Ferry Ticketing System

Software Requirements Specification

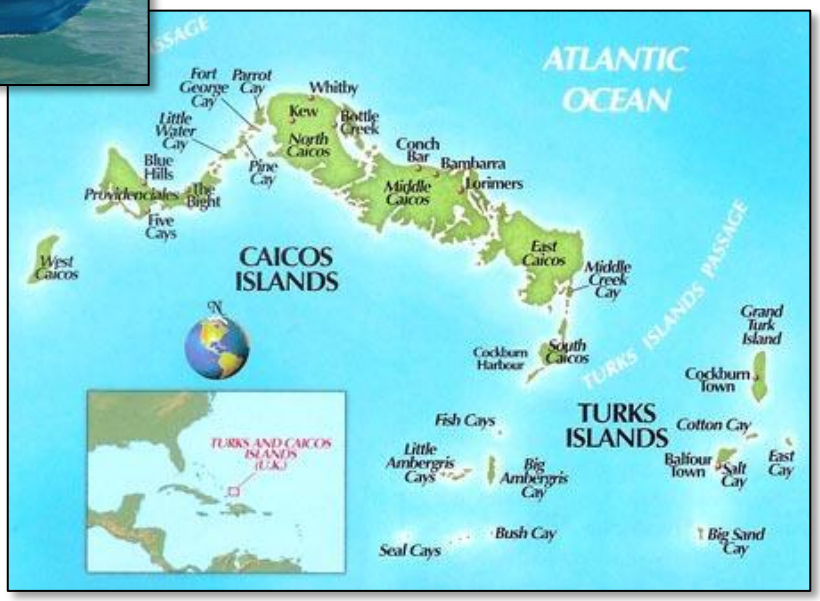


Table of Contents

1. Introduction 4
   1.1 Functionality Overview 4
   1.2 Future Functionality 4
   1.3 Physical Installation 4
   1.4 Terminology 5

2. System Configuration Items 6
   2.1 User Setup 6
   2.2 Vessels – Setup 6
   2.3 Routes – Basic Setup 6
   2.4 Fare Codes – Default Setup 7
   Route 7
   2.5 Fares – Setup 7

3. Route Scheduling 9
   3.1 Standard Schedule Template 9
   3.2 Configuring Runs 9
      3.2.1 Adding a Run 9
      3.2.2 Editing a Run 10
   3.3 Fare Exceptions 11

4. Detailed Route Scheduling & Exception Handling 12
   4.1 Leg Status Screen 12
   4.2 Exceptions & Modifications 13
      4.2.1 Modify a Leg 13
      4.2.2 Cancel a Leg 14
      4.2.3 Storm a Leg 14
      4.2.4 Add a New Leg 14

5. Reserving and Paying for Tickets 15
   5.1 Overview 15
   5.2 Reservation Screen 15
   5.3 Capacity Control 16
   5.4 Ticketing (Passengers) 16
   5.5 Ticketing (Cargo) 17
   5.6 Completing the Reservation 17
   5.7 Passenger Detail and Payment Window 17
   5.8 Payment Methods 18
   5.9 Voiding Tickets 19
   5.10 Physical Tickets 20
   5.11 Receipts 20

6. Passenger Check-In 21
   6.1 Boarding 21
   6.2 Stand-By Boarding 21
   6.3 Over-Selling 21

7. Reporting 22
   7.1 Passenger Manifest 22
   7.2 Ticketing Summary 22
   7.3 Fare Summary Report 22
   7.4 Route Capacity Planning Report 23
   7.5 Vessel Usage Report 23

8. Database Details 24

8.1 Leg Database Table 24
8.2 Ticket Database Table 24
8.3 Draft Data Model 25
9. Future Features 26

1. Introduction

TCI Ferry (aka Caribbean Cruisin') operates passenger ferries (no vehicles) between the islands that make up the Turks & Caicos Islands in the Caribbean. This document outlines the high-level functionality that is desired for a new Ticketing System for TCI Ferry.

The system will consist of a centralized database, along with several Ticketing terminals in various locations. Connectivity between terminals and the database server will be via the internet. We anticipate having a full time "live connection" at each location, and we do not anticipate the need for "batch" processing.

1.1 Functionality Overview

- Sell tickets for trips on specific dates and times
- Passenger tracking by name (to allow for accurate passenger manifests)Passenger check-in at time of boarding (scanning tickets)
- Real-time vessel occupancy when selling tickets and while boarding
- Sell tickets for cargo (accompanied and unaccompanied)
- System configuration to allow for route scheduling, vessel assignment, max seating capacity, ticket fares etc.
- The system will be designed for the sale of ferry tickets only (i.e. no food or beverage items)
- Extensive reporting and the ability to create custom reports using industry standard reporting tools

1.2 Future Functionality

- Sell tickets online via secure Web Site
- Send e-Tickets to passenger's smart-phone (by email or text)

1.3 Physical Installation

The database should be hosted in a secure high-availability environment. The uptime requirements for this service are yet to be determined, but system availability and security will be critical to TCI Ferries' business.

Ticketing terminals will be placed in the following locations:

- Main Ferry Ticketing Office (Providenciales, TCI)
- Each vessel
- Agent/Remote ticketing offices (on other islands)

Each Ticketing terminal will require the following:

- PC or Laptop or Tablet
- Ticket Printer
- Bar Code Scanner
- Internet connection
- Cash Drawer (Optional)
- Credit Card Terminal (Optional)

Internet Connections for remote Ticketing:

- To be provided using cellular data routers located on vessels
- Physical connection for land-based ticketing offices
- In the event of loss of connection, agent will use VHF Radio and have main office staff process transactions

1.4 Terminology

To avoid confusion, the following terminology will be used in this document:

Route This is the combination of a departure point and a destination. For example “Provo – North”, “North – Provo”, or “Provo – South”. That is, the route is something you could draw as an arrow on a map.

Run This is a regularly scheduled trip of a vessel on a specific Route at a specific time. For example, there will always be a 6:30am Run on the Provo-North Route on Wednesdays.

Leg This represents the actual sailing of a Vessel on a specific Route, Date and Time. It is against a Leg that Tickets can be sold. A passenger manifest will be available for any Leg.

2. System Configuration Items

The system will provide a restricted "Back-Office" view of the system, which will have several uses. The detailed configuration of the system will be done here. This section contains a representative example of some of the key lists to be maintained, but it is not comprehensive.

In many cases, the deletion of one of these items will be prohibited. Instead the item will be made "Inactive" so that it can be used for reporting purposes.

