

Traffic Management System (TMS) Manual



VERSION HISTORY

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1. Introduction

Transparity® Traffic Management System (TMS) is a tool for transportation professionals to manage, monitor, and control transportation equipment. The benefits of the software are:

- Create and maintain traffic Controller inventory
- Upload and download timing parameters
- View real time operational status and alarms
- Collect and store traffic Controller logs
- Review discrepancies between timing records
- Connect using legacy and standards-compliant communications protocols

1.1 TRANSPARITY TMS

Transparity TMS is a 24/7/365 client-server system designed for transportation management centers that have full time communications with traffic control equipment. The software consists of server components such as services and databases, and client components installed on desktop computers connected with the server via a LAN or WAN. A web app is delivered with every services installer where the end user can run the on-premise Signal Performance Measures (SPM) reports, other reports, and download the desktop Setup.exe.

Transparity has the functionality to allow a desktop client to prompt for updates, download the update and kick off the install. The desktop closes and the installer is able to uninstall the current version and install the new version with relative ease.

Migration Synchronization is an additional tool written to help a customer upgrade from their legacy central system QuicNet® to *Transparity*. They convert thingslike a *QuicNet* traffic Controller to a *Transparity* traffic Controller, and many other items like detectors, channels, system links, etc. Because *Transparity* was developed to be a drop-in replacement for *QuicNet*, the migration was made straightforward. Thus, the manual effort required to convert to *Transparity* is much less.

LACO-4E is a protocol in Los Angeles county that is based on the California standard fortraffic Controller communications: AB3418. This is a California assembly bill introduced before USDOT NTCIP 1202 came out. LACO-4E takes AB3418 and adds a couple custom messages. *Transparity* supports these custom extensions.

McCain, Inc. signs our code (DLL and EXE files) with a code signing certificate. Whenour software is installed, Windows reports, "This has been signed by a verified publisher, McCain, Inc."

1.1.1 Transparity IMS

Transparity Intersection Management System (IMS) is a companion product to McCain Omni eX® intersection control software and *Transparity TMS*. It is a self-contained pro- gram that does not require a server and is intended for mobile scenarios where personal computers are connected directly with traffic Controllers. This product is ideal for agencies without extensive communication infrastructures.

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1.2 Types of Data

The key function of a traffic management system is to exchange data with equipment via communications channels, displaying data for analysis and editing, and designing responses to varying traffic conditions.

There are four classifications of traffic Controller data:

1.2.1 System Data

System data resides only in the central system and is not stored or recognized by thesoftware running in the equipment. For example, names can be given to phases in Transparity TMS, but these names cannot be saved to the traffic Controllers.

1.2.2 Control Data

Control data exists in field equipment. It is accessible remotely, via communications channels, or locally. It is not typically saved to non-volatile memory in the equipment; therefore, it returns to default values after a power interruption. It must be refreshed on aregular basis in order to remain in effect, while the specifics of the refresh interval and timeout mechanism vary by program and protocol.

An example of control data is the pattern control object in Omni eX software. A Trans-parity TMS system can set pattern control to make the traffic Controller run a cycle, split, and offset. The system must set pattern control at least once within the Controller's configured backup period; if more than the backup period elapses between sets, perhaps due to a failure of the communications link between the system and the traffic Controller, the traffic Controller times out and runs a pattern specified by other sources, such as its internal time of day schedule.

1.2.3 Parameter Data

Parameter data, like control data, resides in field equipment and can be accessed loc- ally or remotely. However, parameter data is saved to non-volatile memory in the equipment and persists across power interruptions. An example of parameter data is the Startup Phases object in Omni eX software. When the program starts, it reads the value of Startup Phases from the flash memory of the traffic Controller and sets the signal indications accordingly.

1.2.4 Status Data

Status data is read-only data that resides in field equipment and represents a currentstate or characteristic of the equipment that is subject to frequent change. An example of status data is the Phase Status object in Omni eX software: it can be read by Transparity TMS and displayed on a diagram of the intersection. The system cannot write to Phase Status since the status of a phase is set by the *Omni eX* software and cannot be changed by another entity.

1.3 Types of Devices

Transparity TMS can be used to view, edit, store, and retrieve differing types of data fordiffering types of devices. Below is a list of categorized devices supported in *Transparity TMS*:

- Traffic Controller (Intersection Signal) Programs
 - McCain Omni eX
 - McCain 2033

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- McCain 233 MC
- McCain 233 RV
- McCain 233 ON
- McCain 750 CF
- McCain 223 SD
- McCain 215 (Interval)
- McCain 215 (Phase)
- McCain 200 CA
- Caltrans C8
- NTCIP 1202
- AB3418
- Fourth Dimension D4
- Cameras and other ITS Devices
 - IP Camera
 - ECcom Device
 - General Device
 - Iteris VRAS Device
 - CCTV Camera Includes User Interface (UI) that can view the feed of a cam-era and for cameras that support the feature, allow us to control the pan, tilt, and zoom.
- Ramp Meter Programs
 - McCain 2042
- Field Master Programs
 - McCain 245 FM
- Detector Stations
 - Wavetronix SmartSensor HD
 - Sensys Networks Sensor Zone Group
- Dynamic Message Signs (DMS)
 - Generic 1203 Sign

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2. USER INTERFACE LAYOUT

- "Customize the Workspace" on page 23.
- "Understand the Home Menu / Toolbar" on page 24.
 - "Devices & Displays Menu" on page 25.
 - "Timing" on page 25.
 - "Groups" on page 25.
 - "Data Collectors" on page 26.
 - "Map Display" on page 27.
 - "Arterial" on page 27.
 - "Reports" on page 28.
 - "Device Logs" on page 30.
 - "Events" on page 31.
 - "Schedules" on page 32.
 - "Tasks" on page 32.
 - "Channels" on page 33
 - "Alarms" on page 33.
 - "Broadcast Time/Date" on page 33.
- "Viewing System Devices" on page 35.
- "Controller Sub-Context Menu" on page 35.
- "Editing Selected Traffic Controller from Sub-Context Menu" on page 36.
- "Logging Off" on page 40.

Transparity TMS is a framework for an advanced set of transportation control modules. Each module (or component) is easily accessible via the *Transparity* interface and editsdata in the *Transparity* database. The framework provides a main menu and several dockable workspaces (shown below).

Most features open in a primary default workspace upon launch; however, the user maydrag a window into the workspace of choice and customize the look and feel of the application.

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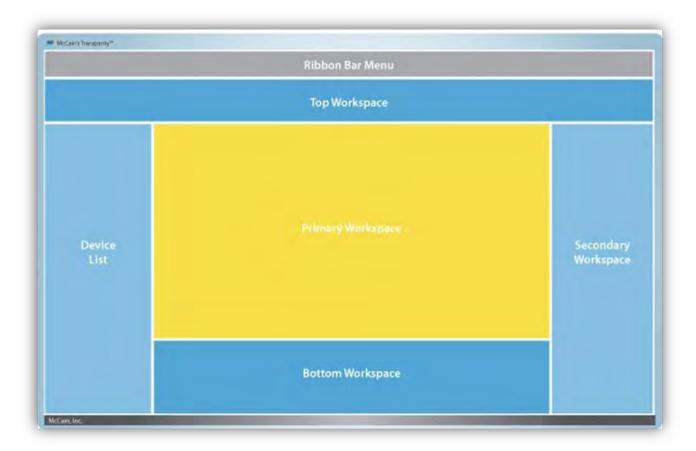


Figure 2-1: User Interface Layout

2.1 CUSTOMIZE THE WORKSPACE

The *Transparity* interface allows users to easily customize their screen by dragging anddropping displays into the desired workspace area.

2.1.1 To Customize the Workspace

- 1. Open the desired function, such as Web Maps, Messaging, etc. The feature willautomatically open in the main workspace.
- 2. Left click and hold on the desired item and drag it to the desired location. Areas shown in yellow above highlight where items may be dropped.

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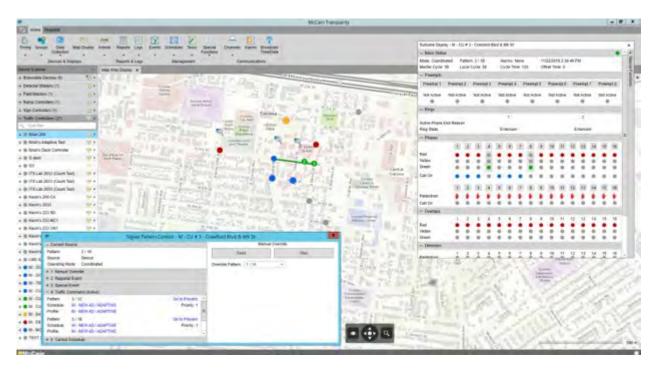


Figure 2-2: Customize the Workspace

2.2 UNDERSTAND THE HOME MENU / TOOLBAR

The Home tab in the main toolbar located across the top of the application provides quick access to primary system functions.

This section provides access to the latest functionality in the Home / Menu Toolbar.

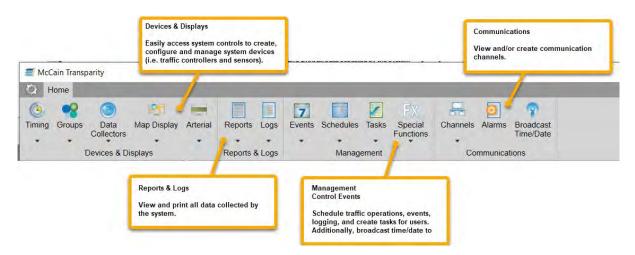


Figure 2-3: Main Menu / Toolbar



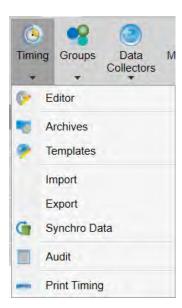
2.2.1 Devices & Displays Menu



Figure 2-4: Devices & Displays Menu

2.2.1.1 **Timing**

The Timing menu dropdown button opens the following options:



Editor	Launches the timing editor
Archives	Create, view, store timing archives
Templates	Create pre-configured templates for common inter-section phasing
Import	Retrieve and store data from external source
Export	Export timing database to controller friendly format
Svnchro Data	Import/Export Synchro supported data format

FIGURE 2-5: Timing Menu

2.2.1.2 **Groups**

Control Groups allow the user to organize traffic Controller inventory for logical or operational reasons. A user with appropriate permissions can send operational commands to multiple traffic Controllers at once using control groups.

