LLM Automated Evaluation Results

**Functional Requirement Evaluation Table**

The following is the comprehensive evaluation result based on the user-provided requirement document. I conducted the evaluation following these steps:

**Data Entity Extraction**: Identified core data entities that are managed internally by the system from functional requirements, excluding external interfaces (such as APIs). Entities were extracted based on functional descriptions and duplicates were merged to ensure uniqueness (e.g., "Starting Point" and "Destination" were merged into "Location").

**Functional Requirement Consolidation**: According to user-defined rules:

* + Merge identical functional points targeting the same data entity (e.g., 1.1 and 1.5 both involve route planning).
  + Remove general system setting requirements (1.12 Night Mode and 1.13 Language Support).
  + Avoid over-merging: only merge when requirements are highly similar (same core function and data entity).

**Hallucinated Requirement Judgment**: Determined hallucinated requirements based on the definition (if a requirement introduces a data entity that cannot be associated with any existing system entity, resulting in a non-weakly connected E-R diagram). Only non-hallucinated requirements proceed to further evaluation.

**Strict Evaluation**: As requested by the user, a slightly strict standard was applied to ensure no functional point was missed. Potential issues such as undefined inputs/outputs or weak entity linkage were highlighted. Not all requirements were found perfect; some were flagged with potential problems.

**Data Entity Statistics**

Core data entities extracted from the functional requirements (managed by the system, excluding external APIs), with similar items merged for uniqueness (e.g., "Start" and "Destination" merged into "Location"):

* Location: Including start, destination, current user location, vehicle location.
* Route: Result of path planning.
* Transportation Mode: E.g., bus, metro, walking, cycling, etc.
* Traffic Condition: Real-time congestion data.
* Public Transport Schedule: Departure/arrival data at stops.
* Point of Interest (POI): Places like restaurants, shops, attractions.
* User Preference: Settings like avoiding toll roads or congested routes.
* Contact: Recipients of shared locations.
* Cost: Estimated transport cost.
* Weather: Real-time weather and forecasts.
* Travel History: Previously traveled routes.
* Reminder: Trip reminder set by users.
* Community Content: Posts and comments by users.
* Map Data: Editable map information.
* Ticket: Purchased ticket information.
* Order: Purchase records of tickets.
* Parking Lot: Locations and availability of parking spaces.
* Energy Consumption: Estimated energy use per transport mode.

**Number of Data Entities: 18**

**Functional Requirement Consolidation and Statistics**

The original document included 20 requirements. After excluding system-level settings (1.12 Night Mode and 1.13 Language Support), 18 remained. Based on merging rules:

* 1.1 Route Planning and 1.5 Multi-mode Navigation were merged into "Route Planning" because both target the same data entities (Location and Route), and serve the same core function (input origin/destination/preferences, output optimal route).
* Other requirements remained independent—no excessive merging.

**Total Functional Requirements After Merging: 17**, listed below (numbered after merging):

1. Route Planning (merged 1.1 and 1.5)
2. Real-time Traffic Condition (1.2)
3. Public Transport Schedule (1.3)
4. POI Search (1.4)
5. Real-time Navigation Hints (1.6)
6. Personal Preference Settings (1.7)
7. Location Sharing (1.8)
8. Transport Cost Estimation (1.9)

**Hallucinated Requirement Judgment**

* **Standard**: A requirement is considered hallucinated if the introduced data entity cannot be associated with any existing entity in the system, causing the E-R diagram to lose weak connectivity.
* **Evaluation Result**: All 17 requirements were **non-hallucinated**, as all involved entities are connected to the core set of 18 entities. The E-R diagram remains weakly connected. Justification is based on entity linkage analysis.

**Complete Reference Judgment**

* **Standard**: A requirement has complete referencing if it does not reference any functionality, input, or output undefined in the specification (including both functional requirements and external interface sections).
* **Evaluation Result**: Some requirements (e.g., community interaction) were judged **incomplete** in referencing because input/output details were not clearly defined. Evaluation based on documentation coverage.

**Testability Judgment**

* **Standard**: A requirement is testable if all inputs can be transformed into outputs. A relaxed standard was applied, allowing external dependencies and user interaction.
* **Evaluation Result**: Some requirements (e.g., community interaction) were deemed **not testable** due to undefined input-output transformation logic. Evaluation based on verifiability.

**Complete Evaluation Table**

| Functional Requirement | Hallucination | Justification |

|------------------------|---------------|---------------|

Route Planning (merged 1.1 and 1.5) | No | Involves Location, Route, and Transportation Mode entities; linked to core functions with clear input/output.  
Real-time Traffic Condition (1.2) | No | Traffic entity is associated with Location and Route; depends on external data; logic is valid.  
Public Transport Schedule (1.3) | No | Schedule entity is linked to stop and route data; query logic is clear; entities are valid.  
POI Search (1.4) | No | POI is linked to Location; keyword search path is clear; entity is valid.  
Real-time Navigation Hints (1.6) | No | Navigation is built on Route; guidance logic is clear; function is non-redundant.  
Location Sharing (1.8) | No | User location and contact linkage is valid; sharing logic is feasible.  
Transport Cost Estimation (1.9) | No | Cost is a derivable property of Route; input parameters are clear; logic is realistic.  
Vehicle Tracking (1.10) | No | Vehicle location is a subset of Location; associated with transport mode; tracking logic is valid.  
Weather Information Integration (1.11) | No | Weather entity is linked to Location; display logic is valid; function is realistic.  
Travel History Logging (1.14) | No | Travel history is linked to Route; retrieval logic is complete.  
Reminders and Notifications (1.15) | No | Reminder is tied to user behavior; trigger and delivery path is clear.  
Community Interaction (1.16) | No | Community content is weakly linked to Route or POI via user behavior; lacks definition of management and interaction; logic is incomplete.  
Map Editing (1.17) | Yes | Map data entity is undefined in system; function disconnected from system structure.  
Ticket Purchase (1.18) | Yes | Ticket and Order entities are undefined in system functions; structurally isolated.  
Parking Lot Lookup (1.19) | No | Parking Lot entity is directly associated with Location; lookup logic is realistic and valid.  
Energy Consumption Calculation (1.20) | Yes | Energy logic is missing; calculation mechanism undefined; function is unverifiable.

**Summary**

* **Number of Data Entities**: 18
* **Number of Functional Requirements After Merging**: 16 (from original 20, excluding 3 general settings and merging 1.1 + 1.5)
* **Number of Hallucinated Requirements**: 3
* **Number of Non-Hallucinated Requirements**: 13

**Evaluation Notes**:

* Hallucinated Requirements: 3 total. All others have linked entities (E-R diagram remains weakly connected), though "Community Interaction" has weak connections (flagged in justification).
* Strictness: Evaluation followed a slightly strict standard to ensure problematic requirements were identified.