2.1 User Setup

- Listing of existing Users is displayed
- User may ADD, EDIT or make INACTIVE a User
- A User will consist of:
    - User Name
    - Password
    - Permission Level (Clerk, Agent, Manager)
    - Last Name
    - First Name

2.2 Vessels – Setup

- Listing of existing vessels is displayed
- User may ADD, EDIT or make INACTIVE a vessel
- A Vessel will consist of:
    - Name of Vessel (e.g. TCI Ferry, Proline, Daze, etc)
    - Maximum Seating Capacity
    - Max Accompanied Cargo (in Pounds weight)
    - Max Unaccompanied Cargo (in Pounds weight)
    - Color (for future reporting use)

Making a vessel inactive will only be allowed if it is no longer used in the schedule. That is, before making a vessel inactive, the vessel must be removed from any runs where it is defined in the standard schedule. If the vessel is also defined in specific Legs in the Leg Database table, these Legs must have a status of either "Sailed" or "Stormed" before this function is allowed. The vessel's record will still exist in the database, with status "Inactive for reporting purposes.

The capacity numbers (passengers and Cargo) may be edited, but these changes will not affect Legs that have tickets sold or reserved already.

2.3 Routes – Basic Setup

- Listing of existing Routes is displayed
- User may ADD, EDIT or make INACTIVE a Route
- A Route will consist of:
    - Route Code (abbreviation of the Route Description, such as PN or NP)
    - Name and/or Description (e.g. Provo to North, North to Provo etc)
    - Default Vessel for route (user selects from drop-down list)

2.4 Fare Codes – Default Setup

The Fare Codes will be standardized across all Routes (which is a departure from the current method). This will allow for reporting that summarizes by Fare Code, such as how many Adult Single fares were sold across all routes last month.

The Fare Codes will fall into one of three colour coded categories:

- Passenger (green)
- Cargo Accompanied (blue)
- Cargo Unaccompanied (amber)

Possible New Fare Codes for All Routes might be as follows:

Fare Type	Fare Code	Fare Description
Passenger	PASS	Adult Single Standard
Passenger	PASD	Adult Single Discount
Passenger	PARS	Adult Return Standard
Passenger	PARD	Adult Return Discount
Passenger	PCSS	Child Single Standard
Passenger	PCSD	Child Single Discount
Passenger	PCRS	Child Return Standard
Passenger	PCRD	Child Return Discount
Cargo-A	CA1BF	Cargo-A 1st Suitcase Free (0-50lb)
Cargo-A	CA5	Cargo-A (0-5lb)
Cargo-A	CA25	Cargo-A (5-25lb)
Cargo-A	CA50	Cargo-A (25-50lb)
Cargo-A	CA50+	Cargo-A (50lb plus)
Cargo-A	CADG	Cargo-A Dog
Cargo-A	CABK	Cargo-A Bike
Cargo-U	CU5	Cargo-U (0-5lb)
Cargo-U	CU25	Cargo-U (5-25lb)
Cargo-U	CU50	Cargo-U (25-50lb)
Cargo-U	CU50+	Cargo-U (50lb plus)

Save Cancel

Once this global list is in place, these codes will be “available” for use in the Route Fares setup screen (see section 2.5). If a specific default Fare Code will not apply on a given Route, the manager will leave it disabled.

This functionality will come into play later, when a new Fare Code is introduced (let’s say CAKY – Cargo Accompanied Kayak), which may only apply on a particular route.

2.5 Route Fares – Setup

A Fare is the $ amount charged for a particular individual ticket. The $ amount of the fare varies by route, and may also vary by date or time. So for each route, a list of available fares will be maintained in the system.

When configuring the Fares for a selected Route, the system will present all the Fare Codes defined in the system (as described in section 2.4). In the case of a new Route, all the default codes will be disabled initially. The manager will enable the desired Fare Codes and set a $ amount for each. Note that this amount could be $0 (zero)! If a specific default Fare Code will not apply on a given Route, the manager will leave it disabled.

Once configured for a Route, these fares will apply by default for each Run that is scheduled on that Route, but can then be over-ridden for specific Runs (see section 3.3 Fare Exceptions on page 11).

Note that while the fares may be identical for Provo-North and North-Provo, these will need to be entered separately (i.e. twice).

- User selects Route from drop-down list
- Listing of existing fares for the route is displayed
- User may Enable or Disable a fare and set $ amounts

Disabled Fare Codes will be grayed out. User clicks check box to enable/disable.

Route: **North-Provo**

Fare Type	Fare Code	Fare Description	Amount	Disable
Passenger	PASS	Adult Single Standard	$15.00	☐
Passenger	PASD	Adult Single Discount		☒
Passenger	PARS	Adult Return Standard	$12.00	☐
Passenger	PARD	Adult Return Discount		☒
Passenger	PCSS	Child Single Standard	$8.00	☐
Passenger	PCSD	Child Single Discount		☒
Passenger	PCRS	Child Return Standard	$7.00	☐
Passenger	PCRD	Child Return Discount		☒
Cargo-A	CA1BF	Cargo-A 1st Suitcase Free (0-50lb)	$0.00	☐
Cargo-A	CA5	Cargo-A (0-5lb)	$5.00	☐
Cargo-A	CA25	Cargo-A (5-25lb)	$7.00	☐
Cargo-A	CA50	Cargo-A (25-50lb)	$10.00	☐
Cargo-A	CA50+	Cargo-A (50lb plus)	$25.00	☐
Cargo-A	CADG	Cargo-A Dog	$10.00	☐
Cargo-A	CABK	Cargo-A Bike		☒
Cargo-U	CU5	Cargo-U (0-5lb)	$10.00	☐
Cargo-U	CU25	Cargo-U (5-25lb)	$15.00	☐
Cargo-U	CU50	Cargo-U (25-50lb)	$20.00	☐
Cargo-U	CU50+	Cargo-U (50lb plus)	$50.00	☐

Save **Cancel**

On clicking Save, system will verify that all Fare Codes that are enabled have a dollar amount entered (even if it is zero). User will be forced to enter a value before saving is allowed.

The Fare Codes enabled will be displayed on the fare buttons in the Reservation screen (see section 5.2 on page 15), along with the $ amounts defined here. When the fares are selected in the Reservation screen, they will appear in the on-screen transaction listing, complete with their full descriptions.

For things like special fares, discounted fares, etc, we will create additional Fare Codes as defined in the preceding sections.

3. Route Scheduling

Schedules for individual routes will be configured in the Back-office system in advance. This schedule will serve as a template for all the regularly scheduled runs. On a given date, the scheduled run will become a "Leg" against which Tickets are sold. The ability to alter the details of a specific Leg (i.e. for a particular date and time) is critical.