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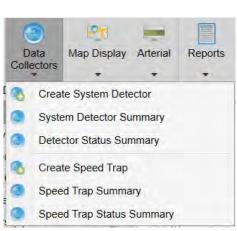
The Groups menu dropdown button opens the following options:



Create Group	Allows for the creation of traffic con-
	troller groups
Group Summary	Summary of all created traffic
Group Timing Editor	Allows for select coordination para- meters to be viewed and edited simultaneously for controllers in a group Manage Coordination parameter across a group of controllers
	Allows pattern controls to be sent to and visualized for all controllers

FIGURE 2-6: Groups Menu

2.2.1.3 Data Collectors



		in Transparity.
1	System Detector	Summary of all created system
	Summary	detectors
	Detector Status	Summary of the status of all system
	Summary	detectors
		Allows the user to create a speed trap
	0	object for collecting speed data in
	Create Speed Trap	Trans-

data

Create System

Detector

Allows the user to create a system

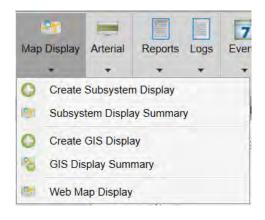
detector object for collecting traffic

FIGURE 2-7: Data Collectors

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2.2.1.4 Map Display



Man Wah Dienlay	Opens the web map centered on the latitude and longitude defined in system
	configuration
Create Subsystem	Allows the user to create Bitmap dis-
Display	plays
Subsystem Display	Lists all of the Bitmap displays
	created
Croata GIS Dia	

Figure 2-5: Map Web Display

2.2.1.5 Arterial

An arterial is a collection of intersections joined by links that can be configured to run a traffic responsive profile, traffic adaptive and run time/space diagrams.

The arterial dropdown menu button opens the following options:

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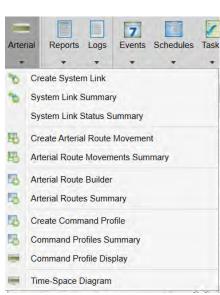
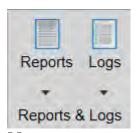


Figure 2-6: Arterial Menu

2.2.2 Reports & Logs



Menu

Figure 2-7: Reports & Logs Menu

2.2.2.1 Reports

Allows creation of links to tie inter-Create System Link sections together System Link Summary of all created links Summary System Link Status Summary of all created links Summary Create Arterial Route Associated phase/overlap Movement Arterial Route Summary of arterial movements Movements created Summary A wizard that can be used to **Arterial Route** create Builder arterial routes Arterial Routes Summary of arterial routes Summary Allows the user to configure an Advanced Adaptive Pattern, Basic Create Command Adaptive Pattern, or Responsive Pro-file Pattern Command Profile Command Profiles Summary of all created command Summary profiles Command Profile Shows History of actions of Traffic Dis-Responsive Operations play Shows status of intersections within a route on a chart, plotting Time-Space green times for the specified Diagram movements in green bands over a defined period

The data collected and stored by the *Transparity* SQL central database is neatly displayed using modern report and chart controls. Users can choose from a variety of para-meters to customize

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general reports and add agency logos or other information to report headers. Each report can be exported in a variety of common formats. While users can customize the content of reports, the general layout is based on industry standards.

Most reports have date range restrictions to avoid too wide a time frame. This limits bigperformance hits on the report and potentially, the rest of the system. Sometimes therestriction is a day, sometimes more or less, depending on what is useful and acceptable to the report.

The Reports dropdown menu opens the following options:

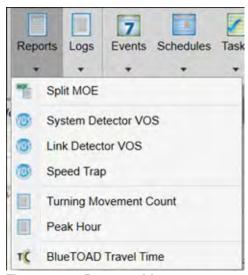


Figure 2-8: Reports Menu

Split MOE	Displays the duration of green foreach phase per cycle in addition to the reason for phase termination
System Detector VOS	Displays system detector VOS datavia a chart and table of values recorded by the system
Link Detector VOS	Displays VOS data collected by the system
Speed Trap	Displays speed data collected by the system
Turning MovementCount	Detector counts for whatever periodselected
Peak Hour	Peak Hour Detector counts during specific hours of the day
Blue TOAD Travel Time	Displays link status data retrieved from BlueTOAD



2.2.2.2 **Device Logs**

Device logs are logs generated by and stored on the Controller. These can be uploaded by *Transparity TMS*, either on demand or on a schedule, for historical purposes. The logs available differ per Controller type.

The Device Logs dropdown menu button opens the following options:

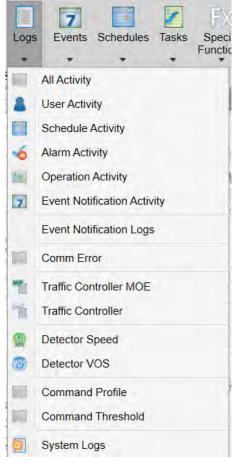


Figure 2-9: Device Logs Menu

opens the following opi	
All Activity	All activity in the system, including field and user operations
User Activity	All activity in the system, including field and user operations
Schedule Activity	Displays all <i>Transparity</i> Scheduling activity
Alarm Activity	Displays all <i>Transparity</i> Alarm activity
Operation Activity	Displays all Operating Mode changes to devices
Comm Error	Shows communication error rates between central and the field
Traffic Controller MOE	Shows method of efficiently dis-playing data, including cycle and split lengths
Traffic Controller	Displays all operational functions at the selected intersection
Detector Speed	Shows collected speed data from detectors
Detector VOS	Shows collected VOS data from detectors
Command Profile	A log of all commands entered onthe <i>Transparity TMS</i> system
Command Threshold	A log of all command threshold events encountered during a Traffic Responsive or Advanced Adaptiveoperation

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2.2.3 Management Menu

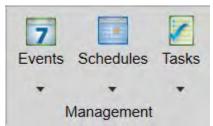
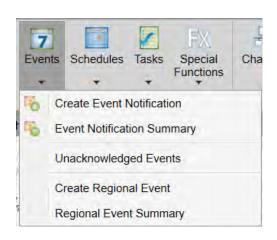


Figure 2-10: Management Menu

2.2.3.1 Events

The Events dropdown menu button opens the following options:



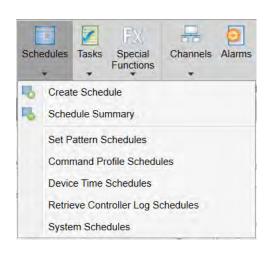
Create Event Notification	Allows user to set notificationpreferences
Event Notification Summary	Summary of all notifications
Unacknowledged Events	Events not yet acknowledged
Create Regional Event	Create new regional event
Regional Event Summary	Summary of all regional events.

Figure 2-11: Events Menu



2.2.3.2 **Schedules**

The Schedules dropdown menu button opens the following options:



	n
Create Schedule	Schedule traffic routines, operational commands, and data collection
Schedule Summary	Summary of created schedules
Set Pattern Schedules	Summary of all Set Pattern schedules
Command Profile Schedules	Summary of all Command Profile schedules
Device Time Sched- ules	Summary of all BroadcastTime/Date schedules
Retrieve Controller Log Schedules	Summary of all controller log upload schedules
System Schedules	Summary of all system schedules

Figure 2-12: Schedules Menu

2.2.3.3 Tasks

The Tasks dropdown menu button opens the following options:

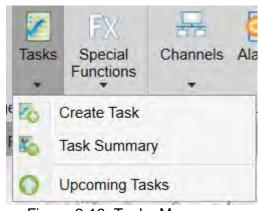


Figure 2-13: Tasks Menu

Create Task	Create tasks to assign to users
Task Summary	Summary of created tasks
Upcoming Tasks	Window at the bottom of the screen shows tasks that are overdue or not completed.

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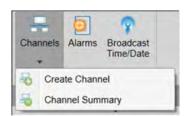
2.2.4 Communications Menu



Figure 2-14: Communications Menu

2.2.4.1 Channels

The Channels dropdown menu button opens the following options:



Create Channel	Where communication channels are set up
Channel Summary	Summary of all added channels

Figure 2-15: Channels Menu

2.2.4.2 Alarms

By selecting the Alarms button, users can view all the currently active Alarms in a Summary format:



Figure 2-16: Alarms Menu

2.2.4.3 Broadcast Time/Date

By selecting the Broadcast Time/Date button, users can update the time and date of user selected traffic Controllers.

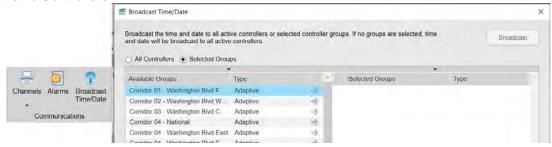


Figure 2-17: Broadcast Time / Date

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2.3 VIEWING SYSTEM DEVICES

By default, a list of system-wide traffic devices is shown on the left side of the screen. The Traffic Devices list is an active menu of devices and system objects. Device status is updated by polling the *Transparity* server. Using the split button where the users can launch a device's sub-context menu specific functions or logs.

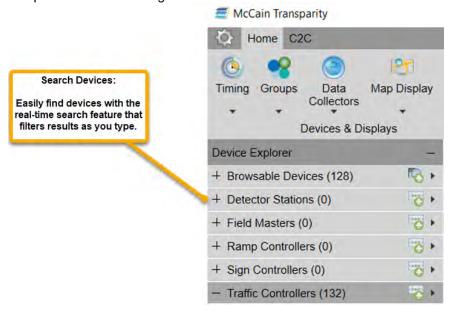


Figure 2-18: Traffic Devices List

2.3.1 Browsable Devices

Expand for a snapshot of the device properties and quick access to object configuration.

2.3.2 Detector Stations

Expand for a list of detectors and quick access to system detector configuration.

2.3.3 Field Masters

Expand for a list of field masters and quick access to edit their configuration.

2.3.4 Ramp Controllers

Expand for a snapshot of all ramp Controllers and quick access to edit their configuration.

2.3.5 Sign Controllers

Expand for a snapshot of all signs and quick access to edit their configuration.

2.3.6 Traffic Controllers

Expand for a list of all traffic Controllers in the system. Colored dots to the left of the con-troller name indicate the operational status of the intersection.

