# **Product Requirements Document: Nationwide Toll Hub**

## **1. Product Overview**

### **1.1 Vision Statement**

Create the definitive unified toll management platform that eliminates the complexity of multi-state toll payments, providing drivers with a single account to manage all their toll roads across the United States.

### **1.2 Value Proposition**

* **For Consumers**: One account, one bill, complete transparency
* **For Fleet Operators**: Centralized cost management and reporting
* **For Partners**: Standardized API access to toll data

### **1.3 Success Criteria**

* 500,000 active users within 12 months
* 30+ integrated toll agencies
* <2% dispute rate on transactions
* 4.5+ App Store rating
* <30 second time to add a vehicle
* <5 minute complete onboarding

## **2. User Personas & Journey Maps**

### **2.1 Primary Personas**

**Sarah - Daily Commuter**

* Age: 34, Software Developer
* Commutes between NJ and NY daily
* Has E-ZPass but confused by different agencies
* Wants: Simple consolidated billing, no surprises

**Mike - Road Trip Enthusiast**

* Age: 45, Sales Executive
* Drives through 10+ states monthly
* Multiple toll accounts, often gets violations
* Wants: Coverage certainty, quick dispute resolution

**Jennifer - Small Fleet Owner**

* Age: 52, Logistics Manager
* Manages 12 delivery vehicles
* Needs per-vehicle cost tracking
* Wants: Bulk management, detailed reporting

### **2.2 User Journey Map**

Awareness → Download → Onboarding → First Trip → Statement → Ongoing Use

│ │ │ │ │ │

├─ Ad ├─ App ├─ Account ├─ Drive ├─ Review ├─ Monitor

├─ Search │ Store ├─ Vehicle ├─ Toll ├─ Pay ├─ Dispute

└─ Referral └─ Install ├─ Payment └─ Capture └─ Export └─ Optimize

└─ Link

## **3. Information Architecture**

### **3.1 Navigation Structure**

┌─────────────────────────────────────────┐

│ Tab Bar │

├─────┬─────┬─────┬─────┬─────────────────┤

│Home │Tolls│Stmt │Vehic│More │

└─────┴─────┴─────┴─────┴─────────────────┘

Home Tolls Statements

├─ Today's Total ├─ Timeline ├─ Current

├─ Quick Actions ├─ Map View ├─ History

├─ Recent Activity ├─ Search/Filter └─ Scheduled

└─ Notifications └─ Details

Vehicles More

├─ My Vehicles ├─ Profile

├─ Add Vehicle ├─ Payment Methods

└─ Assign Tags ├─ Linked Accounts

├─ Coverage Map

├─ Tag Advisor

├─ Disputes

├─ Settings

└─ Help

### **3.2 Data Hierarchy**

User Account

├── Profile Information

├── Vehicles[]

│ ├── License Plate

│ ├── State

│ ├── Type/Class

│ └── Linked Agencies[]

├── Payment Methods[]

├── Agency Links[]

│ ├── Credentials

│ ├── Balance

│ └── Vehicles[]

├── Toll Events[]

│ ├── Timestamp

│ ├── Location

│ ├── Amount

│ └── Evidence

└── Statements[]

├── Period

├── Total

└── Line Items[]

## **4. Detailed Feature Requirements**

### **4.1 Authentication & Onboarding**

#### **4.1.1 Sign Up Flow**

**Screen Flow**

Welcome → Email/Phone → Verification → Password → Profile → Complete

**UI Design: Welcome Screen**

┌─────────────────────────────────┐

│ Status Bar │

├─────────────────────────────────┤

│ │

│ [Toll Hub Logo] │

│ │

│ ━━━━━━━━━━━━━━━ │

│ │

│ One Account. │

│ Every Toll Road. │

│ Daily Unified Bill. │

│ │

│ ────────────── │

│ │

│ ┌─────────────────────┐ │

│ │ Get Started │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Sign In │ │

│ └─────────────────────┘ │

│ │

│ ─ or continue with ─ │

│ │

│ [Apple] [Google] [Email] │

│ │

│ Terms • Privacy │

│ │

└─────────────────────────────────┘

**Requirements**

* Support email, phone, and social authentication
* Email verification required before proceeding
* Password requirements:
  + Minimum 12 characters
  + 1 uppercase, 1 lowercase, 1 number
  + Check against common breach databases
* Social auth should pre-fill known information
* Progress indicator showing onboarding steps

**UI Design: Email Verification**

┌─────────────────────────────────┐

│ ← Back │

├─────────────────────────────────┤

│ │

│ Check your email │

│ │

│ We sent a code to: │

│ sarah@example.com │

│ │

│ ┌───┬───┬───┬───┬───┬───┐ │

│ │ 5 │ 2 │ 7 │ 3 │ 9 │ 1 │ │

│ └───┴───┴───┴───┴───┴───┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Verify │ │

