

# Software Test Plan (STP) – TSRS v1.0

Project: Traffic Sign Recognition System (TSRS)

Version: 1.0

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Date: 07-Sep-2025

## 1. Introduction

### Purpose

This document defines the test plan for the Traffic Sign Recognition System (TSRS) v1.0, developed as part of the Software Engineering course. It outlines objectives, scope, strategy, resources, schedule, and responsibilities for testing. The plan ensures that all functional and non-functional requirements are validated before final submission.

### Scope

Testing covers:

- Core gameplay: car movement, traffic sign display, user interaction
- AI stub integration: top-3 predictions and confidence scores
- UI/UX: animations, sound effects, dark/light mode toggle
- Scoring system: streaks, distance meter, leaderboard (localStorage)
- Security: HTTPS, input validation, session safety

Excluded:

- Real ML model training or camera input
- Backend server deployment or database persistence (beyond localStorage)
- Mobile app packaging or native performance
- Multiplayer or cloud scaling (future scope)

### References

- TSRS SRS v1.0 (25-Aug-2025)
- Jira Project Board (TTSRS)
- RTM (Requirements Traceability Matrix)
- UML Diagrams & Personas (Learner Driver, Instructor, Researcher)
- Agile Sprint Plans & Timeline (Final Submission: Nov 14)

## Definitions

- TSRS: Traffic Sign Recognition System
- AI Stub: Simulated ML model returning mock predictions
- RTM: Requirements Traceability Matrix
- FR/NFR: Functional / Non-Functional Requirement

## 2. Test Items

- Core Gameplay Engine
- Traffic Sign Recognition & AI Stub
- UI/UX & Visual Feedback
- Scoring, Leaderboard & Progress
- Admin & Monitoring Interface
- Testing & Documentation

## 3. Features to be Tested

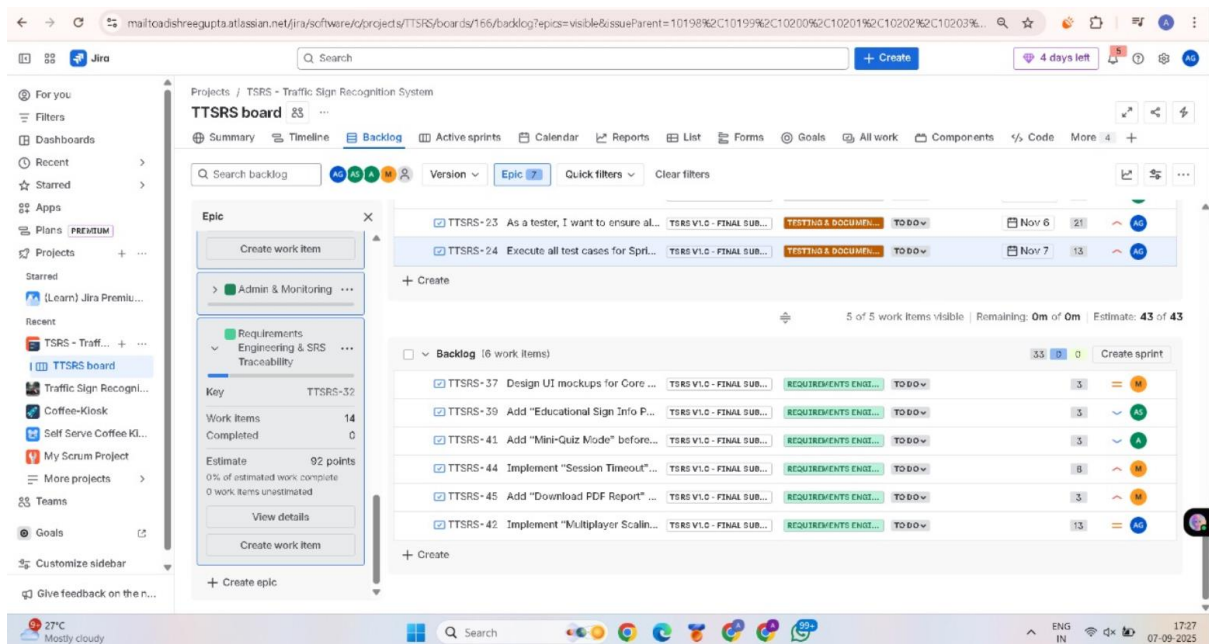
Mapped to SRS Functional Requirements (FR1–FR25):