Right-click on the desired Controller to open the Controller Sub-Context menu (detailed in the next section) which provides quick access to additional functions.

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2.4 CONTROLLER SUB-CONTEXT MENU

The Controller Sub-Context Menu displays a list of functions specific to the intersection of the selected device.

2.4.1 Traffic Controller Menu

1. To access the menu:

Device Explorer Menu > Traffic Controllers Dropdown Menu



Figure 2-19: Access the Controller Sub-Context Menu

- 2. Right-click on the desired Controller.
- 3. Once a Controller is selected the following options are available:



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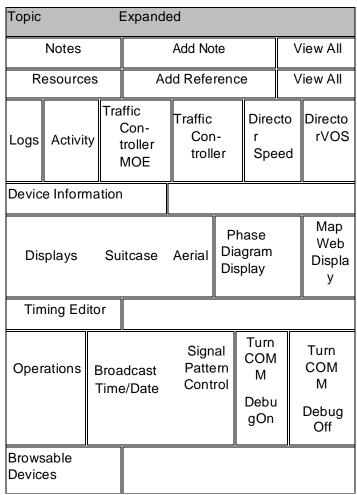


Figure 2-20: Controller Sub-Context Menu

2.4 Editing Selected Traffic Controller from Sub-Context Menu

- 1. Select Home > Devices > Device List.
- 2. Expand + Traffic Controllers group.
- 3. Select the expansion arrow on the right side of a Traffic Controller name (See expansion arrow in graphic) to launch the Traffic Controller's Sub-Context Menu.
- 4. Select the Edit (Selected) Traffic Controller in the Sub-Context Menu.

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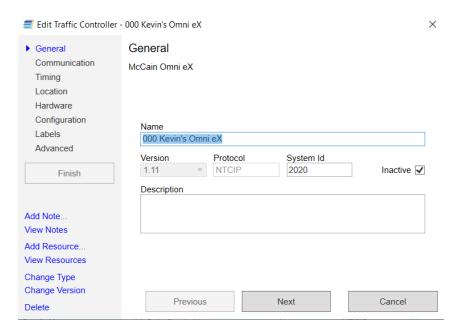


Figure 2-21: Edit Selected Controller from Sub-Context Menu

2.4.1 General

Table 2-1: Create Traffic Controller - General

Name	Assign a Unique name identifying the traffic Controller
Version	- 1.4 or - 1.7
Protocol	NTCIP (non-selectable field)
System Id	The System Id assigned to the traffic Controller
Tru-Traffic Id	The Tru-Traffic Id assigned to the traffic Controller
Description	Non-mandatory description of the traffic Controller
Inactive	A check mark in this box will cause the traffic Controller to be created in an inactive state.

2.4.2 Communication

Table 2-2: Create Traffic Controller – Communication

Channel	Select the Traffic Controller Device type (i.e. McCain Omni eX).
	A unique number that identifies a serial card in a traffic Controller <i>Transparity</i> is communicating with.

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Area Number	A number that further refines the addressing information used by <i>Transparity</i> for communicating to a traffic Controller that communicates via a serial connection.
Area Address	A number that further refines the addressing information used by <i>Transparity</i> for communicating to a traffic Controller that communicates via a serial connection.
IP Address	The IP protocol address assigned to the traffic Controller
IP Port	PC port used to communicate with the IP protocol

2.4.3 Location

Table 2-3: Create Traffic Controller – Location

Latitude	The Latitude location of the traffic Controller
Longitude	The Longitude location of the traffic Controller
Main Street	The primary arterial
Cross Street	A cross street on a primary arterial

2.4.4 Hardware

Table 2-4: Create Traffic Controller – Hardware

Hardware Make	This is the name of the manufacturer that makes the traffic Controller
Reported Version	This is the Firmware version running on the traffic Controller
Hardware Model	This represents the hardware version for the traffic Controller
Cabinet Type	This represents the type of cabinet housing the traffic Controller

2.4.5 Configuration

Table 2-5: Create Traffic Controller – Configuration

Active Phases	The number of phases provisioned
Active Overlaps	The number of overlaps provisioned
Active Detectors	The number of detectors provisioned

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Active Patterns	The number of patterns provisioned
Active Schedules	The number of schedules provisioned
Active Splits	The number of splits provisioned
Active Time base Actions	The number of active time base actions provisioned

2.4.6 Labels

Table 2-6: Create Traffic Controller – Labels

Detector	This interface is used to assign label names to detectors. (1 through 32)		
	This interface is used to assign predefined label names to phases. (1 through 8)		
	- NB/L		
	- NB		
	- NB/R		
	- EB/L		
Phase	- EB		
	- EB/R		
	- SB/L		
	- SB		
	- SB/R		
	- WB/L		
	- WB		
	WB/R		
	This interface is used to assign new or predefined label names to preempts. (1 through 9)		
	Predefined names:		
	- EV-A		
	- EV-B		
	- EV-C		
Preempt	- EV-D		
	- RR-1		
	- RR-2		

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- SE-1
- SE-2
- RR-3

2.4.7 Advanced

Table 2-7: Create Traffic Controller - Advanced

Poll Interval	This interface is used to assign a predefined poll interval. Poll intervals available for selection are:
	- 1 second
	- 2 seconds
	- 3 seconds
	- 5 seconds
	- 10 seconds
	- 15 seconds
	- 30 seconds
	- 60 seconds
Transit	This interface is used to check a box that states:
Logs	- Has Transit Logs

2.5 LOGGING OFF

2.5.1 End the *Transparity* session

a. Click the **Settings** icon.

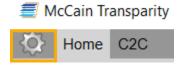


Figure 2-22: Settings Icon

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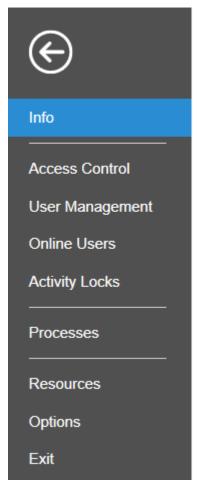


Figure 2-23: Exit the Session

b. Click Exit.



3. Manage Device and Connections

This section provides an overview of:

- "Create a Communications Channel:" below.
- "Create a Traffic Controller" on page 45.
- "Create a Control Group" on page 73.
- "Browsable Devices" on page 59.
- "Create a Detector" on page 62.
- "System Links" on page 69.

3.1 COMMUNICATION CHANNELS

Transparity TMS uses communication channels to represent physical channels and allow for custom latency toleration settings. Polling is accomplished by each virtual channel independently of each other, and it is recommended to keep the number of Controllers assigned to any one UDP channel low.

3.1.1 Create a Communications Channel:

Select Communications > Channels > Create Channel.

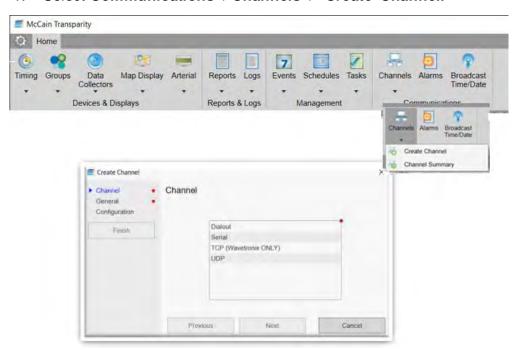


Figure 3-1: Create Communications Channel

Complete the fields in Channel Properties (see table "Channel Properties" below).



3. Click Save once all required fields are completed.

3.1.2 Channel Properties

Table 3-1: Channel Properties

Name	Insert a descriptive name for the channel	
First Byte Time	The amount of time in milliseconds that the field communications processor will allow for messages to be sent back and forth from field devices. Increasing this value will increase the amount of time for messages to be sent across and can be useful in low bandwidth or poor communication environments (1200 baud, outdate copper, etc.).	
	This is generally left at default for UDP communications.	
Baud Rate	The rate of bits per second being sent when utilizing a serial connection. This ranges from 1200 to 115,200 baud and must match the setting at the Controller.	
Stop Bits	This value determines the number of bits sent to end a message when Serial is selected. Typically left at 1.	
Туре	Serial will show all available COM (communications) ports attached to the computer. For UDP this box becomes an open value field where the input can be any number from 8001 to 9999. This number specifies the UDP port that will be utilized to communicate with field devices.	
Parity	When Serial is selected as the Type, the user has the option of odd, even, or none in the Parity field. A parity bit, or check bit is a bit added to the end of a string of binary code that indicates whether the number of bits in the string with the value one is even or odd. Parity bits are used as the simplest form of error detecting code.	

3.1.3 View Channel Summary

1. To view a channel summary, select **Channel > Channel Summary.**



Figure 3-2: Create Communications Channel

- 2. A channel window will open in the main workspace.
- 3. Double-click on the desired channel row to open the **Edit Channel** function.



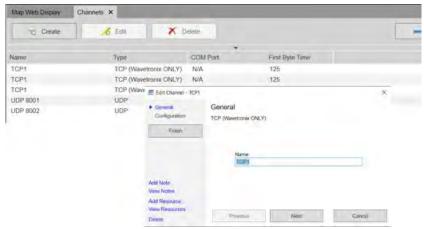


Figure 3-3: Edit Channel

4. Click on the Show Detail button to open the box containing the channel detail.

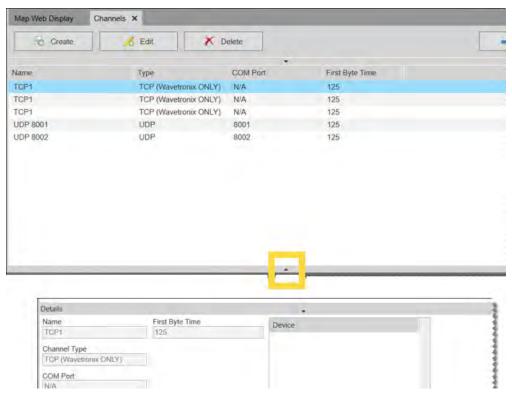


Figure 3-4: Viewing Channel Details

It is possible to drag and drop columns to reorder them in every **Summary** list view. It is also possible to hide and show columns. An action shot of drag/drop column reordering is shown below.



