PD ISO/TR 17185-3:2015

BSI Standards Publication

Intelligent transport systems — Public transport user information

Part 3: Use cases for journey planning systems and their interoperation

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL REPORT

ISO/TR 17185-3

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Intelligent transport systems — Public transport user information —

Part 3: Use cases for journey planning systems and their interoperation

Systèmes intelligents de transport —

Partie 3: Cas utiles pour les systèmes de planification de voyage et leur interopération

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 204, *Intelligence Transport Systems*.

ISO 17185 consists of the following parts, under the general title *Public transport user information*:

— *Part 1: Standards framework for public information systems*

— *Part 3: Use cases for journey planning systems and their inter-operation* [Technical Report]

The following parts are under preparation:

— *Part 2: Data and interface standards catalogue and cross reference* [Technical Report]

Introduction

ISO/TC 204, *Intelligent Transport Systems*, has been discussing enhancement of surface public transport information provision to surface public transport users including international travellers around the world by using ITS technology.

The responsibility of ISO/TC 204 is make surface public transport more convenient by realizing stress-free surface public transport user information provision, and hence, the technical committee has been working to develop one set of international standard and several technical reports which are defining basic framework and practical uses cases that will fit above current national and regional standards as a reference. The accepted national and regional standards (at this point in time, such as TCIP and TRANSMODEL) will be allowed to define the specific information interfaces such as data format, stop point numbering system, etc. that are necessary to implementation of surface public transport information systems.

The set of International Standard and Technical Reports will be beneficial for all ISO/CEN member countries as well as non ISO/CEN member countries. The International Standard/Technical Reports will be a valuable reference to detail basic framework as well as highlight and encourage use of currently available national and regional standards such as TRANSMODEL, TCIP, and possibly others. The intention is that, by deploying these national and regional standards by other countries or regions, duplication of cost and time is avoidable. For those countries that do not have surface public transport information standards, this approach allows more rapid development and deployment of public transport systems that enhance usability and convenience.

ISO 17185 is specifically set at a higher level, or reference and not aiming harmonize currently available national and regional standards to allow use of these robust standards which are set at various levels (for example implementation specifications versus application level standards) but which also experience widespread acceptance in their regional standards. This International Standard intends to establish a basic solid foundation for surface public transport user information provision framework and is specifically limited to this scope to avoid conflict with those currently available regional standards.

ISO 17185 is intended to be fully consistent with those currently available national and regional standards which may be related to international public transport. In fact, in the case of international surface public transport, public transport operators already have transport-related information systems. However, public transport users, including international travellers, are often not provided with static and real time information including bus/train/tram locations in an appropriate and timely manner. ISO 17185, and its scope and approach, will solve this issue by setting basic framework for public transport information provision while embracing existing national and regional standards.

TECHNICAL REPORT **ISO/TR 17185-3:2015(E)**

Intelligent transport systems — Public transport user information —

Part 3:
Use cases for journey planning systems and their interoperation

1 Scope

The purpose of this part of ISO 17185 is to define high level general requirements of journey planning systems by standardizing use cases.

This part of ISO 17185 defines basic requirements for implementing the journey planning system, from the viewpoint that the public transport users should be provided with convenient tool to make his or her journey more efficient ones. In order to realize the desirable journey planning system, public transport information has to be efficiently processed and provided to public transport users in an appropriate way by using currently available regional standards.

This part of ISO 17185 does not standardize specific information interfaces such as data format or a stop point numbering system and so on but currently available regional standards established by regional and national groups are suggested to be applied.

ISO 17185 is composed of the following parts:

— Part 1: Standards framework for public information systems: (International Standard)

— Part 2: Data and Interface standards catalogue and cross reference: (Technical Report)

— Part 3: Use cases for journey planning systems and their inter-operation: (Technical Report)

2 Normative references

There are no normative references.

3 Terms and definitions

For the purpose of this document, following terms and definitions apply.

3.1
administrator
person charged with the installation, configuration, and management of a computer system, network, storage subsystem, database, or application

[SOURCE: ISO/IEC 24775:2011, 2.1.4, modified]

3.2
data
reinterpretable representation of information in a formalized manner suitable for communication, interpretation, or processing

Note 1 to entry: Data can be processed by humans or by automatic means. [ISO/IEC 2382-1:1998, (01.01.02)]

[SOURCE: ISO/IEC 15944, modified]

3.3
database
collection of electronically stored descriptive records or content units (including facts, full texts, pictures, and sound) with a common user interface and software for the retrieval and manipulation of the data

Note 1 to entry: The units or records are usually collected with a particular intent and are related to a defined topic. A database can be issued on CD-ROM, diskette, or other direct-access method, or as a computer file accessed via dial-up methods or via the Internet.

Note 2 to entry: Licensed databases are counted separately even if access to several licensed database products is effected through the same interface.

Note 3 to entry: A common interface providing access to a packet of serials or digital documents, usually offered by a publisher or vendor, is also to be counted as database. Additionally, the single serials or digital documents should be counted as serials or digital documents. [ISO 2789:2006, 3.2.10]

[SOURCE: ISO 9707, modified]

3.4
data model
graphical and/or lexical representation of data, specifying their properties, structure, and inter-relationships

[SOURCE: ISO/IEC 11179, modified]

3.5
entity
concrete or abstract thing that exists, did exist, or might exist, including associations among these things

EXAMPLE: A person, object, event, idea, process, etc.

Note 1 to entry: An entity exists whether data about it are available or not. [ISO/IEC 2382-17:1999, (17.02.05)]

[SOURCE: ISO/IEC 15944, modified]

3.6
fare collection
all activities related to the collection of money from passengers

3.7
framework
structure expressed in diagrams, text, and formal rules which relates the components of a conceptual entity to each other

[SOURCE: ISO 19439:2006, 3.3, modified]

3.8
function
intended effect of a system, subsystem, product, or part

[SOURCE: EN 1325-1:1997]

Note 1 to entry: Functions should have a single definite purpose. Function names should have a declarative structure (e.g. “Validate telecommands”), and say “what” is to be done rather than “how”. Good naming allows design components with strong cohesion to be easily derived.

[SOURCE: ISO 16091, modified]

3.9
functional area
combination of groups and/or elements in a unit that can be used independently

[SOURCE: ISO 16952, modified]

3.10
IC
integrated circuit
a small piece of semiconductive material that contains interconnected electronic elements

[SOURCE: ISO/IEC 2382-1, modified]

3.11
logical data model
data design, that takes into account the type of database to be used, but does not consider means of utilisation of space or access

3.12
management information
information utilized by management or produced to serve a management function

[SOURCE: ISO 6707-2, modified]

Note 1 to entry: In this part of ISO 17185, this term means all activities allowing the company management to collect the information necessary to meet problem-solving needs. Data of operational systems are filtered and aggregated for this purpose, and made available to the user interactively, or in form of pre-defined reports and summaries. Such functions are in principle related to all functional areas of a company, with particular reference to the management of statistical results.

3.13
operations monitoring and control
all activities related to the transportation process, i.e. real-time functions related to the driving and transportation of passengers according to given instructions, including the monitoring of the driving process and its control in case of deviations, as well as all activities that support the driving process (traffic light priority, track switching, bay selection, advance/delay advice, etc.)

Note 1 to entry: Such functions are often assisted by computer-aided tools, known as Automated Vehicle Monitoring (AVM).

3.14
passenger information
activities related to informing the users either on the planned or on the actual transportation services

3.15
personnel disposition
activities related to the mid-term and short-term management of drivers

3.16
scheduling
method of controlling the timing of the execution of a scheduled activity within or represented by a managed object

[SOURCE: ISO/IEC 10164, modified]

Note 1 to entry: In this part of ISO 17185, this term means all activities related to the tactical planning of transportation, splitting into vehicle scheduling, driver scheduling, rostering.

3.17
use case
sequence of actions that an actor (usually a person, but perhaps an external entity, such as another system) performs within a system to achieve a particular goal

[SOURCE: ISO/TR 25102, modified]

3.18
user
entity that uses ITS services provided by a service provider

[SOURCE: ISO 24101-1:2008, 3.13, modified]

4 Symbols and abbreviated terms

AVL	automatic vehicle location
BISON	Beheer Informatie Standaarden OV Nederland, Netherlands public transport information standards management platform
CEN	European Committee for Standardization
DE	Germany
EU	European Union
GPS	global navigation system
IEC	international electro-technical commission
IFOPT	identification of fixed objects in public transport, CEN published standard (EN 28701)
ISO	international organization for standardization
ITS	intelligent transport systems
JP	Journey planning
NaPTAN	National Public Transport Access Nodes, GB national system for uniquely identifying all the points of access to public transport in GB
NEPTUNE	French standard (PR NF 99-506) for format describing public transport routes
NeTEx	Network Exchange, EN TC278 WG3 standard currently in development and the goal is to provide efficient European wide standard for exchanging public transport schedules and related data.
POI	point of interest
PT	public transport
SIRI	service interface for real time information, CEN technical specification (TS 15531)
TCIP	transit communications interface profiles, US standard developed by APTA and is for introducing advanced ITS technologies into public transport to improve safety, security, and efficiency

Transmodel	CEN standard (EN 12896) for reference data model for public transport information and it provide an abstract model of common public transport concepts and data structures that can be used to build many different kind of public transport information system, including for timetabling, fares, operational management, real time data, journey planning, etc.
TransXChange	GB nationwide standard for exchanging bus schedules and related data

5 General requirement

This part of ISO 17185 describes use cases for journey planning systems and their inter-operation of PT user information provisions for PT users, the customers. For the detailed data and interface standards catalogues and cross reference, which fits to those who do not have their own regional and national standards, refer to ISO/TR 17185-2.

5.1 Importance of PT user information provision

PT service operator shall play an important role in surface transport as the society fully depend upon privately-owned cars has its own limitation such as high environmental impact, increasing number of accidents related to aged drivers, and shrinking economy due to scattered population.

The issue of the current PT to be solved varies country to country or city to city, but the following common vision can be observed. From PT service operator view point, benefit/cost factor can be kept high by deploying ITS technologies such as simple and efficient fare transaction device, priority traffic control signal system, etc. From PT user, the customer, view point, PT use shall be more attractive than driving his/her own cars by improving PT transport speed and reducing PT fare, and by providing attractive PT user information to PT users, the customers.

When providing PT user information, it is important to understand that there are various types of customers and their needs vary between customer types. In local resident, there are two types, one who does not know how to use PT, the other who knows basic information and understands that PT is reliable transport means in time and safety. Usually visitor is not familiar with local PT and convenient, accessible and easy to use PT service and information. Therefore, PT user information provision framework shall be designed to accommodate those various needs.

Various PT information provision projects are under practical use, and the project status reports are commonly shared internationally to improve PT user information provision system continuously throughout the world.

There are several key issues concerning PT when creating “PT user” friendly society, namely;

— attractive PT user information provision to potential PT user, the customers;

— attractive PT contactless card system;

— efficient and attractive PT service in timetabling and service route;

— good relationship between regional transit regulator and PT service operator;

— better relationship between PT driver and PT service operator by deploying ITS technologies.

Therefore, defining basic PT user information provision framework, which is commonly acceptable internationally, is indispensable for both of advanced and emerging countries, where PT user information provision system improvements are needed. This is the purpose of ISO 17185-1.

The PT user information provision service architecture and required standards needed varies country to country and therefore, this international standard is not defining new rules but provide basic framework guide lines which shall be referred when such PT information provision system is implemented.

This part of ISO 17185 describes detailed use cases of journey planning systems and their inter-operation. For the detailed data and interface standards catalogues and cross reference, which fits to those who do not have their own regional and national standards, refer to ISO/TR 17185-2.

5.2 Objectives of ISO 17185

The objectives of ISO 17185 are defined as follows.

Part 1: Define the high level stakeholder roles and responsibilities and their PT user information exchanges.

Part 2: Define data interface message comparison.

Part 3: Define use cases for journey planning systems and their inter-operation where in the worldwide standards apply and it may include exchange of information using nomadic devices

Overall, in ISO 17185, it describes a framework to facilitate inter-operability of public transport-related information using different national/regional standards, off the shelf of use of standards, help to guide evolution of standards worldwide to a common framework, identify gaps in existing standards and translate between existing standards to facilitate PT users including worldwide travellers.

This is accomplished through, definition of the high level stakeholder roles and responsibilities and PT user information exchange, data and interface message comparisons, use cases wherein the worldwide standards apply.

5.3 Roles and responsibilities of basic actors in journey planning system

As described in ISO 17185-1, the basic actors of PT journey planning system are shown in Figure 1 below. In the basic PT JP (journey planning) system, four major basic actors are defined as shown in Figure 1. This is shown as basic system framework as an example and at actual system implementation phase, some of those actors shall be modified to fit to each countries service requirements and circumstances.

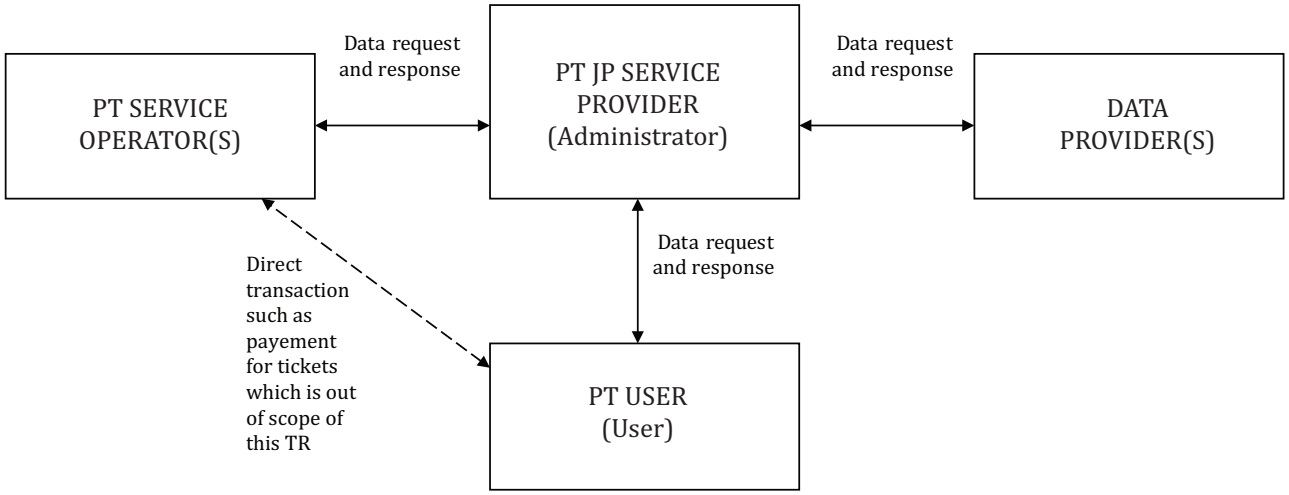


Figure 1 — Basic actors in PT JP system

5.3.1 PT service operator

PT service operator is an entity who operates PT service and in the PT JP system, its function is to provide accurate and up-to-date PT information, such as bus stop/station, vehicle location, scheduled service, ticketing, fare, reservation status, payment status to PT JP service provider. The PT JP service provider sends PT users seat reservation request to PT service operator and receives request results.