│ └─────────────────────┘ │

│ │

│ Didn't receive it? │

│ [Resend Code] (0:45) │

│ │

└─────────────────────────────────┘

#### **4.1.2 Onboarding Flow**

**Screen 1: Add Your First Vehicle**

┌─────────────────────────────────┐

│ Skip → │

├─────────────────────────────────┤

│ │

│ Add Your Vehicle │

│ │

│ ┌─────────────────────┐ │

│ │ License Plate │ │

│ │ ABC1234 │ │

│ └─────────────────────┘ │

│ │

│ State │

│ ┌─────────────────────┐ │

│ │ Texas (TX) ▼ │ │

│ └─────────────────────┘ │

│ │

│ Vehicle Type │

│ ┌─────────────────────┐ │

│ │ Passenger Car ▼ │ │

│ └─────────────────────┘ │

│ │

│ Nickname (Optional) │

│ ┌─────────────────────┐ │

│ │ My Tesla │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Add Vehicle │ │

│ └─────────────────────┘ │

│ │

│ ● ○ ○ ○ │

└─────────────────────────────────┘

**Screen 2: Payment Method**

┌─────────────────────────────────┐

│ ← Back │

├─────────────────────────────────┤

│ │

│ Add Payment Method │

│ │

│ How you'll pay for tolls │

│ │

│ ┌─────────────────────┐ │

│ │ 💳 Credit/Debit >│ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ 🏦 Bank Account >│ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ 📱 Apple Pay >│ │

│ └─────────────────────┘ │

│ │

│ [i] Your payment info is │

│ encrypted and secure │

│ │

│ ○ ● ○ ○ │

└─────────────────────────────────┘

**Screen 3: Link Existing Accounts (Optional)**

┌─────────────────────────────────┐

│ Skip → │

├─────────────────────────────────┤

│ │

│ Link Toll Accounts │

│ │

│ Connect existing accounts │

│ for better rates │

│ │

│ Popular in your area: │

│ │

│ ┌─────────────────────┐ │

│ │ E-ZPass NY │ │

│ │ ✓ Read balances │ │

│ │ ✓ Tag discounts │ │

│ │ [Link] │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ SunPass │ │

│ │ ✓ Florida coverage │ │

│ │ ✓ Auto top-up │ │

│ │ [Link] │ │

│ └─────────────────────┘ │

│ │

│ [Browse All Agencies] │

│ │

│ ○ ○ ● ○ │

└─────────────────────────────────┘

### **4.2 Home Dashboard**

**UI Design: Home Screen**

┌─────────────────────────────────┐

│ 9:41 AM 100% │

├─────────────────────────────────┤

│ │

│ Good morning, Sarah 👋 │

│ │

│ ┌─────────────────────┐ │

│ │ Today's Tolls │ │

│ │ │ │

│ │ $12.75 │ │

│ │ │ │

│ │ 3 trips • 2 vehicles│ │

│ └─────────────────────┘ │

│ │

│ Quick Actions │

│ ┌────┐ ┌────┐ ┌────┐ ┌────┐ │

│ │ 🚗 │ │ 💳 │ │ 🔗 │ │ 📍 │ │

│ │Add │ │Pay │ │Link│ │Map │ │

│ └────┘ └────┘ └────┘ └────┘ │

│ │

│ Recent Activity │

│ ┌─────────────────────┐ │

│ │ 8:15 AM │ │

│ │ I-95 North Exit 7 │ │

│ │ My Tesla • $4.25 │ │

│ └─────────────────────┘ │

│ ┌─────────────────────┐ │

│ │ 7:45 AM │ │

│ │ NJ Turnpike │ │

│ │ My Tesla • $3.50 │ │

│ └─────────────────────┘ │

│ │

│ [Home][Tolls][Stmt][Car][More] │

└─────────────────────────────────┘

**Requirements**

* Real-time toll total updates
* Show last 5 toll events
* Quick action buttons adapt based on user needs
* Pull-to-refresh gesture
* Tap toll total for detailed breakdown
* Notification badge for unread items

### **4.3 Toll Events**

#### **4.3.1 Timeline View**

**UI Design: Tolls Timeline**

┌─────────────────────────────────┐

│ ← Tolls [Map] [Filter] │

├─────────────────────────────────┤

│ │

│ September 27, 2025 │

│ ───────────────────── │

│ │

│ ┌─────────────────────┐ │

│ │ 2:15 PM • Pending ⏱│ │

│ │ Garden State Pkwy │ │

│ │ Exit 98 Northbound │ │

│ │ My Honda │ │

│ │ $1.90 │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ 8:15 AM • Posted ✓│ │