<b>FR1</b>	<b>Car moves automatically on track</b>	<b>TTSRS-7</b>
<b>FR2</b>	Traffic signs appear randomly	TTSRS-12
<b>FR3</b>	Player identifies signs via buttons	TTSRS-15
<b>FR4</b>	Stubbed ML model predicts signs	TTSRS-19
<b>FR5</b>	Display confidence score	TTSRS-22
<b>FR6</b>	Wrong recognition triggers consequences	TTSRS-14
<b>FR7</b>	Visual feedback for correct recognition	TTSRS-20
<b>FR8</b>	Track score, streaks, distance	TTSRS-27
<b>FR9</b>	Obstacles and other cars appear	TTSRS-14
<b>FR10</b>	Leaderboard displays top scores	TTSRS-26
<b>FR11</b>	Pause, resume, restart game	TTSRS-25
<b>FR12</b>	Educational panel explains signs	<i>(Optional)</i>
<b>FR13</b>	Play sound effects	TTSRS-21

<b>FR14</b>	Animate speed boost for correct streaks	TTSRS-18
<b>FR15</b>	Animate slowdown for wrong guesses	TTSRS-19
<b>FR16</b>	Session-based recognition history	TTSRS-29
<b>FR17</b>	Gradual increase in difficulty	TTSRS-30
<b>FR18</b>	Display top-3 AI predictions	TTSRS-22
<b>FR19</b>	Toggle sound on/off	TTSRS-23
<b>FR20</b>	Toggle dark/light mode	TTSRS-24
<b>FR21</b>	Optional preloaded sign images for demo	TTSRS-13

#### 4. Features Not to be Tested

TTSRS-37	Design UI mockups for Core Gameplay Engine	This is a design phase task, not functional code. It supports development but is not testable as a system feature.
TTSRS-39	Add “Educational Sign Info Panel”	An optional educational feature (FR16). Not critical for v1.0; may be added post-release.
TTSRS-41	Add “Mini-Quiz Mode”	A gamified learning mode. Low priority and not part of core gameplay flow.
TTSRS-44	Implement “Session Timeout”	A security enhancement, but not implemented in v1.0. Will be tested if included in later sprints.
TTSRS-45	Add “Download PDF Report”	Admin/reporting feature. Not required for basic functionality.
TTSRS-42	Implement “Multiplayer Scaling”	Future scalability feature. Not in scope for v1.0.



## 5. Test Approach / Strategy

### Levels:

- Unit tests (module-level)
- Integration tests (UI ↔ Game Engine, Game Engine ↔ AI Stub)
- System tests (end-to-end gameplay flow)
- Acceptance tests (UAT by Product Owner)

### Types:

- Functional testing (core features)
- Regression testing
- Performance testing (FPS, AI response time)
- Usability testing (dark mode, sound toggle)
- Security testing (input validation, HTTPS)

### Entry Criteria:

- Stable build delivered
- Test environment ready (local browser)
- Test data prepared (mock signs, user inputs)

## Exit Criteria:

- 100% of planned test cases executed
- 0 critical/high defects open
- All acceptance criteria satisfied