3.1 Standard Schedule Template

- User selects a Route (e.g. Provo-North)
- Screen presents the runs that are currently configured for the selected Route, along with all pertinent information.
- For each run, the following information is configured:
  - Time of Departure for each run
  - Days of the week that the run will take place
  - Vessel to be used for the run (which may vary, defaults to setting from Route setup)
  - Seating Capacity for the run (which may not be the default vessel capacity, but defaults to vessel's default).
  - Accompanied Cargo capacity (in number of pieces, defaults to vessel's default)
  - Unaccompanied Cargo capacity (in Pounds weight, defaults to vessel's default)
  - Whether the run uses the Default Route Fares or special Fares for a particular Run. (This could be used to price specific runs at a discount – e.g. as an incentive for commuter passengers to travel on a specific run)

3.2 Configuring Runs

The user will first select a Route from a drop-down list. The system will display the Standard Schedule as it is currently configured, sorted by departure time.

Route: **Provo-North**

	Time	Vessel	Max Seats	Max Cargo Lbs A	U	Fares	Mon	Tue	Wed	Thu	Fri	Sat	Sun/Hol
O	6:30am	TCI Ferry	42	400	0	Special	■	■	■	■	■	■	□
O	8:30am	TCI Ferry	42	200	0	Default	□	□	□	□	□	□	■
O	9:30am	TCI Ferry	42	400	600	Default	■	■	■	■	■	■	□
O	9:30am	Daze	25	200	0	Default	■	□	■	□	■	□	□
O	12:30pm	TCI Ferry	42	200	0	Default	■	■	■	■	■	■	□
O	1:00pm	TCI Ferry	42	200	0	Default	□	□	□	□	□	□	■
O	3:00pm	TCI Ferry	42	200	0	Default	■	■	■	□	□	□	□
O	3:30pm	TCI Ferry	42	200	0	Default	□	□	□	□	□	□	■
O	5:00pm	TCI Ferry	42	200	0	Special	■	■	■	■	■	■	□

Add Run **Edit Run** **View/Edit Fares** **Delete Run** **Save** **Cancel**

Green squares (or other obvious UI element) will clearly indicate the days on which each run will occur.

3.2.1 Adding a Run

User clicks the **Add Run** button. A dialog opens as follows:

Route: **Provo-North**
Time: 6:30am
Vessel: TCI Ferry
Duration: 30min
Days: ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☑ Sat ☐ Sun/Hol

Max Seats: 42
Max Cargo Attended (Lbs): 400
Max Cargo Unattended (Lbs): 300
Fares: Default

View/Edit Fares **Save** **Cancel**

The user will first enter a Departure Time and select a Vessel (drop-down), and will enter the duration of the run in minutes. The next step is to specify the days of the week that the run will occur, using check boxes.

If the user selects a Vessel and Time that already exists in the standard schedule, a message will be displayed stating: "*This Run is already defined. Would you like to edit this run, or Add New? Edit/Add New*". If user selects **Edit**, see section 3.2.2. Clicking **Add New** will present the existing Run details, with the Day check boxes grayed out (disabled) for the days that the Run is already defined. This could be used to create a Run with unique characteristics on specific Days (special Fares, Seating or Cargo capacities etc).

Uniqueness of Runs: The system will consider a Run to be unique if the combination of Time/Vessel/Day is unique. This will prevent duplicate Runs from being created, but would allow a second Vessel to be scheduled if desired (e.g 6:30am/TCI Ferry/Wed and 6:30am/Daze/Wed).

3.2.2 Editing a Run

User will select a Run in the Route's Run listing (using a radio button) and click the **Edit Run** button. The system will present the screen below, populated with the existing data. The user may change any of the Run's settings, within the Run uniqueness rules stated above.

Route: **Provo-North**
Time: 6:30am
Vessel: TCI Ferry
Duration: 30min
Days: ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☑ Sat ☐ Sun/Hol

Max Seats: 42
Max Cargo Attended (Lbs): 400
Max Cargo Unattended (Lbs): 300
Fares: Special

View/Edit Fares **Save** **Cancel**

Note: Since the Schedule we are describing here is the Standard Schedule, it is by definition only a template for any future Legs. Therefore a change made here will never affect a Leg against which tickets have been sold, or for which the manager has created exceptions (seating, cargo, vessel etc).

The user may also over-ride the Default Fares for the Run by clicking the **View/Edit Fares** button as described in section 3.3.

3.3 Fare Exceptions

By default, when configuring a Run, the default Fares for the selected Route will apply (previously configured, as described in section 2.5 on page 7). It will be Possible to over-ride these default fares for any Run. The user will select a Run in the Run Listing (radio button), and click the **View/Edit Fares** button. The screen will display a record for each existing Fare for the Run.

The user will be able to:

- Over-ride the Fare $ amount
- Disable the Fare (using a check-box)

Route: **North-Provo**
Run: **6:30am**
Days: **Mon, Tue, Wed, Thu, Fri, Sat**

Fare Code	Description	Default	Over-Ride	Disable
NASG	North Adult Single	$15.00	$10.50	☐
NKSG	North Child Single Discount	$8.00	$7.00	☐
NKSG-T	North Child Single Standard	$10.00	---	☑
CA1BF	Acc. First Suitcase Free (0-50lb)	$0.00	---	☐
CA25	Accompanied Cargo (25-50lb)	$10.00	---	☐
CA50	Accompanied Cargo (25-50lb)	$10.00	---	☐
CA50+	Accompanied Cargo (50lb plus)	$25.00	---	☑
CADG	Accompanied Dog	$10.00	---	☐
CABK	Accompanied Bike	$10.00	$0.00	☐
CU5	Unaccompanied Cargo (0-5lb)	$10.00	---	☐
CU25	Unaccompanied Cargo (5-25lb)	$15.00	---	☐
CU50	Unaccompanied Cargo (25-50lb)	$20.00	---	☐
CU50+	Unaccompanied Cargo (50lb plus)	$50.00	---	☑

Save **Cancel**

Any exceptions entered here will cause the screen in sections 3.2 (Run Configuration) and 4.1 (Leg Status) to display the word "Special" in Blue in the Fares column.

Note: If a new Fare is required, it must be added in the Default Fare Setup screen for the selected Route. If this new fare should not be available for sale on certain Runs, it should be disabled accordingly in the Fare Exceptions screen described here.

4. Detailed Route Scheduling & Exception Handling

4.1 Leg Status Screen

A Schedule screen will be available to all users, that displays the Legs that are scheduled for a specific Route and Date. Depending on the User, the screen will be read-only, or will allow editing. The screen will display a record for each planned Leg. These details will be read from both the Schedule database table and the Leg database table as follows:

Read from Leg Table: If a record exists in the Leg table for the selected Route/Date.
This will be the case if any tickets have been sold (passenger or cargo) OR any modifications have been made to the Leg as defined by the standard schedule template OR the Leg was added as an exception (using the Add New Leg function below).
If such a record exists, the system will recognize whether it resulted from a Schedule template entry (LEG_Sched_ID field will be populated). In this case the corresponding record from the Schedule table will be ignored, as this record supersedes it.