│ │ I-95 Express Lane │ │

│ │ Mile 47.3 North │ │

│ │ My Tesla │ │

│ │ $4.25 │ │

│ │ [View Evidence] │ │

│ └─────────────────────┘ │

│ │

│ September 26, 2025 │

│ ───────────────────── │

│ │

│ [Load More] │

│ │

└─────────────────────────────────┘

#### **4.3.2 Map View**

**UI Design: Toll Map**

┌─────────────────────────────────┐

│ ← Tolls [List] [Layers] │

├─────────────────────────────────┤

│ │

│ ┌─────────────────────┐ │

│ │ │ │

│ │ [Map View] │ │

│ │ │ │

│ │ 📍 Current │ │

│ │ ● ● ● │ │

│ │ Route │ │

│ │ ● ● │ │

│ │ 🏁 Destination │ │

│ │ │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Upcoming Tolls │ │

│ │ │ │

│ │ In 2.3 mi: I-495 │ │

│ │ Est: $3.50 │ │

│ │ │ │

│ │ In 5.7 mi: Bridge │ │

│ │ Est: $6.00 │ │

│ └─────────────────────┘ │

│ │

└─────────────────────────────────┘

#### **4.3.3 Toll Event Detail**

**UI Design: Event Detail**

┌─────────────────────────────────┐

│ ← Back [Dispute] │

├─────────────────────────────────┤

│ │

│ Toll Details │

│ │

│ ┌─────────────────────┐ │

│ │ [Gantry Image] │ │

│ │ │ │

│ │ Your Vehicle → │ │

│ └─────────────────────┘ │

│ │

│ Date & Time │

│ Sep 27, 2025 at 8:15 AM │

│ │

│ Location │

│ I-95 North, Mile 47.3 │

│ [View on Map] │

│ │

│ Vehicle │

│ My Tesla (ABC 1234) │

│ │

│ Classification │

│ 2-Axle Passenger │

│ │

│ Amount │

│ Base Rate: $4.00 │

│ Peak Hour: $0.25 │

│ ───────────────── │

│ Total: $4.25 │

│ │

│ Agency │

│ E-ZPass NY │

│ Transaction: #7829461 │

│ │

│ [Report Issue] │

│ │

└─────────────────────────────────┘

### **4.4 Statements**

#### **4.4.1 Statement List**

**UI Design: Statements Screen**

┌─────────────────────────────────┐

│ Statements [Export] │

├─────────────────────────────────┤

│ │

│ ┌─────────────────────┐ │

│ │ Current Statement │ │

│ │ Sep 1-27, 2025 │ │

│ │ │ │

│ │ $247.85 │ │

│ │ 47 trips │ │

│ │ │ │

│ │ Closes in 3 days │ │

│ └─────────────────────┘ │

│ │

│ Past Statements │

│ │

│ ┌─────────────────────┐ │

│ │ August 2025 PAID│ │

│ │ $312.40 │ │

│ │ 62 trips │ │

│ │ Paid Sep 1 │ > │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ July 2025 PAID│ │