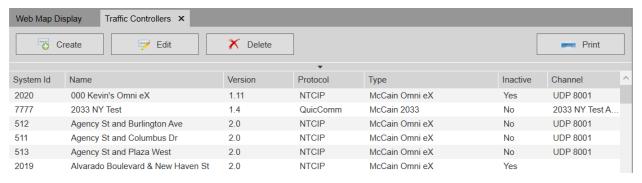


Figure 3-5: Example of Column Reordering

Right clicking on any column in the header gives you a content menu with all possible columns. The ones with a checkbox mean they are already visible. In this way, you can hide and show columns in a list.

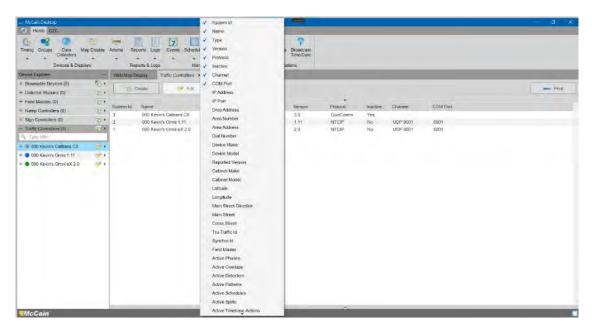


Figure 3-6: Hiding/Showing Columns

3.2 TRAFFIC CONTROLLERS

3.2.1 Create a Traffic Controller

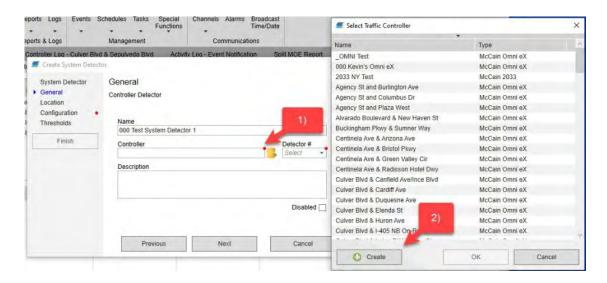
Local Controllers are the heart of every traffic management system. The local Controllerimplements core functionality including intersection timing, coordination, and preemption. Configuring Controllers in *Transparity TMS* allows them to be remotely controlled, viewed, and accessed via the central system.

Transparity has an additional feature which allows you to create new items in item selectors if what you want doesn't exist. For example, you may want to create a Traffic Controller and add it to a channel, but that channel doesn't exist, or perhaps you want it on its own dedicated channel. When you open the item selector to select the channel, there is a **Create** button that allows you to do it on the fly. There are many item selectors in the system, on Detectors, Ramp Controllers, and Field



Masters. Almost anything that can be associated with another object will have this same functionality.

For example, when you create a System Detector you must associate it to a TrafficController. On its item selector, you have the ability to Create a new Traffic Controller right there.



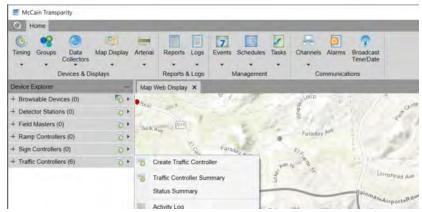


Figure 3-7: Create Traffic Controller

- 1. Select **Device Explorer > Traffic Controllers > Create Traffic Controller.**
- 2. Complete the Traffic Controller Properties using the table shown below:



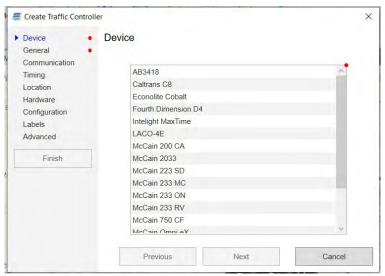


Figure 3-8: Complete Traffic Controller Properties

- 3. All fields with a red dot require completion.
- 4. Click Finish.



NOTE: Users may easily return and update these fields later.

3.2.2 Traffic Controller Properties

3.2.2.1 Device

Device Name	Select the Traffic Controller Device type (i.e. McCain Omni eX)

3.2.2.2 General

Table 3-2: Create Traffic Controller - General

Version	 1.4 or 1.7 NOTE: Versions are sub-functions of Controller type and options change based on type selection.
Protocol	NTCIP (non-selectable field)
System Id	The System Id assigned to the traffic Controller
Tru-Traffic Id	The Tru-Traffic Id assigned to the traffic Controller
Description	Non-mandatory description of the traffic Controller



Inactivo	A check mark in this box will cause the traffic Controller to be created in aninactive state. No communication will be attempted to the device while inactive
----------	---

3.2.2.3 Communication

Table 3-3: Create Traffic Controller - Communication

Channel	Select a channel to communicate to this device.
Drop Address	A unique number that identifies a serial card in a traffic Controller that Transparity is communicating with.
Area Number	A number that further refines the addressing information used by Transparityfor communicating to a traffic Controller that communicates via a serial connection
Area Address	A number that further refines the addressing information used by Transparity for communicating to a traffic Controller that communicates via a serial connection.
IP Address	The IP protocol address assigned to the traffic Controller
IP Port	PC port used to communicate with the IP protocol

3.2.2.4 Location

Table 3-4: Create Traffic Controller - Location

Latitude	The Latitude location of the traffic Controller
Longitude	The Longitude location of the traffic Controller
Main Street	The primary arterial
Cross Street	A cross street on a primary arterial

3.2.2.5 **Hardware**

Table 3-5: Create Traffic Controller – Hardware

Hardware Make	This is the name of the manufacturer that makes the traffic Controller
Reported Version	This is the Firmware version running on the traffic Controller
Hardware Model	This represents the hardware version for the traffic Controller
Cabinet Type	This represents the type of cabinet housing the traffic Controller



3.2.2.6 Configuration

Table 3-6: Create Traffic Controller – Configuration

Active Phases	The number of phases provisioned
Active Overlaps	The number of overlaps provisioned
Active Detectors	The number of detectors provisioned
Active Patterns	The number of patterns provisioned
Active Schedules	The number of schedules provisioned
Active Splits	The number of splits provisioned
Active Time base Actions	The number of active time base actions provisioned

3.2.2.7 Labels

Table 3-7: Create Traffic Controller – Labels

Detector	This interface is used to assign label names to detectors. (1 through 32)
	This interface is used to assign predefined label names to overlaps. (1 through 8)
	• NB/L
	• NB
	• NB/R
O vordon	• EB/L
Overlap	• EB
	• EB/R
	• SB/L
	• SB
	• SB/R
	• WB/L
Phase	This interface is used to assign predefined label names to phases. (1 through 8)
	• NB/L
	• NB
	• NB/R
	• EB/L



	• EB
	• EB/R
	• SB/L
	• SB
	• SB/R
	• WB/L
	• WB
	• WB/R
	This interface is used to assign new or predefined label names to preempts. (1 through 9) Predefined names:
	• EV-A
Preempt	• EV-B
·	• EV-C
	• EV-D
	• RR-1
	• RR-2
	• SE-1
	• SE-2
	• RR-3

3.2.2.8 **Advanced**

Table 3-8: Create Traffic Controller

	This interface is used to assign a predefined poll interval. Poll intervals available for selection are:
	• 1 second
	• 2 seconds
	• 3 seconds
Poll Interval	• 5 seconds
	• 10 seconds
	• 15 seconds
	• 30 seconds
	• 60 seconds



Transit Logs	This interface is used to check a box that states:
	Has Transit Logs

3.2.3 Edit a Traffic Controller

- 1. To edit a traffic Controller, select **Device Explorer > Traffic Controllers.**
- 2. Click the **Edit Traffic Controller** button.
- The Edit Traffic Controller Properties window will open allowing the user to make changes to any of the Controller settings.
- 4. The ability to migrate timing between Omni versions is triggered by **Change Version** in the Controller's edit page. So, if you are upgrading from Omni 1.11 to Omni 2.0, you Change Version and the backend will upgrade the timing conversions to add the new items for Omni 2.0 timing.

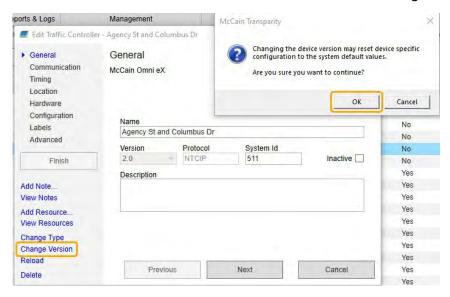


Figure 3-9: Change Device Version



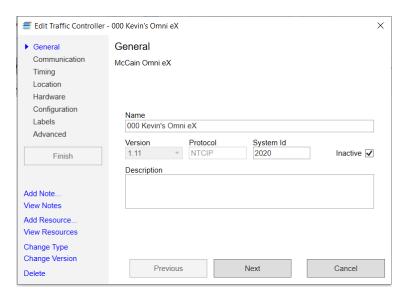


Figure 3-10: Edit Traffic Controller

1. Click **Save** once changes have been made.

3.2.4 Delete a Traffic Controller

- 1. Select Device Explorer > Traffic Controllers.
- 2. Click the **Edit Traffic Controller** button.
- 3. Click Delete.
- 4. Click **Yes** to proceed with the deletion.

3.2.5 Create a Phase Diagram Display

Use the **Phase Diagram Display** to create a visual representation of the phase sequencing and directionality per intersection. This visualization can also be included in Aerial Displays or on the first page of the printed timing sheets for a McCain *Omni eX* traffic control program. Some elements of configuration will be familiar to a user who has created Aerial Displays in *Transparity TMS*.

- 1. Open the Phase Diagram Display: **Display > Phase Diagram Display.**
- 2. Navigate to the context menu for a traffic Controller to create, view, or edit.





Figure 3-11: Phase Diagram Display on a Traffic Controller

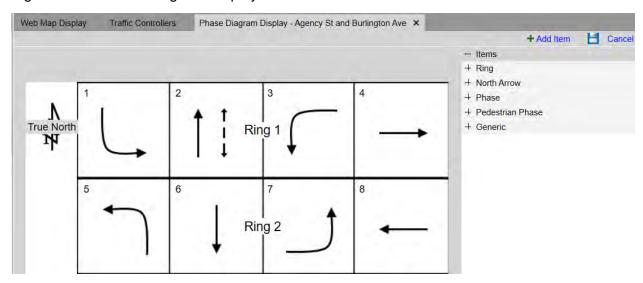


Figure 3-12: Phase Diagram Display

The default display will issue a standard eight phase, two ring, lead-lead sequence diagram.