## 5.1 Security Validation

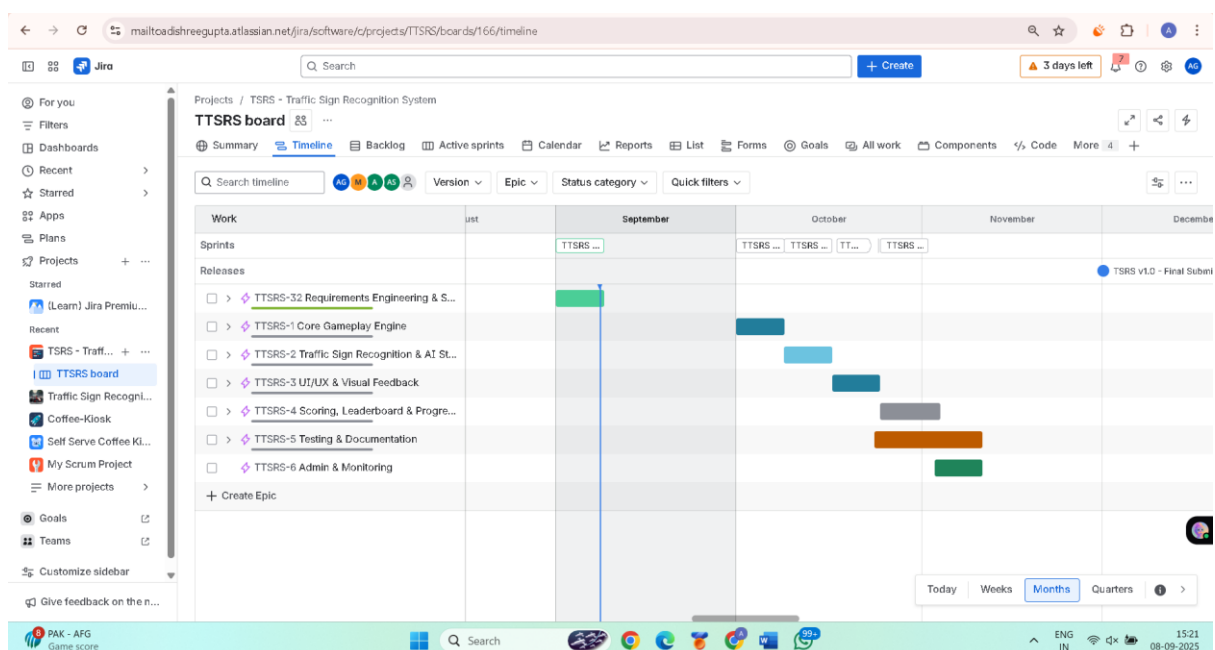
- Validate PIN handling (masking, no logging) → *Not applicable*
- TLS 1.2+ verification → HTTPS enforced
- Fuzzing for input fields → Test file upload, button clicks
- Penetration testing of authentication flows → *No login; use session timeout*

Security Focus: Input sanitization, HTTPS, session safety, no sensitive data stored

## 6. Test Environment

Hardware	Standard laptop/desktop
Software	Chrome 120+, Firefox 115+, Edge 120+, Safari 16+
Tools	Jira (defect tracking), VS Code (debugging
Test Data	Mock sign images, simulated AI responses
Storage	localStorage for score/persistence

## 7. Test Schedule



<b>Test Case Design</b>	<b>Sep 1 – Sep 8</b>
<b>Environment Setup</b>	Sep 8
<b>Test Execution Start</b>	Sep 8
<b>Sprint 1 Testing</b>	Sep 8 – Sep 14
<b>Sprint 2 Testing</b>	Sep 30 – Oct 7
<b>Sprint 3 Testing</b>	Oct 8 – Oct 15
<b>Sprint 4 Testing</b>	Oct 16 – Oct 23
<b>Sprint 5 Testing</b>	Oct 23 – Oct 30
<b>Sprint 6 Testing</b>	Oct 31 – Nov 6
<b>Final Regression &amp; UAT</b>	Nov 7 – Nov 10
<b>Final Submission</b>	Nov 11 – Nov 14

Key Insight: Final submission deadline is Nov 14 — testing must conclude by Nov 10

The screenshot displays the Jira interface for the 'TTSRS - Traffic Sign Recognition System' project. The main view is the 'TTSRS board' in 'Backlog' view. The board shows two sprints: 'TTSRS Sprint 1' (Sep 1 - Sep 8) and 'TTSRS Sprint 2' (Sep 30 - Oct 7). The left sidebar contains navigation options like 'For you', 'Filters', 'Dashboards', 'Recent', 'Starred', 'Apps', 'Plans', 'Projects', 'Goals', and 'Customize sidebar'. The main content area shows the backlog with items categorized by epic: 'Core Gameplay Engine', 'Traffic Sign Recognition & AI Stub', 'UI/UX & Visual Feedback', 'Scoring, Leaderboard & Progress', and 'Testing & Documentation'. The 'TTSRS Sprint 1' section lists several items with their status (e.g., 'IN PROGRESS', 'TO DO') and due dates (e.g., 'Sep 8'). The 'TTSRS Sprint 2' section shows a single item 'TTSRS-40' with a status of 'TO DO' and a due date of 'Sep 8'. The bottom of the screen shows a Windows taskbar with the date '07-09-2023' and time '17:23'.

mailto:cedshreegupta@tlassian.net/jira/software/c/projects/TTSRS/boards/166/backlog?epics=visible&issueParent=10198%2C10199%2C10200%2C10201%2C10202%2C10203%...