│ │ $198.55 │ │

│ │ 41 trips │ │

│ │ Paid Aug 1 │ > │

│ └─────────────────────┘ │

│ │

└─────────────────────────────────┘

#### **4.4.2 Statement Detail**

**UI Design: Statement Detail**

┌─────────────────────────────────┐

│ ← Back [PDF] [CSV] [Pay] │

├─────────────────────────────────┤

│ │

│ September 2025 │

│ Sep 1 - Sep 30 │

│ │

│ ┌─────────────────────┐ │

│ │ Summary │ │

│ │ │ │

│ │ Tolls: $235.60 │ │

│ │ Fees: $12.25│ │

│ │ Credits: -$0.00│ │

│ │ ────────────── │ │

│ │ Total: $247.85 │ │

│ │ │ │

│ │ [Pay Now] │ │

│ └─────────────────────┘ │

│ │

│ By Vehicle │

│ │

│ ┌─────────────────────┐ │

│ │ My Tesla │ │

│ │ 31 trips • $178.25│ > │

│ └─────────────────────┘ │

│ ┌─────────────────────┐ │

│ │ My Honda │ │

│ │ 16 trips • $69.60 │ > │

│ └─────────────────────┘ │

│ │

│ By Agency │

│ │

│ ┌─────────────────────┐ │

│ │ E-ZPass NY │ │

│ │ 28 trips • $142.30│ │

│ └─────────────────────┘ │

│ ┌─────────────────────┐ │

│ │ NJ Turnpike │ │

│ │ 19 trips • $105.55│ │

│ └─────────────────────┘ │

│ │

│ All Trips │

│ [View All 47 Trips] │

│ │

└─────────────────────────────────┘

#### **4.4.3 Payment Flow**

**UI Design: Payment Screen**

┌─────────────────────────────────┐

│ ← Cancel │

├─────────────────────────────────┤

│ │

│ Pay Statement │

│ │

│ September 2025 │

│ Amount Due: $247.85 │

│ │

│ Payment Method │

│ ┌─────────────────────┐ │

│ │ ● Visa •••• 4242 │ │

│ │ Default │ │

│ └─────────────────────┘ │

│ ┌─────────────────────┐ │

│ │ ○ Bank •••• 6789 │ │

│ └─────────────────────┘ │

│ │

│ [+ Add Payment Method] │

│ │

│ ┌─────────────────────┐ │

│ │ │ │

│ │ Pay $247.85 │ │

│ │ │ │

│ └─────────────────────┘ │

│ │

│ [i] Payment will process │

│ immediately. You'll receive │

│ a receipt via email. │

│ │

└─────────────────────────────────┘

### **4.5 Vehicle Management**

#### **4.5.1 Vehicle List**

**UI Design: Vehicles Screen**

┌─────────────────────────────────┐

│ Vehicles [Add] │

├─────────────────────────────────┤

│ │

│ My Vehicles (2) │

│ │

│ ┌─────────────────────┐ │

│ │ 🚗 My Tesla │ │

│ │ ABC 1234 • TX │ │

│ │ │ │

│ │ Linked Accounts: │ │

│ │ • E-ZPass NY ✓ │ │

│ │ • TxTag ✓ │ │

│ │ │ > │

│ │ This Month: $178.25│ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ 🚙 My Honda │ │

│ │ XYZ 5678 • TX │ │

│ │ │ │

│ │ Linked Accounts: │ │

│ │ • None │ │

│ │ │ > │

│ │ This Month: $69.60 │ │

│ └─────────────────────┘ │

│ │

│ [+ Add Another Vehicle] │

│ │

└─────────────────────────────────┘

#### **4.5.2 Vehicle Detail**

**UI Design: Vehicle Detail**

┌─────────────────────────────────┐

│ ← Back [Edit][Delete]│

├─────────────────────────────────┤

│ │

│ 🚗 My Tesla │

│ │

│ Vehicle Information │

│ ┌─────────────────────┐ │

│ │ License Plate │ │

│ │ ABC 1234 │ │

│ ├─────────────────────┤ │

│ │ State │ │

│ │ Texas │ │

│ ├─────────────────────┤ │

│ │ Type │ │

│ │ Passenger Car │ │

│ ├─────────────────────┤ │

│ │ Axles │ │

│ │ 2 │ │

│ └─────────────────────┘ │

│ │

│ Linked Toll Accounts │

│ ┌─────────────────────┐ │

│ │ E-ZPass NY ✓ │ │

│ │ Account: \*\*\*\*4521 │ │

│ │ [Unlink] │ │

│ └─────────────────────┘ │

│ ┌─────────────────────┐ │

│ │ TxTag ✓ │ │

│ │ Account: \*\*\*\*8923 │ │

│ │ [Unlink] │ │

│ └─────────────────────┘ │

│ │

│ [+ Link Another Account] │

│ │

│ Statistics │

│ This Month: $178.25 │

│ Last Month: $156.80 │

│ Year to Date: $1,247.65 │

│ │

└─────────────────────────────────┘

### **4.6 Agency Integration**

#### **4.6.1 Agency List**

**UI Design: Agencies Screen**

┌─────────────────────────────────┐

│ ← Back Coverage Map │

├─────────────────────────────────┤

│ │

│ Linked Accounts (2) │

│ │

│ ┌─────────────────────┐ │

│ │ E-ZPass NY │ │

│ │ Balance: $45.30 │ │

│ │ Auto-reload: ON │ │

│ │ Last sync: 2 min │ > │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ TxTag │ │

│ │ Balance: $23.15 │ │

│ │ Auto-reload: OFF │ │

│ │ Last sync: 1 hour │ > │

│ └─────────────────────┘ │

│ │

│ Available to Link │

│ │

│ ┌─────────────────────┐ │

│ │ SunPass │ │

│ │ Florida Coverage │ │

│ │ [Link Account] │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ FasTrak │ │

