

PRODUCT BACKLOG									
ID	User Story	Use Cases	Acceptance criteria	Estimated Effort (Hours)	Status	Sprint	Priority	Notes	
1	As a developer, I want to set up a standardized development and version control system so that the team can work collaboratively with consistent tools and practices.	<ul style="list-style-type: none">Set up shared development environmentCreate GitHub repositoryConfigure access permissionsSet up version control workflowCreate initial project structure	<ul style="list-style-type: none">Set up a shared development environment with documented requirementsCreate a GitHub repository with proper branch protection rulesConfigure access permissions based on team rolesVerify that all team members can successfully collaborate on codeEstablish and document a CI workflow for the teamCreate an initial project structure with complete documentation	3	Completed	1	High	Core infrastructure	
2	As a developer, I want to set up cloud infrastructure on AWS that meets our project requirements so that we have a scalable, reliable platform for our application.	<ul style="list-style-type: none">Set up AWS environmentConfigure EC2 instanceSet up RDS databaseTest connections between servicesDocument configuration	<ul style="list-style-type: none">Create AWS account with appropriate IAM users and permissionsSet up EC2 instance with necessary security groupsConfigure RDS database instance with appropriate settingsTest connection between EC2 and RDSDocument all AWS resources and configurationsCreate recovery procedures for potential issues	3	Completed	1	High	Cloud infrastructure setup	
3	As a data engineer, I want to implement comprehensive data collection from the Joochikau API so that we can provide real-time and historical bike station data to users.	<ul style="list-style-type: none">Connect to Joochikau APIRetrieve bike station dataHandle API errorsSchedule regular data collectionStore data in a database	<ul style="list-style-type: none">Successfully connect to Joochikau API with proper authenticationRetrieve all bike station data including location, capacities, and real-time availabilityHandle API errors gracefully for network or rate limitingStructure the data in a format suitable for database storageCreate a mechanism for scheduled data collection	5	Completed	1	High	Core data functionality	
4	As a database architect, I want to design and implement an efficient database schema so that bike and weather data can be reliably stored and quickly retrieved.	<ul style="list-style-type: none">Design database schemaImplement tables and relationshipsOptimize for query performanceSet up backup proceduresDocument database structure	<ul style="list-style-type: none">Create an entity-relationship diagram for the database structureImplement tables with appropriate relationships and indexesOptimize schemas for efficient querying of dataTest database performance with expected data volumesDocument database access patterns	5	Completed	1	High	Data infrastructure	
5	As a data engineer, I want to integrate weather data collection with our application so that users can see weather conditions alongside bike availability.	<ul style="list-style-type: none">Connect to weather APIRetrieve Dublin weather dataStore weather informationLink weather data with stationsSchedule regular updates	<ul style="list-style-type: none">Successfully connect to a weather API with proper authenticationRetrieve current and forecasted weather data for DublinStructure the weather data for database storageCreate a mechanism for scheduled weather data collectionSchedule regular updates	5	Completed	1	Medium	Weather integration	
6	As a Scrum Master, I want to establish effective Agile practices and collaboration tools so that our team can work efficiently and track progress effectively.	<ul style="list-style-type: none">Create product backlogSet up sprint planning processImplement progress trackingEstablish team communicationDocument Scrum processes	<ul style="list-style-type: none">Create a product backlog with prioritized user storiesEstablish sprint planning, review, and retrospective proceduresConfigure project management tools for backlog trackingCreate templates for documentationEstablish communication channels and meeting schedules	5	Completed	1	High	Project management	
7	As a UX designer, I want to create mockups and design assets for the Dublin Bikes application so that we have a consistent, user-friendly interface.	<ul style="list-style-type: none">Design page mockupsCreate component libraryDefine color scheme and typographyCreate responsive layoutsPrepare visual assets	<ul style="list-style-type: none">Create visual mockups for all main application pages (Home, Map, How to Use, Pricing, Contact)Design a consistent color scheme, typography, and component libraryEnsure designs follow accessibility guidelinesCreate responsive designs for mobile, tablet, and desktopDocument style guide for frontend implementation	3	Completed	1	High	Design foundation	
8	As a user, I want to see an interactive map of Dublin with all bike stations clearly marked so that I can easily locate available bikes near me.	<ul style="list-style-type: none">View Dublin map with stationsSee bike availabilityFilter stations by statusFind nearby stationsGet directions to stations	<ul style="list-style-type: none">Gather and prepare all required visual assets (icons, images, etc.)Map loads within 3 seconds on standard connectionsEach bike station is marked with a distinct pin on the mapDisplay different colors based on bike availabilityWhen a user clicks on a station marker, a popup shows the station name, number of available bikes, and available statusThe map allows zooming and panning with standard controlsUser's current location is shown on the map (when permission is granted)Stations within 500m of user's location are highlighted	7	Completed	2	High	Core map functionality	