The PT USER access such information through PT JP service provider. This entity is composed of the following sub actors:

a) transport service provider;

b) transport service manager;

c) transport operation manager.

For more details, refer to ISO 17185-1.

5.3.2 PT JP service provider

PT JP service provider is an entity who gathers single or multiple modes (such as bus, train, airplane, tram, metro) and/or single or multiple PT service operators data and provide value added PT JP service to PT user through internet for PC and mobile device and digital TV network. The PT JP service provider for multimodal is often called multi-modal JP service provider. When data format is deferent from PT service operator to PT service operator, data conversion function shall be added in the data line from PT service operator(s).

Responsible for the provision of PT JP information services to PT users or others. Those services may be including journey route search (such as bus stop/station, route, travel time, fares, mobility restricted information), reservation status, payment status, schedules service, ticketing, vehicle location, etc. The major communication link to PT user is currently done through internet with WEB service.

Administrator of PT JP service provider shall perform the system maintenance for updating the system database and improving the services quality.

5.3.3 Data provider

Data provider is an entity who gathers multiple type of information, such as interchange information, such as length and time of foot path between stop points, stairs, escalators, lifts, information for challenged people (or people with big suite case, baby buggy, etc.), disruption information to escalators, lifts, blockages of corridors, access to stop points, etc., graphs for calculating pedestrian (and optional park and ride and cycle and ride) routes from and to the PT station, disruption information for the foot path from and to the stations (plus optional park and ride, cycle and ride, cycle, etc.), addresses, POIs, regional names, zoom able background maps for display. This actor may be private sector or municipal, state, federal government body.

5.3.4 PT user

PT user is a human who use PT service. When a PT user provides geographical location data such as GPS location data to PT JP service provider, the PT user can receive real time route navigation service through mobile device such as smart phone. The PT user is responsible to plan/define journey plan, find best transport route, re-plan journey when needed. In the use cases description defined in 5.4.4, it is described as “user”.

5.4 Use cases description of journey planning system

The use case descriptions of the journey planning systems and their inter-operations shall be defined as shown below. Use cases defined in ISO 17185 are described as informative purpose only and in the real implementation of the journey planning systems, some of these use cases shall be modified to fit each PT service requirements and circumstances.

These use cases described in this part of ISO 17185 do not preclude any “presentation layer” format such as web, mobile web, interactive voice response (phone), or kiosk. A presentation layer represents user interface capabilities as shown in Figure 2 below.

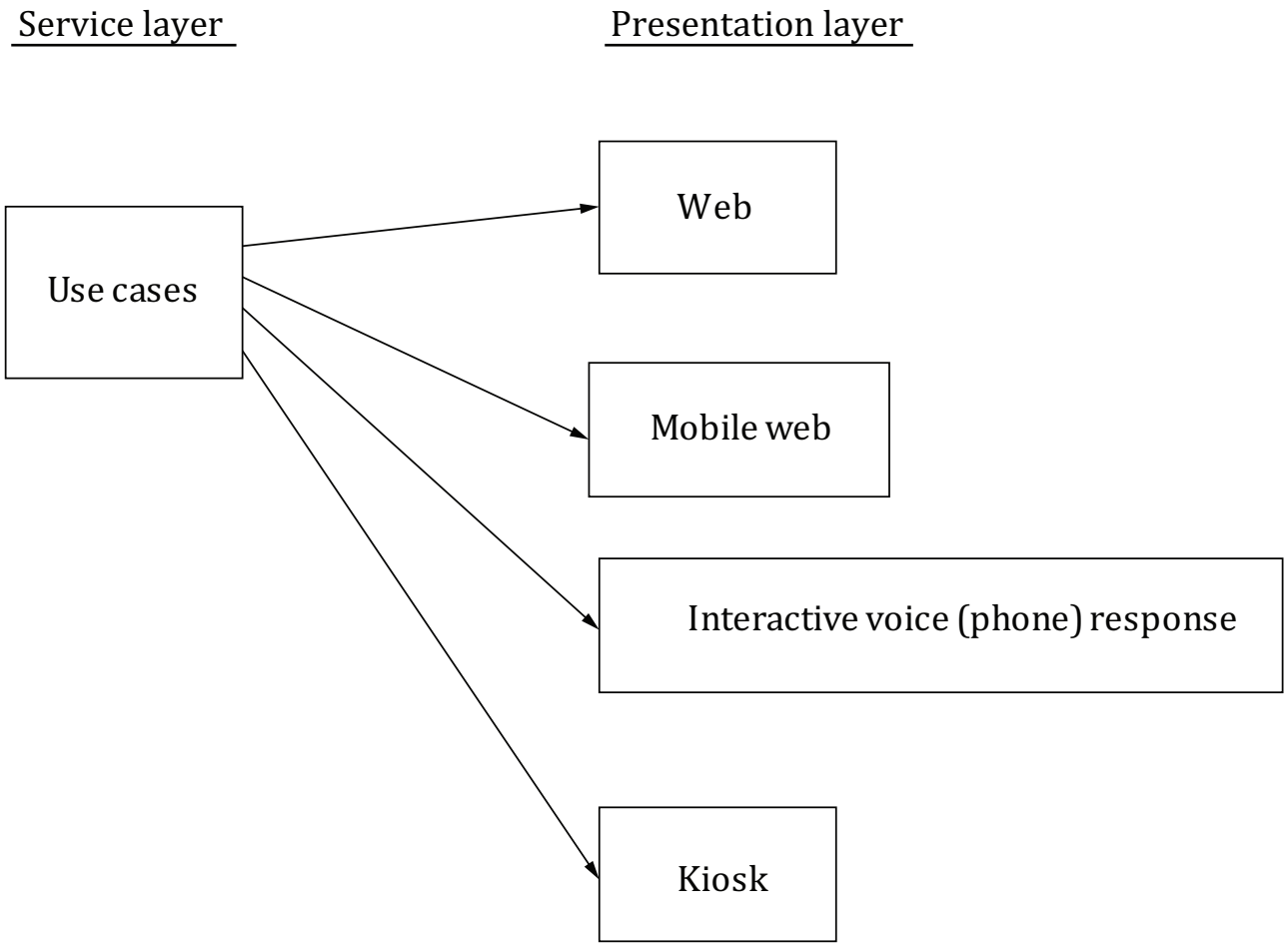
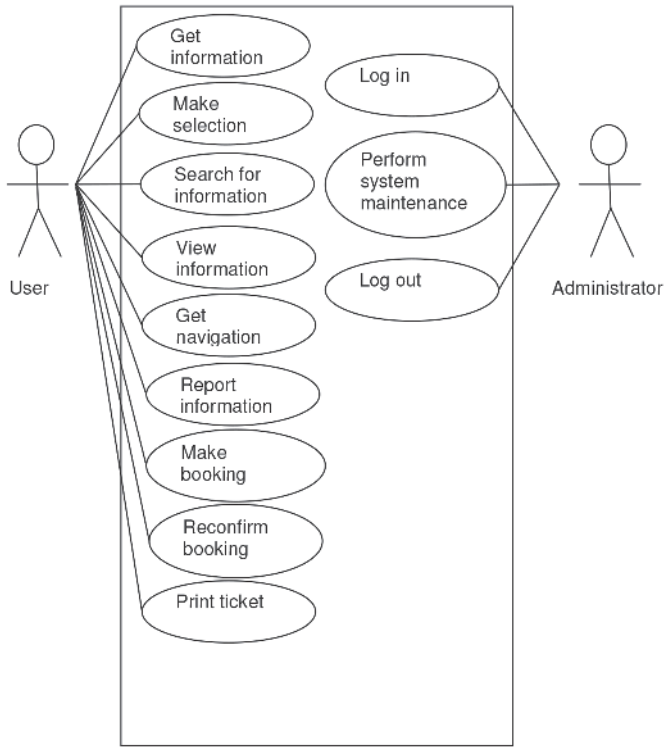


Figure 2 — Service layer and presentation layer

5.4.1 Methodology used for the use case definition

Each use case definition is described in same type of table as shown below. This table shows what each item means. Although these use cases are described based upon a PC web type presentation layer service interface, when implement the journey planning systems, all other modes of presentation methods can be adopted, such as mobile web, interactive voice (telephone) response and kiosk.

Use Case	**Name of each use case**
Description	Brief description of system inter-action when this use case is performed
Actor	Who initiate to make the system start this use case into action
Assumptions	Condition right before this use case has been started
Interactions	Step by step description of system inter-actions when this use case is performed
Results	Description of the result right after this use case has been performed
Issues	The statement of issues to make this use case perform better; System improvements Service improvements Performance improvements
UML diagram	Use case diagram. Following is shown for journey planning system general use case.

Use Case	Name of each use case
	

5.4.2 Use case categorization

In this part of ISO 17185, following use cases are defined. Each use case can be categorized as follows:

a) User use cases

1) Read Instructions : information
2) Select Type of Public Transport : selection
3) Select Departure stop/station : selection
4) Select Destination stop/station : selection
5) Select Via stop/station : selection
6) Select Date : selection
7) Select Time : selection
8) Select Preference : selection
9) Select Combination Type of Walking and Driving : selection
10) Select Walking Speed : selection
11) Select Preference of Wheelchair Use : selection
12) Search for Journey : search
13) Search for Next Departure Service : search
14) Search for Previous Departure Service : search

This key user interface of journey planning system will include most of these selection menus (2) through 11)) on same window so that users can easily and conveniently do their preference selection for journey planning search in a convenient way.

15) View Journey on Map : information

16) View Real Time Route Navigation : information

17) Search for Return Journey : search

18) Return to New Search : search

19) View Scheduled Service Information : information

20) View Real Time Service Station/Stop Information : information

21) View Real Time Route/Line Information : information

22) View Detour Information : information

23) View Incident Information : information

24) View Delay Information : information

25) Report User Real Time Information : report

26) View User Reported Real Time Information : information

27) View Vehicle Location on Map : information

28) View Seat Availability : information

29) Book Seat Reservation : reservation

30) Reconfirm Seat Reservation : information

31) Confirm Payment Status : information

32) Print Ticket : print

Subscription (push type status information) information

b) Administrator use cases

1) System Log-in : operation

2) Add Stop/Station : maintenance

3) Delete Stop/Station : maintenance

4) Commission Stop/Station : maintenance

5) Close Stop/Station : maintenance

6) Add Route/Line : maintenance

7) Delete Route/Line : maintenance

8) Open Route/Line : maintenance

9) Close Route/Line : maintenance

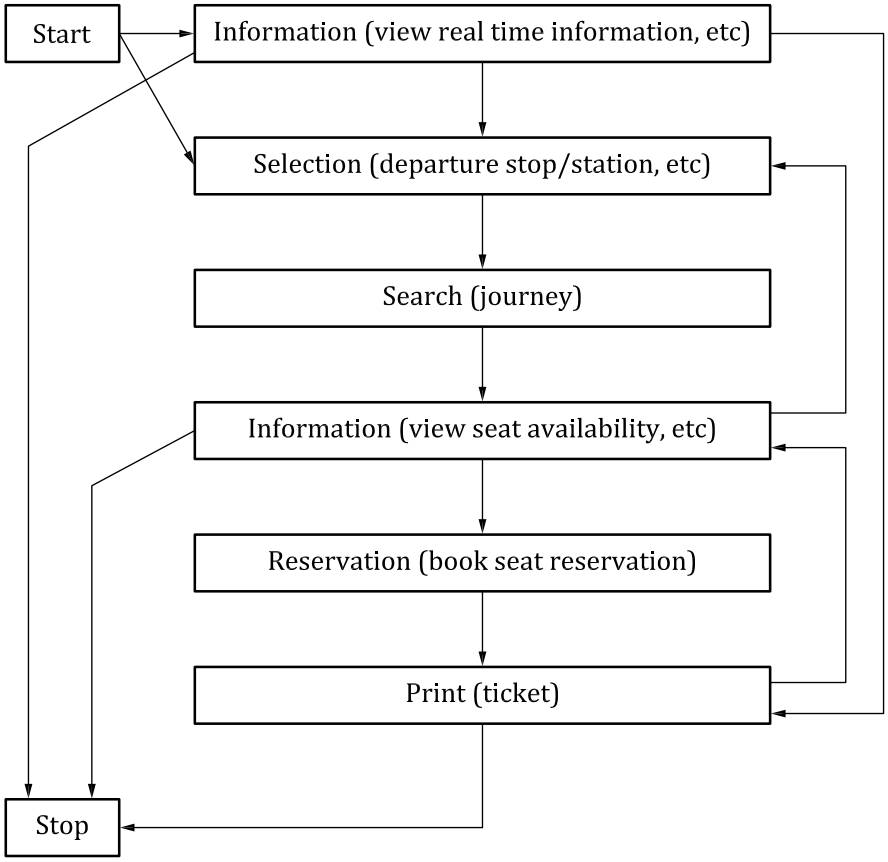
10) System Log-out : operation

5.4.3 Operational scenario

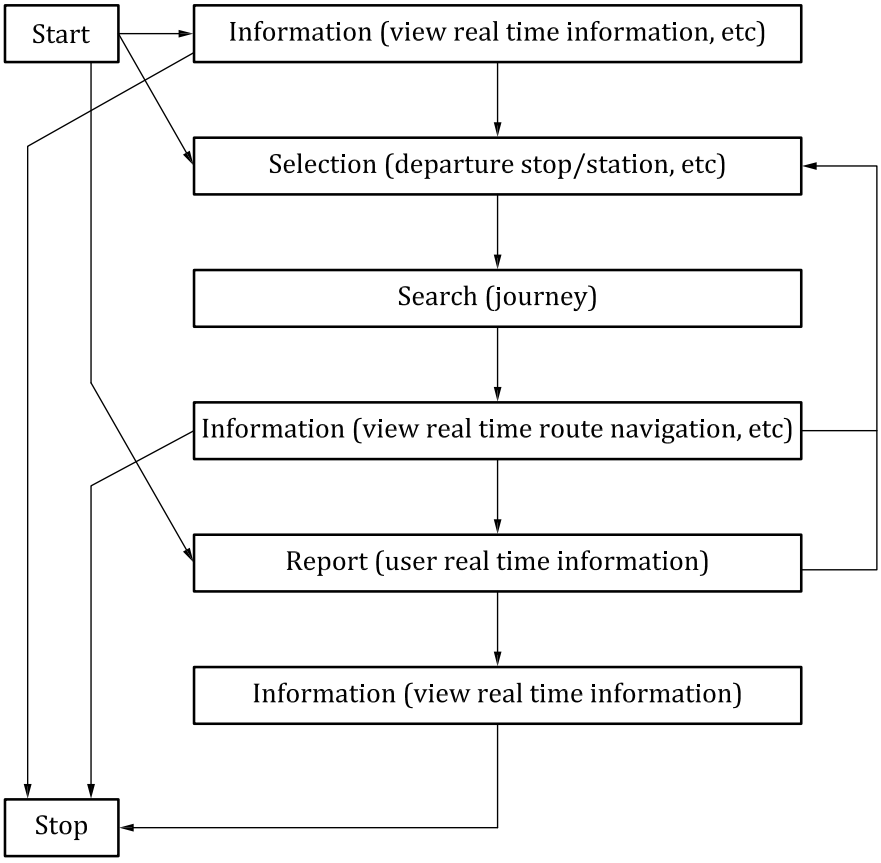
Following operational scenario can be expected when journey planning system is in use. The use case category types defined in 5.4.2 are used for simple expression of each scenario.

