Autonomous Pod Community

Shareable Proposal Packet: Fleet, Residences, Operations, Workforce, and Municipal Financing

November 2026

Abstract

This packet describes a new-build community of 6.0 m autonomous residential pods on ParkShuttle-class chassis, guided by magnetic-grid markers, in an unincorporated area. Each resident has a private pod with a bedroom, workspace, and wet bath. Cooking and dining are shared in a Zone B community hub. Residents receive a $50,000 pre-tax base salary, with universal health coverage (UHC) on top. Rent target is $1,000 to $1,500 per month, closed by a recurring subsidy from a Municipal Sovereign Fund (MSF) that owns community businesses and reinvests most of its proceeds into community services, investment, and healthcare.

Two scales are modeled. Phase 1 has 2,500 residents on 2,000 resident pods and 174 spares, with fleet capital of about $254M and infrastructure of about $56M. Phase 2 has 10,000 residents on 8,000 resident pods and 696 spares, with pod capital of about $874M. At phase 1, required city-owned rent is $2,182 to $2,274 per month; at phase 2 it is $1,957 to $2,049. At a $1,250 target, the subsidy is about $22M to $25M per year at phase 1 and $68M to $77M at phase 2.

Total annual MSF outflow ranges from $47M to $49M at phase 1 if only employed residents are paid (milestone W), to $96M to $98M if all residents are paid a $50,000 universal base (goal U). Pay above three times the lowest-paid employee is redirected to the MSF. The packet lists the open decisions and the placeholders that must be replaced by quotes, studies, and legal advice before external use. The interactive residence blueprint is a companion file, 04_Residence_Blueprint_Visual_Aid.html, to be opened in a web browser; Section 4 refers to it.

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Fleet and Community Investment: Summary Proposal

Status: Draft for discussion. Figures come from the numbered documents in this packet. [PH] marks a placeholder or assumption that needs a source, quote, or legal review before any external use.

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1. Purpose

Fund and build a new-build autonomous pod community on ParkShuttle-class chassis, using magnetic-grid guidance (no guidance-system licence held). The community is funded through a Municipal Sovereign Fund (MSF) that holds commercial, white-collar, and blue-collar businesses. Residents receive a $50,000 pre-tax base salary and UHC on top, and pay rent toward a $1,000 to $1,500 monthly target.

2. What is being proposed

Element	Proposal
Phase 1 scale	2,500 residents, 2,000 resident pods, 174 spares (92% availability [PH])
Phase 2 scale	10,000 residents, 8,000 resident pods, 696 spares, 8,696 pods total
Pod	6.0 m x 2.1 m, about 120 sq ft interior, on a ParkShuttle-class chassis
Guidance	Magnetic-grid guidance (MGG) with a central fleet control system (FCS)
Employment	Milestone W: $50,000 floor for employed residents. Long-term goal U: universal $50,000 base
Pay cap	3x the lowest-paid employee ($150,000), applied to all employees. Excess goes to the MSF
Planning employment rate	60% [PH], pending sector review. Range tested: 58% to 66%

3. Fleet capital

- **Unit cost:** $116,869 per pod at 2,000 pods, against a $78,500 target. The gap is $38,369 per pod. Recurring materials and labor must fall by about 33.5% to close it [PH].
- **Pod fleet capital, phase 1:** about $254.1M for 2,174 pods.
- **Pod fleet capital, phase 2:** about $873.9M for 8,696 pods, at an estimated unit cost of about $100,500 [PH: materials discount, labor hours, and $4.5M program cost are placeholders].
- **Not yet priced:** the Zone B shared kitchen and dining facility.

4. Operations and maintenance

- **Operations:** The fleet runs 4 moves per pod per day. Peak is 60% of departures in one hour. Phase 1 needs 20 to 30 bays and about 58 dispatch FTE. Phase 2 needs about 230 dispatch FTE and 120 bays [PH: from the operational area plan].
- **Maintenance team:** 68 (lean) to 109 (full) at phase 1. 265 to 428 at phase 2.
- **Cost:** $243 to $335 per resident pod per month, including parts and facilities. Annual maintenance is about $23.3M (lean) to $32.2M (full) at phase 2. UHC is excluded here to avoid double counting.

5. Required rent and the MSF subsidy

Measure	Phase 1 (2,500)	Phase 2 (10,000)
Required rent, city-owned	$2,182 to $2,274 per month	$1,957 to $2,049 per month
Rent subsidy to $1,250 target	about $22M to $25M per year	$67.9M to $76.7M per year
Total MSF outflow, W	$47M to $49M per year	$167M to $176M per year
Total MSF outflow, U	$96M to $98M per year	$363M to $372M per year
MSF capital needed at 5% payout, W	$0.94B to $0.99B	$3.3B to $3.5B
MSF capital needed at 5% payout, U	$1.9B to $2.0B	$7.3B to $7.4B

Totals include the social outflow (UHC, floor top-ups, UBI in scenario U, less executive redirect) plus the rent subsidy.

6. Scenario W and U

- **W (milestone):** Only employed residents receive the floor. Social outflow is about $24.7M per year at phase 1.
- **U (goal):** Non-employed residents also receive $50,000. Social outflow rises to about $74M per year at phase 1 and about $295M at phase 2.
- **Sensitivity:** Each 8 points of employment moves U-scenario UBI cost by about $25M per year at phase 1.

7. Key risks

1. **Unit cost.** The $38,369 gap to target is the largest single driver of capital.
2. **Rent gap.** A permanent subsidy is needed. Pods are replaced on a 12-year cycle, so the subsidy does not end.
3. **MSF split.** The rent subsidy and the majority reinvestment into community services, investment, and healthcare compete for the same money. The split must be set explicitly.
4. **Employment rate.** Sector shares and age mix are not yet linked. The 60% rate is a planning figure.
5. **Pay cap tail.** Percentile wage data is not yet pulled, so the cap's cost is a sensitivity only.
6. **Egress and certification.** The bedroom egress is not yet compliant and must be resolved before certification.

7. **Jurisdiction.** Zoning and the regulatory route for autonomous operation are unresearched.

8. Decisions needed

- Confirm the 60% planning employment rate after the sector projections review.
- Set the majority reinvestment definition for the MSF.
- Choose the cap basis: base salary or total compensation.
- Choose the rent target: $1,000, $1,250, or $1,500.
- Decide whether phase 2 is committed now or after phase 1 results.

9. Open items

- Jurisdiction research (pending).
- Bedroom egress design.
- Shore power voltage and PDLC fail-safe state.
- Zone B kitchen costing.
- 18 to 24 employment rate (placeholder 55%).
- BLS percentile wages for the all-employee cap.

Source documents

- Municipal Financial Strategy (10)
- Bill of Materials and Cost Estimate (05)
- Operational Area Plan (06)
- Maintenance Team Plan (07)
- Workforce and Compensation Model (08)
- Sector and Employment Projections (09)
- Master Community Proposal (01)
- Magnetic Grid Guidance spec (02)

Scope note: Operational detail is in the Operational Area Plan (06). Maintenance detail is in the Maintenance Team Plan (07). Vehicle detail is in the Bill of Materials (05), the Magnetic Grid Guidance spec (02), the Residence Details (03), and the Residence Blueprint visual aid (04). Community economics are in the Municipal Financial Strategy (10). Where this document differs from those, they govern.

Master Community Proposal

Scope: New-build residential pods on dedicated berths, with commercial, office, services, and shared community facilities. **Status:** Draft for discussion. Jurisdiction, zoning, and regulatory sections are placeholders until research is complete. Financial figures are in `Municipal Financial Strategy (10)`. Vehicle costs are in `Bill of Materials (05)`.

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1. Summary

- **Site:** New build, unincorporated area. Zoning path to be confirmed.
- **Vehicle:** New-build pod on a ParkShuttle-class chassis where obtainable. Ground-up spaceframe is the fallback.
- **Guidance:** Magnetic grid, chosen over fixed rail. No license held.
- **Homes:** Living and sleeping only. Cooking is a shared service in Zone B.
- **Scale:** 500-pod pilot. 2,000 pods for 2,500 residents. 8,000 pods for 10,000 residents.
- **Rent:** Target $1,000 to $1,500 per month, supported by the Municipal Sovereign Fund (Section 7). The funding is not yet committed.
- **Ownership:** Open. Four models under discussion.

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2. Audiences and what each needs

Audience	What they need from this proposal	Where covered
Host jurisdiction (county or special district)	Land use, public benefit, infrastructure cost, service obligations, zoning path	Sections 4, 6, 7, 8
Developer	Site plan, phasing, infrastructure scope, sale or lease options	Sections 4, 5, 8, 9
Investor	Capital stack, returns, risk, ramp timing, fund structure	Section 7; Municipal Financial Strategy (10)
Factory partner	Volumes, unit spec, certification path, order schedule	Section 9; Bill of Materials (05)

A separate manufacturing case will be prepared for the factory partner.

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3. Concept and daily cycle

Each pod houses one household of one or two residents, with about 120 sq ft of interior. The pod is a home and a vehicle.

Cooking, shared dining, and community services are in Zone B, so pods carry no cooking surface. This is intended to reduce food waste and the cleaning needed in each home. Savings are not yet quantified.

The daily cycle has four stages: 1. **Overnight berth:** Connected to shore power and water. 2. **Morning commute:** Residents seated and restrained. Pod drops them at work. 3. **Staging:** Pod drives empty to a staging structure outside the commercial core. 4. **Evening pickup:** Pod is summoned to a transit or dining node, then returns to its berth.

Open point: Two of the four daily moves are empty. The congestion benefit has not been measured. Total vehicle-kilometers must be compared with the car trips replaced before the congestion claim is made.

Occupant policy: Sleeping and lying down only when parked.

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4. Land use

- **Zone A: Residential berths.** Landscaped perimeter, pedestrian paths, gardens, pavilions. Each berth has shore power, water, sewer, and data.
- **Zone B: Commercial, shared services, and third-space hubs.** Multi-story plazas with raised pod bays. Shared kitchen and dining, grocery, fitness, library, and entertainment.
- **Zone C: Office and light industrial.** Automated drop-off portals, co-working, research, light manufacturing. Also home to MSF-owned businesses (Section 7).
- **Zone D: Services and depot.** Fleet control, pod wash, battery diagnostics, service bays, refurbishment line.
- **Staging structures:** Sized to the fleet, about 2,000 stalls at full build. Stall width is open. A 2.2 m stall width is too narrow for a 2.1 m pod with a side door. Clearance study required.
- **Acreage:** To be determined by site plan.

