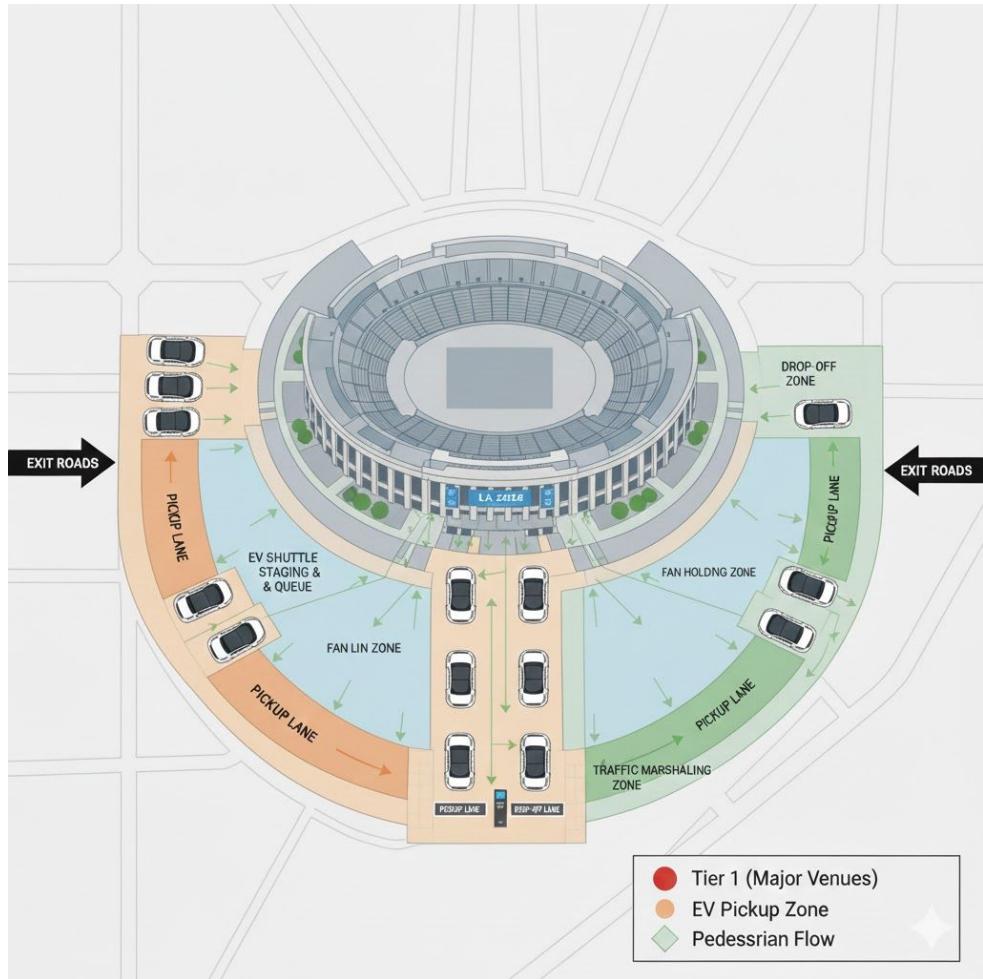
Design Features for Optimal Performance

Separate Lanes: Distinct pickup and drop-off lanes to streamline operations and avoid cross-traffic congestion.

Crowd Marshaling Areas: Dedicated spaces for attendees to gather and await their vehicles, managed by event staff.

Proximity to Gates: Direct access to venue entry gates, significantly reducing last-mile walking distances and improving user convenience.

Node Strategy: Tier 1 (Venue) Nodes Imagined



Node Strategy: Tier 2 (Neighborhood) Nodes

Tier 2 nodes form the crucial link for spectators and tourists beginning or ending their journeys in residential areas. By leveraging existing bus stop infrastructure, we ensure familiarity, safety, and efficiency for first- and last-mile connections.

Why Bus-Stop-Based Nodes Are Optimal

Optimised Infrastructure

Major bus stops are already designed for safe stopping and passenger loading/unloading, minimising the need for new construction.

Arterial Road Access

Located on primary arterial roads, these stops offer ideal ingress and egress for EVs, preventing disruptions in residential side streets.

