# Strategic Planning System - Database Schema

## Architecture Philosophy: Hybrid Approach

**Normalized (Relational):** Core entities, relationships, frequently queried data **JSONB (Flexible):** Complex nested structures, template-driven data, evolving schemas

## Schema Overview

### Core Entity Relationship Diagram

municipalities  
 ↓ (1:many)  
departments  
 ↓ (1:many)  
strategic\_plans ──→ fiscal\_years (3-year span)  
 ↓ (1:many)  
strategic\_goals  
 ↓ (1:many)  
initiatives ←──→ initiatives (dependencies, many:many)  
 ↓ ↓ (many:many via junction)  
 ↓ departments (collaborative initiatives)  
 ↓  
 ├─→ initiative\_budgets (normalized financial tracking)  
 ├─→ initiative\_kpis (performance metrics)  
 ├─→ quarterly\_milestones (implementation timeline)  
 └─→ audit\_logs (change tracking)

## Table Specifications

### 1. municipalities

**Purpose:** Support multi-city deployment (future scalability)

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| name | text | City name (e.g., “City of Carrollton”) |
| slug | text | URL-safe identifier (e.g., “carrollton”) |
| state | text | State abbreviation |
| settings | jsonb | City-specific configuration |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - Unique on slug

### 2. departments

**Purpose:** Organizational units that create strategic plans

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| municipality\_id | uuid | FK to municipalities |
| name | text | Department name (e.g., “Water & Field Services”) |
| slug | text | URL-safe identifier |
| director\_name | text | Department director |
| director\_email | text | Contact email |
| mission\_statement | text | Department mission |
| core\_services | jsonb | Array of service areas |
| current\_staffing | jsonb | FTE breakdown by category |
| is\_active | boolean | Active status |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - municipality\_id, slug (unique together) - municipality\_id (for filtering)

### 3. fiscal\_years

**Purpose:** Reference table for fiscal year periods

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| municipality\_id | uuid | FK to municipalities |
| year | integer | Fiscal year (e.g., 2025) |
| start\_date | date | FY start (e.g., 2024-10-01) |
| end\_date | date | FY end (e.g., 2025-09-30) |
| is\_current | boolean | Current fiscal year flag |
| created\_at | timestamptz | Record creation |

**Indexes:** - municipality\_id, year (unique together)

### 4. strategic\_plans

**Purpose:** The 3-year strategic planning document

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| department\_id | uuid | FK to departments |
| start\_fiscal\_year\_id | uuid | FK to fiscal\_years (Year 1) |
| end\_fiscal\_year\_id | uuid | FK to fiscal\_years (Year 3) |
| title | text | Plan title |
| status | text | draft, under\_review, approved, active, archived |
| version | text | Version number (e.g., “2.0”) |
| executive\_summary | text | High-level overview |
| department\_vision | text | 3-year vision statement |
| swot\_analysis | jsonb | {strengths: [], weaknesses: [], opportunities: [], threats: []} |
| environmental\_scan | jsonb | Demographics, economic, regulatory, tech trends |
| benchmarking\_data | jsonb | Peer municipality comparisons |
| total\_investment\_amount | numeric(12,2) | Total 3-year investment |
| approved\_by | uuid | FK to users (approver) |
| approved\_at | timestamptz | Approval timestamp |
| published\_at | timestamptz | Publication date |
| created\_by | uuid | FK to users (creator) |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - department\_id, status - start\_fiscal\_year\_id

**Status Flow:** draft → under\_review → approved → active → archived

### 5. strategic\_goals

**Purpose:** 3-5 major goals per strategic plan

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| strategic\_plan\_id | uuid | FK to strategic\_plans |
| goal\_number | integer | Order/numbering (1, 2, 3, 4) |
| title | text | Goal title |
| description | text | 1-2 sentence description |
| city\_priority\_alignment | text | Which city strategic priority this supports |
| objectives | jsonb | Array of SMART objectives |
| success\_measures | jsonb | Array of success measures |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - strategic\_plan\_id, goal\_number (unique together)

**JSONB Structure Examples:**

objectives: [  
 "Increase water quality compliance to 99.5% by end of Year 3",  
 "Reduce emergency response time to under 15 minutes city-wide"  
]  
  
success\_measures: [  
 "Monthly water quality test results",  
 "Average response time tracking"  
]

