



Event Parking Management User Acceptance Testing Test Plan

for the Smart Columbus
Demonstration Program

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Produced by City of Columbus

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- City of Columbus, Division of Parking Services
- Experience Columbus
- Short North Alliance
- ParkMobile
- Parking Operators¹
 - Allpro Parking
 - Campus Parc
 - Citrin
 - Columbus Convention Center
 - LAZ Parking
 - Park Place
 - Professional Parking
 - SP+
 - Towne Park

¹ These are parking operators who have committed, and are working through, signing, or have already signed, the memorandum of understanding (MOU) with ParkMobile to participate in the ParkColumbus application.

Abstract

The purpose of this Smart Columbus User Acceptance Testing Test Plan is to establish a common framework for conducting testing activities in support of the Event Parking Management project. The plan facilitates processes among project stakeholders, including City of Columbus – Division of Parking Services, Experience Columbus, Parking Operators, Short North Alliance, ParkMobile, and other stakeholders. The plan categorizes all components that make up the system of interest, outlines the testing strategy, defines the test tasks and interactions with other system elements, and provides a governance scaffold for the execution of all testing activities. The governance scaffold includes the tools to be used for logging, tracking, monitoring, and reporting test outcomes.

The primary goals of the User Acceptance Testing Test Plan are to evaluate how well the system conforms to the allocated requirements and satisfies the system of interest's intended use and user needs. The evaluation will include analysis, demonstration, inspection, and testing of various products, systems, and data to provide final acceptance of the system and allow movement forward to the next phase in the project.

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Project Summary

PROJECT BACKGROUND

The Event Parking Management (EPM) project is one of eight projects in the Smart Columbus program, and is considered the future of smart parking. Creation of the EPM system allows travelers to identify current projected parking availability near their target destination to help reduce additional driving that might otherwise be required to find suitable parking. Users of this system have access to parking reservations and payment options (for garage and surface lot parking). Benefits of an EPM system include increased knowledge of available parking in the downtown and Short North areas during events, reduced parking-related congestion, and reduced emissions.

The project scope encompasses public-class parking facilities within the downtown region (geographic scope detailed below), as well as loading zones, public surface lots, and parking meter expected availability information. The city-owned, restricted-parking garages and surface lots used for employees and short-term visitors are not included in the EPM project.

The amenities listed in **Table 1** are deployed as part of this project.

Table 1: EPM Project Scope

Scope	Description
Parking garage and surface lot spaces	The project captures parking availability and other parking-related data from 86% of the available parking garages and private surface lots in the project area and transmits the data to the EPM Central System and then to the Smart Columbus Operating System (Operating System).
Parking meters and kiosks	The project collects parking-related data from approximately 4,300 single-space parking meters and 9 kiosk payment parking zones and transmits the data back to the Operating System to project availability.
Loading zones	The project collects restriction information for approximately 130 loading zones designated by the City of Columbus.
EPM Central System	The EPM project consist of several new software modules working together to deliver the EPM service, including a front-end-traveler user interface and back-end central system that will connect, capture, relate, store, and respond to real-time parking data collected from various sources and equipment. EPM will interface with the Operating System to house the real-time and archived data and allow stakeholders operational and reporting access. These combined software modules make up the EPM system and will provide current, projected, and complete views of parking status and availability to help travelers plan and pay for parking and realize the City’s smart parking vision and goals.

Source: City of Columbus

PROJECT OBJECTIVES

Smart Columbus has partnered with public and private agencies with a shared focus on enhancing user experience, quality of life, and satisfaction. The project has established intermediate goals and objectives that, when reached, will signal progress toward reaching successful outcomes.

The City of Columbus identified the following objectives to measure EPM impact:

- Increase knowledge of available parking in the downtown area and Short North during events
- Reduce parking-related congestion
- Reduce vehicle emissions

SYSTEM GEOGRAPHIC SCOPE

The EPM project focuses on the Downtown and Short North areas for parking garage, surface lot, parking meter, and loading zone information. The parking meter and loading zone information was expanded citywide.

The Downtown boundaries are consistent with those of the Central Business District, which is bounded by SR-315 on the west, I-70 on the south, I-71 on the east, and I-670 on the north. In addition, the Short North area includes the High Street corridor from I-670 on the south, Dennison Avenue on the west, Third Street on the east, and Fifth Avenue on the north.

Figure 1 presents the geographic boundaries for the EPM project.

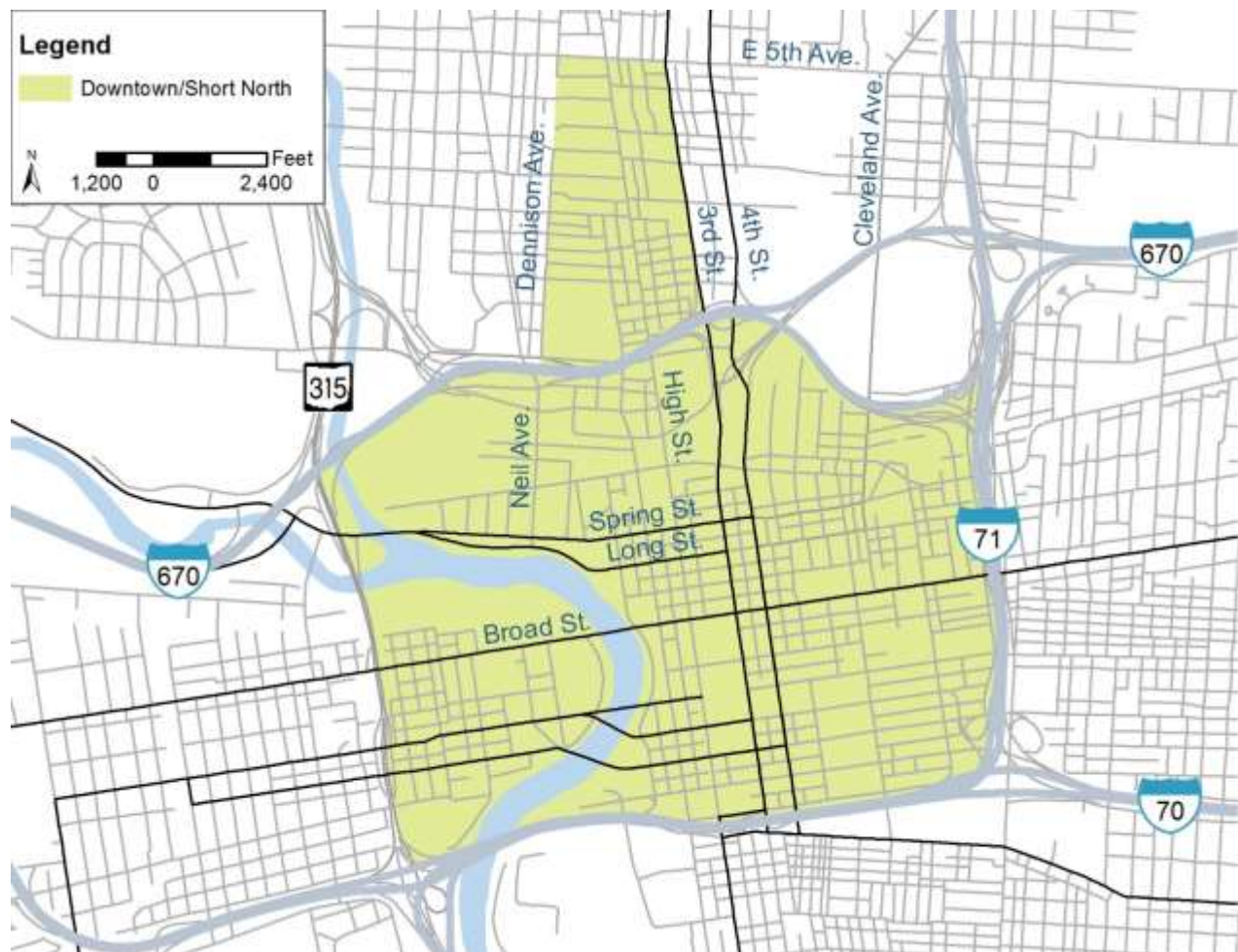


Figure 1: Downtown Columbus and the Short North Area

Source: City of Columbus

Chapter 1. Introduction

1.1. OVERVIEW

This User Acceptance Testing (UAT) Test Plan was prepared to verify the EPM project elements to commission the system for operation and evaluate the functional deployment against its intended function and implementation of the system design. The UAT Test Plan is also intended to demonstrate to project stakeholders that adequate consideration has been given to all aspects of the testing effort to demonstrate readiness of EPM for production use.

The UAT will establish a common framework for testing. This includes describing various testing types and methods, as well as setting expectations for which method(s) should be used and when each method should be used. The document provides information on which functional components and features will and will not be tested, identifies tester roles, instructs testers how to capture defects, and defines pass/fail criteria. This UAT also provides testers with a set of test cases (**Chapter 5**) intended to evaluate the degree to which system functionality conforms to the system requirements, which are traced to user needs.

An outline of the project's test report is provided in **Appendix A**. However, this document is not a test report. Therefore, once all testing activities have been completed, a test report will be developed for traceability purposes and submitted for review.

1.2. OBJECTIVES

The UAT Test Plan supports the following specific objectives:

- Ensure conformance to functional and non-functional requirements
- Demonstrate that all contract requirements have been provided
- Verify necessary functions, communications, and operational interfaces
- Identify how each testable requirement will be demonstrated, including the method for performing the test
- Identify the results that will constitute success for each test
- Identify the resources required to complete each test
- Identify all the deliverables that will result from completing the testing
- Document issues identified during testing and provide an action plan to resolve them
- Ensure that issues are identified and fixed before go-live

1.3. REFERENCES

The EPM system will be constructed to meet the user needs and features identified in the Concept of Operations (ConOps) and to meet the requirements in the System Requirements (SyRS). This document is also supported by other system design documents including System Architecture and Standards Plan, Safety Management Plan and Performance Management Plan. The documents listed in **Table 2** provide additional details on achieving the outcomes for the project.

Table 2: References

Title	Publication Date
Institute of Electrical and Electronics Engineers (IEEE) 829 Test Plan Outline https://standards.ieee.org/standard/829-2008.html	Jul 18, 2008
Smart Columbus Demonstration Program Event Parking Management Concept of Operations https://d3hgzplpmmz6qe4.cloudfront.net/2019-07/Event%20Parking%20Management%20Concept%20of%20Operations.pdf	Jun 27, 2018
Smart Columbus Demonstration Program Event Parking Management System Requirements https://d3hgzplpmmz6qe4.cloudfront.net/2019-07/Event%20Parking%20Management%20System%20Requirements.pdf	Dec 11, 2018
Smart Columbus Demonstration Program System Architecture and Standards Plan https://d2bfd3nxvhnf29.cloudfront.net/2021-01/SCC-B-SASP-UPDATED_V2.pdf	Jan 28, 2021
Smart Columbus Demonstration Program Demonstration Site Map and Installation Plan https://d2bfd3nxvhnf29.cloudfront.net/2020-07/SCC-B-DSP%26IS-UPDATED.pdf	Jun 19, 2020
Smart Columbus Demonstration Program Performance Measurement Plan https://d2bfd3nxvhnf29.cloudfront.net/2021-02/SCC-C-PfMP-Update-v2.pdf	Feb 5, 2021
Smart Columbus Demonstration Program Safety Management Plan https://d2bfd3nxvhnf29.cloudfront.net/2020-03/SCC-F-Safety%20Management%20Plan_12-05-2019_FINAL.PDF	Dec 5, 2019

Source: City of Columbus

More information about the Smart Columbus Demonstration Program and about EPM project can also be found on the Smart Columbus website.²

This UAT was adopted from the IEEE 829-2008 Test Plan Outline and includes tailored project-specific processes recommended by that document, addressing management life cycle test processes.

²<https://smart.columbus.gov/projects>

1.4. TEST TEAM ROLES AND RESPONSIBILITIES

Table 3 identifies the anticipated tester roles and responsibilities for the EPM elements.

Table 3: Tester Roles and Responsibility Matrix

Role	Description	Testers
System owner/City of Columbus project manager	City of Columbus representative overseeing the completion of this project and its testing. Responsible for overseeing adherence to individual policies of service providers.	Ryan Bollo, City of Columbus
Test manager(s)	Responsible for test report summaries and scheduling.	Sai Geetha Koganti, HNTB
General tester (traveler)	General testing role with domain knowledge in transportation and/or familiarity with EPM system requirements.	Andrew Wolpert, City of Columbus
		Sonja Summer, City of Columbus
		Amanda Ford, City of Columbus
		Amber Kohlberg, City of Columbus
		Jeff Kupko, Michael Baker International
		Sherry Kish, HNTB
		Alex Kavanagh, HNTB
		Scott Lowry, HNTB
		Santos Ramos, HNTB
Sai Geetha Koganti, HNTB		
Technical tester	A technically advanced user who can perform advanced system tests such as validating point-to-point data validation.	Jarred Olson, Accenture
		Amanda Ford, City of Columbus
		Amber Kohlberg, City of Columbus
		Casey Ellis, ParkMobile
Parking operators	A parking operator who has a contract to show parking availability on the ParkColumbus user interfaces.	Park Place, Citrin, SP+, Towne Park

Source: City of Columbus

1.5. TEST PLAN SCHEDULE

Table 4 shows the timeline for major deliverables before the project goes live. Please refer to **Chapter 2** for risks associated with the project schedule.

Table 4: EPM Project Testing Schedule

Deliverable	Timeline	Notes
Product stabilization	3/31/2020 – 4/13/2020	
Acceptance testing (Releases 1 and 2)	4/14/2020 – 4/21/2020	
Regression testing until acceptance	5/7/2020 – 5/15/2020	
EPM Final Test Plan	5/8/2020	
Soft Launch (Releases 1 and 2)	7/1/2020	Public release of ParkColumbus app and web with features from Releases 1 and 2. There will be no recruiting or outreach accompanied with this soft launch.
Public Launch	10/28/2020	
Release 3 development	5/4/2020 – 2/12/2021	
Acceptance and Regression testing (Release 3)	8/3/2020 – 2/25/2020	Each functionality developed under Release 3 will be tested until acceptance.
Webinar for Test Plan, preliminary test results, and launch	12/18/2020	
Update Test Plan	3/4/2021	Add test procedures for the Release 3 Test Cases
Draft Test Report	3/9/2021	
Final Test Report	4/16/2021	
Integration to ParkColumbus app and web (Release 3)	8/1/2020 – 3/12/2021	Release 3 features will be integrated into the “Live” version of the ParkColumbus app and web as they are developed and tested.

Source: City of Columbus

Chapter 2. Risks and Contingencies

Several parts of the EPM project are outside the project team's control but have direct impacts on the process and must be validated. Risks, contingencies, and mitigating factors for the EPM project testing are listed below.

- Parking operator agreements could not be in place in time to support EPM release testing. Risks include inability to test parking availability or parking reservations provided by all the parking operators. However, this risk is low due to ParkMobile being in regular contact with the parking operators and has agreements signed with several of them. All parking operators have received the draft contract.
- The EPM application relies on the parking operator's application programming interface (API) to update parking information and confirm reservations and payments. If those external systems have unplanned failures or degraded service, the EPM application would be unable to provide travelers with services, which could lead to adverse perceptions from community members. The project team will work with external systems to mitigate this risk by coordinating service-level agreements (SLAs) and strategies for monitoring and notification in case of service disruption.
- Early adopters may experience usability issues, risks, and/or annoyances common to early-stage product use and may therefore be dissuaded from using the system in the future. This risk is low, as the ParkColumbus application is already in operation.
- Originally, EPM was going to integrate with another Smart Columbus project, CPS, to provide payment options. In June 2020, CPS was removed from the Smart Columbus Program and requirements related to CPS were updated or marked obsolete as necessary. The risk to this change and any impact to users is low given ParkMobile already had built-in payment options.
- Resource availability issues may affect the testing schedule, leading to a delay in acceptance testing. To mitigate the risk, the City will leverage additional resources from the Smart Columbus consultant contracts for additional support if needed. Training material will be provided to the testers before testing to familiarize them with testing tools. Testing team and vendor will meet regularly to discuss features and functionality of the system to understand the application as a whole while testing. Testers will also be required to leverage the test tools, which will provide an up-to-date snapshot for new testers to quickly get up to speed on test procedures, expectations, and progress.
- Schedule risks are associated with various integration and external elements of the project, including:
 - The Operating System for parking availability – The Operating System team is developing a predictive analytics tool for on-street parking and loading zones availability. This tool will need to integrate with ParkMobile. Discussions are ongoing between project teams so that development, integration, and user experience are all discussed in parallel.
 - Schedule risks associated with Coronavirus (COVID-19) pandemic –
 - The COVID-19 pandemic has affected the launch of the EPM application in various ways. The State of Ohio implemented a stay-at-home order, travel restrictions, and a state of emergency that are in effect through May 2020. Removal of these orders and restrictions will be phased throughout summer 2020. As a result, most, if not all, major events in Central Ohio have been canceled or rescheduled for fall 2020. For this reason, the public launch and marketing efforts have been delayed through October 2020.

- ParkMobile’s business model is reliant on parking fees and with parking being affected on every level, ParkMobile’s staffing and third party contracts were affected. Resource changes occurred which affected the timeline of development, testing and launch. The development team will implement Release 3 requirements and implementation of these features into the production application will take place through March 12, 2021. The schedule in the Test Plan, shown in **Table 4** accounts for these assumptions.

Chapter 3. Approach

This section contains the overall approach to testing. The testing strategy is designed to ensure that each major group of features or feature combinations is adequately tested. Major activities, techniques, and tools that are used to test the designated groups of features are defined in this section.

3.1. TESTING APPROACH

This UAT Test Plan describes the approach for acceptance of the integrated EPM system. Two methods were used in combination: a systems engineering V-model was used to develop system requirements, and agile development was used to deliver those requirements. A key aspect of documentation is use of software tools that enable development, tracking, and traceability throughout the process.

Agile development was selected to deliver the EPM system to allow for iterative and incremental delivery and to respond quickly to changes during the development process. Using agile development also ensured that the development work was aligned to the highest business value for the City of Columbus and its stakeholders.

For the EPM system, the requirements listed in the EPM SyRS³ are broken down into test cases for testing and assigned an appropriate testing method and traceability method based on the functional requirement. Testers are responsible for executing test cases in accordance with the features being tested. For example, a “technical tester” with advanced knowledge of security and privacy will be responsible for testing requirements in the feature class of Administration, Policy, and Compliance. A tester with the role of “traveler” will be responsible for testing requirements that pertain to application usage features.

Operational scenarios from the project ConOps, as well as functional system requirements from the EPM SyRS, form the basis of the test cases in **Section 5.1**. These test cases make up the acceptance criteria for the operational readiness of the EPM elements.

3.2. TEST DELIVERABLES

During testing there will be additional artifacts that extend this plan to support and enhance the testing process. The following deliverables will result from the UAT testing process:

- Test cases
- Requirements Traceability Matrix (RTM)
- Defects Matrix with corrective actions
- Change request (CR) log
- Error logs, bug reports, and/or screen captures (where feasible)
- Test Acceptance (see **Appendix A.8**)

³ <https://d3hzp0pmmz6qe4.cloudfront.net/2019-07/Event%20Parking%20Management%20System%20Requirements.pdf>

- EPM Test Case Report (see **Appendix A.1.1**)
- EPM Test Plan and Report webinar

3.3. TEST TYPES

The EPM project has the following features: user accounts, parking reservations, parking availability, user preferences, parking amenities, and payment. Test types include functional and non-functional testing to validate the requirements. Various test types are used in this UAT to test each project feature. Each methodology has a defined test objective, strategy, and pass/fail criterion (expected result). The following are examples of test types to be used:

- System testing – System testing involves testing the EPM system to verify that it meets specified requirements as defined in the SyRS for the system.
- Integration testing – Integration testing is performed to expose defects in the interfaces and in the interactions between the EPM and integrated components or systems.
- API testing – API testing involves testing APIs directly and as part of EPM integration testing to determine whether they meet expectations for functionality, reliability, performance, and security. API testing is performed manually, as opposed to automated API testing, which is the responsibility of the EPM developers.
- Installation testing – Installation testing follows a set of procedures that are necessary before the software can be used and tested.
- Unit testing – Unit tests are performed by the developer. Individual units or components of a software application are tested to validate that each unit or component performs as designed.
- Regression testing – Regression testing is performed against all requirements to verify that recent code changes, defect fixes, or performance updates have not adversely affected existing features.

3.4. VERIFICATION METHODS

Each of the EPM requirements requires a verification method, which details the plan for verifying the requirement based on its stated definition. For each test case defined in the RTM, one of the verification methods listed in **Table 5** is assigned.

Table 5: Methods of Verification

Type	Description
Inspection	Verification through a visual, auditory, or tactile observation and comparison of observations with required attributes and characteristics of the system.
Demonstration	Verification that exercises the system software or hardware as it is designed to be used, without external influence, to verify that the system behaves as specified by the requirement.
Test	Verification using controlled and predefined inputs and other external elements (e.g., data, triggers) that influence or induce the system to produce the output specified by the requirement.
Analysis	Verification through indirect and logical conclusion using mathematical analysis, models, calculations, and derived outputs based on validated data sets.

Source: City of Columbus

3.5. TEST CRITERIA

3.5.1. Test Status

Each test case consists of several unique properties that should be considered holistically during the testing evaluation process. Properties include, but are not limited to, test identifier (ID), test objective, procedure, expected outcome, number of test runs that must be completed, and status. The RTM maintains the following status for each test case:

1. Planned – The test case has been defined, its role has been identified, testers have been assigned, and the test case is logged in the RTM as ready for testing.
2. In progress – The test case is underway but has not been completed.
3. Passed – A “passed” value indicates the defined number of tests have been completed by various testers without error and the expected result has been achieved. It is expected that each time this test is performed, independent of who is testing, the same successful results will be achieved.
4. Failed – A test case is marked as “failed” when it does not meet part or all of its expected outcomes. In this case, a defect would be logged, and a brief note would be entered in the comments column listing the defect ID for traceability. For all failed test cases, one or more defects must be logged to capture the details surrounding the failure and to track its status.
5. Deferred – A test case is marked as “deferred” when it cannot be performed at the time of testing or when requirements changed. If a test is deferred, the tester should provide a brief reason in the comments column of the RTM. The test manager is responsible for tracking deferred cases and evaluating the most appropriate time and/or response for addressing them.
6. Canceled – A test case is marked “canceled” when the requirement affiliated with the test case no longer applies to the project; that test case should be logged in the CR Log (see **Section 3.6.3**).