a) User operational scenario

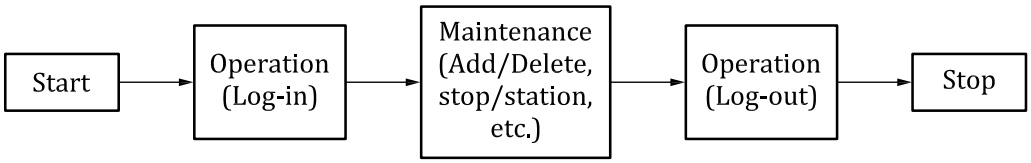
1) Before departing for journey



2) During journey



b) Administrator operational scenario

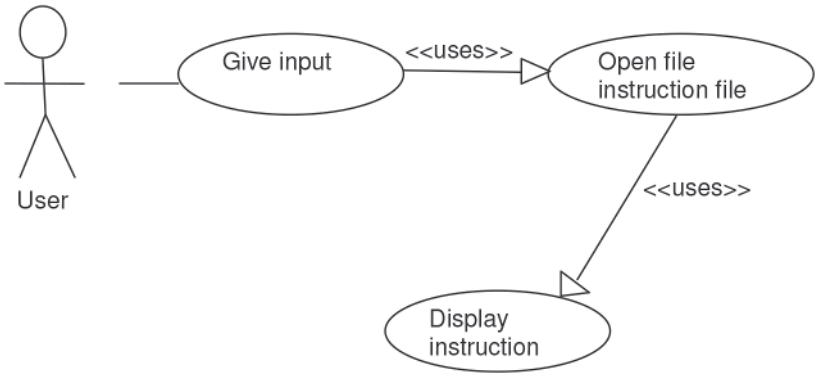


5.4.4 User use cases

Users of the journey planning system use cases are defined as follows. Some users will require more than one use case provided at the same time to meet their needs. For example, journey planning request includes multiple combinations of the use cases from 5.4.4.2 through 5.4.4.11.

5.4.4.1 Read Instructions

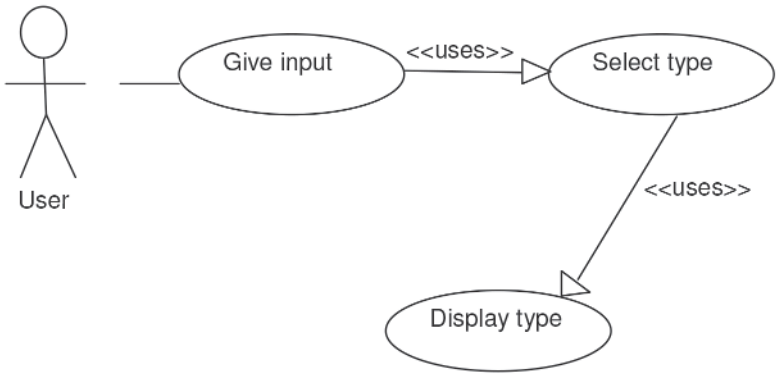
Use Case	**Read Instructions**
Description	The user clicks on “Instruction” button, the system read the instructions from a text file and displays instructions about how to use the system. After the user has finished reading the instruction, the user can resume journey planning.
Actor	User
Assumptions	Application has loaded without errors.

Use Case	**Read Instructions**
Interactions	a) System opens specified file containing instructions. b) System reads instructions from the file and attaches them to an instruction display box. c) System displays the dialogue box containing instructions. d) User reads instructions.
Results	System has responded by displaying application window with instructions. User can use the system easily even in the first time. User can be skilled in using the system.
Issues	Multi language function shall be available when the international traveller uses are expected.
UML diagram	

5.4.4.2 Select Type of Public Transport

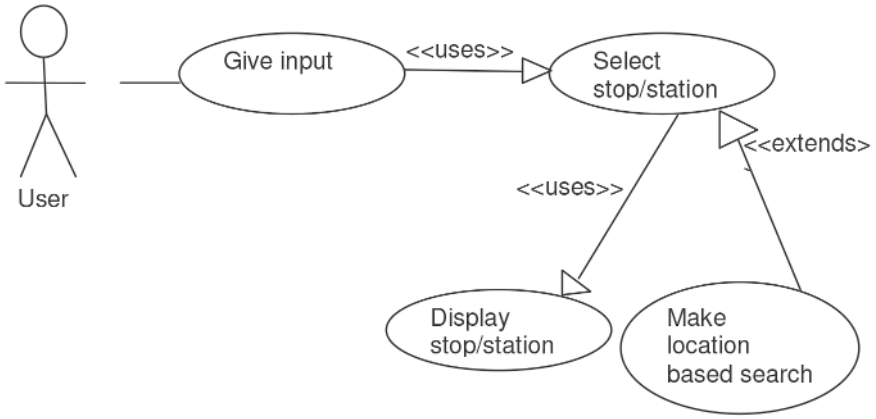
Use Case	**Select Type of Public Transport**
Description	The user defines the type of public transport to be used.
Actor	User
Assumptions	System has loaded without errors. User may know exact type of transport.
Interactions	a) User requests for selection of type of public transport by clicking on the type of transport button. b) System displays types of transport in list. c) User selects one or more type of type of transport from list. d) System confirms returned type of transport and displays it in the type of transport display field.
Results	Type(s) of transport is confirmed and displayed in type of transport display field. User can define type of transport (such as subway, tram, train, bus, coach, demand responsive transport[a]) for the journey.
Issues	

[a] Demand Responsive Transport or Demand-Responsive Transit (DRT) or Demand Responsive Service or Dial-a-ride or Flexible Transport Services is "an advanced, user-oriented form of public transport characterized by flexible routing and scheduling of small/medium vehicles operating in shared-ride mode between pick-up and drop-off locations according to passenger needs". In many areas, DRT is instead known as DART, or Dial-a-Ride Transit.

Use Case	**Select Type of Public Transport**
UML diagram	
[a] Demand Responsive Transport or Demand-Responsive Transit (DRT) or Demand Responsive Service or Dial-a-ride or Flexible Transport Services is "an advanced, user-oriented form of public transport characterized by flexible routing and scheduling of small/medium vehicles operating in shared-ride mode between pick-up and drop-off locations according to passenger needs". In many areas, DRT is instead known as DART, or Dial-a-Ride Transit.	

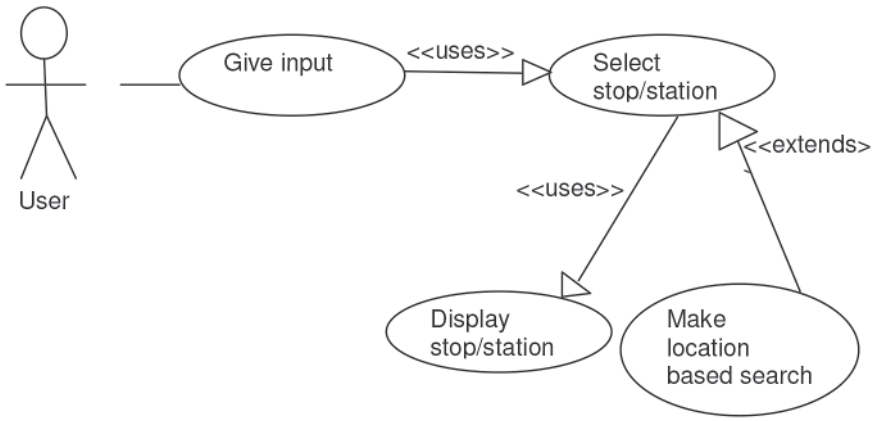
5.4.4.3 Select Departure Stop/Station

Use Case	**Select Departure stop/station**
Description	The user defines the departure stop/station.
Actor	User
Assumptions	System has loaded without errors. User may know exact stop/station name.
Interactions	a) User requests for selection of departure stop/station by clicking on the departure stop/station button. b) User selects type of departure point by clicking on "stop/station", "address", "landmark" button. c) User types criteria in the text field. d) System displays candidate list. e) User selects departure stop/station by clicking on the departure stop/station list. f) System confirms returned stop/station as departure stop/station and displays it in the departure stop/station display field.
Results	Departure stop/station is confirmed and displayed in departure stop/station text field. User can define departure stop/station for the journey.
Issues	User needs to find the nearest point of access to PT by some means. System needs to use gazetteers and other mechanism to make location-based search to find the departure stop/station. System shall remember previously selected stop/station and list it on top of the list for faster search at next search by user.

Use Case	**Select Departure stop/station**
UML diagram	

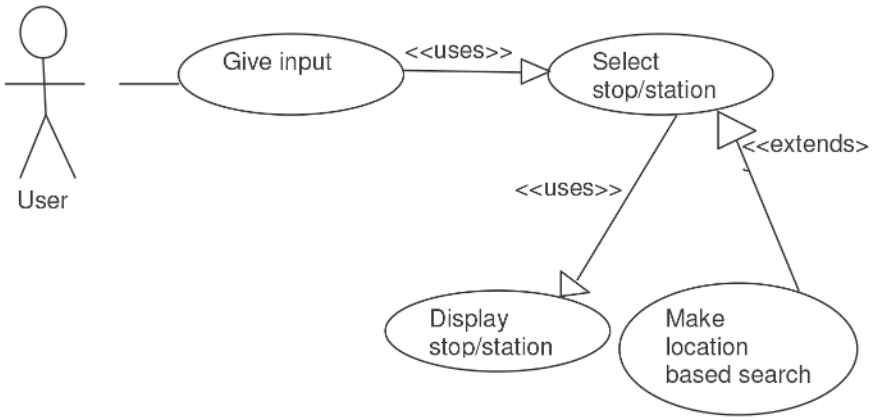
5.4.4.4 Select Destination Stop/Station

Use Case	**Select Destination stop/station**
Description	The user defines the destination stop/station.
Actor	User
Assumptions	System has loaded without errors. User may know exact stop/station name.
Interactions	a) User requests for selection of destination stop/station by clicking on the destination stop/station button. b) User selects type of departure point by clicking on “stop/station”, “address”, “landmark” button. c) User types criteria in the text field. d) System displays candidate list. e) User selects destination stop/station by clicking on the destination stop/station list. f) System confirms returned stop/station as destination stop/station and displays it in the destination stop/station display field.
Results	Destination stop/station is confirmed and displayed in destination stop/station display field. User can define destination stop/station for the journey.
Issues	User needs to find the nearest point of access to PT by some means. System needs to use gazetteers and other mechanism to make location-based search to find the destination stop/station. System shall remember previously selected stop/station and list it on top of the list for faster search at next search by user.

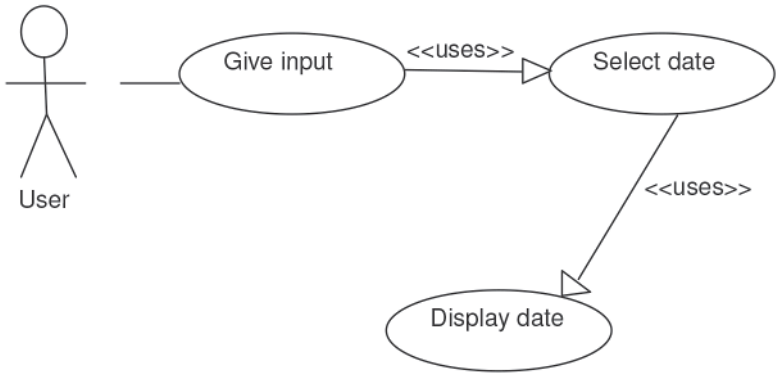
Use Case	**Select Destination stop/station**
UML diagram	

5.4.4.5 Select Via Stop/Station

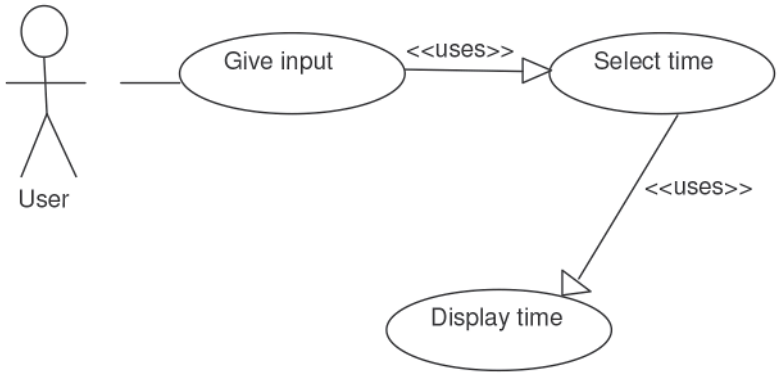
Use Case	**Select Via stop/station**
Description	The user defines the via stop/station.
Actor	User
Assumptions	System has loaded without errors. User may know exact stop/station name.
Interactions	a) User requests for selection of via stop/station by clicking on the via stop/station button. b) User selects type of departure point by clicking on “stop/station”, “address”, “landmark” button. c) User types criteria in the text field. d) System displays candidate list. e) User selects via stop/station by clicking on the via stop/station list. f) System confirms returned stop/station as via stop/station and displays it in the via stop/station display field.
Results	Via stop/station is confirmed and displayed in via stop/station text field. User can define via stop/station for the journey.
Issues	User needs to find the nearest point of access to PT by some means. System needs to use gazetteers and other mechanism to make location-based search to find the destination stop/station. In planning a multi-leg journey plan through a network, system needs to take into account the transfer time needed to transfer between services at an interchange point. Transfer time varies under different constraints for mobility restricted users. See use cases 5.4.4.10 and 5.4.4.11. System shall remember previously selected stop/station and list it on top of the list for faster search at next search by user.