Search

4 days left

Projects / TTSRS - Traffic Sign Recognition System

TTSRS board

Summary Timeline Backlog Active sprints Calendar Reports List Forms Goals All work Components Code More

Search backlog

Version Epic 7 Quick filters Clear filters

Epic

No epic

Core Gameplay Engine

Traffic Sign Recognition & AI Stub

Key TTSRS-2

Work Items 6

Completed 0

Estimate 37 points

0% of estimated work complete

0 work items unestimated

View details

Create work item

UI/UX & Visual

TTSRS Sprint 2 30 Sep - 7 Oct (6 work items)

Deliver a playable prototype: car moves, sign appears, user selects answer, consequence shown - all working in browser.

TTSRS-40 Extend AI stub to support 50... TTSRS V1.0 - FINAL SUB... REQUIREMENTS ENGI... TODO... Sep 8 8

TTSRS-7 Code car movement logic TTSRS V1.0 - FINAL SUB... CORE GAMEPLAY ENG... IN PROGRESS... Oct 4 13

TTSRS-30 Implement Streak & Distance ... TTSRS V1.0 - FINAL SUB... SCORING, LEADERBO... TODO... Oct 30 6

TTSRS-8 Design car and track PNG assets TTSRS V1.0 - FINAL SUB... CORE GAMEPLAY ENG... TODO... Oct 6 1

TTSRS-9 Write test case: "Verify car mov... TTSRS V1.0 - FINAL SUB... CORE GAMEPLAY ENG... TODO... Oct 6 2

TTSRS-10 Write User Story - AC in Jira TTSRS V1.0 - FINAL SUB... CORE GAMEPLAY ENG... TODO... Oct 6 1

6 of 6 work items visible | Remaining: 0m of 0m | Estimate: 33 of 33

TTSRS Sprint 3 8 Oct - 15 Oct (5 work items)

Implement dynamic scoring, streak tracking, distance meter, and persistent leaderboard using localStorage.

TTSRS-11 As a player, I want my car to ... TTSRS V1.0 - FINAL SUB... CORE GAMEPLAY ENG... TODO... Oct 7 8

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Epic

Create work item

UI/UX & Visual Feedback

Key TTSRS-3

Work Items 5

Completed 0

Estimate 36 points

0% of estimated work complete

0 work items unestimated

View details

Create work item

Scoring, Leaderboard & Progress

Key TTSRS-4

TTSRS Sprint 3 8 Oct - 15 Oct (5 work items)

Implement dynamic scoring, streak tracking, distance meter, and persistent leaderboard using localStorage.

TTSRS-11 As a player, I want my car to ... TTSRS V1.0 - FINAL SUB... CORE GAMEPLAY ENG... TODO... Oct 7 8

TTSRS-13 Design 10 traffic sign PNGs + ... TTSRS V1.0 - FINAL SUB... TRAFFIC SIGN RECO... TODO... Oct 15 2

TTSRS-15 Write test case: "Verify clickin... TTSRS V1.0 - FINAL SUB... TRAFFIC SIGN RECO... TODO... Oct 15 2

TTSRS-27 Implement Real-Time Scoring ... TTSRS V1.0 - FINAL SUB... SCORING, LEADERBO... TODO... Oct 30 13

TTSRS-16 Write User Story - AC in Jira TTSRS V1.0 - FINAL SUB... TRAFFIC SIGN RECO... TODO... Oct 15 3

5 of 5 work items visible | Remaining: 0m of 0m | Estimate: 28 of 28

TTSRS Sprint 4 16 Oct - 23 Oct (5 work items)

Integrate stubbed AI model that returns top-3 predictions and confidence scores for each sign

TTSRS-12 Code sign display + button lo... TTSRS V1.0 - FINAL SUB... TRAFFIC SIGN RECO... TODO... Oct 15 21

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Projects / TTSRS - Traffic Sign Recognition System

**TTSRS board**

Summary Timeline **Backlog** Active sprints Calendar Reports List Forms Goals All work Components % Code More

