# Non-Functional Requirements

## Performance

**Response Time:** - Page load: <2 seconds (p95) - Dashboard queries: <3 seconds (p95) - PDF generation: <30 seconds

**Scalability:** - Support 50 concurrent users - Support 20 departments - Support 500+ initiatives per department

**Database:** - Query optimization for aggregation queries - Proper indexing on foreign keys and commonly filtered fields

## Security

**Authentication:** - Supabase Auth with email/password - Optional: SSO with city’s identity provider (future)

**Authorization:** - Row-level security (RLS) enforced at database level - Role-based access control (RBAC)

**Data Protection:** - HTTPS only (TLS 1.2+) - Passwords hashed with bcrypt - Sensitive data encrypted at rest (Supabase default)

**Audit & Compliance:** - Comprehensive audit log (all changes tracked) - Data retention policy (7 years for government records)

## Usability

**Accessibility:** - WCAG 2.1 Level AA compliance - Keyboard navigation support - Screen reader compatible - Color contrast ratios meet standards

**Browser Support:** - Chrome/Edge (latest 2 versions) - Firefox (latest 2 versions) - Safari (latest 2 versions) - No IE11 support

**Responsive Design:** - Desktop-first (primary use case) - Tablet-friendly (iPad, etc.) - Mobile-readable (not optimized for data entry)

## Reliability

**Uptime:** - 99.5% uptime (target) - Maintenance windows: Weekends, off-hours

**Backup & Recovery:** - Daily automated backups (Supabase) - Point-in-time recovery (7 days) - Disaster recovery plan documented

**Error Handling:** - Graceful degradation for failed queries - User-friendly error messages - Error logging and monitoring

## Maintainability

**Code Quality:** - TypeScript for type safety - ESLint + Prettier for code formatting - Unit tests for critical business logic (>60% coverage target) - E2E tests for critical user journeys

**Documentation:** - Inline code comments for complex logic - README for setup and deployment - Architecture documentation (ADRs)

**Monitoring:** - Application logging (errors, warnings) - Performance monitoring (query times) - User analytics (page views, feature usage)