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Providing local push notifications for crew members of a mass transportation vehicle

Abstract

Provided herein are techniques to facilitate sending notifications to one or more wireless crew devices for travel crew members that may be assigned to provide passenger services for a duration of travel involving a mass transportation vehicle. In one instance, a method may include identifying, by a wireless device and based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for a duration of travel involving a vehicle and registering with a notification server of the vehicle to receive the local push notifications in which the local push notifications that are to be received by the wireless device are based on a role of the travel crew member for the duration of travel and are based on location(s) of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services.

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References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
9665998	12/2016	Shields et al.	N/A	N/A
10051421	12/2017	Pinard	N/A	H04W 4/029
11101874	12/2020	Yerli	N/A	N/A
2017/0228804	12/2016	Soni et al.	N/A	N/A
2018/0287986	12/2017	Yoon et al.	N/A	N/A
2019/0379584	12/2018	Fischer et al.	N/A	N/A
2022/0038399	12/2021	Sain	N/A	H04L 65/4046
2023/0259835	12/2022	Kasbe	705/5	G06N 5/022

OTHER PUBLICATIONS

Qutheory, LLC, "Vapor," https://vapor.codes/, retrieved on Feb. 21, 2024, 4 pages. cited by applicant
Apple, Inc., "Receiving Voice and Text Communications on a Local Network," Apple Developer Documentation, https://developer.apple.com/documentation/networkextension/local_push_connectivity/receiving_voice_and_text_communications_on_a_local_networ retrieved on Feb. 21, 2024, 3 pages. cited by applicant
Apple, Inc., "Local push connectivity," Apple Developer Documentation, https://developer.apple.com/documentation/networkextension/local_push_connectivity, retrieved on Feb. 21, 2024, 3 pages. cited by applicant

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Background/Summary

PRIORITY CLAIM (1) This application claims the benefit of priority under 35 U.S.C. § 119 (e) to U.S. Provisional Patent Application No. 63/503,987, filed on May 24, 2023, which application is hereby incorporated by reference in its entirety.

TECHNICAL FIELD
(1) The present disclosure relates to network equipment and services for mass transportation vehicles.
BACKGROUND
(2) Mass transportation vehicles typically offer different amenities and services to passengers, such as food and beverage services. With the development of new electronic networking architectures, there are new opportunities to provide or augment different amenities and services that can be provided to passengers of mass transportation vehicles.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) FIG. **1**A is a block diagram of a connected cabin system that may facilitate local push notifications for crew members of a mass transportation vehicle for a duration of travel involving the vehicle, according to an example embodiment.
(2) FIG. **1**B is a diagram of a portion of a mass transportation vehicle, such as an aircraft, in which the connected cabin system of FIG. **1**A may be implemented, according to an example embodiment.
(3) FIG. **2**A is a message sequence diagram illustrating various operations that may be performed in order to facilitate registration for local push notifications by a wireless crew device of a travel crew member for a mass transportation vehicle, according to an example embodiment.
(4) FIG. **2**B is a schematic diagram illustrating an example notification registration message format that may be utilized to register for local push notifications by a wireless crew device of a travel crew member for a mass transportation vehicle, according to an example embodiment.
(5) FIG. **3** is a block diagram illustrating example operations that may be performed to facilitate receiving a passenger request and providing a local push notification for a wireless crew device of a travel crew member for a mass transportation vehicle, according to an example embodiment.
(6) FIG. **4** is a message sequence diagram illustrating various operations that may be performed in order to facilitate local push notifications wireless crew device of a travel crew member for a mass transportation vehicle, according to an example embodiment.
(7) FIG. **5** is a flowchart depicting a method according to an example embodiment.
(8) FIG. **6** is a hardware block diagram of a computing device that may perform functions associated with any combination of operations discussed in connection with techniques described for embodiments herein.
DETAILED DESCRIPTION
Overview
(9) Provided herein are techniques through which local push notifications can be enabled for wireless devices of one or more crew members that may be providing passenger services (e.g., food/beverage service, etc.) for passengers traveling on a mass transportation vehicle for a duration of travel involving the vehicle. In various example embodiments, a mass transportation vehicle may include aircraft, busses, ships, trains, or any other vehicle capable of transporting a plurality of passengers for a duration of travel involving multiple geographic locations or, more generally, any mass transportation device capable of traveling via any combination of air, water, and/or land.
(10) Wireless devices of crew members (also referred to herein interchangeably as 'travel crew members') providing passenger or travel services (e.g., hospitality services, such as food/beverages services, etc.) for a duration of travel involving a mass transportation vehicle may also be referred to herein interchangeably as 'wireless crew devices' in which such wireless crew devices can include, but not be limited to, mobile phones, tablets, or the like that travel crew members may utilize to access and/or obtain electronic information that may be available via one or more networks/systems that may be provided for a mass transportation vehicle.
(11) In various embodiments, networks/systems that may be accessed/utilized by travel crew members for a mass transportation vehicle can include, but not be limited to, in-vehicle wireless/wired networks (e.g., wireless local area networks (WLANs), wireless personal area networks (WPANs), wired networks, etc.), passenger entertainment systems, hospitality systems (e.g., ordering/order fulfillment systems), passenger seating systems, travel information systems, vehicle information systems, combinations thereof, and/or the like.
(12) In at least one embodiment, a computer-implemented method is provided that may include detecting, by a wireless device operated by a travel crew member, a trigger indicating that the wireless device is to connect to a wireless communication system of a vehicle and is to attempt to register for local push notifications for a duration of travel involving the vehicle and obtaining, by the wireless device upon connection to the wireless communication system of the vehicle, vehicle travel information that identifies the duration of travel involving the vehicle. The computer-implemented method may further include identifying, by the wireless device and based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, wherein the identifying includes comparing the vehicle travel information that identifies the duration of travel involving the vehicle with travel assignment information that identifies durations of travel for a plurality of vehicles to which the travel crew member is assigned. Further, based on determining that one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, the computer-implemented method may further include registering, by the wireless device, with a notification server of

the vehicle to receive the one or more local push notifications for the duration of travel involving the vehicle, wherein the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based on a role of the travel crew member for the duration of travel involving the vehicle and are based on one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.

Example Embodiments

(13) It is common in the travel industry to provide services to passengers that are traveling aboard an aircraft, a ship, a train, etc. (generally referred to herein as 'mass transportation vehicles') from one city to another. During a trip or, more generally, a duration of travel involving such a mass transportation vehicle, a number of crew members for the vehicle can execute or otherwise provide services for the passengers, such as hospitality services, etc. that may involve providing food/beverage services for passengers, or other similar services. For example, a passenger may request a food/beverage item from a food/beverage service provided during a trip and the food/beverage request can be prepared and delivered via one or more crew members. Generally, this passenger request/crew response process can be viewed as an order request/order fulfilment process or exchange.

(14) With the development of modern wireless communication devices, such as handheld wireless phones, tablets, etc. capable of wireless wide area and/or wireless local area communications, crew members providing passenger services for a given duration of travel involving a mass transportation device can receive notifications, via wireless devices carried/operated by the crew members, for passenger requests and/or other services that may be performed by such crew members for the duration of travel. Wireless devices of crew members (also referred to herein interchangeably as 'travel crew members') providing passenger services for a duration of travel involving a mass transportation vehicle may also be referred to herein interchangeably as 'wireless crew devices'.

(15) In one example scenario, consider that a mass transportation vehicle is an aircraft that is flying from an originating airport to a destination airport. In this example, a passenger may request a beverage item during the flight that can trigger a local notification to be sent or 'pushed' to one or more wireless devices operated by one or more corresponding crew members and a crew member can facilitate fulfilment of the beverage request.

(16) Current options for providing local push notifications for wireless crew devices for a duration of travel involving a mass transportation vehicle (e.g., during a flight for an aircraft) are limited to processes that involve high power usage for wireless crew devices and, thus, lead to increased battery drain of such devices throughout the duration of travel. For example, one potential option for providing local push notifications to a wireless crew device for a duration of travel involves playing a silent song in the background of the wireless crew device such that device 'stays awake' in order to receive push notifications. Thus, such an option involves the wireless crew device always being actively in-use (constantly playing the silent song) thereby causing increased battery drain of the device.

(17) Another potential option for providing local push notifications to a wireless crew device for a duration of travel involves the use of short-range wireless communication system (e.g., Bluetooth®) beacons. For this option, Bluetooth low energy proximity sensing functionality can be used to transmit a universally unique identifier that can be received/identified by a compatible application or operating system. The identifier and several bytes sent with it can be used to determine a wireless crew device's location, track devices, and/or trigger a location-based action on the device, such as facilitating a push notification. However, this option requires additional hardware to be installed for a mass transportation vehicle that can emit/detect Bluetooth communication signals, as well as to process notifications. The installation of such hardware aboard a mass transportation vehicle, such as an aircraft, requires government certifications and/or approval, such as certification/approval from the Federal Aviation Administration (FAA) and, thus, is not a preferred option for providing local push notifications for travel crew members.

(18) Techniques are described for various embodiments herein that can facilitate providing local push notifications for wireless devices of travel crew members providing passenger services for a duration of travel involving a mass transportation device, such as during a flight of an aircraft. Such techniques as provided by embodiments herein can reduce the amount battery drain of wireless crew devices in comparison to the 'silent song' option for providing local push notifications and may also be implemented in a manner that may not involve the installation of hardware for a mass transportation vehicle that could trigger government approval/certification procedures.

(19) Referring to FIG. **1**A, FIG. **1**A is a block diagram of a connected cabin system **100** that may facilitate local push notifications for crew members of a mass transportation vehicle for a duration of travel involving the vehicle, according to an example embodiment. FIG. **1**B is a diagram of a portion of a mass transportation vehicle, such as an aircraft, in which the connected cabin system of FIG. **1**A may be implemented, according to an example embodiment. FIGS. **1**A and **1**B are discussed together herein in connection with various embodiments of connected cabin system **100**.

(20) Connected cabin system **100** may include a number of wireless access points (APs), shown in FIG. **1**A as a wireless AP **114-1** and a wireless AP **114-2**, a vehicle network server **120**, and a passenger seat network **140**. Also shown in FIG. **1**A are a number of travel crew members **111-1**, **111-2** thru **111**-X, each using or operating a corresponding wireless crew device **112-1**, **112-2** thru **112**-X within the connected cabin system **100**. Although only two wireless APs are illustrated in FIG. **1**A, it is to be understood that any number (more or less) of wireless APs can be configured for connected cabin system **100** in accordance with embodiments herein. Wireless APs **114-1** and **114-2** may provide a wireless communication system **115** for the connected cabin system **100**.