3.5.2. Entry/Exit Criteria for Testing

Entry criteria to begin initial testing:

- Successful completion of EPM development of Releases 1, 2
- Test cases and scenarios added to the RTM
- Signed memorandum of understanding with parking operators in Columbus (84% of the market share in Columbus)

Exit criteria to complete testing:

- All planned test cases and scenarios have been executed
- Test scenarios achieve a 100% pass ratio with respect to failures
- All defects found have been recorded in the defect management tool
- All high-severity defects have been resolved and retested
- A plan and schedule exist for resolution of outstanding issues
- A test report has been issued to stakeholders

3.5.3. Testing Suspension and Resumption

There could be cases in which a critical, severe defect is detected that is significant enough that, if not addressed, it would require one or more iterations of the same tests to be performed again or could even require suspension of testing. In such cases, the test manager should be notified immediately. He or she will work with stakeholders and vendors as appropriate to correct the issue as quickly as possible. Testing will resume once the test manager has confirmed the issue has been resolved.

The following situations would cause testing to be suspended:

- **App/web crash** – Inability to execute a test case without crashing the app or web.
- **Inaccurate information** – Incorrect information associated with the parking availability, reservation, and/or payment information.
- **Network failure** – Failure of network connection required for normal operation.
- **Injury** – Any situation that could lead to bodily injury or significant damage to property.

3.6. TEST TOOLS

3.6.1. Requirements Traceability Matrix

An RTM will be used to ensure that 100% of the requirements are tested. The RTM is a spreadsheet that links requirements to test cases. The test manager will be responsible for updating the RTM, in coordination with other testers, to indicate the status of test cases and to record any applicable defects, notes, or observations. Test status includes planned, in progress, passed, failed, deferred, and canceled. Canceled test cases do not count toward the goal of ensuring that 100% of the requirements are tested.

3.6.2. Defect Log

The test manager will monitor the defect log for corrective action. A defect log will be used during testing to capture, track, monitor, and address anomalies observed during UAT. For each entry, the development team will work to understand and reproduce (where possible) the defect, identify the root cause, summarize a response, and log the activities undertaken to resolve the issue. Deferred tests will be assigned to a subsequent release or an estimated completion date to be able to be tracked and tested. The severity of the defect needs to be assessed and the defect must be assigned to the category of critical, high, medium, or low, where “critical” is the most serious classification, causing the feature or product to be unusable. Defects of this severity should be brought to the immediate attention of the test manager for further inspection, coordination, and decision-making. Low severity indicates a cosmetic observation.

The defect tracker will also be leveraged (with the RTM) to measure the feasibility and readiness of the software to be promoted to production. Additional information can be found in **Section 3.10**.

3.6.3. Change Request Log

The ability to track system design changes or changes to requirements associated with a feature is a fundamental strategy for configuration management and an important aspect of managing projects and maintaining traceability across the Smart Columbus program. The RTM provides testers with a change tracking mechanism to capture and justify requests for change, which often derive from a defect or an enhancement request. The City of Columbus project manager is responsible for assessing the impact of the change as it relates to the project objectives, schedule, cost, and so forth, and for providing final authorization on the request through the tool. **Appendix A.3, Table 15**, provides a record of all the CRs logged throughout the testing process, along with justifications and authorization status.

3.7. HARDWARE AND SOFTWARE REQUIREMENTS

iOS hardware requirements are:

- Operating system – Compatible with iPhone and iPad. iOS version 12.0 and greater.
- Storage size – Minimum 65.9 MB.

Android hardware requirements are:

- Operating system – Compatible with Android devices. Android version 6.0 and greater.
- Storage size – Minimum 17 MB.

Web requirements:

- Google Chrome (version 87.0)
- Safari (version 14.0)

3.8. ENVIRONMENTAL NEEDS

Testers must have an internet connection to test the EPM web portal as well as an Apple or Android smartphone to download and test the EPM app. Testers should also be familiar with ways to capture screenshots from their testing device in case an error occurs or the expected result is not achieved. Screenshots aid in debugging because they document the event for the development team.

3.9. CONTRACTUAL REQUIREMENTS

Listed below in **Table 6** are the contractual requirements and supported documents defined in the EPM contracts.

Table 6: EPM Contractual Agreements and Supporting Documents

Phase	Contractual Requirement	Status
Development phase	Quality Assurance/Quality Control Plan	Complete
	Interfaces with external systems and other Smart Columbus projects	Complete
	Product demonstrations for Smart Columbus	Complete
	Coordination meetings	Complete
Prior to operational testing period	Acceptance test criteria	Complete
	Training Plan	Complete
Prior to deployment	Test results documentation	Ongoing
	Communications Plan	Complete
	Data Backup and Recovery Plan	Complete
	Data Protection Policy	Complete
	Information Security Policy	Complete
	Network and Infrastructure Policy	Complete
	Secure Software Development Policy	Complete

Phase	Contractual Requirement	Status
	System Security Plan	Complete
	Overall System Schematic and Architecture Plan	Complete
After deployment	Operations and Maintenance Plan	Complete
	Usage data to support performance measurement	Ongoing

Source: City of Columbus

3.10. MEASURES AND METRICS

The RTM contains a defect tracker, which testers will use to capture anomalies, incongruences, errors, or any other output inconsistent with the expected test case result. The RTM, combined with the defect tracker, will capture the following testing metrics:

- Total number of test cases
- Number and percentage of test cases passed
- Number and percentage of test cases failed
- Number and percentage of test cases deferred
- Number and percentage of defects found
- Number and percentage of high-severity defects
- Number and percentage of defects accepted
- Number and percentage of defects rejected
- Number and percentage of defects deferred
- Total number of testers

The City of Columbus will leverage these data points to determine the feasibility and operational readiness of the EPM project to receive final acceptance test approval as outlined in the test summary in **Appendix A.6**.

Chapter 4. Test Items

4.1. EPM FEATURES TO BE TESTED

The following features and capabilities of EPM will be tested:

- Traveler web portal
 - User profile/account
 - Individual
 - Fleet
 - Parking restrictions
 - Event parking
 - Reservations and Zone Parking
 - Discount/promotional code
 - Notifications and alerts
 - Payment
 - Navigation
 - Guest account
 - User feedback
- Traveler mobile app
 - User profile/account
 - Parking availability and restrictions
 - Event parking
 - Reservation and Zone Parking
 - Discount/promotional code
 - Notifications and alerts
 - Payment
 - Navigation
 - User feedback
- Parking Operator application (OPAPP)
 - Demand-based pricing
 - Discounts
- Administrator web portal
 - Demand-based pricing
- Predicted availability functionality

- On-street
- API/integration
 - Parking availability
 - Performance measurement data to Operating System

4.2. FEATURES NOT TO BE TESTED

Some features will not be specifically addressed. Testing of these features will be indirect, inferred, or assumed because of other testing efforts:

- **API testing** – Inspection of service provider APIs will not be part of this UAT. Integration with parking operators through APIs to send and receive parking facility information will be demonstrated as part of development release testing.
- **Network security** – Inspection of individual transactions or packets will not be tested as part of this UAT. It is sufficient to accept the secure socket layer protection configured, which secures communication to the end user.
- **Support environment** – A Support environment will be demonstrated as part of the contractual requirements but not tested as part of this UAT.
- **Non-functional requirements** – Successful demonstration of requirements related to information management (IM), lifecycle (LC), availability and recovery (AR), maintainability (MT), disposal (DP), and policy and regulation (PR) requirements will be demonstrated through submittal and acceptance of the Data Backup and Recovery Plan, Systems Architecture and Standards Plan, Operations and Maintenance Plan and other supporting documents listed in **Table 6**.
- **Data Requirements (DR)** – Data requirements will be verified in accordance with the Smart Columbus Operating System and Data Privacy Plan (DPP). Inspection of the API and data transmitted to the Operating System will ensure that all requirements have been met and that no PII has been transferred to the Operating System.
- **Performance Requirements (PRs)** – EPM will be tested for operational performance but will not undergo benchmarking for stress testing. Capacity, throughput, high availability, and disaster recovery are inherent to the requirements in the contract and managed through the contract awarded to ParkMobile.
- **Operations and maintenance** – Operations and maintenance requirements will be demonstrated in accordance with the Operations and Maintenance Plan as part of the contractual requirements listed in **Table 6**.
- **Obsolete Functional Requirements** – All functional requirements have been reviewed with the system owner and a few of the requirements are considered obsolete after considering the multiple scenarios and user needs listed in the EPM ConOps. Requirements that are changed to obsolete are listed in **Table 7** with a justification.

Table 7: Requirements Identified as Obsolete for EPM Testing

Requirement ID	Description	Justification
EPM-FN1896-V02	The EPMCS shall provide off-street parking availability at each parking facility to the PARKAPP.	A new requirement EPM-FN3266-V00 is added to differentiate between off-street and on-street parking. This requirement is considered obsolete since parking availability is not provided for parking facilities which includes garages and surface lots. EPM-FN3266-V00: The EPMCS shall provide on-street parking availability at each parking facility to the PARKAPP. Refer to EPM-MAP025-V01 and EPM-MAN025-V01 test cases related to on-street parking availability.
EPM-FN1897-V02	The EPMCS shall provide the number of parking spaces available at each gated parking facility to the PARKAPP.	This requirement is marked obsolete since parking availability information is not available for gated facilities.
EPM-FN1898-V01	The EPMCS shall provide loading zone availability to the PARKAPP.	The requirement is marked as obsolete since parking availability information is not available for loading zones.
EPM-FN1909-V01	The EPMCS shall calculate the probability of finding an open loading zone parking spaces based on existing block faces and probe vehicle data.	The requirement is marked as obsolete since parking availability information is not available for loading zones.
EPM-FN1910-V01	The EPMCS (Event Parking Management Central System) shall include a visual indicator showing the probability of finding open parking meter spaces and open loading zone spaces.	This requirement was revised into two requirements to separate meters and loading zones. EPM-FN1909-V01 pertains to loading zones. As noted in Table 7 , this requirement is marked as obsolete since no availability information is available for loading zones. EPM-FN1908-V03 pertains to parking meter spaces. Refer to EPM-MAP025-V01 and EPM-MAN025-V01 test cases related to parking meter spaces availability.

Requirement ID	Description	Justification
EPM-FN1926-V01	Creating a profile in the EPMCS shall require submission of traveler's first and last name.	This requirement is marked as obsolete since ParkMobile platform does not require a user to enter first and last name when creating a profile. Traveler can enter his or her first and last name later in the settings. ParkMobile has deployed numerous instances of its platform around the country, both off-the-shelf and customized white-label versions. ParkMobile's experience and industry best practice is to minimize the information that is collected when creating a profile. Therefore, the City and ParkMobile determined to be consistent with the same settings to the ParkColumbus platform and provide an expected experience.
EPM-FN1934-V01	A profile in the EPMCS may be associated with exactly one CPS account to reconcile transactions with the respective account.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1935-V01	A profile in the EPMCS may be associated with exactly one CPS account to collect reporting data.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1958-V01	The PARKAPP shall support mobile landscape mode (form factor).	This requirement is marked obsolete since the requirement is specific to the navigation and the app allows the traveler to open his or her navigation app (test case: EPM-MAP018-V01 and EPM-MAN018-V01) and can change to landscape mode if supported by the navigation app.
EPM-FN1968-V01	The PARKAPP shall display the dollar amount of available funds in the Traveler's CPS account.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1969-V01	The PARKAPP shall integrate with CPS landing pages for payment processing and CPS account management.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1970-V01	The PARKWEB shall have functionality as the PARKAPP.	To focus the available vendor resources where they would have the most impact on the user experience, the City decided to have advance functionalities including Predictive availability for zone parking and multi-language available on PARKAPP when compared to PARKWEB. Hence, this requirement is marked obsolete.
EPM-FN1971-V02	The PARKWEB shall provide the same access to real-time parking availability information for gated parking facility systems as the PARKAPP.	This requirement is marked obsolete since the no parking availability information is available for gated facilities.

Requirement ID	Description	Justification
EPM-FN1974-V01	UFAC parking operators shall be able to manage create and manage CPS Provider accounts.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1975-V01	GFAC parking operators shall be able to manage create and manage CPS Provider accounts.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1976-V01	The EPMCS shall utilize the CPS to process payment transactions in real-time.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1978-V01	Payment shall be held in reserve in the Traveler's CPS account for the vehicle until the parking reservation goes into effect.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1979-V01	The PARKAPP shall provide Travelers with access to CPS landing pages to make payments.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1981-V01	The PARKAPP shall provide Travelers with access to CPS landing pages to manage CPS accounts.	This requirement is marked obsolete since the CPS project is no longer part of Smart Columbus program.
EPM-FN1983-V01	The EPMCS shall be capable of mobile device payments by presenting a reservation ID through NFC, if supported by the traveler's mobile device.	This requirement is marked obsolete since parking operators in Columbus support bar codes for mobile device payments and do not support near-field communications (NFCs) as a payment method.

Source: City of Columbus

Chapter 5. Test Cases

5.1. ACCEPTANCE TEST CASES

The EPM elements will be tested across four different channels [Web, App (Apple and Android), OPAPP and system administrator]. The test cases listed in the below tables are critically important to the acceptance of the EPM system, as it tests the system's ability to meet the requirements holistically, end-to-end, from all active participant viewpoints (traveler, parking operators, City of Columbus, and system administrator).

The tables below list the EPM test cases that make up the operational readiness for the EPM elements.

- Test cases related to ParkColumbus web portal are listed in **Table 8**.
- Test cases related to ParkColumbus app for Apple are listed in **Table 9**.
- Test cases related to ParkColumbus app for Android are listed in **Table 10**.
- Test cases related to OPAPP are listed in **Table 11**.
- Test cases for EPMCS system administration, City of Columbus administration, Policy and Compliance are listed in **Table 12**.

The test cases outlined below are reflective of the capabilities the system must be able to perform in order to receive acceptance of the EPM system.

5.1.1. Web Portal Test Cases

The web portal is an essential channel for travelers to access ParkColumbus through a computer, regardless of the location where they may be accessing from (e.g., home, work, library, etc.). The test cases designed for the web portal will include top-to-bottom testing of the essential functions that are offered through ParkColumbus. Eight testers will test all the web portal test cases at different days and times of the week including early morning (before meters collect fees), mid-morning, afternoon, evening, weekdays, and weekends.

The following essential test cases are planned for the ParkColumbus web portal.

Table 8: ParkColumbus Web Portal Test Cases

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB001-V01	System	Demonstration	Geolocation information	Verify that PARKWEB requests consent from the travelers before accessing location information.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Open ParkColumbus web portal for the first time. 2. Pop-up appears on the top of the screen asking about using accessing location. 'ParkColumbus wants to know your location' – 'Allow' or 'Block'. 3. Click 'Allow'. 4. For more information on privacy, click 'Privacy Policy' located on the bottom of the screen. 5. Privacy Policy lists what data will be collected from the traveler along with accessing with geolocation data. 6. Traveler will also need to accept the terms of use and privacy policy to create an account with ParkColumbus. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Travelers will need to give location permission when they use the ParkColumbus web portal for the first time to access traveler's location. <p><u>Post-condition:</u> Traveler location information is shown on the web portal after the permission to access location information is given by the traveler.</p>	Consent is requested to access traveler's location when using ParkColumbus web page.	Travelers	Release 1	EPM-UN028-V01	EPM-FN1947-V02: The PARKAPP and PARKWEB shall obtain affirmative express consent from the Traveler before accessing geolocation information or contact info.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB002-V01	System	Demonstration	Geolocation information	Verify that PARKWEB determines current location to search for parking options.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top right panel of the webpage. 2. Click on the small compass symbol located on the bottom right corner of the webpage. 3. Traveler location shown on the map is accurate to the traveler's current location. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler location shown on the map should be accurate to the traveler's location. <p><u>Post-condition:</u> Traveler's current location is accurate on the ParkColumbus web portal.</p>	Current location shown on the web portal should match with traveler's current location.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1946-V02: The PARKAPP and PARKWEB shall use the GPS device of the Traveler's smartphone or computer to determine current location to search for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB003-V01	System	Demonstration	Contact feature	Verify that PARKWEB provides link to City's 311 webpage which has email and telephone number to City's 311 system.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Columbus 311' located on the top right of the ParkColumbus homepage. 2. City of Columbus 311 webpage opens on the browser that has Columbus 311 customer service information. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler is able to find the link to City of Columbus 311 webpage on ParkColumbus webpage which has email and telephone number to City's 311 system. <p><u>Post-condition:</u> Traveler has navigated away from the ParkColumbus webpage and is on the City of Columbus 311 webpage.</p>	Link to City's 311 webpage is available on the PARKWEB.	Travelers	Release 1	EPM-UN013-V01	EPM-FN1952-V03: The PARKAPP and PARKWEB shall provide a link to the City's 311 webpage.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB004-V01	System	Demonstration	Search options	Verify that traveler is able to search for parking options without creating an account on the PARKWEB.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u> <u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' on the home page. 2. Enter street address in the search tab and click 'Enter' or pan to the desired location. 3. Parking locations around the search location are displayed on the landing screen, if available. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' on the home page. 2. Toggle to select 'Search Zones' on top of the screen for zone parking. 3. Enter street address in the search tab and click 'Enter' or pan to the desired location. 4. Parking locations around the search address are displayed on the landing screen, if available. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to search for parking options without creating an account. <p><u>Post-condition:</u> Parking options are displayed and traveler will need to create an account or continue as guest to pay and reserve selected parking.</p>	Able to search for parking options without creating an account.	Travelers	Release 1	EPM-UN014-V01	EPM-FN2109-V01: Travelers shall not be required to create a profile to search for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB005-V01	System	Demonstration	User accounts	Verify that PARKWEB allows travelers to enter their email address and password when creating a profile.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Log In/Sign Up' located on top right corner of the web page. 2. Enter email address, password and accept ParkMobile Terms of Use and Privacy Policy. 3. Click 'Create Your Account'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler when creating a profile, should provide a valid email address. 2. Traveler is required to enter password when creating an account. <p><u>Post-condition:</u> Traveler is logged in to their ParkColumbus web portal account.</p>	Travelers should enter email address and password when creating a profile with PARKWEB.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1927-V02 EPM-FN1928-V03 EPM-FN1936-V02 EPM-FN1937-V02	<p>EPM-FN1927-V02: Creating a profile with PARKAPP and PARKWEB shall require submission of Traveler's email address and password.</p> <p>EPM-FN1925-V02: The PARKAPP and PARKWEB shall allow Travelers to create a profile in the EPMCS to store profile information and mobile application settings.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB006-V01	System	Test	User accounts	Verify that email and password authentication is required when signing in and accessing a traveler account on PARKWEB.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed under Test Case ID EPM-WEB005-V01 to create an account. Click on the three lines located on top right corner of the webpage and click 'Logout'. Click 'Log In/Sign Up' located on top right corner of the web page. Enter email address and password used while creating an account and click 'Sign In'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler is able to sign in by entering correct email address and password. Traveler is not able to sign in if incorrect email or password is entered and error is presented to the Traveler. <p><u>Post-condition:</u> Traveler is logged in when correct email and password is entered or error is presented for incorrect email and/or password.</p>	Travelers need to enter correct email and password to login to their PARKWEB account.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1928-V03: EPMCS shall authenticate traveler sign in and account access with an email and password.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB007-V01	System	Demonstration	User accounts	Verify that PARKWEB allows travelers to enter their mobile number in their profile.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click three lines located on top right corner of the webpage and click 'Settings'. 2. Click 'Edit' under 'Contact' tab to enter mobile number. 3. Enter first name, last name and mobile number. 4. Click 'Save Updates'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter and save mobile number to the profile under account settings. 2. Traveler should receive email notification for the changes made to the account. <p><u>Post-condition:</u> Traveler is logged in and the mobile number and other profile information is added and stored to the account.</p>	Traveler adds mobile number to their PARKWEB profile.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1927-V02 EPM-FN1928-V03 EPM-FN1936-V02 EPM-FN1937-V02	<p>EPM-FN1930-V03: Creating a profile with PARKAPP and PARKWEB should include the option of providing a Traveler's telephone number, first name and last name.</p> <p>EPM-FN1925-V02: The PARKAPP and PARKWEB shall allow Travelers to create a profile in the EPMCS to store profile information and mobile application settings.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB008-V01	System	Demonstration	User accounts	Verify that travelers can log in to their account with their login information.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Log In/Sign Up' located on the top right of the webpage. 2. Enter registered email address or mobile number and password and click 'Sign In'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Travelers should be able to log in to their ParkColumbus web account with their login information. <p><u>Post-condition:</u> Traveler is logged in to the ParkColumbus web portal.</p>	Travelers log in to their PARKWEB account with their login information.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1937-V02: Travelers shall have access to manage their profiles in the PARKAPP and PARKWEB by correctly entering their login information.
EPM-WEB009-V01	System	Demonstration	Notifications and alerts	Verify that PARKWEB allows travelers to configure notifications and alerts on their account.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click the three lines located on top right corner of the webpage and click 'Settings'. 2. Under 'Notifications', click 'Edit' to update notifications. Select the type of notification (email or text notification) and click 'Save Updates'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select notification type in the ParkColumbus web settings. <p><u>Post-condition:</u> Receive notifications based on the traveler's preference.</p>	Travelers configure notifications to receive alerts about parking sessions and reservations.	Travelers	Release 3	EPM-UN015-V01 EPM-FN1901-V02 EPM-FN1902-V02 EPM-FN1903-V02 EPM-FN1904-V02	EPM-FN1941-V02: The PARKAPP and PARKWEB shall provide the Traveler the capability to configure notifications and alerts.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB010-V01	System	Demonstration	Search options	Verify that PARKWEB allows travelers to search for parking options by entering a street address.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' on the home page. 2. Enter street address in the search tab and click 'Enter'. 3. Parking locations around the search address pop up on the landing screen if any available. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' on the home page. 2. Toggle to select 'Search Zones' on top of the screen for zone parking. 3. Enter street address in the search tab and click 'Enter'. 4. Parking locations around the search address pop up on the landing screen if any available. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter any street address to search parking options near that location for both reservations and zone parking. <p><u>Post-condition:</u> Available parking options around the searched address are displayed on the screen.</p>	Traveler can search for parking options around a selected street address.	Travelers	Reservations – Release 1 Zone Parking – Release 3	EPM-UN008-V01	EPM-FN1948-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to search for parking options by entering a street address.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB011-V01	System	Demonstration	User accounts	Verify that PARKWEB allows travelers to book and pay for parking reservation using a guest account.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking'. 2. Select the parking facility to reserve parking. 3. Confirm the date and time of the reservation on the left side dashboard and click 'Reserve. Park Here!'. 4. Page with Sign in fields should open with option to 'Continue as Guest'. 5. Click 'Continue as Guest'. 6. Enter valid email address, vehicle details and payment details. 7. Confirm the details and purchase the parking reservation. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to pay and book parking reservation without creating an account with ParkColumbus. <p><u>Post-condition:</u> Traveler reserves and pays for parking without creating an account with ParkColumbus.</p>	Traveler pays for a one-time parking reservation using the guest account feature on the PARKWEB.	Travelers	Release 1	EPM-UN016-V01	EPM-FN1939-V03: The PARKWEB shall provide Travelers with the option of creating an EPM guest account (temporary account) to book a one-time reservation.
EPM-WEB012-V01	System	Demonstration	Parking reservation	Verify that PARKWEB allows travelers to select and pay only for selected period of time.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking'. 2. Enter street address in search tab. 3. Click 'Arrive after,' select date and time and click 'Set'. 4. Click 'Leave by,' select date and time and click 'Set'. 	Traveler selects a specific period of time to park and pays only for the selected time.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN031-V01	EPM-FN1922-V02: The PARKAPP and PARKWEB shall allow Travelers to pay for a specific period of parking time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
					<p>5. Select parking facility for reservation.</p> <p>6. Enter email address and mobile number and password and click 'Sign In'.</p> <p>7. If traveler has no existing account, click 'Continue as Guest' or click 'Create an account'.</p> <p>8. Enter required information to log in and continue.</p> <p>9. Click 'Reserve. Park Here!' located on the left side of the dashboard showing the parking amenities and other information.</p> <p><u>Zone Parking:</u></p> <p>1. Click 'Park Now' to enter a zone number or Click 'Find Parking' and select 'Search Zones' located on the map.</p> <p>2. Select a parking zone and click 'Park Here'.</p> <p>3. Confirm the city location and click 'Continue'.</p> <p>4. Select the duration and click 'Continue'.</p> <p>5. Enter valid vehicle information and click 'Continue'.</p> <p>6. Enter valid payment information and click 'Continue'.</p> <p>7. Review the order and click 'Start Parking' to book the parking zone.</p> <p><u>Pass Criteria:</u></p> <p>Verification by eight independent testers:</p> <p>1. Traveler should be able to select a specific period of time while booking and pay only for the selected duration.</p> <p><u>Post-condition:</u></p> <p>Traveler to get an email confirmation of successful payment after booking a parking space.</p>					