9	As a user, I want the web interface to have a consistent, intuitive design so that I can easily navigate and use all features of the application.	<ul style="list-style-type: none">Navigate between pagesAccess all featuresUse interface on all devicesComplete tasks without confusionAccess help when needed	<ul style="list-style-type: none">All pages follow the same design system (colors, typography, spacing)Navigation menu is consistent across all pagesInteractive elements have clear hover and active statesForms include clear validation feedbackLayout is responsive and functional across device sizesAll interactive elements are accessible via keyboardColor contrast meets accessibility standards	9	Completed	2	High	User experience foundation	
10	As a developer, I want to set up a Flask application with proper structure so that we can build a scalable, maintainable web application.	<ul style="list-style-type: none">Set up Flask environmentImplement modular structureConfigure environment settingsSet up database connectionsCreate error handling	<ul style="list-style-type: none">Flask application is set up with a modular, package-based structureConfiguration is separated from application codeEnvironment-specific settings are properly managedDatabase connections are established through SQLAlchemyLogging is configured for different environmentsError handling is implemented with proper status codesAPI routes are documented and follow RESTful conventionsAuthentication framework is in place for future implementation	8	Completed	2	High	Backend framework	
11	As a frontend developer, I want to develop responsive web pages so that users can access the application from any device and have a consistent experience.	<ul style="list-style-type: none">Implement responsive layoutsCreate mobile-friendly interfacesEnsure cross-browser compatibilityImplement touch interactionsOptimize performance	<ul style="list-style-type: none">All pages adapt properly to different screen sizesFlexbox is implemented using semantic HTML5CSS files use a consistent methodology for maintainabilityJavaScript uses modern practices and avoids dependencies where possibleInteractive elements have appropriate statesPage load time does not exceed 3 secondsAnimations enhance usability without being distractingContent is accessible according to WCAG standards	13	Completed	2	High	Frontend implementation	
12	As a user, I want a professionally designed web interface so that I can easily navigate and access all features of the bike rental service.	<ul style="list-style-type: none">Access all features intuitivelyNavigate between pagesComplete tasks efficientlyUse interface across devicesGet visual feedback on actions	<ul style="list-style-type: none">All UI elements follow a cohesive design systemDesign passes contrast checks for accessibilityAll interactive elements have clear hover and active statesDesign is responsive across mobile, tablet, and desktopAll components are documented in a design systemDesign has been tested with potential usersLoading states and error states are clearly designed	6	Completed	3	High	UI refinement	
13	As a developer, I want to create a modular code architecture so that our application is maintainable, scalable, and follows engineering best practices.	<ul style="list-style-type: none">Organize code structureImplement component systemCreate reusable modulesDocument architectureOptimize build process	<ul style="list-style-type: none">Code follows a consistent structure across the codebaseStyles are organized using a consistent methodologyReusable components are abstracted into reusable modulesGlobal styles are separated from component-specific stylesJavaScript follows modern best practicesDocumentation explains the architecture and standardsBuild process optimizes assets for production	4	Completed	3	Medium	Code architecture	
14	As a user, I want an intuitive homepage that clearly communicates the purpose and benefits of the Dublin Bikes service so that I can quickly understand what's offered.	<ul style="list-style-type: none">Understand service purposeLearn about key featuresAccess primary functionsView service statisticsSign up or login	<ul style="list-style-type: none">Homepage clearly communicates the core value propositionKey features are highlighted with visual elementsCall-to-action buttons are prominently displayedPage load time is under 2 secondsContent is organized in order of importanceUser testimonials or social proof is includedMobile version maintains clarity and focus	2	Completed	3	High	Homepage implementation	
15	As a user, I want clear navigation throughout the website so that I can easily find information and access all features.	<ul style="list-style-type: none">Navigate between pagesFind specific informationUnderstand current locationAccess all major featuresReturn to homepage	<ul style="list-style-type: none">Navigation menu is consistently positioned on all pagesCurrent page is clearly indicated in the navigationNavigation is accessible with keyboard and screen readersMobile navigation works intuitively on touch devicesNavigation contains all primary sections of the websiteDropdown menus are clearly indicated if present	1	Completed	3	High	Site navigation	