Users can edit each of the elements of the display including: Rings, North Arrow, Phase Movement, Pedestrian Movement, and Generic customizable labels.

3.2.6 Traffic Controller Summary

The **Traffic Controller Summary** provides users with a list of previously configured Traffic Controllers where users can quickly review the properties of the Traffic Controllers, sort and filter the list, or Create, Edit, and Delete Traffic Controllers.

3.2.7 Traffic Controller Status Summary

The **Traffic Controller Status Summary** updates each minute and displays the real-timevalue of Traffic Controller in the list.



3.3 FIELD MASTERS

3.3.1 Create a Field Master

A **Field Master** has one or more Traffic Controllers connected to it. Each traffic Controller connected to a field master uses it for all of communications with *Transparity TMS*.

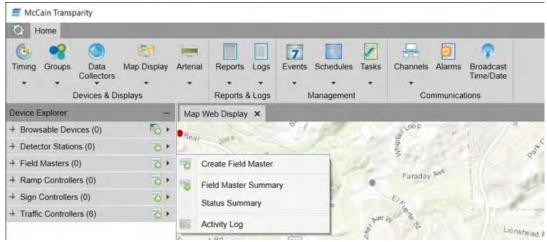


Figure 3-13: Create a Field Master

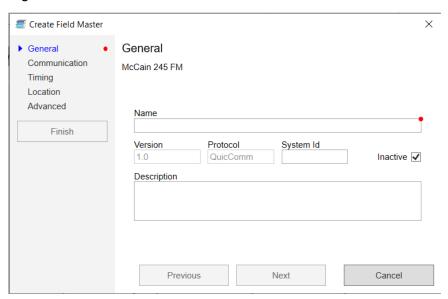


Figure 3-14: Create a Field Master 2

- 1. Select: Device Explorer > Field Master > Create Field Master.
- Complete the Field Master Properties using the table at Create a Field Master above.
- 3. Click Finish after completion.



3.3.2 Field Master Properties

3.3.2.1 **General**

Table 3-9: Create Field Master - General

Name	Populate the Type field with McCain 245FM
Version	Hardware make, model, firmware version and cabinet type (selectable from a dropdown list).
	Channel, IP information, and area fields for serial device communications.
	Select a channel by clicking on the file folder button
	Be sure the IP address matches the IP address of the Controller in the field
Protocol	Select the appropriate Field Master to populate the Field Master field
	Populate Dial Number field if a Field Master's connection will be via analog Check the box titled: "Use PBX Dial out Access Code" followed by thecode access number if dialing out through a PBX is necessary (via modem)
System Id	Latitude and longitude of the traffic Controller, which ensures the device will appear on the system map. You may also add the device's street location.
Description	Configuration settings vary depending on the type of Controller. buttons are greyed out if they are not applicable to the selected device type
Inactive	A check mark in this box will cause the traffic Controller to be created in an inactive state. No communication will be attempted to the device while inactive

3.3.2.2 Communication

Table 3-10: Create Field Master – Communication

Channel	Select a channel to communicate to this device.
Drop Address	A unique number that identifies a serial card in a traffic Controller <i>Transparity</i> is communicating with.
Area Number	A number that further refines the addressing information used by <i>Transparity</i> for communicating to a traffic Controller that communicates via a serial connection.
Area Address	A number that further refines the addressing information used by <i>Transparity</i> for communicating to a traffic Controller that communicates via a serial connection.
IP Address	The IP protocol address assigned to the traffic Controller. This is only necessary when Channel type is UDP.



IP Port	PC port used to communicate with the IP protocol
ir Foit	PC port used to communicate with the IP protocol

3.3.2.3 Location

Table 3-11: Create Field Master - Location

Latitude	Populate the Type field with McCain 245FM
Longitude	Hardware make, model, firmware version and cabinet type (selectable from a dropdown list).
Main Street	 Channel, IP information, and area fields for serial device communications. Select a channel by clicking on the file folder button Be sure the IP address matches the IP address of the Controller in the field Select the appropriate Field Master to populate the Field Master field Populate Dial Number field if a Field Master's connection will be via analog. Check the box titled: "Use PBX Dial out Access Code" followed by the access code number if dialing out through a PBX is necessary (via modem)
Cross Street	Latitude and longitude of the traffic Controller, which ensures the device will appear on the system map. You may also add the device's street location.

3.3.2.4 **Hardware**

Table 3-12: Create Field Master - Hardware

Hardware Make	Populate the Type field with McCain 245FM
Reported Version	Hardware make, model, firmware version and cabinet type (selectable from a dropdown list).
	Channel, IP information, and area fields for serial device communications. •Select a channel by clicking on the file folder button
	Be sure the IP address matches the IP address of the Controller in thefield
Hardware Model	 Select the appropriate Field Master to populate the Field Master field
	 Populate Dial Number field if a Field Master's connection will be via analog Check the box titled: "Use PBX Dial out Access Code" followedby the access code number if dialing out through a PBX is necessary (via modem)
Cabinet Type	Latitude and longitude of the traffic Controller, which ensures the device will appear on the system map. You may also add the device's street location.



3.3.3 Field Master Summary

The **Field Master Summary** provides users with a list of previously configured Field Masters where users can quickly review the properties of the Field Master, sort and filter the list, or Create, Edit, and Delete Field Masters.

3.3.4 Field Master Status Summary

The **Field Master Status Summary** updates each minute and displays the real-time value of Field Masters in the list.

3.4 DETECTOR STATIONS

Detector volume, occupancy, and speed (VOS) data is traditionally collected from the detector objects of local Controller software (i.e. Controller system detectors); however, many municipalities collect traffic data from systems disjointed from the traffic Controller inputs.

In order to collect VOS data from an external device or system, the user must first configure a **detector station**. The detector station represents the device that is collecting VOS data from zones or lanes. Upon configuration of the detector station, users can create system detectors affiliated with the detector station in order to discriminate the data collected by the detector station into zones or lanes.

Transparity TMS natively communicates with the Wavetronix SmartSensor HD detector station. It can also integrate with Sensys Networks' SNAPS servers for collection of detector data.

3.4.1 Create a Wavetronics SmartSensor HD

- Select: Device Explorer > Detector Stations > Device List > Create Detector Station.
- 2. Click the **Add** button on the Detector Stations menu.



Figure 3-15: Create a Detector Station

 Select Wavetronics SmartSensor HD on the device page of the configuration wizard.



2. Complete the **Detector Station Properties** at Step "Wavetronix SmartSensor HD Properties" on the next page. All fields with red dots require completion.

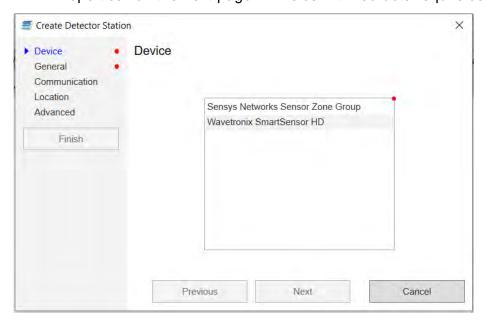


Figure 3-16: Complete Detector Properties

3. Click Finish once all the required fields are completed.

3.4.2 Wavetronix SmartSensor HD Properties

3.4.2.1 **General**

Table 3-13: Detector Properties - General

Name	Enter the Detector Station Name
Description	Additional space to bolster the name of the Browsable Device
Inactive	Disable collection from this detector station

3.4.2.2 Communication

Table 3-14: Detector Properties - Communication

Channel	Select a channel to communicate to this device
Subnet	The WaveTronix SmartSensor HD subnet
Station Id	The WaveTronix SmartSensor HD identifier
IP Address	The IP protocol address assigned to the traffic Controller
IP Port	PC port used to communicate with the IP protocol



3.4.2.3 Location

Table 3-15: Detector Properties - Location

Latitude	The Latitudinal location of the Browsable Device.
Longitude	The Longitudinal location of the Browsable Device.
Main Street	The primary arterial.
Cross Street	The cross street on a primary arterial.

3.5 Browsable Devices

Browsable Devices are device types that provide users with functionality via the browserinterface of the device. With Browsable Devices the user can launch displays for: general webpages, CCTV Cameras, RTSP Streams, Video Detection Cameras, and Conflict Monitors.

3.5.1 Browsable Device Properties

Table 3-16: Browsable Device Properties

Name	Enter the Browsable Device Name.
Туре	 General Device IP Camera ECcom device Iteris VRIS Device
Description	Additional space to bolster the name of the Browsable Device
Associated Device	The Browsable Device will appear in popup menus for that traffic Controller if you select a traffic Controller in the Associated Controller field.
Latitude	The Latitudinal location of the Browsable Device.
Longitude	The Longitudinal location of the Browsable Device.
Address	The address where the Browsable Device is located
Browse to Device	button that allows the user to Browse to the Device

3.5.2 Create a Browsable Device - General Device

1. Select: Devices Explorer > Browsable Devices > Create Browsable Device.



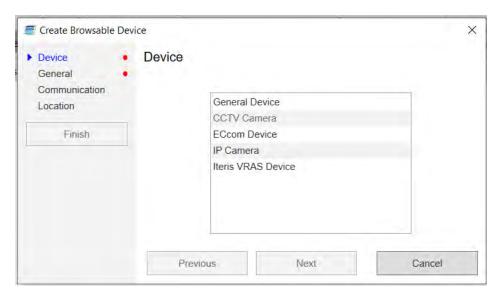


Figure 3-17: Create Browsable Device

- 2. Select General Device.
- 3. Click Next.
- 4. Provide a common Name for the device or webpage or associate the device/webpage with a Traffic Controller, and optionally provide a Description.
- 5. Click Next.
- 6. Specify the Address (i.e. URL of the webpage).
- 7. Specify the **Latitude** and **Longitude** for inclusion of the device on the system map. (Main Street / Cross Street are optional text fields).
- 8. Click Finish.

3.5.3 Create a Browsable Device - CCTV Camera

- 1. Select CCTV Camera.
- 2. Click Next.
 - a. If the Video Management System properties have not been configured in:

Options > External Systems > Video Management System, then the CCTV Camera option will be greyed out.

- 3. Define the Name and Description of the Camera (i.e. Main St. @ 3^{rd.} Ave WB).
- 4. Choose an Associated traffic Controller (optional).
- 5. Select the appropriate camera from the **Camera** dropdown menu.