Use Case	**Select Via stop/station**
UML diagram	

5.4.4.6 Select Date

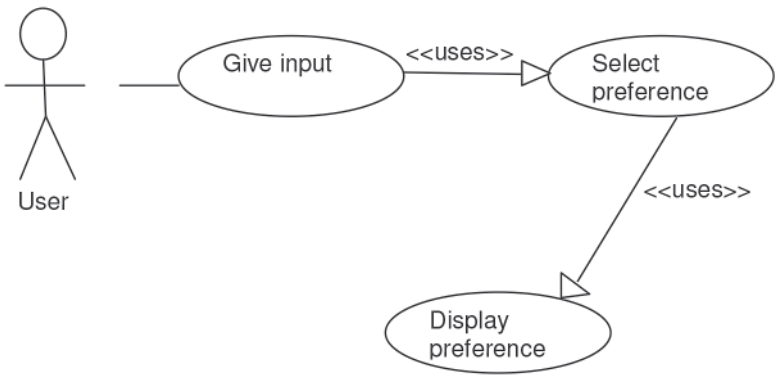
Use Case	**Select Date**
Description	The user selects Date of travel.
Actor	User
Assumptions	System has loaded without errors. User knows travel date.
Interactions	a) User selects date of travel from date list. It shall include "depart now" button and when user clicks it, system shall move to 5) below. "Calendar" button shall be provided in next to text filed so that user can select date by clicking on the date desired and text filed is automatically filled with desired date text. b) User selects month of travel from month list. c) User selects year of travel from year list. d) System combines select date, month and year into format *dd/mm/yy*. e) System confirms combined date, returns and displays it in date text field.
Results	Date of travel is confirmed and displayed in date text field. User can define date of the journey.
Issues	
UML diagram	

5.4.4.7 Select Time

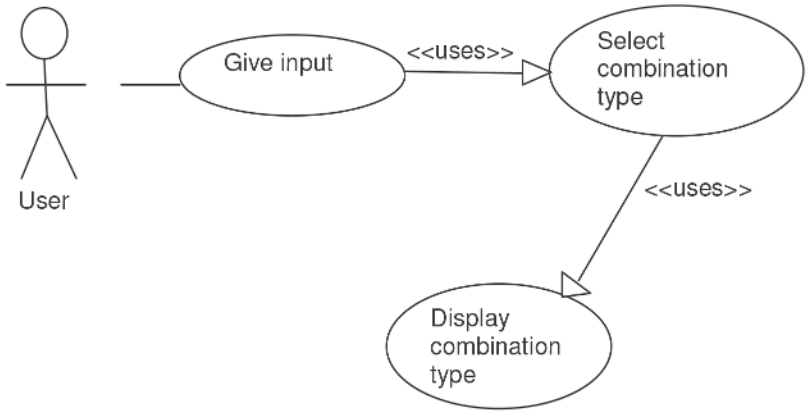
Use Case	**Select Time**
Description	The user selects departure or arrival time of travel.
Actor	User
Assumptions	System has loaded without errors. User knows departure time or arrival time of travel.
Interactions	a) User selects desired departure or arrival of travel from list. It shall include "depart now" button and when user clicks it, system shall move to e) below. b) User selects type of time either depart or arrival from list. c) User selects time of travel from list. It shall include AM and PM selection buttons. d) System displays in a format of hh/mm/AM or hh/mm/PM. e) System confirms combined time, returns and displays it in time text field.
Results	Desired departure or arrival time of travel is confirmed and displayed in the text field. User can define desired departure or arrival time of the journey.
Issues	This is very useful function when user is on middle of journey and wishes to make some changes in his/her journey plan.
UML diagram	

5.4.4.8 Select Preference

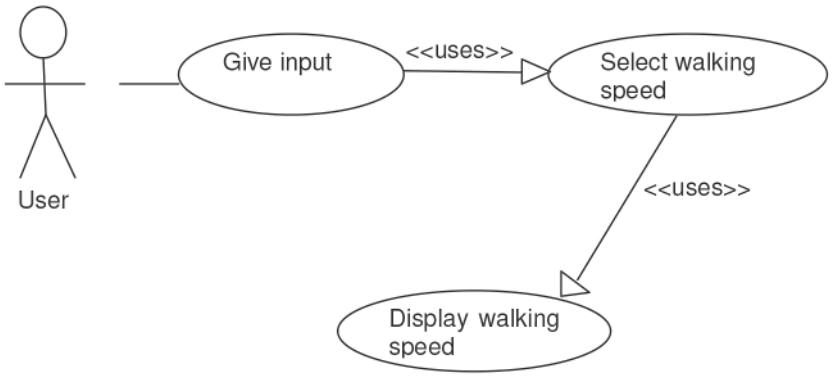
Use Case	**Select Preference**
Description	The user selects preference of travel.
Actor	User
Assumptions	System has loaded without errors. User knows preference of travel.
Interactions	a) User selects desired preference of travel from the list. It shall include "Earliest arrival", "Lowest fare", "Fewest changes", "Least walking" menu. b) User selects type of preference from list. c) When user selects "Least walking". It shall show next list for user selection of walking distance such as 5 min., 10 min., 15 min., 20 min., 25 min., 30 min., etc. d) System displays user preferences. e) System confirms and displays in text field.
Results	User can define preference of the journey.
Issues	

Use Case	**Select Preference**
UML diagram	

5.4.4.9 Select Combination Type of Walking and Driving

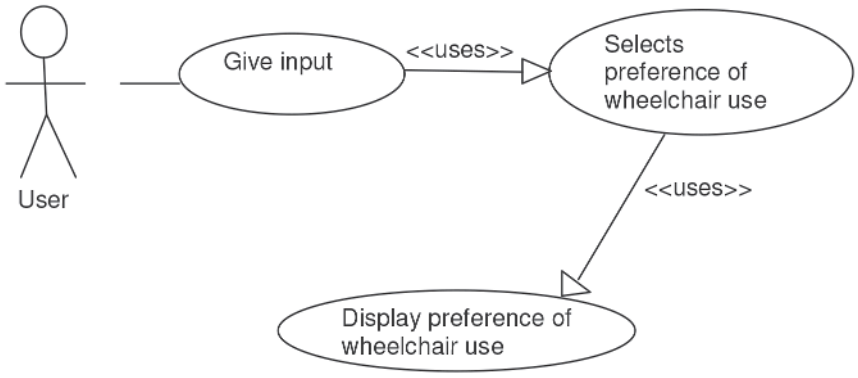
Use Case	**Select Combination Type of Walking and Driving**
Description	The user selects combination type of "walking and driving" of travel.
Actor	User
Assumptions	System has loaded without errors. User knows combination type of "walking and driving" of travel.
Interactions	a) User selects desired combination type of "walking and driving" of travel from the list. It shall include "walking only", "cycle and ride", "park and ride" menu. b) User selects combination type from list. c) System displays user selection result. d) System confirms and displays in text field.
Results	User can define combination type of "walking and driving" of the journey.
Issues	
UML diagram	

5.4.4.10 Select Walking Speed

Use Case	**Walking Speed**
Description	The user selects walking speed of travel.
Actor	User
Assumptions	System has loaded without errors. User selected his/her "walking only" preference and wishes to define walking speed of travel.
Interactions	a) User selects desired walking speed of travel from the list or slide bar adjusting walking speed. It, at least, shall include "slow", "average" and fast" menu. b) User selects walking speed from list or by adjusting slide bar. c) System displays user selection result. d) System confirms and displays in text field.
Results	User can define walking speed of the journey.
Issues	
UML diagram	

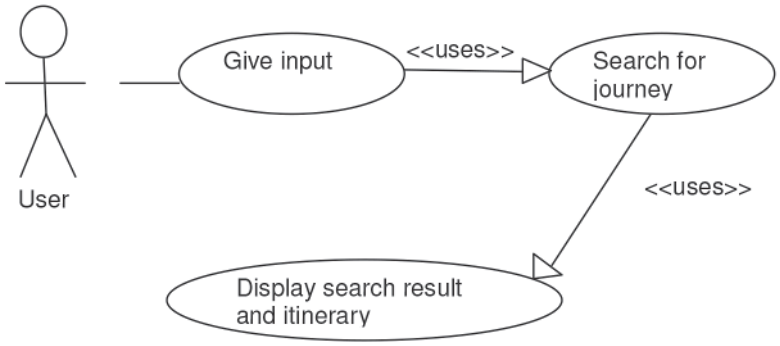
5.4.4.11 Select Preference of Wheelchair Use

Use Case	**Select Preference of Wheelchair Use**
Description	The user selects preference of wheelchair use of travel.
Actor	User
Assumptions	System has loaded without errors. User knows preference of wheelchair use of travel.
Interactions	a) User selects preference of wheelchair use of the travel from the list. It shall include "only use services with wheelchair access" and only use stop/station with wheelchair access' menu. b) User selects preference(s) from list. c) System displays user preference result. d) System confirms and displays in text field.
Results	User can define wheelchair use preference of the journey.
Issues	

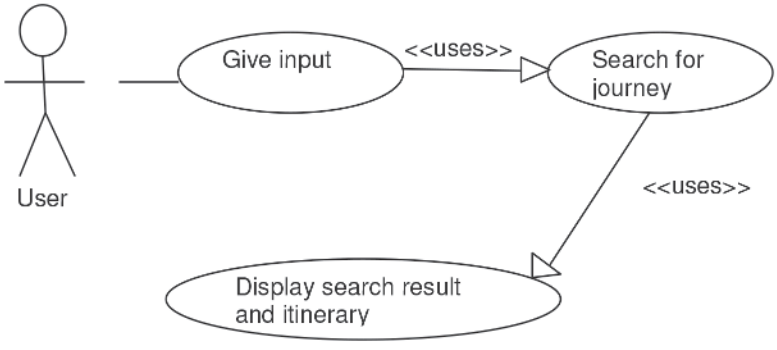
Use Case	**Select Preference of Wheelchair Use**
UML diagram	

5.4.4.12 Search for Journey

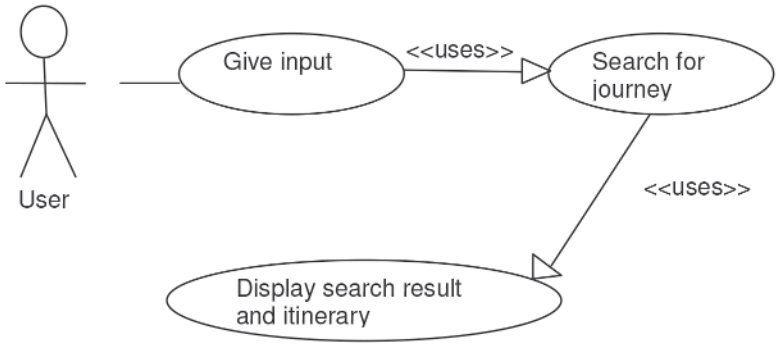
Use Case	**Search for journey**
Description	The user clicks on "Search for journey" button, the system receives the details provided by user and uses them to search for the journey. The system then returns and displays the search results.
Actor	User
Assumptions	User has selected departure and destination stop/stations, together with via stop/station, desired time, date of travel and other preferences.
Interactions	a) User requests for journey search by clicking "Search for Journey" button. b) System searches for the journey using the criteria provided by user. c) System returns results of the search. d) System displays results of the search. 1) System displays time and date of travel. 2) System displays departure stop/station. 3) System displays destination stop/station. 4) System displays via stop/station. 5) System displays action to take during travelling. 6) System displays several journey details results for user selection. Each result shall be with information such as departure or arrival time, travel duration time, transfer time, fare, mobility restricted information, and other information user selected as his/her preferences. e) User selects a desired journey plan. f) System displays itinerary of the selected journey in chronological order.
Results	System has searched for the journey, returned and displayed the results. User can get journey detailed information.
Issues	Platform number and car number nearest to lift/stair should be given when user uses train service.

Use Case	**Search for journey**
UML diagram	

5.4.4.13 Search for Next Departure Service

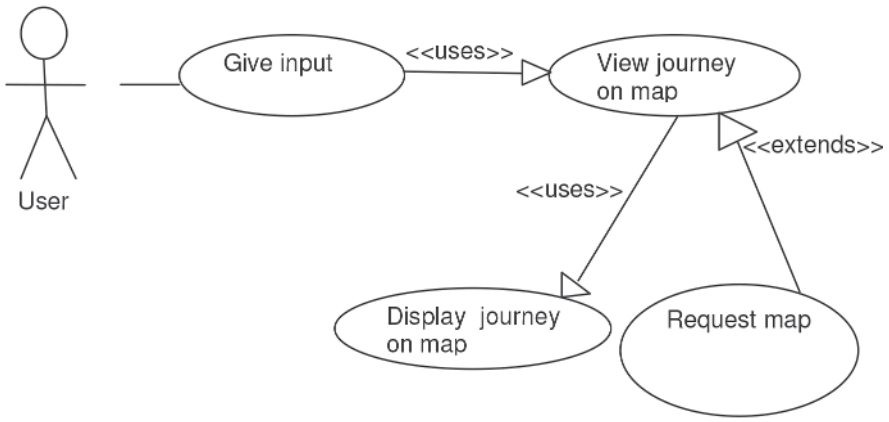
Use Case	**Search for Next Departure Service**
Description	User clicks “Next departure service” button and the system displays the results of the journey search when user chooses next departing service.
Actor	User
Assumptions	User has viewed returned results but it is too early to arrive at destination and user wishes to view the journey search result when user departs using next departing bus/ train.
Interactions	a) User clicks “Next departing service” button. b) System searches for the journey using the criteria provided by user. c) System returns results of the search. d) System displays results of the search. 1) System displays time and date of travel. 2) System displays departure stop/station. 3) System displays destination stop/station. 4) System displays via stop/station. 5) System displays action to take during travelling. e) System displays journey details with information such as departure or arrival time, travel duration time, transfer time, fare, mobility restricted information, and other information user selected as his/her preferences.
Results	System has searched for the journey, returned, and displayed the results. User can get journey detailed information.
Issues	Platform number and car number nearest to lift/stair should be given when user uses train service.
UML diagram	

5.4.4.14 Search for Previous Departure Service

Use Case	**Search for Previous Departure Service**
Description	User clicks “Previous departure service” button and the system displays the results of the journey search when user chooses previous departing service.
Actor	User
Assumptions	User has viewed returned results but it is too late to arrive at destination and user wishes to view the journey search result when user departs using previously departing bus/train.
Interactions	a) User clicks “Previous departing service” button. b) System searches for the journey using the criteria provided by user. c) System returns results of the search. d) System displays results of the search. 1) System displays time and date of travel. 2) System displays departure stop/station. 3) System displays destination stop/station. 4) System displays via stop/station. 5) System displays action to take during travelling. e) System displays journey details with information such as departure or arrival time, travel duration time, transfer time, fare, mobility restricted information, and other information user selected as his/her preferences.
Results	System has searched for the journey, returned and displayed the results. User can get journey detailed information.
Issues	Platform number and car number nearest to lift/stair should be given when user uses train service.
UML diagram	

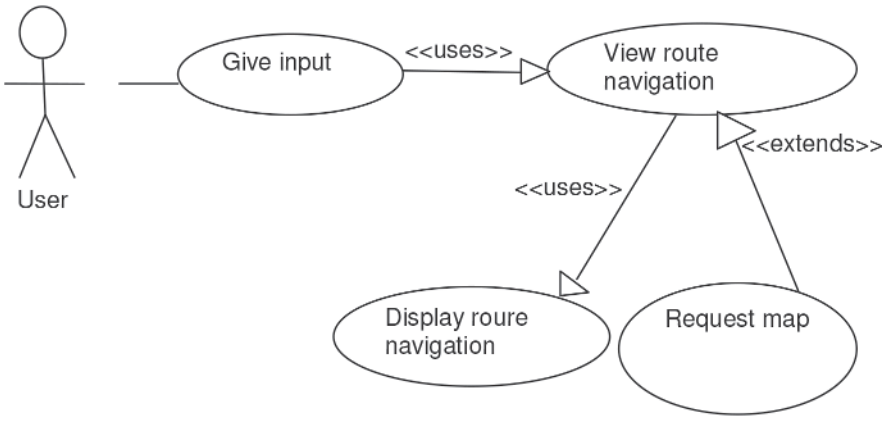
5.4.4.15 View Journey On Map

Use Case	**View Journey On Map**
Description	User clicks “View Journey on map” button and the system displays the results of the journey search on a route map together with the action to take while travelling such as changing trains, etc.
Actor	User
Assumptions	User has viewed returned results and wishes to view them on a map.