16	As a user, I want to learn about the company behind Dublin Bikes so that I can trust them with my transportation needs.	<ul style="list-style-type: none">Learn about company missionView team informationUnderstand company historyAccess contact informationFind legal information	<ul style="list-style-type: none">About page explains the company mission and valuesTeam members are introduced with appropriate informationCompany history is presented in an engaging wayContact information is easily accessibleLegal information and privacy policy links are included	10	Completed	3	Medium	Company information	
17	As a user, I want to find answers to common questions quickly so that I can resolve issues without contacting customer service.	<ul style="list-style-type: none">Browse FAQ categoriesSearch for specific questionsFind related questionsAccess detailed answersContact support if needed	<ul style="list-style-type: none">FAQ page organizes questions into logical categoriesQuestions are written from the user's perspectiveAnswers are concise and helpfulExpandable sections keep the page organizedRelated questions are suggestedContact option is available for unanswered questionsContent is regularly updated based on support issues	3	Completed	3	Medium	Self-service support	
18	As a user, I want to easily contact Dublin Bikes with questions or feedback so that I can get assistance when needed.	<ul style="list-style-type: none">Find contact informationSubmit inquiry formReceive submission confirmationFind alternative contact methodsView office location	<ul style="list-style-type: none">Content is regularly updated based on support issuesContact form is easy to find and useForm fields are clearly labeled with proper validationUsers receive confirmation when form is submittedAlternative contact methods are providedForm data is securely transmitted and storedExpected response time is communicatedForm is fully functional on all devices	10	Completed	3	Medium	Customer support	
19	As a user, I want to see detailed information about bike availability and station locations so that I can plan my journey effectively.	<ul style="list-style-type: none">Find stations on mapCheck bike availabilityPlan journey between stationsView station detailsCheck weather conditions	<ul style="list-style-type: none">Map clearly shows all station locationsStation markers indicate bike availability statusUsers can search for stations by name or addressClicking a station shows detailed informationRoute planning between stations is availableCurrent weather conditions are displayedMap is responsive and usable on mobile devicesData refreshes automatically at regular intervals	5	Completed	3	High	Core map functionality	
20	As a customer service representative, I want to receive and manage user inquiries efficiently so that I can provide timely and helpful responses.	<ul style="list-style-type: none">Receive contact form submissionsAccess inquiry detailsTrack inquiry statusRespond to customer inquiriesGenerate reports on inquiries	<ul style="list-style-type: none">All contact form submissions are stored in Google SheetData includes name, email, message content, and timestampCustomer service has access to inquire messages in a structured formatMessages can be sorted and filtered by date and topicResponse status can be tracked for each message	5	Completed	3	Medium	Backend functionality	
21	As a user, I want to see accurate predictions of bike availability based on historical patterns so that I can plan my journeys in advance.	<ul style="list-style-type: none">View predicted availabilitySelect future date and timeCompare predictions with current statusUnderstand prediction confidenceUse predictions for journey planning	<ul style="list-style-type: none">ML model predicts bike availability with at least 80% accuracyPredictions are available for all stations for up to 24 hours in advanceUsers can select a future date and time to view predicted availabilityPrediction confidence level is displayedModel accounts for weather conditions, time of day, and day of weekPrediction results are displayed within 2 seconds of requestInterface clearly distinguishes between current and predicted dataSystem handles prediction failures gracefully with appropriate messaging	14	Completed	4	High	Machine learning feature	
22	As a developer, I want to create a modular, maintainable codebase so that our application is easy to extend and maintain in the future.	<ul style="list-style-type: none">Create component architectureImplement style systemDocument code structureOptimize for performanceEnsure code quality	<ul style="list-style-type: none">Code is organized into logical components with clear interfacesGlobal styles are separated from component-specific stylesReusable components have documentation and usage examplesCode follows a consistent methodologyJavaScript follows modern best practicesCode duplication is minimized/reduced through the codebaseAll code passes linting with agreed standards	4	Completed	4	Medium	Code architecture	

