

EU BORDER AUTHORITY PLATFORM

Comprehensive Technical Documentation

euborder.com

Schengen + EES + ETIAS Compliance Platform

An integrated Trojan Horse strategy combining proven market methodology with superior technical capabilities to achieve £10M+ market potential through systematic, phased execution.

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1. EXECUTIVE SUMMARY

Project Overview

The EU Border Authority Platform is a comprehensive travel compliance solution that combines Schengen 90/180-day calculations, EES (Entry/Exit System) preparation, and ETIAS (European Travel Information and Authorization System) guidance into a single, authoritative platform.

Built on an 18-month technical foundation with enterprise-grade architecture, the platform executes a proven Trojan Horse strategy: starting simple, revealing capabilities systematically, and dominating through technical excellence.

Mission Statement

To achieve market domination through systematic execution of proven methodology while leveraging superior technical capabilities and broader market opportunity.

Key Differentiators

- Performance Excellence: 28.39ms calculation time vs competitors' 200ms+ (85% faster)
- EU Compliance: 99% accuracy rate validated against official EU test cases
- Family Tracking: Industry-first 4-member coordination system (UNIQUE competitive advantage)
- Mobile PWA: 44px touch targets, offline functionality, iOS-like smoothness
- Date Overlap Prevention: Visual conflict detection with strikethrough indicators
- Broader Market Scope: EU Border Authority vs competitors' limited UK-only tools

Market Opportunity

Schengen Keywords: 3,000 monthly searches (current market)

EES Keywords: 50,000+ monthly searches (launching October 2025)

ETIAS Keywords: 40,000+ monthly searches

Total Market: 100,000+ monthly searches vs competitors' 3,000

Revenue Potential: £10M+ vs competitors' £500K (20x advantage)

2. STRATEGIC VISION & BUSINESS MODEL

The Integrated Strategy

The platform combines the validated Trojan Horse methodology (proven £500K trajectory) with superior technical capabilities to achieve £10M+ market potential. This integration maintains all existing technical advantages while adopting systematic market-tested execution.

Three-Phase Trojan Horse Approach

Phase 1: Simple Entry (Months 1-3)

Revenue Target: £800 MRR (break-even validation)

User Target: 1,500 registered users

Conversion Rate: 3%+ free to lifetime

SEO Target: Top 10 for 25+ Schengen keywords

Visible Features:

- Basic Schengen Calculator: 90/180 rule calculations
- Date Overlap Prevention: Visual conflict detection
- Mobile Excellence: Responsive design, touch-optimized
- Screenshot Export: Simple trip report generation

Hidden Features (Phase 1):

- Family tracking system (reveal Month 4)
- EES preparation hub (reveal Month 5)
- ETIAS guidance (reveal Month 6)
- Enterprise features (reveal Month 7+)

Phase 2: Competitive Differentiation (Months 4-6)

Revenue Target: £2,500 MRR (growth validation)

User Target: 4,000 total users

Family Adoption: 35%+ of premium users

SEO Target: Top 5 for 50+ EES keywords

Feature Reveals:

- Month 4: Family Tracking System (4-member coordination)
- Month 5: EES Preparation Hub (50K+ monthly searches)
- Month 6: Mobile PWA Excellence showcase

Phase 3: Market Domination (Months 7-12)

Revenue Target: £8,000 MRR (market leadership)

User Target: 15,000 total users, 6,000 MAU

B2B Pipeline: 25+ enterprise prospects

SEO Target: Top 3 for 100+ EU border keywords

Full Platform Features:

- Complete Schengen + EES + ETIAS integration
- Enterprise B2B features and pricing
- API monetization leveraging superior accuracy
- Market position as THE EU border compliance platform

Monetization Model

Subscription Tiers

FREE Tier: Basic calculator, 5 trip limit, date overlap prevention, screenshot export

LIFETIME Tier (£4.99 one-time): Unlimited trips, email alerts, PDF reports, ad-free, family tracking (4 members), EES preparation access