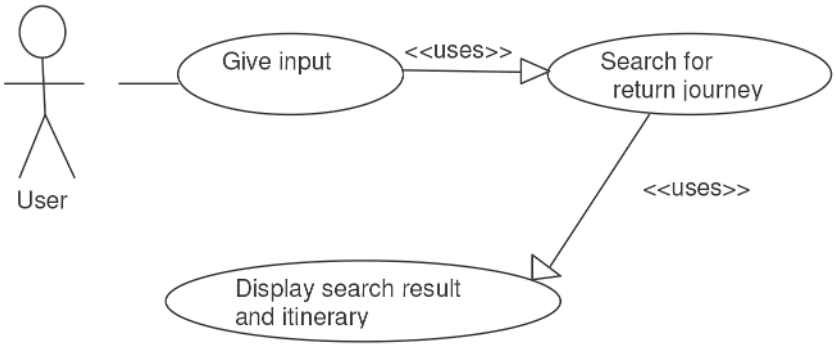
Use Case	**View Journey On Map**
Interactions	a) User clicks “View Journey on map” button. b) System shows window and displays “view journey on map” window. c) System displays map (route) of the returned results. d) System displays departure, destination stop/station and via stop/station on route. e) System displays action to taken during the course of the journey.
Results	Journey is displayed on the map. User can view the journey on the map.
Issues	
UML diagram	

5.4.4.16 View Real Time Route Navigation

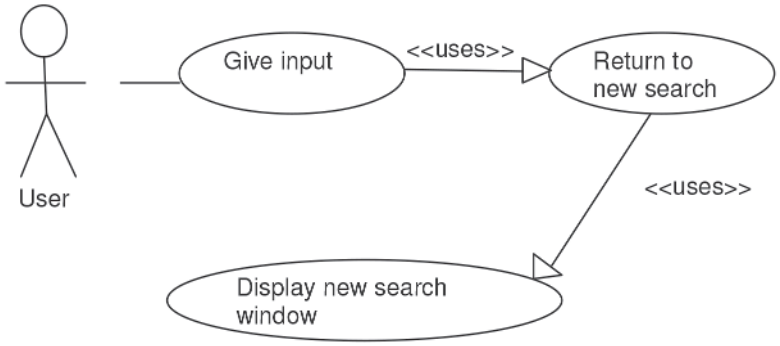
Use Case	**View Real Time Route Navigation**
Description	User clicks “Real time route navigation” button and the system displays user real time location on the map with the detailed journey route, including foot path together with the action to take while travelling such as changing trains, etc.
Actor	User
Assumptions	User has viewed returned results and wishes to view real time navigation guide on a map. User shall have accepted his/her real time position GPS data use by the system.
Interactions	a) User clicks “Real time route navigation” button. b) System shows window and displays “real time route navigation” window. c) System displays navigation map (route) of the returned results. d) System displays user position and route navigation information on route. e) System displays action to taken during the course of the journey in a timely manner. f) As the user moves, system makes navigation map updates in real time basis and performs action d) and e) automatically. g) New sub-window shall appear as needed to show detailed map (such as indoor station navigation) and street view. h) The journey path user taken is clearly marked on the map.
Results	Real time route navigation guide information is displayed on the map. User can reach to the destination without getting lost the way.

Use Case	**View Real Time Route Navigation**
Issues	For visually impaired user, the audio guidance function shall be added. Map shall be zoom in able and zoom out able, so that landmarks can be shown as needed. Car number close to platform lift/stair shall be given as needed.
UML diagram	

5.4.4.17 Search for Return Journey

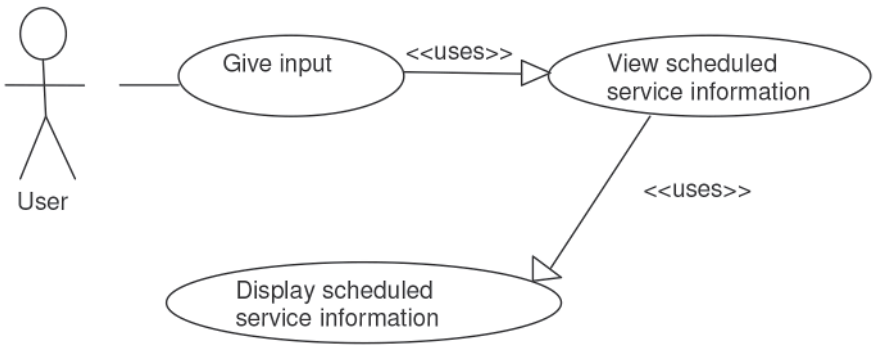
Use Case	**Search for Return Journey**
Description	User clicks “Return Journey” button and the system swaps the stop/station, i.e. the Original departure stop/station becomes destination stop/station and vice versa, and uses the values to search for the return journey.
Actor	User
Assumptions	User wishes to travel back along the same route.
Interactions	a) User clicks “Return Journey” button. b) System swaps destination with departure stop/station. c) System shows window and displays new search window. d) System confirms new departure stop/station and displays it in the departure stop/station text field. e) System confirms new destination stop/station and displays it in the destination stop/station text field.
Results	Departure and destination stop/station have been swapped, confirmed, and displayed in their respective text fields. User can search for the information on the return journey.
Issues	
UML diagram	

5.4.4.18 Return to New Search

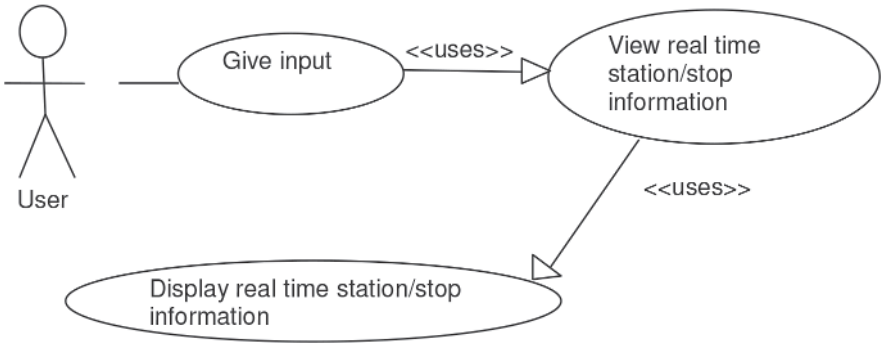
Use Case	Return to New Search
Description	User clicks “New Search” button and the system returns to main application window to start a new search.
Actor	User
Assumptions	User wishes to start another journey planning.
Interactions	a) User clicks “New Search” button. b) System shows the window and displays main application window.
Results	System returned to main application window. User can start another journey search.
Issues	
UML diagram	

5.4.4.19 View Scheduled Service Information

Use Case	View Scheduled Service Information
Description	User clicks “Scheduled Service Information” button and the system returns to the window to defines the stop/station to start a scheduled service information search.
Actor	User
Assumptions	System has loaded without errors. User knows exact stop/station name.
Interactions	a) User requests for selection of stop/station by clicking on the stop/station drop down list. b) System displays stop/station in list. c) User selects stop/station from list. d) System confirms returned stop/station as desired stop/station and displays it in the desired stop/station text field. e) System displays scheduled service information of that stop/station.
Results	User can know scheduled service information such as timetables of particular stop/station.
Issues	

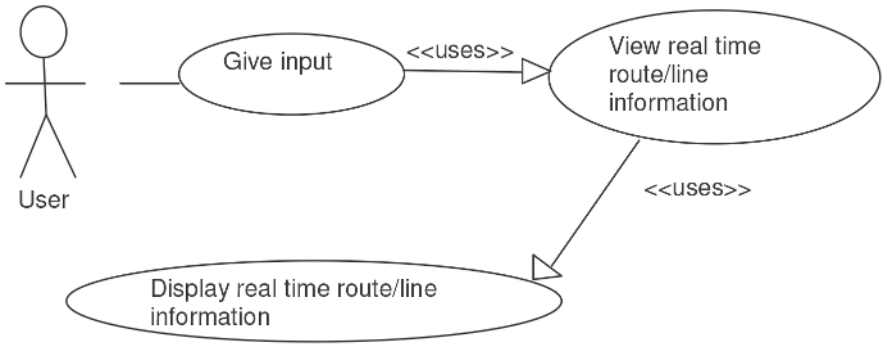
Use Case	**View Scheduled Service Information**
UML diagram	

5.4.4.20 View Real Time Station/Stop Information

Use Case	**View Real Time Station/Stop Information**
Description	User clicks "Real Time Station/Stop Information" button and the system returns to the window to defines the stop/station to start a real time station/stop information search.
Actor	User
Assumptions	System has loaded without errors. User knows exact stop/station name.
Interactions	a) User requests for selection of stop/station by clicking on the stop/station list. b) System displays stop/station in list. c) User selects stop/station from list. d) System confirms returned stop/station as desired stop/station and displays it in the desired stop/station text field. e) System displays real time service information of that stop/station.
Results	User can know real time service information of particular stop/station. Example: XXX bus departed from YYY stop and next bus will arrive in ZZZ minutes.
Issues	
UML diagram	

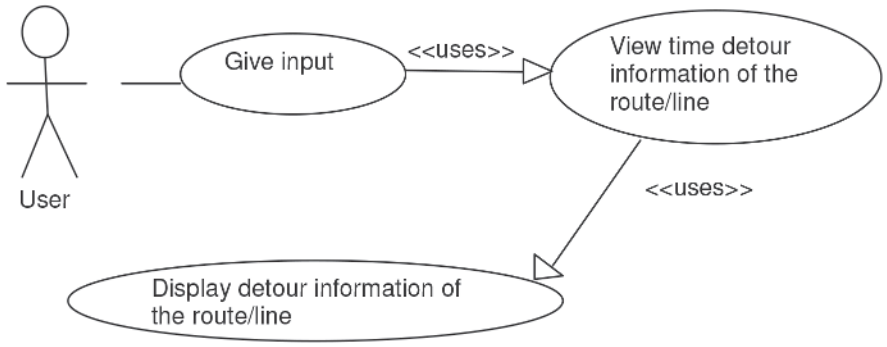
5.4.4.21 View Real Time Route/Line Information

Use Case	**View Real Time Route/Line Information**
Description	User clicks "Real Time Route/Line Information" button and the system returns to the window to defines the route/line to start a real time route/line information search.
Actor	User
Assumptions	System has loaded without errors. User knows exact route/line name.

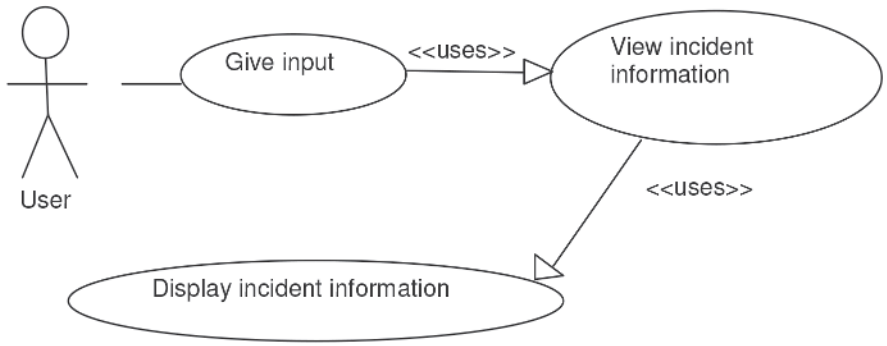
Use Case	**View Real Time Route/Line Information**
Interactions	a) User requests for selection of route/line by clicking on the route/line list. b) System displays route/line in list. c) User selects route/line from list. d) System confirms returned route/line as desired route/line and displays it in the desired route/line text field. e) System displays real time service information of that route/line.
Results	User can know real time service information of particular route/line. Example: XYX route/line is operating normally. ABC route/line is subject to severe delays.
Issues	Multiple route/line information may be able to be available at the same time for users to select most convenient route/line.
UML diagram	

5.4.4.22 View Detour Information

Use Case	**View Detour Information**
Description	User clicks “Detour Information” button and the system returns to the window to defines the route/line to start a detour information search.
Actor	User
Assumptions	System has loaded without errors. User knows exact route/line name.
Interactions	a) User requests for selection of route/line by clicking on the route/line list. b) System displays route/line in list. c) User selects route/line from list. d) System confirms returned route/line as desired route/line and displays it in the desired route/line text field. e) System displays real time detour information of that route/line.
Results	User can know real time detour information of particular route/line. Example: XYX route/line is out of service. Use ABC route/line as detour route/lice.
Issues	Multiple route/line information may be able to be available at the same time for users to select most convenient detour route/line.

