



PiRail - User Stories

Persona 1:

- Role: Walter Brown - Track Inspector

Motivations/Stories:

- As a track inspector, I want to be able to have a visual aid that showcases the railroad environment in my general vicinity so that I don't have to rely on latitude and longitude.
- As a track inspector, I want to be able to see bridges along the railroad path so that I can have a visual of potential infrastructural hazards.
- As a track inspector, I want to be able to select a specific train route so that I can focus on my current train.
- As a track inspector, I want all information to be a live representation of the railroad's environment so that I can have confidence in the safety of my railway.
- As a track inspector, I want to be able to report and display points of interest I may encounter so that I can inform other inspectors/conductors.

Persona 2:

- Role: Albert Smith – Railroad Enthusiast

Motivations/Stories:

- As a railroad enthusiast, I want to be able to easily traverse through the PiRail user interface so that I can use it without requesting instructions.
- As a railroad enthusiast, I want to be able to use any modern device to run PiRail (Laptop, tablet, mobile, etc.) so that I can use it anywhere I please.
- As a railroad enthusiast, I want the new map display to be similar to other GPS software / applications to promote a familiar user experience so I can pick up the functionality fast.
- As a railroad enthusiast, I want to be able to access the PiRail Raspberry Pi from a Wi-Fi connection so that the data is available regardless of proximity.

- As a railroad enthusiast, I want to use PiRail to follow along when I take a train trip, so that I'm aware of interesting landmarks

Persona 3:

- Role: Jon Miner – PiRail Developer
- Motivations/Stories:
 - As a PiRail Developer, I want to have a viable way to simulate old track data for better software testing so that I don't have to always collect new info.
 - As a PiRail Developer, I want to have a way to test new UI components so I can refrain from having bugs in the public version of the software.
 - As a PiRail Developer, I want to have a way to input a data set containing old LIDAR information, so I don't have to do it manually.
 - As a PiRail Developer, I want to be able to test PiRail without using live data collection so that I can avoid relying on proper weather.
 - As a PiRail Developer I would like to generate a data stream with noise so that I can test the software against random information.

Expanded User Stories:

User Story 1:

- User Story: As a track inspector, I want to have a visual tool that shows the railroad environment around me, so I can easily inspect tracks and identify bridges along the route.
- Definition of done:
 - A map is available that visually displays the railroad environment
 - The user can select specific train routes and view them on the map
 - Bridges and key landmarks along the railroad path are clearly marked
 - The map updates in real-time based on the user's location
- Tasks:
 - Create a visual map interface for displaying the railroad environment
 - Add functionality that lets users select and view train routes
 - Highlight bridges and other important structures on the map
 - Ensure the map updates based on the user's current location
- Persona:
 - Walter Henry – Track Inspector
- Steps:
 - Open the app and see a map showing the surrounding railroad environment

- Choose a specific train route from a list of options
- Identify key points like bridges along the selected route
- Use the map as a visual guide while inspecting the tracks

User Story 2:

- User Story: As a user of PiRail, I want to be able to access the railroad information from my mobile phone.
- Definition of done:
 - The newly implemented map feature can be opened through a phone application.
 - All information available on the desktop version of the software is available on mobile.
 - Map data is reflective of the phone's location.
 - Map can be scrolled through.
 - Obstacles that need to be removed are visible through markers.
- Tasks:
 - Develop a responsive mobile interface for the PiRail app.
 - Ensure compatibility with multiple devices (laptop, tablet, mobile).
 - Synchronize map data with the mobile device's GPS.
 - Implement scroll and zoom functionalities on the map view.
 - Add markers for obstacles detected on the tracks.
- Persona:
 - Albert Smith – Railroad Enthusiast
- Steps:
 - Open the PiRail software / app
 - Display the existing dashboard page
 - Click on the “Map” page, opening said view.
 - Display all map feature information on the phone.
 - Scroll and interact with the map to view current railroad conditions.

User Story 3:

- User Story: As a PiRail Developer, I want to have a robust simulator so I can have a more effective test bed moving forward.
- Definition of done:
 - Simulator can take a previously collected data set.
 - The simulator can both play back a real dataset or generate a data stream.

- Implementation has been approved as sufficient by the Project Manager.
- Tasks:
 - Create a new page that allows you to input previously saved LIDAR information.
 - Develop functionality to generate simulated data streams with noise.
 - Implement a playback feature for historical data sets.
 - Ensure the simulator can function without live data collection.
- Persona:
 - Jon Miner – PiRail Developer
- Steps:
 - Access the PiRail developer interface.
 - Navigate to the simulation section.
 - Input a dataset containing old LIDAR information.
 - Run simulations using both playback of real data and noise-added streams.
 - Validate the simulator’s functionality and adjust as needed based on feedback.

Release Plan:

Milestone:	Artifacts:	Description / Sprint Goals:
Sprint 0 - Planning	Creating of charter & Project Stories - Individual resumes.	Meet with Jon to learn his expectations. Plan out the initial design for “Waze-like” map display and how page is going to fit into what is already implemented. Initial project stories and outlining of sprints.
Sprint 1 - Preparation	Syncing of GitLab – Accesses the remote test bed – Interpret the existing system – Outline potential fixes.	SSH into and experiment with the existing PiRail system to gain understanding of functionality and currently implemented UI. Sync into Jon’s existing repository. View and interpret the GIS

		(Geographic Information System) data sources, providing a mini-study of findings. Provide Jon with a summary of usability issues. Individual retrospectives.
Sprint 2 - MVP	Update UI to use PiRail API – Improve usability – Design simulator.	Updating of the UI to use the PiRail Packet API interface. Improve website usability by simplifying design and streamlining. Individual retrospectives.
Sprint 3 – End of Semester	Refine and continue Sprint 2 work – Usability test plan – Build the map page – Replay functionality	Using the design outlined in Sprint 0 and 1, implement the new map page and connect it into the existing PiRail framework. Further refine the UI after adding the map system. Create the initial simulator replay to be used for UI testing. Outline a usability test plan to gain data confirming improvements. Any additional misc. software changes. Individual retrospective.

Work Breakdown Structure (WBS):

Initiative	GitLab Epics	Stories / Features (Gitlab sub-epics or Issues)	Tasks (GitLab issues)
PiRail	Investigation		Charter
			Stories
			Designs
	Usability / Simulator CONOPS	User Story: Developer	Record / Save LIDAR information

			Data stream generation
			Historical dataset playback
			Test simulator functionality
		User Story: Train Hobbyist	Mobile functionality integration
			Cross-device compatibility
			Map / device GPS synchronization
			View controls (zoom, scroll)
			Interactive Map Obstacle Marker
	New UI / Replay Mode	User Story: Track Inspector	Map UI
			Train route selection
			Important Structure Highlighting
			Train route selection
	Testing / Improvements	Simulator Map UI control	
		Usability testing	Data collection / User testing
			Report creation
			Data-based improvements