

1. VEHICLE CLASSIFICATION

ANEV must be designed to comply with:

Low-Speed Vehicle (LSV / NEV class)

- Top speed: 20–25 mph (32–40 km/h)
- Gross Vehicle Weight Rating (GVWR): $\leq 3,000$ lbs
- Wheels: 4-wheel vehicle required
- Road usage: roads ≤ 35 mph speed limit

This classification is critical to:

- avoid full automotive certification
- enable faster deployment
- minimize cost

2. CORE PERFORMANCE REQUIREMENTS

Category	Minimum Spec
Passenger capacity	2–4 passengers (required)
Max speed	25 mph
Daily range	30–120 miles target range (configurable)
Typical trip distance	≤ 2 miles (high-frequency use)
Turning radius	Small / urban optimized
Duty cycle	high-frequency (20–40 trips/day)

3. POWERTRAIN & BATTERY

Electric Only

Battery type: lithium-ion (preferred)

- Typical pack sizes (baseline range):
 - 8 kWh – 32 kWh
- Charging:
 - Level 1 + Level 2 compatible
- Range flexibility:
 - modular or upgradable packs preferred

Performance Characteristics

- Quiet operation (urban safe)
- Designed for:
 - stop/start usage
 - short-distance high repetition

4. SAFETY & REGULATORY REQUIREMENTS

ANEV must meet Federal Motor Vehicle Safety Standard (FMVSS 500):

Required Equipment

- Headlights
- Taillights / brake lights
- Turn signals
- Reflectors
- Windshield (DOT compliant)
- Seat belts for all passengers
- Parking brake
- VIN (Vehicle Identification Number)
- Horn / audible alert

Additional Requirements

- Registerable with DMV
- Insurable (liability coverage)
- Meets local/state roadway compliance

5. AUTONOMY

Levels Supported:

Mode	Requirement
Autonomous	Required baseline

Autonomous System

- Sensor suite: cameras, radar, lidar (configurable)
- Real-time navigation
- Remote monitoring capability
- Safety override system

Industry Note:

Existing microtransit LSV systems operate at:

- ≤25 mph
- 2–6 passengers
- controlled environments (campuses, downtown zones)

6. OPERATING ENVIRONMENT

ANEV must be optimized for:

Use Cases

- Transit station zones (~2-mile radius)
- Downtown corridors
- Employment zones / business parks
- Residential neighborhoods

Conditions

- Stop-and-go traffic
- Short trips (<2 miles)
- High ride turnover
- Mixed pedestrian environments

7. VEHICLE DESIGN CONSTRAINTS

Physical Envelope

Parameter	Target
Footprint	Golf cart scale
Width	Narrow for urban streets
Weight	≤ 3,000 lbs
Seating	Forward-facing required Carriage seating optional
Accessibility	Step-in or low-floor preferred

Design Priorities

- Safety (primary)
- Low cost (critical)
- Durability (fleet use)
- Ease of maintenance
- Passenger comfort (basic)

8. PLATFORM & CONNECTIVITY

Required Capabilities

- Ride dispatch integration:
 - API-ready system
- GPS tracking
- Usage data reporting

Data Outputs

- Trips per day
- utilization rates
- energy consumption
- system uptime

9. COST TARGET (DESIGN CONSTRAINT)

Target Manufacturing Range:
\$30,000 – \$50,000 per unit

Implied Requirements:

- simplified architecture
- minimal regulatory overhead (LSV vs full vehicle)
- scalable production
- modular battery + electronics

10. LIFECYCLE & DURABILITY

Category	Target
Vehicle life	5–10 years
Battery life	5–8 years (typical cycle use)
Daily usage	20–40 trips/day
Maintenance design	Low-complexity systems

11. ENERGY & GRID INTEGRATION (OPTIONAL)

- smart charging (off-peak)
- utility integration (OBR-compatible system)
- potential:
 - vehicle-to-grid (V2G)
 - emergency dispatch capability

12. DESIGN PRINCIPLES (CRITICAL)

ANEV should prioritize:

Low Complexity

- avoid full automotive complexity
- modular design

High Utilization

- optimized for short-trip frequency

Cost Efficiency

- manufacturable at scale

Safety

- pedestrian-friendly design
- low-speed operation

BASELINE SUMMARY

An ANEV must be:

- A low-speed electric vehicle (≤ 25 mph)
- Carrying 2–4 passengers
- Operating within ~2-mile zones
- Fully compliant with FMVSS 500 safety standards
- Manufacturable at \$30K–\$50K
- Designed for high-frequency ride-share use
- Compatible with ride dispatch platforms
- Optionally extendable to autonomous operation

Strategic Insight

The key to feasibility is not building a “small car” — it is building a high-cycle, low-cost, LSV-compliant mobility asset optimized for short, repeatable trips.