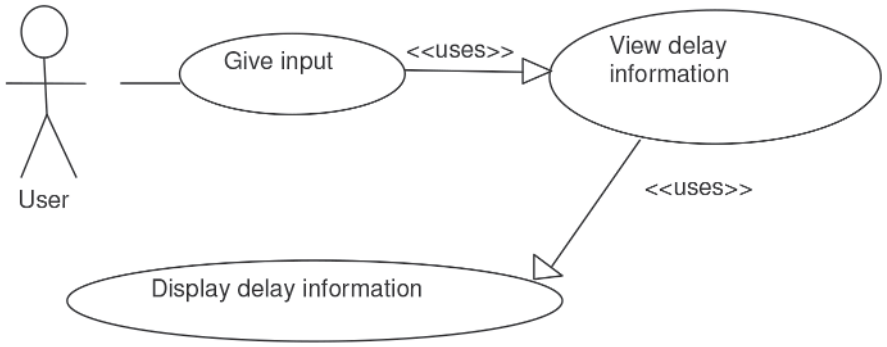
Use Case	View Detour Information
UML diagram	

5.4.4.23 View Incident Information

Use Case	View Incident Information
Description	User clicks “Incident Information” button and the system returns to the window to defines the route/line to start an incident information search.
Actor	User
Assumptions	System has loaded without errors. User knows exact route/line name.
Interactions	a) User requests for selection of route/line by clicking on the route/line list. b) System displays route/line in list. c) User selects route/line from list. d) System confirms returned route/line as desired route/line and displays it in the desired route/line text field. e) System displays real time incident information of that route/line.
Results	User can know real time incident information of particular route/line. Example: XYX route/line is out of service due to incident at ZZZ station. Will be back on service within 30 min.
Issues	Multiple incident information may be able to be available at the same time for users to catch whole incident image.
UML diagram	

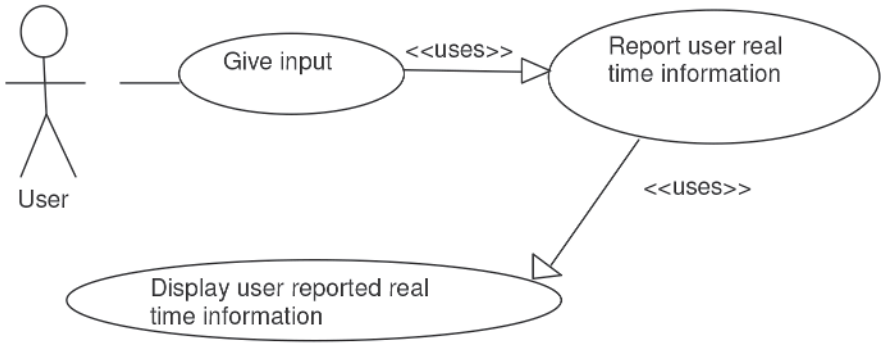
5.4.4.24 View Delay Information

Use Case	View Delay Information
Description	User clicks “Delay Information” button and the system returns to the window to defines the route/line to start a real time delay information search.
Actor	User
Assumptions	System has loaded without errors. User knows exact route/line name.

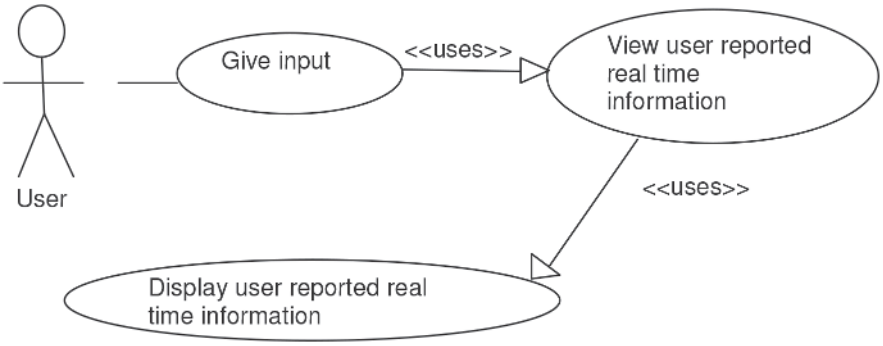
Use Case	**View Delay Information**
Interactions	a) User requests for selection of route/line by clicking on the route/line list. b) System displays route/line in list. c) User selects route/line from list. d) System confirms returned route/line as desired route/line and displays it in the desired route/line text field. e) System displays real time delay information of that route/line.
Results	User can know real time delay information of particular route/line. Example: ABC route/line is subject to severe delays.
Issues	Multiple route/line information may be able to be available at the same time for users to select most convenient route/line.
UML diagram	

5.4.4.25 Report User Real Time Information

Use Case	**Report User Real Time Information**
Description	User clicks “Report real time information” button and the system returns to the window where user can report real time route/line information.
Actor	User
Assumptions	System has loaded without errors. User has encountered incident and wishes to report to other users.
Interactions	a) User requests to report to the system by clicking on the “report real time information” button. b) System displays text field box for user to type in the information. c) User types in the information to the text box. d) System confirms returned the reporting text field with time stamped. e) System displays user reported real time service information with time stamped.
Results	User can report user real time service information of particular route/line. Example: XYX route/line is operating normally. ABC route/line is subject to severe delays. ZZZ line is not packed so that passenger can read newspaper inside train.
Issues	

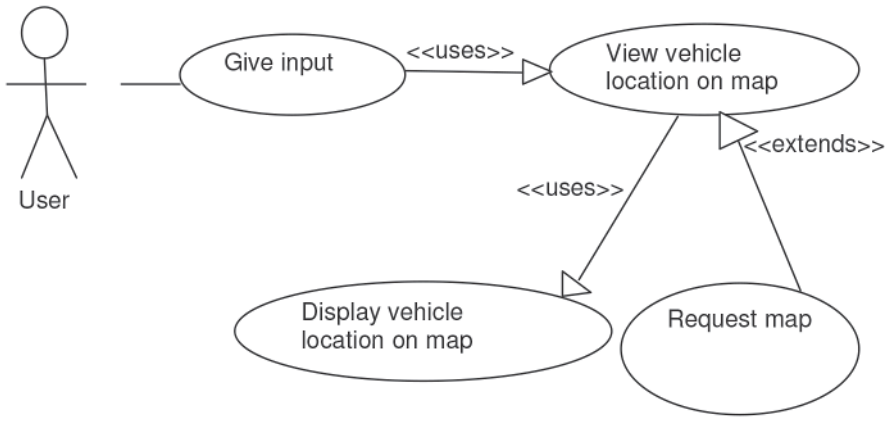
Use Case	Report User Real Time Information
UML diagram	

5.4.4.26 View User Reported Real Time Information

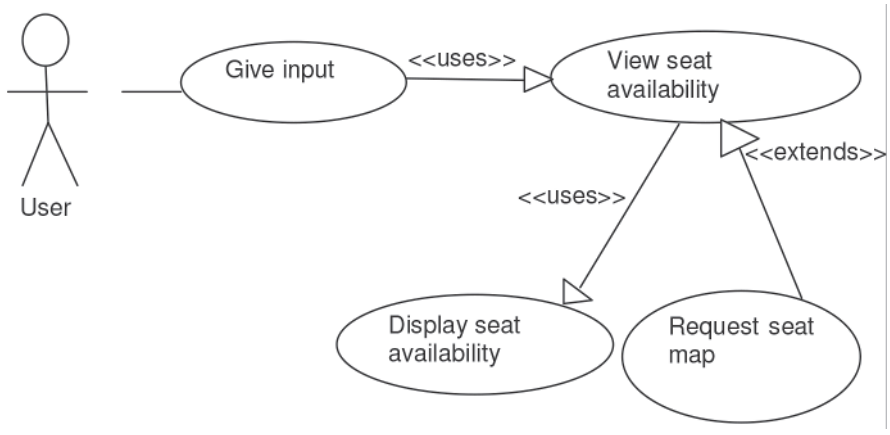
Use Case	View User Reported Real Time Information
Description	User clicks "View user reported real time information" button and the system returns to the window to show user reported real time route/line information.
Actor	User
Assumptions	System has loaded without errors. User has encountered incident and wished to view other user reported information for the guide to the user.
Interactions	a) User requests system to show other user reported information by clicking on the "view user reported real time information" button. b) System displays the other user reported real time information in the text box in a reverse chronological order. c) User views the information in the text box.
Results	User can view other user reported real time service information of particular route/line. Example: XYX route/line is operating normally. ABC route/line is subject to severe delays.
Issues	
UML diagram	

5.4.4.27 View Vehicle Location on Map

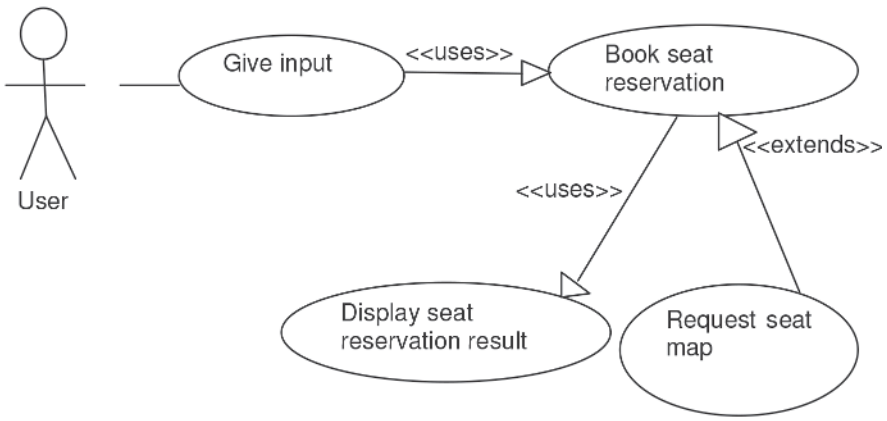
Use Case	View Vehicle Location on Map
Description	User clicks "View vehicle location on map" button and the system displays the results of the vehicle location search on a route map.
Actor	User
Assumptions	User has viewed desired journey search results and wishes to view the real time vehicle location on a map.

Use Case	**View Vehicle Location on Map**
Interactions	a) User clicks "View vehicle location on map" button. b) System repaints window and displays "View vehicle location on map" window. c) System displays map (route) of the returned results. d) System displays real time vehicle location on route.
Results	User can view the real time vehicle location of the journey on the map and know his/her desired bus/train location.
Issues	
UML diagram	

5.4.4.28 View Seat Availability

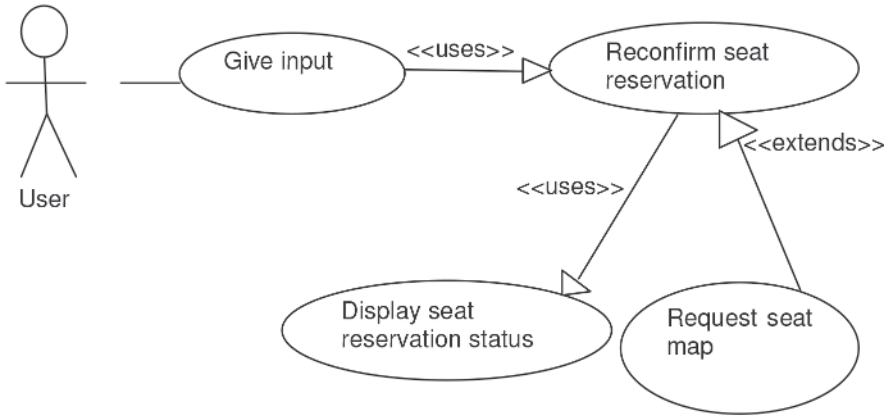
Use Case	**View Seat Availability**
Description	User clicks "View Seat Availability" button and the system displays the results of the seat availability search results.
Actor	User
Assumptions	User has viewed desired journey search results and wishes to view the seat availability on that journey.
Interactions	a) User clicks "View seat availability" button. b) System repaints window and displays "View seat availability" window. c) System displays seat availability results on that journey.
Results	User can view the real time seat availability of the journey.
Issues	
UML diagram	

5.4.4.29 Book Seat Reservation

Use Case	**Book Seat Reservation**
Description	User clicks “Seat reservation” button and the system displays seat assignment map on particular part of journey route, user clicks desired seat position and system displays seat reservation results.
Actor	User
Assumptions	User has viewed seat availability on particular part of journey and wishes to make seat reservation by seeing seat assignment map.
Interactions	a) User clicks “Seat reservation” button. b) System repaints window and displays “Seat assignment map” window. c) System displays seat assignment map of the returned results with occupied seat positions. d) User clicks desired seat position where marked vacant. e) System displays user reservation seat position on seat assignment map. f) System requests user confirmation. g) User confirms desired seat position. h) System displays reservation status on seat assignment map i) System displays reservation number for user future seat reservation reconfirmation.
Results	User can make seat reservation on particular part of journey.
Issues	Seat assignment map shall be the one easily understandable for new users. This may be a part of PT service operator role.
UML diagram	

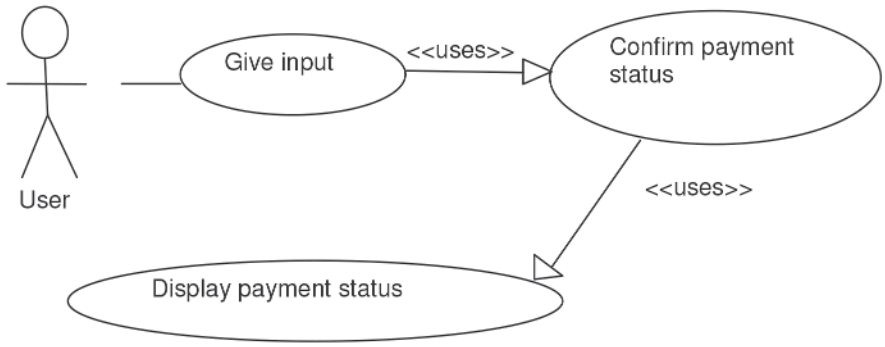
5.4.4.30 Reconfirm Seat Reservation

Use Case	**Reconfirm Seat Reservation**
Description	User clicks “Seat reservation reconfirmation” button and types user reservation number in and system displays seat assignment map on particular part of journey route with user seat reservation position results.
Actor	User
Assumptions	User has made seat reservation on particular part of journey and wishes to make reconfirmation of seat reservation.

