Zeus Interface

The interface with Zeus to this point allows for the conversion between MMRP class objects and a corresponding Zeus object. Due to some minor differences in where data is stored in the MMRP class versus the Zeus class, generating a Zeus object may require a different MMRP object than the obvious choice. Below is discussed the values that were included into the MMRP class structure in able to ease interaction with Zeus along with how Zeus items can be generated through pre-existing MMRP objects.

1. Zeus Shipment

Zeus shipments hold a lot more information than initially allowed for in the MMRP class structure. Despite the fact that these fields are not used as of yet within the MMRP algorithms these fields were added to our class structure in order to ease any future or current interfacing between Zeus and MMRP. While these fields are not currently implemented, they could be in the future and therefore full error checking is performed on all of the following values. Since the values are not used within the MMRP project, default values are assigned to these fields when an object within the MMRP class structure is instantiated. The Zeus values added are as follows:

* Hazmat Constraints
* Loading/Unloading Rate
* Unload/Load times
* Maximum number of stops allowed
* Preferred Carriers
* The option of taking toll roads or not
* The option to bypass local congestion
* Trailer type
* Unloading/Loading type

Within the MMRP project these values are used in both the Shipment and the Truck Type classes. A shipment has these values, where as a truck type can or cannot support these values. Generation of a Zeus shipment from pre-existing MMRP objects requires two MMRP locations, a departure location and a destination location, and a MMRP shipment to be passed to the generateZeusShipment function of the Zeus Interface class. The Zeus shipment will have the same values in corresponding fields as the MMRP shipment.

1. Zeus Truck Type

Zeus supports two different truck types. A base truck type, which encompasses a lot of different variables and was made partially for a different problem, and an extension of this type called a VRP Truck Type. For the MMRP project the VRP Truck Type is the truck type that needs implemented. A truck type defines the following:

* Duration
* Max capacity
* Type of customer’s that can be serviced

For the MMRP project only capacity has been implemented in our generation of a Zeus truck type. The other values could be added at any point if they were to be implemented in the MMRP project. The generation of a Zeus truck type requires a MMRP segment. This is due to the segments holding capacity information in the MMRP project. The reasoning behind this, and the connection between a Zeus Truck Type and a MMRP segment, is that a truck type can be thought of as representing the trailer that a truck is carrying. Truck types include the same values that were listed in the first section which discussed shipments. Shipments require specific truck types, these truck types can be changed though; a truck can easily switch trailers when it arrives to a stop. Due to this the MMRP project ties truck type to segments and not to individual trucks.

1. Zeus Truck

Zeus Trucks hold mostly the same information as MMRP Trucks. However a Zeus Truck requires a Zeus Truck Type. For this reason in order to generate a Zeus Truck both a MMRP Truck and an MMRP Segment are required. The MMRP Segment is required so that a Zeus Truck Type can be created for the Zeus Truck. After the VRP Truck Type is created the Zeus Truck is created and the VRP Truck Type is assigned to the Truck. The only other value that is currently able to be set is the Contractor name. Other Zeus Truck values are not incorporated into the MMRP project yet, and some do not relate to vehicle routing and instead are in place for a different problem.