(21) In various embodiments, wireless APs **114-1** and **114-2** may implement any combination of a wireless local area air or radio frequency (RF) interface (e.g., any appropriate Institute of Electrical and Electronics Engineers (IEEE) 802.11 or Wi-Fi® RF interface, such as Wi-Fi 5, 6, 6E, 7, etc.) and/or a wireless wide area air or RF interface (e.g., any appropriate Third Generation Partnership Project (3GPP) or cellular RF interface, such as 4.sup.th Generation/Long Term Evolution (4G/LTE), Fifth Generation (5G), etc.). Thus, wireless APs **114-1** and **114-2** may facilitate any combination of a wireless local area network (WLAN) and/or a wireless wide area (WWA) network in various embodiments or, more generally, medium and/or long-range wireless communications via wireless communication system **115** (medium/long-range wireless communications as compared to short-range wireless communication systems, such as Bluetooth®). Generally, WLAN (e.g., Wi-Fi®) communications may be considered medium-range wireless communications, whereas WWA (e.g., cellular) communications may be considered long-range wireless communications.

(22) Wireless APs **114-1** and **114-2** may include any hardware and/or software to perform baseband signal processing (such as modulation/demodulation) as well as hardware (e.g., baseband processors (modems), transmitters and receivers, transceivers, and/or the like), software, logic and/or the like to facilitate signal transmissions and signal receptions via antenna assemblies (not shown) in order to provide over-the-air RF coverage for one or more radio access technology (RAT) types (e.g., Wi-Fi, 4G/LTE, 5G, etc.) for one or more radio access networks (RANs) of wireless communication system **115** through which one or more wireless devices, such as wireless crew devices may utilize to connect to vehicle network server **120** and, more specifically as discussed for embodiments herein, to LPNS **126** and connected cabin API **124**.

(23) A wireless device, such as any of wireless crew devices **112-1**-**112**-X, may be considered any electronic device, etc. that initiates a connection or communication session with a corresponding wireless communication system, such as a computer, a mobile phone, an electronic tablet, and/or any other electronic device, component, element, or object capable of initiating voice, audio, video, media, or data exchanges

within connected cabin system **100**. Thus, wireless crew devices **112-1-112**-X may include any hardware and/or software to perform baseband signal processing (such as modulation/demodulation) as well as hardware (e.g., baseband processors (modems), transmitters and receivers, transceivers, and/or the like), software, logic and/or the like to facilitate signal transmissions and signal receptions via antenna assemblies (not shown) in order to connect to one or more radio nodes of a RAN, wireless AP **114-1** and/or wireless AP **114-2**, for one or more communication sessions facilitated via the wireless communication system **115** of connected cabin system **100**.

(24) Each wireless crew device **112-1-112**-X can be configured with a travel application (not shown in FIG. **1**A), which may facilitate various operations for each wireless crew device **112-1-112**-X in accordance with embodiments herein. The travel application can be provisioned, configured, updated, etc. for each wireless crew device **112-1-112**-X by a travel/fleet operator that operates a fleet of mass transportation vehicles. For example, in one instance, the travel application can be provisioned for each wireless crew device **112-1-112**-X by an airline operating a fleet of aircraft.

(25) Vehicle network server **120** may include control logic **122**, a connected cabin application programming interface (API) **124**, and a local push notification server (LPNS) **126**. Additionally, vehicle travel information can be stored via a vehicle travel database **128** via vehicle network server **120** and/or may be accessible by vehicle network server **120** in which the vehicle travel information can identify travel details for different durations of travel that a mass transportation vehicle may serve for a period of time (e.g., different flights that an aircraft is to perform for a day, etc.). Passenger seat network **140** may include a seat server **142** and a number of seat communication devices **144-1**, **144-2** thru **144**-N.

(26) For the connected cabin system **100**, each seat communication device **144-1-144**.N can interface with seat server **142**, which can further interface with vehicle network server **120** via connected cabin API **124**. Connected cabin API **124** may further interface with LPNS **126** and control logic **122**, which may also interface with LPNS **126**. Control logic **122** of vehicle network server **120** may further interface with wireless APs **114-1** and **114-2**.

(27) The connected cabin system **100** of FIG. **1**A may be considered an 'on-vehicle' system that can be implemented for a mass transit vehicle, such as an aircraft. A portion of an aircraft **102** in which the connected cabin system **100** may be implemented in at least one embodiment is shown in FIG. **1**B. For the connected cabin system **100**, consider that wireless APs **114-1** and **114-2** broadcast a network identifier for the wireless communication system **115** provided by the APs, which, for the embodiment of FIG. **1**A, may be a Service Set Identifier (SSID) that identifies the wireless communication system **115** provided for aircraft **102**.

(28) Although certain embodiments/examples herein are discussed with reference to wireless communication system **115** being implemented as a WLAN configured with an SSID, in some embodiments a wireless communication system configured for a mass transportation vehicle can be implemented as a WWA communication system, such as a private 3GPP (cellular) communication system that can be configured with a public land mobile network (PLMN) identifier (ID). For example, for a large mass transportation vehicle, such as a ship, a train, or the like, the wireless communication system configured for the mass transportation vehicle can provide a long-range wireless communication coverage area, such as can be provided via a cellular access network (e.g., a 4G/LTE, 5G, next Generation (nG), etc.) access network. Thus, it is to be understood that embodiments herein involving mass transportation vehicles may encompass any combination of WLAN and/or WWA communication system.

(29) Returning to FIG. **1**A, in some embodiments, the connected cabin system **100** can interface with one or more external networks **160**, which may be considered 'off-vehicle' networks, such as satellite network(s) **160-1** and/or a ground-based wide area network such as the (public) internet **160-2** and/or another wide area network. However, for a duration of travel involving the aircraft, the aircraft **102** can be disconnected from or isolated from ground-based networks. For example, while the aircraft **102** is in-flight, the vehicle network server **120** or, more specifically, LPNS **126**, may not be connected to the internet **160-2**, a wide area ground-based network, or the like.

(30) Generally, control logic **122** of vehicle network server can include instructions that, when executed, cause processor(s) (not shown) of vehicle network server **120** to perform operations, which can include, but not be limited to, providing overall control operations of the server; interacting with and/or controlling other entities, systems, etc. described herein (e.g., providing management/control of wireless APs **114-1** and **114-2**); maintaining and/or interacting with stored data, information, parameters, etc. (e.g., memory element(s), storage, data structures, databases, tables, etc.); combinations thereof; and/or the like to facilitate various operations for embodiments described herein.

(31) Connected cabin API **124** can include instructions that, when executed by processor(s) of vehicle network server **120**, can facilitate function calls/operations, application calls/operations, and/or the like to facilitate communications between LPNS **126**, control logic **122**, and passenger seat network **140**/seat server **142** and/or any other elements, nodes, logic etc. that may be configured for connected cabin system **100**.

(32) LPNS **126** can include instructions that, when executed by processor(s) of vehicle network server **120**, facilitates local push notifications that can be sent to one or more wireless crew devices **112-1-112**-X of corresponding travel crew members **111-1-111**-X via wireless APs **114-1-114-2**, as discussed in further detail herein, below.

(33) In at least one embodiment, LPNS **126** can be implemented within a Docker container with the vehicle network server **120** environment. In some embodiments, LPNS **126** can implemented via a virtual machine (VM) configured for vehicle network server **120**. LPNS **126** may facilitate a computing environment that utilizes minimal compute resources (e.g., approximately 2 megabytes (MB) of memory or less) and may provide a Representational State Transfer (REST) interface (typically referred to as a 'RESTful' interface), a WebSocket interface, databases/storage, and/or any other customizable communication protocols, and/or generic server side interfaces that may be used to facilitate connections with wireless crew devices **112-1-112**-X in order to facilitate various local push notification operations as discussed for embodiments herein.

(34) The computing environment provided by LPNS **126** may be implemented in such a manner as to comply with various vehicle environmental and/or operational constraints such that implementation of the LPNS **126** within the connected cabin system **100** of aircraft **102** does not require additional government (e.g., FAA) certification and/or approval.

(35) In various embodiments, seat server **142** facilitates operations, interactions, communications, etc. with seat communication devices **144-1-144**-N through which passengers traveling aboard aircraft **102** for a trip (i.e., a duration of travel) may interact via a user interface (UI) provided by the seat communication devices **144-1-144**-N in order to initiate hospitality/passenger requests (e.g., food/beverage requests, blanket/pillow requests, change seat requests, upgrade requests, do not disturb requests (or updates to such requests, such as do not disturb on/off), and/or any other requests that may be initiated via a seat-based communication device), watch videos, listen to music, play games, obtain passenger-specific and/or flight-specific information (e.g., remaining flight time, connecting gate information, travel itinerary information, baggage claim information, etc.) and/or consume/interact with any other information that may be provided via connected cabin system **100**/seat server **142** for the duration of travel involving aircraft **102**. Thus, seat server **142** may be configured to provide any communication protocols, API functionality/operations (e.g., to interface with connected cabin API **124**), media server operations, and/or the like to facilitate operations for connected cabin system **100** in accordance with embodiments herein.

(36) In various embodiments, seat communication devices **144-1-144**-N may be implemented as any computing device capable of facilitating communications (wired and/or wirelessly), hosting/streaming media, and/or the like within connected cabin system **100**. Seat communication

devices **144-1**-**144**-N can be configured within connected cabin system **100** to facilitate per-passenger communications within the system. As noted above, the connected cabin system **100** of FIG. **1**A may be considered an 'on-vehicle' system implemented for a mass transit vehicle, such as aircraft **102**. As shown in FIG. **1**B, the aircraft **102** can include a cabin in which a number of passengers can each be seated via each of a number of seats, shown in FIG. **1**B as seats **104-1** thru **104-10**, for a duration of travel involving the aircraft. A number of seat communication devices **144-1** thru **144-10** are also shown in FIG. **1**B.