│ │ California Coverage│ │

│ │ [Link Account] │ │

│ └─────────────────────┘ │

│ │

│ [View All Agencies] │

│ │

└─────────────────────────────────┘

#### **4.6.2 Link Agency Flow**

**UI Design: Link Agency**

┌─────────────────────────────────┐

│ ← Cancel │

├─────────────────────────────────┤

│ │

│ Link E-ZPass Account │

│ │

│ Sign in with your E-ZPass │

│ credentials │

│ │

│ ┌─────────────────────┐ │

│ │ Username/Email │ │

│ │ │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Password │ │

│ │ •••••••• │ │

│ └─────────────────────┘ │

│ │

│ ☐ Save credentials securely │

│ │

│ ┌─────────────────────┐ │

│ │ Link Account │ │

│ └─────────────────────┘ │

│ │

│ 🔒 Your credentials are │

│ encrypted and never shared │

│ │

│ [Forgot Password?] │

│ │

└─────────────────────────────────┘

### **4.7 Disputes**

#### **4.7.1 Dispute List**

**UI Design: Disputes Screen**

┌─────────────────────────────────┐

│ ← Back [Filter] │

├─────────────────────────────────┤

│ │

│ Active Disputes (2) │

│ │

│ ┌─────────────────────┐ │

│ │ Sep 15 - I-95 North│ │

│ │ Status: Under Review│ │

│ │ Amount: $8.50 │ │

│ │ Reason: Wrong class│ > │

│ │ Submitted: Sep 16 │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Sep 10 - NJ Tpke │ │

│ │ Status: Pending │ │

│ │ Amount: $3.25 │ │

│ │ Reason: Duplicate │ > │

│ │ Submitted: Sep 11 │ │

│ └─────────────────────┘ │

│ │

│ Resolved (5) │

│ │

│ ┌─────────────────────┐ │

│ │ Aug 28 - Garden St │ │

│ │ Status: Approved ✓ │ │

│ │ Refund: $4.75 │ > │

│ │ Resolved: Sep 5 │ │

│ └─────────────────────┘ │

│ │

│ [View All Resolved] │

│ │

└─────────────────────────────────┘

#### **4.7.2 Create Dispute**

**UI Design: New Dispute**

┌─────────────────────────────────┐

│ ← Cancel │

├─────────────────────────────────┤

│ │

│ Dispute Toll Charge │

│ │

│ Toll Information │

│ Sep 15, 8:30 AM │

│ I-95 North Exit 7 │

│ Amount: $8.50 │

│ │

│ What's the issue? │

│ ┌─────────────────────┐ │

│ │ ○ Wrong vehicle │ │

│ │ ○ Wrong class │ │

│ │ ● Duplicate charge │ │

│ │ ○ Never traveled │ │

│ │ ○ Other │ │

│ └─────────────────────┘ │

│ │

│ Additional Details │

│ ┌─────────────────────┐ │

│ │ I was charged twice │ │

│ │ for the same trip. │ │

│ │ See transaction │ │

│ │ #7829461 for the │ │

│ │ original charge. │ │

│ └─────────────────────┘ │

│ │

│ Evidence (Optional) │

│ ┌─────────────────────┐ │

│ │ 📎 Add Photos/Docs │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Submit Dispute │ │

│ └─────────────────────┘ │

│ │

└─────────────────────────────────┘

### **4.8 Coverage Map**

**UI Design: Coverage Map**

┌─────────────────────────────────┐

│ ← Back [Layers] │

├─────────────────────────────────┤

│ │

│ ┌─────────────────────┐ │

│ │ │ │

│ │ [US Map View] │ │

│ │ │ │

│ │ 🟢 Integrated │ │

│ │ 🟡 Read-only │ │

│ │ 🔴 Not available │ │

│ │ │ │

│ └─────────────────────┘ │

│ │

│ Coverage Legend │

│ │

│ 🟢 Fully Integrated (15) │

│ Full read/write access │

│ │

│ 🟡 Read Only (8) │

│ View tolls, no payment │

│ │

│ 🔴 Not Available (27) │

│ Coming soon │

│ │

│ Your Coverage │

│ ┌─────────────────────┐ │

│ │ ✓ Northeast Corridor│ │

│ │ ✓ Texas │ │

│ │ ⚠ Florida (partial)│ │

│ │ ✗ California │ │

│ └─────────────────────┘ │

│ │

│ [Request Coverage] │

│ │

└─────────────────────────────────┘

### **4.9 Tag Advisor**

**UI Design: Tag Advisor**

┌─────────────────────────────────┐

│ ← Back │

├─────────────────────────────────┤

│ │

│ Tag Advisor │

│ │

│ Tell us about your travel │

│ │

│ Home State │

│ ┌─────────────────────┐ │

│ │ Texas ▼ │ │

│ └─────────────────────┘ │

│ │

│ States You Travel │

│ ┌─────────────────────┐ │

│ │ ☑ Louisiana │ │

│ │ ☑ Oklahoma │ │

│ │ ☐ New Mexico │ │

│ │ ☐ Arkansas │ │

│ └─────────────────────┘ │

│ │

│ ┌─────────────────────┐ │

│ │ Get Recommendations│ │

│ └─────────────────────┘ │

│ │

│ Your Recommendations │

│ │

│ ✅ TxTag │

│ Required for TX toll roads │

│ Saves 25% on tolls │

│ [Order Tag →] │

│ │

│ ⚠️ Oklahoma PikePass │

│ Optional but recommended │

│ Saves $0.25 per toll │

│ [Learn More →] │

│ │

│ ✅ GeauxPass │

│ Required for LA bridges │

│ [Order Tag →] │

│ │

└─────────────────────────────────┘

## **5. Component Specifications**

### **5.1 Common Components**

#### **5.1.1 Navigation Bar**

Properties:

- title: string

- leftAction: back | menu | none

- rightActions: Array<{icon, action}>

- style: default | transparent | primary

Behavior:

- Back navigation saves form state

- Title truncates with ellipsis

- Max 2 right actions

#### **5.1.2 Card Component**

Properties:

- title: string

- subtitle: string

- amount: number

- status: pending | posted | disputed

- onClick: function

- actions: Array<{label, action}>

States:

- Default

- Pressed (scale 0.98)

- Disabled (opacity 0.5)

#### **5.1.3 Form Input**

Properties:

- label: string

- placeholder: string

- type: text | email | password | number

- validation: RegExp | function

- error: string

- required: boolean

States:

- Empty

- Focused

- Filled

- Error

- Disabled

#### **5.1.4 Button**

Properties:

- label: string

- variant: primary | secondary | text

- size: large | medium | small

- loading: boolean

- disabled: boolean

- fullWidth: boolean

States:

- Default

- Pressed

- Loading (spinner)

- Disabled

### **5.2 Design System**

#### **5.2.1 Color Palette**

Primary:

- Blue 600: #2563EB (Primary actions)

- Blue 500: #3B82F6 (Interactive elements)

- Blue 100: #DBEAFE (Backgrounds)

Secondary:

- Green 500: #10B981 (Success)

- Yellow 500: #F59E0B (Warning)

- Red 500: #EF4444 (Error)

Neutral:

- Gray 900: #111827 (Primary text)

- Gray 600: #4B5563 (Secondary text)

- Gray 400: #9CA3AF (Disabled)

- Gray 100: #F3F4F6 (Backgrounds)

#### **5.2.2 Typography**

Display:

- Font: SF Pro Display / Inter

- Size: 32px

- Weight: 700

Title:

- Font: SF Pro Display / Inter

- Size: 24px

- Weight: 600

Headline:

- Font: SF Pro Text / Inter

- Size: 18px

- Weight: 600

Body:

- Font: SF Pro Text / Inter

- Size: 16px

- Weight: 400

Caption:

- Font: SF Pro Text / Inter

- Size: 14px

- Weight: 400

#### **5.2.3 Spacing**

Base unit: 4px

Spacing scale:

- xs: 4px

- sm: 8px

- md: 16px

- lg: 24px

- xl: 32px

- 2xl: 48px

- 3xl: 64px

## **6. User Flows**

### **6.1 Critical User Flows**

#### **6.1.1 First-Time User Flow**

1. Download app from App Store/Play Store

2. Open app → Welcome screen

3. Tap "Get Started"

4. Enter email → Verify email

5. Create password

6. Add first vehicle (optional skip)

7. Add payment method (optional skip)

8. Link existing accounts (optional skip)

9. Enable notifications (system prompt)

10. Land on home dashboard

#### **6.1.2 Daily Check Flow**

1. Open app (Face ID/Touch ID if enabled)

2. View home dashboard

3. Check today's toll total

4. Pull down to refresh

5. Tap total for breakdown

6. View by vehicle or agency

7. Close app

#### **6.1.3 Statement Payment Flow**

1. Receive push notification

2. Open app → Statements tab

3. View current statement

4. Review charges

5. Tap "Pay Now"

6. Confirm payment method

7. Authorize payment

8. View confirmation

9. Receive email receipt

#### **6.1.4 Dispute Flow**

1. View toll event in timeline

2. Tap event for details

3. Tap "Report Issue"

4. Select dispute reason

5. Add description

6. Upload evidence (optional)

7. Submit dispute

8. Receive confirmation

9. Track status in Disputes section

## **7. Data Requirements**

### **7.1 Real-Time Data**

* Current toll total (update within 60 seconds)
* Vehicle location (when app in use)
* Agency account balances
* Toll plaza status

### **7.2 Cached Data**

* User profile (1 hour TTL)
* Vehicle list (1 hour TTL)
* Recent transactions (15 minutes TTL)
* Agency capabilities (24 hours TTL)

### **7.3 Offline Capabilities**

* View last 30 days of transactions
* View current statement
* Access vehicle information
* View saved receipts

## **8. Platform-Specific Requirements**

### **8.1 iOS Requirements**

* iOS 14.0+
* Support iPhone 6s and later
* iPad support (responsive)
* Apple Pay integration
* Face ID/Touch ID
* Push notifications via APNS
* App Store guidelines compliance