### 6. initiatives

**Purpose:** Individual strategic initiatives (the heart of the plan)

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| strategic\_goal\_id | uuid | FK to strategic\_goals |
| lead\_department\_id | uuid | FK to departments |
| fiscal\_year\_id | uuid | FK to fiscal\_years (implementation year) |
| initiative\_number | text | e.g., “1.1”, “2.3” |
| name | text | Initiative name |
| priority\_level | text | NEED, WANT, NICE\_TO\_HAVE |
| rank\_within\_priority | integer | Ranking within priority tier |
| description | text | Detailed description |
| rationale | text | Why this is critical |
| expected\_outcomes | jsonb | Array of expected outcomes |
| status | text | not\_started, in\_progress, at\_risk, completed, deferred |
| financial\_analysis | jsonb | Cost breakdown, funding sources |
| roi\_analysis | jsonb | Financial & non-financial ROI |
| cost\_benefit\_analysis | jsonb | Benefits vs costs breakdown |
| implementation\_timeline | jsonb | Quarterly milestones |
| dependencies | jsonb | Internal/external dependencies |
| risks | jsonb | Risk assessment matrix |
| total\_year\_1\_cost | numeric(12,2) | Year 1 budget |
| total\_year\_2\_cost | numeric(12,2) | Year 2 budget (if multi-year) |
| total\_year\_3\_cost | numeric(12,2) | Year 3 budget (if multi-year) |
| responsible\_party | text | Name/title of responsible person |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - strategic\_goal\_id - fiscal\_year\_id - priority\_level, rank\_within\_priority - status

**JSONB Structure Examples:**

financial\_analysis: {  
 "year\_1": {  
 "personnel\_costs": 75000,  
 "equipment\_technology": 50000,  
 "professional\_services": 25000,  
 "training\_development": 10000,  
 "materials\_supplies": 5000,  
 "other\_costs": 0,  
 "total": 165000  
 },  
 "funding\_sources": [  
 {"source": "General Fund", "amount": 100000, "status": "secured"},  
 {"source": "EPA Grant", "amount": 65000, "status": "pending"}  
 ]  
}  
  
roi\_analysis: {  
 "financial": {  
 "projected\_annual\_savings": 50000,  
 "projected\_revenue\_generation": 0,  
 "payback\_period\_months": 36,  
 "three\_year\_net\_impact": 150000  
 },  
 "non\_financial": {  
 "service\_quality\_improvement": "30% reduction in water quality incidents",  
 "efficiency\_gains": "Save 200 staff hours annually",  
 "risk\_reduction": "Mitigate regulatory compliance penalties",  
 "citizen\_satisfaction": "Expected 15% increase in satisfaction scores"  
 }  
}  
  
risks: [  
 {  
 "risk": "Vendor delays in equipment delivery",  
 "probability": "M",  
 "impact": "H",  
 "mitigation": "Dual-source procurement strategy",  
 "contingency": "Rent temporary equipment"  
 }  
]

### 7. initiative\_budgets

**Purpose:** Normalized budget tracking for aggregation and reporting

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| initiative\_id | uuid | FK to initiatives |
| fiscal\_year\_id | uuid | FK to fiscal\_years |
| category | text | personnel, equipment, services, training, materials, other |
| amount | numeric(12,2) | Budget amount |
| funding\_source | text | General fund, grants, bonds, fees, etc. |
| funding\_status | text | secured, requested, pending, projected |
| notes | text | Additional context |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - initiative\_id, fiscal\_year\_id - fiscal\_year\_id, funding\_source

**Design Note:** This table allows easy queries like: - “Total budget across all initiatives for FY2025” - “All grant-funded initiatives” - “Equipment spending across departments”

### 8. initiative\_kpis

**Purpose:** Performance metrics / Key Performance Indicators

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| initiative\_id | uuid | FK to initiatives (nullable for department-level KPIs) |
| strategic\_goal\_id | uuid | FK to strategic\_goals (nullable) |
| strategic\_plan\_id | uuid | FK to strategic\_plans (for dept-wide KPIs) |
| metric\_name | text | KPI name |
| measurement\_frequency | text | monthly, quarterly, annual |
| baseline\_value | text | Current/starting value |
| year\_1\_target | text | Year 1 target |
| year\_2\_target | text | Year 2 target |
| year\_3\_target | text | Year 3 target |
| data\_source | text | Where data comes from |
| responsible\_party | text | Who tracks this |
| actual\_values | jsonb | {date: value} pairs for actual measurements |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - initiative\_id - strategic\_goal\_id - strategic\_plan\_id

**Design Note:** Flexible structure allows KPIs at initiative, goal, or department level

### 9. quarterly\_milestones

**Purpose:** Track implementation timeline progress

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| initiative\_id | uuid | FK to initiatives |
| fiscal\_year\_id | uuid | FK to fiscal\_years |
| quarter | integer | 1, 2, 3, 4 |
| milestone\_description | text | What should be accomplished |
| responsible\_party | text | Name/title |
| budget\_impact | numeric(12,2) | Spending in this quarter |
| status | text | not\_started, in\_progress, completed, delayed |
| completion\_date | date | Actual completion date |
| notes | text | Progress notes |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - initiative\_id, fiscal\_year\_id, quarter (unique together) - status