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5. Mobility and guidance

- **Dedicated loop:** Magnetic markers in roadways and berth pads at 2 to 4 m intervals.
- **Accuracy target:** 1.5 cm, to be verified.
- **Control:** Fleet Control System (FCS) for dispatch and routing. Onboard hardwired emergency stop, plus remote stop from FCS.
- **Intersections:** The dedicated loop has no signals in the design. Interaction with public roads at the boundary depends on the jurisdiction.
- **Pedestrian priority:** Commercial and office zones are pedestrian-first, with separate pod and tram rights-of-way.

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6. Regulatory and permitting (placeholder)

Research on the host jurisdiction is pending. No rule is stated until verified.

- **Vehicle:** AV operation approval, vehicle certification path, and exemptions. To be determined.
- **Dwelling:** The pod is also a home. Whether it falls under building or housing standards, vehicle standards, or both is open.
- **Zoning:** Permanent residence needs a residential category. Standard short-stay park rules often limit stays.
- **Egress:** The bedroom needs an operable or break-out egress. The desk window does not yet qualify (Bill of Materials (05), Section 8).
- **Safety:** Fire and battery standards, to be set with the jurisdiction and certifier.

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7. Community economics and the Municipal Sovereign Fund

7.1 Intent (draft statement, not binding)

The Municipal Sovereign Fund (MSF) is intended to own and operate community-owned commercial, white-collar, and blue-collar businesses within the community. The businesses are expected to:

1. **Cap executive compensation** at 3 times the lowest-paid employee's pay. The cap is an intentional restriction. Whether "pay" means base or total compensation is to be defined.
2. **Pay a base salary of $50,000.** First stage: MSF employees. Long-term aim: a universal base for residents, not costed in the current model (Section 7.4).
3. **Reinvest a majority of portfolio proceeds** into community services, investment, and healthcare. "Majority" to be defined [PH: more than 50% of distributable proceeds].
4. **Support residential rent** at a target of $1,000 to $1,500 per month, subject to the funding commitment in 7.3.

7.2 Points to define before the intent is shared

- **Legal form and authority.** A county or special district may lack authority to create a sovereign fund. "Sovereign" is a loaded term for an unincorporated area. A name such as "Community Investment Fund" may be more accurate. Counsel to confirm entity type.
- **Scope of the $50,000 base.** Resolved for the first stage: MSF employees. A universal base is the long-term aim.
- **Capital source.** A mix of investors and an MSF portfolio of digital and manufactured goods and services. Portfolio detail is outside this document. The payout and return assumptions depend on it and are not yet supported.
- **Securities.** If residents hold shares or membership interests, counsel should confirm whether securities rules apply.
- **Tension with reinvestment.** Rent subsidy and reinvestment draw on the same proceeds. The priority order must be set.
- **Concentration risk.** A downturn in the local economy can affect income and subsidy together.

7.3 What makes the intent count toward rent

Documented intent supports governance and the narrative. It does not lower rent alone. Lenders, investors, and residents will need a funded commitment, covering: - **Capitalization:** Amount, source, and schedule. - **Payout rule:** How much flows to housing each year, and the formula. - **Rent-setting rule:** Who sets rent, and when it can change. - **Return assumptions:** Stated and stress-tested, including a downturn case. - **Priority:** Where housing ranks against services, investment, and healthcare. - **Reporting and audit:** Annual audited statements to residents and the host jurisdiction. - **Review and exit:** What happens if returns fall short.

The Municipal Financial Strategy (10), Section 6, shows the subsidy needed to reach the rent target. At a $1,250 target, that is about $22M to $25M per year at 2,500 residents and about $68M to $77M per year at 10,000 residents.

7.4 Wage costs

- **Employee base at $50,000:** Each 100 MSF employees costs about $5.0M per year in base pay, before benefits and payroll taxes. The cost sits in the portfolio businesses and reduces their margins, so return assumptions must include it.
- **Fleet operations:** The $120 per pod per month line (about $2.9M per year at 2,000 pods) equals about 58 full-time staff at $50,000 base alone. The staffing plan must be checked against this.
- **Executive cap:** At 3 times a $50,000 lowest-paid salary, the cap is $150,000. If any employee is paid less, the cap falls. The basis must be defined.
- **Universal base (long-term aim):** $50,000 for every resident would cost about $125M per year at 2,500 residents, and about $500M per year at 10,000. This is not in the rent model. It would need its own funding source, and it is far larger than the capital discussed in the financial strategy.

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8. Ownership and finance models (decision)

Model	Who owns the pod	Resident monthly cost (Municipal Financial Strategy (10))
A	Public or community entity, leased to residents	To be re-run on the current cost basis (required rent $2,182 to $2,274 at 2,500 residents)
B	Resident owns the pod on community land, pays a site fee	About $1,385 (20-year loan) to $1,695 (12-year loan), before any subsidy
C	Developer owns and rents	Similar to B-scale rent, with developer margin
D	Hybrid, subsidized through the MSF	Target $1,000 to $1,500

Under the current BOM, a city-owned lease at $1,000 to $1,500 needs a recurring subsidy. The size depends on the operating costs and the unit cost actually achieved.

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9. Phasing

Phase 1 (months 1 to 12): Site work and infrastructure. 500 berths. 500 pods, about $70.6M pod cost at current assumptions, plus infrastructure. FCS live on the loop.

Phase 2 (months 13 to 24): Zone B shared services, commercial and office drop-off, staging structures. Scale to 2,000 pods.

Phase 3 (months 25 to 48): Expand to 8,000 pods and 10,000 residents. Refurbishment line in operation.

Pod life: The plan assumes a 12-year life. Whether pods are replaced or refurbished at year 12 is open.

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10. Open decisions and questions

1. **Ownership model** (Section 8).
2. **MSF:** Legal form, name, and a binding funding commitment. Universal base timing and funding (Section 7.4).
3. **Chassis:** Availability and licensing of a ParkShuttle-class chassis, or ground-up.
4. **Jurisdiction and zoning path** (after research).
5. **Guidance technology:** License, partner, or develop.
6. **Rent target:** Confirm $1,000 to $1,500 and whether it applies to all pods or a tier.
7. **Pod life:** 12-year replacement or refurbishment.
8. **Occupancy:** One or two residents per pod. Drives the 1.25 residents-per-pod assumption.
9. **Congestion case:** Is total vehicle-kilometer reduction the right measure, given empty moves?
10. **Zone B shared kitchen and dining:** Cost, operator, and whether it is part of the MSF.
11. **Electrical service and staging geometry:** Shore power voltage and stall width.
12. **Majority reinvestment:** Define “majority” (more than 50% of distributable proceeds is the working assumption).
13. **Cap basis:** Base or total compensation for the lowest-paid employee.
14. **MSF return and payout assumptions:** Depend on the portfolio, which is outside this document’s scope.

Magnetic Grid Guidance, Navigation, and Door-Side Panel Specification

Platform: 6.0 m autonomous residential pod, new build, ParkShuttle-class chassis where obtainable. **Status:** Draft for discussion. Performance values are targets to verify by test, not established results.

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0. Design basis

- The guidance system is **Magnetic Grid Guidance (MGG)**. No license is held.
- The central fleet server is the **Fleet Control System (FCS)**.
- Charging is overnight AC only. No fast-charge claim is made.
- A hardwired onboard emergency stop is fitted. The remote stop is secondary, not the only stop.
- Residents are seated and restrained during transit. Bed use is only when parked.
- Egress, fire, and battery safety requirements are design inputs.
- Cooking is a Zone B community service. A 12 V fridge remains for food storage.
- Egress is not yet compliant: the desk window does not meet residential requirements (see Section 5).

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1. System architecture

- **MGG (guidance):** Permanent magnetic markers in dedicated roadways and berth pads, read by under-chassis sensor bars. Chosen over fixed rail. Technology path (license, partner, or in-house) is open.
- **Onboard AV controller:** Redundant drive-by-wire compute with sensor fusion. Dual independent processing is a requirement, not yet designed.
- **FCS (central):** Route optimization, dispatch, staging, and telemetry. Off-vehicle.
- **Gateway:** 5G-NR and C-V2X communications to FCS.
- **Sensors:** Dual endcap 3D LiDAR, eight ultrasonic sensors, wheel encoders, MGG sensor bars.

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2. Localization

- **Markers:** Cylindrical permanent magnets, 15 mm by 30 mm, flush-mounted at 2 to 4 m intervals in dedicated roadways and berth pads.
- **Sensors:** Two multi-axis sensor bars, front and rear axles. They correct wheel-odometry drift.
- **Target accuracy:** Position within 1.5 cm, heading within 0.2 degrees. **To be verified by a field test plan (Section 11).**
- **Berth pads:** Markers in every berth pad add to infrastructure cost. Confirm density with engineering.

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3. Obstacle detection

- Bi-directional 3D LiDAR, 250 m range, 360 degree field of view, one at each endcap.
- Eight ultrasonic sensors for low-speed proximity around walkways and berths.
- Cameras (eight) for classification and occupant monitoring.
- Obstacle behavior and failover logic are not yet specified.

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4. Operating cycle

1. **Overnight berth:** Connected to shore power and water. Charges overnight.
2. **Morning departure:** Disconnects, retracts jacks, enters the MGG corridor. Occupants are seated and restrained.
3. **Drop-off:** Pod crabs to a level passenger platform, aligning within a 2 cm target. Smart glass door goes transparent.
4. **Staging:** Pod drives empty to a staging structure outside the commercial core.
5. **Evening pickup:** Dispatched by panel or app. Pod drives empty to the pickup point, then loads occupants.
6. **Return:** Pod returns to its berth.

Note: Two of the four daily moves are empty. The congestion benefit must be measured against this. Not yet quantified.