Read From Schedule Table: If no record yet exists in the Leg table for the selected Route/Date.
This will occur if no tickets have yet been sold (passenger or cargo) AND no modifications have been made to the Leg as defined by the standard schedule template.

This screen will be used by the manager to monitor vessel activity for the current day. In addition to the example illustrated below, the data for all routes might be displayed. Additionally, this table could be sorted by column by clicking on the column titles (route, time, vessel)

The **Leg Status Screen** described above might resemble the following:

Route: **Provo – North** (Defaults to "ALL Routes")
Date: ◀ **15May2013 Wed** ▶ (Ability to Select Any Date, Future or Past)

					Seating			Cargo-A (Lbs)			Cargo-U (Lbs)				
	Route	Time	Status	Vessel	Max	Sold	Chkd	Max	Sold	Chkd	Max	Sold	Chkd	Schedule	Fares
○	Provo-North	6:30am	Sailed	TCI-Ferry	42	22	19	400	300	300	0	0	0	Standard	Special
○	Provo-North	9:30am	Sailed	TCI-Ferry	42	42!	42	400	250	250	0	0	0	Standard	Default
○	Provo-North	9:30am	Sailed	ProLine	8	4	4	0	0	0	300	300!	300	Extra	Default
○	Provo-North	12:30pm	Boarding	Daze	36	21	18	400	350	150	200	125	50	Modified	Default
○	Provo-North	3:30pm	Cancelled	TCI-Ferry	42	0	0	0	0	0	0	0	0	Cancelled	Default
○	Provo-North	5:00pm	Pending	TCI-Ferry	42	36	0	200	150	0	100	60	0	Standard	Special

Storm Leg **Modify Leg** **View Manifest**
Cancel Leg **Add New Leg** **View Tickets**

Date can be selected using Forward/Reverse buttons or drop-down click to display small calendar control. By default, all routes for the selected date will be displayed, or a specific may be selected.

The screen will display tallies for the number of tickets sold and checked in, and will automatically update without user interaction.

Functionality in this screen might include the ability to drill down into the details of a particular Leg, such as:

- View number of tickets sold by fare
- View Passenger Manifest and an option to print it.

4.2 Exceptions & Modifications

A Manager will have the ability to override the details of a future leg, provided it has not yet sailed. The following scenarios will all be handled in the same screen illustrated in section 4.1, to either:

- **Modify** a scheduled Leg (specific Route/Date/Time/Vessel)
- **Cancel** a scheduled Leg (specific Route/Date/Time/Vessel)
- **Storm** a scheduled Leg (specific Route/Date/Time/Vessel)
- **Add a New Leg** on any Route (for a specific Route/Date/Time/Vessel)

In the Leg Status screen, the manager will first select the appropriate Date (as described and illustrated in section 4.1), and may select a particular Route. Finally, a single Leg will be selected using a radio button, and one of the four buttons described above will be used.

Note that there will be no ability to modify the Fares for a specific Leg. The fares for a Leg are dictated by the default Fares configured for the Route (see section 2.5), and any exceptions configured for the specific Run (section 3.3).

4.2.1 Modify a Leg

This will allow the manager to alter details of the Leg, such as:

- Alter the Departure Time
- Alter Seating Capacity (cannot exceed that of the selected Vessel)
- Alter the Max Attended Cargo (Weight in Pounds)
- Alter the Max Unattended Cargo (Weight in Pounds)

The manager selects a specific Leg (using a radio button) in the Leg Status screen, then clicks the **Modify Leg** button. This opens a dialog box displaying the Leg details, allowing the parameters above to be modified, as illustrated below:

Leg Details

Route:	**Provo-North**
Date:	15May2013 - Wednesday
Time:	5:00pm
Vessel:	TCI Ferry
Duration:	30min
Status:	Pending

Seating:	Max:	42	Sold:	36	Chkd:	0
Cargo-A (Lbs):	Max:	200	Sold:	150	Chkd:	0
Cargo-B (Lbs):	Max:	100	Sold:	60	Chkd:	0
Fares:	Special					

Save **Cancel**

Changes to Seating and Cargo capacities are fairly straightforward, but cannot exceed the vessel's maximums. In addition, such changes will take into account any tickets sold/reserved for the Leg, and prevent the lowering of capacities below these numbers.

Switching Vessels: If there is a need to switch vessels for a Leg, the manager will use the Storm function and the Add Leg functions as described in sections 4.2.3 and 4.2.4.

These changes are recorded in the Leg database table.

4.2.2 Cancel a Leg

This will allow the manager to cancel a Leg that would normally result from the Standard Schedule.

The manager selects a specific leg (using a radio button) in the Leg Status screen, then clicks the **Cancel Leg** button. After confirming this choice, the system will mark the Leg as cancelled. This Leg will still appear in the Leg Status screen, but its Status will be Cancelled and it will be highlighted in Red. A cancelled Leg will no longer be visible in the Ticketing screen.

A record will be created/updated in the Leg database table to indicate the Leg has been cancelled.

Note: This function will only be possible if no tickets (passenger or cargo) have been sold or reserved for the Leg.

4.2.3 Storm a Leg

This will allow the manager to "Storm" a Leg that would normally result from the Standard Schedule. This function will be used in the event a scheduled Leg cannot sail as scheduled. This could be due to poor weather, or mechanical failure, or any other reason. The decision to "storm a Leg" can be made at any moment prior to the vessel departing, even if all passengers have already boarded.

The manager selects a specific Leg (using a radio button) in the Leg Status screen, then clicks the **Storm Leg** button. After confirming this choice, the system will mark the status of this Leg as "Storm". This Leg will still appear in the Leg Status screen, but will be identified by colour and/or message. This Leg will no longer be visible in the Ticketing screen except as is required to move a ticket from this leg to another.

A record will be created/updated in the Leg database table to indicate the Leg has been stormed.

Note: This function will prevent any further tickets from being sold on this leg. Tickets already sold will not be cancelled, and any user can move a purchased ticket from this leg to another without penalty to the passenger. In other words, a ticket on a "stormed" leg can be exchanged at full value for another ticket, even after the scheduled sailing date.

When "storming" a Leg, the system will simply mark the affected tickets as "Standby", meaning that they are no longer associated with any Leg (i.e. no reservation). These passengers now have the option of boarding any Leg (matching the ticket Route) as a standby passenger, OR they can go to the ticketing office to get a reservation for any future Leg with seating capacity. Depending on policy, tickets may be refunded in full.

When storming a Leg, the manager may need to Add one (or more) new legs to accommodate the displaced passengers. This would occur in the event the Storm function was used to deal with a mechanical failure.