(37) In various embodiments, seat communication devices provided for a mass transportation vehicle, such as seat communication devices **144-1**, **144-2**, **144-3**, **144-4**, **144-5**, **144-6**, **144-7**, **144-8**, **144-9**, and **144-10** shown in FIG. **1**B, can be provided within the cabin of aircraft **102** such that each passenger located in each corresponding seat can interact with a corresponding seat communication device for the duration of travel involving aircraft **102** for various services that may be provided to the passengers during the duration of travel.

(38) In addition to facilitating passenger services, seat communication devices provided for aircraft **102** can be configured with unique identifying information that identifies a location of each seat communication device within the cabin of aircraft **102** in relation to the corresponding passenger utilizing each device for a corresponding seat with the cabin of aircraft **102**. For example, seat communication device **144-7** can be identified by seat server **142** for any communications with seat server **142** to identify the corresponding seat **104-7**/passenger within seat **104-7** such that the seat/passenger can be located within the cabin of aircraft **102** for any passenger services requested by the passenger of the seat, media requested/consumed by the passenger, etc.

(39) Thus, in some embodiments seat communication devices may be housed within a seatback of seat. For example, seat communication device **144-2** can be housed with a seatback of seat **104-1** such that a passenger for seat **104-2** can interact with seat communication device **144-2**. In other embodiments, such as for seats that may not be behind another seat, seat communication devices may be housed in a structural feature provided within a cabin of a mass transportation device, such as a bulkhead, a wall, or the like. For example, seat communication device **144-1** can be housed on a cabin wall **105-1** within the cabin of aircraft **102** such that a passenger of seat **104-1** can interact with seat communication device **144-1**, seat communication device **144-4** can be housed on a cabin wall **105-2** within the cabin of aircraft **102** such that a passenger of seat **104-4** can interact with seat communication device **144-4**, and seat communication device **144-7** can be housed on a cabin wall **105-3** within the cabin of aircraft **102** such that a passenger of seat **104-7** can interact with seat communication device **144-7**. Other configurations of seat communication devices can be envisioned depending on the configuration of a cabin and/or seats of a given mass transportation vehicle.

(40) Further as shown in FIG. **1**B, the cabin of aircraft **102** can be divided or separated into a number of different cabin locations, which may represent different levels and/or priorities of seating and/or services that may be provided for passengers traveling aboard aircraft **102** for a duration of travel. For example, as shown in FIG. **1**B, the cabin of aircraft **102** can be divided into a first cabin location **103-1** that encompasses a first or premium class or level of seating (e.g., class 1, including seats **104-1**, **104-2**, and **104-3**), a second cabin location **103-2** that encompasses a second class or level of seating (e.g., class 2, such as a business class or the like, including seats **104-4**, **104-5**, and **104-6**), and a third cabin location **103-3** that encompasses a third class or level of seating (e.g., class 3, such as an economy class, including seats **104-7**, **104-8**, **104-9**, **104-10**, etc.). In some instances, the different classes or levels of seating can represent a first or premium class, a business or executive class, a coach or economy class, and/or the like and may be characterized as different cabins or different cabin locations/zones/area within a given aircraft.

(41) In some embodiments one or more cabin locations may further be divided into or include one or more sub-locations that may be associated with different sub-levels and/or sub-priorities of seating and/or services that may be provided for passengers traveling aboard aircraft **102** for a duration of travel. For example, in some instances, there may be multiple levels of first, business, and/or coach classes that may be associated with different seating levels and/or services.

(42) Broadly during operation of various embodiments herein, LPNS **126** enables clients within connected cabin system **100**, such as wireless crew devices **112-1**-**112**-X, to connect to the wireless communication system **115** of aircraft **102** and subscribe or register to a list of 'actions' or push notifications (also referred to herein interchangeably as 'notification actions') that each wireless crew device **112-1**-**112**-X is to receive (via the wireless communication system **115** provided by wireless APs **114-1** and **114-2**) for a duration of travel involving aircraft **102**. Such functionality can be facilitated via the travel application provisioned for each wireless crew device **112-1**-**112**-X by the airline operating the fleet of aircraft including aircraft **102** such that the subscriptions/registrations initiated by each wireless crew device **112-1**-**112**-X may be individually tailored based on the role/location(s) assigned to each corresponding travel crew member **111-1**-**111**-X for each of one or more specific duration(s) of travel involving one or more different mass transportation vehicles (e.g., different flights involving different aircraft).

(43) LPNS **126** may provide a RESTful API (not shown in FIG. **1**A) through which external callers, such as seat communication devices **144-1**-**144**-N via connected cabin API **124**, can initiate requests or other actions towards LPNS, which can trigger sending notifications by LPNS **126** towards to all clients (e.g., wireless crew devices) that have subscribed to each of one or more notifications, along with a freeform payload that can be used for other functions and/or to carry other information (e.g., seat/passenger location initiating a request, type of request, request details, etc.) via a persistent WebSocket connection maintained between each of the clients and LPNS **126**, which can be configured with a WebSocket interface (not shown in FIG. **1**A). The persistent WebSocket connection can allows the clients (wireless crew devices) to wake-up and execute instructions in order to receive the notifications when the LPNS **126** sends a "push" notification message via the WebSocket with each client that has registered to receive the notifications. LPNS **126** can store a list of clients and notifications for which each client has registered via a connected clients database (not shown in FIG. **1**A).

(44) Thus, in at least one embodiment, a wireless crew device can subscribe to notifications that are to be received by the device for a duration of travel involving a mass transportation vehicle based on the travel crew member that operates the wireless crew device being specifically assigned to the specific vehicle for the specific duration of travel in order to provide services (e.g., passenger services) for passengers traveling aboard the vehicle for the specific duration of travel.

(45) More specifically, notification(s) that are to be received by a given wireless crew device of a given travel crew member may be based on the travel crew member being assigned to provide services for a specific duration of travel involving a specific vehicle, as well as being based on a role of the travel crew member for the duration of travel involving the vehicle and on one or more locations of a cabin of the specific vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.

(46) For instance, in one illustrative example, consider that travel crew member **111-1** operating wireless crew device **112-2** is assigned to work on (e.g., provide passenger services) aircraft **102** for a duration of travel (e.g., a flight) that is to begin at an originating airport and end at a destination airport. Further, consider that the travel crew member **111-1** is assigned to provide passenger services for passengers that may be seated within the first class/level of seating provided at cabin location **103-1** of the aircraft **102** for the duration of travel.

(47) Wireless crew device **112-1** can be periodically updated (e.g., daily, weekly, etc.) with travel assignment information identifying travel details for different durations of travel involving different aircraft to which travel crew member **111-1** is assigned (e.g., flight numbers, originating cities/airports/airport codes, flight times, etc.), a role (or roles) of the travel crew member for each duration of travel for each aircraft, location(s) within the cabin of each aircraft to which the travel crew member is assigned, and SSID information/connection credentials (e.g., username, password, certificates, etc.) to enable wireless crew device **112-1** to connect wireless communication systems for

different aircraft. For example, a vehicle fleet operator, such as an airline, etc. can periodically push or otherwise communicate travel assignment information to each wireless crew device **112-1-112**-X of each travel crew member **111-1-111**-X that identifies the assignments of each travel crew member **111-1-111**-X for a given period of time. Travel assignment information can be pushed/communicated to wireless crew devices **112-1-112**-X using any over-the-air RF and/or web-based update mechanisms (e.g., via the public internet, an enterprise network, etc.) via one or more servers, etc. of the vehicle fleet operator using any techniques now known and/or hereinafter developed as would be understood by a person of ordinary skill in the art.

(48) In various embodiments, travel crew member roles can include, but not be limited to "flight leader, "service leader," and "purser" in which each role may be assigned different responsibilities and/or locations within the cabin for which to provide various passenger services throughout a duration of travel involving a given aircraft. In some instances, flight leader may be considered a highest responsibility role, while purser may be considered a lowest responsibility role, with service leader being considered a medium responsibility role. In some embodiments, the responsibilities of each role may vary depending on the type of route being flown.

(49) In some embodiments, different "leader" roles may be used to identify which travel crew members have the authority to edit information seen by passengers via seat communication devices (e.g., seat communication devices **144-1-144-10**) (e.g., cackling or rescheduling meal service), while travel crew members having lower/non-leader roles may only have read-only access to such information.

(50) In some embodiments, the location to which a travel crew member is assigned for a particular duration of travel for an aircraft can be tied to a particular role to which the travel crew member is assigned such that specific roles may be assigned to work locations, such as different cabins/classes (e.g., first, business, economy, etc.) and/or sets of seats within an aircraft (or particular cabin/class), which can impact the notifications that are to be received by the travel crew member.

(51) In one example, the SSID information/connection credentials may be configured such that they can be utilized for multiple aircraft within a fleet of aircraft operated by the airline. Thus, SSID information for a wireless communication system for a given aircraft may not uniquely identify each aircraft within the fleet (e.g., 2-4 unique SSIDs may be reused across an entire fleet). Rather, vehicle travel information configured/provided for vehicle travel database **128** may identify the specific travel information/travel details involving each flight that aircraft **102** is to serve for a period of time (e.g., days, times within a day, week, or any other calendar/schedule-based information that may be applicable) in which the vehicle travel information can include any combination of flight numbers, originating cities/airports/airport codes, flight times, etc. that can be used to identify the specific flight(s) that are to be served by the aircraft **102**.

(52) In at least one embodiment, say, for an embodiment in which a wireless communication system provided for a mass transportation vehicle includes cellular coverage, wireless crew devices can be provisioned, via an electronic/embedded/universal/integrated Subscriber Identity Module (SIM) provided for the devices, with PLMN-ID information and cellular identifiers/credentials (e.g., an International Mobile Subscriber Identity (IMSI) or the like) to enable such devices to attach to a cellular network provided for one or mass transportation devices.

(53) In some embodiments, travel information/travel details for aircraft **102** may include a list of one or more hospitality services that may and/or may not be offered for each flights involving the aircraft. For example, some flights may include a snack and beverage service but not a meal service, while other flights may include a combination of snack, beverage, and meal services. Other variations of different combinations of hospitality services that may/may not be provided for one or more flights can be envisioned and, as such, could also be identified in travel information/travel details involving one or more flights for an aircraft.