Occupant policy: The bed and sleeping are permitted only when the pod is parked. Transit is seated and restrained. Regulators will decide the final rule.

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5. Safety

- **Emergency stop, onboard:** Hardwired, independent of the fleet network. Required.
- **Emergency stop, remote:** From FCS. Secondary to the onboard stop.
- **Door release:** Manual inside release for the entry door, with no lock that needs a key from inside.
- **Egress (open, not yet compliant):** The proposed egress is the desk ribbon window. It does not yet meet typical residential requirements. It is 0.45 m (about 18 in) tall, it is fixed PDLC glazing that cannot open, and it sits over the central workspace, not the sleeping area. Required: an operable or designated break-out egress serving the bedroom, sized to the verified code minimum. Residential codes commonly use a 5.7 sq ft net clear opening, 24 in minimum height, and 20 in minimum width; verify against the adopted code. The lockable bedroom vault must not block the egress path. The entry door (70 cm) is not yet verified as an egress route for the sleeping area.
- **Fire:** Smoke and heat detection, suppression, and battery thermal monitoring. The subfloor LiFePO4 pack needs thermal-runaway design. Confirm applicable battery safety standards with the certifier. Examples to check include UL 2580 for EV battery packs.
- **Crash protection:** Occupant restraint system (BOM line 20). Crash standards for occupant position are not yet defined.

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6. Charging and energy

- **Charging:** Overnight from shore power only. Rate to be stated in kW at input and output. A 15-minute 80% charge on 50 kWh would need roughly 160 kW. The listed 50 A charger cannot deliver that.
- **Shore power:** Voltage and current to be fixed (50 A shore is usually 240 V). Transfer switch and input protection required.
- **Energy budget:** 50 kWh pack, 48 V bus. Off-grid for about 15 hours per day, including 800 W average HVAC (about 12 kWh over that period) before driving. A full daily energy budget is required.
- **Loads:** Inverter 3,000 W continuous. Main loads: HVAC, driving, cooking, computing, lighting.

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7. Electrical

- 48 V DC main bus, 50 kWh LiFePO4, subfloor.
- 12 V auxiliary battery for door panel, controls, and emergency systems.
- 3,000 W pure sine inverter and charger.
- AC distribution panel: input voltage and main breaker to be reconciled with the shore power spec.
- DC fuse block, GFCI and AFCI where applicable.

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8. HVAC and ventilation

- 12,000 BTU variable-speed heat pump. The supplier must confirm a 48 V-native unit at this capacity. If not available, use a 120/240 V unit with an inverter.
- Two zones (bedroom vault and central workspace) via ducted zone dampers.
- ERV in the wet bath, 85% heat recovery as stated by supplier, to verify.
- Heat-load calculation at design temperatures required. The 800 W figure is not yet validated.

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9. Smart glass (PDLC)

- **Entry door (70 cm x 200 cm), desk ribbon window (1.58 m x 0.45 m), bedroom panoramic window (1.50 m x 1.20 m).**
- PDLC claims of 99.5% light blocking and 0.5% visible transmission are aggressive. Require supplier datasheets.
- **Fail-safe state (opaque or transparent on power loss) is open.** Decide with the egress review. Opaque on power loss protects privacy but reduces visibility from inside during an emergency.
- Glass drivers: one per zone (BOM line 8).

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10. Door-side smart panel

- 15.6 in industrial IPS touchscreen, 1920 x 1080, anti-glare, mounted on the partition wall beside the entry door at 145 cm centerline.
- Connectivity: Gigabit Ethernet (internal bus), Wi-Fi 6E, 5G-NR, C-V2X.
- Backup: 12 V auxiliary buffer battery.
- Functions: instant dispatch, scheduled departures and pickups, live telemetry, climate and glass controls, emergency stop to FCS, manual door release.
- The panel's emergency stop is a request to FCS. The onboard hardwired stop is separate (Section 5).

10A. Serviceability and maintenance access

- **Service access:** Removable panels for the drive, battery, HVAC, ERV, water, and electrical bays. The battery bay is accessible from underneath, with a lockout-tagout interlock.
- **Jacking and lift points:** Defined at four corners, rated for the chosen chassis. The depot lifts or pits must match.
- **Sensor service:** MGG sensor bars removable without axle disassembly. LiDAR endcaps removable for replacement. Calibration target and procedure defined for each sensor.
- **Diagnostics:** Onboard diagnostic port, plus remote diagnostics through FCS. Logs retained for safety review.
- **Battery service:** BMS readout and cell-level health data. Module-swap design for the mid-life replacement.
- **Egress and fire:** Maintenance must not require removing the egress window or the bedroom vault fixtures.
- **Interior:** Wall and cabinet panels removable without damaging fire or acoustic barriers.
- **Occupant protocol:** No work on a pod with a resident inside. A loaner pod is provided first.
- **Service schedule:** See the Maintenance Team Plan (07), Section 2.

11. Test and validation plan (proposed)

1. MGG localization accuracy on a test loop, including wear and debris.
2. Emergency stop response, onboard and remote.
3. Fire, battery thermal event, and suppression tests.
4. Egress test with occupants inside.
5. Occupant restraint crash test on the chosen chassis.
6. HVAC performance at design temperatures.
7. Energy budget on a representative daily cycle.
8. Smart glass switching, fail-safe state, and durability.

---

12. Open items

1. Guidance technology path (license, partner, or develop).
2. Chassis choice: ParkShuttle-class availability and licensing, or ground-up.
3. Shore power voltage and current.

4. Fail-safe state for PDLC glass.
5. Occupant restraint and crash standard for the chosen vehicle class.
6. Battery safety standards and certifier.
7. Energy budget and heat-load calculation.
8. Mass budget.
9. Operable egress design for the bedroom, and its verification against the code.

Residence Details: 6.0 m Autonomous Residential Pod

Status: Draft for discussion. Dimensions and component data come from the Residence Blueprint (04). Items marked [PH] or "to confirm" are not yet verified. **Related:** Vehicle guidance (02), Bill of Materials (05), Operational Area Plan (06), Maintenance Team Plan (07).

---

1. Overview

- **Size:** 6.0 m long, 2.1 m wide, 2.8 m high. Interior is about 120 sq ft.
- **Layout:** One bedroom with a queen bed, a central workspace and living area, and a rear wet bath. Pods have no cooking surface.
- **Cooking and dining:** Shared in Zone B, the community's third-space hub. A 12 V fridge in the pod is for food storage only.
- **Power:** 50 kWh LiFePO4 underfloor battery, 48 V DC system, 3,000 W pure sine inverter.
- **Climate:** 12,000 BTU variable-speed heat pump with dual-zone ceiling diffusers and a bathroom energy recovery ventilator.
- **Guidance:** Magnetic Grid Guidance (MGG) with a Fleet Control System (FCS) off-vehicle. The guidance spec is in Section 02.

---

2. Zones and areas

Zone	Footprint	Area	Notes
Rear wet bath	1.20 m x 2.10 m	2.52 m² (27.1 sq ft)	Sliding pocket door, polyurea liner
Central workspace and living	2.80 m x 2.10 m	5.88 m² (63.3 sq ft)	Desk, chair envelope, flanking shelves, entry door
Bedroom and storage vault	2.00 m x 2.10 m	4.20 m² (45.2 sq ft)	Longitudinal queen bed, under-bed vault
Sum of zones	6.00 m x 2.10 m	**12.60 m² (135.6 sq ft)**	Equals the outer footprint, not the stated interior

Open item: The stated interior of about 120 sq ft (about 11.1 m²) does not match the zone sum. Confirm whether the zone areas include wall thickness, and restate one basis.

---

3. Living and sleeping

Workspace - Desk: 1.78 m W x 0.50 m D (70 in x 20 in). Fits dual 27 in ultra-wide displays. - Connectivity: AC, USB-C PD, and Ethernet pass-through. - Chair envelope: 1.28 m diameter, so the chair moves without blocking the central walkway. - Flooring: commercial resilient vinyl plank.

Bed and storage - Bed: queen mattress, 1.52 m W x 2.00 m L (60 in x 80 in), placed lengthwise. - Platform height: 55 cm, with under-bed storage. - Side walkway: 58 cm clear (22.8 in) by 1.93 m long. - Storage vault: hinged, lockable access panel. Supports about 850 L of cargo. - Shelving: two floor-to-ceiling units, each 45 cm wide with four adjustable Baltic birch trays. The right unit sits flush against the partition wall.

Seating and restraint: Residents are seated and restrained during transit. Bed use is only when parked.

---

4. Rear wet bath

- **Footprint:** 1.20 m x 2.10 m interior, framed with Baltic birch and lined with seamless molded polyurea.
- **Door:** Sliding pocket door in the wall, STC 35 acoustic rating.
- **Shower:** 75 cm x 85 cm fiberglass pan with a wall-mounted thermostatic mixer valve. PEX-a flexible water lines.
- **Vanity:** Wall-mounted matte composite micro sink with a tall swivel faucet. Low-profile P-trap to the grey tank.
- **Toilet:** Swivel-bowl cassette toilet, 18 L removable cassette, active carbon vent.
- **Ventilation:** Bathroom energy recovery ventilator, 85% heat recovery, automatic humidity sensor.

---

5. Glazing

Element	Size	Function
Entry door panel	70 cm entry, PDLC	Switches in under 100 ms between clear and 99.5% privacy. Low-E double-pane argon, laminated tempered glass
Desk ribbon window	1.58 m W x 0.45 m H	Electrochromic, automated solar-tracking tint, 99% UV filtration. Fixed, not operable
Endcap panoramic window	1.50 m W x 1.20 m H	Electrochromic, 0.5% to 70% visible light transmission. Opaque frost or total blackout for sleep

Privacy control: Set by app or wall touch control. The PDLC fail-safe state is open (see Section 8).

---

6. Systems

Climate and air - Heat pump: variable-speed DC inverter on the front nosecone. 12,000 BTU cooling, 24.5 SEER2, reverse-cycle with PTC backup. Runs natively on 48 V DC. - Ductwork: dual-zone linear slot diffusers in the acoustic headliner. Independent control for the bedroom vault and the workspace. 280 CFM high, 90 CFM night mode. Under 28 dBA.