### **8.2 Android Requirements**

* Android 7.0+ (API 24)
* Material Design 3 guidelines
* Google Pay integration
* Biometric authentication
* Push notifications via FCM
* Play Store policies compliance

### **8.3 Web Requirements**

* Chrome 90+, Safari 14+, Firefox 88+, Edge 90+
* Responsive design (320px - 1920px)
* PWA capabilities
* Web push notifications
* Accessibility: WCAG 2.1 AA

## **9. Performance Requirements**

### **9.1 Load Times**

* App launch: <2 seconds
* Screen transitions: <300ms
* API responses: <500ms (P95)
* Image loading: Progressive
* Statement generation: <5 seconds

### **9.2 Data Usage**

* Optimize for cellular networks
* Image compression
* Pagination for large lists
* Delta syncs for updates

### **9.3 Battery Usage**

* Minimize background activity
* Batch API requests
* Efficient location tracking

## **10. Accessibility Requirements**

### **10.1 Visual**

* Minimum contrast ratio 4.5:1
* Support for Dynamic Type (iOS)
* Support for Display Size (Android)
* Color-blind friendly palette
* Focus indicators

### **10.2 Motor**

* Touch targets minimum 44x44pt (iOS) / 48x48dp (Android)
* Gesture alternatives
* Adjustable timeouts

### **10.3 Cognitive**

* Clear error messages
* Consistent navigation
* Progressive disclosure
* Undo actions where possible

### **10.4 Screen Readers**

* VoiceOver support (iOS)
* TalkBack support (Android)
* ARIA labels (Web)
* Semantic HTML
* Logical focus order

## **11. Security & Privacy Requirements**

### **11.1 Authentication**

* Biometric authentication option
* Session timeout after 15 minutes
* Secure password requirements
* MFA for sensitive operations

### **11.2 Data Protection**

* End-to-end encryption for credentials
* PCI compliance for payment data
* No local storage of sensitive data
* Secure key storage (iOS Keychain/Android Keystore)

### **11.3 Privacy**

* Explicit consent for data collection
* Granular privacy controls
* Data export capability
* Account deletion option

## **12. Analytics Requirements**

### **12.1 User Analytics**

* Session duration
* Screen views
* Feature usage
* Conversion funnels
* Error tracking

### **12.2 Business Metrics**

* Daily active users
* Transactions per user
* Payment success rate
* Dispute rate
* Agency link success rate

### **12.3 Performance Metrics**

* API latency
* Crash rate
* ANR rate (Android)
* Network errors

## **13. Notification Requirements**

### **13.1 Push Notifications**

Types:

1. Statement Ready

Title: "Your September statement is ready"

Body: "Total: $247.85 - Tap to review and pay"

2. New Toll Posted

Title: "New toll recorded"

Body: "$4.25 - I-95 North at 8:15 AM"

3. Dispute Updated

Title: "Dispute resolved"

Body: "Your dispute for $8.50 has been approved"

4. Low Balance Warning

Title: "E-ZPass balance low"

Body: "Balance: $5.30 - Tap to reload"

5. Payment Successful

Title: "Payment confirmed"

Body: "$247.85 paid successfully"

### **13.2 In-App Messages**

* Feature announcements
* System maintenance
* Coverage updates
* Promotional offers

## **14. Error States**

### **14.1 Network Errors**

No Connection:

"You're offline. Check your connection and try again."

[Retry Button]

Server Error:

"Something went wrong on our end. Please try again."

[Retry Button]

Timeout:

"This is taking longer than expected. Please try again."

[Retry Button]

### **14.2 Data Errors**

No Results:

"No tolls found for this period."

[Change Filters]

Failed Agency Link:

"Could not link your account. Please check your credentials."

[Try Again]

Payment Failed:

"Payment could not be processed. Please try another method."

[Use Different Card]

### **14.3 Empty States**

No Vehicles:

[Car Illustration]

"Add your first vehicle"

"Track tolls for all your vehicles in one place"

[Add Vehicle Button]

No Transactions:

[Road Illustration]

"No tolls yet"

"Your toll charges will appear here"

No Disputes:

[Checkmark Illustration]

"No disputes"

"All your toll charges look correct"

## **15. Success Metrics**

### **15.1 User Acquisition**

* Target: 50,000 downloads Month 1
* 500,000 active users Year 1
* 25% organic growth via referrals

### **15.2 Engagement**

* DAU/MAU ratio: >40%
* Session length: >2 minutes
* Sessions per day: 2.5

### **15.3 Retention**

* D1: 80%
* D7: 60%
* D30: 40%
* M6: 30%

### **15.4 Business Metrics**

* Agency link rate: >60%
* Payment success rate: >95%
* Dispute resolution: <5 days average
* Customer support tickets: <2% of MAU