(54) Returning to the embodiment of FIG. **1**A, utilizing local push notification technology now known in the art or hereinafter developed, wireless crew device **112-1** can be triggered upon detecting the SSID for the wireless communication system **115** of aircraft **102** (as provided/broadcast by wireless APs **114-1** and **114-2**) to "wake up" and execute instructions (via control logic provided for the device) to attempt to register for one or more notifications that may occur for passengers located at cabin location **103-1** for the flight involving aircraft **102**. For example, travel crew member **111-1** can enter or be near the cabin of aircraft **102** or, more specifically, the wireless coverage area provided by wireless APs **114-1** and **114-2**, such that wireless crew device **112-1** can detect the SSID broadcast by wireless APs **114-1** and **114-2** identifying the wireless communication system **115** of aircraft **102**.

(55) Detecting the SSID can trigger wireless crew device **112-1** to connect to the wireless communication system **115** for aircraft **102** and retrieve vehicle travel information identifying specific travel details for one or more durations of travel involving the aircraft **102** via vehicle travel database **128**. Upon obtaining the vehicle travel information for aircraft **102**, wireless crew device can compare the vehicle travel information for aircraft **102** to the travel assignment information stored via wireless crew device **112-1** that identifies travel details for different durations of travel involving different aircraft to which travel crew member **111-1** is assigned say, for example, for a given day, to determine whether the vehicle travel information for the aircraft **102** matches any of the travel assignment information stored via wireless crew device **112-1** for travel crew member **111-1**.

(56) Upon determining a match between the vehicle travel information for aircraft **102** and the travel assignment information stored via wireless crew device **112-1** (i.e., the travel crew member **111-1** is assigned to the specific flight that is to be provided by aircraft **102**), wireless crew device **112-1** initiates subscription or registration with LPNS **126** for one or more notifications that are to be received by the wireless crew device **112-1**/travel crew member **111-1** based on the role of travel crew member **111-1** and on one or more locations of the cabin of the aircraft **102** to which the travel crew member **111-1** is assigned to perform passenger services for the specific flight involving the aircraft **102**.

(57) A persistent WebSocket connection is maintained between the wireless crew device **112-1** and LPNS **126** that allows the wireless crew device **112-1** to wake-up and execute instructions in order to receive the notifications when the LPNS **126** sends a "push" message via the WebSocket.

(58) It is to be understood that different travel crew members can each receive different travel assignment information for different assigned flights. Further, it is to be understood that different travel crew members, even if assigned the same flight, can be assigned different roles and/or the same or different locations with the cabin of an aircraft for passenger services that are to be provided by the travel crew members for a given flight. Thus, each corresponding wireless crew device **112-1-112**-X can subscribe to any combination of the same or different notifications for a given flight based on corresponding assignments for each corresponding travel crew member **111-1-111**-X for each of a corresponding flight or flights and travel information/details provided to each wireless crew device **112-1-112**-X for each of the flight or flights.

(59) With reference to FIG. **2**A, FIG. **2**A is a message sequence diagram **200** illustrating example operations associated that may be performed in order to facilitate registration for local push notification(s) by wireless crew device **112-1** of travel crew member **111-1** for aircraft **102**, according to an example, embodiment. FIG. **2**B is a schematic diagram illustrating an example registration message format **230** that may be utilized to register for local push notifications by a wireless crew device of a travel crew member for a mass transportation vehicle, according to an example embodiment, and is discussed with reference to FIG. **2**A.

(60) FIG. **2**A includes wireless crew device **112-1** (including a travel application (app) **113-1** that may include any application logic that can be utilized by wireless crew device **112-1** to perform any operations as discussed for embodiments herein) of travel crew member **111-1**, a local domain name system (DNS) server **129**, LPNS **126**, and connected cabin API **124**. In at least one embodiment, local DNS server can be configured via vehicle network server **120** and may facilitate resolving Internet Protocol (IP) address and/or Uniform Resource Locator (URL)

information for one or more elements, nodes, functions, etc. that can be provided within connected cabin system **100**.
(61) As shown at **202**, consider that wireless crew device **112-1** is provisioned with travel assignment information for one or more flights/aircraft to which travel crew member **111-1** is assigned (e.g., duration(s) of travel for (different) aircraft to which the travel crew member **111-1** is assigned), say, for example, for a particular airline operating a fleet of aircraft for a given day. The wireless crew device **112-1** is also provisioned with SSID information and connection credentials to enable wireless crew device **112-1** to detect/connect to wireless communication systems of aircraft of the fleet operated by the airline.
(62) For the embodiment of FIG. **2**A, consider that the travel assignment information provisioned for wireless crew device **112-1** includes travel details for a flight (duration of travel) involving aircraft **102** to which travel crew member **111-1** is assigned to provide passenger services, etc. In addition to the travel details for the flight involving aircraft **102**, consider that the travel assignment information identifies that travel crew member **111-1** is assigned a role of "flight leader" and is assigned to provide passenger services for cabin location **103-1** (e.g., for class 1, such as a first or premium class, for example) for the flight involving aircraft **102**.
(63) In various embodiments, wireless crew device **112-1** can be provisioned with the travel assignment information for travel crew member **111-1** via over-the-air updates pushed to the device/travel app **113-1** (provided by the airline operating aircraft **102**) each day at a given time for the specific travel crew member **111-1**), can be retrieved by the travel crew member **111-1** via the travel app **113-1**, combinations thereof, and/or the like.
(64) Continuing to **204**, consider that wireless crew device **112-1** detects the SSID broadcast by wireless APs **114-1** and **114-2** for aircraft **102** and connects to the wireless communication system **115** of the aircraft **102** using the SSID/credential information provisioned for the wireless crew device **112-1**/travel app **113-1**.
(65) Detecting the SSID can be a trigger indicating that the wireless crew device **112-1** is to connect to the wireless communication system **115** of aircraft **102** and is to attempt to register for local push notifications for the aircraft **102** for a duration of travel involving the aircraft **102**. For example, as shown at **206**, following connection of the wireless crew device **112-1** to the wireless communication system **115** of aircraft **102**, wireless crew device **112-1** can perform a DNS exchange with local DNS server **129** in order to resolve the connected cabin API **124** IP address and the LPNS **126** IP address.
(66) Prior to obtaining vehicle travel information for aircraft **102**, as shown at **208**, a persistent WebSocket connection can be established between the wireless crew device **112-1** and LPNS **126** that allows the wireless crew device **112-1** to register for and receive notifications (notification actions) from LPNS **126**. In at least one embodiment, the persistent WebSocket connection can be established based on a request message sent from the wireless crew device **112-1**, which may be a JavaScript Object Notation (JSON) encoded request message that includes an identifier of the travel app **113-1** (e.g., com.provider.travelapp) and an identifier (ID) for wireless crew device **112-1** (e.g., a client ID for the wireless crew device **112-1**), such as an IP address for the wireless crew device **112-1**, a Media Access Control (MAC) address for the wireless crew device **112-1**, and/or the like for wireless crew device **112-1** that can be registered with/stored by LPNS **126** and/or a database maintained/managed thereby for any supported actions provided by the LPNS **126**, such as pushing notifications or notification actions to the registered wireless crew device.
(67) Continuing to **210**, the wireless crew device **112-1** initiates a query to connected cabin API **124** in order to obtain vehicle travel information for aircraft **102** in order to determine whether a corresponding flight for aircraft **102** is a flight to which travel crew member **111-1** is actually assigned (and is to register for notifications, etc.). In at least one embodiment, the query at **210** may be a Hypertext Transfer Protocol (HTTP) GET message sent to the connected cabin API **124** requesting flight information (e.g., vehicle travel information) for the corresponding flight for aircraft **102**.
(68) Upon obtaining the query from wireless crew device **112-1**, connected cabin API **124** retrieves, as shown at **212**, the vehicle travel information for aircraft **102** via vehicle travel database **128** (not shown in FIG. **2**A) and sends the vehicle travel information for aircraft **102** to wireless crew device **112-1**, as shown at **214**.
(69) At **216**, wireless crew device **112-1** determines whether it is to register for local push notifications for the aircraft **102** or, more specifically, whether travel crew member **111-1** is assigned to the flight involving aircraft **102** based on comparing the vehicle travel information obtained at **214** to the travel assignment information stored via wireless crew device **112-1** that identifies travel details for different durations of travel involving different aircraft to which travel crew member **111-1** is assigned, to determine whether the vehicle travel information for the aircraft **102** matches any of the travel assignment information stored via wireless crew device **112-1** for travel crew member **111-1**.
(70) For example, the comparison performed at **216** may identify that the flight number, originating city information, and flight times for the corresponding flight for aircraft **102** matches the same travel assignment information stored for travel crew member **111-1** via wireless crew device **112-1**.
(71) In at least one embodiment, the comparison performed at **216** may further include performing a comparison between one or more service(s) offered for the corresponding flight (e.g., as identified vie travel information/details obtained for aircraft **102**) in relation to travel assignment information stored via wireless crew device **112-1** identifying a role (or roles) and location(s) of the cabin of aircraft **102** to which the travel crew member **111-1** is assigned in order to identify one or more types of notifications to which to register/subscribe (e.g., order requests from the class 1 cabin, service requests from the class 1 cabin, order requests from the class 3 cabin, etc.).
(72) Upon determining a match between the vehicle travel information obtained at **214** and travel assignment information for travel crew member **111-1** stored via wireless crew device **112-1**, wireless crew device **112-1** can, as shown at **218**, subscribe or register with LPNS **126** (with which the persistent WebSocket connection was been established at **208**), for one or more notifications that are to be received by the wireless crew device **112-1** for the corresponding flight involving aircraft **102** based on the role that is assigned to the travel crew member **111-1** for the flight and the one or more locations of the cabin of the aircraft **102** to which the travel crew member **111-1** is assigned for the flight. Wireless crew device **112-1** may send a notification registration message to LPNS **126** in order to subscribe/register for the one or more notifications. In at least one embodiment, the notification registration message sent at **218** may be formatted as JSON encoded message including one or more fields that facilitate registration for notification(s) to be received by wireless crew device **112-1** for the duration of flight involving aircraft **102**. In at least one embodiment, although not shown in FIG. **2**A, LPNS **126** can send a confirmation to wireless crew device **112-1** regarding successful registration for the notifications.
(73) However, if it is determined at **216** that there is not a match between any of the vehicle travel information obtained at **212** and any of the travel assignment information for travel crew member **111-1** stored via wireless crew device **112-1**, wireless crew device **112-2** determines that the travel crew member **111-1** is not assigned to the corresponding flight involving aircraft **102** and, thus, would not register for any notifications to be received for the flight involving aircraft **102**.
(74) In at least one example (upon determining a match at **216**), the registration performed at **218** can include the wireless crew device **112-1** registering, for example, to receive notifications for any combination of food requests, beverage requests, and/or any other passenger service requests originating/being sent from any of the seat communication devices associated with any of the seats located in at least cabin location **103-1** to which travel crew member **111-1** is assigned for the flight, such as being sent from any passengers/seat communication devices