Search backlog Version **Epic** Quick filters Clear filters

**Epic**

Scoring, Leaderboard & Progress

Key TTSRS-4

Work Items 5

Completed 0

Estimate 30 points

0% of estimated work complete

0 work items unestimated

View details

Create work item

**TTSRS Sprint 4** 16 Oct - 23 Oct (5 work items)

Integrate stubbed AI model that returns top-5 predictions and confidence scores for each sign

Item	Key	Label	Category	Status	Due Date	Points	Assignee
TTSRS-12	Code sign display + button lo...	TTSRS VLG - FINAL SUB...	TRAFFIC SIGN RECO...	TODD	Oct 15	21	AG
TTSRS-14	Design "Correct" and "Caught..."	TTSRS VLG - FINAL SUB...	TRAFFIC SIGN RECO...	TODD	Oct 15	1	M
TTSRS-22	Test "Verify sound mutes whe...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	7	AG
TTSRS-21	Source 2 sound effects (corre...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	7	AG
TTSRS-19	Code feedback animations + ...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	8	AG

+ Create

5 of 5 work items visible | Remaining: 0m of 0m | Estimate: 44 of 44

**TTSRS Sprint 5** 23 Oct - 30 Oct (5 work items)

Design UI with dark/light mode, animations, pause/restart, and responsive design

Item	Key	Label	Category	Status	Due Date	Points	Assignee
TTSRS-17	Code feedback animations + ...	TTSRS VLG - FINAL SUB...	TRAFFIC SIGN RECO...	TODD	Oct 23	8	AG
TTSRS-20	Create confetti animation PNG...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	1	M
TTSRS-25	Log any bugs found with scre...	TTSRS VLG - FINAL SUB...	TESTING & DOCUMEN...	TODD	Nov 7	3	AG
TTSRS-26	Update RTM Excel with Sprint ...	TTSRS VLG - FINAL SUB...	TESTING & DOCUMEN...	TODD	Nov 7	3	AG
TTSRS-18	As a player, I want visual and ...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	13	AG

+ Create

5 of 5 work items visible | Remaining: 0m of 0m | Estimate: 28 of 28

**TTSRS Sprint 6** 24 Oct - 31 Oct (5 work items)

Implement security features: HTTPS, input validation, error handling, session timeout

Item	Key	Label	Category	Status	Due Date	Points	Assignee
TTSRS-29	Write Test Cases + Execute M...	TTSRS VLG - FINAL SUB...	LEADERBO...	TODD	Oct 30	1	M
TTSRS-28	Design & Integrate Score/Sta...	TTSRS VLG - FINAL SUB...	SCORING, LEADERBO...	TODD	Oct 30	3	AG

+ Create

5 of 5 work items visible | Remaining: 0m of 0m | Estimate: 43 of 43

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mailto:cdshrekgupta@atlassian.net/jira/schware/c/projects/TTSRS/boards/166/backlog?epics=visible&issueParent=10198%2C10199%2C10200%2C10201%2C10202%2C10203%...

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Search backlog Version **Epic** Quick filters Clear filters

**Epic**

Testing & Documentation

Key TTSRS-5

Work Items 4

Completed 0

Estimate 40 points

0% of estimated work complete

0 work items unestimated

View details

Create work item

**TTSRS Sprint 5** 23 Oct - 30 Oct (5 work items)

Design UI with dark/light mode, animations, pause/restart, and responsive design

Item	Key	Label	Category	Status	Due Date	Points	Assignee
TTSRS-17	Code feedback animations + ...	TTSRS VLG - FINAL SUB...	TRAFFIC SIGN RECO...	TODD	Oct 23	8	AG
TTSRS-20	Create confetti animation PNG...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	1	M
TTSRS-25	Log any bugs found with scre...	TTSRS VLG - FINAL SUB...	TESTING & DOCUMEN...	TODD	Nov 7	3	AG
TTSRS-26	Update RTM Excel with Sprint ...	TTSRS VLG - FINAL SUB...	TESTING & DOCUMEN...	TODD	Nov 7	3	AG
TTSRS-18	As a player, I want visual and ...	TTSRS VLG - FINAL SUB...	UI/UX & VISUAL FEED...	TODD	Oct 23	13	AG