4.2.4 Add a New Leg

This will allow the manager to add a completely new Leg that is not defined in the standard Schedule. This may be used to:

- Add a second vessel to a scheduled Leg (in the event seating/cargo space is sold out on the scheduled vessel)
- Add an unscheduled Leg for a particular day (for any reason, including special Holiday Schedules)

The manager clicks the **Add New Leg** button. This opens a dialog box displaying the pre-selected Route and Date. The manager then specifies the Departure Time, selects a vessel and specifies the seating and cargo capacities.

5. Reserving and Paying for Tickets

5.1 Overview

The process of purchasing one or more tickets will always begin with creating a reservation. The reservation may be saved for later payment, or payment may be made immediately after creating the reservation. Reservations will be retrievable by lookup of the primary contact's phone number.

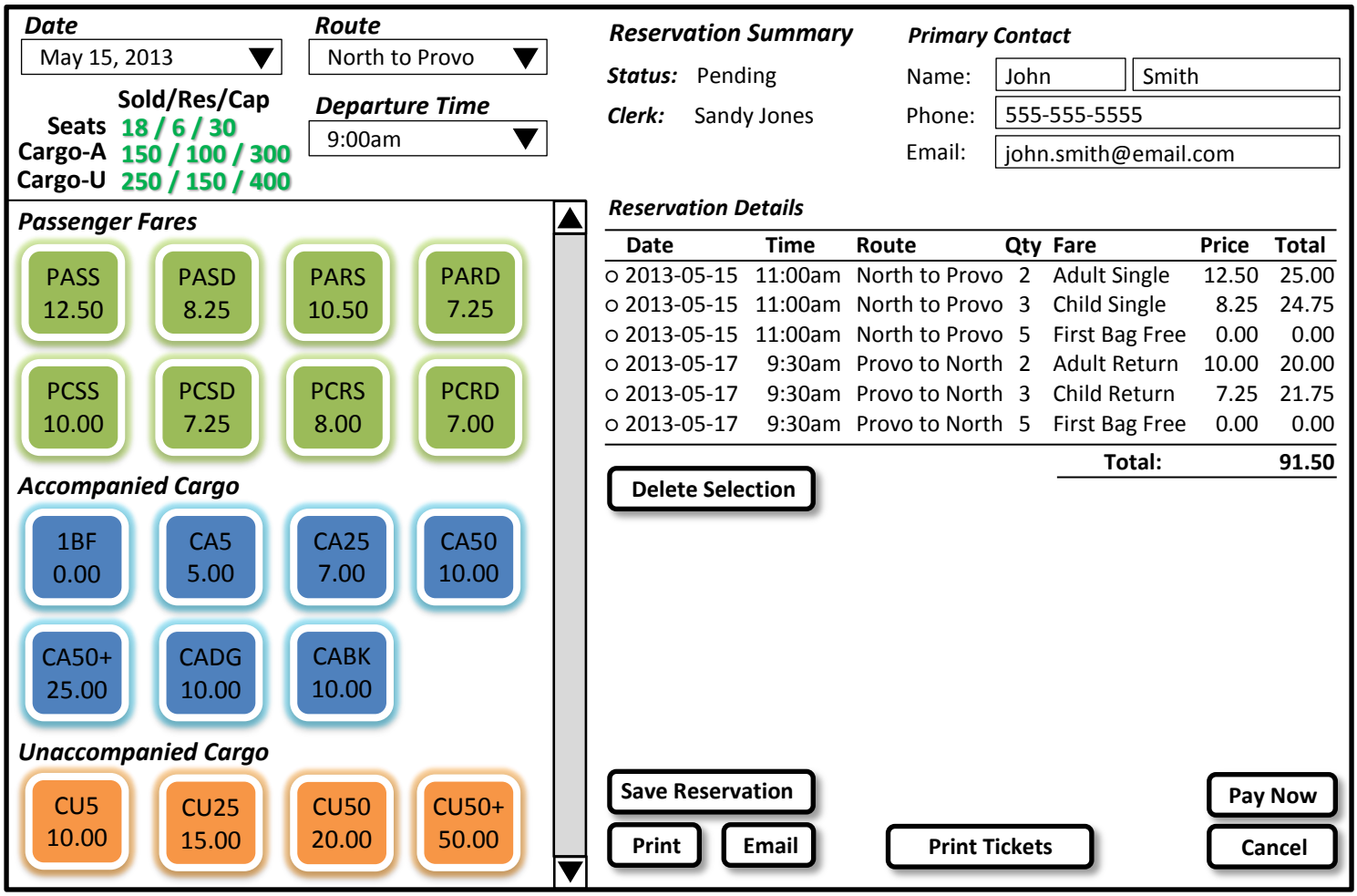
A Reservation may contain passenger tickets only, cargo tickets (unaccompanied) only, or a mix of both.

The primary contact's name, email and phone number will be associated with all the tickets by default. There will also be an ability to enter names of passengers for the other tickets in the Reservation, to allow for an accurate vessel manifest.

Sales Transaction
A sales transaction will be defined as the purchase of one or more tickets, paid for together with one or more forms of payment. For example, one person purchases 2 adult tickets and 3 child tickets, and pays for them all using a credit card transaction for half of the payment, and cash for the balance. Only once the reservation is paid in full, can tickets be printed.

5.2 Reservation Screen

This screen will be used by a clerk to build a sales transaction. We envision a screen with two sides as illustrated below:



While building the reservation, items selected on left will appear in listing on right side. Pressing the same button more than once will increment the quantity for the selected fare (in the Qty column in right hand side Reservation Details). The clerk should also have the ability to directly modify the quantities in this column.

The clerk may delete an item on right by selecting it (using a radio button) and clicking **Delete Selection**.

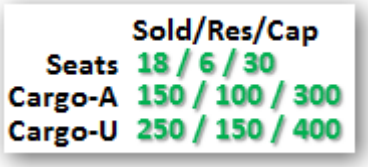
Reservation Status will be one of the following:

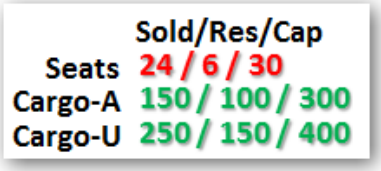
- Pending
- Saved
- Paid in Full.

The **Print Tickets** button will be disabled until the Reservation Status is "Paid In Full".

5.3 Capacity Control

Capacity status for the selected Leg will always be displayed in the reservation screen, and will show 3 numbers: e.g. 18/6/30 - Sold/Reserved/Capacity. The Leg's Cargo Status in Pounds weight will be displayed in a similar fashion, both for Accompanied and Unaccompanied cargo.