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB013-V01	System	Demonstration	Parking reservation	Verify the PARKWEB provides confirmation code of a parking reservation to the traveler.	<p><u>Pre-condition:</u> Traveler has access to ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-WEB012-V01 to reserve parking. 2. If reservation is successful, confirmation code with reservation information and email with payment confirmation is provided to the traveler. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be presented with a confirmation code and a receipt of payment with email confirmation after reserving a parking facility through the ParkColumbus web portal. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Parking reservation confirmation is provided to the traveler after a parking reservation is booked through PARKWEB.	Travelers	Release 1	EPM-UN006-V01 EPM-UN021-V01	<p>EPM-FN1914-V02: The EPMCS shall provide a response to the PARKAPP and PARKWEB of a confirmed reservation.</p> <p>EPM-FN1915-V02: The confirmation response provided to the PARKAPP and PARKWEB shall include a reservation confirmation code.</p> <p>EPM-FN1917-V02: The confirmation response provided to the PARKAPP and PARKWEB shall include notice of payment completion and amount.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB014-V01	System	Demonstration	Navigation	Verify that PARKWEB links to traveler's map-based navigation to direct the traveler to the designated parking location.	<p><u>Pre-condition:</u> The ParkColumbus webpage is open and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-WEB012-V01 to reserve parking. 2. Open the Reservation, Click 'Get Directions' to open a webpage with map-based navigation. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus web should be able to open the map-based navigation system when traveler requests directions to the reserved parking location. <p><u>Post-condition:</u> Traveler has navigated from the ParkColumbus app and is on his/her map-based navigation page.</p>	Link to map-based navigation for directions to the reserved parking is available on the PARKWEB.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1964-V02: The PARKAPP and PARKWEB shall include the ability to link to map-based navigation on the traveler's smartphone/computer/tablet to direct the traveler to the designated parking location

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EPM-WEB015-V01	System	Demonstration	Payment	Verify that travelers can pay for the parking on the PARKWEB without redirecting to another web page.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed in EPM-WEB012-V01 to reserve parking. 2. Traveler is on the ParkColumbus webpage from start to finish of the parking reservation. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter credit or debit card information and pay for the selected parking without redirecting to a different webpage. <p><u>Post-condition:</u> Traveler is still on the ParkColumbus webpage.</p>	Traveler completes the purchase of parking space within the PARKWEB without redirecting to another webpage.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1980-V02: Travelers shall be able to pay instantly without being redirected away from the PARKAPP and PARKWEB to complete a transaction.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB016-V01	System	Demonstration	Parking reservation	Verify the PARKWEB does not provide reservation confirmation code if payment for parking reservation is not complete.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed in EPM-WEB012-V01 to reserve parking. If payment or reservation is unsuccessful, an error message is displayed on the review page. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should receive an error message upon an unsuccessful payment. Payment method used should not be charged with the parking reservation amount when the reservation is unsuccessful. <p><u>Post-condition:</u> Payment is not processed and traveler is on the checkout page.</p>	Payment error message is displayed on the webpage within PARKWEB when the payment for parking reservation is unsuccessful.	Travelers	Release 1	EPM-UN006-V01 EPM-UN021-V01	EPM-FN1916-V02: The EPMCS shall not provide a reservation confirmation code to PARKAPP and PARKWEB if payment is not complete.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB017-V01	System	Demonstration	Parking reservation	Verify that PARKWEB provides paid status of parking reservation to the traveler in real-time.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed in EPM-WEB012-V01 under reservations to reserve parking or follow steps for zone parking to pay for on-demand parking. If reservation is successful, a digital receipt of the reservation is displayed on the screen along with the amount paid and method of payment used and the reservation code. Click on the three lines located at the top right corner of the ParkColumbus webpage and click 'Reservations'. All upcoming reservations along with the payment confirmation should be listed on the landing page. An email confirmation with the paid status of the parking reservation should be received within two minutes of the reservation. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should be presented with confirmation for booked reservation in real-time. Traveler should receive email notification for the parking reservation. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Traveler receives email confirmation with the paid status of the parking reservation within two minutes after reserving a parking through PARKWEB.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN031-V01	EPM-FN1921-V02: The EPMCS shall communicate the paid status of reservations to the PARKAPP and PARKWEB in real-time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB018-V01	System	Demonstration	Notifications and alerts	Verify that PARKWEB provides email notification to travelers of reservation confirmation.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed under EPM-WEB012-V01 to reserve parking. If reservation is successful, confirmation code with reservation information and email with payment confirmation is provided to the traveler. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should receive email notification about the parking reservation. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Traveler receive notification for the reservation confirmation.	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	EPM-FN1901-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of reservation confirmation.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB019-V01	System	Demonstration	Notifications and alerts	Verify that PARKWEB provides notifications to travelers of changes to existing booking based on preference selected (text or email).	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u> Parking reservations should be made at least 3 hours ahead to be able to cancel a reservation.</p> <ol style="list-style-type: none"> Follow steps listed for test case ID: EPM-WEB012-V01 to reserve parking and EPM-WEB009-V01 to select preferred notifications. Click on the three lines located on top right corner of the webpage and click 'Reservations' and chose the upcoming reservation previously arranged. Scroll down on the reservation and click 'Cancel Reservation', then select a reason for cancelling from the drop-down menu. Click 'Cancel Reservation' and select 'Yes' to confirm cancellation. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should be able to cancel reservation and see canceled activity. Traveler should receive an email confirmation for the canceled reservation. <p><u>Post-condition:</u> Reservation is canceled and traveler is on the ParkColumbus web homepage.</p>	Traveler receive notification for any changes made to the existing reservation.	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	EPM-FN1902-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of changes to an existing reservation.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB020-V01	System	Demonstration	Event parking	Verify that travelers can purchase event parking packages.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking'. 2. Enter a street address or City, select a parking option displayed on the screen with a ticket symbol and click 'Packages'. 3. Select a package. Example: 2019-20 Blue Jackets quarter season and click 'Select Parking' under the package name. 4. Select a parking location and click 'Reserve'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler is able to purchase an event package. 2. Traveler reserves a parking space for all the events in that package. <p><u>Post-condition:</u> Traveler should receive an email confirmation about parking reservation and successful payment confirmation.</p>	Traveler selects an event parking package within the PARKWEB and reserve parking for all events listed in that package at once.	Travelers	Release 1	EPM-UN001-V01	EPM-FN3269-V01: The PARKWEB shall provide the ability for Travelers to purchase event parking packages for events at stadiums and/or arenas.

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EPM-WEB021-V01	System	Demonstration	Event parking	Verify that event employees can enter event access code when booking parking space associated with that event.	<p><u>Pre-condition:</u> An event employee has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking'. 2. Enter a street address or City, select a parking option displayed on the screen with a ticket symbol and Click 'Events' or 'Packages'. 3. Select a package. Example: 2019-20 Blue Jackets quarter season or select an event. Example: 2020 Columbus Marathon - October 18, 2020 4. Click 'Apply Access Code'. 5. Enter access code associated with that event and click 'Done'. 6. Several parking options are displayed on the map that accept the event access code. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Event employee is able to enter an access code for selected event. 2. Multiple parking options are displayed on the screen that allow parking for the selected event and accept the entered event access code. <p><u>Post-condition:</u> Event employee uses the access code to book parking space for an event.</p>	Event employee enters an event access code when reserving parking space for an event.	Travelers	Release 1	EPM-UN001-V01	<p>EPM-FN3272-V02: The PARKAPP and PARKWEB shall provide the ability for event employees to enter an access code associated with an event.</p> <p>EPM-FN3273-V02: The PARKAPP and PARKWEB provides event employees access to appropriate parking options after entering event access code associated with that event.</p>

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EPM-WEB022-V01	System	Demonstration	Parking reservation	Verify that PARKWEB does not allow travelers to reserve on-street parking.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Click 'Find Parking' located on top menu bar of the webpage. Click 'Search Zones' to explore metered parking options. Select a zone to park and click 'Park Here' location on the left side panel. Click 'Continue' on the landing page. Enter duration by the hour and minute or can select maximum parking time (for this testing select 30min of parking time) and click 'Continue'. Verify that future date and time cannot be selected. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should not be able to select a future date when zone parking is selected. <p><u>Post-condition:</u> Traveler can select the parking duration and pay for metered parking through ParkColumbus webpage.</p>	PARKWEB doesn't allow reservations for on-street parking.	Travelers	Release 3	EPM-UN003-V01 EPM-UN006-V01	EPM-FN3267-V01: The PARKAPP and PARKEB shall not allow the reservation of on-street parking.

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EPM-WEB023-V01	System	Demonstration	Parking reservation	Verify that PARKWEB allows travelers to pre-pay for the parking meters before the enforcement time up to the allowable timeframe.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u> City of Columbus parking meters enforcement time is 8 a.m. to 10 p.m. Pre-payment is only allowed 2 hours before the enforcement time. This test is conducted between 6 a.m. and 8 a.m.</p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. Click 'Search Zones' to explore metered parking options. 2. Select a zone for which the enforcement time has not started. 3. Enter duration by the hour and minute or can select maximum parking time. 4. Select vehicle information and click 'Continue'. 5. Select a payment method and click 'Continue'. 6. Verify the information and click 'Start Parking'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able select the duration and pre-pay for that time before the enforcement time of the parking meter begins. <p><u>Post-condition:</u> Notifications can be received for warnings of expiration.</p>	Traveler pre-pays for the parking meter before the enforcement time within the allowable timeframe which is 2 hours in Columbus, Ohio.	Travelers	Release 3	EPM-UN031-V01	EPM-FN1977-V02: The PARKWEB and PARKAPP shall allow pre-payment of parking up to the allowable timeframe prior to paid parking operational hours.
EPM-WEB024-V01	System	Demonstration	Parking Availability	Verify that EPMCS provides parking restrictions of each parking facility to the PARKAPP.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u> <u>Zone Parking:</u></p>	Travelers cannot purchase parking for zone parking or reservations when restrictions are in place for the selected location.	Travelers	Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	EPM-FN1895-V02: The EPMCS shall provide parking restrictions at each parking facility to the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
					<ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Select a zone to park and click 'Park'. 4. Confirm the location and click 'Continue'. 5. If there are any restrictions at the selected parking meter, a pop-up will appear on top of the screen 'Parking is not allowed at this time, see regulatory signage for more information'. 6. Click 'OK' to acknowledge. 7. Traveler will not be able to purchase the parking meter time when restrictions are in place. <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Reserve Parking' to explore parking options that can be reserved in advance. 3. Click 'Arrive after', select date and time and click 'Set'. 4. Click 'Leave by', select date and time and click 'Set'. 5. Only the parking facilities that are available during the selected times are displayed on the map. 6. Traveler will not be able to reserve a parking facility outside the facility operating hours. <p><u>Pass Criteria:</u></p> <p>Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to purchase the parking meter duration when parking restrictions are in place or are coming up during the requested time period. 2. Traveler should not be able to reserve a parking location 					

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					<p>outside the facility operating hours.</p> <p><u>Post-condition:</u> Traveler will need to select a different parking location due to parking restrictions at the current parking location.</p>					
EPM-WEB025-V01	System	Demonstration	Parking Availability	Verify that PARKWEB will not allow travelers to extend parking time when restricted parking times are in place.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Click on the three lines located on top right corner of the webpage and click 'Zones'. Select an active parking session and click 'Extend'. Select the duration and click 'Continue'. If there are any restrictions at the parking meter, a pop-up will appear on top of the screen 'Parking is not allowed at this time, see regulatory signage for more information'. Click 'OK' to acknowledge. Traveler will not be able to extend the parking meter time when restrictions are in place. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should not be able to extend the parking meter duration when parking restrictions are in place or are coming up during the requested time period. <p><u>Post-condition:</u> Traveler will need to select a different parking location due to parking restrictions at the current parking location.</p>	Parking session cannot be extended when parking restriction is in place for the selected zone.	Travelers	Release 3	EPM-UN006-V01 EPM-UN010-V01 EPM-UN011-V01 EPM-FN1905-V02	EPM-FN1907-V02: The PARKAPP and PARKWEB shall not allow purchase of parking meter time when restricted parking periods are in effect.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB026-V01	System	Demonstration	Parking availability	Verify PARKWEB allows travelers to purchase additional parking meter time.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click on the three lines located on top right corner of the screen and click 'Zones'. 2. Select an active parking session to extend parking session. 3. Click 'Extend Time' to extend parking duration. 4. Enter duration by the hour and minute or can select maximum parking time. 5. Traveler will not be able to select duration more than the permitted time at that parking meter. 6. Review the parking fee information and click 'Extend Time'. 7. When selected max time, traveler will not have 'Extend Time' option for their active session. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to extend the parking meter time through the ParkColumbus webpage. <p><u>Post-condition:</u> Parking meter time is extended and will receive notification as per the settings chosen.</p>	Traveler is able to extend parking meter time.	Travelers	Release 3	EPM-UN006-V01 EPM-UN010-V01 EPM-UN011-V01 EPM-FN1907-V02	<p>EPM-FN1905-V02: The PARKAPP and PARKWEB shall allow purchase of additional parking meter time.</p> <p>EPM-FN1906-V03: The PARKAPP and PARKWEB shall not allow purchase of additional parking meter time past the maximum time allowed within mobile pay zones.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB027-V01	System	Demonstration	Notifications and alerts	Verify that PARKWEB provides notifications to travelers of warnings of expiration of paid parking based on preference selected (text or email).	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click three lines located on top right corner of the webpage and click 'Settings'. 2. Under 'Notifications', click 'Edit' to update notifications. Select the type of notification (email or text notification) and click 'Save Updates'. 3. Click 'Find Parking' and click 'Search Zones'. 4. Select a parking zone to book a parking meter. 5. Book a meter for 30 minutes. After 15 min, verify that a notification of the parking expiring is received as per the notifications selected. 6. Verify after 30 min, a notification for expired parking session is received. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select notification type in the ParkColumbus web settings. 2. Traveler should receive notification for warning of expiration of paid parking session as per the preferences chosen. 3. Traveler should receive notification for expiration of paid parking session as per the preferences chosen. <p><u>Post-condition:</u> Traveler receive notifications based on the preferences selected.</p>	Notifications and alerts are provided to the traveler for the expiration of parking session.	Travelers	Release 3	EPM-UN006-V01 EPM-FN1941-V02	<p>EPM-FN1903-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of warnings of expiration of paid parking session.</p> <p>EPM-FN1904-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of expiration of paid parking session.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB028-V01	System	Test	Promotion Codes	Verify that PARKWEB provides local merchants parking options at discounted price.	Vendor to work with local merchants to get the information on discounted parking options offered.	Local Merchants offer discounted parking options and are available on PARKWEB.	Local Merchants	Release 3	EPM-UN021-V01 EPM-FN3193-V02 EPM-FN3105-V02	EPM-FN1918-V02: The EPMCS shall allow local merchants to offer discounted parking options through the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB029-V01	System	Test	Promotion Codes	Verify that PARKWEB allows travelers to purchase parking spaces that have discounted prices.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park Now' to enter a zone number or Click 'Find Parking' and select 'Search Zones' located on the map. 2. Select a parking zone and click 'Park Here'. 3. Confirm the city location and click 'Continue'. 4. Select the duration and click 'Continue'. 5. Enter valid vehicle information and click 'Continue'. 6. Enter valid payment information and click 'Continue'. 7. On the 'Review Order' page, enter promo code in the promo code tab and click 'Apply'. 8. If a valid promo code is applied, discounted amount is reflected in the total cost of the parking on the 'Review Order' page. 9. If an invalid promo code is applied, an error is presented. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler is able to purchase parking when a valid promo code is applied and discount is applied at the checkout. <p><u>Post-condition:</u> Traveler is presented with a confirmation of the parking reservation.</p>	Traveler is able to purchase parking spaces that discounted prices using promo codes.	Travelers	Release 3	EPM-FN1918-V02 EPM-UN021-V01	EPM-FN3105-V02: The PARKAPP and PARKWEB shall provide Travelers with the ability to activate discounted parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB030-V01	System	Demonstration	Promotion Codes	Verify that EPMCS can validate and provide PARKWEB confirmation of discounted parking reservation.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-WEB029-V01 to pay for parking. 2. On the confirmation page, click 'View Details' to review the parking amount and the discount applied. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Confirmation receipt shows the total parking cost reflects the discount applied using the promo code. <p><u>Post-condition:</u> As per the notifications set under 'Settings', Traveler may also receive email confirmation of the parking details.</p>	Traveler is able to validate discount received from the confirmation details provided for the booked parking.	Travelers	Release 3	EPM-FN1918-V02 EPM-UN021-V01	EPM-FN3193-V02: The EPMCS shall validate the discounted parking options and provide confirmation of validation to the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB031-V01	System	Demonstration	Search options	Verify the PARKWEB allows travelers to search for parking options by frequently traveled locations.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Click 'Enter Zone Number' on the bottom left corner of the website. 4. Click below the 'Zone #', on the type bar and all previous zones frequently visited should pop down. 5. Traveler should be able to choose from the previously used or searched zones. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to choose from previously used or searched zones. <p><u>Post-condition:</u> Traveler will be able to decide on which parking zone to choose based on the frequently traveled, or searched zones.</p>	Traveler is able to store frequently traveled locations as favorites.	Travelers	Release 3	EPM-FN1945-V03 EPM-UN015-V01	EPM-FN3096-V03: The PARKAPP and PARKWEB shall allow travelers to select preferred/frequently traveled zones.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB032-V01	System	Demonstration	Search options	Verify that PARKWEB allows travelers to select amenities at parking spaces to filter search option.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Reserve Parking' to look for available parking reservations. 3. Click on 'Apply Filters' on the left-hand side underneath the search option. 4. Select desired amenities and click 'Done' to filter parking options by amenities available at parking spaces. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Click 'Apply Filters' on the left-hand side underneath the search option. 4. Select amenities from the filter menu such as 'EV Charging', 'Accessible Parking', 'Loading Zones', 'Metered Parking' and 'Lot/Garage'. 5. Traveler should be able to see only parking zones that include the chosen amenities. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking options with selected amenities. <p><u>Post-condition:</u> Traveler will be able to decide on which parking spot to choose based on the parking options displayed on the map.</p>	Traveler is able to select amenities to filter for parking options.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN015-V01 EPM-FN3094-V03 EPM-FN3095-V03 EPM-FN3096-V03	EPM-FN1945-V03: The PARKAPP and PARKWEB shall provide travelers with the ability to select amenities that will be used to filter search results for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB033-V01	System	Demonstration	Search options	Verify that PARKWEB allows travelers to filter parking options by parking garages, lots, and streets.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Reserve Parking' to look for available parking reservations. 3. Click on 'Apply Filters' on the left-hand side underneath the search option. 4. Select amenities such as 'Covered Parking' or 'Paved' and click 'Done' to filter parking options by amenities available at parking spaces. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Click 'Apply Filters' on the left-hand side underneath the search option. 4. Select amenities from the filter menu such as 'Street Parking' or 'Lot/Garage' and click 'Done'. 5. Traveler should only see parking zones that include the filters chosen. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map should have amenities selected as the filter. <p><u>Post-condition:</u> Traveler will be able to decide on which parking spot to choose based on the parking options displayed on the map.</p>	Traveler is able to filter zone parking by parking garages, lots and streets.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN002-V01	EPM-FN1962-V02: The PARKAPP and PARKWEB shall provide the ability to filter by any combination of garages, lots, and streets.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB034-V01	System	Demonstration	Search options	Verify that PARKWEB allows travelers to filter parking options by selecting a parking meter zone or parking loading zone.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Click 'Apply Filters' on the left-hand side underneath the search option. 4. Select amenities from the filters menu such as 'Loading Zones' and 'Metered Parking' and click 'Done'. 5. Map now shows parking meter zones (black pin with a 4 or 5 digit number) and loading zones (striped pin). <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking options by parking meter zone and loading zone. <p><u>Post-condition:</u> Map shows parking meter zones and loading zones.</p>	Traveler is able to filter parking options by parking meter or loading zone.	Travelers	Release 3	EPM-UN008-V01	EPM-FN1949-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to search for parking options by selecting a parking meter zone or parking loading zone.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB035-V01	System	Demonstration	Loading zones	Verify that PARKWEB provides travelers loading zone locations, hours, and restrictions.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Zoom in near the Downtown area until striped pins appear. 4. Click on one of the striped pins to open loading zone information. 5. Depending on the loading zone, information such as location, hours, and restrictions, if any, will pop up on the left-hand side of the webpage. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to see loading zone details for the selected zone on the left-hand side of the webpage. <p><u>Post-condition:</u> Traveler will be informed of the different loading zones around the selected area.</p>	Loading zone details are presented to the traveler.	Travelers	Release 3	EPM-UN004-V01	EPM-FN1961-V02: The PARKWEB and PARKAPP shall display loading zone locations, hours, and restrictions.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB036-V01	System	Demonstration	Search options	Verify the PARKWEB allows travelers to search for metered parking spaces (including on-street Electric Vehicle (EV) charging and ADA metered spaces).	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Search Zones' to explore metered parking options. 3. Click 'Apply Filters' on the left-hand side underneath the search option. 4. Select amenities from the filter menu such as 'EV Charging' or 'Accessible Parking' and click 'Done'. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Map shows parking zones that include the chosen filter options. <p><u>Post-condition:</u> Traveler will be able to choose the parking options displayed on the map with selected amenities.</p>	Zone parking options can be filtered for EV charging and ADA accessible spaces.	Travelers	Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN1959-V02: The PARKWEB and PARKAPP shall allow requests for locating metered parking spaces (including on-street EV and ADA metered spaces).</p> <p>EPM-FN1900-V03: The EPMCS shall provide access to ADA accessible parking spaces in accordance with standards for accessible design as determined by the ADA to the PARKAPP and PARKWEB.</p> <p>EPM-FN1899-V02: The EPMCS shall provide the location of electric vehicle charging stations to the PARKAPP and PARKWEB.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB037-V01	System	Demonstration	Search options	Verify that PARKWEB allows travelers to filter parking spaces that are Americans with Disabilities Act (ADA) accessible.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Reserve Parking' to look for available parking reservations. 3. Click 'Apply Filters', select 'Disabled Parking' and click 'Done'. 4. Results displayed on the map show parking facilities that have access to disabled parking spots. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top panel of the web page. 2. Toggle to select 'Search Zones'. 3. Click 'Apply Filters' and select 'Accessible Parking'. 4. Click 'Done' to show parking zones with accessible parking. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map are ADA accessible. <p><u>Post-condition:</u> Traveler can choose from the parking options displayed on the map with selected amenities.</p>	Parking options can be filtered for ADA accessible.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN3094-V03: The PARKAPP and PARKWEB shall allow Travelers to filter available parking spaces based on ADA compliance.</p> <p>EPM-FN1900-V03: The EPMCS shall provide access to ADA accessible parking spaces in accordance with standards for accessible design as determined by the ADA to the PARKAPP and PARKWEB.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB038-V01	System	Demonstration	Search options	Verify the PARKWEB allows travelers to filter parking options based on the availability of EV charging.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top menu bar of the webpage. 2. Click 'Reserve Parking' to look for available parking reservations. 3. Click 'Apply Filters', select 'EV Charging' and click 'Done'. 4. Results displayed on the map show parking facilities with EV Charging facility. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Find Parking' located on top panel of the web page. 2. Toggle to select 'Search Zones'. 3. Click 'Apply Filters' and select 'EV Charging'. 4. Click 'Done' to show parking zones with access to EV charging. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map have EV charging facility. <p><u>Post-condition:</u> Map shows all the parking options which have EV charging facility.</p>	Parking options can be filtered for EV charging available spaces.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01 EPM-FN1945-V03 EPM-UN015-V01	<p>EPM-FN3095-V03: The PARKAPP and PARKWEB shall allow Travelers to filter available parking spaces based on availability of EV charging.</p> <p>EPM-FN1899-V02: The EPMCS shall provide the location of electric vehicle charging stations to the PARKAPP and PARKWEB.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB039-V01	System	Demonstration	Fleet account	Verify that traveler is able to add a fleet account on a single account.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click three lines located on top right corner of the webpage and click 'Fleets'. 2. A new webpage opens and a form is presented to fill out to request for a demo. 3. Once the form is filled out, a ParkMobile representative will reach out with addition information. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Fleet account is created through a representative. 2. Multiple user accounts are added to a single account. <p><u>Post-condition:</u> Traveler is able to add a fleet account on a single account for the traveler to manage multiple user profiles.</p>	Multiple user accounts are added to a single account.	Travelers	Releases 1	During contract negotiations, ParkMobile made the City aware of this capability. This capability and option for including it in EPM was discussed with the EPM project team, who identified utility and potential value for the users of the application. As such it has been included in the features to be tested.	EPM-FN3274-V01: The PARKWEB shall provide the ability for Travelers to create a fleet account to manage multiple user profiles on a single account.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB040-V01	System	Demonstration	User accounts	Verify that PARKWEB provides travelers access to transaction log consisting of a history of paid parking transactions, locations, and time and date.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage and has a ParkColumbus account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Enter email address or mobile number and password click 'Sign In'. 2. Click on the three lines on the right top corner of the ParkColumbus webpage. 3. Click 'Reservations' or 'Zones' under 'Account'. 4. Click 'View History' to view all reservations made for the past 12 months. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to view transaction history for up to 12 months on his/her ParkColumbus web account. 2. Transactions viewed should be only for the past 12 months and not beyond 12 months. <p><u>Post-condition:</u> Transaction made for the past 12 months is displayed on the screen.</p>	PARKWEB provides access to paid parking transactions, locations and date and time of transactions for the past 12 months.	Travelers	Release 1	EPM-UN015-V01	<p>EPM-FN1942-V02: The PARKAPP and PARKWEB shall provide Travelers with access to a transaction log consisting of a history of paid parking transactions, locations, and time and date.</p> <p>EPM-FN1943-V02: The transaction log shall be limited to prior 12 months of transactions.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB041-V01	System	Demonstration	User feedback	Verify that PARKWEB provides travelers customer care contact information for complaints.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-WEB012-V01 to reserve parking. 2. Click 'View Your Order'. 3. Select the parking session for which there is a parking complaint. 4. Click 'support.parkmobile.io' to navigate to a different customer support webpage. 5. Scroll down to the end of the webpage and click 'Submit a request', or live chat with the support personnel. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to submit an online request, call customer care or live chat with ParkMobile support for any complaints. <p><u>Post-condition:</u> Customer care information is displayed on the screen.</p>	PARKAPP provides access to ParkMobile customer care (phone number and online request support) to contact with parking issues.	Travelers	Release 1	EPM-UN012-V01	EPM-FN1951-V04: The PARKAPP and PARKWEB shall provide the traveler the ability to contact the customer care with complaints.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-WEB042-V01	System	Demonstration	User feedback	Verify that PARKWEB allows traveler to submit user feedback.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus webpage.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Click on the three lines and click 'Help' to open ParkMobile Help page on a different tab. Click on the chat icon to chat with the customer service representative to provide comments or ask questions or scroll down to the bottom of the 'Help' page to find the 'Submit a Request' tab for comments and/or questions. <p><u>Pass Criteria:</u> Verification by eight independent testers:</p> <ol style="list-style-type: none"> Traveler should be able to submit an online request or chat with the customer service to provide comments or ask questions. <p><u>Post-condition:</u> Traveler submits an online request for comments and questions.</p>	Travelers are able to submit comments and questions through PARKWEB.	Travelers	Release 3	EPM-UN012-V01	EPM-FN1950-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to submit user feedback.