High Familiarity

Users are already accustomed to bus stop locations, providing intuitive wayfinding and reducing confusion.

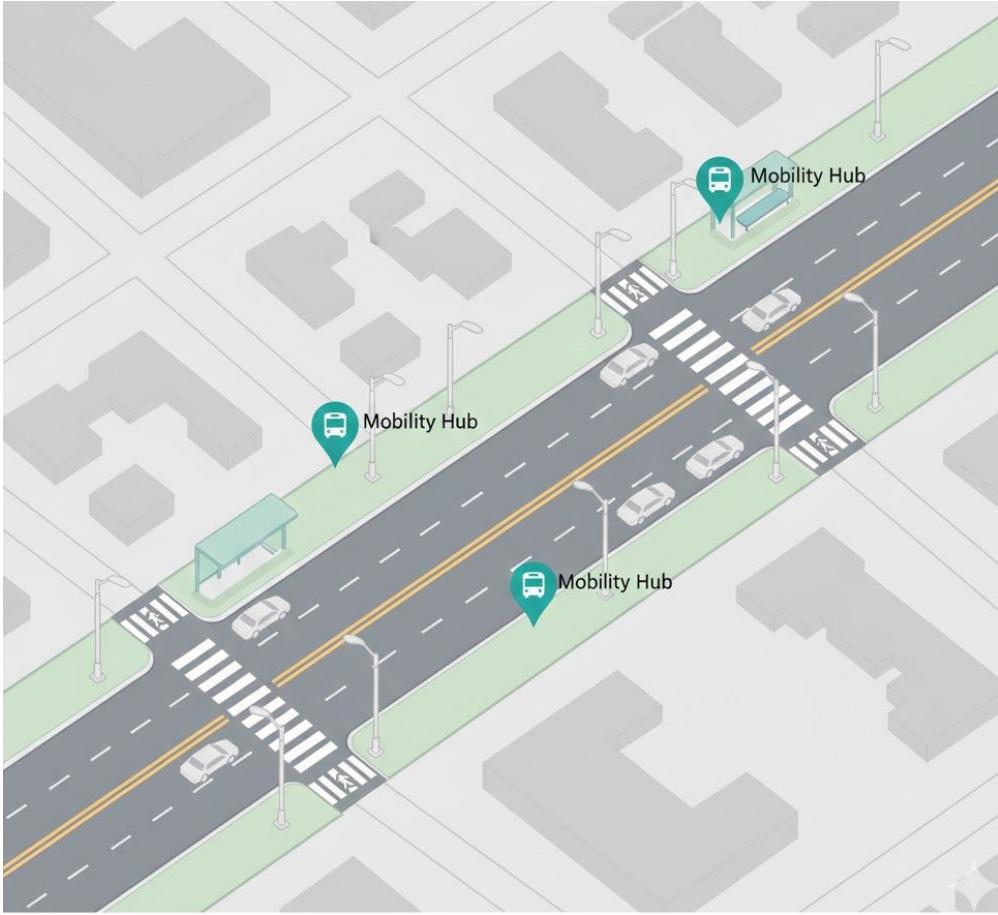
Effective Walkability

A walkability radius of 5–7 minutes from these nodes effectively covers a significant portion of residential demand.

Selection Criteria

Selection is precise: we target only major bus stops along primary corridors like Vermont Avenue or Wilshire Boulevard. Residential side streets and areas with high gradients are intentionally avoided to maintain operational efficiency and safety.

Node Strategy: Tier 2 (Neighborhood) Nodes Imagined



Node Strategy: Tier 3 (Connector) Nodes Explained

Tier 3 nodes, primarily located at major metro stations and transit hubs, are pivotal for integrating our EV network with Los Angeles' broader public transport system. They are designed to facilitate seamless multimodal journeys and strategically redistribute demand across the city.

Role in the Network

Multimodal Integration: Enable smooth transfers, for example, from a metro train to a Honda EV and then on to a venue.

Demand Distribution: Help reduce the load on neighborhood nodes by efficiently distributing citywide passenger flows.

Predictable Transfers: Support anticipated transfers during peak hours, ensuring timely connections for attendees.