- a. Confirm that the camera has been discovered by the Video Management System if the camera of interest does not appear in the list.
- b. Select a camera from the list (the IP of the camera can be confirmed via the Camera Information once selected).
- 6. Specify the **Latitude** and **Longitude** for inclusion of the device on the system map (Main Street / Cross Street are optional text fields).
- 7. Click Finish.

3.5.4 Create a Browsable Device - ECcom Device

- 1. Select ECcom Device.
- 2. Click Next.
- 3. Provide a common **Name** for the device or webpage or associate the device/webpage with a Traffic Controller, and optionally provide a Description.
- 4. Click Next.
- 5. Specify the **IP Address** of the Conflict Monitor.
- 6. Specify the **Latitude** and **Longitude** for inclusion of the device on the system map (Main Street / Cross Street are optional text fields).
- 7. Click Finish.

3.5.5 Create a Browsable Device – IP Camera

- 1. Select IP Camera.
- 2. Click Next.
- 3. Provide a common **Name** for the device or webpage or associate the device/webpage with a Traffic Controller, and optionally provide a Description.
- 4. Click Next.
- 5. Specify the RTSP URL of the IP Camera.
- 6. Specify the **Latitude** and **Longitude** for inclusion of the device on the system map (Main Street / Cross Street are optional text fields).
- 7. Click Finish.

3.5.6 Create a Browsable Device – Iteris VRAS Device

1. Select Iteris VRAS Device.



- 2. Click Next.
- 3. Provide a common **Name** for the device or webpage or associate the device/webpage with a Traffic Controller, and optionally provide a Description.
- 4. Click Next.
- 5. Specify the IP Address and IP Port of the Video Detection Processor.
- 6. Specify the **Latitude** and **Longitude** for inclusion of the device on the system map (Main Street / Cross Street are optional text fields).
- 7. Click Finish.

3.6 DETECTORS AND SPEED TRAPS

Transparity TMS allows users to collect traffic data from both detectors and speed traps. A detector or sensor is typically a single point or zone that is monitored by one of many methods, from inductive loop, video, ultrasonics, or collecting traffic data. A speed trap is typically two detectors used in concert to collect more accurate speed readings than a single detector can provide.

3.6.1 Create a Detector

Before proceeding, ensure the following has been completed, as required:

- "Create a Traffic Controller" on page 45.
- "Create a Detector " on page 62.

Configuring detectors enables the system to collect data such as speed, occupancy, and volume. Collected data can then be used for the following:

- Traffic responsive coordination.
- Adaptive coordination.
- Congestion level monitoring.
- 1. Select: Device Explorer > Detector Stations.



Figure 3-18: Create a Detector

Complete the **Detector Properties** (see "Detector Properties" below). All fields with red dots require completion.



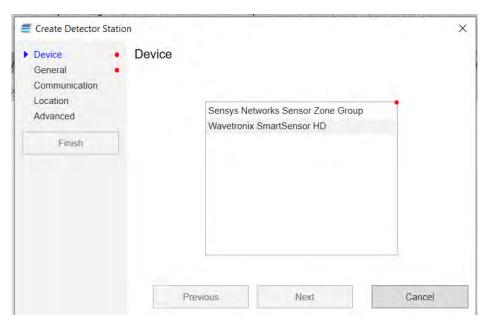


Figure 3-19: Complete Detector Properties

3. Click Finish once all the required fields are complete.

3.6.2 Detector Properties

Table 3-17: Detector Properties

Name	A method to identify a detector and potentially what intersection and lane it resides in.
Туре	Select the type of detector. Controller Detector – Detectors that support traffic Controllers
Description	The description can be used to augment existing descriptor-type fields suchas "Detector Name" and "Controller Name."
Controller	Pairs the detector with a traffic Controller. The detector and traffic Controller selected are usually found at the same intersection and share a parent/childrelationship whereby the detector is the child.
Detector	Select a detector number from a dropdown list. The number of detectors maybe dependent on the type of Controller you selected
Disabled	Checking this box prevents the system from polling the Controller or device for VOS data. A disabled detector is used for reference in SPM reports.



	This area contains general configuration information for the new detector.
	Information includes:
	Movement - The selectable type of movement through a lane.
	o Right - for right turn movement
	Left - for left turn movement
	 Through – for through movement
General	Direction – Dropdown used to designate the direction of the traffic flow in the lane the detector is located in. (i.e. north, southwest, east, etc.)
	 Detector Type – Dropdown allowing the user to select the type of detector (i.e. inductive-loop, video-image, etc.).
	Vehicle Length - Default Value=17 (feet)
	Loop Length - Default value = 6 (feet)
	Threshold This area contains high and low limit thresholds for volume (vph),occupancy (%) and Speed (mph)
	 Volume (vph) - Volume threshold boundaries
	High Limit = 2000 (Default Value)
	Low Limit = 0 (Default Value)
Threshold	Occupancy (%) - Occupancy (%) threshold boundarieso High Limit = 100 (Default Value)
	Low Limit = 0 (Default Value)
	Speed (mph) - Speed threshold boundaries
	High Limit = 150 (Default Value)
	Low Limit = 0 (Default Value)

3.7 CREATE A SPEED TRAP

In conjunction with McCain $Omni\ eX^{\otimes}$ traffic Controller software, $Transparity\ TMS$ uniquely collects real-time speed from the NTCIP speed traps.

3.7.1 Configure a Speed Trap

Configuring speed traps enables the system to collect real-time speed data from the traffic Controller software. This data can be visualized in reports and utilized as a link data source for speed.

1. Select: Data Collectors > Create Speed Trap.



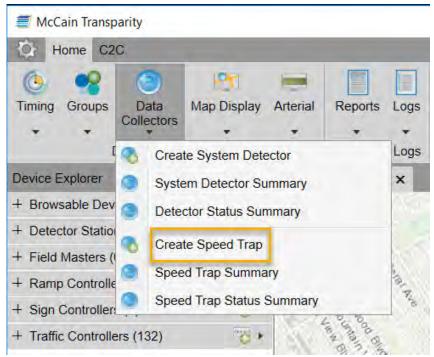


Figure 3-20: Create Speed Trap

- 2. Provide the general information necessary to identify the speed trap and collect data:
 - a. Provide a common **Name** for the Speed Trap (i.e. Approach Intersection and Lane Number).
 - b. Select the **Controller** from which the Speed Trap data will be collected.
 - c. Select the **Speed Trap number** that corresponds with the Speed Trap number of the Controller.
 - d. Provide additional descriptive information about the location and configuration of the Speed Trap in the **Description** field (optional).



e. Ensure the **Disabled** checkbox is empty to guarantee the system will collect real-time data.

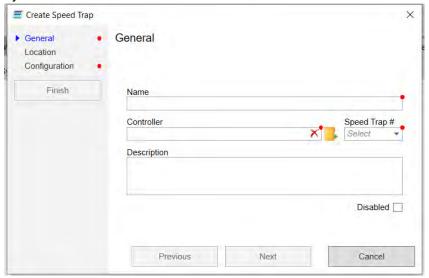


Figure 3-21: Create Speed Trap

- f. Click Next.
- 3. Provide the location properties of the Speed Trap:
 - a. Enter the Latitude.
 - b. Enter the Longitude.
 - c. Click Next.

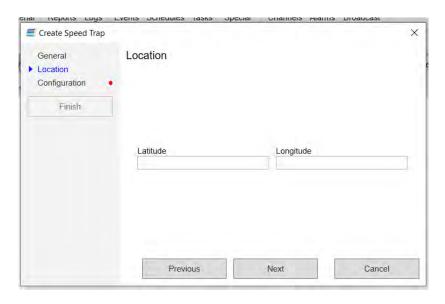


Figure 3-22: Enter Latitude and Longitude of Speed Trap



- Provide essential configuration data. This information is critical from identification of the Speed Trap in reports and data sharing between systems.
 - a. Select the appropriate Movement.
 - b. Select the appropriate **Direction**.
 - c. Choose a **Sensor Type** from the dropdown list.
 - d. Identify the Lane Number of the Speed Trap.

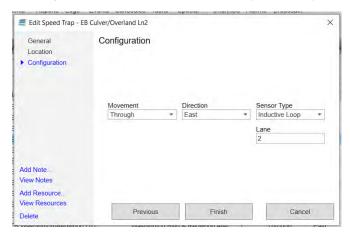


Figure 3-23: Identify Lane Number of Speed Trap

e. Click Finish.

3.7.2 Edit a Speed Trap

1. Select: Data Collectors > Speed Trap Summary.

Configured Speed Traps can be reviewed within the Speed Trap Summary.

- 2. Edit an existing Speed Trap:
 - a. Select the subject **Speed Trap** from the Speed Trap Summary.
 - b. Click the **Edit** button.

OR

- a. Right Click the subject Speed Trap.
- b. Select Edit.

3.7.3 Delete a Speed Trap

1. Select: **Data Collectors > Speed Trap Summary.**

Configured Speed Traps can be reviewed within the Speed Trap Summary.

2. Delete an existing Speed Trap:



- a. Select the subject **Speed Trap** from the Speed Trap Summary.
- b. Click the **Delete** button.

OR

- a. Right Click the subject Speed Trap.
- b. Select **Delete**.
- c. Select Yes to confirm the deletion.

3.7.4 Speed Trap Properties

TABLE 3-18: Speed Trap Properties

Name	A method to identify the speed trap location (i.e. Approach Intersection and Lane Number).
Controller	Pairs the detector with a traffic Controller. The detector and traffic Controller selected are usually found at the same intersection and share a parent/child relationship whereby the detector is the child.
Speed Trap#	This value shall match the corresponding Speed Trap # of the traffic Controller software (which collects and distributes the real-time speed).
Description	The description can be used to augment existing descriptor-type fields such as "Detector Name" and "Controller Name."
Disabled	When selected, <i>Transparity TMS</i> will not actively collect real-time data from the subject Speed Trap.
Latitude	Latitude location of the Speed Trap.
Longitude	Longitude location of the Speed Trap.
Movement	Use to identify the movement of the lane where the Speed Trap is located.
Direction	Use to identify the cardinal direction of the Speed Trap movement.
Sensor Type	Provides informative information regarding the underlying detection technology of the Speed Trap.
Lane Number	Identifies the lane number where the Speed Trap is located.