Source: City of Columbus

5.1.2. Mobile App Test Cases

The mobile application is an essential channel for travelers to reserve and pay for parking through their personal device. Additional functionality, such as alerts about parking reservations and filtering search options will help enhance the experience of the traveler. The test cases designed for the mobile apps will include testing of the essential functions for each feature available. The following cases are planned for the ParkColumbus mobile applications. Eight testers will test all the mobile app test cases on different days and times of the week including early morning (before meters collect fees), mid-morning, afternoon, evening, weekdays, and weekends. The testers will split testing the Apple and Android versions of the app.

5.1.2.1. Test Cases for the Apple Mobile App

The following essential test cases are planned for the Apple mobile app.

Table 9: ParkColumbus Mobile App Test Cases for Apple Software

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP001-V01	System	Demonstration	Geolocation information	Verify that PARKAPP requests consent from the travelers before accessing location information.	<p><u>Pre-condition:</u> The ParkColumbus app is installed on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Open ParkColumbus app. 2. A message is displayed about using 'Location Services' to find nearby parking locations. 3. Click 'GOT IT'. 4. Pop-up appears on the screen asking about using location 'Allow While Using App,' 'Allow Once,' or 'Don't Allow'. 5. Click 'Allow While Using App' or click 'Allow Once' for one time access to current location to search nearby parking locations. 6. Click 'Don't Allow' to not provide access to current location. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Travelers will need to give permission when they use the app for the first time to access location information. <p><u>Post-condition:</u> Traveler location information is accurate on the app after the permission to access geolocation is given by the traveler.</p>	Consent is requested to access traveler's location when using the app on an Apple device.	Travelers	Release 1	EPM-UN028-V01	EPM-FN1947-V02: The PARKAPP and PARKWEB shall obtain affirmative express consent from the Traveler before accessing geolocation information or contact info.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP002-V01	System	Demonstration	Geolocation information	Verify that location of the traveler is updated in real-time in PARKAPP.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Make sure current location shown on the app matches with the traveler current location. 2. Travel few blocks to make sure current location is updated within the app in real-time. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app should be able to update current location on the map in real-time. <p><u>Post-condition:</u> Current location is updated on the map in real-time.</p>	Location of the traveler in the PARKAPP is updated in real-time to match current location of the traveler.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1965-V01: Map-based navigation shall use the GPS device of the Traveler's smartphone to update the location of the Traveler on the map in real-time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP003-V01	System	Demonstration	Multi-language	Verify that default language is English on the PARKAPP, unless changed to Spanish as the mobile device language.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Make sure the default language is set to English under phone settings. 2. Language displayed should be English on the ParkColumbus app when traveler opens the app and when logged in. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Language displayed when ParkColumbus app is opened should be English. <p><u>Post-condition:</u> N/A</p>	Displayed language within the app is English unless Spanish is chosen as the device language.	Travelers	Release 3	EPM-UN005-V01	EPM-FN1955-V02: The PARKAPP shall default to English language user interface unless Spanish is chosen as language within the phone settings.
EPM-MAP004-V01	System	Demonstration	Multi-language	Verify that PARKAPP is displayed in Spanish when Spanish is chosen as the default language within phone settings.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Make sure the default language is set to Spanish under phone settings. 2. Language displayed should be in Spanish on the ParkColumbus app when traveler opens the app and when logged in. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Language displayed when ParkColumbus app is opened should be Spanish. <p><u>Post-condition:</u> N/A</p>	Displayed language within the app is Spanish including transaction pages, settings and parking messages.	Travelers	Release 3	EPM-UN005-V01	EPM-FN1956-V02: The PARKAPP shall provide the Traveler with the option of changing all static text (including CTAs, navigational items, links, authentication (create account/login), on-demand flow (excluding error text), reservations flow (excluding error text), activity (tab labels and on-demand active session UI), time selector units (days, hours, minutes), setting screen section labels) in the user interface from English to Spanish, and vice versa (images will remain the same regardless of language choice).

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP005-V01	System	Demonstration	Geolocation information	Verify that PARKAPP determines traveler's current location to search for parking options.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed for EPM-MAP001-V01 to allow tracking location. Click 'Park' or 'Reserve'. Traveler location shown on the map should be accurate to the traveler's current location. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> Traveler location shown on the map should be accurate to the traveler's location. <p><u>Post-condition:</u> Traveler's current location is accurate on the app.</p>	Current location shown in the app should match with traveler's current location.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1946-V02: The PARKAPP and PARKWEB shall use the GPS device of the Traveler's smartphone or computer to determine current location to search for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP006-V01	System	Demonstration	Contact feature	Verify that PARKAPP provides link to City's 311 webpage which has email and telephone number to City's 311 system.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Settings'. 2. Click on 'Visit 311 Columbus Site' to navigate to City of Columbus 311 webpage for contact information. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app should navigate traveler to City of Columbus 311 webpage which has email and telephone number to City's 311 system. <p><u>Post-condition:</u> Traveler has navigated away from the ParkColumbus app and is on the 311 webpage.</p>	Link to City's 311 webpage is available in the app on an Apple device.	Travelers	Release 1	EPM-UN013-V01	EPM-FN1952-V03: The PARKAPP and PARKWEB shall provide a link to the City's 311 webpage.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP007-V01	System	Demonstration	View	Verify that PARKAPP supports mobile portrait mode on Apple devices.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Ensure phone screen settings are set to auto rotate. 2. Change mobile view to landscape. 3. ParkColumbus app to remain in portrait mode. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app screen should remain in portrait mode. <p><u>Post-condition:</u> ParkColumbus app is open and is in portrait mode.</p>	Only portrait mode is supported by the app on an Apple device.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1957-V01: The PARKAPP shall support mobile portrait mode (form factor).

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP008-V01	System	Demonstration	Search options	Verify that traveler is able to search for parking options without creating an account on the PARKAPP.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' tab. 2. Choose duration of parking time to search for parking options. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' tab to explore zone parking options. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to search for parking options without creating an account. <p><u>Post-condition:</u> Parking options are displayed and traveler will need to log in or create an account to park or reserve the selected parking option.</p>	Able to search for parking options without creating an account on the PARKAPP.	Travelers	Release 1	EPM-UN014-V01	EPM-FN2109-V01: Travelers shall not be required to create a profile to search for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP009-V01	System	Demonstration	User accounts	Verify that PARKAPP allows travelers to enter a valid email address and password when creating a profile.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 2. Click 'Activity' located on the bottom left corner of the screen. 3. Click 'Create an Account' to create a profile with ParkColumbus app. 4. Enter email address and password. 5. Accept terms and conditions and privacy policy and click 'Sign In'. 6. On the next page, enter vehicle license plate number, State or Province and Nickname. 7. Click 'Done'. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. When creating a profile, travelers should provide a valid email address. 2. Traveler is required to enter password when creating an account. <p><u>Post-condition:</u> Traveler is logged in to their ParkColumbus app.</p>	Travelers enter email address and password when creating a profile with PARKAPP on their Apple device.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1927-V02 EPM-FN1928-V03 EPM-FN1936-V02 EPM-FN1937-V02	<p>EPM-FN1927-V02: Creating a profile in the EPMCS shall require submission of traveler's email address and password.</p> <p>EPM-FN1925-V02: The PARKAPP and PARKWEB shall allow Travelers to create a profile in the EPMCS to store profile information and mobile application settings.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP010-V01	System	Test	User accounts	Verify that email and password authentication is required when signing in and accessing a traveler account on PARKAPP.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under Test Case ID EPM-MAP009-V01 to create an account. 2. Click on 'Settings' and click 'Sign Out' to logout of the account. 3. Click 'Activity' or 'Settings' and click 'Sign In'. 4. Enter email address and password used while creating an account to and click 'Sign In'. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler is able to sign in by entering correct email address and password. 2. Traveler is not able to sign in if incorrect email or password is entered and error is presented to the traveler. <p><u>Post-condition:</u> Traveler is logged in when correct email and password is entered or error is presented for incorrect email and/or password.</p>	Travelers need to enter correct email and password to login to their PARKAPP account.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1928-V02: EPMCS shall authenticate traveler sign in and account access with an email and password.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP011-V01	System	Demonstration	User accounts	Verify that PARKAPP allows travelers to enter their mobile number in their profile.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. After creating an account, click 'Settings' and click 'Account Settings' to edit account information. 2. Under 'Account Settings', enter mobile number and click 'Save'. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter and save mobile number to the profile under account settings. 2. Traveler should receive an email notification about the changes made to the account. <p><u>Post-condition:</u> Traveler is logged in and the mobile number is added to his/her account.</p>	Traveler adds mobile number to their PARKAPP profile.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1927-V02 EPM-FN1928-V03 EPM-FN1936-V02 EPM-FN1937-V02	<p>EPM-FN1930-V03: Creating a profile with PARKAPP and PARKWEB should include the option of providing a Traveler's telephone number, first name and last name.</p> <p>EPM-FN1925-V02: The PARKAPP and PARKWEB shall allow Travelers to create a profile in the EPMCS to store profile information and mobile application settings.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP012-V01	System	Demonstration	User accounts	Verify that travelers can log in to their PARKAPP account with their login information.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' located on the bottom left corner of the screen. 2. On the landing page, click 'Sign In' and enter email address or mobile number and password to log in to the ParkColumbus app account. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to log in to their ParkColumbus app account with their login information. <p><u>Post-condition:</u> Traveler is logged in to the ParkColumbus app.</p>	Travelers log in to their PARKAPP with their login information.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1937-V02: Travelers shall have access to manage their profiles in the PARKAPP and PARKWEB by correctly entering their login information.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP013-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to search for parking options by entering a street address.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to begin searching for the parking options. 2. Under 'Search Location' tab, enter street address to find parking in that area. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter any street address to search parking options in that location. <p><u>Post-condition:</u> Parking availability options around the searched address are displayed on the screen.</p>	Search for parking options on the PARKAPP on an Apple device by entering a street address.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1948-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to search for parking options by entering a street address.
EPM-MAP014-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP allows travelers to configure notifications and alerts on their account.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Settings' to select 'Notifications' under 'Profile'. 2. Select the preferred type of notification (email, text, or push notification) of parking reservation. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select notification type in the ParkColumbus app settings. <p><u>Post-condition:</u> Receive notifications based on the traveler's preference.</p>	Traveler configures notifications and alerts on the PARKAPP on an Apple device.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1901-V02 EPM-FN1902-V02 EPM-FN1903-V02 EPM-FN1904-V02	EPM-FN1941-V02: The PARKAPP and PARKWEB shall provide the Traveler the capability to configure notifications and alerts.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP015-V01	System	Demonstration	Parking reservation	Verify that PARKAPP allows travelers to select and pay only for selected period of time.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u> <u>Reservations</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' and pan to the desired area to search for parking options. 2. Select a parking option. 3. Select date and time and payment information. 4. Click 'Reserve Your Spot' to confirm reservation for the selected date and time. <p><u>Zone parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to select parking facility. 2. Select a zone or on-demand parking facility to park. 3. Enter duration by the hour and minute or can select maximum parking time. 4. Click 'Proceed to Checkout'. 5. On the next page, select payment method and click 'Start Parking'. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select date and time while reserving for parking and pay for only the selected duration. <p><u>Post-condition:</u> Traveler pays only for the selected period of time and confirmation is presented to the traveler.</p>	Traveler selects the date and time to park and pays only for the selected time.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1922-V02: The PARKAPP and PARKWEB shall allow Travelers to pay for a specific period of parking time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP016-V01	Integration	Demonstration	Payments	Verify that traveler is able to pay for on-demand gated parking and activate the parking on the PARKAPP.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-MAP015-V01: zone parking to pay for an on-demand gated parking space. 2. At the selected parking garage, press the parking ticket button to collect parking ticket for the gate arm to open and enter the facility. 3. Open the on-demand booking, click 'Scan' to scan the parking ticket to activate the booked parking. 4. App shows the time the vehicle is parked at the facility. 5. When existing, scan the ticket to open the gate arm. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler is able to pay for on-demand parking through the app. 2. Payment is verified and the traveler is able to exit the parking facility. <p><u>Post-Condition:</u> Timer within the app stops after the parking ticket is scanned at the exit.</p>	PARKAPP is able to pay for an on-demand parking and scan the parking tickets and activate parking.	Travelers	Release 3	EPM-UN027-V01 EPM-UN031-V01	EPM-FN1982-V02: The EPMCS shall be capable of mobile device payments, if supported by the Traveler's mobile device and the hardware used by the parking operator.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP017-V01	System	Demonstration	Parking reservation	Verify the PARKAPP provides confirmation of a parking reservation to the traveler.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-MAP015-V01 to reserve parking. 2. If payment is successful, a digital receipt of the reservation is displayed on the screen along with the amount paid and method of payment used and the reservation code. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be presented with a confirmation code and a receipt of payment with an email confirmation after reserving parking through the ParkColumbus app. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Parking reservation confirmation code along with an email confirmation of payment is provided to the traveler after reserving a parking place through PARKAPP.	Travelers	Release 1	EPM-UN006-V01 EPM-UN021-V01	<p>EPM-FN1914-V02: The EPMCS shall provide a response to the PARKAPP and PARKWEB of a confirmed reservation.</p> <p>EPM-FN1915-V02: The confirmation response provided to the PARKAPP and PARKWEB shall include a reservation confirmation code.</p> <p>EPM-FN1917-V02: The confirmation response provided to the PARKAPP and PARKWEB shall include notice of payment completion and amount.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP018-V01	System	Demonstration	Navigation	Verify that PARKAPP links to traveler's map-based navigation to direct the traveler to the designated parking location.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Select start time and end time and click 'Find Parking'. 3. Select one of the parking options displayed on the map. 4. On the next page, traveler selects 'Directions' to get the route to the parking location from current location. 5. When 'Directions' is clicked, traveler's map-based navigation app opens with the route information. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app should be able to open the target device map-based navigation system when travelers' requests directions to the selected parking location. <p><u>Post-condition:</u> Traveler has navigated from the ParkColumbus app and is on his/her map-based navigation page.</p>	PARKAPP is linked to the traveler's map-based navigation on the Apple device to provide directions to designated parking location.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1964-V02: The PARKAPP and PARKWEB shall include the ability to link to map-based navigation on the traveler's smartphone/computer/tablet to direct the traveler to the designated parking location