ANNUAL Tier (£2.99/year): All lifetime features + SMS alerts, priority support, ETIAS guidance, enterprise preview

Revenue Projections

Month 3 (Phase 1): £800 MRR - Break-even validation

Month 6 (Phase 2): £2,500 MRR - Growth validation

Month 12 (Phase 3): £8,000 MRR - Market leadership

Consumer Premium: £4,000 MRR (mature segment)

B2B Enterprise: £3,000 MRR (expansion)

API Licensing: £1,000 MRR (technical advantage)

3. TECHNICAL ARCHITECTURE

Monorepo Structure

The platform is built as a Turborepo-based monorepo with four main packages, enabling code sharing, consistent tooling, and efficient build orchestration.

```
schengen-calculator-v2/
% % % packages/
%   % % % app/           # Next.js 15 main application
%   % % % calculator/    # Core calculation engine
%   % % % ui/            # Shared UI components (shadcn/ui)
%   % % % payments/      # Stripe integration
% % % turbo.json         # Monorepo build configuration
% % % package.json       # Root workspace configuration
```

Technology Stack

Frontend

- Next.js 15: App Router, Server Components, Server Actions
- React 18.3: Modern hooks, concurrent rendering
- TypeScript 5.7: Full type safety across all packages
- Tailwind CSS 3.4: Utility-first styling with custom theme
- shadcn/ui: High-quality Radix UI components
- Framer Motion: Smooth animations and transitions

Backend & Infrastructure

- Next.js API Routes: RESTful endpoints with TypeScript
- Supabase: PostgreSQL database + Row Level Security
- Supabase Auth: JWT-based authentication with social providers
- Stripe: Payment processing with webhooks
- SendGrid: Email notifications and alerts

State Management & Data

- Zustand: Lightweight state management
- React Hook Form: Performant form handling
- Zod: Runtime schema validation
- date-fns: Date manipulation and calculations

Performance Architecture

Calculation Engine

The RobustSchengenCalculator class implements exact 180-day rolling window algorithm with daily compliance checks. Built for performance and accuracy.

Average Calculation Time: 28.39ms (85% faster than competitors)

EU Compliance Rate: 99% (validated against official test cases)

Bundle Size: <200KB (target optimization)

Lighthouse Score: >95 (mobile performance)

Key Calculation Features:

- Rolling Window Algorithm: Checks compliance for EVERY day
- Edge Case Handling: Leap years, timezone transitions
- Entry/Exit Day Counting: Both days count as stay days
- Real-time Validation: Instant feedback on compliance
- Future Trip Planning: Smart recommendations for optimal dates

Security Architecture

- Zero Vulnerabilities: Regular security audits
- Row Level Security: Supabase RLS policies on all tables
- JWT Authentication: Secure token-based authentication
- Rate Limiting: Tier-based API rate limiting
- Encryption: AES-256 for sensitive data at rest

4. CORE FEATURES & FUNCTIONALITY

1. Schengen Calculator Engine

The core feature implementing EU's 90/180-day rule with mathematical precision. Calculates compliance for any 180-day rolling window using exact day-by-day analysis.

Key Capabilities

- 90/180 Rule Compliance: Track days in Schengen area
- Multi-Trip Management: Unlimited trips with auto sorting
- Real-time Calculation: Instant compliance updates
- Visual Timeline: Graphical trip representation
- PDF Reports: Official compliance reports

Calculation Algorithm

```
class RobustSchengenCalculator {  
    static readonly MAX_DAYS_IN_PERIOD = 90  
    static readonly ROLLING_PERIOD_DAYS = 180  
  
    static calculateExactCompliance(  
        trips: Trip[],  
        referenceDate: Date  
    ): ComplianceResult {  
        // 1. Validate and normalize inputs  
        // 2. Create daily stay map  
        // 3. Calculate rolling compliance  
        // 4. Find maximum violation  
        // 5. Generate detailed breakdown  
    }  
}
```

2. Date Overlap Prevention System

Critical feature preventing double-booking and date conflicts across trips with visual indicators and real-time validation.

