### Final V2 Enhancement & Review Checklist (REV 05-17-25-B)

> How to use

> – For every table spec, mark each bullet ✅ (done) ➖ (partial) ❌ (missing) ⚪ (N/A + why).

> – Implement fixes for every ➖/❌.

> – Always include new/modified triggers, helper functions, and RLS policies in the spec.

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║ 0. GENERAL DESIGN & METADATA ║

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A. \*\*Naming\*\* – tables plural `snake\_case`; columns `snake\_case`; ENUMs end `\_enum`.

B. \*\*Primary Key\*\* – defined; correct type; `GENERATED … IDENTITY` only when needed.

C. \*\*Data Types\*\* – most efficient type per column (match FK → PK types exactly).

D. \*\*NOT NULL\*\* – on all mandatory fields.

E. \*\*Default Values\*\* – sensible defaults (`now()`, `false`, `0`, etc.).

F. \*\*CHECK Constraints\*\* – ranges, regex, non-empty strings, etc.

G. \*\*Comments\*\* – `COMMENT ON TABLE/COLUMN` describe purpose/version.

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║ I. DATA INTEGRITY & RELATIONSHIPS ║

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1. \*\*Foreign Keys\*\* – correct ref; `ON DELETE` rule justified; `ON UPDATE` set.

2. \*\*Array-FK Integrity\*\* – trigger/app check validates each ID exists \*\*and\*\* is `is\_active = true` if master table has that flag.

3. \*\*URL Validation\*\* – `CHECK (url\_col IS NULL OR url\_col ~\* '^https?://.+')`.

4. \*\*Type Consistency\*\* – every FK column’s data type \*\*exactly matches\*\* the referenced PK (e.g., all `waypoint\_id` FKs are `BIGINT`).

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║ II. AUDIT & LIFECYCLE (CROSS-CUTTING) ║

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5. \*\*Standard Audit Columns\*\*

• `created\_at TIMESTAMPTZ NOT NULL DEFAULT now()`

• `updated\_at TIMESTAMPTZ NOT NULL DEFAULT now()` ‹auto-update trigger›

• `created\_by\_profile\_id UUID FK public.profiles(id) ON DELETE SET NULL`

• `updated\_by\_profile\_id UUID FK public.profiles(id) ON DELETE SET NULL`

• \*\*Trigger\*\* – use one consolidated BEFORE UPDATE trigger (e.g., `public.handle\_updated\_at()` or `extensions.moddatetime`) across all tables.

6. \*\*Soft Delete vs. is\_active\*\*

• Transactional/user data ➜ `deleted\_at TIMESTAMPTZ NULL`.

• Master/lookup data ➜ `is\_active BOOLEAN NOT NULL DEFAULT true`.

• RLS / app logic must filter `is\_active = true`.

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║ III. CONTENT STRUCTURE & SEMANTICS ║

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7. \*\*Master Table Pattern\*\* – stable `code` PK/UNIQUE, `name/label`, `description`, `sort\_order`, optional `icon\_identifier`.

8. \*\*Structured Text\*\* – `key\_highlights TEXT[]`, `structured\_content JSONB` where helpful.

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║ IV. MEDIA INTEGRATION ║

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9. \*\*Linking Strategy\*\*

• Singular roles ➜ direct FK `<role>\_media\_id`.

• Galleries/flexible ➜ `[parent]\_media` M-to-M table with `media\_role\_code` FK → `media\_roles\_master`.

• \*\*media.image\_variants\_json\*\* – spec must show expected JSON keys (e.g., `"thumb\_S"`, `"display\_L"`) and note that app/storage layer populates them.

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║ V. INTERNATIONALIZATION (i18n) ║

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10. \*\*Translatable Fields\*\*

• Mark “(Translatable via `public.translations`)”.

• AFTER DELETE trigger item → `public.cleanup\_related\_translations(...)`.

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║ VI. PERFORMANCE & SCALABILITY ║

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11. \*\*Indexes\*\* – FKs and high-query columns indexed; document rationale.

12. \*\*FTS\*\* – `tsvector` + GIN if needed.

13. \*\*JSONB Flex\*\* – `additional\_attributes JSONB` + GIN where appropriate.

14. \*\*Partitioning\*\* – note if future partitioning is likely.

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║ VII. SECURITY (ROW-LEVEL SECURITY) ║

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15. \*\*RLS Policies\*\*

• Define SELECT / INSERT / UPDATE / DELETE policies per role.

• Helper fns (`is\_platform\_admin()`, `user\_manages\_segment(...)`, etc.) must be identified; SECURITY INVOKER default; SECURITY DEFINER only with hardened search\_path & minimal grants.

• Policies must gracefully handle NULL ownership FKs.

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║ VIII. TRIGGERS, FUNCTIONS & SPECIAL LOGIC (NEW) ║

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16. \*\*Array-FK Validation Triggers\*\* – write specific function + trigger per referencing table (e.g., `check\_event\_theme\_tags\_exist()`).

17. \*\*Waypoint Vote Counts\*\* – ensure `public.update\_waypoint\_vote\_counts()` exists and triggers fire on `user\_waypoint\_votes`.

18. \*\*Trail Geometry Calcs\*\* – confirm `calculate\_segment\_geom\_properties()`, `update\_segment\_geom\_derived\_fields()`, `update\_route\_aggregates\_from\_segments()` are present and linked.

19. \*\*Standard updated\_at Trigger\*\* – ensure one chosen implementation is attached to every table with `updated\_at`.

20. \*\*Orphan Translation Cleanup\*\* – generic `public.cleanup\_related\_translations()` exists and every translatable parent table has AFTER DELETE trigger.

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║ IX. DOCUMENTATION & SEED DATA ║

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21. \*\*Comments & JSON Schema Mirror\*\* – keep SQL comments and JSON schema perfectly in sync after changes.

22. \*\*Initial Seed Data\*\* – for every `\_master` table, list V1 seed rows (`code`, `name\_en`, `is\_active`, `sort\_order`, etc.).

\*\*End of Checklist\*\*