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP019-V01	System	Demonstration	Payment	Verify that travelers can pay for the parking on the PARKAPP without redirecting to another web page.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-MAP015-V01 to reserve parking. 2. Traveler is on the ParkColumbus app from start to finish of the parking reservation. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter credit or debit card information and pay for the selected parking without redirecting to a different webpage. <p><u>Post-condition:</u> Traveler is still in the ParkColumbus app.</p>	Traveler completes the purchase of parking space within the PARKAPP without redirecting to another webpage.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1980-V02: Travelers shall be able to pay instantly without being redirected away from the PARKAPP and PARKWEB to complete a transaction.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP020-V01	System	Demonstration	Parking reservation	Verify the PARKAPP does not provide reservation confirmation code if payment for parking reservation is not complete.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed under EPM-MAP015-V01 to reserve parking. If payment is unsuccessful, the traveler is redirected to the checkout page and an error message is displayed on the screen. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> Traveler should receive an error upon an unsuccessful payment. Payment method used should not be charged with the parking reservation amount when the reservation is unsuccessful. <p><u>Post-condition:</u> Payment was not successful and traveler is on checkout page.</p>	Payment error message is displayed on the PARKAPP when the payment for parking reservation is not complete.	Travelers	Release 1	EPM-UN006-V01 EPM-UN021-V01	EPM-FN1916-V02: The EPMCS shall not provide a reservation confirmation code to PARKAPP and PARKWEB if payment is not complete.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP021-V01	System	Demonstration	Parking reservation	Verify that PARKAPP provides paid status of parking reservation to the traveler in real-time.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-MAP015-V01 to reserve parking. 2. If payment is successful, digital receipt of the reservation is displayed on the screen along with amount paid and method of payment used and reservation code. 3. Click 'Activity' and click 'Upcoming' on top to view upcoming parking reservations along with reservation codes in real-time. 4. An email confirmation with the paid status of the parking reservation should be received within two minutes of the reservation if selected in Notification Settings. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to view his/her upcoming parking reservations on their ParkColumbus app. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Traveler receives email confirmation with the paid status of the parking reservation within two minutes after reserving a parking space through PARKAPP on their Apple device.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1921-V02: The EPMCS shall communicate the paid status of reservations to the PARKAPP and PARKWEB in real-time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP022-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP provides email notification to travelers of reservation confirmation.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed under EPM-MAP015-V01 to reserve parking. Email confirmation is received along with payment confirmation if selected in Notification Settings. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> Traveler should receive email notification about the parking reservation. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Traveler receive notification for the reservation confirmation.	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	EPM-FN1901-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of reservation confirmation.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP023-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP provides notifications to travelers of changes to existing booking.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u> Parking reservations should be made at least 3 hours ahead to be able to cancel a reservation.</p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-MAP014-V01 to allow email notifications. 2. Follow steps listed under EPM-MAP015-V01 to reserve parking for the next day. 3. Click 'Activity' and select 'Upcoming'. 4. Under 'Upcoming', select the parking reservation for cancellation. 5. Click 'Cancel Reservation' and select 'Yes' to confirm cancellation. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to cancel reservation and see canceled activity. 2. Traveler should receive an email confirmation for the canceled reservation. <p><u>Post-condition:</u> Reservation is canceled and traveler will receive an email confirmation about the cancellation.</p>	Traveler receive notification for any changes made to the existing reservation.	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	EPM-FN1902-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of changes to an existing reservation.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP024-V01	System	Demonstration	Event parking	Verify that event employees can enter event access code when booking parking associated with that event.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and an event employee is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Select start time and end time and click 'Find Parking'. 3. Locate and select a parking option displayed on the screen with a ticket symbol and select the event. Example: 2020 Columbus Marathon - October 18, 2020. 4. Click on 2020 Columbus Marathon. 5. Click on 'Have Access Code?'. 6. Enter Access Code into the open text box. 7. Click 'Apply' and several parking options are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Event employee is able to enter an access code for selected event. 2. Multiple parking options are displayed on the screen that allow parking for the selected event and accept the entered event access code. <p><u>Post-condition:</u> Event employee uses the access code to book parking space for an event.</p>	Event employee enters an event access code when reserving parking space for an event.	Travelers	Release 1	EPM-UN001-V01	<p>EPM-FN3272-V02: The PARKAPP and PARKWEB shall provide the ability for event employees to enter an access code associated with an event.</p> <p>EPM-FN3273-V02: The PARKAPP and PARKWEB provides event employees access to appropriate parking options after entering event access code associated with that event.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP025-V01	System	Demonstration	Search Options	Verify that PARKAPP allows travelers to get parking availability information in real-time without having an EPM profile.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is not logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' located on the bottom menu bar of the screen. 2. Zoom in to Downtown Columbus for zone parking options. 3. Map shows different colors of zone parking pins based on their probability of having open parking spaces. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be to see parking availability information without having to be logged in. 2. Traveler is presented with different zone colors based on their probability of finding open parking meter spaces. 3. The zone color is black when there is availability information for that zone <p><u>Post-condition:</u> Traveler is informed of parking availability without having to be logged in.</p>	Parking availability options presented to the traveler based on their probability of having open parking spaces	Travelers	Release 3	EPM-UN016-V01 EPM-UN002-V01 EPM-UN003-V01 EPM-UN017-V01 EPM-UN029-V01 EPM-UN030-V01	<p>EPM-FN1938-V02: Travelers shall be able to use the PARKAPP to get parking availability information without having an EPM profile.</p> <p>EPM-FN1963-V01: The PARKAPP shall provide an interactive map display showing real-time parking options.</p> <p>EPM-FN1908-V03: The EPMCS shall provide a visual indicator showing the probability of finding open parking meter spaces by specified area to the PARKAPP.</p> <p>EPM-FN3266-V00: The EPMCS shall provide on-street parking availability to the PARKAPP.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP026-V01	System	Demonstration	Parking reservation	Verify that PARKAPP does not allow travelers to reserve on-street parking.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to select parking meter zone. 2. Select a zone to park. 3. Verify that future date and time cannot be selected. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to select a future date when paying for on-street parking. <p><u>Post-condition:</u> Traveler can select the parking duration and pay for on-street parking through ParkColumbus app.</p>	PARKAPP on an Apple device doesn't allow reservations for on-street parking.	Travelers	Release 1	EPM-UN003-V01 EPM-UN006-V01	EPM-FN3267-V01: The PARKAPP and PARKEB shall not allow the reservation of on-street parking.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP027-V01	System	Demonstration	Parking reservation	Verify that PARKAPP allows travelers to pre-pay for the parking meters before the enforcement time up to the allowable timeframe.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u> (City of Columbus parking meters enforcement time is 8 a.m. to 10 p.m. Pre-payment is only allowed 2 hours before the enforcement time. This test should be performed between 6 a.m. and 8 a.m.)</p> <ol style="list-style-type: none"> 1. Click 'Park' to select parking facility. 2. Select a zone for which the enforcement time has not started. 3. Enter duration by the hour and minute or can select maximum parking time. 4. Click 'Proceed to Checkout'. 5. On the next page, select payment method and click 'Start Parking'. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able select the duration and pre-pay for that time before the enforcement time of the parking meter. <p><u>Post-condition:</u> Traveler should receive an email confirmation when the payment is successful.</p>	Traveler pre-pays for the parking meter before the enforcement time within the allowable timeframe which is 2 hours in Columbus, Ohio.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1977-V02: The PARKWEB and PARKAPP shall allow pre-payment of parking up to the allowable timeframe prior to paid parking operational hours.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP028-V01	System	Demonstration	Parking availability	Verify that PARKAPP will not allow travelers to purchase parking time when restricted parking times are in effect.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and select the active parking session under 'Active'. 2. Click 'Extend' to extend parking duration. 3. If there are any restrictions at the parking meter, parking restriction message is displayed on the screen and traveler will not be able to extend the parking meter time. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to extend the parking meter duration when parking restrictions are in place or are coming up during the requested time period. <p><u>Post-condition:</u> Traveler will need to select a different parking location due to parking restrictions at the current parking location.</p>	Traveler cannot extend parking meter time when restricted parking times are in effect.	Travelers	Release 1	EPM-UN006-V01 EPM-UN010-V01 EPM-UN011-V01 EPM-FN1905-V02	EPM-FN1907-V02: The PARKAPP and PARKWEB shall not allow purchase of parking meter time when restricted parking periods are in effect.

EPM-MAP029-V01	System	Demonstration	Parking Availability	Verify that EPMCS provides parking restrictions of each parking facility to the PARKAPP.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u> <u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' and select a parking zone. 2. If there are any restrictions at the parking meter, parking restriction message is displayed on the screen and traveler will not be able to purchase the parking meter time. <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' and pan to the desired area to search for parking options. 2. Select date and time to reserve the space. 3. Only the parking locations that are available during the selected data and time are displayed on the map. 4. Traveler will not be able to reserve a parking facility outside the facility operating hours. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to purchase the parking meter duration when parking restrictions are in place or are coming up during the requested time period. 2. Traveler should not be able to reserve a parking location outside the facility operating hours. <p><u>Post-condition:</u> Traveler will need to select a different parking location due to parking restrictions at the current parking location.</p>	Travelers cannot purchase parking for zone parking or reservations when restrictions are in place for the selected location.	Travelers	Release 1	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	EPM-FN1895-V02: The EPMCS shall provide parking restrictions at each parking facility to the PARKAPP and PARKWEB.
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TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP030-V01	System	Demonstration	Parking availability	Verify PARKAPP allows travelers to purchase additional parking meter time.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and select the active parking session under 'Active'. 2. Click 'Extend' to extend parking duration. 3. Selects the duration and pays for the parking either by adding a payment method or using the existing payment method. 4. Traveler will not be able to select duration more than the permitted time at that parking meter. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to extend the parking meter time through the ParkColumbus app. <p><u>Post-condition:</u> Parking meter time is extended and will receive notification as per the settings chosen.</p>	Traveler extend parking meter time through PARKAPP on an Apple device.	Travelers	Release 1	EPM-UN006-V01 EPM-UN010-V01 EPM-UN011-V01 EPM-FN1907-V02	<p>EPM-FN1905-V02: The PARKAPP and PARKWEB shall allow purchase of additional parking meter time.</p> <p>EPM-FN1906-V03: The PARKAPP and PARKWEB shall not allow purchase of additional parking meter time past the maximum time allowed within mobile pay zones.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP031-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP provides notifications to travelers of warnings of expiration and expiration of paid parking based on preference selected (text, email, or push notifications).	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Settings' to select 'Notifications' under 'Profile'. 2. Select the type of notification (email, text or push notification) of parking reservation. Set the notification alert for time remaining to 5 minutes. 3. Click 'Park' and select a parking zone to book a parking meter. 4. Book a meter for 10 minutes and wait 5 minutes to verify that a notification of the parking expiring is received. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select notification type in the ParkColumbus app settings. 2. Traveler should receive warning notification for expiration of paid parking session as per the preferences chosen. 3. Traveler should receive notification for expiration of paid parking session as per the preferences chosen. <p><u>Post-condition:</u> Traveler receive notifications based on the preferences selected.</p>	PARKAPP provides notifications of warnings of expiration and expiration of paid parking based on the notifications and alerts selected (text, email or push notifications).	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	<p>EPM-FN1903-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of warnings of expiration of paid parking session.</p> <p>EPM-FN1904-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of expiration of paid parking session.</p>
EPM-MAP032-V01	System	Test	Promotion codes	Verify that PARKAPP provides local merchants parking options at discounted price.	Vendor to work with local merchants to get the information on discounted parking options offered.	Local Merchants offer discounted parking options and are available on PARKAPP.	Local Merchants	Release 3	EPM-UN021-V01 EPM-FN3193-V02 EPM-FN3105-V02	EPM-FN1918-V02: The EPMCS shall allow local merchants to offer discounted parking options through the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP033-V01	System	Test	Promotion codes	Verify that PARKAPP allows travelers to purchase parking spaces that have discounted prices.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Under 'Settings' click 'Promotional Codes'. Click 'Add New' and enter a promo code. If invalid promo code is entered, an error message will be presented. Click 'Back' located on the top left corner of the screen and click 'Park' to select a zone parking. Select a zone or on-demand parking facility to park. Enter duration by the hour and minute or can select maximum parking time. Click 'Proceed to Checkout'. On the next page, review payment method, vehicle information and total parking cost along with promo code discount. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> Traveler is able to purchase parking when a valid promo code is applied and discount is applied at the checkout. <p><u>Post-condition:</u> Traveler is presented with a confirmation of the parking reservation which shows the discount amount and total parking cost.</p>	Traveler is able to purchase parking spaces that discounted prices using promo codes.	Travelers	Release 1	EPM-FN1918-V02 EPM-UN021-V01	EPM-FN3105-V02: The PARKAPP and PARKWEB shall provide Travelers with the ability to activate discounted parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP034-V01	System	Demonstration	Promotion codes	Verify that EPMCS can validate and provide PARKAPP confirmation of discounted parking reservation.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-WEB033-V01 to pay for parking. 2. Click 'Activity' to view the active parking sessions. 3. Click 'i' to view parking details to review the parking amount and the discount applied. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Confirmation receipt shows the total parking cost reflects the discount applied using the promo code. <p><u>Post-condition:</u> As per the notifications set under 'Settings', traveler may also receive email, text or in-app notifications of parking details.</p>	Traveler is able to validate discount received from the confirmation details provided for the booked parking.	Travelers	Release 1	EPM-FN1918-V02 EPM-UN021-V01	EPM-FN3193-V02: The EPMCS shall validate the discounted parking options and provide confirmation of validation to the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP035-V02	System	Demonstration	Search options	Verify the PARKAPP allows travelers to search for parking options by frequently/preferred traveled locations.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to begin searching for the parking options. 2. Click 'Enter Zone Number'. 3. Click on 'Favorites' or 'Recent' which show zones that are used frequently. 4. Select a zone to start parking transaction. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select favorite zone or recent zone to filter parking options. <p><u>Post-condition:</u> Frequently and recently traveled locations are displayed on the account.</p>	Traveler can select parking options using favorites and recent for zone parking on the PARKAPP.	Travelers	Release 1	EPM-FN1945-V03 EPM-UN015-V01	EPM-FN3096-V03: The PARKAPP and PARKWEB shall allow travelers to select preferred/frequently traveled zones.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP036-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to store favorite searches on their account for easy retrieval.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and then click 'History' on top of the screen. 2. Click on a previously used parking zone. 3. Click 'Favorite this zone'. 4. Enter nickname for this zone and click 'Save'. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to search for favorites under 'Park' within the app. <p><u>Post-condition:</u> Traveler will search and access favorite zones easily.</p>	Traveler can favorite zone parking for easy retrieval.	Travelers	Release 1	EPM-UN015-V01	EPM-FN1944-V01: The PARKAPP shall provide Travelers with the ability to store favorite searches for easy retrieval.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP037-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to select amenities at parking spaces to filter search option.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u> <u>Zone Parking</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Click on the three lines on the top right-hand corner of the screen to access filter options. 3. Select desired amenities and click 'Show Results' to filter parking options by amenities. <p><u>Reservations</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to look for available parking reservations. 2. Click on 'Filter' on the top right-hand corner of the screen to access filter options. 3. Select desired amenities and click 'Done' to filter parking options by amenities. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler will be able to select amenities to filter parking options for both, zone and reservation parking. <p><u>Post-condition:</u> Traveler selected amenities will be displayed on the map as possible parking options.</p>	Traveler is able to select amenities to filter for parking options.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN015-V01 EPM-FN3094-V03 EPM-FN3095-V03 EPM-FN3096-V03	EPM-FN1945-V03: The PARKAPP and PARKWEB shall provide travelers with the ability to select amenities that will be used to filter search results for parking options.

EPM-MAP038-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to filter parking options by parking garages, lots, and streets.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to look for available parking reservations. 2. Click on 'Filter' on the top right-hand corner of the screen to access filter options. 3. Select amenities such as 'Covered Parking' or 'Paved' and click 'Done' to filter parking options by amenities available at parking spaces. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Location Type' chose 'Parking Garage' and click 'Show Results'. 5. Only parking zones with the selected filters should show up and can be analyzed as potential parking options. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking zone options based on options selected. 2. Parking options displayed on the map have the selected amenities. <p><u>Post-condition:</u> Traveler can purchase a parking zone based on the filters chosen.</p>	Traveler is able to filter zone parking or reservations by parking garages, lots and streets.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN002-V01	EPM-FN1962-V02: The PARKAPP and PARKWEB shall provide the ability to filter by any combination of garages, lots, and streets.
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TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP039-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to search for parking options by selecting a parking meter zone or parking loading zone.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Click 'Show Loading Zone' or 'Street Parking' and click 'Show Results'. 5. Only parking zones and loading zones are displayed on the map. 6. Map now shows parking meter zones (4 or 5 digit number) and loading zones (striped pin). <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking zone options by loading zone or parking meter zone. 2. Parking options displayed on the map have the selected amenities. <p><u>Post-condition:</u> Traveler can purchase a parking zone based on the filters chosen.</p>	Traveler is able to filter parking options by parking meter or loading zone.	Travelers	Release 3	EPM-UN008-V01	EPM-FN1949-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to search for parking options by selecting a parking meter zone or parking loading zone.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP040-V01	System	Demonstration	Loading zone	Verify that PARKAPP provides travelers loading zone locations, hours, and restrictions.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' located on the bottom menu bar of the screen. 2. Click the three lines on the top right-hand corner of the screen. 3. Under 'More Options' turn on the 'Show Loading Zones' bar to show loading zones nearby. 4. Zoom in to Downtown Columbus to find a loading zone. 5. Click on one of the identified loading zones to open loading zone information. 6. Depending on the loading zone, information such as location, hours, and restrictions, if any, will be displayed on the screen. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to see loading zone details for the selected zone on the bottom of the screen. <p><u>Post-condition:</u> N/A</p>	Loading zone details are presented to the traveler.	Travelers	Release 3	EPM-UN004-V01	EPM-FN1961-V02: The PARKWEB and PARKAPP shall display loading zone locations, hours, and restrictions.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP041-V01	System	Demonstration	Search options	Verify the PARKAPP allows travelers to search for metered parking spaces (including on-street EV and ADA metered spaces).	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Features' choose 'EV Charging' and/or 'Handicap Accessible' and click 'Show Results'. 5. Only parking zones with the selected filters are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking zone options based on options selected. 2. Parking options displayed on the map have the selected amenities. <p><u>Post-condition:</u> Traveler can view a parking zone displayed on the map with selected amenities.</p>	Zone parking options can be filtered for EV charging and ADA accessible spaces.	Travelers	Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN1959-V02: The PARKWEB and PARKAPP shall allow requests for locating metered parking spaces (including on-street EV and ADA metered spaces).</p> <p>EPM-FN1900-V03: The EPMCS shall provide access to ADA accessible parking spaces in accordance with standards for accessible design as determined by the ADA to the PARKAPP and PARKWEB.</p> <p>EPM-FN1899-V02: The EPMCS shall provide the location of electric vehicle charging stations to the PARKAPP and PARKWEB.</p>

EPM-MAP042-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to filter parking spaces that are ADA accessible.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Click 'Filter' located on top right corner of the screen. 3. Toggles to select 'Handicap Accessible' under filter options and clicks 'Done'. 4. Parking options displayed on the map should be handicap accessible. 5. From the results shown on the map, click on a parking facility, and scroll down to the amenities to confirm ADA parking is listed under amenities. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Features' choose 'Handicap Accessible' and click 'Show Results'. 5. Only parking zones with the selected filters are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map should be handicap accessible and should be in accordance with standards for accessible design as determined by the ADA. <p><u>Post-condition:</u></p>	PARKAPP on the Apple device allows to filter parking options that are ADA accessible.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN3094-V03: The PARKAPP and PARKWEB shall allow Travelers to filter available parking spaces based on ADA compliance.</p> <p>EPM-FN1900-V03: The EPMCS shall provide access to ADA accessible parking spaces in accordance with standards for accessible design as determined by the ADA to the PARKAPP and PARKWEB.</p>
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TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
					Map shows all the parking options are ADA accessible.					
EPM-MAP043-V01	System	Demonstration	Search options	Verify the PARKAPP allows travelers to filter parking options based on the availability of EV charging.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Click 'Filter' located on top right corner of the screen. 3. Toggle to select 'EV Charging Available' under filter options and click 'Done'. 4. Parking options displayed on the map have EV charging infrastructure to charge EVs. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Features' choose 'EV Charging' and click 'Show Results'. 5. Only parking zones with the selected filters are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map have EV charging amenity. <p><u>Post-condition:</u> Map shows all the parking options which have EV charging facility.</p>	PARKAPP on an Apple device allows travelers to filter parking locations that have EV charging facility.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-FN1945-V03 EPM-UN015-V01 EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN3095-V03: The PARKAPP and PARKWEB shall allow Travelers to filter available parking spaces based on availability of EV charging.</p> <p>EPM-FN1899-V02: The EPMCS shall provide the location of electric vehicle charging stations to the PARKAPP and PARKWEB.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP044-V01	System	Demonstration	User accounts	Verify that PARKAPP provides travelers access to transaction log consisting of a history of paid parking transactions, locations, and time and date.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' located on the bottom left corner of the screen. 2. On the landing page, traveler clicks 'History' to view 12 months of transactions including the history of paid parking transactions, locations, time and date. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to view transaction history for up to 12 months on his/her ParkColumbus app account. 2. Transactions viewed should be only for the past 12 months and not beyond 12 months. <p><u>Post-condition:</u> Transaction made for the past 12 months is displayed on the screen.</p>	PARKAPP provides access to paid parking transactions, locations and date and time of transactions for the past 12 months.	Travelers	Release 1	EPM-UN015-V01	<p>EPM-FN1942-V02: The PARKAPP and PARKWEB shall provide Travelers with access to a transaction log consisting of a history of paid parking transactions, locations, and time and date.</p> <p>EPM-FN1943-V01: The transaction log shall be limited to prior 12 months of transactions.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP045-V01	System	Demonstration	User feedback	Verify that PARKAPP provide travelers customer care contact information for any complaints.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and select any parking reservation from 'Active', 'Upcoming' or 'History'. 2. Select the parking session for which there is a parking complaint. 3. Scroll down to the end and click 'Call ParkMobile Customer Service' to call customer care or click 'Submit Support Request' to submit an online request. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to call customer care or submit an online request for parking issues. <p><u>Post-condition:</u> Traveler talks to the customer care to resolve parking issues.</p>	PARKAPP provides access to ParkMobile customer care (phone number and online request support) to contact with parking issues.	Travelers	Release 1	EPM-UN012-V01	EPM-FN1951-V04: The PARKAPP and PARKWEB shall provide the traveler the ability to contact the customer care with complaints.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAP046-V01	System	Demonstration	User feedback	Verify that PARKAPP allows traveler to submit user feedback.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Click 'Help' under 'Settings' to open ParkMobile Help page. Click on the chat icon to chat with the customer service representative to provide comments or ask questions or scroll down to the bottom of the 'Help' page to find the 'Submit a Request' tab for comments and/or questions. <p><u>Pass Criteria:</u> Verification by four independent iOS testers:</p> <ol style="list-style-type: none"> Traveler should be able to submit an online request or chat with the customer service to provide comments or ask questions. <p><u>Post-condition:</u> Traveler submits an online request for comments and questions.</p>	Travelers are able to submit comments and questions through PARKAPP.	Travelers	Release 2	EPM-UN012-V01	EPM-FN1950-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to submit user feedback.