+ Create

5 of 5 work items visible | Remaining: 0m of 0m | Estimate: 28 of 28

**TTSRS Sprint 6** 24 Oct - 31 Oct (5 work items)

Implement security features: HTTPS, input validation, error handling, session timeout

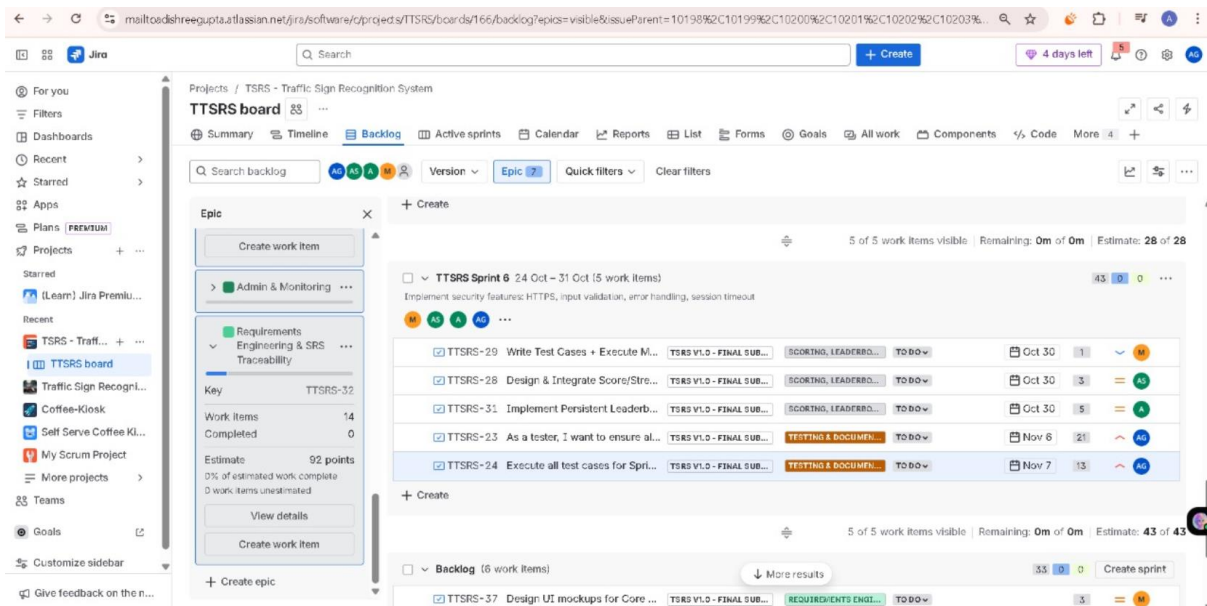
Item	Key	Label	Category	Status	Due Date	Points	Assignee
TTSRS-29	Write Test Cases + Execute M...	TTSRS VLG - FINAL SUB...	LEADERBO...	TODD	Oct 30	1	M
TTSRS-28	Design & Integrate Score/Sta...	TTSRS VLG - FINAL SUB...	SCORING, LEADERBO...	TODD	Oct 30	3	AG

+ Create

5 of 5 work items visible | Remaining: 0m of 0m | Estimate: 43 of 43

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## 8. Test Deliverables

- Test Plan (this document)
- Test Cases (manual & automated)
- Test Scripts
- Test Data
- Test Execution Logs
- Defect Reports (in Jira)
- Test Summary Report
- Updated RTM

## 9. Roles and Responsibilities

Roles	Name (SRN)	Responsibilities
Product Owner	Dr. Swetha P	Guide project scope, clarify requirements, approve test readiness
QA Lead + Developer+ Test Planner	Adishree Gupta (PES1UG23CS024)	Planned and designed the entire test strategy. Also contributed to core development tasks including game logic, UI integration, and AI stub setup .