Why Connector Nodes Are Powerful



Timed Arrivals

Riders exiting metro stations arrive in timed waves, which is perfect for dynamic EV pooling and rapid dispatch.

Existing Capacity

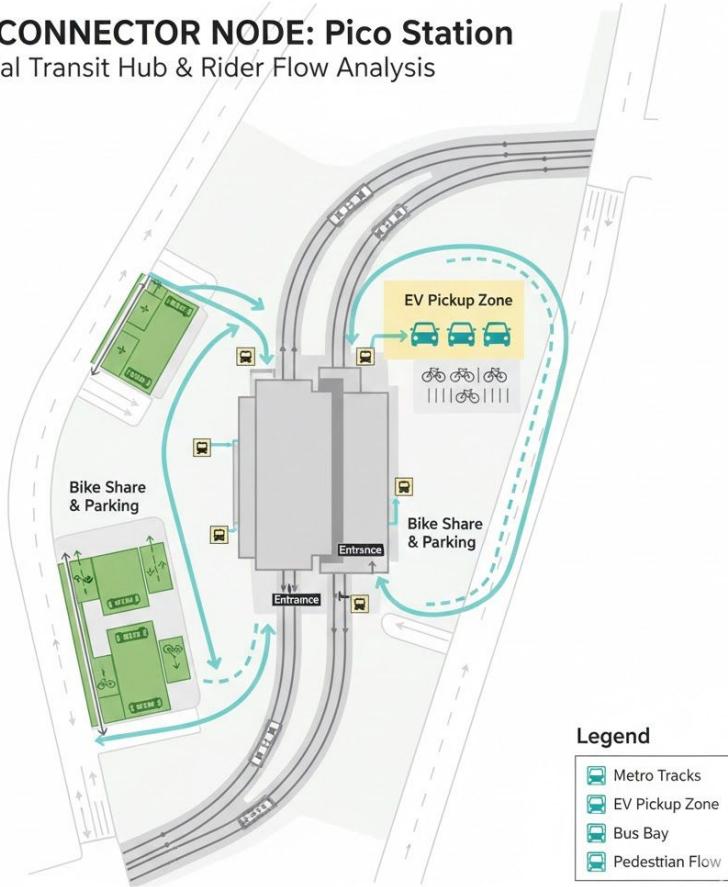
High infrastructure capacity (bus bays, plazas, clear signage) already exists, requiring minimal adaptation.