Source: City of Columbus

5.1.2.2. Test Cases for the Android Mobile App

The essential test cases planned for the Android mobile app are the same as those tested within the Apple mobile app. These cases are separated because Android and Apple are separate platforms and under the hood are completely separate software packages. It is altogether possible for a case to pass on one platform and fail on other. Testers will be able to track each case uniquely via its identifier in order to capture results and report any defects as appropriate.

Table 10: ParkColumbus Mobile App Test Cases for Android Software

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN001-V01	System	Demonstration	Geolocation information	Verify that PARKAPP requests consent from the travelers before accessing location information.	<p><u>Pre-condition:</u> The ParkColumbus app is installed on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Open ParkColumbus app. 2. A message is displayed about using 'Location Services' to find nearby parking locations. 3. Click 'GOT IT'. 4. Pop-up appears on the screen asking to allow ParkColumbus to access device location 'Deny' and 'Allow'. 5. Click 'Allow' to search nearby parking locations. 6. For more information, click 'Settings' located on the bottom right corner of the screen and click 'Privacy Policy'. 7. A webpage with Privacy Policy opens up which lists what data will be collected from the traveler along with accessing with geolocation data. 8. Traveler will need to accept the terms of use and privacy policy to create an account to sign up. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Travelers will need to give location permission when they use the app for the first time to access location information. <p><u>Post-condition:</u> Traveler location information is accurate on the app after the permission to access geolocation is given by the traveler.</p>	Consent is requested to access traveler's location when using the app on the Android device.	Travelers	Release 1	EPM-UN028-V01	EPM-FN1947-V02: The PARKAPP and PARKWEB shall obtain affirmative express consent from the Traveler before accessing geolocation information or contact info.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN002-V01	System	Demonstration	Geolocation information	Verify that location of the traveler is updated in real-time in PARKAPP.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Make sure current location shown on the app matches with the traveler current location. 2. Travel few blocks to make sure current location is updated within the app in real-time. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app should be able to update current location on the map in real-time. <p><u>Post-condition:</u> Current location is updated on the map in real-time.</p>	Location of the traveler in the PARKAPP is the current location of the traveler when navigating to the parking reservation.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1965-V01: Map-based navigation shall use the GPS device of the Traveler's smartphone to update the location of the Traveler on the map in real-time.
EPM-MAN003-V01	System	Demonstration	Multi-language	Verify that default language is English on the PARKAPP unless changed to Spanish as the device language.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Make sure the default language is set to English under phone settings. 2. Language displayed should be English on the ParkColumbus app when traveler opens the app and when logged in. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Language displayed when ParkColumbus app is opened should be English. <p><u>Post-condition:</u> N/A</p>	Displayed language within the app is English unless Spanish is chosen as the device language.	Travelers	Release 3	EPM-UN005-V01	EPM-FN1955-V02: The PARKAPP shall default to English language user interface unless Spanish is chosen as language within the phone settings.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN004-V01	System	Demonstration	Multi-language	Verify that ParkColumbus app is displayed in Spanish when Spanish is chosen as the default language within phone settings.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Make sure the default language is set to Spanish under phone settings. 2. Language displayed should be in Spanish on the ParkColumbus app when traveler opens the app and when logged in. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Language displayed when ParkColumbus app is opened should be Spanish. <p><u>Post-condition:</u> N/A</p>	Displayed language within the app is Spanish including transaction pages, settings and parking messages.	Travelers	Release 3	EPM-UN005-V01	EPM-FN1956-V02: The PARKAPP shall provide the Traveler with the option of changing all static text (including CTAs, navigational items, links, authentication (create account/login), on-demand flow (excluding error text), reservations flow (excluding error text), activity (tab labels and on-demand active session UI), time selector units (days, hours, minutes), setting screen section labels) in the user interface from English to Spanish, and vice versa (images will remain the same regardless of language choice).
EPM-MAN005-V01	System	Demonstration	Geolocation information	Verify that PARKAPP determines traveler's current location to search for parking options.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for EPM-MAN001-V01 to allow tracking location. 2. Click 'Park' or 'Reserve'. 3. Traveler location shown on the map should be accurate to the traveler's current location. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler location shown on the map should be accurate to the traveler's location. <p><u>Post-condition:</u> Traveler's current location is accurate on the app.</p>	Current location shown in the app should match with traveler's current location.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1946-V02: The PARKAPP and PARKWEB shall use the GPS device of the Traveler's smartphone or computer to determine current location to search for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN006-V01	System	Demonstration	Contact feature	Verify that PARKAPP provides link to City's 311 webpage which has email and telephone number to City's 311 system.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Settings'. 2. Click on 'Visit 311 Columbus Site' to navigate to City of Columbus 311 webpage for contact information. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app should navigate traveler to City of Columbus 311 webpage which has email and telephone number to City's 311 system. <p><u>Post-condition:</u> Traveler has navigated away from the ParkColumbus app and is on the City of Columbus 311 webpage.</p>	Link to City's 311 webpage is available in the app on an Android device.	Travelers	Release 1	EPM-UN013-V01	EPM-FN1952-V03: The PARKAPP and PARKWEB shall provide a link to the City's 311 webpage.
EPM-MAN007-V01	System	Demonstration	View	Verify that PARKAPP supports mobile portrait mode on Android devices.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Ensure phone screen settings are set to auto rotate. 2. Change mobile view to landscape. 3. ParkColumbus app to remain in portrait mode. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app screen should remain in portrait mode. <p><u>Post-condition:</u> ParkColumbus app is open and is in portrait mode.</p>	Only portrait mode is supported by the app on an Android device.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1957-V01: The PARKAPP shall support mobile portrait mode (form factor).

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN008-V01	System	Demonstration	Search options	Verify that traveler is able to search for parking options without creating an account on the PARKAPP.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' tab. 2. Choose duration of parking time to search for parking options. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' tab to explore zone parking options. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to search for parking options without creating an account. <p><u>Post-condition:</u> Parking options are displayed and traveler will need to log in or create an account to park or reserve the selected parking option.</p>	Able to search for parking options without creating an account on the PARKAPP.	Travelers	Release 1	EPM-UN014-V01	EPM-FN2109-V01: Travelers shall not be required to create a profile to search for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN009-V01	System	Demonstration	User accounts	Verify that PARKAPP allows travelers to enter a valid email address and password when creating a profile.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' located on the bottom left corner of the screen. 2. Click 'Create an Account' to create a profile with ParkColumbus app. 3. Enter email address and password. 4. Accept terms and conditions and privacy policy and click 'Sign Up'. 5. On the next page, enter vehicle license plate number, State or Province and Nickname. 6. Click 'Done'. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. When creating a profile, travelers should provide a valid email address. 2. Traveler is required to enter password when creating an account. <p><u>Post-condition:</u> Traveler is logged in to their ParkColumbus app.</p>	Travelers enter email address and password when creating a profile with PARKAPP on their Android device.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1927-V02 EPM-FN1928-V03 EPM-FN1936-V02 EPM-FN1937-V02	<p>EPM-FN1927-V02: Creating a profile in the EPMCS shall require submission of traveler's email address and password.</p> <p>EPM-FN1925-V02: The PARKAPP and PARKWEB shall allow Travelers to create a profile in the EPMCS to store profile information and mobile application settings.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN010-V01	System	Test	User accounts	Verify that email and password authentication is required when signing in and accessing a traveler account on PARKAPP.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed under Test Case ID EPM-MAN009-V01 to create an account. Click on 'Settings' and click 'Sign Out' to logout of the account. Click 'Activity' or 'Settings' and click 'Sign In'. Enter email address and password used while creating an account to and click 'Sign In'. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> Traveler is able to sign in by entering correct email address and password. Traveler is not able to sign in if incorrect email or password is entered and error is presented to the traveler. <p><u>Post-condition:</u> Traveler is logged in when correct email and password is entered or error is presented for incorrect email and/or password.</p>	Travelers need to enter correct email and password to login to their PARKAPP account.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1928-V02: EPMCS shall authenticate traveler sign in and account access with an email and password.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN011-V01	System	Demonstration	User accounts	Verify that PARKAPP allows travelers to enter their mobile number in their profile.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. After creating an account, click 'Settings' and click 'Account Settings' to edit account information. 2. Under 'Account Settings', enter mobile number and click 'Save'. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter and save mobile number to the profile under account settings. 2. Traveler should receive an email notification about the changes made to the account. <p><u>Post-condition:</u> Traveler is logged in and the mobile number is added to his/her account.</p>	Traveler adds mobile number to their PARKAPP profile.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1927-V02 EPM-FN1928-V03 EPM-FN1936-V02 EPM-FN1937-V02	<p>EPM-FN1930-V03: Creating a profile with PARKAPP and PARKWEB should include the option of providing a Traveler's telephone number, first name and last name.</p> <p>EPM-FN1925-V02: The PARKAPP and PARKWEB shall allow Travelers to create a profile in the EPMCS to store profile information and mobile application settings.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN012-V01	System	Demonstration	User accounts	Verify that travelers can log in to their PARKAPP account with their login information.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Click 'Activity' located on the bottom left corner of the screen. On the landing page, click 'Sign In' and enter email address or mobile number and password to log in to the ParkColumbus app account. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> Traveler should be able to log in to their ParkColumbus app account with their login information. <p><u>Post-condition:</u> Traveler is logged in to the ParkColumbus app.</p>	Travelers log in to their PARKAPP with their login information.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1937-V02: Travelers shall have access to manage their profiles in the PARKAPP and PARKWEB by correctly entering their login information.
EPM-MAN013-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to search for parking options by entering a street address.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Click 'Reserve' to begin searching for the parking options. Under 'Search Location' tab, enter street address to find parking in that area. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> Traveler should be able to enter any street address to search parking options in that location. <p><u>Post-condition:</u> Parking availability options around the searched address are displayed on the screen.</p>	Search for parking options on the PARKAPP on an Android device by entering a street address.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1948-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to search for parking options by entering a street address.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN014-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP allows travelers to configure notifications and alerts on their account.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Settings' to select 'Notifications' under 'Profile'. 2. Select the preferred type of notification (email, text, or push notification) of parking reservation. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select notification type in the ParkColumbus app settings. <p><u>Post-condition:</u> Receive notifications based on the traveler's preference.</p>	Traveler configures notifications and alerts on the PARKAPP on an Android device.	Travelers	Release 1	EPM-UN015-V01 EPM-FN1901-V02 EPM-FN1902-V02 EPM-FN1903-V02 EPM-FN1904-V02	EPM-FN1941-V02: The PARKAPP and PARKWEB shall provide the Traveler the capability to configure notifications and alerts.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN015-V01	System	Demonstration	Parking reservation	Verify that PARKAPP allows travelers to select and pay only for selected period of time.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' and pan to the desired area to search for parking options. 2. Select a parking option. 3. Select date and time and payment information. 4. Click 'Reserve Your Spot' to confirm reservation for the selected date and time. <p><u>Zone parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to select parking facility. 2. Select a zone to park. 3. Enter duration by the hour and minute or can select maximum parking time. 4. Click 'Proceed to Checkout'. 5. On the next page, select payment method and click 'Start Parking.' <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select date and time while reserving for parking and pay for only the selected duration. <p><u>Post-condition:</u> Traveler pays only for the selected period of time and confirmation is presented to the traveler.</p>	Traveler selects the date and time to park and pays only for the selected time.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1922-V02: The PARKAPP and PARKWEB shall allow Travelers to pay for a specific period of parking time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN016-V01	Integration	Demonstration	Payments	Verify that traveler is able to pay for on-demand gated parking and activate the parking on the PARKAPP.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-MAN015-V01 to pay for on-demand gated parking. 2. At the selected parking garage, press the parking ticket button to collect parking ticket for the gate arm to open and enter the facility. 3. Open the on-demand booking, click 'Scan' to scan the parking ticket to activate the booked parking. 4. App shows the time the vehicle is parked at the facility. 5. When existing, scan the ticket to open the gate arm. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler is able to pay for on-demand parking through the app. 2. Payment is verified and the traveler is able to exit the parking facility. <p><u>Post-Condition:</u> Timer within the app stops after the parking ticket is scanned at the exit.</p>	PARKAPP is able to pay for an on-demand parking and scan the parking tickets and activate parking.	Travelers	Releases 3	EPM-UN027-V01 EPM-UN031-V01	EPM-FN1982-V02: The EPMCS shall be capable of mobile device payments, if supported by the Traveler's mobile device and the hardware used by the parking operator.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN017-V01	System	Demonstration	Parking reservation	Verify the PARKAPP provides confirmation of a parking reservation to the traveler.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-MAN015-V01 to reserve parking. 2. If payment is successful, a digital receipt of the reservation is displayed on the screen along with the amount paid and method of payment used and the reservation code. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be presented with a confirmation code and a receipt of payment with an email confirmation after reserving parking through the ParkColumbus app. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Parking reservation confirmation code along with an email confirmation of payment is provided to the traveler after reserving a parking place through PARKAPP.	Travelers	Release 1	EPM-UN006-V01 EPM-UN021-V01	<p>EPM-FN1914-V02: The EPMCS shall provide a response to the PARKAPP and PARKWEB of a confirmed reservation.</p> <p>EPM-FN1915-V02: The confirmation response provided to the PARKAPP and PARKWEB shall include a reservation confirmation code.</p> <p>EPM-FN1917-V02: The confirmation response provided to the PARKAPP and PARKWEB shall include notice of payment completion and amount.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN018-V01	System	Demonstration	Navigation	Verify that PARKAPP links to traveler's map-based navigation to direct the traveler to the designated parking location.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Select start time and end time and click 'Find Parking'. 3. Select one of the parking options displayed on the map. 4. On the next page, traveler selects 'Directions' to get the route to the parking location from current location. 5. When 'Directions' is clicked, traveler's map-based navigation app opens with the route information. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. ParkColumbus app should be able to open the target device map-based navigation system when traveler requests directions to the selected parking location. <p><u>Post-condition:</u> Traveler has navigated from the ParkColumbus app and is on his/her map-based navigation page.</p>	PARKAPP is linked to the traveler's map-based navigation on the Android device to provide directions to designated parking location.	Travelers	Release 1	EPM-UN008-V01	EPM-FN1964-V02: The PARKAPP and PARKWEB shall include the ability to link to map-based navigation on the traveler's smartphone/computer/tablet to direct the traveler to the designated parking location

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN019-V01	System	Demonstration	Payment	Verify that travelers can pay for the parking on the PARKAPP without redirecting to another web page.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-MAN015-V01 to reserve parking. 2. Traveler is on the ParkColumbus app from start to finish of the parking reservation. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to enter credit or debit card information and pay for the selected parking without redirecting to a different webpage. <p><u>Post-condition:</u> Traveler is still in the ParkColumbus app.</p>	Traveler completes the purchase of parking space within the PARKAPP without redirecting to another webpage.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1980-V02: Travelers shall be able to pay instantly without being redirected away from the PARKAPP and PARKWEB to complete a transaction.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN020-V01	System	Demonstration	Parking reservation	Verify the PARKAPP does not provide reservation confirmation code if payment for parking reservation is not complete.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Follow steps listed under EPM-MAN015-V01 to reserve parking. If payment is unsuccessful, the traveler is redirected to the checkout page and an error message is displayed on the screen. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> Traveler should receive an error upon an unsuccessful payment. Payment method used should not be charged with the parking reservation amount when the reservation is unsuccessful. <p><u>Post-condition:</u> Payment was not successful and traveler is on checkout page.</p>	Payment error message is displayed on the PARKAPP when the payment for parking reservation is not complete.	Travelers	Release 1	EPM-UN006-V01 EPM-UN021-V01	EPM-FN1916-V02: The EPMCS shall not provide a reservation confirmation code to PARKAPP and PARKWEB if payment is not complete.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN021-V01	System	Demonstration	Parking reservation	Verify that PARKAPP provides paid status of parking reservation to the traveler in real-time.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-MAN015-V01 to reserve parking. 2. If payment is successful, digital receipt of the reservation is displayed on the screen along with amount paid and method of payment used and reservation code. 3. Click 'Activity' and click 'Upcoming' on top to view upcoming parking reservations along with reservation codes in real-time. 4. An email confirmation with the paid status of the parking reservation should be received within two minutes of the reservation if selected in Notification Settings. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to view his/her upcoming parking reservations on their ParkColumbus app. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Traveler receives email confirmation with the paid status of the parking reservation within two minutes after reserving a parking space through PARKAPP on their Android device.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1921-V02: The EPMCS shall communicate the paid status of reservations to the PARKAPP and PARKWEB in real-time.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN022-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP provides email notification to travelers of reservation confirmation.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed under EPM-MAN014-V01 to allow for email notifications. 2. Follow steps listed under EPM-MAN015-V01 to reserve parking. 3. Email confirmation is received along with payment confirmation. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should receive email notification about the parking reservation. <p><u>Post-condition:</u> Traveler can use the email confirmation to access the parking facility for the reserved time.</p>	Traveler receive notification for the reservation confirmation.	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	EPM-FN1901-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of reservation confirmation.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN023-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP provides notifications to travelers of changes to existing booking.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u> Parking reservations should be made at least 3 hours ahead to be able to cancel a reservation.</p> <ol style="list-style-type: none"> Follow steps listed under EPM-MAN015-V01 to reserve parking for the next day. Click 'Activity' and select 'Upcoming'. Under 'Upcoming', select the parking reservation for cancellation. Click 'Cancel Reservation' and select 'Yes, cancel' to confirm cancellation. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> Traveler should be able to cancel reservation and see canceled activity. Traveler should receive an email confirmation for the canceled reservation. <p><u>Post-condition:</u> Reservation is canceled and traveler will receive an email for the cancellation confirmation.</p>	Traveler receive notification for any changes made to the existing reservation.	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	EPM-FN1902-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of changes to an existing reservation.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN024-V01	System	Demonstration	Event parking	Verify that event employees can enter event access code when booking parking associated with that event.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and an event employee is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Select start time and end time and click 'Find Parking'. 3. Locate and select a parking option displayed on the screen with a ticket symbol and select the event. Example: 2020 Columbus Marathon - October 18, 2020. 4. Click on 2020 Columbus Marathon. Click on 'Have Access Code?'. 5. Enter Access Code into the open text box. 6. Click on 'Apply'. 7. Several parking options are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Event employee is able to enter an access code for selected event. 2. Multiple parking options are displayed on the screen that allow parking for the selected event and accept the entered event access code. <p><u>Post-condition:</u> Event employee uses the access code to book parking space for an event.</p>	Event employee enters an event access code when reserving parking space for an event.	Travelers	Release 1	EPM-UN001-V01	<p>EPM-FN3272-V02: The PARKAPP and PARKWEB shall provide the ability for event employees to enter an access code associated with an event.</p> <p>EPM-FN3273-V02: The PARKAPP and PARKWEB provides event employees access to appropriate parking options after entering event access code associated with that event.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN025-V01	System	Demonstration	Search Options	Verify that PARKAPP allows travelers to get parking availability information in real-time without having an EPM profile.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is not logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' located on the bottom menu bar of the screen. 2. Zoom in to Downtown Columbus for zone parking options. 3. Map shows different colors of zone parking pins based on their probability of having open parking spaces. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be to see parking availability information without having to be logged in. 2. Traveler is presented with different zone colors based on the probability of finding an open parking meter spaces. <p><u>Post-condition:</u> Traveler is informed of parking availability without having to be logged in.</p>	Parking availability options presented to the traveler based on their probability of having open parking spaces	Travelers	Release 3	EPM-UN016-V01 EPM-UN002-V01 EPM-UN003-V01 EPM-UN017-V01 EPM-UN029-V01 EPM-UN030-V01	<p>EPM-FN1938-V02: Travelers shall be able to use the PARKAPP to get parking availability information without having an EPM profile.</p> <p>EPM-FN1963-V01: The PARKAPP shall provide an interactive map display showing real-time parking options.</p> <p>EPM-FN1908-V03: The EPMCS shall provide a visual indicator showing the probability of finding open parking meter spaces by specified area to the PARKAPP.</p> <p>EPM-FN3266-V00: The EPMCS shall provide on-street parking availability to the PARKAPP.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN026-V01	System	Demonstration	Parking reservation	Verify that PARKAPP does not allow travelers to reserve on-street parking.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to select parking meter zone. 2. Select a zone to park. 3. Verify that time cannot be reserved in the future. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to select a future date when reserving on-street parking. <p><u>Post-condition:</u> Traveler can select the parking duration and pay for on-street parking through ParkColumbus app.</p>	Traveler will not be able to select future date and time for on-street parking through PARKAPP on their Android device.	Travelers	Release 1	EPM-UN003-V01 EPM-UN006-V01	EPM-FN3267-V01: The PARKAPP and PARKEB shall not allow the reservation of on-street parking.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN027-V01	System	Demonstration	Parking reservation	Verify that PARKAPP allows travelers to pre-pay for the parking meters before the enforcement time up to the allowable timeframe.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and traveler is logged in.</p> <p><u>Procedure:</u> (City of Columbus parking meters enforcement time is 8 a.m. to 10 p.m. Pre-payment is only allowed 2 hr. before the enforcement time. This test should be performed between 6 a.m. and 8 a.m.)</p> <ol style="list-style-type: none"> 1. Click 'Park' to select parking facility. 2. Select a zone for which the enforcement time has not started. 3. Enter duration by the hour and minute or can select maximum parking time. 4. Click 'Proceed to Checkout'. 5. On the next page, select payment method and click 'Start Parking'. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able select the duration and pre-pay for that time before the enforcement time of the parking meter. <p><u>Post-condition:</u> Traveler should receive an email confirmation when the payment is successful.</p>	Traveler pre-pay for the parking meter before the enforcement time within the allowable timeframe which is 2 hr. in Columbus, Ohio.	Travelers	Release 1	EPM-UN031-V01	EPM-FN1977-V02: The PARKWEB and PARKAPP shall allow pre-payment of parking up to the allowable timeframe prior to paid parking operational hours.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN028-V01	System	Demonstration	Parking availability	Verify that PARKAPP will not allow travelers to purchase parking time when restricted parking times are in effect.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and select the active parking session under 'Active'. 2. Click 'Extend' to extend parking duration. 3. If there are any restrictions at the parking meter, parking restriction message is displayed on the screen and traveler will not be able to extend the parking meter time. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to extend the parking meter duration when parking restrictions are in place or are coming up during the requested time period. <p><u>Post-condition:</u> Traveler will need to select a different parking location due to parking restrictions at the current parking location.</p>	Traveler cannot extend parking meter time when restricted parking times are in effect.	Travelers	Release 1	EPM-UN006-V01 EPM-UN010-V01 EPM-UN011-V01 EPM-FN1905-V02	EPM-FN1907-V02: The PARKAPP and PARKWEB shall not allow purchase of parking meter time when restricted parking periods are in effect.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN029-V01	System	Demonstration	Parking Availability	Verify that EPMCS provides parking restrictions of each parking facility to the PARKAPP.	<p><u>Pre-condition:</u> Traveler has access to the ParkColumbus app and the traveler is logged in.</p> <p><u>Procedure:</u> <u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' and select a parking zone. 2. If there are any restrictions at the parking meter, parking restriction message is displayed on the screen and traveler will not be able to purchase the parking meter time. <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' and pan to the desired area to search for parking options. 2. Select date and time to reserve the space. 3. Only the parking locations that are available during the selected data and time are displayed on the map. 4. Traveler will not be able to reserve a parking facility outside the facility operating hours. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should not be able to purchase the parking meter duration when parking restrictions are in place or are coming up during the requested time period. 2. Traveler should not be able to reserve a parking location outside the facility operating hours. <p><u>Post-condition:</u> Traveler will need to select a different parking location due to parking restrictions at the current parking location.</p>	Travelers cannot purchase parking for zone parking or reservations when restrictions are in place for the selected location.	Travelers	Release 1	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	EPM-FN1895-V02: The EPMCS shall provide parking restrictions at each parking facility to the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN030-V01	System	Demonstration	Parking availability	Verify PARKAPP allows travelers to purchase additional parking meter time.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and select the active parking session under 'Active'. 2. Click 'Extend' to extend parking duration. 3. Selects the duration and pays for the parking either by adding a payment method or using the existing payment method. 4. Traveler will not be able to select duration more than the permitted time at that parking meter. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to extend the parking meter time through the ParkColumbus app. <p><u>Post-condition:</u> Parking meter time is extended and will receive notification as per the settings chosen.</p>	Traveler extend parking meter time through PARKAPP on an Android device.	Travelers	Release 1	EPM-UN006-V01 EPM-UN010-V01 EPM-UN011-V01 EPM-FN1907-V02	<p>EPM-FN1905-V02: The PARKAPP and PARKWEB shall allow purchase of additional parking meter time.</p> <p>EPM-FN1906-V03: The PARKAPP and PARKWEB shall not allow purchase of additional parking meter time past the maximum time allowed within mobile pay zones.</p>