associated with any of seats **104-1** thru **104-3**.
(75) However, as the travel crew member **111-1** is not assigned to cabin location **103-2** and **103-3** for the flight, wireless crew device **112-1** may not register for certain types of notifications that may originate/be sent from seats located in cabin locations **103-2** and **103-3**, such as food/drink orders, and/or other service requests for services that may be requested by passenger(s) sitting in the various cabin locations.
(76) In some embodiments, wireless crew device **112-1** may register for other types of notifications that may originate from any cabin locations, such as notifications that may not be service request specific notifications, which may include, but not be limited to, emergency notifications, and/or any other universal or non-service-request-specific type notifications that may be initiated by passengers for a duration of travel involving the aircraft **102**.
(77) Thereafter, for the duration of travel involving the aircraft **102**, travel crew member **111-1** can receive local push notifications sent from LPNS **126** to the wireless crew device **112-1** via the persistent WebSocket maintained between the wireless crew device **112-1** and LPNS **126** that allows the wireless crew device **112-1** to wake-up and execute instructions in order to receive the notifications when the LPNS **126** sends a “push” message via the WebSocket. Additional example details for example local push notification operations that may be performed for the connected cabin system **100** are discussed herein below.
(78) Following a duration of travel (trip) for a travel crew member, once the travel crew member/wireless crew device exits the aircraft **102** and is no longer connected to wireless communication system **115**, the wireless crew device for the travel crew member would not receive any local push notifications involving a connected cabin system.
(79) FIG. **2**B is a schematic diagram illustrating an example notification registration message format **230** that may be utilized to register for local push notifications by a wireless crew device of a travel crew member for a mass transportation vehicle, according to an example embodiment. For example, wireless crew device **112-1** may utilize the notification registration request message format **230** for registering for one or more local push notifications, as shown at **218** of FIG. **2**A.
(80) In at least one embodiment, the notification registration message format **230** can be a JSON encoded message format including a number of message fields, such as an application identifier (AppID) field **232**, a client identifier (ClientID) field **234**, and an Action field **236**.
(81) In at least one embodiment, the AppID field **232** can be set to identify the travel application through which the persistent WebSocket was established for a given wireless crew device (e.g., com.provider.travelapp) and the ClientID field **234** can be set identifier that the wireless crew device used for establishing the persistent WebSocket with LPNS **126** (e.g., IP address, MAC address, etc. for the wireless crew device).
(82) The Action field **236** can be encoded with notification information (shown in FIG. **2**B as NotificationInfo-1, NotificationInfo-2, thru NotificationInfo-M) for each of one or more notifications or notification actions to which the wireless crew device is subscribing/registering for notifications for the duration of travel involving a vehicle (e.g., aircraft **102**).
(83) The notification information encoded in the Action field **236** can be encoded in any format in order to identify notification(s) for which a wireless crew device may register/subscribe based on the role of a given travel crew member for the duration of travel involving the vehicle and the one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle. The format of the notification information to be included in the Action field of a notification request message can be encoded in logic provided for the travel application provided for wireless crew devices and encoded in logic provided for LPNS **126** in order to appropriately identify notification(s) subscribed to by any wireless crew devices for any duration(s) of travel involving a vehicle.
(84) In some embodiments, notification information included in the Action field **236** for a given notification registration message may be formatted with a [Notification Type, Cabin Location(s)] format such that a ‘Notification Type’ indicator may be set to a particular name that identifies a type of notification, such as ‘cabin order’, ‘do not disturb’, etc., for which a device is registering, and a ‘Cabin Location(s)’ indicator may be set to one or more locations of the cabin of the23rovidint to which the travel crew member is assigned (e.g., identifying cabin location **103-1**, etc.).
(85) In some embodiments, notification information included in the Action field **236** for a given notification registration message may be formatted with a [NotificationLabel] format such that a given ‘NotificationLabel’ may be set to a particular name that identifies both a type of notification and a location associated with the notification type for which a device is registering. For example, a NotificationLabel set to “premium cabin order” may identify both a food/beverage or any other service order/request type notification and that the service order request type is specific to a particular location within the cabin of a vehicle, such as the premium or first class cabin location (e.g., class 1); while a NotificationLabel set to “economy cabin order” may identify both a service order/request type notification and that the service order request type is specific to a particular location within the cabin of the vehicle, such as the economy class cabin location (e.g., class 3).
(86) These example formats for notification information and/or fields included in a notification request message for various notification(s) to which a wireless crew device may register/subscribe are provided for illustrative purposes only and are not meant to limit the broad scope of embodiments herein. Virtually any other formats for subscribing/registering for notifications by a wireless crew device may be provided and, therefore, are clearly within the scope of the teachings of embodiments herein. In some embodiments, for example, a JSON encoded message can further include one or more payload fields including other information for a message.
(87) By subscribing/registering to location specific notifications for a vehicle, embodiments herein provide not only that a wireless crew device may receive notifications for passenger requests originating from the locations of a cabin to which a travel crew member is assigned for a duration of travel involving a vehicle but may also provide that the wireless crew device may not receive notifications for passenger requests originating from locations of the cabin that the travel crew member is not assigned for the duration of travel involving the vehicle. For example, a travel crew member assigned to provide passenger services for a first class cabin of a vehicle may not receive passenger requests for passengers located outside the first class cabin of the vehicle (e.g., in the economy or coach cabin) or, vice-versa, a travel crew member assigned to provide passenger services to the economy or coach cabin locations may not receive notifications for passenger requests originating form the first class cabin location.
(88) Further, consider various example scenarios in which travel crew member role, in addition one or more locations of the cabin of the aircraft **102** to which the travel crew member is assigned for a given flight, may impact the type(s) of notifications for which the wireless crew device of the crew member may register for the flight. For example, in one instance, a travel crew member that is assigned a flight leader role for a flight may have the authority to handle passenger upgrade requests, passenger seat change requests such that the wireless crew device of the travel crew member would register for notifications involving such types of passenger requests. In contrast, a travel crew member that is assigned a purser role for a flight (or some other non-leader role), may not have the authority to handle such upgrade/seat change/etc. requests and, thus, the wireless crew device of the travel crew member having such a ‘non-leader’ role would register not for notifications involving such types of passenger requests but, instead, may only register for basic hospitality services type requests (e.g., food, beverage, etc.). Thus, travel crew member role for a given flight may impact the notification(s) for which the wireless crew device of the member may register for the given flight.
(89) Referring to FIG. **3**, FIG. **3** is a block diagram **300** illustrating example operations that may be performed to facilitate receiving a passenger request via a seat communication device of aircraft **102** and providing a local push notification for wireless crew device **112-1**

(configured with travel app **113-1**) of travel crew member **111-1**, according to an example embodiment. As noted above, LPNS **126** can expose both a RESTful API and WebSocket interface in which the WebSocket interface can be used for clients (wireless crew devices) to connect to the LPNS and register or subscribe to a list of "actions" for which they clients desire to receive updates or, more specifically for embodiments herein, notifications regarding various type(s) of passenger requests for cabin location(s) to which each travel crew member is assigned.

(90) As shown in FIG. **3**, LPNS **126** may include a RESTful API **130**, a WebSocket interface **132**, and a connected clients database **134**. When a wireless crew device, such as wireless crew device **112-1** registers for one or more actions or notifications that are to be received from LPNS **126**, information regarding the registration(s) for the wireless crew device **112-1** can be stored via connected clients database. In at least one embodiment, notification subscription/registration information stored for a wireless crew device, such as wireless crew device **112-1**, may include a table identifying wireless crew device **112-1**, such as an IP address for the wireless crew device, a Media Access Control (MAC) address for the wireless crew device, port information associated with the persistent WebSocket connection, etc. and one or more notifications to which the wireless crew device is registered can be stored via connected clients database **134**. In at least one embodiment, location specific cabin information for aircraft **102** and role information identifying corresponding roles of each travel crew member pertaining to each of the registered notifications may also be stored via connected clients database **134** along with corresponding notifications for which each travel crew member/device is subscribed/registered to receive. As noted above, in at least one embodiment, the location to which a travel crew member is assigned for a particular duration of travel for an aircraft can be tied to a particular role to which the travel crew member is assigned such that specific roles may be assigned to work locations, such as different cabins/classes (e.g., first, business, economy, etc.) and/or sets of seats within an aircraft (or particular cabin/class) and could be used to determine which notifications are appropriate for registering for the wireless crew device.

(91) Continuing from the example discussed above for FIG. **2**A, consider for example, that wireless crew device **112-1** is registered with LPNS **126** to receive various passenger service notifications for providing passenger services for cabin location **103-1** (e.g., for both of class 1) for the flight involving aircraft **102**. In this example, consider at **302** that wireless crew device **112-1** has established a persistent WebSocket connection with WebSocket interface **132** of LPNS **126** (e.g., as discussed above at **208** of FIG. **2**A) and, at **304**, has registered to receive one or more passenger service notifications from LPNS **126** (e.g., as discussed above at **218** of FIG. **2**A).

(92) In this example, consider that a passenger in seat **104-3** orders a beverage via seat communication device **144-3**, which triggers a request to be sent to seat server **142** and connected cabin API **124** such that an HTTP POST notification is sent to LPNS **126** including details of the request (e.g., drink type, seat/passenger information, a notification action identifier such as "premium cabin order", an order identifier (ID), etc.), as shown at **310**. The request is received via RESTful API **130** of LPNS **126** and triggers a look-up, as shown at **312**, via connected client database **134** to check or identify if there are any travel crew members/connected wireless crew devices that are to receive a notification informing them of the passenger request (e.g., are registered for this action/notification), along with details of the request. For example, upon identifying via the look-up on connected clients database **134** that travel crew member **111-1**/wireless crew device **112-1** is to receive the notification, LPNS **126** can initiate a notification to the wireless crew device **112-1**, as shown at **314**, such that the notification can be sent to wireless crew device **112-1**, as shown at **316** (via the persistent WebSocket connection **302**) maintained between wireless crew device **112-1** and LPNS **126**/WebSocket interfaces **132**.