3.7.5 Speed Trap Summary

The **Speed Trap Summary** provides users with a list of previously configured SpeedTraps where users can quickly review the properties of the Speed Traps, sort and filter the list, or Create, Edit, and Delete Speed Traps.

3.7.6 Speed Trap Status Summary

Status summaries are additional UI views, such as lists with multiple columns in which the columns are all defaulted to status data.



The **Speed Trap Status Summary** updates each minute and displays the real-time value of Speed Trap in the list.

3.7.7 Speed Trap Report

The **Speed Trap Report** enables the user to graphically visualize the speed data of one or more Speed Traps over a user-specified time.

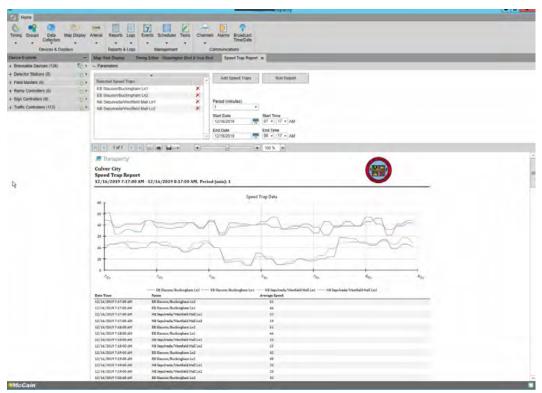


Figure 3-24: Speed Trap Report

3.8 SYSTEM LINKS



NOTE: Before proceeding, ensure the following has been completed: "Create a Detector" on page 62.

The creation of a system link captures all the necessary configuration data for a link that connects one inbound or outbound intersection with another.



3.8.1 Create a System Link

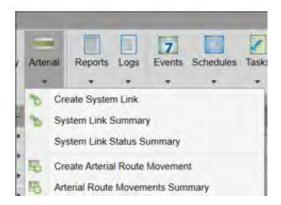


Figure 3-25: Create a System Link

1. Select: Devices & Displays > Arterial > Create System Link.

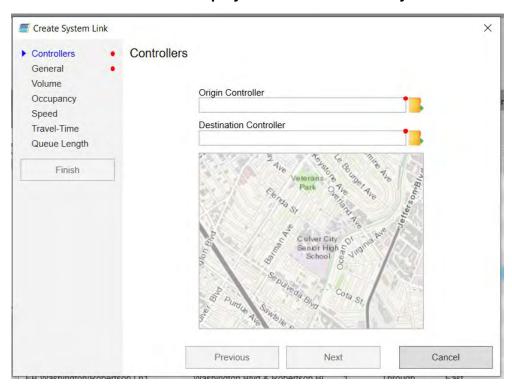


Figure 3-26: Create a System Link 2

- 2. Complete the **System Link Properties** (see table below).
- 3. Click Finish once all required fields have been completed.



3.8.2 Controllers

Table 3-18: Create a System Link - Controllers

	The first traffic Controller assigned to a new link. It may connect to the destination Controller of another link.
Il lactination ('ontrollar	The second traffic Controller assigned to a new link. It may connect to the origin Controller of another link.

3.8.3 General

Table 3-19: Create a System Link - General

Name	User can accept the default name provided which is created by Transparity by appending the origin Controller name to the destination Controller name.
System Id	This is the unique number assigned to each Traffic Controller added to Transparity.
Tru-Traffic Id	Unique Id assigned by the TruTraffic Offset software.
Movement	The movement of the Origin and Destination portions of a Link. Can be Through, Left, or Right.
Direction	The East, West, North, etc. direction of and arterial and the links that comprise it.
Length	The number of feet in a link, or the distance in feet between the end of the origin intersection and the beginning of the destination intersection.
Speed	The value allowed on a link. (I.e. 35 MPH).
Lanes	This is the unique number assigned to each Traffic Controller added to <i>Transparity.</i>
Capacity	The total platoon capacity that the link can support.

3.8.4 Congestion

Table 3-20: Create a System Link - Congestion

Speed Threshold	• Low-Medium (MPH)
	Medium-Heavy (MPH)
Occupancy Threshold	• Low-Medium (%)
	Medium-Heavy (%)
Volume Threshold	Low-Medium (VPH)
	Medium-Heavy (VPH)



3.8.5 Detectors

Table 3-21: Create a System Link – Detectors

Aveilable Detectors	A conclusive list of detectors managed by the CSS software. Selecting the "+" symbol results in the associated detector being added to the link being created.
Selected Detectors	Detectors that have been assigned to the link being created by moving them from the Available Detectors screen to the Selected Detectors screen.

3.8.6 System Link Summary

- 1. To view the System Link Summary: Home > Arterial > System Link Summary.
- 2. Right-click on a summary item, or selecting one of the summary buttons enables the following capabilities:
- Create a new System Link.
- Edit (Selected) System Link.
- Delete (Selected) System Link.
- Print the summary listing.
- 3. Use the **Filter** capability to search and isolate a particular profile (See expansion arrow in graphic below).
- 4. Select the **Print** button to print the summary listing.

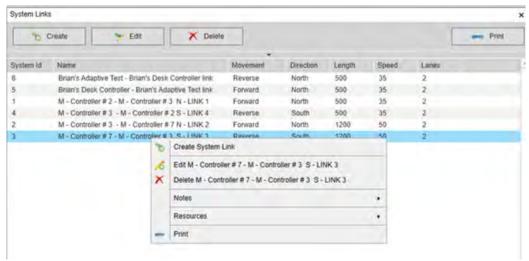


Figure 3-27: System Link Summary

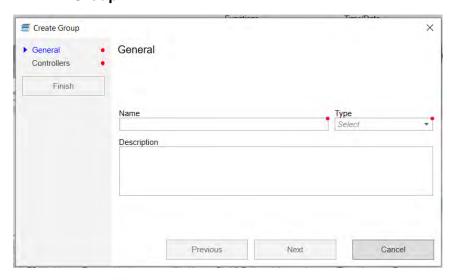


3.9 GROUPS

3.9.1 Create a Control Group

Creating a traffic **Control Group** allows users to create groups of traffic Controllers subject to a common set of controls versus being controlled individually. This is an important capability when it comes to trying to coordinate several intersections on an arterial, as an example.

1. To create a control group: **Devices & Displays > Groups > Create Control Group.**



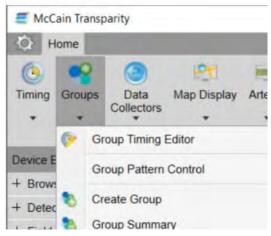


Figure 3-28: Create Control Group

- 1. Complete the **Group Properties** (Fields with a red dot require completion).
- 2. Create a Control Group General:



Table 3-22: Create a Control Group - General

Name	Select the Traffic Controller Device type (i.e. McCain Omni eX).
Туре	Four types of Control Groups can be created: - Coordination - Adaptive
	- Jurisdiction - Ramp Meter
Description	- A short description of the control group being created can be entered

3. Create a Control Group - Controllers:

Table 3-23: Create a Control Group - Controllers

Control Group	Select the Traffic Controller that will be included in the control group by selectingthe "+" symbol which moves them from the Available Controllers group to the Selected Controllers group.
Manual Override	Placing a check mark in the box next to Manual Override allows the user to manually override the current pattern running in a control group.

4. **Manual Override** – Check this box to ensure the control group is subject to manual override commands.

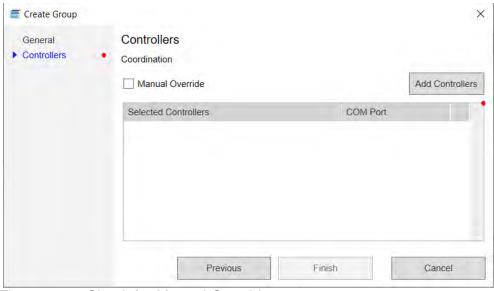


Figure 3-29: Check for Manual Override



5. Click **Add Controllers** to place additional Controllers in the group.

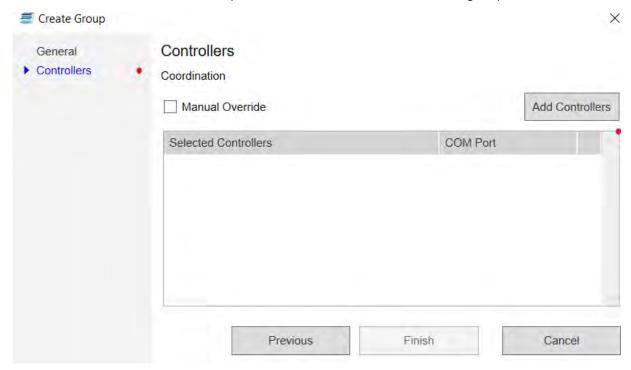


Figure 3-30: Add Controller Group

6. Click **Finish** to create the new Controller group.

3.9.2 View Group Summary

1. To view a list of all device groups, select: **Devices & Displays > Groups > Group Summary.**

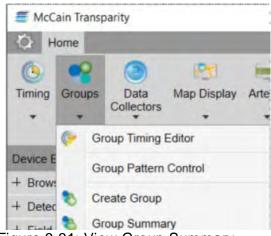


Figure 3-31: View Group Summary

2. All traffic Controller control groups are listed in order by name.



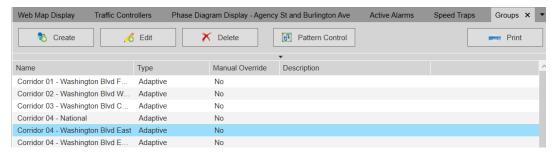


Figure 3-32: View All Control Groups

- a. The default view also showcases the name of the traffic Controller control group, a profile type (i.e. Responsive, Advanced Adaptive Pattern, Basic Adaptive Pattern), check box which indicates whether the group may be overridden and any available description.
- b. Right Click on a summary item.

OR

- a. Select one of the summary buttons to enable the following capabilities:
 - Create a Group.
 - Edit Group.
 - Delete Group.
 - Pattern Control (the current pattern running on a group).
- 3. Use the **Filter** to search and isolate a particular profile (See expansion arrow ingraphic below).
- 4. Select the **Print** button to print the summary listing

3.10 ARTERIAL ROUTE BUILDER

The creation of an **Arterial Route** captures all necessary configuration data for a route along an arterial that connects one intersection with another.