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EPM-MAN031-V01	System	Demonstration	Notifications and alerts	Verify that PARKAPP provides notifications to travelers of warnings of expiration and expiration of paid parking based on preference selected (text, email, or push notifications).	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Settings' to select 'Notifications' under 'Profile'. 2. Select the type of notification (email, text or push notification) of parking reservation. Set the notification alert for time remaining to 5 minutes. 3. Click 'Park' and select a parking zone to book a parking meter. 4. Book a meter for 10 minutes and wait 5 minutes to verify that a notification of the parking expiring is received. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select notification type in the ParkColumbus app settings. 2. Traveler should receive warning notification for expiration of paid parking session as per the preferences chosen. 3. Traveler should receive notification for expiration of paid parking session as per the preferences chosen. <p><u>Post-condition:</u> Traveler receive notifications based on the preferences selected.</p>	PARKAPP provides notifications of warnings of expiration and expiration of paid parking based on the notifications and alerts selected (text, email or push notifications).	Travelers	Release 1	EPM-UN006-V01 EPM-FN1941-V02	<p>EPM-FN1903-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of warnings of expiration of paid parking session.</p> <p>EPM-FN1904-V02: The PARKAPP and PARKWEB shall be capable of notifying Travelers via text, email, or push notification of expiration of paid parking session.</p>
EPM-MAN032-V01	System	Test	Promotion codes	Verify that PARKAPP provides local merchants parking options at discounted price.	Vendor to work with local merchants to get the information on discounted parking options offered.	Local Merchants offer discounted parking options and are available on PARKAPP.	Local Merchants	Release 3	EPM-UN021-V01 EPM-FN3193-V02 EPM-FN3105-V02	EPM-FN1918-V02: The EPMCS shall allow local merchants to offer discounted parking options through the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN033-V01	System	Test	Promotion codes	Verify that PARKAPP allows travelers to purchase parking spaces that have discounted prices.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> Under 'Settings' click 'Promotion Codes'. Click the plus button in the lower right corner. Enter a promo code and click 'Save'. If invalid promo code is entered, an error message will be presented. Click the back arrow located on the top left corner of the screen and click 'Park' to select zone parking. Select a zone or on-demand parking facility to park. Enter duration by the hour and minute or can select maximum parking time. Click 'Proceed to Checkout'. On the next page, review payment method, vehicle information and total parking cost along with promo code discount. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> Traveler is able to purchase parking when a valid promo code is applied and discount is applied at the checkout. <p><u>Post-condition:</u> Traveler is presented with a confirmation of the parking reservation which shows the discount amount and total parking cost.</p>	Traveler is able to purchase parking spaces that discounted prices using promo codes.	Travelers	Release 1	EPM-FN1918-V02 EPM-UN021-V01	EPM-FN3105-V02: The PARKAPP and PARKWEB shall provide Travelers with the ability to activate discounted parking options.

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EPM-MAN034-V01	System	Demonstration	Promotion codes	Verify that EPMCS can validate and provide PARKAPP confirmation of discounted parking reservation.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Follow steps listed for test case ID: EPM-WEB033-V01 to pay for parking. 2. Click 'Activity' to view the active parking sessions. 3. Click 'i' to view parking details to review the parking amount and the discount applied. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Confirmation receipt shows the total parking cost reflects the discount applied using the promo code. <p><u>Post-condition:</u> As per the notifications set under 'Settings', traveler may also receive email, text or in-app notifications of parking details.</p>	Traveler is able to validate discount received from the confirmation details provided for the booked parking.	Travelers	Release 1	EPM-FN1918-V02 EPM-UN021-V01	EPM-FN3193-V02: The EPMCS shall validate the discounted parking options and provide confirmation of validation to the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN035-V01	System	Demonstration	Search options	Verify the PARKAPP allows travelers to search for parking options by frequently/preferred traveled locations.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to begin searching for the parking options. 2. Click 'Enter Zone Number'. 3. Click on 'Favorites' or 'Recent' which show zones that are used frequently. 4. Select a zone to star parking transaction. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to select favorite zone or recent zone to filter parking options. <p><u>Post-condition:</u> Frequently and recently traveled locations are displayed on the account.</p>	Traveler can select parking options using favorites and recent for zone parking on the PARKAPP.	Travelers	Release 1	EPM-FN1945-V03 EPM-UN015-V01	EPM-FN3096-V03: The PARKAPP and PARKWEB shall allow travelers to select preferred/frequently traveled zones.

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EPM-MAN036-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to store favorite searches on their account for easy retrieval.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and then click 'History' on top of the screen. 2. Click on a previously used parking zone. 3. Click 'Favorite'. 4. Enter nickname for this zone and click 'Save'. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to search for favorites under 'Park' within the app. <p><u>Post-condition:</u> Traveler will search and access favorite zones easily.</p>	Traveler can favorite zone parking for easy retrieval.	Travelers	Release 1	EPM-UN015-V01	EPM-FN1944-V01: The PARKAPP shall provide Travelers with the ability to store favorite searches for easy retrieval.

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EPM-MAN037-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to select amenities at parking spaces to filter search option.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u> <u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Click on the three lines on the top right-hand corner of the screen to access filter options. 3. Select desired amenities and click 'Show Results' to filter parking options by amenities. <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to look for available parking reservations. 2. Click on the three lines on the top right-hand corner of the screen to access filter options. 3. Select desired amenities and click 'Show Results' to filter parking options by amenities. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler will be able to select amenities to filter parking options for both, zone and reservation parking. <p><u>Post-condition:</u> Traveler selected amenities will be displayed on the map as possible parking options.</p>	Traveler is able to select amenities to filter for parking options.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN015-V01 EPM-FN3094-V03 EPM-FN3095-V03 EPM-FN3096-V03	EPM-FN1945-V03: The PARKAPP and PARKWEB shall provide travelers with the ability to select amenities that will be used to filter search results for parking options.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN038-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to filter parking options by parking garages, lots, and streets.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to look for available parking reservations. 2. Click the three lines on the top right-hand corner of the screen. 3. Select amenities such as 'Covered Parking' or 'Paved' and click 'Show Results' to filter parking options by amenities available at parking spaces. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Location Type' chose 'Lot/ Garage' and click 'Show Results'. 5. Only parking zones with the selected filters should show up and can be analyzed as potential parking options. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking zone options based on options selected. 2. Parking options displayed on the map have the selected amenities. <p><u>Post-condition:</u> Traveler can purchase a parking zone based on the filters chosen.</p>	Traveler is able to filter zone parking or reservations by parking garages, lots and streets.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN002-V01	EPM-FN1962-V02: The PARKAPP and PARKWEB shall provide the ability to filter by any combination of garages, lots, and streets.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN039-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to search for parking options by selecting a parking meter zone or parking loading zone.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Click 'Show Loading Zone' or 'Street Parking' and click 'Show Results.' 5. Only parking zones and loading zones are displayed on the map. 6. Map now shows parking meter zones (4 or 5 digit number) and loading zones (striped pin). <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking zone options by loading zone or parking meter zone. 2. Parking options displayed on the map have the selected amenities. <p><u>Post-condition:</u> Traveler can purchase a parking zone based on the filters chosen.</p>	Traveler is able to filter parking options by parking meter or loading zone.	Travelers	Release 3	EPM-UN008-V01	EPM-FN1949-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to search for parking options by selecting a parking meter zone or parking loading zone.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN040-V01	System	Demonstration	Loading zone	Verify that PARKAPP provides travelers loading zone locations, hours, and restrictions.	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' located on the bottom menu bar of the screen. 2. Click the three lines on the top right-hand corner of the screen. 3. Under 'More Options' turn on the 'Show Loading Zones' bar to show loading zones nearby. 4. Zoom in to Downtown Columbus to find a loading zone. 5. Click on one of the identified loading zones to open loading zone information. 6. Depending on the loading zone, information such as location, hours, and restrictions, if any, will be displayed on the screen. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to see loading zone details for the selected zone on the bottom of the screen. <p><u>Post-condition:</u> N/A</p>	Loading zone details are presented to the traveler.	Travelers	Release 3	EPM-UN004-V01	EPM-FN1961-V02: The PARKWEB and PARKAPP shall display loading zone locations, hours, and restrictions.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN041-V01	System	Demonstration	Search options	Verify the PARKAPP allows travelers to search for metered parking spaces (including on-street EV and ADA metered spaces).	<p><u>Pre-condition:</u> ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Features' chose 'EV Charging' and/or 'Accessible Parking' and click 'Show Results'. 5. Only parking zones with the selected filters are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to filter parking zone options based on options selected. 2. Parking options displayed on the map have the selected amenities. <p><u>Post-condition:</u> Traveler can purchase a parking zone displayed on the map with selected amenities.</p>	Zone parking options can be filtered for EV charging and ADA accessible spaces.	Travelers	Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN1959-V02: The PARKWEB and PARKAPP shall allow requests for locating metered parking spaces (including on-street EV and ADA metered spaces).</p> <p>EPM-FN1900-V03: The EPMCS shall provide access to ADA accessible parking spaces in accordance with standards for accessible design as determined by the ADA to the PARKAPP and PARKWEB.</p> <p>EPM-FN1899-V02: The EPMCS shall provide the location of electric vehicle charging stations to the PARKAPP and PARKWEB.</p>

EPM-MAN042-V01	System	Demonstration	Search options	Verify that PARKAPP allows travelers to filter parking spaces that are ADA accessible.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Click the three lines on the top right-hand corner of the screen. 3. Toggles to select 'Accessible Parking' under filter options and clicks 'Show Results'. 4. Parking options displayed on the map should be handicap accessible. 5. From the results shown on the map, click on a parking facility, and scroll down to the amenities to confirm ADA parking is listed under amenities. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Features' choose 'Accessible Parking' and click 'Show Results'. 5. Only parking zones with the selected filters are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map should be handicap accessible and should be in accordance with standards for accessible design as determined by the ADA. <p><u>Post-condition:</u></p>	PARKAPP on the Android device allows to filter parking options that are ADA accessible.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN3094-V03: The PARKAPP and PARKWEB shall allow Travelers to filter available parking spaces based on ADA compliance.</p> <p>EPM-FN1900-V03: The EPMCS shall provide access to ADA accessible parking spaces in accordance with standards for accessible design as determined by the ADA to the PARKAPP and PARKWEB.</p>
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TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
					Traveler can login to his/her account, apply filters and reserve for the parking.					
EPM-MAN043-V01	System	Demonstration	Search options	Verify the PARKAPP allows travelers to filter parking options based on the availability of EV charging.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <p><u>Reservations:</u></p> <ol style="list-style-type: none"> 1. Click 'Reserve' to start parking reservation. 2. Click the three lines on the top right-hand corner of the screen. 3. Toggle to select 'EV Charging' under filter options and click 'Show Results'. 4. Parking options displayed on the map have EV charging infrastructure to charge EVs. <p><u>Zone Parking:</u></p> <ol style="list-style-type: none"> 1. Click 'Park' to look for available parking zones. 2. Zoom in to Downtown Columbus until parking zones appear. 3. Click the three lines on the top right-hand corner of the screen. 4. Under 'Features' choose 'EV Charging' and click 'Show Results'. 5. Only parking zones with the selected filters are displayed on the map. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Parking options displayed on the map have EV charging facility. <p><u>Post-condition:</u> Map shows all the parking options which have EV charging facility.</p>	PARKAPP on an Android device allows travelers to filter parking locations that have EV charging facility.	Travelers	Reservations – Releases 1 Zone Parking – Release 3	EPM-FN1945-V03 EPM-UN015-V01 EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	<p>EPM-FN3095-V03: The PARKAPP and PARKWEB shall allow Travelers to filter available parking spaces based on availability of EV charging.</p> <p>EPM-FN1899-V02: The EPMCS shall provide the location of electric vehicle charging stations to the PARKAPP and PARKWEB.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN044-V01	System	Demonstration	User accounts	Verify that PARKAPP provides travelers access to transaction log consisting of a history of paid parking transactions, locations, and time and date.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' located on the bottom left corner of the screen. 2. On the landing page, traveler clicks 'History' to view 12 months of transactions including the history of paid parking transactions, locations, time and date. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to view transaction history for up to 12 months on his/her ParkColumbus app account. 2. Transactions viewed should be only for the past 12 months and not beyond 12 months. <p><u>Post-condition:</u> Transaction made for the past 12 months is displayed on the screen.</p>	PARKAPP provides access to paid parking transactions, locations and date and time of transactions for the past 12 months.	Travelers	Release 1	EPM-UN015-V01	<p>EPM-FN1942-V02: The PARKAPP and PARKWEB shall provide Travelers with access to a transaction log consisting of a history of paid parking transactions, locations, and time and date.</p> <p>EPM-FN1943-V01: The transaction log shall be limited to prior 12 months of transactions.</p>

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN045-V01	System	Demonstration	User feedback	Verify that PARKAPP provide travelers customer care contact information for any complaints.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Activity' and select any parking reservation from 'Active', 'Upcoming' or 'History'. 2. Select the parking session for which there is a parking complaint. 3. Scroll down to the end and click 'Call ParkMobile Customer Service' to call customer care or click 'Submit Support Request' to submit an online request. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to call customer care or submit an online request. <p><u>Post-condition:</u> Traveler talks to the customer care to resolve parking issues.</p>	PARKAPP provides access to ParkMobile customer care (phone number and online request support) to contact with parking issues.	Travelers	Release 1	EPM-UN012-V01	EPM-FN1951-V04: The PARKAPP and PARKWEB shall provide the traveler the ability to contact the customer care with complaints.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-MAN046-V01	System	Demonstration	User feedback	Verify that PARKAPP allows traveler to submit user feedback.	<p><u>Pre-condition:</u> The ParkColumbus app is open on the target device and the traveler is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Help' under 'Settings' to open ParkMobile Help page. 2. Click on the chat icon to chat with the customer service representative to provide comments or ask questions or scroll down to the bottom of the 'Help' page to find the 'Submit a Request' tab for comments and/or questions. <p><u>Pass Criteria:</u> Verification by four independent Android testers:</p> <ol style="list-style-type: none"> 1. Traveler should be able to submit an online request or chat with the customer service to provide comments or ask questions. <p><u>Post-condition:</u> Traveler submits an online request for comments and questions.</p>	Travelers are able to submit comments and questions through PARKAPP.	Travelers	Release 2	EPM-UN012-V01	EPM-FN1950-V02: The PARKAPP and PARKWEB shall provide the Traveler the ability to submit user feedback.

Source: City of Columbus

5.1.3. Parking Operator Application Test Cases

The OPAAP is a back-end application for the gated parking facility system (GFAC) and ungated parking facility system (UFAC) (parking operators to update the parking facility, reservations and payment information which is reflected in the EPMCS). The test cases shown in **Table 11** are planned for OPAPP.

Table 11: OPAPP Test Cases

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE001-V01	Integration	Demonstration	Data	Verify that Parking Operators have access to EPMCS through OPAPP.	<p><u>Pre-condition:</u> Parking Operators have access to OPAPP.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Parking Operators log in to the OPAPP account. 2. Parking Operators click 'Manage Profile' to access their parking facility information. 3. Parking Operators receive all the parking reservations data, transaction data and pricing information in their OPAPP account. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Parking Operators log in to their OPAPP account and has access to their parking account information. <p><u>Post-condition:</u> ParkColumbus web and app is updated with parking information made in OPAPP.</p>	Parking Operators can log in to the OPAPP.	Parking Operator, Technical	Release 2	EPM-UN021-V01	EPM-FN1972-V01: Parking Operators shall be able to interface with the EPMCS through the OPAPP.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE002-V01	System	Demonstration	Parking Information	Verify that Parking Operators can enter the parking rates and schedules in real-time through the OPAPP.	<p><u>Pre-condition:</u> Parking Operators are logged into their OPAPP account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Parking Operators Click 'Manage Policies' and select parking facility. 2. Select the zone to enter parking rates and schedules. 3. Enter parking rates and schedules for the selected parking facility and click 'Publish'. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Parking Operators have access to OPAPP account. 2. Parking Operators can enter, modify and save parking rates and schedules in OPAPP in real-time. 3. Technical tester to confirm the parking rates are reflected in the ParkColumbus app and web. 4. Parking rates should be updated in EPMCS within two minutes of updating in the OPAPP. <p><u>Post-condition:</u> ParkColumbus web and app is updated with parking information made in OPAPP.</p>	Parking Operators enter parking rates information through OPAPP and update EPMCS in real-time.	Parking Operator, Technical	Release 2	EPM-UN020-V01	EPM-FN1973-V01: Parking Operators shall be able to enter and modify event rates and schedules in real-time through the OPAPP.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE003-V01	System	Demonstration	Event Information	Verify that Parking Operators can create "to be determined" events for events with no information yet available.	<p><u>Pre-condition:</u> Parking Operators are logged into their OPAPP account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Parking Operators create a new event and enter 'To be determined' for event information. 2. Click 'Publish' to publish this information to ParkColumbus app and web. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Parking Operator has access to update event information when available to ParkColumbus app and web through EPMCS. <p><u>Post-condition:</u> ParkColumbus web and app is updated with event parking information made in OPAPP.</p>	Parking Operators logs in to OPAPP and create events and name 'to be determined' when information not available.	Parking Operator, Technical	Release 2	EPM-UN018-V01	EPM-FN3270-V00: The EPMCS shall provide the ability for Parking Operators to create "to be determined" events where date and time are unknown, or date is known but time has yet to be announced.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE004-V01	System	Demonstration	Event Information	Verify that Parking Operators can modify "to be determined" events to enter known information of the events.	<p><u>Pre-condition:</u> Parking Operators are logged into their OPAPP account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Parking Operators edit event information. 2. Click 'Publish' to publish this information to ParkColumbus app and web. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Parking Operator has access to update event information when available to ParkColumbus app and web through EPMCS. <p><u>Post-condition:</u> ParkColumbus web and app is updated with event parking information made in OPAPP.</p>	Parking Operators logs in to OPAPP and modifies event information.	Parking Operator, Technical	Release 2	EPM-UN018-V01	EPM-FN3271-V00: The EPMCS shall provide the ability for Parking Operators to modify "to be determined" events when date/time becomes known.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE005-V01	System	Demonstration	Data updates	Verify that there is no system downtime updating PARKAPP and PARKWEB when EPMCS is modified via the OPAPP.	<p><u>Pre-condition:</u> Parking operators have access to OPAPP. The ParkColumbus app is open on the target device.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Parking operators make changes to the parking reservations for a parking facility through OPAPP. 2. Parking operators save changes to the modifications to the OPAPP. 3. Traveler opens the ParkColumbus app. 4. Click 'Reserve' and locate the parking facility for which changes were made in the OPAPP. 5. Make sure changes are reflected in the ParkColumbus app and web to the parking facility match the changes in the OPAPP within two minutes of the update. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Confirm the changes made in the OPAPP are reflected in the ParkColumbus app and web within two minutes. <p><u>Post-condition:</u> ParkColumbus app and web is updated with parking reservations information made through OPAPP.</p>	Parking information is updated in OPAPP and PARKAPP and PARKWEB are updated within two minutes of updating the data.	Parking Operator, Traveler	Release 3	EPM-UN020-V01 EPM-UN021-V01	EPM-FN1923-V02: The EPMCS shall update the PARKAPP and PARKWEB without any system downtime or data latency when data is entered or modified in the EPMCS via the OPAPP.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE006-V01	System	Demonstration	Pricing	Verify that EPMCS allows City of Columbus admin to modify parking meter pricing based on demand.	<p><u>Pre-condition:</u> City of Columbus administrator has access to EPMCS administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Manage Policies'. 2. The landing page shows the all the parking zones. 3. Under search bar, enter the policy or location name, address or zone number. 4. Selected the Zone, click 'Create Rate'. 5. Enter name of the new rate and click 'continue'. 6. On the next step, select rate type: Charge by the 'day', 'hour' or 'minute'. 7. Select the price increment by each day, hour or by minute. 8. Enter days and hours and click 'Publish' to publish information to the ParkColumbus app and web. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. City of Columbus has access to set parking meter prices in the EPMCS based on the demand for parking at that location. <p><u>Post-condition:</u> New rates for the selected parking facility are published on the ParkColumbus app and web set the by the City of Columbus administrator.</p>	Authorized individuals update parking meter pricing based on demand within EPMCS.	Technical Testers	Release 2	EPM-UN022-V01	EPM-FN1924-V02: The City shall have the ability to set demand-based pricing for meters in the OPAPP, allowing rates to be increased or decreased based on demand for parking.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE007-V01	System	Demonstration	Data storage	Verify that EPMCS is capable of storing and retrieving of data from PARKAPP and PARKWEB.	<p><u>Pre-condition:</u> EPMCS system administrator has access to EPMCS administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Financial Reporting' or 'Operational Reporting'. 2. Administrator will be able to retrieve data for approved transactions for all accounts either by filtering payment methods used or by filtering approved transactions through financial reporting. 3. Administrator will be able to retrieve data for recent performance, transactions stats, and historical performance for the last 12 months. 4. A report will be generated based on the filter selection. 5. The displayed data can be exported to a spreadsheet for storing and performance measure purposes. <p><u>Pass Criteria:</u> Verification by three independent testers (iOS, Android, and Web):</p> <ol style="list-style-type: none"> 1. EPMCS administrator has access to financial and operational reports and the reports can be retrieved and stored through EPMCS. <p><u>Post-condition:</u> Financial and Operational reports are displayed on the screen.</p>	Authorized individual logs into the EPMCS account and accesses stored data and is also able to retrieve stored data.	Technical Testers	Release 2	EPM-UN019-V01	EPM-FN1920-V02: The EPMCS shall provide data storage and retrieval for the PARKAPP and PARKWEB.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE008-V01	System	Demonstration	Policy and Compliance	Verify that PARKAPP and PARKWEB provide the ability to reserve parking in accordance with the policies of individual facilities.	<p><u>Pre-condition:</u> EPMCS administrator has access to administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Manage Policies'. 2. The tab provides overview of all accounts included in the portfolio. 3. Click on an account, to edit policy information, event rates and recurring prices. 4. Click 'Publish' to update the information to the ParkColumbus app and web. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. EPMCS administrator confirms that Terms and Conditions and Privacy Policies are presented to the user. 2. Confirm that those policies are in accordance with the policies of individual facilities. <p><u>Post-condition:</u> EPMCS provides policies for different parking facilities to the ParkColumbus app and web for travelers to follow when reserving and parking at the parking facilities.</p>	Authorized individuals have access to parking facility policies to edit in accordance with the policies of individual parking facilities.	Technical Testers	Release 2	EPM-UN006-V01	EPM-FN1966-V02: The PARKAPP and PARKWEB shall provide the ability to reserve parking in accordance with the policies of individual facilities.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE009-V01	System	Demonstration	Policy and Compliance	Verify that ParkColumbus app and ParkColumbus web provides parking in accordance with the policies of individual facilities, parking rates, and payment methods.	<p><u>Pre-condition:</u> EPMCS system administrator has access to administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Manage Policies'. 2. The tab provides overview of all accounts included in the portfolio. 3. Click on an account, to edit policy information, event rates and recurring prices. 4. Click 'Publish' to update the information to the ParkColumbus app and web. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. EPMCS administrator has access to edit and update policies of individual facilities, parking rates, and payment methods and upload it to the ParkColumbus app and web. <p><u>Post-condition:</u> Policy information is update as per the individual parking facilities in the EPMCS.</p>	Authorized individuals have access to EPMCS admin account to update policies in accordance with the policies of individual facilities, parking rates, and payment methods.	Technical Testers	Release 2	EPM-UN006-V01	EPM-FN1967-V02: The PARKAPP and PARKWEB shall allow Travelers to pay for parking in accordance with the policies of individual facilities, parking rates, and payment methods.