(93) It is to be understood that notifications can be sent to multiple wireless crew devices/travel crew members, based other registrations between such wireless crew devices and LPNS **126**.

(94) With reference to FIG. **4**, FIG. **4** is a message sequence diagram illustrating example operations **400** that may be associated with a passenger order and order fulfilment that may be facilitated via the connected cabin system **100**, according to an example embodiment. FIG. **4** includes wireless crew device **112-1** configured with travel app **113-1**, wireless AP **114-1**, a seat communication device, which for the present example, can be seat communication device **144-3**, and seat server **142**. Also shown in FIG. **4** is connected cabin API **124**, and LPNS **126**.

(95) Continuing from the example discussed above for FIG. **2**A, consider for example, that wireless crew device **112-1**, via travel app **113-1**, is registered with LPNS **126** to receive various passenger service notifications for provide passenger services for cabin location **103-1** (e.g., for class 1) for the flight involving aircraft **102**. In this example, consider at **402** that wireless crew device connects to wireless AP **114-1** and establishes a persistent connection with LPNS **126**. As shown at **404**, wireless crew device **112-1** can register for specific notifications or push actions that are to be provided via LPNS **126**. In some embodiments, as shown at **406**, LPNS **126** can send a confirmation to wireless crew device **112-1** regarding successful registration for the notifications.

(96) As shown at **408**, consider that a passenger in seat **104-3** initiates a drink order via seat communication device **144-3**/seat server **142** that is sent to and stored via connected cabin API **124**, which triggers a notification message to be sent towards all wireless crew devices via LPNS **126**, as shown at **410**, for such wireless crew devices that have subscribed/registered to receive such notifications for cabin location **103-1** and are of a corresponding role that may fulfill the drink order. Upon identifying such wireless crew devices, including wireless crew device **112-1** of travel crew member **111-1**, LPNS **126** pushes an "update available" notification (e.g., "there is an update," such as the drink order, a "premium cabin order", or the like) to the wireless crew device **112-1**, as shown at **412**. In at least one embodiment, messages used for communications between a wireless crew device and/or connected cabin API **124** and LPNS **126** can be configured according to JSON conventions to communicate various information, notifications, etc. For example, some embodiments, a notification message encoded in a JSON notification message format may include an action field identifying the notification, such as "premium cabin order" and may include a payload field that includes an order ID for the passenger order, such that the wireless client device **112-1**/travel app **113-1** can request details for the order (e.g., passenger information, seat information, etc.) using the order ID. In some embodiments, the notification encoded in a JSON message format may include a payload field that identifies passenger information, passenger seat information, combinations thereof, or the like that are associated with a given notification (or notifications) identified in an action field of a JSON encoded notification message sent to a wireless crew device.

(97) Receiving the update from the LPNS **126** (at **412**) triggers the application logic of wireless crew device (e.g., travel app **113-1**) to wake up, refresh an order queue via connected cabin API **124** (as shown at **414** and **416**), and determine what information is new (e.g., details for the drink order requested by the passenger at seat **104-3**) and whether to display it via wireless crew device **112-1** (to the travel crew member). For example, some notifications may be handled silently by the wireless crew device **112-1**, such as "do not disturb" requests or updates to such "do not disturb" requests, in which such passenger requests may update information associated with the passenger managed/maintained by the travel app **113-1** but may not issue a display notification to be provided on a display of wireless crew device.

(98) In this example, a new order triggered the notification, so the travel crew member is provided the ability to "claim" the order (e.g., via a user interface (UI) radio button, etc.), as shown at **418**. For example, using an order ID that may be included in the push notification message received by the wireless client device **112-1**/travel app **113-1** at **412**, the wireless client device **112-1**/travel app **113-1** can claim the order initiated by the passenger located at seat **104-3**.

(99) When the order is claimed, the state of the order is updated on the connected cabin API **124** and the seat communication device **144-3** to show "in progress" for the passenger and another "update available" notification is pushed out via connected cabin API **124** and LPNS **126**, as shown via operations **420**, **422**, **422**, **424**, and **426**, marking the order as no longer available to claim (on other wireless crew devices for other

travel crew members).
(100) Once the order is fulfilled, the travel crew member can indicate via the application logic of wireless crew device **112-1** that the order is complete, as shown at **428**, triggering another "update available" notification that can be pushed out via connected cabin API **124** and LPNS **126**, as shown via operations **430**, **432**, **434**, and **436** to the wireless crew devices and the seat communication device **144-2** indicating that the order has been completed.
(101) Referring to FIG. **5**, FIG. **5** is a flowchart depicting a method **500** according to an example embodiment. In at least one embodiment, method **500** may be associated with techniques that may be utilized to facilitate registering for one or more push notifications that are to be received by a wireless crew device for a duration of travel involving a mass transportation device, according to an example embodiment. In various embodiments, method **500** may be performed by a computing device or combination of computing devices as discussed for embodiments herein, such as any of wireless crew devices **112-1**-**112**-X.
(102) As shown at **502**, method **500** may include detecting, by a wireless device operated by a travel crew member, a trigger indicating that the wireless device is to connect to a wireless communication system of a vehicle and is to attempt to register for local push notifications for a duration of travel involving the vehicle.
(103) At **504**, the method may include obtaining, by the wireless device upon connection to the wireless communication system, vehicle travel information that identifies the duration of travel involving the vehicle. At **506**, the method may include identifying, by the wireless device and based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle in which the identifying includes comparing the vehicle travel information that identifies the duration of travel involving the vehicle with travel assignment information that identifies durations of travel for a plurality of vehicles to which the travel crew member is assigned.
(104) At **508**, based on determining that one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, registering, by the wireless device, with a notification server of the vehicle to receive the one or more local push notifications for the duration of travel involving the vehicle in which the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based on a role of the travel crew member for the duration of travel involving the vehicle and are based on one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.
(105) Referring to FIG. **6**, FIG. **6** illustrates a hardware block diagram of a computing device **600** that may perform functions associated with operations discussed herein in connection with the techniques depicted in FIGS. **1**A, **1**B, **2**A, **2**B **3**, **4**, and **5**. In various embodiments, a computing device or apparatus, such as computing device **600** or any combination of computing devices **600**, may be configured as any entity/entities as discussed for the techniques depicted in connection with operations illustrated/discussed for various embodiments herein, such as any of wireless crew devices **112-1**-**112**-X, vehicle network server **120**, seat server **142**, seat communication devices **144-1**-**144**-N, wireless AP **114-1**, and wireless AP **114-2** discussed herein, and/or any other elements/functions/nodes discussed herein.
(106) In at least one embodiment, the computing device **600** may be any apparatus that may include one or more processor(s) **602**, one or more memory element(s) **604**, storage **606**, a bus **608**, one or more network processor unit(s) **630** interconnected with one or more network input/output (I/O) interface(s) **632**, one or more I/O interface(s) **616**, and control logic **620**. In various embodiments, instructions associated with logic for computing device **600** can overlap in any manner and are not limited to the specific allocation of instructions and/or operations described herein.
(107) For embodiments in which computing device **600** may be implemented as any device capable of wireless communications (e.g., wireless crew device **112-1**-**112**-X, wireless AP **114-1**, and wireless AP **114-2**), computing device **600** may further include at least one baseband processor or modem **610**, one or more radio RF transceiver(s) **612** (e.g., any combination of RF receiver(s) and RF transmitter(s)), one or more antenna(s) or antenna array(s) **614**.
(108) In at least one embodiment, processor(s) **602** is/are at least one hardware processor configured to execute various tasks, operations and/or functions for computing device **600** as described herein according to software and/or instructions configured for computing device **600**. Processor(s) **602** (e.g., a hardware processor) can execute any type of instructions associated with data to achieve the operations detailed herein. In one example, processor(s) **602** can transform an element or an article (e.g., data, information) from one state or thing to another state or thing. Any of potential processing elements, microprocessors, digital signal processor, baseband signal processor, modem, PHY, controllers, systems, managers, logic, and/or machines described herein can be construed as being encompassed within the broad term 'processor'.
(109) In at least one embodiment, memory element(s) **604** and/or storage **606** is/are configured to store data, information, software, and/or instructions associated with computing device **600**, and/or logic configured for memory element(s) **604** and/or storage **606**. For example, any logic described herein (e.g., control logic **620**) can, in various embodiments, be stored for computing device **600** using any combination of memory element(s) **604** and/or storage **606**. Note that in some embodiments, storage **606** can be consolidated with memory element(s) **604** (or vice versa) or can overlap/exist in any other suitable manner.
(110) In at least one embodiment, bus **608** can be configured as an interface that enables one or more elements of computing device **600** to communicate in order to exchange information and/or data. Bus **608** can be implemented with any architecture designed for passing control, data and/or information between processors, memory elements/storage, peripheral devices, and/or any other hardware and/or software components that may be configured for computing device **600**. In at least one embodiment, bus **608** may be implemented as a fast kernel-hosted interconnect, potentially using shared memory between processes (e.g., logic), which can enable efficient communication paths between the processes.
(111) In various embodiments, network processor unit(s) **630** may enable communication between computing device **600** and other systems, entities, etc., via network I/O interface(s) **632** (wired and/or wireless) to facilitate operations discussed for various embodiments described herein. In various embodiments, network processor unit(s) **630** can be configured as a combination of hardware and/or software, such as one or more Ethernet driver(s) and/or controller(s) or interface cards, Fibre Channel (e.g., optical) driver(s) and/or controller(s), wireless receivers/transmitters/transceivers, baseband processor(s)/modem(s), and/or other similar network interface driver(s) and/or controller(s) now known or hereafter developed to enable communications between computing device **600** and other systems, entities, etc. to facilitate operations for various embodiments described herein. In various embodiments, network I/O interface(s) **632** can be configured as one or more Ethernet port(s), Fibre Channel ports, any other I/O port(s), and/or antenna(s)/antenna array(s) now known or hereafter developed. Thus, the network processor unit(s) **630** and/or network I/O interface(s) **632** may include suitable interfaces for receiving, transmitting, and/or otherwise communicating data and/or information (wired and/or wirelessly) in a network environment.
(112) I/O interface(s) **616** allow for input and output of data and/or information with other entities that may be connected to computing device **600**. For example, I/O interface(s) **616** may provide a connection to external devices such as a keyboard, keypad, a touch screen, and/or any other suitable input and/or output device now known or hereafter developed. In some instances, external devices can also include portable computer readable (non-transitory) storage media such as database systems, thumb drives, portable optical or magnetic disks, and memory cards. In still some instances, external devices can be a mechanism to display data to a user, such as, for example, a computer monitor, a