Power and distribution - Battery: 50 kWh LiFePO4 bank under the subfloor. Charged overnight from AC only. Charge rate to be confirmed. - Inverter/charger: 3,000 W continuous, 6,000 W surge for 5 seconds. Converts 48 V DC to 120 V AC. 50 A AC-to-DC charger. - Distribution panel: 120 V / 30 A main with four sub-circuits. 12 V 12-position smart fuse block. GFCI and AFCI protection. Bluetooth circuit monitoring. - Outlets: desk has dual 120 V AC and two 100 W USB-C PD ports. Bedside has two 100 W USB-C PD ports.

Utility hookup - Service bay at each overnight berth: 50 A smart shore power connection (voltage to be confirmed), filtered city water inlet, and tank fill.

Guidance and sensing - Magnetic Grid Guidance sensor array: under-chassis sensors read markers in the transit roadway. Docking precision under 1.5 cm. - LiDAR: 360-degree units at both endcaps, 250 m continuous sensing. Dual independent processing units.

---

7. Daily use

Stage	Time	What happens
1. Overnight berth	00:00 to 07:30	Pod docks at a perimeter berth. Shore power and water connect. Battery charges to 100%. Tanks cycle.
2. Commute	07:30 to 08:30	Pod disconnects and enters the dedicated autonomous corridor. Resident works at the desk, seated and restrained.
3. Staging	08:30 to 17:00	Pod drops the resident at work and parks at a remote staging lot, then serves dispatch.
4. Evening summon	17:00 to 23:00	Resident summons the pod by app from a third space. Pod returns to its overnight berth.

Egress (open, not yet compliant): The current egress is the desk ribbon window. It is 0.45 m tall, fixed, and sits over the workspace, not the sleeping area. Residential requirements are not met. The bedroom needs an operable or designated break-out egress. Typical residential

minimums to verify against the adopted code: 5.7 sq ft clear opening, 24 in minimum height, and 20 in minimum width.

---

8. Open items

1. Interior area basis: zone sum (12.60 m²) versus stated interior (about 11.1 m²).
2. Bedroom egress: operable or break-out design, sized to the verified code minimum.
3. Shore power voltage and current (50 A shore is usually 240 V; the inverter and panel are 120 V).
4. Battery charge rate at input and output (overnight AC only).
5. PDLC fail-safe state when power is lost.
6. Endcap window location: confirm it sits at the sleeping area as designed.
7. Blueprint wording: the blueprint's component label for the guidance array ("Station and platform sideways crabbing") needs review.
8. Zone B cooking facility: cost and operator (Municipal Financial Strategy (10), Section 2, [PH]).

---

9. Visual aid

The interactive blueprint is saved as **04_Residence_Blueprint_Visual_Aid.html**. Open it in a web browser; it needs no installation.

- **Layers:** Toggle dimensions, smart glass, materials, plumbing, HVAC, electrical, and autonomous systems.
- **Privacy mode:** Switches the three glazing elements between transparent and opaque.
- **Component inspector:** Click any zone, fixture, or system to see its description and specifications.
- **Daily use:** The lifecycle tab shows the four daily stages in Section 7.

The printed packet describes the same content in text. The HTML file is the reference for layout and placement.

Bill of Materials and Cost Estimate: 6.0 m Autonomous Residential Pod (New Build)

Platform: 6.0 m x 2.1 m x 2.8 m exterior. New build, ParkShuttle-class chassis where obtainable, ground-up spaceframe as fallback. **Status:** Draft for discussion. Baseline line items are listed below. Added lines are placeholders [PH] until quoted.

Design basis: No kitchen in the pod. Cooking is a shared Zone B community service. A 12 V food-storage fridge remains.

---

1. Build basis

- **Baseline:** Ground-up 6061-T6 spaceframe and axles . Conservative.
- **Preferred if obtainable:** A ParkShuttle-class chassis or running gear would replace the spaceframe ($14,500) and axles and steering ($9,600). Quote required. Current baseline for those two lines is $24,100.
- **Guidance:** Magnetic grid guidance. No license held. Licensing, partnering, or in-house path is open.
- **New build only.**

---

2. Baseline subtotals

Section	Subtotal
Chassis, shell, and smart glazing	$43,560
Propulsion, autonomy, and electrical	$36,410
HVAC, ERV, and plumbing	$6,030
Interior and joinery	$4,534
Materials, baseline	**$90,534**

Corrections to baseline lines

- **LiDAR sourcing:** Ouster and Velodyne have been one company since 2023. Get quotes from two different vendors, or name one source.
- **Fleet and AV compute:** The line “AV Main Computer” is onboard compute. The central server is off-vehicle and is the Fleet Control System.
- **Inverter and charger:** Specify input voltage and current. A 50 A shore connection is usually 240 V, while the inverter and panel are 120 V.
- **48 V mini-split:** Confirm a supplier makes a 48 V-native unit at 12,000 BTU. If not, a 120/240 V unit with an inverter changes the energy budget.
- **Electrical panel:** The baseline lists a 30 A main with a 50 A shore input. Reconcile.

---

3. Added lines

#	Item	Specification	Qty	Est. unit	Extended
1	Water heater	Compact, sized for shower	1	$450	$450
2	12 V auxiliary battery	Buffer for door panel and controls	1	$350	$350
3	Stabilizing jacks	Electric, four corners	4	$300	$1,200
4	Tires and wheels	Load-rated for GVWR	4	$400	$1,600
5	Service and parking brakes	Four corners, EV-compatible	1 set	$2,400	$2,400
6	Suspension	Sized for payload and crab steering	1 set	$2,000	$2,000
7	HVAC zone dampers and controls	Two zones, one ducted unit	1 set	$400	$400
8	Smart glass drivers	One per PDLC zone	3	$300	$900
9	Cameras	Surround and interior	8	$180	$1,440
10	Communications	5G-NR modem, C-V2X unit, Wi-Fi 6E router	1 set	$900	$900
11	Door panel hardware	15.6 in touchscreen and controller	1	$1,200	$1,200
12	Onboard emergency stop	Hardwired, independent of fleet network	1	$600	$600
13	Fire detection and suppression	Detectors, suppression, battery thermal monitoring	1 set	$1,200	$1,200

#	Item	Specification	Qty	Est. unit	Extended
14	Food storage	12 V fridge only. No cooking surface (cooking is a Zone B service)	1	$1,000	$1,000
15	Emergency egress	See Section 8, item 3. Operable or break-out window required	1	$450	$450
16	Interior DC lighting	LED, dimmable	1 set	$400	$400
17	Bedding and mattress	Queen	1 set	$900	$900
18	Office chair	Rolling, fits 1.28 m envelope	1	$350	$350
19	Fold-out seating	Dining and second seat	1 set	$600	$600
20	Occupant restraint system	Seated positions during transit	1 set	$1,500	$1,500
21	Exterior paint and finish	Aluminum and composite panels	1 set	$2,000	$2,000
22	Exterior lighting, bumpers, signage	Including required markings	1 set	$1,200	$1,200
23	Fasteners, consumables, miscellaneous	About 5% of baseline materials	1	$4,500	$4,500
	Added materials				**$27,540**

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4. Materials total

	Amount
Materials, baseline	$90,534
Added lines (Section 3)	$27,540
Materials, updated	**$118,074**

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5. Labor (prototype build)

Activity	Hours	Rate	Cost
Chassis welding and frame assembly	65	$85	$5,525
Body panel bonding and shell	45	$85	$3,825
EV powertrain and harness	75	$110	$8,250
HVAC, ERV, and plumbing	35	$90	$3,150
Interior joinery and smart glass	50	$80	$4,000
Testing, calibration, compliance	30	$125	$3,750
Baseline total	**300**		**$28,500**

Added activity	Hours	Rate	Cost
Running gear (brakes, suspension, tires, jacks)	14	$110	$1,540
Controls, sensors, cameras, comms, emergency stop	12	$125	$1,500
Food storage, fire, restraints, egress, seating	12	$85	$1,020
Paint and finish	8	$85	$680
Added total	**46**		**$4,740**

Labor, prototype build: 346 hours, $33,240 (blended about $96 per hour).

Third-party testing and approvals are in the program costs below, not here.

---

6. Program (nonrecurring) costs [PH]

Order-of-magnitude placeholders, not quotes.

Program item	Amount
Vehicle engineering and validation	$2,000,000
ADS software and safety case	$1,500,000
Certification and testing	$750,000
Tooling (endcap molds, spaceframe jigs, body fixtures)	$250,000
Total	**$4,500,000**

Per pod: $45,000 at 100 pods, $9,000 at 500, $2,250 at 2,000.

---

7. All-in cost per pod (from the Municipal Financial Strategy, Section 2)

Volume	Materials	Labor	Program	All-in
100	$118,074	$33,216	$45,000	$196,290
500	$106,267	$25,920	$9,000	$141,187
2,000	$94,459	$20,160	$2,250	$116,869

Materials discounts (10% at 500, 20% at 2,000) and labor hours (270 and 210) are assumptions, not quotes.

Against the $78,500 target at 2,000 pods: the all-in cost is $38,369 higher. Reaching the target requires about a 33.5% cut to recurring cost.

---

8. Technical notes

1. **Weight:** The 50 kWh LiFePO4 pack alone is likely roughly 250 to 350 kg at typical pack densities. A full mass budget is needed.
2. **GVWR:** the baseline states 3,500 kg. Confirm against the chosen chassis and axle ratings.
3. **Egress:** The desk ribbon window is proposed as the egress window. It does not yet meet typical requirements: it is 0.45 m tall, it is fixed PDLC glazing that cannot open, and it sits over the central workspace rather than the sleeping area. An operable or designated break-out egress serving the bedroom is required. Sizes must be verified against the adopted code for the jurisdiction.
4. **Thermal load:** The 800 W average HVAC figure is unvalidated. Glazing is about 3.9 m2. A heat-load calculation at design temperatures is required.
5. **Charging:** Overnight AC charging only. The 15-minute fast-charge claim is removed.