TEST CASE ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-OPE010-V01	System	Demonstration	Parking Confirmation	Verify that parking operators at GFAC can confirm parking reservations from the EPMCS.	<p><u>Pre-condition:</u> GFAC parking operators are logged into their EPMCS account.</p> <p><u>Procedure:</u> 1. GFAC parking operators analyze reservation data from travelers.</p> <p><u>Pass Criteria:</u> Verification by four independent testers: 1. Parking Operator at GFAC have access to all reservation confirmations.</p> <p><u>Post-condition:</u> GFAC is able to confirm traveler's reservation when parking at the facility.</p>	Parking reservations made through PARKAPP and PARKWEB can be verified by the GFAC.	Parking Operator, Technical	Release 3	EPM-UN006-V01 EPM-UN021-V01 EPM-UN018-V01 EPM-CN1675-V01	EPM-FN1912-V01: The GFAC shall confirm reservations with the EPMCS.
EPM-OPE011-V01	System	Demonstration	Parking Confirmation	Verify that parking operators at UFAC can confirm parking reservations from the EPMCS.	<p><u>Pre-condition:</u> UFAC parking operators have access to OPAPP.</p> <p><u>Procedure:</u> 1. UFAC parking operators analyze reservation data from travelers.</p> <p><u>Pass Criteria:</u> Verification by four independent testers: 1. Parking Operator at UFAC have access to all reservation confirmations.</p> <p><u>Post-condition:</u> UFAC is able to confirm traveler's reservation when parking at the facility.</p>	Parking reservations made through PARKAPP and PARKWEB can be verified by the UFAC.	Parking Operator, Technical	Release 3	EPM-UN006-V01 EPM-UN021-V01 EPM-UN018-V01 EPM-CN1675-V01	EPM-FN1913-V01: The UFAC shall confirm reservations with the EPMCS.

Source: City of Columbus

5.1.4. Policy, Compliance and Administration

In addition to the web portal and mobile apps, the EPM central system will also be tested from the view of the system administrator and other administrator-related functions common during service operations. The EPMCS will also be tested for policies and compliance followed for the parking reservations and payment. For testing the following test cases, which involve security access to application central system, is coordinated with the vendor. Vendor will be live and on-call screensharing with the testing team to go through each test case and each step of the test procedure to test the administration related requirements. The following test cases are planned for administrative access.

Table 12: Test Cases for Policy, Compliance and Administration

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM001-V01	System	Demonstration	Administrative Access	Verify authorized individuals have permit to close any traveler profile from EPMCS due to inactivity or abuse of policies.	<p><u>Pre-condition:</u> EPMCS administrator has access to secured EPMCS administrative account and is logged in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> To close any travelers account, City administration call the ParkMobile administrator. ParkMobile administrator will look into the traveler's profile and make sure there is inactivity or abuse of policies listed to the account. Only ParkMobile administrator has access to close any traveler's profile. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> ParkMobile administrator can close or block any traveler's account due to prolonged inactivity or abuse of policies. <p><u>Post-condition:</u> Traveler will be notified about closing or blocking of the account.</p>	Authorized individuals from City of Columbus have access to close traveler's profile from EPMCS.	Technical Testers	Release 1	EPM-UN015-V01 EPM-FN1925-V02	EPM-FN1936-V02: The EPMCS shall permit authorized individuals to close any Traveler profile (e.g. due to prolonged inactivity or abuse of policies).

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM002-V01	System	Demonstration	Administrative Access	Verify that authorized individuals at City have a secure administrative account to the EPMCS.	<p><u>Pre-condition:</u> ParkMobile sends link to EPMCS portal to the City of Columbus authorized user along with username and temporary password to log in.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Authorized user at the City opens the link to the EPMCS portal. 2. Logs in with provided username and temporary password. 3. Landing page requests the authorized user to create a new password. 4. When creating a password, password must contain a minimum of few characters making it a secure access. 5. Agree to terms and conditions. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. City of Columbus authorized individual should create a new password once authorization is provided. <p><u>Post-condition:</u> City of Columbus has a secure administrative account to the EPMCS.</p>	Authorized individuals at City of Columbus will access EPMCS and log in to their account with their secure login information.	Technical Testers	Release 2	EPM-UN030-V01	EPM-FN3097-V01: The EPMCS shall provide a secure administrative account for authorized individuals at the City.

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM003-V01	System	Demonstration	Administrative Access	Verify authorized individuals have permit to block any parking providers from EPMCS due to abuse of policies.	<p><u>Pre-condition:</u> EPMCS administrator has access to the EPMCS administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> To close any parking provider's account, City administration call the ParkMobile administrator. ParkMobile administrator will look into the parking operators' profile and make sure abuse of policies listed to the account. Only ParkMobile administrator has access to close or block any parking provider's profile. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> ParkMobile administrator can close or block any parking provider from using the EPM system due to abuse of policies. <p><u>Post-condition:</u> Parking provider will be notified of closing or blocking of the account.</p>	Authorized individuals from City of Columbus have access to block parking providers from EPMCS.	Technical Testers	Release 1	EPM-UN030-V01	EPM-FN3098-V01: The EPMCS shall allow the administrative account to block any parking provider from using the EPM system due to abuse of policies.

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM004-V01	API	Demonstration	Parking facility information	Verify that EPMCS provides parking facility location information to the PARKAPP and PARKWEB.	<p><u>Pre-condition:</u> EPMCS administrator is logged into EPMCS administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Parking facility location information is available through an API and is integrated into the EPMCS. 2. Backend EPMCS system is updated with new API with any changes to location information. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Parking facility location information is available through an API and is integrated into the EPMCS. 2. EPMCS is integrated into the ParkColumbus web and ParkColumbus app to update off-street parking facility location information with no system downtime. <p><u>Post-Condition:</u> ParkColumbus app and web is updated with the parking location restriction information.</p>	Authorized individuals update parking facility information within EPMCS to update parking information in PARKAPP and PARKWEB.	Technical Testers	Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN004-V01 EPM-UN008-V01 EPM-UN020-V01 EPM-UN030-V01	EPM-FN1893-V02: The EPMCS shall provide parking facility location information to the PARKAPP and PARKWEB.

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM005-V01	System	Demonstration	Parking facility information	Verify that EPMCS provides parking facility hours of operation to the PARKAPP and PARKWEB.	<p><u>Pre-condition:</u> EPMCS administrator is logged into EPMCS administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Click 'Manage Policies'. 2. Under search tab, enter the zone number or parking address and hit 'Enter'. 3. Click on the parking location to open the settings and price zone information. 4. Edit pricing and parking restriction information and timings. 5. Click 'Publish' to update parking information to the ParkColumbus app and web. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. EPMCS is integrated into the ParkColumbus web and ParkColumbus app to update off-street parking facility hours of operation information with no system downtime. <p><u>Post-Condition:</u> ParkColumbus app and web is updated with the new parking hours for the selected facility.</p>	Authorized individuals update parking facility hours of operation within EPMCS to update parking information in PARKAPP and PARKWEB.	Technical Testers	Release 3	EPM-UN001-V01 EPM-UN003-V01 EPM-UN020-V01 EPM-UN030-V01	EPM-FN1894-V02: The EPMCS shall provide parking facility hours of operation to the PARKAPP and PARKWEB.
EPM-ADM006-V01	Unit	Inspection	Policy and Compliance	Verify that applicable elements of the PARKWEB and PARKAPP comply with relevant accessibility requirements of Section 508 of the Rehabilitation Act of 1973.	Verified through vendor documentation	Authorized individuals verified that the applicable elements of the PARKWEB and PARKAPP comply with relevant accessibility requirements of Section 508 of the Rehabilitation Act of 1973.	Technical Testers	Release 3	EPM-UN001-V01	EPM-FN1953-V03: Accessibility audits of the mobile and web applications will occur by external third-party auditors and internal auditors relative to Section 508 of the Rehabilitation Act of 1973.

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM007-V01	Unit	Inspection	Policy and Compliance	Verify that PARKWEB's user interface is AA compliant with the relevant sections of the WCAG 2.0 guidelines.	Verified through vendor documentation	Authorized individuals verified that PARKWEB's user interface is AA compliant with the relevant sections of the WCAG 2.0 guidelines.	Technical Testers	Release 3	EPM-UN001-V01	EPM-FN1954-V03: Accessibility audits of the mobile and web applications will occur by external third-party auditors and internal auditors relative to the WCAG 2.0 guidelines.

TEST ID	TEST TYPE	VERIFICATION METHOD	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	RELEASE	USER NEEDS TRACEABILITY	REQUIREMENT TRACEABILITY
EPM-ADM008-V01	Integration	Demonstration	Operating System	The calculation of predicted availability for metered parking shall be based on data related to occupancy, availability, and historic transaction data.	<p><u>Pre-condition:</u> EPMCS administrator is logged into EPMCS administrative account.</p> <p><u>Procedure:</u></p> <ol style="list-style-type: none"> 1. Operating System team collects data sets related occupancy, availability and historic transaction data. 2. Operating System team created an algorithm to have the predictive availability for each parking zone using the data sets collected. 3. City of Columbus Division of Parking Services team used the output from the algorithm to verify with the field data in real-time. 4. The field data check is performed for multiple weekdays and weekends different times of the days and the results were also used to update the algorithm. 5. API of the predictive availability information from the Operating System for each parking zone is sent to EPMCS. 6. Information is injected into EPMCS which is then displayed then on PARKAPP. <p><u>Pass Criteria:</u> Verification by four independent testers:</p> <ol style="list-style-type: none"> 1. Related data sets are used to calculate the parking availability information. <p><u>Post-Condition:</u> Parking availability information is available on PARKAPP.</p>	Predictive availability information is 85% accurate to the real-time data.	Technical Testers	Release 3	EPM-UN003-V01 EPM-UN004-V01	EPM-FN1911-V03: The calculation of predicted availability for metered parking shall be based on data related to occupancy, availability and historic transaction data.

Source: City of Columbus

Appendix A. Test Result Summary

This appendix outlines how the test results for each test scenario, the defect management tool, test metrics, exit criteria, and test results conclusions and sign-offs will be shown in the Test Report.

A.1. TEST RESULTS

A.1.1. EPM Test Case Report

This section identifies the test results for each of the test cases. The test cases will focus on the functionality of each essential function. All functions will be tested under the leadership of the system owner and test manager. The test manager will test each test case from the perspective of the traveler or parking operator. Throughout this process, any bugs, inconsistencies, errors, or the like that were detected were captured in the defect tool and reported to the development team. The development team modified, updated, and enhanced the software to address issues that occurred during testing.

Table 13 provides a detailed log of the final results of testing for each test case listed in Section 5.1.

Table 13: Test Case Results Matrix

TEST ID	FEATURE	TEST OBJECTIVE	TEST PROCEDURE	METRIC	TESTER ROLE	DATE RUN	TEST STATUS	TESTING COMMENTS

Source: City of Columbus

A.2. DEFECT MANAGEMENT TOOL

The defect tool will be used during testing to capture, track, monitor, and address anomalies observed during the testing period. For each entry, the development team will work to understand and reproduce (where possible) the defect, identify the root cause, summarize a response, and log the activities taken to resolve the issue. As outlined in Section 3.6.2, the defect tracker helps prioritize defects based on severity level (critical to low) and

maintains traceability to the test ID and status. The status field provides a simplified view of the states a defect passes through as it moves toward resolution and closure. A defect can have the following status values:

- **Opened** – Indicates the defect has been logged and reported for correction.
- **Re-opened** – Indicates a defect was once closed and then re-opened for modification.
- **Closed** – Indicates a potential defect was received, reviewed, and determined to be not a defect (e.g., it was a duplicate entry or a request for enhancement). In these cases, no corrective action is taken, and the development team provides an explanation and closes out the defect ticket.
- **Canceled** – Indicates a scenario or test case for which the defect derived was canceled and therefore the defect is canceled by default.
- **Resolved** – Indicates a defect has been successfully reviewed and verified, and that a resolution was implemented to solve the problem; the resolution date (when the defect was corrected) is provided.
- **Returned** – Indicates the defect was returned to the tester for additional information.
- **Deferred** – Indicates the defect was designated for correction later.

When a conflict arises between a design element that is tied to a requirement and the software product, the development manager will coordinate with the test manager to determine whether a change to the system design and/or requirement is appropriate. The test manager carefully reviews all requests to make a change that might affect the system design and requirements. All CRs will be captured in the change logger tool.

Table 14 provides an overview of the defects captured and closed or resolved during testing.

Table 14: Defect Management Matrix

DEFECT NO.	DEFECT DESCRIPTION	SEVERITY	DEFECT STATUS	TEST ID	RESOLUTION DESCRIPTION

Source: City of Columbus

A.3. CHANGE REQUEST LOG

Table 15 documents the CRs that were captured, evaluated, and substantiated throughout the testing life cycle.

Table 15: Change Request Log

CR ID	DESCRIPTION	JUSTIFICATION	DEFECT ID	REQUIREMENT ID	STATUS

Source: City of Columbus

A.4. OUTSTANDING ISSUES

This section discusses any open defects the project is tracking, along with the reason the defects remain open.

Table 16: Outstanding Issues

DEFECT ID	DEFECT DESCRIPTION	SEVERITY	DEFECT STATUS	NOTES

Source: City of Columbus

A.5. ENHANCEMENTS

Table 17 discusses any requests for enhancement the project is tracking along with the reason it remains open. Outstanding issues are not the result of failed functionality, but feedback from the test team on how to improve the application.

Table 17: Enhancements

ENHANCEMENT ID	ISSUE DESCRIPTION	JUSTIFICATION	TEST ID	STATUS

Source: City of Columbus

A.6. TEST METRICS

This section identifies the test summary resulting from executing the Test Plan.

Table 18: Test Results Summary

		Total Planned	In Progress	Total Passed	Total Failed	Total Deferred	Total Canceled
ParkColumbus App on Apple Device	Total Number of Tests						
	Percentage						
ParkColumbus App on Android Device	Total Number of Tests						
	Percentage						
ParkColumbus Web Portal	Total Number of Tests						
	Percentage						
OPAPP	Total Number of Tests						
	Percentage						
Policy, Compliance and Administrator	Total Number of Tests						
	Percentage						
Total	Total Number of Tests						
	Percentage						

Source: City of Columbus

Table 19: Defect Matrix, Open or Closed

Defect Status	Total	High	Medium	Low
Open				
Closed				
Canceled				
Resolved				
Deferred				

Source: City of Columbus

Table 20: Change Request Status

CR Status	No. of CRs
Submitted	
Approved	
Total	

Source: City of Columbus

A.7. EXIT CRITERIA

This section gives the conditions that were fulfilled so as to stop testing.

Table 21: Test Exit Criteria

Criteria	Met/Not Met
All planned test cases and scenarios have been executed	
All planned test scenarios achieve a 95% pass ratio (in relation to failures)	
All defects found have been recorded in the defect management tool	
All high-severity defects have been resolved and retested	

Criteria	Met/Not Met
Outstanding issues have a plan and schedule for resolution	

Source: City of Columbus

A.8. TEST ACCEPTANCE

This section confirms that the information being reported on this UAT is correct and grants permission for the project to move forward with the production deployment.

Table 22: Test Sign-offs

Tester	Role	Name	Date	Signature
System Owner	City of Columbus representative overseeing the completion of all projects and testing.	Ryan Bollo		
Test Manager	Develops testing report summaries and scheduling	Sai Geetha Koganti		
Technical Tester	A technically advanced user able to perform advanced system tests, such as validate point-to-point data protection.	Jarred Olson		

Source: City of Columbus

Appendix B. Terminology and Conventions

B.1. NUMBERING CONVENTION

Each testing element contains a unique identifier for traceability and configuration management. Test cases and scenarios for all projects in the Smart Columbus program will follow the same convention, each representing an identifiable attribute of the traced metric. The convention is shown in **Figure 2**.

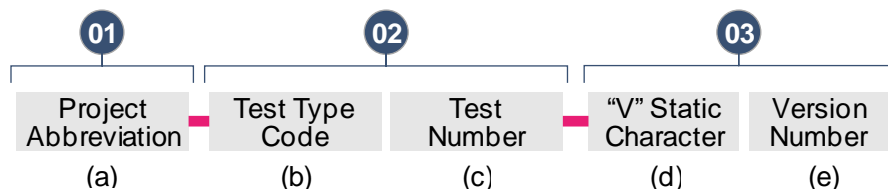


Figure 2: Numbering Convention

Source: City of Columbus

Table 23: Numbering Convention Definitions

Octet	Description	Data Type, Casing	Number of Characters or Digits
a. Project Abbreviation	The designated Smart Columbus project acronym (i.e., EPM).	String, upper case	Variable
b. Test Type Code	WEB: Test Case for the web portal MAP: Test Case for the Apple mobile app MAN: Test Case for the Android mobile app OPE: Test Case for OPAPP ADM: Test Case policy, compliance and administration function	String, upper case	3
c. Test Number	An integer in a set of integers that increment by one, indicating the number of requirements established.	Integer	3
d. "V" Static Character	Static letter "V" represents the version for the particular test objective and procedure.	Character	1
e. Version Number	An integer in a set of integers that increments by one, indicating the number of revisions made to the test element being traced.	Integer	2

Source: City of Columbus

An example of a test case for the web portal would be EPM-WEB001-V01.

1. “EPM” is the project abbreviation.
2. “WEB001” is the test type code coupled with the three-digit test number for a web portal test case.
3. “V01” is the static “V” coupled with the two-digit version number.

Appendix C. Acronyms and Definitions

Table 24 contains project-specific acronyms used throughout this document.

Table 24: Acronym List

Abbreviation/Acronym	Definition
ADA	Americans with Disabilities Act
API	application programming interface
ConOps	Concept of Operations
COVID-19	Coronavirus
CPS	[Smart Columbus] Common Payment System
CR	change request
DPP	Data Privacy Plan
EPM	Event Parking Management
EPMCS	Event Parking Management Central System
EV	Electric Vehicle
GFAC	gated parking facility system
GPS	global positioning system
ID	test identifier
IEEE	Institute of Electrical and Electronics Engineers
NFC	near-field communication
OPAPP	Parking Operator Application
Operating System	[Smart Columbus] Operating System
PR	performance requirement
RTM	Requirements Traceability Matrix
SLA	service-level agreement
SyRS	System Requirements
UAT	User Acceptance Testing
UFAC	ungated parking facility system

Source: City of Columbus

Appendix D. Glossary

Table 25 contains project-specific terms used throughout this document.

Table 25: Glossary

Term	Definition
311 Columbus call center	The City of Columbus Service Center, which is the single point of contact for requesting all non-emergency City services and is available to residents, City businesses, and visitors.
Agile	A method of project management characterized by the division of tasks into short phases of work and frequent reassessment and adaptation of plans.
Parking facility	Land or a structure used for light-duty vehicle parking.
Parking management system	A system intended to aggregate location, availability, payment information, and reservation capabilities across all public and private parking options.
Real-time data	Information delivered immediately after collection.
Test number	An integer in a set of integers that increment by one, indicating the number of tests established.
Travelers	The travelers (residents and visitors) in Columbus who will be interacting with the EPM system to view, plan, reserve, and navigate to desired parking.
Testing version number	An integer in a set of integers that increment by one, indicating the number of revisions made to a test case or scenario.
"V" static character	Static letter "V" represents the testing version number.

Source: City of Columbus



THE CITY OF
COLUMBUS^{*}
ANDREW J. GINTHER, MAYOR