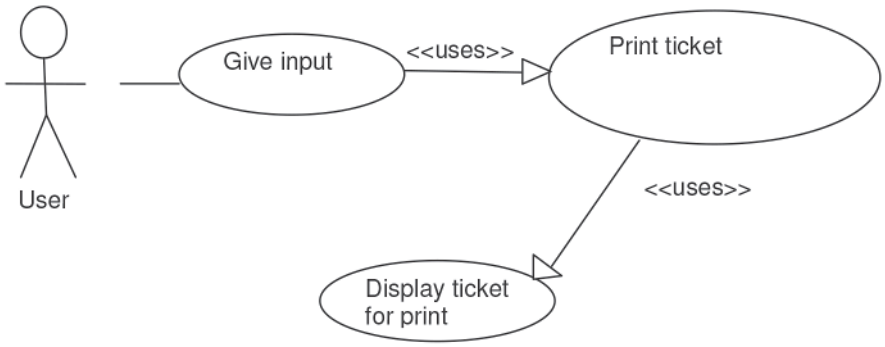
Use Case	Reconfirm Seat Reservation
Interactions	a) User clicks “Seat reservation reconfirmation” button. b) System repaints window and displays “Reservation number” type in window. c) User types in reservation number. d) System displays seat assignment map of the returned results with user seat position. e) User confirms his/her desired and reserved position. f) System requests user confirmation whether user wishes to change. g) User confirms desired seat position by clicking on “no change” button. When user clicks on “change reservation” button, system returns to window of use case 5.4.4.29 h) System displays reservation status on seat assignment map
Results	User can make seat reservation reconfirmation on particular part of journey.
Issues	Seat assignment map shall be the one easily understandable for new users. This may be a part of PT service operator role.
UML diagram	

5.4.4.31 Confirm Payment Status

Use Case	Confirm Payment Status
Description	User clicks “Payment confirmation” button and types user reservation number and system displays payment status on particular part of journey route with user seat reservation results.
Actor	User
Assumptions	User has made seat reservation on particular part of journey and made payment for that reservation by some other means and wishes to make confirmation of payment status.
Interactions	a) User clicks “Payment confirmation” button. b) System repaints window and displays “reservation number” type in window. c) User types in reservation number. d) System displays payment status of the returned results with reserved seat information. e) User confirms his/her payment status.
Results	User can make seat reservation payment confirmation on particular part of journey.
Issues	This may be a part of PT service operator role.

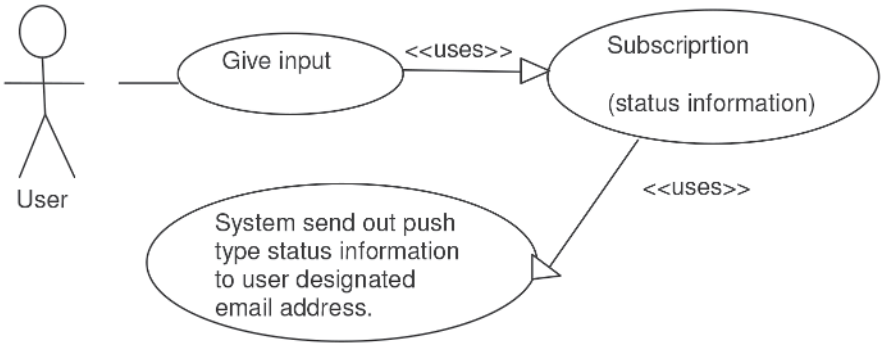
Use Case	**Confirm Payment Status**
UML diagram	

5.4.4.32 Print Ticket

Use Case	**Print Ticket**
Description	User clicks "Print ticket" button and types user reservation number in and system displays e-ticket on particular part of journey route.
Actor	User
Assumptions	User has made seat reservation on particular part of journey, made payment for that reservation by some other means, and wishes to print e-ticket before leaving for his/her journey.
Interactions	a) User clicks "Print ticket" button. b) System repaints window and displays "reservation number" type in window. c) User types in reservation number. d) System displays e-ticket of the returned results. e) User prints e-ticket by clicking on 'print' button.
Results	User can print e-ticket on particular part of journey.
Issues	This may be a part of PT service operator role.
UML diagram	

5.4.4.33 Subscription (push type status information)

Use Case	**Subscription (push type status information)**
Description	User clicks "Subscription" button and types user email address in and system sends out (push out), in a timely manner, updated route/line dynamic status information such as accidents, delays, change of services, etc.
Actor	System (by initiation of user request to subscribe)
Assumptions	User has made "Search for journey" and system understands which route/line user will use for his/her journey. User receives push type updated information regarding users selected route/line service.

Use Case	Subscription (push type status information)
Interactions	a) User clicks “Subscription” button. b) System repaints window and displays “email address” type in window. c) User types in email address for receiving desired information. d) System gives response to show that it acknowledges user request. e) System send out email(s) to user designated email address, in proper timing, the updated and dynamic route/line status information of his/her journey. f) User clicks “Cancel subscription” button to stop receiving status updated information in any time.
Results	User can receive status information when the status of user selected route/line has been changed such as delays, accidents, and so on.
Issues	This may be a part of PT service operator role.
UML diagram	

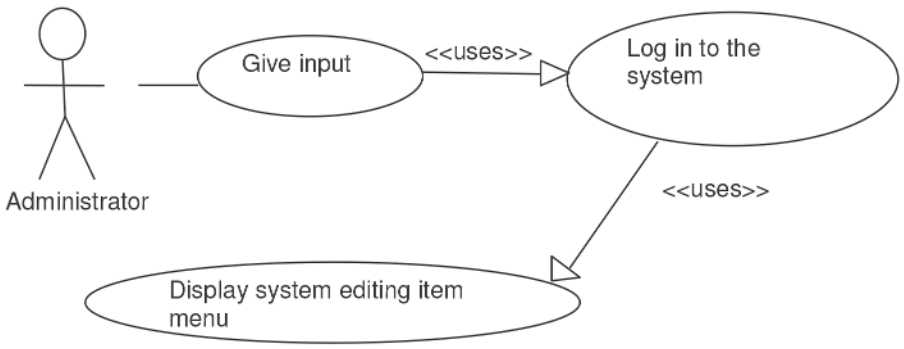
5.4.5 Administrator use cases

Administrator of the journey planning system use cases are defined as follows. Administrator will create, edit data structures, and manage system functionality.

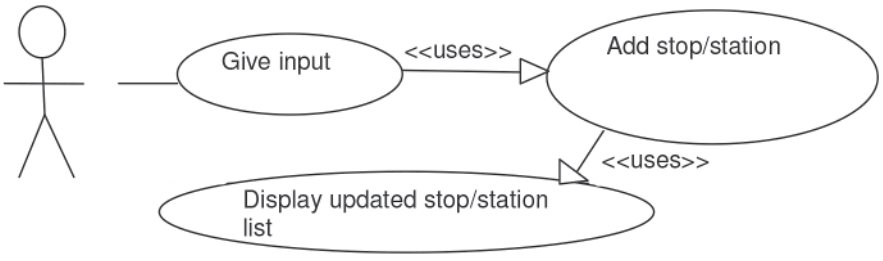
The processing interfaces of data interface between the system and data provider(s) should be considered in the back-stage management. The use case description in this part of ISO 17185 does not preclude any batch processing.

5.4.5.1 System Log-in

Use Case	System Log-in
Description	The administrator wishes to log into the system to carry out maintenance.
Actor	Administrator
Assumptions	Application has loaded without errors.
Interactions	a) System displays a “log in” window and requests for a username and password. b) Administrator provides username and password. c) Administrator requests system for log in. d) System verifies username and password. e) System logs administrator into the system and enables the menu items for editing system. f) System closes “log in” window.
Results	System has logged administrator in. Menu items are enabled. Administrator can log in to the system for the maintenance purposes.

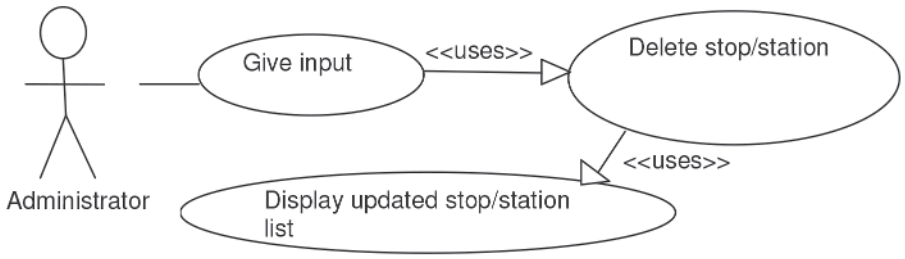
Use Case	**System Log-in**
Issues	
UML diagram	

5.4.5.2 Add Stop/Station

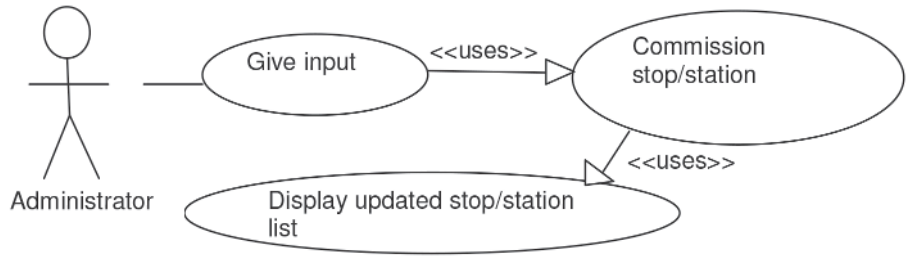
Use Case	**Add Stop/Station**
Description	The administrator will add a stop/station to the list of stop/station.
Actor	Administrator
Assumptions	The stop/station the administrator wishes to add is not on the current list.
Interactions	a) System displays a “add stop/station” window and requests administrator to type in the stop/station name to add. b) Administrator type in stop/station name. c) Administrator requests the system to add the stop/station to the list. d) System requests the administrator to confirm the stop/station name e) Administrator confirms the stop/station name. f) System adds the stop/station to the list. g) System closes “add stop/station” window.
Results	The stop/station is added to the list and the list in updated successfully.
Issues	To describe the relation to the stop to nearby objects and landmarks to help identify them to the public. To relate physical access point (entrance) with complex features such as stations and POIs.
UML diagram	

5.4.5.3 Delete Stop/Station

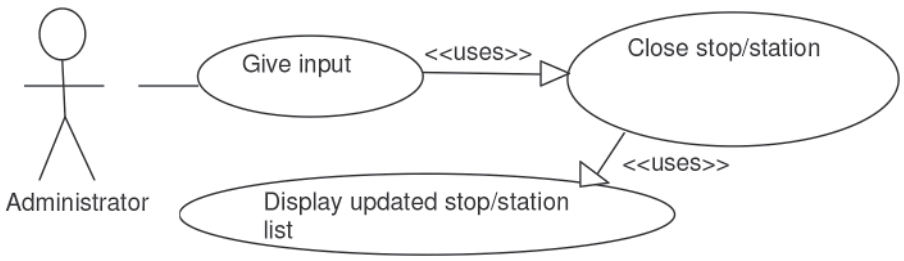
Use Case	**Delete Stop/Station**
Description	The administrator will delete a stop/station from the list of stop/station.
Actor	Administrator
Assumptions	The stop/station the administrator wishes to delete is on the current list.

Use Case	**Delete Stop/Station**
Interactions	a) System displays a "delete stop/station" window and requests administrator to select the stop/station to delete form the stop/station list. b) Administrator selects the stop/station. c) Administrator requests the system to delete the stop/station from the list. d) System requests the administrator to confirm the deletion e) Administrator confirms the deletion. f) System deletes the stop/station from the list. g) System closes "delete stop/station" pop-up window.
Results	The stop/station is deleted from the list and the list in updated successfully.
Issues	
UML diagram	

5.4.5.4 Commission Stop/Station

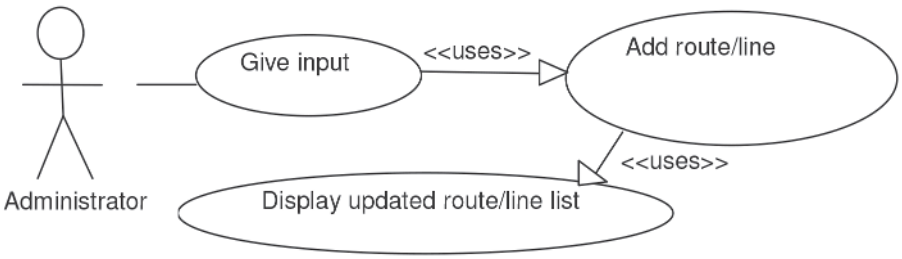
Use Case	**Commission Stop/Station**
Description	The administrator will commission a stop/station that has been temporarily closed.
Actor	Administrator
Assumptions	The stop/station the administrator wishes to commission is closed.
Interactions	a) System displays a "commission stop/station" window and requests administrator to type in the stop/station name to open. b) Administrator type in stop/station name. c) Administrator requests the system to commission the stop/station. d) System requests the administrator to confirm the stop/station name e) Administrator confirms the stop/station name. f) System commissions the stop/station. g) System closes "commission stop/station" window.
Results	The stop/station is commissioned and the list in updated successfully.
Issues	
UML diagram	

5.4.5.5 Close Stop/Station

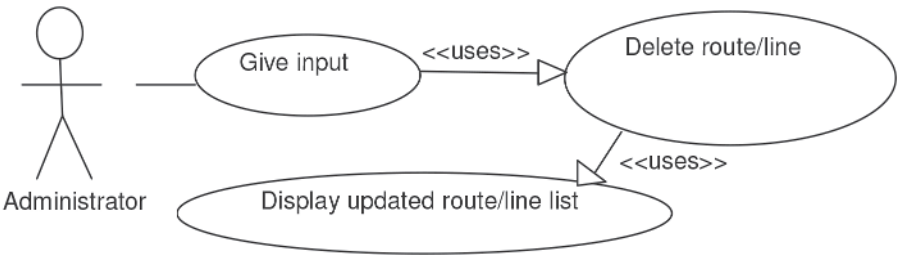
Use Case	**Close Stop/Station**
Description	The administrator will temporarily close a stop/station, which will make it unavailable during the course of the journey plan until the stop/station is re-opened.
Actor	Administrator
Assumptions	The stop/station the administrator wishes to close is included in the current list and is open for service.
Interactions	a) System displays a "close stop/station" window and requests administrator to select the stop/station to close from the stop/station list. b) Administrator select stop/station name. c) Administrator requests the system to close the stop/station in the list. d) System requests the administrator to confirm the close. e) Administrator confirms closing of the stop/station. f) System closes the stop/station. g) System closes "close stop/station" window.
Results	The stop/station is closed and the list in updated successfully.
Issues	
UML diagram	

5.4.5.6 Add Route/Line

Use Case	**Add Route/Line**
Description	The administrator will add a route/line between two stops/stations.
Actor	Administrator
Assumptions	The route/line the administrator wishes to add does not exist.
Interactions	a) System displays a "add route/line" pop-up window and requests administrator to provide route/line details for the route/line to add. b) Administrator type in stop/station from, to and selects the course of the route/line from the list. c) Administrator requests the system to add the route/line to the list. d) System requests the administrator to confirm the route/line e) Administrator confirms the route/line. f) System adds the route/line to the list. g) System closes "add route/line"' window.
Results	The route/line is added to the list and the list in updated successfully.
Issues	