Operational Area Plan: Loop, Berths, Staging, Dispatch, and Depot

Scope: How the community runs day to day. **Related:** Vehicle (Sections 02, 04, and 05). Maintenance (Section 07). Financial figures (Section 10). **Status:** Draft. Values marked [PH] are working assumptions to be replaced by simulation, pilot data, or design.

---

1. Operating model

Each pod makes four moves per day: 1. Berth to office or work node, loaded. 2. Drop-off to staging, empty. 3. Staging to pickup node, empty. 4. Pickup node to berth, loaded.

At 2,000 resident pods that is about 8,000 moves per day, of which about 4,000 are empty. The empty share is the main operating cost driver and the main test of the congestion claim.

---

2. Fleet sizing and spare pool

- **Resident pods:** 2,000 (1.25 residents per pod, 2,500 residents).
- **Availability target:** 92%, the agreed working target. Pods are in service 92% of the time.
- **Spare pool:** 2,000 divided by 0.92 gives about 2,174 pods in total, so the spare pool is about 174 pods.
- **Loaner rule:** A resident whose pod is out of service receives a loaner pod with the same layout within 4 hours [PH]. Residents are never without a home.
- **Capital effect:** 174 spare pods at $116,869 each is about $20.3M (Municipal Financial Strategy (10)).

---

3. Peak demand and staging

- **Peak departure window:** 07:30 to 08:30. Assumed 60% of resident pods leave their berths in that hour [PH]. That is about 1,200 departures per hour.
- **Staging demand:** Assumed 60% of resident pods are parked at staging from 08:30 to 17:00 [PH]. That is about 1,200 stalls, plus a 10% buffer for a total of about 1,320 stalls.
- **Proposal figure:** The master proposal's 2,000 stalls is an upper bound, assuming every pod is parked. The design figure is about 1,320 stalls at the assumed participation rate.
- **Stall width:** Set by a clearance study. A 2.2 m width is too narrow for a 2.1 m pod with a side door.

---

4. Loop capacity

- At 1,200 departures per hour in one lane, the headway is 3 seconds. At 38 km/h that is about 32 m between pods.
- Two lanes give a 6-second headway, about 63 m, which is more practical.

- **Decision:** Lane count, and whether the loop can be signal-free at that density. Test in simulation before the pilot is sized.
- Pilot (500 pods): about 300 departures per hour, which is manageable on one lane.

---

5. Drop-off and pickup bays

- **Dwell time:** 60 seconds per pod for passengers to exit or board [PH].
- **Bays at peak:** 1,200 departures per hour at 60 seconds each needs about 20 bays at once. With a 1.5x margin, plan for 30.
- **Pilot:** 300 departures per hour needs 5 bays, or 8 with margin.
- **Location:** Commercial hubs (Zone B) and office drop-off (Zone C). Level, raised platforms for entry.

---

6. Berths and utilities

- **Resident berths:** 2,000. Each has shore power, water, sewer, data, and an MGG marker.
- **Shore power:** Voltage and current to be fixed (Bill of Materials (05), Section 2; Magnetic Grid Guidance spec (02), Section 6).
- **Berth outage:** If a berth fails, the pod moves to a backup berth. Plan for 5% of berths as backup [PH].
- **Overnight:** Pods charge and receive water on their berths. Berth utilities must be shut down safely during maintenance.

---

7. Dispatch and fleet control (FCS)

- **Hours:** 24/7 dispatch with three shifts.
- **Functions:** Automatic routing and departure scheduling, resident requests, staging allocation, loop monitoring, incident response.
- **Staffing:** About 58 full-time staff at the $50,000 package (Municipal Financial Strategy (10), Section 5). Roles include dispatch controllers, staging coordinators, berth and utility coordinators, resident support, and emergency response.
- **Manual override:** Dispatch can take manual control of any pod. Remote stop is secondary to the onboard emergency stop (Magnetic Grid Guidance spec, Section 5).

---

8. Depot interface (Zone D)

- **Service bays:** Heavy service, lifts or pits, calibration bays. See the Maintenance Team Plan (07).
- **Spare pool parking:** Space for about 174 pods, with charging.
- **Wash and battery bays:** Pod wash, battery diagnostics, and a battery-service area with lockout.
- **Refurbishment line:** For year-12 refurbishment, if chosen.

- **Dispatch from depot:** Pods leave the depot under FCS control, and only after a passing pre-departure check.

---

9. Emergency and degraded operations

Each scenario needs a written procedure before the pilot: - **Loop outage or FCS failure:** Pods stop safely. Residents are instructed on what to do. Pods on the loop are recovered by the depot team. - **Power outage at berths:** Pods run on their batteries within limits. Residents are told the expected run time [PH]. - **Pod stuck or stopped mid-loop:** Recovery by tow or remote commands, with a defined response time [PH: 15 minutes]. - **Fire or battery event:** Suppression, evacuation, and emergency services access routes. Berth and loop access must allow fire response. - **Resident emergency:** Onboard stop, intercom, and FCS alert. - **Medical emergency:** Route to nearest medical facility in Zone B; coordination with UHC provision (for the $50k package, to be confirmed).

---

10. Community services interface

- **Shared kitchen and dining (Zone B):** Pods have no cooking surface. Pickup and drop-off for dining is part of the daily cycle. Volumes of trips to Zone B should be modeled, since they add to the empty-move count.
- **Pedestrian priority:** Commercial and office zones are pedestrian-first. Pod rights-of-way are separate.

---

11. Key performance indicators

- On-time departure rate in the morning window.
- Pod availability (target 92% or higher).
- Loaner response time (target within 4 hours).
- Empty-move share of total moves.
- Staging utilization.
- Incident rate per 1,000 moves.
- Localization faults per 1,000 km.

---

12. Open items

1. Loop lane count and signal strategy (simulate at 1,200 departures per hour).
2. Staging stall count and width (clearance study).
3. Bay count and dwell time (validate with pilot).
4. Availability target and spare pool size.
5. Shore power voltage and capacity for 2,000 berths.
6. Backup berth share.
7. Emergency procedures written and tested before pilot.
8. Community trip volume to Zone B.

13. Scale: 10,000 residents (8,000 resident pods)

Item	2,000 pods (2,500 residents)	8,000 pods (10,000 residents)
Spare pool at 92% availability	174	696
Peak departures per hour (60% in one hour)	1,200	4,800
Lanes (3-second headway, 1,200 per hour per lane)	1 (2 recommended)	4 at 3 seconds, or 8 at 6 seconds
Drop-off bays (60-second dwell, 1.5x margin)	30	120 (80 before margin)
Staging stalls (60% parked, plus 10% buffer)	1,320	5,280
Berths (resident plus 5% backup)	2,000 plus 100	8,000 plus 400
Dispatch and operations FTE (about $120 per pod per month at $50,000)	about 58	about 230
Maintenance team, lean to full	68 to 109	265 to 428
Total community operations and maintenance FTE	126 to 167	495 to 658

Implications: - 10,000 residents need a network of loops, not a single loop. - Staging needs roughly 5,300 stalls, which is a major land and layout item. - Per-pod operating assumptions are unchanged. No scale efficiency is assumed. Scale efficiency is an upside to test. - The 60% peak assumption is the most sensitive input. A spread-out peak reduces lanes and bays sharply.

Maintenance Team Plan: Staffing, Service, and Depot

Scope: The people and processes that keep the pod fleet in service. **Related:** Vehicle (Sections 02, 04, and 05). Operations (Section 06). Financial figures (Section 10). **Status:** Draft. Workload hours and ratios are working assumptions [PH] to be replaced by pilot data.

---

1. Principles

- **No resident is without a home.** A pod out of service is replaced by a loaner (operational plan, Section 2).
- **Service comes to the pod where possible.** Routine work is done at the berth. Heavy work goes to the depot.
- **Safety first.** High-voltage battery work, lifting, and fire risk are controlled by written procedures.
- **Training is a community asset.** The team is intended to be drawn from residents where possible, with an apprenticeship path.

---

2. Service schedule (vehicle)

Interval	Tasks
Daily	Automated pre-departure check. Exterior and glass inspection. Sensor self-test review.
Weekly	Clean MGG sensor bars, LiDAR windows, and cameras. Check tire pressure. Check water system.
Monthly	Inspect brakes and suspension. Replace HVAC filter. Service ERV. Test fire detectors. Test doors, glass, and egress window.
Quarterly	Calibrate MGG sensor bars and LiDAR. Review ADS logs. Inspect occupant restraints.
Annual	Full chassis inspection. Lift and jack inspection. Battery health test (capacity and BMS). Occupant safety audit.
Mid-life (about years 6 to 10)	Battery module replacement. LiDAR replacement as needed. Tire and running gear cycle.
Year 12	Refurbish or replace the pod (decision open).

---

3. Workload model

Hours per pod per month, by category [PH]:

Category	Lean case	Full case
Preventive maintenance	1.5	2.5
Cleaning and turnover	1.0	1.5
Sensor cleaning, calibration, checks	0.25	0.5
Battery and power system checks	0.25	0.25
Corrective repairs	0.75	1.5
Water and waste service	0.25	0.25
Total hours per pod per month	**4.0**	**6.5**

Productive hours per technician: About 147 per month [PH], after leave, training, and travel. That is roughly 173 paid hours less about 15%.

Technician count at 2,000 pods: - Lean case: 8,000 hours per month, about **54 technicians**. - Full case: 13,000 hours per month, about **88 technicians**.

Spare-pool pods also need service, so the counts should be revisited once the pool size is confirmed.

---

4. Team structure

Role	Lean	Full	Ratio assumption
Technicians	54	88	Workload model
Leads	6	9	1 per 10 technicians
QA inspectors	3	5	1 per 20 technicians
Parts and tooling	2	4	1 per 25 technicians
Depot manager, maintenance operations manager, training coordinator	3	3	Fixed
Total	**68**	**109**	

Technician split (full case):

Specialty	Lean	Full
Chassis and running gear	10	16
Drive and battery	9	14
AV sensors and compute	9	14
HVAC, ERV, and water	8	12
Interior, glass, and egress	8	12
Cleaning and turnover	10	20

---

5. Cost (for the financial model)

Assumptions [PH]: - Pre-tax salary: $50,000 per FTE. UHC is on top of salary, but it is costed per resident in the compensation model, not here, to avoid double counting. - Payroll taxes: 8%. - Routine parts and consumables: $60 per pod per month. Battery and sensor replacement reserves are separate in the financial model. - Facilities, tooling, and depot insurance: $30 per pod per month.