display screen, or the like.
(113) For embodiments in which computing device **600** is implemented as a wireless device or any apparatus capable of wireless communications, the RF transceiver(s) **612** may perform RF transmission and RF reception of wireless signals via antenna(s)/antenna array(s) **614**, and the baseband processor or modem **610** performs baseband modulation and demodulation, etc. associated with such signals to enable wireless communications for computing device **600**.
(114) In various embodiments, control logic **620** can include instructions that, when executed, cause processor(s) **602** to perform operations, which can include, but not be limited to, providing overall control operations of computing device; interacting with other entities, systems, etc. described herein; maintaining and/or interacting with stored data, information, parameters, etc. (e.g., memory element(s), storage, data structures, databases, tables, etc.); combinations thereof; and/or the like to facilitate various operations for embodiments described herein.
(115) The programs described herein (e.g., control logic **620**) may be identified based upon application(s) for which they are implemented in a specific embodiment. However, it should be appreciated that any particular program nomenclature herein is used merely for convenience; thus, embodiments herein should not be limited to use(s) solely described in any specific application(s) identified and/or implied by such nomenclature.
(116) In various embodiments, any entity or apparatus as described herein may store data/information in any suitable volatile and/or non-volatile memory item (e.g., magnetic hard disk drive, solid state hard drive, semiconductor storage device, random access memory (RAM), read only memory (ROM), erasable programmable read only memory (EPROM), application specific integrated circuit (ASIC), etc.), software, logic (fixed logic, hardware logic, programmable logic, analog logic, digital logic), hardware, and/or in any other suitable component, device, element, and/or object as may be appropriate. Any of the memory items discussed herein should be construed as being encompassed within the broad term ‘memory element’. Data/information being tracked and/or sent to one or more entities as discussed herein could be provided in any database, table, register, list, cache, storage, and/or storage structure: all of which can be referenced at any suitable timeframe. Any such storage options may also be included within the broad term ‘memory element’ as used herein.
(117) Note that in certain example implementations, operations as set forth herein may be implemented by logic encoded in one or more tangible media that is capable of storing instructions and/or digital information and may be inclusive of non-transitory tangible media and/or non-transitory computer readable storage media (e.g., embedded logic provided in: an ASIC, digital signal processing (DSP) instructions, software [potentially inclusive of object code and source code], etc.) for execution by one or more processor(s), and/or other similar machine, etc. Generally, memory element(s) **604** and/or storage **606** can store data, software, code, instructions (e.g., processor instructions), logic, parameters, combinations thereof, and/or the like used for operations described herein. This includes memory element(s) **604** and/or storage **606** being able to store data, software, code, instructions (e.g., processor instructions), logic, parameters, combinations thereof, or the like that are executed to carry out operations in accordance with teachings of the present disclosure.
(118) In some instances, software of the present embodiments may be available via a non-transitory computer useable medium (e.g., magnetic or optical mediums, magneto-optic mediums, CD-ROM, DVD, memory devices, etc.) of a stationary or portable program product apparatus, downloadable file(s), file wrapper(s), object(s), package(s), container(s), and/or the like. In some instances, non-transitory computer readable storage media may also be removable. For example, a removable hard drive may be used for memory/storage in some implementations. Other examples may include optical and magnetic disks, thumb drives, and smart cards that can be inserted and/or otherwise connected to a computing device for transfer onto another computer readable storage medium.
(119) In one form, a computer-implemented method is provided that may include detecting, by a wireless device operated by a travel crew member, a trigger indicating that the wireless device is to connect to a wireless communication system of a vehicle and is to attempt to register for local push notifications for a duration of travel involving the vehicle; obtaining, by the wireless device upon connection to the wireless communication system of the vehicle, vehicle travel information that identifies the duration of travel involving the vehicle; identifying, by the wireless device and based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, wherein the identifying includes comparing the vehicle travel information that identifies the duration of travel involving the vehicle with travel assignment information that identifies durations of travel for a plurality of vehicles to which the travel crew member is assigned; and based on determining that one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, registering, by the wireless device, with a notification server of the vehicle to receive the one or more local push notifications for the duration of travel involving the vehicle, wherein the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based on a role of the travel crew member for the duration of travel involving the vehicle and are based on one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.
(120) In one instance, the cabin of the vehicle includes a plurality of locations at which passengers are located for the duration of travel involving the vehicle and the travel crew member is one of a plurality of travel crew members, each using an associated wireless device for the duration of travel involving the vehicle, that are to provide the passenger services for each of the plurality of locations of the cabin for the duration of travel involving the vehicle. In one instance, each location of the plurality of locations is associated with at least one of a level or a priority of seating for passengers of the vehicle for the duration of travel involving the vehicle. In one instance, each location of the plurality of locations includes a plurality of sub-locations that are associated with at least one sub-level or one sub-priority of seating for the passengers of the vehicle for the duration of travel involving the vehicle. In one instance, the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based further on one or more sub-locations of the one or more locations of the cabin of the vehicle to which the travel crew member is assigned to perform the passenger services for the duration of travel involving the vehicle.
(121) In one instance, the wireless communication system of the vehicle is a wireless local area network of the vehicle and the trigger detected by the wireless device is a Service Set Identifier (SSID) of the wireless local area network of the vehicle. In one instance, the wireless communication system of the vehicle is a private cellular access network of the vehicle and the trigger detected by the wireless device is a public land mobile network (PLMN) identifier of the private cellular access network. In one instance, the wireless communication system of the vehicle is isolated from and not connected to a public internet network or a wide area network for the duration of travel involving the vehicle. In at least one instance, the method may further include receiving at least one local push notification by the wireless device via the wireless communication system during the duration of travel involving the vehicle. In one instance, the wireless device does not receive any local push notifications when the wireless device is not connected to the wireless communication system of the vehicle.
(122) In one instance, prior to obtaining the vehicle travel information that identifies the duration of travel involving the vehicle, the method further includes establishing, by the wireless device, a persistent websocket connection with the notification server. In one instance, vehicle travel information that identifies the duration of travel involving the vehicle includes one or more of: a flight number or trip number that identifies the duration of travel involving the vehicle; at least one of calendar information or timing information that identifies the duration of travel involving the vehicle; an originating location and a destination location that identifies the duration of travel involving the vehicle; or one or more passenger services that are to be provided during the duration of travel involving the vehicle.

(123) In one instance, the wireless device does not identify that it is to receive the one or more local push notifications based on determining that the vehicle travel information that identifies the duration of travel involving the vehicle does not match any of the travel assignment information that identifies the durations of travel for the plurality of vehicles to which the travel crew member is assigned.
(124) In one instance, the method may further include obtaining, by the wireless device, the travel assignment information that identifies the durations of travel for the plurality of vehicles to which the travel crew member is assigned prior to the wireless device detecting the trigger. In one instance, the vehicle is capable of traveling via at least one of air, water, or land.
(125) Variations and Implementations
(126) Embodiments described herein may include one or more networks, which can represent a series of points and/or network elements of interconnected communication paths for receiving and/or transmitting messages (e.g., packets of information) that propagate through the one or more networks. These network elements offer communicative interfaces that facilitate communications between the network elements. A network can include any number of hardware and/or software elements coupled to (and in communication with) each other through a communication medium. Such networks can include, but are not limited to, any local area network (LAN), virtual LAN (VLAN), wide area network (WAN) (e.g., the Internet), software defined WAN (SD-WAN), wireless local area (WLA) access network, wireless wide area (WWA) access network, metropolitan area network (MAN), Intranet, Extranet, virtual private network (VPN), Low Power Network (LPN), Low Power Wide Area Network (LPWAN), Machine to Machine (M2M) network, Internet of Things (IoT) network, Ethernet network/switching system, any other appropriate architecture and/or system that facilitates communications in a network environment, and/or any suitable combination thereof.
(127) Networks through which communications propagate can use any suitable technologies for communications including wireless communications (e.g., 4G/5G/nG, IEEE 802.11 (e.g., Wi-Fi®)), Radio-Frequency Identification (RFID), Near Field Communication (NFC), Bluetooth™, mm.wave, Ultra-Wideband (UWB), etc.), and/or wired communications (e.g., T1 lines, T3 lines, digital subscriber lines (DSL), Ethernet, etc.). Generally, any suitable means of communications may be used such as electric, sound, light, infrared, and/or radio to facilitate communications through one or more networks in accordance with embodiments herein. Communications, interactions, operations, etc. as discussed for various embodiments described herein may be performed among entities that may directly or indirectly connected utilizing any algorithms, communication protocols, interfaces, etc. (proprietary and/or non-proprietary) that allow for the exchange of data and/or information.
(128) In various example implementations, any entity or apparatus for various embodiments described herein can encompass network elements (which can include virtualized network elements, functions, etc.) such as, for example, network appliances, forwarders, routers, servers, switches, gateways, bridges, loadbalancers, firewalls, processors, modules, radio receivers/transmitters, or any other suitable device, component, element, or object operable to exchange information that facilitates or otherwise helps to facilitate various operations in a network environment as described for various embodiments herein. Note that with the examples provided herein, interaction may be described in terms of one, two, three, or four entities. However, this has been done for purposes of clarity, simplicity and example only. The examples provided should not limit the scope or inhibit the broad teachings of systems, networks, etc. described herein as potentially applied to a myriad of other architectures.
(129) Communications in a network environment can be referred to herein as ‘messages’, ‘messaging’, ‘signaling’, ‘data’, ‘content’, ‘objects’, ‘requests’, ‘queries’, ‘responses’, ‘replies’, etc. which may be inclusive of packets. As referred to herein and in the claims, the term ‘packet’ may be used in a generic sense to include packets, frames, segments, datagrams, and/or any other generic units that may be used to transmit communications in a network environment. Generally, a packet is a formatted unit of data that can contain control or routing information (e.g., source and destination address, source and destination port, etc.) and data, which is also sometimes referred to as a ‘payload’, ‘data payload’, and variations thereof. In some embodiments, control or routing information, management information, or the like can be included in packet fields, such as within header(s) and/or trailer(s) of packets. Internet Protocol (IP) addresses discussed herein and in the claims can include any IP version 4 (IPv4) and/or IP version 6 (IPv6) addresses.
(130) To the extent that embodiments presented herein relate to the storage of data, the embodiments may employ any number of any conventional or other databases, data stores or storage structures (e.g., files, databases, data structures, data or other repositories, etc.) to store information.
(131) Note that in this Specification, references to various features (e.g., elements, structures, nodes, modules, components, engines, logic, steps, operations, functions, characteristics, etc.) included in ‘one embodiment’, ‘example embodiment’, ‘an embodiment’, ‘another embodiment’, ‘certain embodiments’, ‘some embodiments’, ‘various embodiments’, ‘other embodiments’, ‘alternative embodiment’, and the like are intended to mean that any such features are included in one or more embodiments of the present disclosure, but may or may not necessarily be combined in the same embodiments. Note also that a module, engine, client, controller, function, logic or the like as used herein in this Specification, can be inclusive of an executable file comprising instructions that can be understood and processed on a server, computer, processor, machine, compute node, combinations thereof, or the like and may further include library modules loaded during execution, object files, system files, hardware logic, software logic, or any other executable modules.
(132) It is also noted that the operations and steps described with reference to the preceding figures illustrate only some of the possible scenarios that may be executed by one or more entities discussed herein. Some of these operations may be deleted or removed where appropriate, or these steps may be modified or changed considerably without departing from the scope of the presented concepts. In addition, the timing and sequence of these operations may be altered considerably and still achieve the results taught in this disclosure. The preceding operational flows have been offered for purposes of example and discussion. Substantial flexibility is provided by the embodiments in that any suitable arrangements, chronologies, configurations, and timing mechanisms may be provided without departing from the teachings of the discussed concepts.
(133) As used herein, unless expressly stated to the contrary, use of the phrase ‘at least one of’, ‘one or more of’, ‘and/or’, variations thereof, or the like are open-ended expressions that are both conjunctive and disjunctive in operation for any and all possible combination of the associated listed items. For example, each of the expressions ‘at least one of X, Y and Z’, ‘at least one of X, Y or Z’, ‘one or more of X, Y and Z’, ‘one or more of X, Y or Z’ and ‘X, Y and/or Z’ can mean any of the following: 1) X, but not Y and not Z; 2) Y, but not X and not Z; 3) Z, but not X and not Y; 4) X and Y, but not Z; 5) X and Z, but not Y; 6) Y and Z, but not X; or 7) X, Y, and Z.
(134) Each example embodiment disclosed herein has been included to present one or more different features. However, all disclosed example embodiments are designed to work together as part of a single larger system or method. This disclosure explicitly envisions compound embodiments that combine multiple previously discussed features in different example embodiments into a single system or method.
(135) Additionally, unless expressly stated to the contrary, the terms ‘first’, ‘second’, ‘third’, etc., are intended to distinguish the particular nouns they modify (e.g., element, condition, node, module, activity, operation, etc.). Unless expressly stated to the contrary, the use of these terms is not intended to indicate any type of order, rank, importance, temporal sequence, or hierarchy of the modified noun. For example, ‘first X’ and ‘second X’ are intended to designate two ‘X’ elements that are not necessarily limited by any order, rank, importance, temporal sequence, or hierarchy of the two elements. Further as referred to herein, ‘at least one of’ and ‘one or more of’ can be represented using the