Simplified Movement

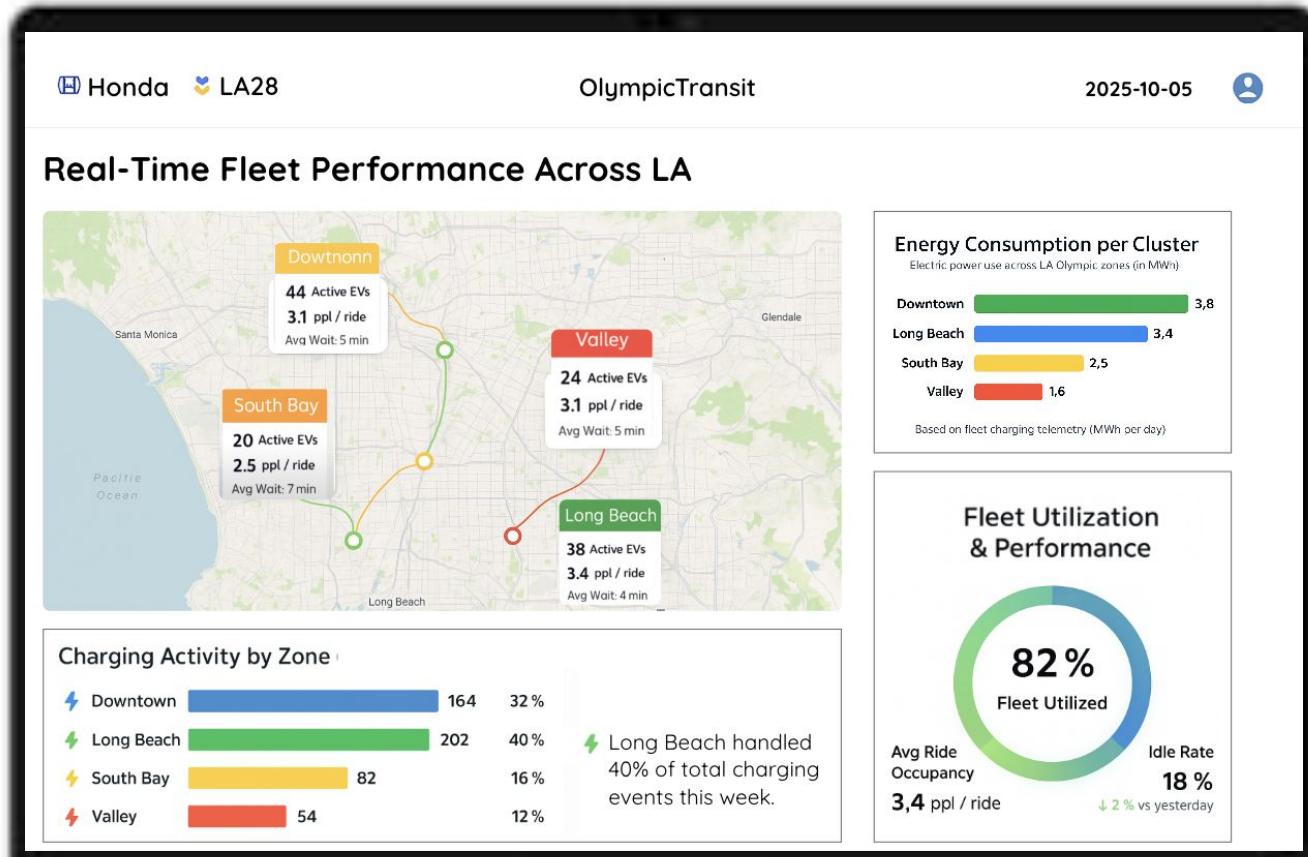
Significantly simplifies north-south and east-west movement across the vast expanse of Los Angeles, connecting key areas.

Node Strategy: Tier 3 (Connector) Nodes Explained

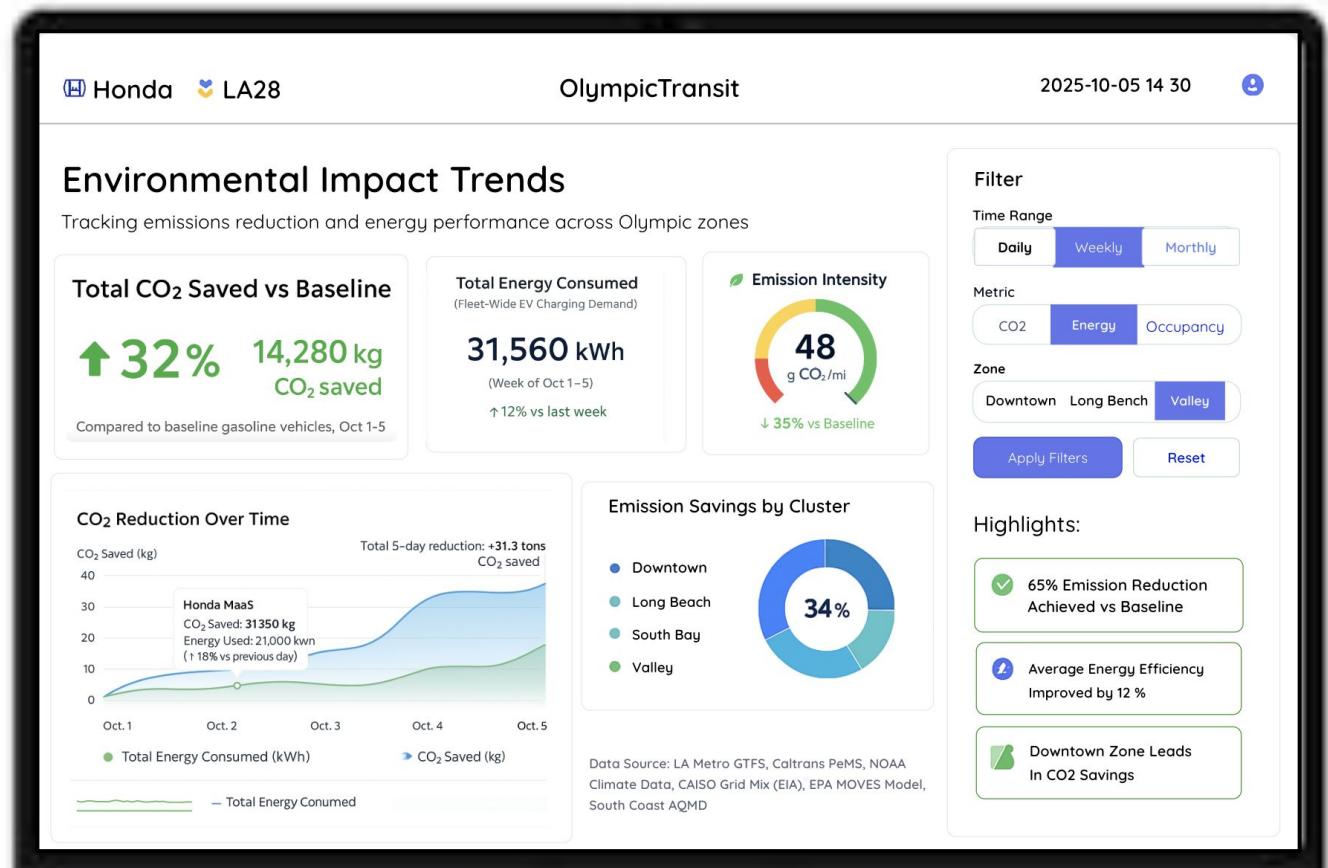
TIER 3 CONNECTOR NODE: Pico Station Multimodal Transit Hub & Rider Flow Analysis