Cost per resident pod per month	Lean	Full
Labor (68 or 109 FTE at $50,000)	$142	$227
Payroll taxes	$11	$18
Routine parts	$60	$60
Facilities, tooling, insurance	$30	$30
Maintenance total	**$243**	**$335**

The maintenance line in the financial model is taken from this plan, not from a flat per-pod placeholder.

---

6. Depot and equipment

- **Lifts or pits:** Compatible with the chassis lift points (Magnetic Grid Guidance spec (02), Section 10A).
- **Calibration rigs:** For MGG sensor bars and LiDAR. Calibration pass or fail is recorded per pod.
- **Diagnostics:** Onboard and FCS-linked tools. Logs kept for safety review.
- **Battery service area:** Lockout-tagout, insulated tools, battery test equipment, and fire-safe storage.
- **Wash bay:** Exterior wash and interior turnover.
- **Parts store:** Stock for tires, brakes, filters, sensors, and battery modules. Stock levels based on the failure data from the pilot.
- **Spare pool bays:** Space for about 174 pods, with charging and a loaner-pod inventory check.

---

7. Workforce, pay, and training

- **Pay:** The $50,000 package applies to maintenance staff as the first-stage employee base (Municipal Financial Strategy (10), Section 7).
- **Career path:** Apprentice, technician, lead, supervisor. Pay progression within the $50,000 base and the 3x executive cap.
- **Certifications:** High-voltage battery safety, AV sensor calibration, lifting and rigging, fire safety, and first aid.
- **Recruitment:** Prioritize residents. Build a training pipeline before the pilot opens.
- **Retention risk:** A fixed $50,000 package may be below the market for specialist skills (AV sensors and battery). Track attrition from the pilot.

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8. Safety

- High-voltage lockout for the 48 V DC bus and the battery.
- Lifting and jacking procedures tied to the lift points.
- Confined-space rules for the bedroom vault and under-floor battery bay.
- Fire response plan for battery events, with suppression service in the depot.
- Occupant-safe protocol: no work on a pod with a resident inside. A loaner is provided first.

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9. Key performance indicators

- Pod availability (target 92% or higher).
- First-time fix rate.
- Time to loaner (target within 4 hours).
- Sensor calibration pass rate.
- Defects found after release.
- Technician hours per pod per month against the workload model.
- Attrition and training completion.

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10. Open items

1. Confirm the workload hours from pilot data.
2. Confirm the UHC proxy cost ($9,325 per resident) against community pricing.
3. Confirm the spare pool size, which changes the technician count.
4. Decide the year-12 refurbish or replace policy.
5. Define the depot lift type, bay count, and calibration equipment.
6. Benchmark technician ratios against transit fleet maintenance.
7. Confirm the training pipeline and recruitment before pilot.

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11. Scale: 10,000 residents (8,000 pods)

Item	Lean	Full
Workload (hours per pod per month)	4.0	6.5
Total hours per month	32,000	52,000
Technicians (147 productive hours each)	218	354
Leads (1 per 10 technicians)	22	36
QA inspectors (1 per 20 technicians)	11	18
Parts and tooling (1 per 25 technicians)	9	15
Depot and operations management	5	5
Total	**265**	**428**
Cost per resident pod per month (same as 2,000-pod case)	$243	$335
Annual maintenance cost	about $23.3M	about $32.2M

Notes: - Spare-pool pods (696) are included in the workload. - Per-pod cost is unchanged, so no scale efficiency is assumed. - Depot sizing: about 120 service bays at peak throughput (see operational plan, Section 13), plus calibration rigs and parts storage for 8,696 pods.

Workforce and Compensation Model: 2,500 and 10,000 Residents

Scope: Pay structure, UHC, UBI scenarios, executive redirection, and MSF cost at two scales. **Status:** Draft. Sample salaries are BLS OEWS May 2025 national **mean** annual wages unless noted. Means run higher than medians for skewed occupations, so these figures overstate payroll somewhat. Sector shares, employment rate, and executive ratio are working assumptions [PH].

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1. Rules

- **Salary floor:** $50,000 pre-tax per employed resident.
- **Employed pay:** The higher of the sector sample salary and $50,000.
- **UHC:** On top of salary, provided per resident. Costed at $9,325 per year, the KFF 2025 average single-coverage premium, as a proxy [PH]. Residents are assumed to be adults.
- **Pay cap (all employees):** 3 times the lowest-paid employee. At a $50,000 floor, the cap is $150,000. Pay above the cap is redirected to the MSF. Section 5 sizes the executive case. Sector projections (09) size the all-employee case as a sensitivity. Percentile wages are still needed.
- **Non-employed residents:** Scenario W: no UBI. Scenario U: $50,000 UBI. **Decision open.**

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2. Sector sample salaries

Sector	Representative blend (BLS May 2025 means unless noted)	Sample salary	Pay after $50,000 floor	Share of workers
Aerospace manufacturing	40% aerospace engineers ($142,060); 60% production occupations ($50,090, May 2024)	$86,878	$86,878	8%
Automotive manufacturing	30% mechanical engineers ($113,610); 70% production	$69,146	$69,146	8%

Sector	Representative blend (BLS May 2025 means unless noted)	Sample salary	Pay after $50,000 floor	Share of workers
Electrical manufacturing	30% electrical and electronics engineers ($129,100); 20% engineering technologists ($80,680); 50% production	$79,911	$79,911	8%
Green technology R&D	60% engineers (average of mechanical and electrical, $121,355); 20% technologists; 20% production (lab support proxy)	$98,967	$98,967	7%
Ecommerce and logistics	30% logisticians ($89,730); 70% production (fulfillment proxy)	$61,982	$61,982	10%
Print and digital media	40% graphic designers ($70,560); 30% editors ($90,060); 30% writers ($86,090)	$81,069	$81,069	5%
Corporate offices	Accountants and auditors ($94,750), as proxy	$94,750	$94,750	9%
Education	Elementary school teachers ($72,650)	$72,650	$72,650	6%

Sector	Representative blend (BLS May 2025 means unless noted)	Sample salary	Pay after $50,000 floor	Share of workers
Healthcare	50% registered nurses ($101,420); 50% nursing assistants ($42,700)	$72,060	$72,060	9%
Retail	50% retail salespersons ($37,310); 50% cashiers ($33,220)	$35,265	$50,000	5%
Food services	50% food preparation and serving ($37,150); 50% cooks ($38,730)	$37,940	$50,000	7%
Facilities and janitorial	Janitors and cleaners ($38,760)	$38,760	$50,000	2%
Community operations and maintenance	Pod operations and fleet maintenance (see operational and maintenance plans)	at floor	$50,000	11%
Other public and community services	At floor	at floor	$50,000	5%

Proxies: The BLS May 2025 table does not list team assemblers, maintenance mechanics, auto or aircraft technicians, customer service representatives, or stockers. Production occupations ($50,090, May 2024 mean) and the listed occupations above stand in for them. Results should be replaced with local wage data for the chosen site.

---

3. Headcount

Item	2,500 residents (2,000 pods)	10,000 residents (8,000 pods)
Workers (60% employment)	1,500	6,000
Executives (1 per 75 workers)	20	80

Item	2,500 residents (2,000 pods)	10,000 residents (8,000 pods)
Employed residents	1,520	6,080
Non-employed residents	980	3,920

Workers by sector (2,500 scale; 10,000 is four times each figure): Aerospace 120, automotive 120, ecommerce 150, electrical 120, green R&D 105, print and digital 75, corporate offices 135, education 90, healthcare 135, retail 75, food services 105, facilities 30, community operations 165, other 75.

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4. Payroll (paid by businesses)

Sector	Payroll, 2,500	Payroll, 10,000
Aerospace	$10,425,360	$41,701,440
Automotive	$8,297,520	$33,190,080
Ecommerce	$9,297,300	$37,189,200
Electrical	$9,589,320	$38,357,280
Green R&D	$10,391,535	$41,566,140
Print and digital	$6,080,175	$24,320,700
Corporate offices	$12,791,250	$51,165,000
Education	$6,538,500	$26,154,000
Healthcare	$9,728,100	$38,912,400
Retail	$3,750,000	$15,000,000
Food services	$5,250,000	$21,000,000
Facilities	$1,500,000	$6,000,000
Community operations	$8,250,000	$33,000,000
Other services	$3,750,000	$15,000,000
Worker payroll	**$105,639,060**	**$422,556,240**
Executives (capped at $150,000 each)	$3,000,000	$12,000,000

Average pay per employed worker at 2,500 residents: about $70,400.

---

5. Executive redirection

	2,500	10,000
Executives	20	80
Pay before cap ($213,990 median each)	$4,279,800	$17,119,200
Pay after cap ($150,000 each)	$3,000,000	$12,000,000
Redirected to MSF	**$1,279,800**	**$5,119,200**

The median used is BLS May 2025 for chief executives ($213,990). The mean is $269,630, which would increase the redirected amount.

6. UHC

	2,500	10,000
UHC at $9,325 per resident	$23.3M per year	$93.3M per year

Proxy: KFF's average single-coverage premium is an employer-sponsored figure. Community UHC cost is not yet known.

7. MSF annual outflow

Item	2,500, W	2,500, U	10,000, W	10,000, U
UHC	$23.3M	$23.3M	$93.3M	$93.3M
Floor top-ups for below-$50,000 sectors	$2.7M	$2.7M	$10.8M	$10.8M
Less executive excess redirected	($1.3M)	($1.3M)	($5.1M)	($5.1M)
UBI for non-employed residents	none	$49.0M	none	$196.0M
Social subtotal	**$24.7M**	**$73.7M**	**$99.0M**	**$295.0M**
Rent subsidy to $1,250 (lean to full operating case)	$22.4M to $24.6M	$22.4M to $24.6M	$67.9M to $76.7M	$67.9M to $76.7M
Total annual outflow	**$47.1M to $49.3M**	**$96.1M to $98.3M**	**$166.9M to $175.7M**	**$362.9M to $371.7M**
Capital needed at 5% payout	$0.94B to $0.99B	$1.92B to $1.97B	$3.34B to $3.51B	$7.26B to $7.43B

Rent figures use the current pod costs (Municipal Financial Strategy (10)). Floor top-ups are treated as MSF costs, the conservative choice.