These numbers shall be defined as follows:

- Sold = Total ticket units (or cargo in Lbs) paid for in full
- Reserved = Total ticket units (or cargo in Lbs) reserved but not paid in full
- Capacity = Maximum capacity, as defined in the route schedule (or Leg exception)

When the clerk selects a Route, the system will check the availability of Seating and Cargo Capacity. If the sum of the "Sold" quantity and "Reserved" quantity for one of these categories has reached the Maximum (i.e. Capacity), this portion of the display will turn red, and all Fare buttons of that category will be grayed out (disabled). This condition will not prevent the clerk from selling a fare that has not yet reached capacity however. For example, if the max seating capacity has been reached, but there is still Cargo-U capacity available, the clerk may still add one or more Cargo-U fares to a reservation.

IMPORTANT!! Reservations will be held until a specific number of minutes before sailing time (configurable for entire system). Up until this time, reserved seats that are not yet paid for count as occupied as far as available seats are concerned in the user screen. After this time, reservations will expire, and the associated seats will become available for sale.

5.4 Ticketing (Passengers)

A ticket will be defined as the combination of one Date/Route/Time/Vessel/Fare. For example:

2013-05-15/North-Provo/11:00am/TCI Ferry/Adult Single
2013-05-17/Provo-North/9:30am/TCI Ferry/Adult Single

In the main Reservation screen, the clerk will:

- Enter Primary Contact's first name and last name, email address and contact phone number
- Select Date (default is today), drop-down click brings up calendar
- Select from list of applicable routes (filtered list based on date selection)
- Select from available times (i.e. Legs, filtered list based on date selection)

- Select the appropriate fare (Adult, Child etc) by clicking buttons on left
- Select the Quantity (multiples of the exact same ticket)
- Name of clerk who completes transaction is displayed, manager can modify (allows call in sales)

This process shall at all times be governed by the Capacity Control algorithms described in section 5.3.

5.5 Ticketing (Cargo)

A Cargo ticket will be sold in much the same way as a Passenger ticket. Only routes and times that are available on the selected date will be available for sale.

As the route/time/fare selections are made, they will be listed in a Transaction Summary on-screen.
In the main Reservation screen, the user will:

- Select Date (default is today)
- Select from list of applicable routes (filtered list based on date selection)
- Select from available times (i.e. Legs, filtered list based on date selection)
- Select the appropriate Cargo Fare by clicking a button on left side of screen
- If **Accompanied**, enter the number of pieces of cargo AND weight
- If **Unaccompanied**, enter the number of pieces of cargo AND weight of each piece, and the receiver first name, last name, email address and contact phone number

This process shall at all times be governed by the Capacity Control algorithms described in section 5.3.

Zero Cost Cargo: There may be Cargo Fares that have a charge of $0 (zero), such as a First Bag Free. This fare will still result in a ticket being printed.

5.6 Completing the Reservation

Once the reservation summary contains all the desired items, the user can select from the following buttons:

SAVE RESERVATION – saves the current reservation
EMAIL RESERVATION – saves reservation and converts report to pdf, attaches to email to be sent to Primary Contact using default email client
PRINT RESERVATION – saves reservation and converts report to pdf and sends to print window
PAY NOW – saves reservation and opens "Passenger Detail and Payment Window"

The user/clerk can go back to the Reservations window by searching for the name (phone number?) in an autocomplete, drop down window. In the online version, a user can only see reservations created by their username. Reservations for legs that have not yet sailed, can be modified. Reservations for legs that have sailed cannot be modified.

Reservations will be held until a specific number of minutes before sailing time (configurable for entire system). Up until this time, reserved seats that are not yet paid for count as occupied as far as available seats are concerned in the user screen. After this time, reservations will expire, and the associated seats will become available for sale.

5.7 Passenger Detail and Payment Window

Once the desired ticket(s) have been selected, the user will click "Pay Now" to proceed to a screen that allows entry of the individual passenger names. This will be mandatory, and will form the basis of the vessel's manifest.

For each ticket sold, the clerk will type in the passenger's First and Last Name. Only once this information has been entered, will the system proceed to the payment . The Last Name for each passenger for whom a ticket is purchased, defaults to the Last Name of the person who made the reservation (i.e. the Primary Contact). The email address and contact phone number for each passenger defaults to that of the Primary Contact.

If unaccompanied cargo is selected, the "sender" defaults to the person who made the reservation AND a place opens up to fill in "receiver" name, receiver email and contact phone number.

A price for each line entry will appear beside the line entry (first, last, email, phone ……$25). At the bottom of the price column will be the total. Under the total will be a place to enter in a payment type, and payment amount. A date stamp will automatically be placed beside a payment. If the outstanding balance is not $0 (zero), an additional payment line appears with an opportunity to select payment type, payment amount and a date stamp that automatically fills in when the payment fills in. Once a payment has been entered (saved), it cannot be modified.

The following illustrates how this screen might look:

Ticket	First	Last	Email	Phone	Price
NASG	John	Lawson	jklawson@tciway.tc	231-5646	25.00
NASG	Karen	Lawson	jklawson@tciway.tc	231-5646	25.00
Cargo Dog	John	Lawson	jklawson@tciway.tc	231-5646	10.00
Cargo 5lb	John	Lawson	jklawson@tciway.tc	231-5646	5.00
				Total:	**65.00**
			15APR2013	Visa	-30.00
			15APR2013	Cash	-35.00
				Balance:	**0.00**
				Reservation Status:	Paid In Full

Print Tickets **Save** **Cancel**

Telephone and email are not mandatory, but a name in first and last is mandatory.

DATABASE: Transaction ID will be used to link records in the Ticket table and the Payment table.

If making changes to a prior reservation, the exact same screens will be used. I.e. Reservation, then Payment screens. In doing so, any passenger names previously entered will be deleted, and the main contact's details will be applied to all tickets (Last Name, Email and Phone number), exactly as happens on a new reservation. Clerk will then re-enter names as appropriate in the payment screen.

Once the Balance is zero, the Reservation Status will be updated to "Paid In Full". This will allow for printing of tickets.

Print Tickets is only allowed if the entire transaction has an outstanding balance of $0. Tickets can be re-printed at any time.

5.8 Payment Methods

The following payment types will be available in the TICKETING screen:

- Cash
- Credit Card (Visa, Master Card)
- Voucher
- Account

NOTE: Cheques are not accepted by the ticketing software. If the person has an account with us, we can accept a cheque at the POS station and a ticket voucher can be purchased there.

These 4 choices will be used for reporting purposes only. That is, each sales transaction (i.e. reservation) will be recorded in the system, along with which of the 4 payment methods was used for the purchase. At the end of each business day, a

report will summarize total $ amounts for each method of payment. This report will then be used to reconcile the cash in the cash drawer, the Credit Card totals etc.

Cash: Amount of the sale goes into the cash drawer in cash

Credit Card: The Clerk will use customer's credit card to process payment using the bank's CC terminal.