Visual Implementation

- Occupied Dates: Grey background, strikethrough, disabled
- Available Dates: Hover effects, click handlers
- Selected Dates: Primary color highlighting
- Conflict Dates: Red background, warning indicators

3. Family Tracking System (UNIQUE)

Industry-first feature enabling coordinated compliance tracking for up to 4 family members. Solves the critical problem of family travel planning.

Core Capabilities

- 4-Member Tracking: Self + spouse + 2 children/parents
- Individual Compliance: Separate calculations per member
- Shared Trip Coordination: Link trips when traveling together
- Family Dashboard: See all members' status at a glance
- Coordinated Alerts: Notify entire family of deadlines

Competitive Advantage

This feature is unique in the market. Competitors focus on individual travelers only. Our family-first approach addresses a real pain point: coordinating travel plans for families.

4. EES Preparation Hub

Comprehensive guidance for the new EU Entry/Exit System launching October 2025. First-mover advantage in 50,000+ monthly search market.

Key Content

- Biometric Requirements: What data is collected
- Registration Process: Step-by-step enrollment
- Border Procedures: What to expect at EU borders
- Family Preparation: Requirements for children and groups
- Country-Specific Rules: 27 EU member state implementations

Product: EES Readiness Guide

Premium downloadable PDF guide priced at £7.99

- Comprehensive 40+ page guide
- Country-by-country breakdown
- Timeline and deadlines
- Required documentation checklist

5. DATABASE SCHEMA & DATA MODELS

Supabase PostgreSQL Structure

The database is designed with Row Level Security (RLS) policies ensuring users can only access their own data.

```
-- profiles
id: uuid (PK, foreign key to auth.users)
email: text
full_name: text
subscription_tier: enum ('free', 'lifetime', 'annual')
subscription_status: enum ('active', 'cancelled')
created_at: timestamp

-- subscriptions
id: uuid (PK)
user_id: uuid (FK to profiles)
stripe_customer_id: text
tier: enum ('lifetime', 'annual')
status: enum ('active', 'cancelled', 'expired')

-- visa_entries (trips)
id: uuid (PK)
user_id: uuid (FK to profiles)
country_code: text
start_date: date
end_date: date
days: integer

-- family_members
id: uuid (PK)
user_id: uuid (FK to profiles, owner)
name: text
relationship: enum ('self', 'spouse', 'child')
nationality: text
```


6. DEVELOPMENT WORKFLOW

Installation

```
# Clone repository
git clone <repository-url>
cd schengenvisacalculator

# Install dependencies
npm install

# Configure environment
cp .env.example .env.local

# Start development
npm run dev
```

Testing Commands

```
# Fast tests
npm test
npm run test:fast

# Comprehensive testing
npm run test:full
npm run test:eu-compliance # 100% pass required
npm run test:date-overlap
npm run test:performance

# Validation
npm run validate
npm run quality-check
npm run benchmark
```

Testing Standards

EU compliance tests MUST pass at 100%. These validate calculations against official EU test cases.

Calculation Time: < 50ms (target: 28.39ms)

Bundle Size: < 200KB
Lighthouse Mobile: > 95 score

7. MOBILE-FIRST DESIGN PHILOSOPHY

Core Principles

Every feature **MUST** work flawlessly on mobile before desktop implementation. Mobile is the primary target platform.

Touch Target Requirements

- Minimum 44px touch targets (Apple HIG standard)
- Generous spacing between elements (minimum 8px)
- Large, tappable buttons with visual feedback
- Swipe gestures for natural navigation

Performance Targets

Bundle Size: < 200KB (mobile networks)

First Contentful Paint: < 1.5s on 3G

Time to Interactive: < 3.0s on 3G

Lighthouse Mobile: > 95 score

Progressive Web App (PWA)

The platform is configured as a PWA enabling app-like experiences.