Dashboard UI - Fleet Performance



Dashboard UI - Environmental Impact



How Honda Can Use These Dashboards

→ **Cluster-level monitoring**

Helps the team keep track of activity across Downtown, Long Beach, South Bay, and Valley, making it easier to anticipate rush periods and adjust fleet placement.

→ **Smarter energy planning**

Live charging and energy-use metrics give clearer visibility for coordinating with utilities and avoiding overload during peak event hours.

→ **Operational decision support**

Utilization, occupancy, and wait-time trends highlight where performance dips occur, allowing quick rebalancing before congestion builds.

→ **Sustainability reporting**

CO₂ savings, emission intensity, and efficiency metrics provide clear inputs for internal reporting and LA28 sustainability communication.

How the Dashboard Tie into Sustainability Goals



Real-time insights support an organized and less congested mobility network, helping LA move people cleanly and efficiently.



Energy-per-cluster and charging-by-zone visuals encourage responsible EV energy management without adding extra work for operators.



CO₂ saved, emission intensity, and reduction-over-time charts make it easy to keep track of the positive environmental impact



Fleet utilization, occupancy, and idle-rate metrics encourage efficient use of EVs and reduce unnecessary energy or vehicle deployment.

System Architecture Overview

Frontend

- React Native + TypeScript with Mapbox/Google Maps SDKs.
- Recoil/Redux for UI state across user and admin screens.

→ Routing Engine

- Time-dependent A* / Dijkstra for path computation.
- ETA + demand models using Python (LightGBM / Prophet).

→ Backend Platform

- FastAPI / Node.js microservices containerized with Docker + Kubernetes.
- Redis for caching routes, ETAs, and frequent queries.

→ Data Layer

- PostgreSQL + PostGIS for geospatial storage and zone data.
- Kafka / MQTT streams for traffic, transit, and EV telemetry.



Future Work

1. SUMO-Based Traffic Simulation

- Integrate SUMO simulations to validate congestion reduction at Tier-1, Tier-2, and Tier-3 nodes.
- Model EV flows, lane restrictions, and Olympic-time road closures.

2. Real-Time Demand Prediction Improvements

- Add LSTM / Temporal GNN-based models for more granular surge forecasting.
- Incorporate live feeds (Metro data, road closures, event egress times).

3. Dynamic Node Adjustment

- Test temporary/pop-up nodes during peak events.
- Use simulation feedback loops to adjust node capacities on the fly.

4. Charging + Energy Optimization

- Agent-based scheduler for real-time battery routing and minimizing downtime.