Voucher: These will be pre-sold for each route on heavy card stock. This will allow a customer to buy a book of 10 Adult tickets for Provo-North/North-Provo, for example. The TICKETING employee will verify that the voucher presented matches the route and fare being booked, they will stamp it (cut, hole, rip, etc) so it cannot be used again and place the voucher(s) in the cash drawer. The vouchers will be sold by another system (not tracked by the ticketing system). When the customer uses such a voucher, it will just be considered a method of payment, but it cannot be used again.

Account: Some customers will be billed periodically for travel during a period. For each "Account" sale, the ticketing clerk will fill in a paper form identifying the information relevant to the account, the sale, and customer. The customer will sign the form, and it will be filed. The ticketing system will have no knowledge of actual account details, balances etc.

5.9 Voiding Tickets

If customer needs to make changes to tickets previously purchased (and paid for), the clerk will retrieve the customer's reservation and have the ability to "Void" a ticket. The result of this change will create a negative balance on the transaction (i.e. the reservation). Unless other tickets are being added, a refund will be given to the customer and recorded just like a payment (I.e. by negative amount and method of payment).

Voided tickets will be marked as such in the system, and will be refused check-in when boarding a vessel. This should be avoided by mandating that the physical ticket be surrendered by the customer when voiding it.

Print Tickets is only allowed if the entire transaction has an outstanding balance of $0. Tickets can be re-printed at any time.

It may be necessary to track which User, and possibly which terminal, received payment. This would be used to reconcile cash amounts at the end of day or shift.

VOIDED Tickets: Whenever a ticket is being re-printed, a new Ticket record will be created in the Ticket table, complete with new Ticket ID. The original ticket will remain in the database, but its status will be marked VOID. A voided ticket can never be used to board a vessel, in fact it has zero value. Note that the act of voiding a ticket cannot be undone.

5.10 Physical Tickets

An individual ticket will have 2 parts: one to be surrendered upon boarding vessel, the other to be retained by passenger. Both printed copies of each ticket will display the following information:

Passenger Ticket

Ticket Number (TICKET_ID)
Route Description
Date (of departure)
Time (of departure)
Fare Code
Fare Description
Amount Paid
Passenger First Name
Passenger Last Name
Passenger Phone #
Bar Code (QR?) of Ticket Number

Cargo Ticket (Unaccompanied)

Ticket Number (TICKET_ID)
Route Description
Date (of departure)
Time (of departure)
Fare Code
Fare Description
Amount Paid
Sender First Name
Sender Last Name
Sender Phone #
Receiver First Name
Receiver Last Name
Receiver Phone #
Bar Code (QR?) of Ticket Number

Once payment has been made in full (Reservation Balance = 0), the tickets and a receipt can be printed. Each individual ticket will be printed separately. That is if qty 4 was selected for a particular Date/Route/Time/Fare combination, 4 separate tickets will be printed. After all the tickets have been printed, a summary receipt will be printed.

Zero Cost Cargo: There may be Cargo Fares that have a charge of $0 (zero), such as a First Bag Free. This fare will still result in a ticket being printed.

5.11 Receipts

Whenever tickets are printed, after all the tickets for a transaction have been printed, a summary receipt will be printed. This receipt will contain as a minimum:

- Ferry Company Name and other details as configured in the system (Phone#, Web Address etc)
- Primary Contact Name & Phone #
- Date and Time of transaction
- Total Amount paid
- Method(s) of payment

6. Passenger Check-In

In order to board a vessel, each and every passenger must have a valid ticket, which will be scanned at time of boarding.

6.1 Boarding

When a passenger boards a vessel, a TCI Ferry employee will use a portable device to scan the passenger's ticket. The employee will use a Check-In screen that first prompts for the Leg Details. The selections available will be based on the current date and time, but the employee will select the specific Leg being boarded (unique Route/Date/Time/Vessel). The terminal will now await the scanning of tickets.

The check-in process will validate that the passenger is in fact scheduled for the specific Leg he/she is boarding. This process will update the Ticket database table to indicate that the passenger has boarded. If the ticket being scanned is not for the current Leg, the system will reject it, and emit an audible error tone.

Acceptable tickets that are scanned, are immediately marked as used in the system.

6.2 Stand-By Boarding

If the Leg is sold out, stand-by boarding will be allowed starting at some time before departure (eg 10 minutes before departure). If there is available seating capacity, the system will allow stand-by passengers to be boarded at any time up to max seating capacity, provided they have a valid ticket for a future sailing of the same Route. Such boarding will update the Ticket table to reflect the actual Leg the passenger travelled on.

6.3 Over-Selling

The process described in section 6.2 may result in a pre-booked customer who arrives late, being denied boarding. Such a passenger's ticket will still be valid, and can be used on a subsequent Leg. By default, this passenger will be a stand-by passenger on a future leg. However, if the passenger wants to, he/she may contact the office, and request that the ticket be changed to a specific future Leg (subject to seating availability). If the ticket was originally purchased for a less costly Run, the passenger will have to upgrade his/her ticket at one of the ticketing locations.

Once a ticket has been used to board a vessel, it is assumed to have been used. That is, a ticket that has been scanned at check-in has no subsequent value. If a passenger does attempt to board a future Leg with such a ticket, the system will reject it, emitting an audible error tone and displaying an appropriate message.

Note that if a Leg is "Stormed" (i.e. cancelled after boarding has begun but before it sails), all tickets for the affected Leg retain value and can be exchanged for future sailing.

7. Reporting

The system will provide a number of reports for use by management and accounting staff. The reports described below are listed in priority sequence.

We would also like to have the ability to have other custom reports added to the system, or the ability to create them ourselves (i.e. using Crystal Reports or other tools).

7.1 Passenger Manifest

Each "Leg" (North to Provo/15MAY2013/9:00am/TCI Ferry) must have a printable manifest, which lists the passengers by name who actually boarded the vessel. Passenger details should be in one section, and Cargo in a separate section.

The Cargo section should be divided into Accompanied and Unaccompanied for checking off.

7.2 Ticketing Summary

User specifies Date Range, default is from Today to Today
Report lists the following:

- Rows are Payment Methods (4 Rows)
- Column 2 Displays total $ amount for Passenger Tickets sold
- Column 3 Displays total $ amount for Cargo Tickets sold
- Column 4 displays totals by payment method
- Row 5 displays totals

Leg	Pax	Total Revenue	Previous	Cash	Visa	Mastercard	Voucher	Account
6:30 PN	**12**	**300**	**50**	**200**	**25**			**25**
7:00 NP	**13**	**325**		**300**		**25**		
Future Trips								
TOTAL	**25**	**625**	**50**	**500**	**25**	**25**	**0**	**25**

Future Trips- records payments taken for future trips

REPEAT OF EARLIER COMMENT (Eloborate) It may be necessary to track which User and possibly terminal received payment. This would be used to reconcile cash amounts at the end of day or shift.