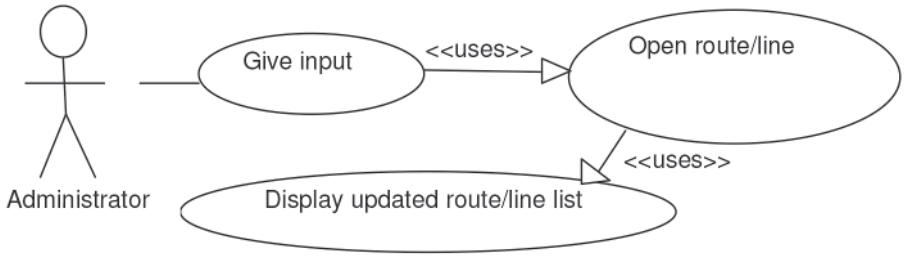
Use Case	**Add Route/Line**
UML diagram	

5.4.5.7 Delete Route/Line

Use Case	**Delete Route/Line**
Description	The administrator will delete a route/line between two stops/stations.
Actor	Administrator
Assumptions	The route/line the administrator wishes to delete exists.
Interactions	a) System displays a "delete route/line" window and requests administrator to provide route/line details for the route/line to delete. b) Administrator type in stop/station from, to for the route/line to delete. c) Administrator requests the system to delete the route/line from the list. d) System requests the administrator to confirm the route/line e) Administrator confirms the route/line. f) System deletes the route/line from the list. g) System closes "delete route/line" window.
Results	The route/line is deleted from the list and the list in updated successfully.
Issues	
UML diagram	

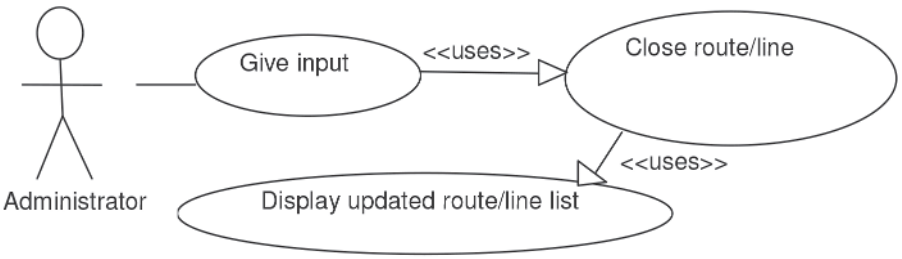
5.4.5.8 Open Route/Line

Use Case	**Open Route/Line**
Description	The administrator will open a route/line that is closed.
Actor	Administrator
Assumptions	The route/line the administrator wishes to open is closed.

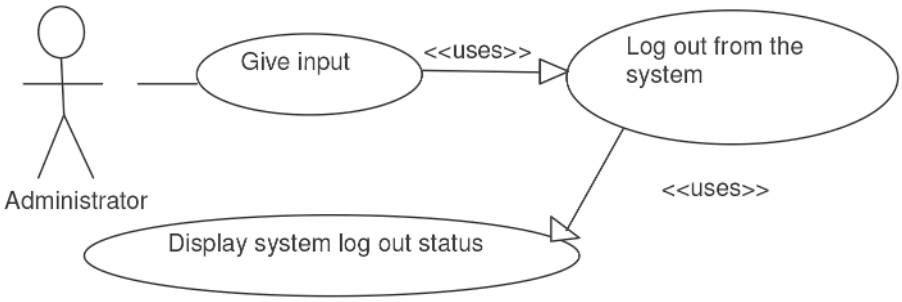
Use Case	**Open Route/Line**
Interactions	a) System displays a “open route/line” window and requests administrator to provide stop/station from and to, to pen. b) Administrator type in stop/station from, to and selects the course of the route/line from the list. c) Administrator requests the system to open the route/line. d) System checks whether the route/line has been declared closed. e) System returns the route details that administrator wishes to open. f) System requests the administrator to confirm the route/line g) Administrator confirms the route/line. h) System opens the route/line. i) System closes “open route/line” window.
Results	The route/line is opened and the list in updated successfully.
Issues	
UML diagram	

5.4.5.9 Close Route/Line

Use Case	**Close Route/Line**
Description	The administrator will temporarily close a route/line between two stops/stations which will make it unavailable during the course of the journey until the route/line is re-opened.
Actor	Administrator
Assumptions	The route/line the administrator wishes to close is open.
Interactions	a) System displays a “close route/line” window and requests administrator to provide route/line details for the route/line to close. b) Administrator type in stop/station from, to and selects the course of the route/line from the list. c) Administrator requests the system to close the route/line d) System checks whether the route/line administrator wishes to close has been declared open. e) System returns the route/line details that administrator wishes to close and requests the administrator to confirm the route/line f) Administrator confirms the route/line. g) System closes the route/line. h) System closes “close route/line” window.
Results	The route/line is closed and the list in updated successfully.
Issues	

Use Case	**Close Route/Line**
UML diagram	

5.4.5.10 System Log-out

Use Case	**System Log-out**
Description	The administrator wishes to log out from the system after maintenance.
Actor	Administrator
Assumptions	Application has loaded without errors.
Interactions	a) Administrator requests to log out of the system after maintenance. b) System requests administrator to confirm log out. c) Administrator confirms log out. d) System disables the menu items for editing system and log out administrator.
Results	System has logged administrator out. Menu items are disabled.
Issues	
UML diagram	

5.5 Currently available regional standards

In implementing journey planning system, reader of this part of ISO 17185 should understand that several regional standards required for such implementation are currently available around the world and those standards, which are most recently issued ones, shall be carefully studied.

For the clear explanation of the relationship between ISO 17185 and currently available regional standards, layer concept is adopted. ISO 17185 and currently available regional standards can be identified in the several layers as shown in the Figure 3 below.

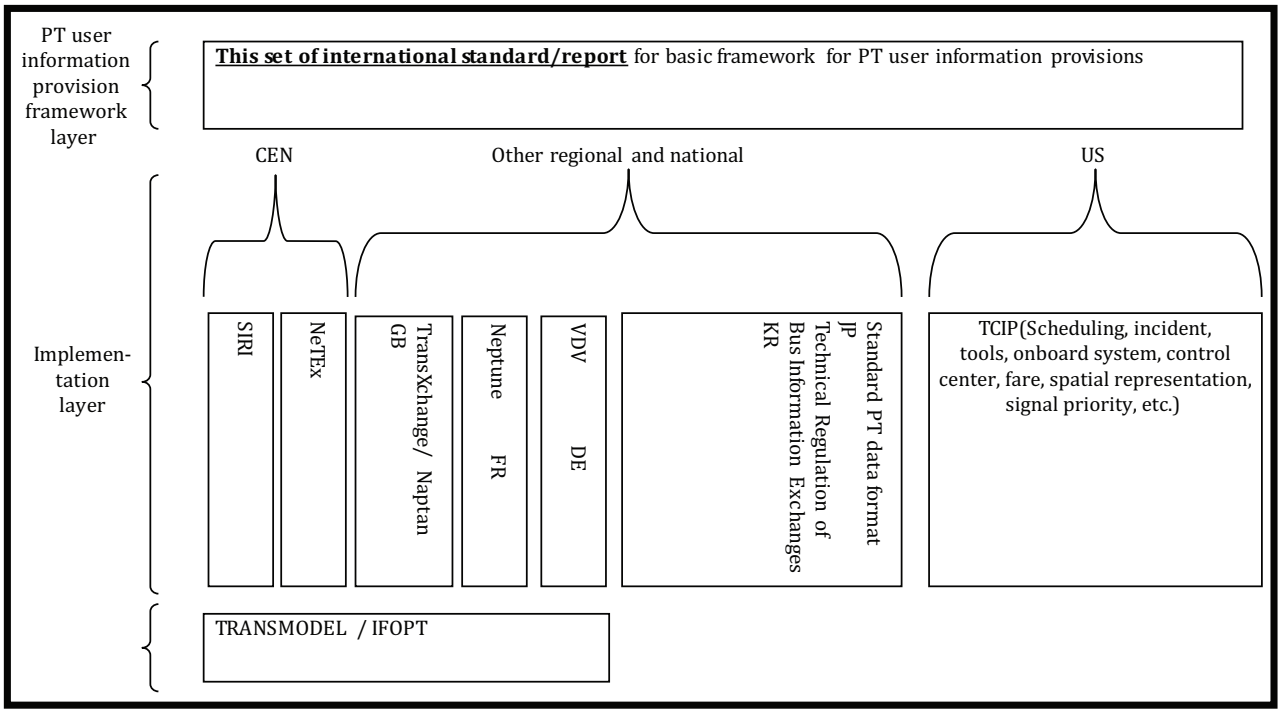


Figure 3 — Layer conceptual view of currently available regional and national standards

Because of the nature of origin and history of these regional and national standards, terms and definition expressions are somewhat different each other, however, the meanings and usage of those words are basically same. ISO 17185 is not trying to standardizing nor harmonizing those terms and definition expressions but showing the basic relationship and conceptual view of these standards by using layer expressions as shown in Figure 3 above.

Since name and nature of those current regional standards may be new to readers of this part of ISO 17185, some of the standards are explained for better understanding purpose only. Readers of ISO 17185 need to understand that these currently available regional and national standards are in constant development/improvement stages and latest issues shall be obtained and examined.

— Transmodel is the European Standard EN 12896 Reference Data Model for Public transport that covers most aspects of PT operation. It describes the semantics of the PT data for the domains: Network Description, Scheduling, Operations Monitoring and Control, Passenger information, Fare Collection, Personnel Disposition, Management Information.

— IFOPT is a CEN published standard (EN 28701). IFOPT is complementary to Transmodel and defines a data model for the main fixed objects related to Public Transport (e.g. stop points, stop areas, stations, entrances, etc.). It also defines navigation paths through complex stop places. Its submodels are Stop place model, POI model, Administrative model, Gazetteer/Topographical model, parking model.

— SIRI is a CEN Technical Specification (TS 15531) on the way to become an EN. It specifies services, i.e. data exchange format and protocol for real-time PT data. It is based upon Transmodel as regards the exchanged data and their semantics. SIRI documentation is composed of five parts: Part 1: Introduction, Part 2: Communications infrastructure, Part 3: Functional service interfaces, schema, white paper.

— NeTEx is a CEN Technical Specification under development, complementary to SIRI, specifying data exchange messages and protocol for planned (scheduled) data, mainly network (Part 1) and timetable (Part 2) data. Part 3 intends to define exchanges of fare data. NeTex is based upon Transmodel and IFOPT.

— TCIP is a US standard developed by APTA and is for introducing advanced ITS technologies into PT to improve safety, security, and efficiency.

— The Japanese standard specification for inter PT/information provider data exchange data format: It provides implementation level specification for basic database of multi-modal, multi- PT operator system.

— Korean Technical Regulation of Bus Information Exchanges, the standard for Messages for exchanging between bus information centres.

Annex A
(informative)

Currently available regional journey planning systems

A.1 General

Following currently available regional journey planning systems are listed for informative purpose only and reader of this part of ISO 17185 should review the latest status of those systems.

A.1.1 Europe

- EU Spirit — http://fahrinfo.vbb.de/bin/query.exe/en
- Finland
  - Helsinki Region Transport — http://www.hsl.fi/en/Pages/default.aspx
  - Finnish Transport Agency — http://www.journey.fi/
- France
  - ViaMichelin — http://www.viamichelin.com/
  - HopStop — http://www.hopstop.com
- Great Britain
  - Transport for London's journey planner — http://journeyplanner.tfl.gov.uk/user/XSLT_TRIP_REQUEST2?language=en
  - Traveline — http://traveline.info/
  - Transport Direct portal — http://www.transportdirect.info/Web2/Home.aspx?&repeatingloop=Y
  - Easy Jet — http://www.easyjet.com/
  - National Rail Enquiries — http://www.nationalrail.co.uk/
  - Xephos — http://www.internet.xephos.com/site/xephos/en/home.php
  - JourneyOn — http://www.journeyon.co.uk/
  - PlymGo — http://www.plymgo.com/
  - HopStop — http://www.hopstop.com
- Germany
  - Deutsche Bahn — http://www.bahn.com/i/view/index.shtml
  - HopStop — http://www.hopstop.com
- Greece

- — OptiTrans (Athens) http://www.optitrans.net/
- — Ireland
  - — Transport for Ireland http://www.journeyplanner.transportforireland.ie/nta/XSLT_TRIP_REQUEST2?language=en
  - — HopStop http://www.hopstop.com
- — Netherlands
  - — Tom Tom Route planner system http://routes.tomtom.com/#/map/?center=36%2C138&zoom=9&map=basic
  - — 9292 http://9292.nl/en/
  - — HopStop http://www.hopstop.com
- — Norway
  - — HopStop http://www.hopstop.com
  - — Ruter# https://ruter.no/en/
- — Russia
  - — HopStop http://www.hopstop.com
- — Sweden
  - — Resplus http://www.resplus.se/Resplus/
  - — SL http://reseplanerare.sl.se/bin/query.exe/en
  - — HopStop http://www.hopstop.com

A.1.2 North American, Canadian, Central American region

- — Canada
  - — Quebec City transit agency (RTC): Trajecto http://www.rtcquebec.ca/Horairesettrajets/Trajecto/tabid/210/Default.aspx
  - — GO Transit: Regional public transit service for the Greater Toronto and Hamilton Area http://www.gotransit.com/public/en/schedules/google.aspx
  - — HopStop http://www.hopstop.com
- — Costa Rica
  - — Costa Rica Transport Services http://www.anywherecostarica.com/transportation
- — USA
  - — Google Transit http://www.google.com/intl/en/landing/transit/#ymd

- Mapquest http://www.mapquest.com/routeplanner
- Bing Map and Directions http://www.bing.com/maps/
- HopStop http://www.hopstop.com/

A.1.3 Asia-Pacific region

- Australia
  - Public Transport Victoria http://ptv.vic.gov.au
  - HopStop http://www.hopstop.com
- New Zealand
  - HopStop http://www.hopstop.com
- China
  - Beijing subway http://www.bjsubway.com/
- India
  - Delhi Metro http://www.delhimetrorail.com/
- Israel
  - HopStop http://www.hopstop.com
- Japan
  - Ekitan http://ekitan.com/
  - NAVITIME http://www.navitime.co.jp/
  - Norikaeannai http://www.jorudan.co.jp/norikae/
  - Okinawa Naha bus http://www.nahabus.jp/pc/Default.aspx
  - Tokyo To– bus http://tobus.jp/blsys/navi
  - JR East http://www.jreast-timetable.jp/
- Korea
  - Seoul Bus-Metro Line Search Service http://bus.go.kr/
- Malaysia
  - RapidKL Online http://www.putralrt.com.my/
- Singapore
  - SBS Transit http://www.sbstransit.com.sg/journeyplan/step1.aspx
- Thailand

— State Railway of Thailand http://www.railway.co.th/home/

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