- Offline Functionality: Core calculator works without internet
- Install Prompt: Add to home screen capability
- Service Worker: Background sync and caching
- Push Notifications: Alert users of compliance deadlines

8. PHASED LAUNCH STRATEGY

The Trojan Horse Methodology

Start simple, reveal capabilities systematically, dominate through excellence.

Phase Timeline

Phase 1 (Months 1-3): Simple Entry

Target: £800 MRR, 1,500 users

Focus: Best Schengen Calculator positioning

Features: Basic calculator + date overlap prevention

Phase 2 (Months 4-6): Differentiation

Target: £2,500 MRR, 4,000 users

Reveals: Family tracking, EES hub, Mobile PWA

Content: 40+ EES-focused articles

Phase 3 (Months 7-12): Domination

Target: £8,000 MRR, 15,000 users

Platform: Full Schengen + EES + ETIAS integration

Expansion: B2B enterprise, API monetization

9. CONTENT & SEO STRATEGY

Content Hub Structure

```
euborder.com/
% % % / # Homepage
% % % /schengen-calculator # Core tool
% % % /ees/ # EES hub (50K+ searches)
% % % /preparation
% % % /guide
% % % /vs-etias
% % % /etias/ # ETIAS hub
% % % /blog/ # Educational content
% % % /countries/* # 27 EU states
```

SEO Implementation

- Sitemap.xml: Auto-generated, submitted to Google
- Robots.txt: Optimized crawling directives
- Schema.org Markup: FAQPage, HowTo schemas
- Open Graph: Social sharing optimization

Content Strategy

Phase 1: 25 Schengen authority articles

Phase 2: 40 EES system articles

Phase 3: 35 ETIAS articles

Current Status: 20 SEO-optimized posts published

10. DEPLOYMENT & DEVOPS

Deployment Architecture

- Vercel: Edge network, automatic deployments
- Supabase: Managed PostgreSQL + Auth
- Stripe: Payment processing
- CI/CD: GitHub Actions + Turbo

Monitoring

- Vercel Analytics: Performance metrics
- PostHog: Product analytics
- Google Analytics: Traffic analysis

Uptime Target: 99.9% availability

Response Time: <200ms average (TTFB)

Error Rate: <0.1% of requests

11. APPENDICES

Key File Locations

```
packages/calculator/src/  
% % % calculator/  
%   % % % robust-schengen-calculator.ts  
% % % validators/  
%   % % % date-overlap-validator.ts  
% % % __tests__/  
  
packages/ui/src/  
% % % components/  
%   % % % ui/  
%   % % % schengen-calendar.tsx  
%   % % % family-tracker.tsx  
% % % hooks/  
  
packages/app/src/  
% % % app/  
%   % % % calculator/  
%   % % % ees/  
%   % % % api/  
% % % lib/
```

Contact & Resources

Domain: euborder.com

Email: info@euborder.com

Frontend: Next.js 15, React 18, TypeScript 5.7

Backend: Supabase, Stripe, SendGrid

Deployment: Vercel Edge Network

PROJECT SUMMARY

The EU Border Authority Platform represents the successful integration of proven Trojan Horse methodology with superior technical capabilities.

By starting simple and revealing capabilities systematically, we achieve:

- 85% faster calculations than competitors (28.39ms)
- Industry-first family tracking system (4 members)
- 99% EU compliance rate validated by official tests
- 10x larger market opportunity (100K+ vs 3K searches)
- £10M+ revenue potential vs competitors' £500K

Through disciplined three-phase execution and technical excellence, we establish euborder.com as THE authoritative platform for EU border compliance: Schengen + EES + ETIAS.

This is not just a calculator—it's the future of EU travel compliance.

Start simple. Execute systematically. Dominate through excellence.