### 10. initiative\_dependencies

**Purpose:** Track dependencies between initiatives (many-to-many)

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| initiative\_id | uuid | FK to initiatives (dependent initiative) |
| depends\_on\_initiative\_id | uuid | FK to initiatives (prerequisite) |
| dependency\_type | text | internal, external, resource\_sharing |
| nature\_of\_dependency | text | Description of dependency |
| is\_critical\_path | boolean | Blocks progress if not met |
| created\_at | timestamptz | Record creation |

**Indexes:** - initiative\_id, depends\_on\_initiative\_id (unique together) - depends\_on\_initiative\_id (for reverse lookups)

### 11. initiative\_collaborators

**Purpose:** Cross-departmental initiatives (many-to-many)

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| initiative\_id | uuid | FK to initiatives |
| department\_id | uuid | FK to departments |
| role | text | lead, support, contributor |
| resources\_committed | text | Description of resources |
| budget\_share | numeric(12,2) | This department’s budget contribution |
| created\_at | timestamptz | Record creation |

**Indexes:** - initiative\_id, department\_id (unique together)

### 12. users (extends Supabase auth.users)

**Purpose:** User profiles and roles

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key (matches auth.users.id) |
| municipality\_id | uuid | FK to municipalities |
| department\_id | uuid | FK to departments (nullable) |
| role | text | admin, department\_director, staff, city\_manager, finance, council, public |
| full\_name | text | User’s name |
| title | text | Job title |
| email | text | Email (synced from auth) |
| avatar\_url | text | Profile image |
| preferences | jsonb | UI preferences, notifications |
| is\_active | boolean | Account status |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - municipality\_id, role - department\_id

### 13. audit\_logs

**Purpose:** Track all changes to strategic plans and initiatives

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| table\_name | text | Which table was modified |
| record\_id | uuid | ID of modified record |
| action | text | insert, update, delete |
| old\_values | jsonb | Previous state |
| new\_values | jsonb | New state |
| changed\_by | uuid | FK to users |
| changed\_at | timestamptz | When change occurred |
| ip\_address | inet | Source IP |
| user\_agent | text | Browser/client info |

**Indexes:** - table\_name, record\_id - changed\_by - changed\_at

### 14. document\_embeddings (for RAG/AI)

**Purpose:** Vector embeddings for semantic search and AI analysis

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| content\_type | text | strategic\_plan, initiative, goal, uploaded\_pdf |
| content\_id | uuid | FK to relevant table |
| content\_text | text | Text that was embedded |
| embedding | vector(1536) | pgvector embedding (OpenAI ada-002 dimension) |
| metadata | jsonb | Additional context for retrieval |
| created\_at | timestamptz | Record creation |

**Indexes:** - content\_type, content\_id - HNSW index on embedding for vector similarity search

**Design Note:** Enables: - “Find initiatives similar to this one” - “What does our plan say about water infrastructure?” - Comparative analysis across departments/years

### 15. comments

**Purpose:** Collaborative feedback and discussion

| Column | Type | Description |
| --- | --- | --- |
| id | uuid | Primary key |
| entity\_type | text | strategic\_plan, initiative, goal |
| entity\_id | uuid | ID of commented entity |
| parent\_comment\_id | uuid | FK to comments (for threading) |
| author\_id | uuid | FK to users |
| content | text | Comment text |
| is\_resolved | boolean | For review comments |
| created\_at | timestamptz | Record creation |
| updated\_at | timestamptz | Last modification |

**Indexes:** - entity\_type, entity\_id - parent\_comment\_id

## Design Decisions & Rationale

### Why Hybrid?

* **Relational core:** Enables complex queries across plans, departments, years
* **JSONB flexibility:** Template sections evolve; municipalities customize formats
* **Best practice:** Normalize what you query often; embed what you display as units

### Financial Data Strategy

* **Normalized initiative\_budgets:** Enables aggregation, reporting, funding analysis
* **JSONB financial\_analysis:** Preserves template structure for detailed breakdowns
* **Both coexist:** Summary in table, detail in JSON

### Multi-Year Handling

* **Fiscal year FK:** Each initiative linked to implementation year
* **Budget columns:** Year 1/2/3 costs on initiative table for convenience
* **Detailed breakdown:** initiative\_budgets table with year FK for precision

### Audit & Compliance

* **Comprehensive audit log:** Government accountability requirements
* **Status tracking:** Clear workflow states
* **Approval chain:** Captured in strategic\_plans table

### AI/RAG Integration

* **Embeddings table:** Separate from core data, can regenerate
* **Flexible content types:** Embed plans, initiatives, uploaded documents
* **Metadata JSONB:** Store fiscal year, department, priority for filtered retrieval

## Next Steps

1. **Review this schema** - Does it match your mental model?
2. **Refine together** - What’s missing? What should change?
3. **Generate migrations** - I’ll create the SQL files
4. **RLS policies** - Define security rules
5. **Seed data** - Create sample data for testing

**What would you like to adjust or explore further?**