### **15.5 Quality Metrics**

* App Store rating: 4.5+
* Crash-free rate: >99.5%
* API uptime: >99.95%

## **16. Launch Requirements**

### **16.1 MVP Features (Phase 1)**

* [x] User registration/authentication
* [x] Vehicle management
* [x] Payment method management
* [x] 6 agency integrations
* [x] Toll timeline
* [x] Daily statements
* [x] Basic coverage map
* [x] Push notifications

### **16.2 Phase 2 Features (Month 3-6)**

* [ ] Dispute management
* [ ] Tag advisor
* [ ] 15+ agency integrations
* [ ] CSV/PDF exports
* [ ] Apple/Google Pay
* [ ] Partner API

### **16.3 Phase 3 Features (Month 6-12)**

* [ ] Fleet management
* [ ] Rental car mode
* [ ] Tax categorization
* [ ] Predictive toll estimates
* [ ] Multi-language support
* [ ] Business accounts

## **17. Testing Requirements**

### **17.1 User Testing**

* Onboarding flow (10 users)
* Payment flow (10 users)
* Dispute flow (5 users)
* Accessibility testing (5 users)

### **17.2 QA Testing**

* Functional testing (all features)
* Integration testing (agency connectors)
* Performance testing (load/stress)
* Security testing (penetration)
* Compatibility testing (devices/OS)

### **17.3 Beta Testing**

* Internal beta (100 users, 2 weeks)
* Closed beta (1,000 users, 4 weeks)
* Open beta (10,000 users, 2 weeks)

## **18. Documentation Requirements**

### **18.1 User Documentation**

* In-app onboarding
* Help center articles
* FAQ section
* Video tutorials

### **18.2 Technical Documentation**

* API documentation
* Integration guides
* Deployment guides
* Troubleshooting guides

## **19. Support Requirements**

### **19.1 Customer Support**

* In-app chat (business hours)
* Email support (24h response)
* Phone support (P2)
* Self-service help center

### **19.2 Issue Categories**

* Account issues
* Payment problems
* Dispute assistance
* Agency linking
* Technical problems

## **20. Compliance Requirements**

### **20.1 Legal**

* Terms of Service
* Privacy Policy
* Payment Terms
* Agency Agreements
* State regulations compliance

### **20.2 Financial**

* PCI DSS compliance
* SOC 2 Type II
* State tax requirements
* Financial auditing

### **20.3 Data**

* CCPA/CPRA compliance
* Data retention policies
* Data export capabilities
* Right to deletion

## **Appendix A: Sample API Responses**

### **A.1 Toll Event Response**

{

"id": "evt\_7829461",

"timestamp": "2025-09-27T08:15:00Z",

"vehicle": {

"id": "veh\_123",

"plate": "ABC1234",

"nickname": "My Tesla"

},

"location": {

"agency": "E-ZPass NY",

"gantry": "I-95-N-047",

"description": "I-95 North, Mile 47.3",

"coordinates": {

"lat": 40.8462,

"lng": -73.8648

}

},

"amount": {

"base": 4.00,

"fees": 0.25,

"total": 4.25,

"currency": "USD"

},

"status": "posted",

"evidence\_url": "https://...",

"disputable": true

}

### **A.2 Statement Response**

{

"id": "stmt\_202509",

"period": {

"start": "2025-09-01T00:00:00Z",

"end": "2025-09-30T23:59:59Z"

},

"summary": {

"tolls": 235.60,

"fees": 12.25,

"credits": 0.00,

"total": 247.85

},

"vehicles": [

{

"id": "veh\_123",

"nickname": "My Tesla",

"trips": 31,

"total": 178.25

}

],

"agencies": [

{

"id": "ezpass\_ny",

"name": "E-ZPass NY",

"trips": 28,

"total": 142.30

}

],

"status": "open",

"due\_date": "2025-10-01T00:00:00Z"

}

## **Appendix B: Error Codes**

| **Code** | **Description** | **User Message** |
| --- | --- | --- |
| AUTH\_001 | Invalid credentials | "Email or password incorrect" |
| AUTH\_002 | Session expired | "Please sign in again" |
| VEH\_001 | Duplicate vehicle | "This vehicle is already added" |
| PAY\_001 | Payment failed | "Payment could not be processed" |
| LINK\_001 | Agency link failed | "Could not link account" |
| TOLL\_001 | Event not found | "Toll record not found" |
| STMT\_001 | Statement locked | "Statement already paid" |

This comprehensive requirements document provides everything needed to begin implementation of the Nationwide Toll Hub platform. The detailed UI designs, user flows, and acceptance criteria ensure consistent implementation across all platforms while maintaining flexibility for platform-specific optimizations.