Previous- records amount of revenue that was accepted prior to period

7.3 Fare Summary Report

User specifies Date Range, default is from Today to Today

Report lists the following in three columns:

- Each row displays a unique Route/Fare combination
- Column 2 displays quantity sold
- Column 3 displays the corresponding $ amount

7.4 Route Capacity Planning Report

User selects one or more routes from list using check boxes
User selects a date range, default is from Today to Today
Report lists the following:

- Each row displays a day of the week
- Each column displays a time at which the selected routes were offered during the date range, and displays the seats sold (regardless of fares paid) as well as Cargo-A and Cargo-U in pounds weight.

7.5 Vessel Usage Report

User selects a date range, default is from Today to Today
User selects one from the following (radio buttons): Trips, Revenue, Passengers
Report lists the following:

- Each row displays a vessel
- Each column displays a day of the week (Sunday through Saturday)
- Each cell displays a total of either Trips, Revenue or Passengers for the vessel on that day

8. Database Details

This section begins to outline the database tables and the relationships between them. This is not intended as a complete description of the database, or as a database model. It is intended to convey some of the functionality that may otherwise be difficult to explain. As this system comes closer to reality, this section will contain more such detail.

8.1 Leg Database Table

This table is populated with a single record for each unique sailing or "Leg" (eg Provo-North, 15Jan2014, 6:30am).

This record is created at the time that either:

- The first ticket for a scheduled route is sold (either Passenger or Cargo)
- A manager over-rides one of the following:
    - Vessel
    - Max seating capacity
    - Max accompanied cargo capacity
    - Max unaccompanied cargo capacity

This table will contain the following fields as a minimum:

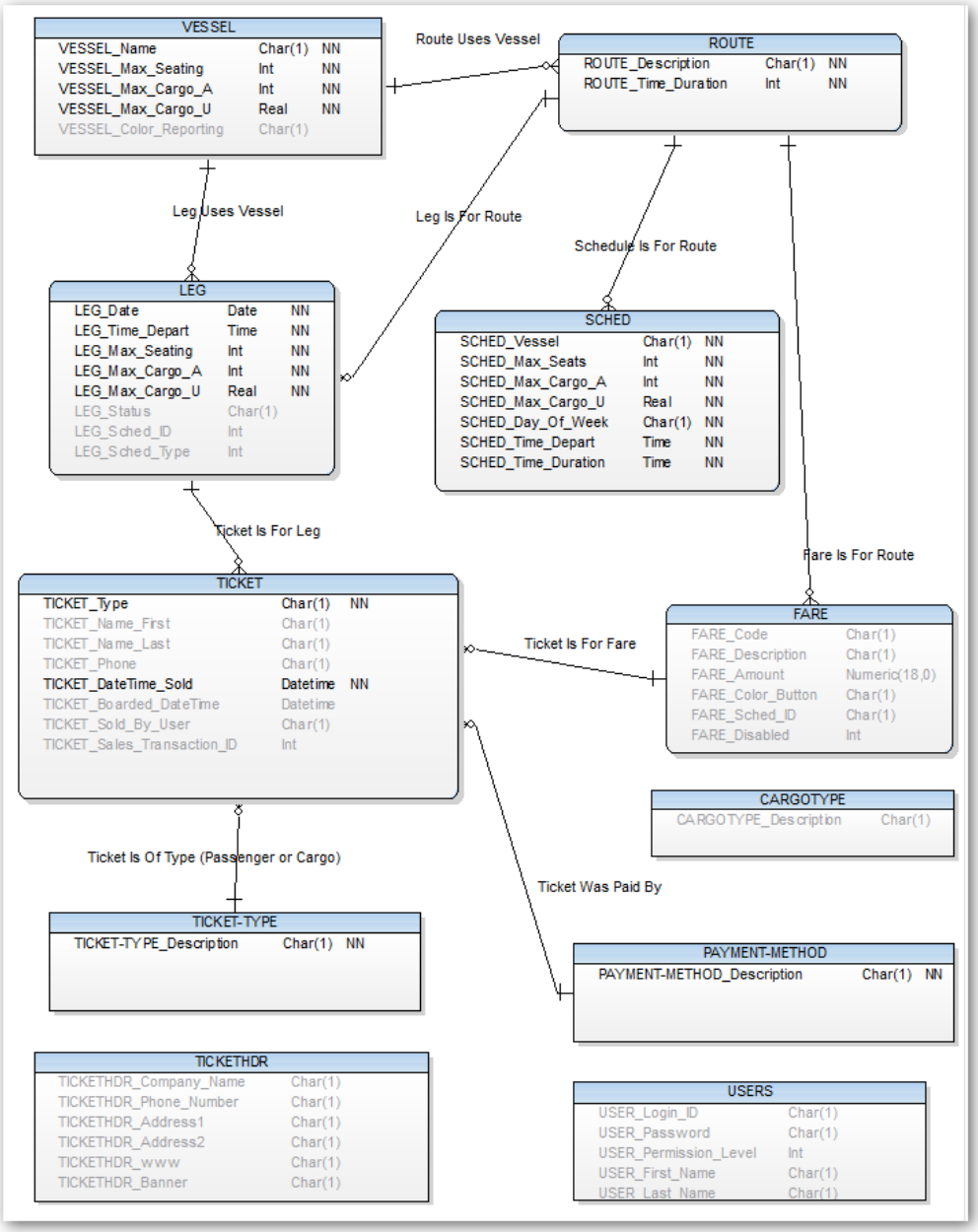
- Leg_ID (Primary Key, automatically assigned)
- Vessel_ID (links to Vessel table)
- Route_ID (Links to Route Table)
- Date
- Departure Time
- Max Seating Capacity
- Max accompanied cargo capacity (Pieces)
- Max unaccompanied cargo capacity (Pounds)

8.2 Ticket Database Table

This table is populated with a single record for each individual ticket sold. It will contain the following fields as a minimum:

- Ticket_ID (Primary Key, automatically assigned)
- Leg_ID (Links to Leg table)
- Ticket Type (Passenger or Cargo-A or Cargo-U)
- Passenger Last Name (for Passengers Only)
- Passenger First Name (for Passengers Only)
- Cargo Sender First Name (for Cargo Only)
- Cargo Sender Last Name (for Cargo Only)
- Cargo Sender Phone Number (for Cargo Only)
- Fare_ID (Links to Fare table)
- Check-In Status (DateTime of actual check-in at time of boarding, blank until checked in)

8.3 Draft Data Model



9. Future Features

The following features are not required initially, but may be desirable in the future.

- Customer Debit Card – Customer loads loyalty card with currency
- Ticket Sales via Secure Web Site – need this now
- ATM Ticket Sales
- Send Tickets to customer's smart phone