Virtual Earth Nation - Appendix A: Zero-Carbon Mobility Mandate (v1.0-textfix)

A.1 Policy (Binding)

• Zero tailpipe CO_2 for all transport in VEN: passenger, freight, and service vehicles.

• Energy source rules: Electricity must be 100% renewable; hydrogen must be green (electrolytic from renewables).

• Lifecycle guardrail: publish gCO_2e/passenger-km and gCO_2e/ton-km (Scope-2 electricity accounted); targets ratcheted down annually.

• Disallowed: internal-combustion engines; fossil-derived hydrogen; conventional kerosene planes.

• Allowed (if zero-emission): eVTOL, autonomous pods, micromobility, electric/hydrogen freight pods, intercity maglev and Hyperloop.

A.2 Network Design (Planes -> Maglev/Hyperloop)

• Intercity/International: replace airplanes with high-speed maglev and Hyperloop corridors.

• Stations: integrated with Section 4 depots and hubs; platform screen doors; automated baggage/parcel transfer.

• Freight: dedicated off-peak Hyperloop slots; cargo maglev consists with swap-body logistics.

A.3 Intracity Mobility (Maybe no more cars)

• Private cars: sunset path; move to shared autonomous pods plus eVTOL for medium hops.

• First/last mile: micromobility and sidewalk robots where permitted (zero-emission only).

• Curb policy: dynamic pricing; zero-emission priority lanes; no-idle zones.

A.4 Airspace & Route Approval (AI-ATC)

• Pre-flight clearance mandatory: all eVTOL/drone flights must receive AI-controlled 4D trajectory approval (space + time).

• Separation & deconfliction: real-time conflict detection, reroute, and geofenced no-fly bubbles over sensitive zones.

• Slot marketplace: time-window slots auctioned/allocated by SLA priority; penalties for deviations.

• Failsafe: en-route contingency corridors and auto-land beacons at certified pads.

A.5 Hydrogen/eVTOL Standards

• Hydrogen: on-site green H2 production or certified pipeline; leak monitoring and fire safety SOPs.

• eVTOL: noise caps (dB(A) by zone); battery/H2 safety cases; black-box logging to on-chain telemetry escrow.

A.6 Logistics Work & Jobs (WT -> VEX -> VC)

• Roles: AI-ATC controllers, tele-operators, eVTOL pilots, hydrogen techs, maglev ops, Hyperloop safety marshals, corridor planners, maintenance techs.

• Verification: telemetry plus customer/consignee attestations and randomized QA.

• Pay: WT -> VEX -> VC; surge multipliers for peak/hazard duty (aligned with Section 2).

A.7 KPIs & Safeguards

• Zero-carbon: 0 tailpipe CO_2; lifecycle gCO_2e/p-km and gCO_2e/t-km trending down.

• Safety: incidents per million ops; near-miss rate; route-approval compliance.

• Energy: kWh/p-km and kWh/t-km caps by mode; renewable share = 100%.

• Community: noise footprint; equity coverage of priority zones.

• Data integrity: tamper-evident telemetry; third-party audits; public dashboards (Section 6).

A.8 Transition Plan

• T0 (now): new concessions must be zero-emission.

• T+6 months: plane ban in VEN simulations; all long-haul demand routed to maglev/Hyperloop designs.

• T+12 months: private car phase-down milestones; shared pods + eVTOL become default.

• T+18 months: full compliance; penalties and slot restrictions for non-compliant operators.

A.9 Interoperability

• Section 2: pricing of slots/energy, WT->VEX->VC conversion, anti-hoarding.

• Section 3: safety standards, labor protections, ADR for incidents.

• Section 4: stations, depots, pads, corridors in the infrastructure pipeline.

• Section 5: concierge/returns integrated with last-mile zero-emission ops.

• Section 6: all mobility KPIs feed environmental dashboards; maglev/Hyperloop prioritized.