	As a user, I want to receive a pickup code after completing my payment, so that I can unlock a bike.	<ul style="list-style-type: none"> Complete payment process Receive unlock code View code instructions Use code at bike station Request new code if needed 	<ul style="list-style-type: none"> After successful payment, a unique pickup code is generated for the user The pickup code is displayed on the confirmation page or pop up The code format is standardized (e.g., 6-digit alphanumeric or QR code) A success message clearly indicates the code is for bike pickup 	3	Completed	4	High	Payment integration
24	As a marketing manager, I want to collect user information through a sign-up form so that I can communicate with potential customers and grow our user base.	<ul style="list-style-type: none"> Create user sign-up form Collect contact information Store user data securely Access user database Send marketing communications 	<ul style="list-style-type: none"> Users are able to submit their information (e.g., name and email) via a form on the website Submitted user data is stored securely in a database or external system Marketing team members can access or export the collected data in a structured format A confirmation message is shown to users after submission Validation is in place to ensure data completeness 	4	Completed	4	Medium	Marketing functionality
25	As a user, I want to easily identify bike stations on the map and see predicted availability so that I can plan my journeys more effectively.	<ul style="list-style-type: none"> View station numbers Find stations quickly View availability details See predictions for chosen time Find stations by search 	<ul style="list-style-type: none"> Each station displays a unique, visible station number Station markers are clearly visible at different zoom levels Stations can be searched by number or address Selected station is highlighted visually Station details and availability are displayed on selection Predicted availability is shown for selected date/time Visual indicators help understand availability patterns 	8	Completed	4	High	Enhanced map feature
26	As a backend developer, I want to store user account information securely so that the application can manage user login and registration.	<ul style="list-style-type: none"> Create user database Implement registration process Secure user credentials Manage user sessions Handle password resets 	<ul style="list-style-type: none"> A user registration API is available to receive name, email, and password Submitted account data is validated (e.g., email format, required fields) The backend stores the account data in a structured and persistent storage Duplicate accounts with the same email are prevented A response is returned to the frontend confirming success or failure 	3	Completed	4	Medium	User authentication
27	As a developer, I want to ensure the application is thoroughly tested so that users experience minimal bugs and issues.	<ul style="list-style-type: none"> Create test suite Perform unit testing Conduct integration tests Test functionality Verify cross-browser compatibility Perform performance testing 	<ul style="list-style-type: none"> Unit tests cover at least 80% of non-UI code Integration tests verify all API endpoints UI tests check critical user flows Responsive design is tested across device sizes Performance meets acceptable standards Accessibility compliance is verified Cross-browser compatibility is confirmed 	6	Completed	4	High	Quality assurance
28	As a developer, I want to deploy our application to a production environment so that users can access it online.	<ul style="list-style-type: none"> Configure production server Deploy application code Set up domain and SSL Configure security settings Implement monitoring 	<ul style="list-style-type: none"> The project is successfully deployed and running on an AWS EC2 instance A valid public IP or custom domain is configured and accessible over the internet Required ports are open on the EC2 security group to allow access Testers can visit the website without login or SSH access The deployed version matches the current development branch Any necessary backend services or APIs are also hosted and working properly 	2	Completed	4	High	Deployment
29	As a developer, I want to implement user feedback and fix identified issues so that the final product meets user expectations and quality standards.	<ul style="list-style-type: none"> Collect user feedback Prioritize issues based on their fix Implement bug fixes Improve UI/UX issues Verify fixes with testing 	<ul style="list-style-type: none"> All reported bugs and UI issues from testers are reviewed and documented Logic errors, broken features, and UI/UX issues are identified and fixed Each fix is tested manually or with automated tests to ensure the issue is resolved UI/UX adjustments are made based on usability testing feedback The testing team confirms that critical issues have been resolved A final version is deployed 	8	Completed	4	High	Quality improvement
	As a stakeholder, I want comprehensive documentation of the project so that we have a record of what was built and how it works.	<ul style="list-style-type: none"> Create architectural diagrams Document user stories Explain technical implementation Document testing process Create user guides Prepare final project report 	<ul style="list-style-type: none"> Project report covers all required sections Documentation includes architecture diagrams User stories and acceptance criteria are documented Technical implementation details are explained Testing process and results are documented Future improvement recommendations are included Repository has a detailed README 	40	Completed	4	Medium	Project documentation