‘(s)’ nomenclature (e.g., one or more element(s)).
(136) One or more advantages described herein are not meant to suggest that any one of the embodiments described herein necessarily provides all of the described advantages or that all the embodiments of the present disclosure necessarily provide any one of the described advantages. Numerous other changes, substitutions, variations, alterations, and/or modifications may be ascertained to one skilled in the art and it is intended that the present disclosure encompass all such changes, substitutions, variations, alterations, and/or modifications as falling within the scope of the appended claims.

Claims

1. A method comprising: detecting, by a wireless device operated by a travel crew member, a trigger indicating that the wireless device is to connect to a wireless communication system of a vehicle and is to attempt to register for local push notifications for a duration of travel involving the vehicle; obtaining, by the wireless device upon connection to the wireless communication system of the vehicle, vehicle travel information that identifies the duration of travel involving the vehicle; identifying, by the wireless device and based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, wherein the identifying includes comparing the vehicle travel information that identifies the duration of travel involving the vehicle with travel assignment information that identifies durations of travel for a plurality of vehicles to which the travel crew member is assigned; and based on determining that one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, registering, by the wireless device, with a notification server of the vehicle to receive the one or more local push notifications for the duration of travel involving the vehicle, wherein the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based on a role of the travel crew member for the duration of travel involving the vehicle and are based on one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.
2. The method of claim 1, wherein the cabin of the vehicle includes a plurality of locations at which passengers are located for the duration of travel involving the vehicle and the travel crew member is one of a plurality of travel crew members, each using an associated wireless device for the duration of travel involving the vehicle, that are to provide the passenger services for each of the plurality of locations of the cabin for the duration of travel involving the vehicle.
3. The method of claim 2, wherein each location of the plurality of locations is associated with at least one of a level or a priority of seating for passengers of the vehicle for the duration of travel involving the vehicle.
4. The method of claim 3, wherein each location of the plurality of locations includes a plurality of sub-locations that are associated with at least one sub-level or one sub-priority of seating for the passengers of the vehicle for the duration of travel involving the vehicle.
5. The method of claim 4, wherein the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based further on one or more sub-locations of the one or more locations of the cabin of the vehicle to which the travel crew member is assigned to perform the passenger services for the duration of travel involving the vehicle.
6. The method of claim 1, wherein the wireless communication system of the vehicle is a wireless local area network of the vehicle and the trigger detected by the wireless device is a Service Set Identifier (SSID) of the wireless local area network of the vehicle.
7. The method of claim 1, wherein the wireless communication system of the vehicle is a private cellular access network of the vehicle and the trigger detected by the wireless device is a public land mobile network (PLMN) identifier of the private cellular access network.
8. The method of claim 1, wherein the wireless communication system of the vehicle is isolated from and not connected to a public internet network or a wide area network for the duration of travel involving the vehicle.
9. The method of claim 8, further comprising: receiving at least one local push notification by the wireless device via the wireless communication system during the duration of travel involving the vehicle.
10. The method of claim 8, wherein the wireless device does not receive any local push notifications when the wireless device is not connected to the wireless communication system of the vehicle.
11. The method of claim 1, wherein, prior to obtaining the vehicle travel information that identifies the duration of travel involving the vehicle, establishing, by the wireless device, a persistent websocket connection with the notification server.
12. The method of claim 1, wherein vehicle travel information that identifies the duration of travel involving the vehicle includes one or more of: a flight number or trip number that identifies the duration of travel involving the vehicle; at least one of calendar information or timing information that identifies the duration of travel involving the vehicle; or an originating location and a destination location that identifies the duration of travel involving the vehicle.
13. The method of claim 12, wherein the wireless device does not identify that it is to receive the one or more local push notifications based on determining that the vehicle travel information that identifies the duration of travel involving the vehicle does not match any of the travel assignment information that identifies the durations of travel for the plurality of vehicles to which the travel crew member is assigned.
14. The method of claim 1, further comprising: obtaining, by the wireless device, the travel assignment information that identifies the durations of travel for the plurality of vehicles to which the travel crew member is assigned prior to the wireless device detecting the trigger.
15. The method of claim 1, wherein the vehicle is capable of traveling via at least one of air, water, or land.
16. One or more non-transitory computer readable storage media encoded with instructions that, when executed by a processor, cause the processor to perform operations, comprising: detecting, by a wireless device operated by a travel crew member, a trigger indicating that the wireless device is to connect to a wireless communication system of a vehicle and is to attempt to register for local push notifications for a duration of travel involving the vehicle; obtaining, by the wireless device upon connection to the wireless communication system of the vehicle, vehicle travel information that identifies the duration of travel involving the vehicle; identifying, by the wireless device and based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, wherein the identifying includes comparing the vehicle travel information that identifies the duration of travel involving the vehicle with travel assignment information that identifies durations of travel for a plurality of vehicles to which the travel crew member is assigned; and based on determining that one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, registering, by the wireless device, with a notification server of the vehicle to receive the one or more local push notifications for the duration of travel involving the vehicle, wherein the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based on a role of the travel crew member for the duration of travel involving the vehicle and are based on one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.
17. The media of claim 16, wherein the instructions, when executed by a processor, cause the processor to perform further operations, comprising: receiving at least one local push notification by the wireless device via the wireless communication system during the duration of

travel involving the vehicle.

18. A wireless device comprising: at least one memory element for storing data; and at least one processor for executing instructions associated with the data, wherein executing the instructions causes the wireless device to perform operations, comprising: detecting, by the wireless device that is operated by a travel crew member, a trigger indicating that the wireless device is to connect to a wireless communication system of a vehicle and is to attempt to register for local push notifications for a duration of travel involving the vehicle; obtaining, upon connection to the wireless communication system of the vehicle, vehicle travel information that identifies the duration of travel involving the vehicle; identifying, based on the vehicle travel information, whether one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, wherein the identifying includes comparing the vehicle travel information that identifies the duration of travel involving the vehicle with travel assignment information that identifies durations of travel for a plurality of vehicles to which the travel crew member is assigned; and based on determining that one or more local push notifications are to be received by the wireless device for the duration of travel involving the vehicle, registering with a notification server of the vehicle to receive the one or more local push notifications for the duration of travel involving the vehicle, wherein the one or more local push notifications that are to be received by the wireless device for the duration of travel involving the vehicle are based on a role of the travel crew member for the duration of travel involving the vehicle and are based on one or more locations of a cabin of the vehicle to which the travel crew member is assigned to perform passenger services for the duration of travel involving the vehicle.

19. The wireless device of claim 18, wherein executing the instructions causes the wireless device to perform further operations, comprising: obtaining the travel assignment information that identifies the durations of travel for the plurality of vehicles to which the travel crew member is assigned prior to detecting the trigger.

20. The wireless device of claim 18, wherein executing the instructions causes the wireless device to perform further operations, comprising: receiving at least one local push notification by the wireless device via the wireless communication system during the duration of travel involving the vehicle.