		Handled majority of documentation, sprint coordination, and defect tracking
Test Engineer + Developer	Aditya Sharma (PES1UG23CS035)	Designed test cases, prepared test data, Will execute tests once prototype is ready. Supported QA lead in planning and documentation.
Developer (Core/Game Engine)	Akshat (PES1UG23CS048)	Assigned to build core gameplay Will support bug fixes during testing phase.
UI Designer	Monica M (PES1UG24CS813)	Listed as UI Designer in SRS

## 10. Risks and Mitigation

<b>Delayed stable build</b>	<b>Ask developers to give early test builds so we can start testing sooner</b>
<b>Missing assets (PNGs, sounds)</b>	Assign each asset to a team member in Jira so someone is responsible
<b>AI stub returns invalid format</b>	Add a check in code to make sure the AI output is correct before using it
<b>Low frame rate</b>	Make animations simpler and load all images before game starts

## 11. Assumptions & Dependencies

- AI stub returns consistent JSON
- All assets delivered on time
- localStorage available
- No real backend — all logic client-side

## 12. Suspension & Resumption Criteria

Suspend if:

- Environment unavailable >4 hours
- Build unstable (>30% test cases blocked)

Resume if:

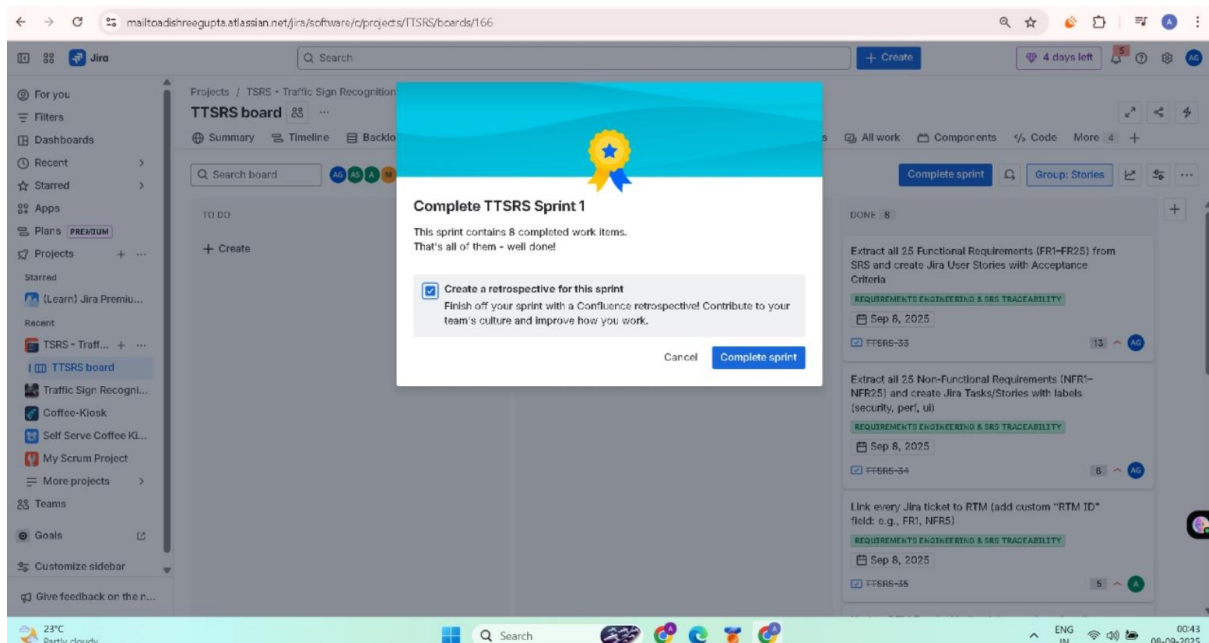
- Blocking defects resolved
- Environment stabilized

## 13. Test Case Management & Traceability

RTM ensures mapping of SRS requirements to test cases.

Example:

- FR1 → TTSRS-GAME-01: "Verify car moves continuously on track"
- FR6 → TTSRS-FEEDBACK-03: "Verify 'Caught by Police' pop-up appears on wrong answer"



This screenshot confirms that all functional and non-functional requirements have been extracted from the SRS and converted into Jira User Stories with acceptance criteria. This ensures full traceability between requirements and test cases.

#### 14. Test Metrics & Reporting

##### Metrics Collected:

- % test cases executed
- % passed/failed
- Defect density
- Requirement coverage
- Defect aging

##### Reports:

- Daily status updates
- Weekly summaries
- Final Test Summary Report

#### 15. Approvals

Role	Name	Signature / Date
QA Lead	Adishree Gupta	Adishree Gupta/ 07-Sep-2025
Dev Lead	Adishree Gupta	Adishree Gupta/ 07-Sep-2025
Product Owner	Dr. Swetha P	Dr. Swetha P/11-Aug-2025