8. Observations

- **UHC and UBI dominate the cost.** Rent subsidy is 19% to 48% of total outflow, depending on scenario.

- **Executive redirection is small**, about $1.3M at 2,500 and $5.1M at 10,000, against $23M to $295M of social cost. It matters as a principle, not as funding.
- **Worker payroll is large.** About $106M per year at 2,500 and $423M at 10,000, paid by the businesses. Portfolio revenue must cover it before any payout to the MSF.
- **Payout rate is the key sensitivity.** Capital needed falls by 37.5% if the payout rises from 5% to 8%, but a higher payout competes with reinvestment.

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9. Decisions needed

1. **UBI for non-employed residents:** Scenario W (no) or U (yes).
2. **Employment rate:** 60% assumed.
3. **Sector mix:** Shares in Section 2 are placeholders.
4. **Executive ratio:** One per 75 workers assumed.
5. **Cap scope:** All employees. Tail sizing needs BLS percentile wages (pending).
6. **Regional pay:** BLS figures are national. The site's region changes them.
7. **Mean or median:** Means assumed. Medians would lower payroll.

Sector and Employment Projections

Purpose: Check whether a 60% employment assumption is realistic once the community's age mix (education and retirement) is considered, and show sector headcounts at each rate. Feeds the Workforce and Compensation Model (08). **Status:** Draft. Age-group employment rates are from BLS. The community age mix and the 18 to 24 rate are working assumptions [PH].

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1. Employment rates by age (BLS, 2025)

Age group	Employment-to-population ratio	Source
25 to 54	about 80%	BLS, 2025 (secondary summary of the seasonally adjusted series, approx.)
55 to 64	64.7%	BLS CPS annual averages, 2025 (Table 7b)
65 and over	18.4%	BLS CPS annual averages, 2025 (Table 3)
18 to 24	55% [PH]	Not retrieved. Placeholder. Verify against BLS 16 to 24 data.

Each figure is the share of that age group that is employed.

---

2. Community age mix scenarios

Shares of adult residents by age. Residents are assumed to be adults.

Scenario	18 to 24	25 to 54	55 to 64	65+	Weighted employment rate
A. Working-age base	10%	60%	15%	15%	**66%**
B. Retirement-heavy	5%	50%	15%	30%	**58%**
C. Education-heavy	20%	55%	15%	10%	**66%**

Calculation (scenario A): 0.10 x 55 + 0.60 x 80 + 0.15 x 64.7 + 0.15 x 18.4 = 66.0%.

Reading: The planning rate of 60% sits between the retirement-heavy case (58%) and the working-age cases (66%). A 60% assumption is defensible for a mixed community. It becomes optimistic if retirees are a large share, and conservative if the community is working-age.

Caution on the education case: Students in the 18 to 24 group have a lower employment rate, but the 55% figure is a placeholder. The result is sensitive to it.

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3. Sector projections (non-executive workers)

Community operations (pod operations and fleet maintenance) is held at a fixed headcount, since it follows the fleet. The other sectors share the remainder in proportion to their shares.

3.1 At 2,500 residents (2,000 pods)

Sector	Share of other workers	58% (1,450 workers)	60% (1,500 workers)	66% (1,650 workers)
Aerospace manufacturing	9.0%	116	120	134
Automotive manufacturing	9.0%	116	120	134
Ecommerce and logistics	11.2%	144	150	167
Electrical manufacturing	9.0%	116	120	134
Green technology R&D	7.9%	101	105	117
Print and digital media	5.6%	72	75	83
Corporate offices	10.1%	130	135	150
Education	6.7%	87	90	100
Healthcare	10.1%	130	135	150
Retail	5.6%	72	75	83
Food services	7.9%	101	105	117
Facilities and janitorial	2.2%	29	30	33
Other public and community services	5.6%	72	75	83
Community operations (fixed)	n/a	165	165	165
Total workers		**1,450**	**1,500**	**1,650**
Executives (1 per 75 workers)		19	20	22

Rounding means totals may differ by one or two.

3.2 At 10,000 residents (8,000 pods)

Each sector is four times its 2,500 figure. Community operations is 660, which matches the full operations and maintenance team for 8,000 pods.

	58%	60%	66%
Other workers	5,140	5,340	5,940
Community operations	660	660	660
Total workers	5,800	6,000	6,600
Executives	77	80	88

4. Pay cap applies to all employees

The cap is 3 times the lowest-paid employee, or $150,000 at a $50,000 floor. It applies to every employee, not just executives.

Current model limitation: Sector means in the model are all below $150,000, so the cap currently bites only on executives. Individual employees above $150,000 exist in every sector with a range of pay (for example, senior engineers, financial managers, and senior nurses). Their excess would also be redirected to the MSF.

Sensitivity: Each 1% of workers above the cap, with an average excess of $40,000 [PH], redirects about $0.6M per year at 2,500 residents, or $2.4M per year at 10,000.

Needed: BLS percentile wages (90th and 95th) by sector occupation, to size the tail properly. Not yet pulled.

Effect on recruitment: The cap truncates the top of white-collar pay. That is the policy intent (community experience over pay leverage). The risk is harder recruitment for senior engineering, finance, and clinical roles. Track vacancy time and attrition in the pilot.

5. MSF outflow by employment rate (2,500 residents)

Rent is $1,250 per month; the rent subsidy is $22.4M to $24.6M per year (unchanged by employment rate, since it depends on the fleet). Floor top-ups are in the MSF cost. Executive redirection is included.

	58%	60%	66%
UHC ($9,325 per resident)	$23.3M	$23.3M	$23.3M
Floor top-ups	$2.6M	$2.7M	$3.0M
Less executive redirect	($1.2M)	($1.3M)	($1.4M)
Social, workers only (W)	**$24.7M**	**$24.7M**	**$24.9M**
Non-employed residents	1,031	980	828
UBI, non-employed (U)	$51.6M	$49.0M	$41.4M
Social, universal (U)	**$76.3M**	**$73.7M**	**$66.3M**

	58%	60%	66%
Total with rent subsidy, W	$47.1M to $49.3M	$47.1M to $49.3M	$47.3M to $49.5M
Total with rent subsidy, U	$98.7M to $100.9M	$96.1M to $98.3M	$88.7M to $90.9M
MSF capital at 5% payout, W	$0.94B to $0.99B	$0.94B to $0.99B	$0.95B to $0.99B
MSF capital at 5% payout, U	$1.97B to $2.02B	$1.92B to $1.97B	$1.77B to $1.82B

---

6. MSF outflow by employment rate (10,000 residents)

Everything scales by four (the community is four times the size, and the employment rate applies equally). Rent subsidy: $67.9M to $76.7M per year.

	58%	60%	66%
Social, workers only (W)	$98.8M	$99.0M	$99.6M
Social, universal (U)	$305.0M	$295.0M	$265.2M
Total, W	$166.7M to $175.5M	$166.9M to $175.7M	$167.5M to $176.3M
Total, U	$372.9M to $381.7M	$362.9M to $371.7M	$333.1M to $341.9M
Capital at 5%, U	$7.46B to $7.63B	$7.26B to $7.43B	$6.66B to $6.84B

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7. Findings

1. **60% is a defensible planning rate.** It sits between a retirement-heavy community (58%) and a working-age community (66%).
2. **The rate moves UBI cost more than anything else.** Each 8 points of employment shifts about $25M per year at 2,500 residents in scenario U. Non-employed residents are the UBI cost base.
3. **Workers-only (W) cost barely moves with the rate**, because the UHC cost is paid per resident regardless of work.
4. **Sector shares must follow the age mix.** A retirement-heavy community needs more healthcare and community services, and fewer manufacturing and logistics roles. The shares in this document are held fixed for comparison.
5. **Community operations is set by the fleet, not by employment.** At 2,500 residents it needs 126 to 167 people. That is about 11% of workers at 60%, and must be filled whatever the employment rate.
6. **The cap sizing is still missing.** The tail above $150,000 needs BLS percentile data before the MSF revenue from the cap can be stated.

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8. Open items

1. Verify the 18 to 24 employment rate from BLS.
2. Choose the planned age mix, which determines the employment rate and sector shares.
3. Pull BLS percentile wages to size the all-employee cap.
4. Decide whether the sector shares move with the age mix (recommended).
5. Confirm the employment-rate planning target (60% recommended, subject to the age mix).

Municipal Financial Strategy: Pod Community, Rent Target, and Municipal Sovereign Fund

Status: Draft for discussion. Items marked [PH] are placeholders or assumptions with no source yet. Replace them with quotes, studies, and legal and bond advice before any external use.

Scope: Capital, debt, operating cost, required rent, the rent subsidy gap, and the Municipal Sovereign Fund (MSF) intent. Cost inputs come from the Bill of Materials (05), the Operational Area Plan (06), the Maintenance Team Plan (07), and the Workforce and Compensation Model (08).

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1. Summary

- **Required rent, city-owned:** $2,182 to $2,274 per month at 2,500 residents. $1,957 to $2,049 per month at 10,000 residents.
- **Target rent:** $1,000 to $1,500 per month. A recurring subsidy closes the gap. At a $1,250 target, the subsidy is about $22M to $25M per year at 2,500 residents and $68M to $77M per year at 10,000 residents.
- **Total MSF outflow at a $1,250 target:** $47M to $49M per year at 2,500 residents if only employed residents are paid (scenario W). About $96M to $98M per year if non-employed residents are also paid (scenario U). At 10,000 residents: $167M to $176M (W) and $363M to $372M (U).
- **Capital at a 5% MSF payout:** $0.94B to $0.99B (2,500, W); $1.9B to $2.0B (2,500, U); $3.3B to $3.5B (10,000, W); $7.3B to $7.4B (10,000, U).
- **Subsidy and reinvestment compete for the same money.** The rent subsidy must be sized inside the MSF's majority reinvestment, not added on top of it.

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2. Unit cost basis

Volume (pods)	Materials	Labor	Program cost per pod	All-in per pod
100	$118,074	$33,216	$45,000	$196,290
500	$106,267	$25,920	$9,000	$141,187
2,000	$94,459	$20,160	$2,250	$116,869

Assumptions [PH]: - Materials discount vs. base: 0% at 100 pods, 10% at 500, 20% at 2,000. - Labor: 346 hours at 100 pods, 270 at 500, 210 at 2,000, at a blended $96 per hour. - Program costs: $4.5M total (engineering $2.0M, software and safety case $1.5M, certification $0.75M, tooling $0.25M).

Target gap: At 2,000 pods the all-in cost is $38,369 above the $78,500 target. Recurring cost (materials plus labor, currently $114,619) must fall by about 33.5% to reach the target.

Price check: $116,869 over about 120 sq ft of interior is about $970 per square foot.

Not priced: The Zone B shared kitchen and dining facility. Cost is a placeholder [PH: TBD].

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3. Capital budget

3.1 Phase 1: 2,500 residents

Item	Amount	Basis
Pod fleet (2,174 pods: 2,000 resident pods plus 174 spares at 92% availability [PH])	$254.1M	2,174 x $116,869
Pod berths	$29.0M	[PH: unverified]
Magnetic grid and roadways	$18.5M	[PH: unverified]
Fleet depot	$8.5M	[PH: unverified]
Zone B shared kitchen and dining	not included	[PH: TBD]
Total	**$310.1M**	

3.2 Phase 2: 10,000 residents

Item	Amount	Basis
Pod fleet (8,696 pods: 8,000 resident pods plus 696 spares)	$873.9M	8,696 x about $100,500 [PH]
Infrastructure	$142.4M	Infrastructure at the 10,000-resident scale [PH: to re-run]
Total	**$1,016.3M**	

No scale efficiency is assumed in operating costs. Phase 2 uses the same per-pod operating costs as phase 1, so the unit-cost reduction is the only scale benefit.

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4. Debt service

Assumptions [PH]: 5% interest, level monthly payments. Pods over 12 years (pod life). Infrastructure over 25 years.

Tranche	Phase 1 amount	Term	Monthly per resident pod	Phase 2 monthly per resident pod
Pods	$254.1M	12 years	$1,175	$1,010 (on $873.9M)
Infrastructure	$56.0M	25 years	$164	$104 (on $142.4M)

Tranche	Phase 1 amount	Term	Monthly per resident pod	Phase 2 monthly per resident pod
Capital per resident pod per month			**$1,339**	**$1,114**

Term mismatch: A loan longer than the 12-year pod life means paying for years after the pod is retired. Lenders are likely to require terms that match pod life, which raises payments.

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5. Operating cost per pod per month [PH]

Item	Lean	Full	Notes
Pod berth services (water, sewer, bulk Wi-Fi)	$135	$135	Carried from the initial estimate
Energy (charging and HVAC)	$95	$95	About 21 kWh per day at $0.15 per kWh; not yet checked against the energy budget
Maintenance	$243	$335	Lean and full team cases, from the Maintenance Team Plan (07). Includes labor, parts, and facilities
Fleet operations and dispatch	$120	$120	About 58 FTE at $50,000 (phase 1). Could be supplied by MSF businesses
Insurance (fleet liability and property)	$150	$150	AV liability must be insured
Battery and sensor mid-life reserve	$100	$100	Battery and LiDAR replacement during pod life
Total excluding capital	**$843**	**$935**	

Excluded: UHC is costed in the MSF figures (Section 7), not here, to avoid double counting.

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6. Required rent and the subsidy gap

6.1 Required rent per resident pod per month

Scale	Capital	Operating (lean to full)	Required rent
2,500 residents (2,000 resident pods)	$1,339	$843 to $935	**$2,182 to $2,274**
10,000 residents (8,000 resident pods)	$1,114	$843 to $935	**$1,957 to $2,049**

6.2 Annual subsidy to reach each target

Annual subsidy = (required rent minus target rent) x resident pods x 12 months. Required rent range runs from lean to full operating cost.

Target rent	2,500 residents	10,000 residents
$1,000	$28.4M to $30.6M per year	$92.0M to $100.7M per year
$1,250	$22.4M to $24.6M per year	$67.9M to $76.7M per year
$1,500	$16.4M to $18.6M per year	$43.9M to $52.7M per year

6.3 Reading the table

- A $1,000 to $1,500 rent is achievable only with a recurring subsidy. The subsidy is effectively permanent, because pods are replaced on a 12-year cycle.
- The capital needed to fund the subsidy at a 5% payout is shown in Section 7.4.
- The rent subsidy is one use of MSF proceeds. It must sit inside the majority reinvestment split (Section 7.1).

6.4 Ownership comparison (not recalculated) [PH]

Model B (resident-owned pods): site fee $519 per month, plus energy $95, plus pod loan. All-in $1,385 per month on a 20-year loan, or $1,695 on a 12-year loan. At a $1,250 all-in target, the gap is $135 per month on a 20-year loan (about $3.2M per year), or $445 per month on a 12-year loan (about $10.7M per year). **These figures were not recalculated for the current cost basis.**

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7. Municipal Sovereign Fund

7.1 Intent (draft statement, not binding)

The Municipal Sovereign Fund (MSF) is intended to own and operate community-owned commercial, white-collar, and blue-collar businesses within the community. The businesses are expected to:

1. **Cap pay at 3 times the lowest-paid employee**, applied to all employees, as an intentional restriction. The aim is community experience and quality of life, not pay leverage.
2. **Pay a base salary of $50,000** before taxes, with UHC on top. First stage: MSF employees (scenario W). Long-term aim: a universal base for residents (scenario U).

3. **Reinvest a majority of portfolio proceeds** into community services, investment, and healthcare. “Majority” is to be defined [PH: more than 50% of distributable proceeds].
4. **Support residential rent** at a target of $1,000 to $1,500 per month, subject to the capitalization rules in Section 7.3.

7.2 Points to define before the intent is shared

- **Legal form and authority.** A county or special district may not have the power to create a sovereign fund. “Sovereign” is also a loaded term for an unincorporated area. A name such as “Community Investment Fund” may be more accurate. Counsel should confirm the entity type (cooperative, public benefit corporation, public enterprise, or other).
- **Cap basis.** Base or total compensation for the lowest-paid employee is to be defined.
- **Capital source.** A mix of investors and an MSF portfolio of digital and manufactured goods and services. Portfolio detail is outside this document. The 5% payout assumption in Section 7.4 is not yet supported by the portfolio.
- **Securities.** If residents receive shares or membership interests, counsel should confirm whether securities rules apply.
- **Concentration risk.** Businesses inside one community share its economy. A downturn can hit income and subsidy together.

7.3 What makes the intent count toward rent

Documenting intent helps governance and explains the purpose. It does not lower rent by itself. Lenders, investors, and any subsidy-dependent rent need a funded commitment. A term sheet should include:

- **Capitalization:** Amount, source, and schedule of contributions.
- **Payout rule:** How much flows to housing each year, and its formula.
- **Rent-setting rule:** Who sets rent and under what conditions it can change.
- **Return assumptions:** Stated and stress-tested, including a downturn case.
- **Priority:** Where housing subsidy ranks against services, investment, and healthcare.
- **Reporting and audit:** Annual audited statements to residents and the host jurisdiction.
- **Review and exit:** What happens if returns fall short, and how the fund can be wound down.

7.4 Capital needed at a 5% payout

Scenario	2,500 residents	10,000 residents
W (workers only)	$0.94B to $0.99B	$3.34B to $3.51B
U (universal)	$1.92B to $1.97B	$7.26B to $7.43B

Capital needed falls by 37.5% if the payout rises from 5% to 8%. A higher payout competes with reinvestment.

7.5 Wage costs in the fund’s numbers

- **Employee base:** Each 100 MSF employees costs about $5.0M per year in base pay, before benefits and payroll taxes. The cost sits in the portfolio businesses and lowers their margins. Return and payout assumptions must include it.

- **Fleet operations:** The $120 per pod per month line (about $2.9M per year at 2,000 pods) equals about 58 full-time staff at $50,000 base alone. The staffing plan must be checked against this.
- **Pay cap:** At 3 times a $50,000 lowest-paid salary, the cap is $150,000. The cap falls if any employee is paid less.
- **Universal base (long-term aim):** $50,000 for each of 2,500 residents is about $125M per year. For 10,000 residents it is about $500M per year. This is not in any rent figure above. It needs a separate funding source.

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8. Levers

1. **Pod unit cost.** A ParkShuttle-class chassis if obtainable, volume contracts, and the Zone B cooking model already applied.
2. **Pod life and loan term.** Refurbishing at year 12 lowers annual capital.
3. **Operating cost.** MSF businesses may supply fleet operations staff, which could reduce the $120 line.
4. **Ownership model.** Model B with a site-fee subsidy may need the smallest fund (not recalculated, Section 6.4).
5. **Land and infrastructure.** Donated land and shared utilities lower the $56M infrastructure tranche.
6. **Phasing.** A 500-pod pilot is about $70.6M of pod cost before infrastructure.

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9. Assumptions register [PH]

- Interest rate: 5%.
- MSF payout rate on capital: 5%.
- Pod life: 12 years. Infrastructure life: 25 years.
- Residents per pod: 1.25. Resident pods: 2,000 at 2,500 residents; 8,000 at 10,000 residents.
- Spare pool: 92% availability, 174 spares at phase 1 and 696 at phase 2.
- Electricity: $0.15 per kWh.
- Pod berths, magnetic grid, and depot costs: carried from the initial estimate, unverified.
- Materials discount at volume: 10% at 500 pods, 20% at 2,000.
- Program costs: $4.5M.
- Occupancy: 100% in all rent figures. No vacancy or collection loss is modeled.
- Zone B shared kitchen and dining: unpriced.
- Universal base: not costed in rent figures (Section 7.5).
- MSF capital: investors and portfolio, no commitments yet.
- Executive pay: BLS May 2025 median for chief executives, $213,990, redirected above the cap.