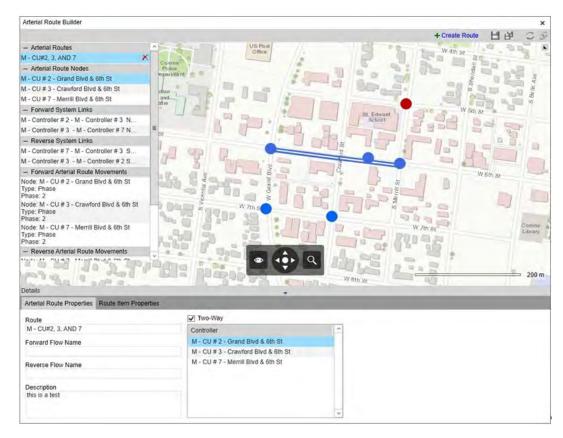


Figure 3-33: Build an Arterial Route

3.10.1 Create an Arterial Route

1. Select: Devices & Displays > Arterial > Arterial Route Builder.

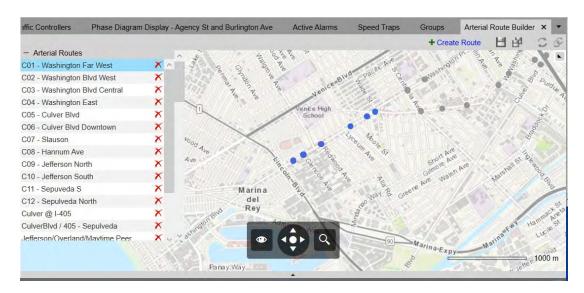


Figure 3-34: Create an Arterial Route



2. Right click on the Arterial Route pane to initiate a context menu to create, delete, save, or discard arterial routes. (See "Arterial Route Map Display Mini Map " on page 81.



Figure 3-35: Map Web Display

- 3. Use this pane to create a new Arterial Route by selecting an existing group of traffic Controllers in the Web Map Display pane along the route you wantto designate as an arterial route. This process will also result in populating the associated fields of the following Arterial Route Builder panes and tabs:
 - Arterial Route Nodes pane.
 - Forward System Links pane.
 - Forward Arterial Route Movements pane.
 - Arterial Route Properties tab.
 - Route Item Properties tab.



3.10.1.1 Arterial Route Builder Toolbar

The Arterial Route Builder Toolbar is in the top right-hand portion of the screen.

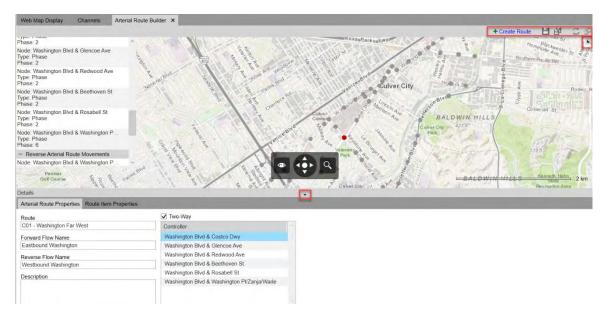
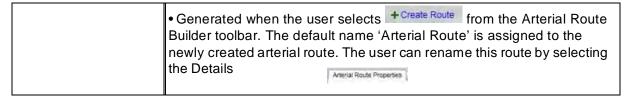


Figure 3-36: Arterial Route Builder Toolbar

Create Route	• +Create Route Create Route is used to create a new route in the Arterial Route expansion list	
Save Selected Route	Used to save a new route that has been created during the current sitting	
Save all Modified Routes	If the user has created multiple arterial routes in the current sitting, he/she can then use the 'Save all modified routes' icon	
Discard Selected Route		
Changes	This will result in selected route changes being discarded	
Discard All Route	This will result in all route changes being discarded	

3.10.2 Arterial Route Builder Properties

Table 3-24: Arterial Route Builder Properties





Arterial Route	'Arterial Route Properties' tab and modifying the default name
	'Arterial Route' located in the 'Route Name' field
	An Arterial Route that has been previously saved can be deleted by selecting the 'Delete Arterial Route' icon.
	 Each Node (Traffic Controller) in the selected Arterial Route appears in thisexpansion list.
	Selecting an Arterial Route Node (Traffic Controller) in this expansion list
Arterial Route Nodes	causes the related Node on the Arterial Route Builder Map Display to turn
Arterial Route Nodes	from blue to orange indicating where the node appears in the arterial route being viewed.
	This is the link that is forward of the origin node (Traffic Controller)
Forward System Links	Selecting a Forward System Link in this expansion list causes the relatedLink on the Arterial Route Builder Map Display to turn from blue to orange indicating where the link selected appears in the arterial route being viewed.
Forward Arterial Route Movements	Nodes in this list are used to enter a 'Phase' number to indicate the forward movement of the Arterial Route into the 'Movement Phase' field Movement Phase under 'Route Item Properties' Tab Route Item Properties' in the 'Details' pane at the bottom of the Arterial Route Builder screen • Selecting a Node (Traffic Con-troller) in this expansion list places a note on the Arterial Route Builder Map Display indicating the placement of a node (Traffic Controller), its type, and Phase Number.

3.10.3 Arterial Route Properties Tab

Table 3-25: Arterial Route Properties Tab

Route Name	The name assigned to the new Arterial Route.
Forward Flow Name	The name assigned to the primary flow direction.
Reverse Flow Name	The name assigned to the secondary flow direction.
Description	Text to augment the information provided by other Arterial Route Properties fields.
Two-Way	If a two-way arterial route a 'check mark' is placed into this box.
Controller	The names of the traffic Controllers that comprise the arterial route.



3.10.4 Route Item Properties Tab

Table 3-26: Route Item Properties Tab

	The link between the traffic Controller node name selected in the 'Forward Arterial Route Movements' group and the traffic Controller it is linked to in itsforward direction.
Destination Link	The link between the second to last traffic Controller (or destination Controller) and the last traffic Controller (or destination Controller).
Movement Type	Phase Overlap
Movement Phase	• 1 through 8

3.10.5 Arterial Route Map Display Mini Map

Table 3-27: Arterial Route Display - Mini Map

	Can set the viewable portion of the map by moving the rectangle in the middle of the map. Located in the upper right-hand corner of the Arterial Route Map Display.
	• Launched by left clicking on the expansion arrow located in the upper right
Mini Map	corner of the Arterial Route Map Display

3.10.6 Arterial Route Map Display Context Menu

Table 3-28: Arterial Route Map Display Context Menu

Create	Traffic Controller System Link	
Layers	Controls what is displayed on the Arterial Route Map Display. If selected and item will be displayed. Items selected are displayed by check marks next to the layer name like Examples are: Intersections Ramp Controllers Field Masters Browsable Devices System Links	



this location	This allows the user to left click on a location on the map and select a traffic Controller from the device list and have its LAT/LONG coordinates modified to reflect the point select.
Show Large Icons	Selecting and unselecting this value allows the user to show default- sized icons, or larger-sized icons.

3.10.6.1 Arterial Routes Summary

- 1. To view the Arterial Routes Summary: **Home > Arterial > Arterial Routes Summary.**
- 2. Right-click on a summary item, or selecting one of the summary buttons enables the following capabilities:
 - Create a new Arterial Route.
 - Edit (Selected) Arterial Route.
 - Delete (Selected) Arterial Route.
 - Launch Time-Space Diagram.
 - **Print** the Summary listing.
- 3. Use the **Filter** to search and isolate a particular profile (See expansion arrow ingraphic below).
- 4. Select the **Print** button to print the summary listing.

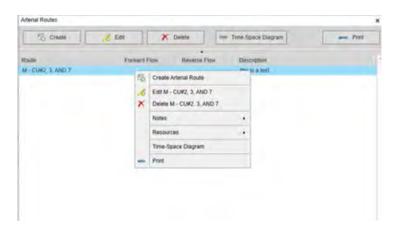


Figure 3-37: Arterial Routes Summary



4. REAL-TIME STATUS DISPLAY

This section provides an overview of real-time and graphical displays of the *Transparity* TMS user interface:

- "Map Web Display" below
- "Create a Map GIS Display" on page 89
- "Suitcase Display" on page 95
- "Aerial Display" on page 96
- "Cabinet Display" on page 103

4.1 MAP WEB DISPLAY

The *Transparity* **Map Web Display** allows users to easily view system devices and execute actions related to traffic Controllers, system links, field masters, browsable devices, and ramp Controllers.

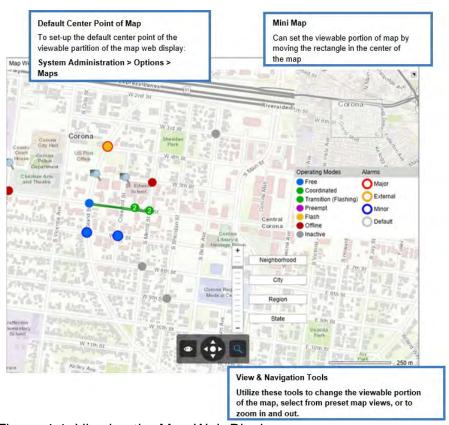


Figure 4-1: Viewing the Map Web Display

4.1.1 Quick Access for Map Web Display

Users may quickly access a variety of other control settings directly from the Map WebDisplay, including the following.



Table 4-1; Quick Access for Map Web Display

Access the Controller sub-context menu	Right-click on a traffic Controller.
Create a new traffic Controller	Right-click on the desired location on the map.
Create Traffic Controller	Will automatically populate the longitudeand latitude under traffic Controller properties.
Relocate a traffic Controller	Right-click on the new desired location on the map and select Relocate Controller to this Location.
Access the Map Web Display Context Menu	Right-click on the map a Map Web Display Context Menu will appear:
	Select Layers
	Select the following layers in the Map Web Display Context Menu to display a corresponding icon, or icons on the Map Webuntil they are unselected.
	Intersections
	Ramp Controllers
	Field Masters
	Browsable Devices
	System Links Create
	Select "Create" and one of the context items listed below to generate the add screen for the context item:
	Traffic Controller
	Ramp Controller
	Field Master
	Browsable Device
	System Link
	Select to makeShow Large Icons display larger than normal.

4.1.2 Configure Map Web Display

This overview describes how to generate and use the Map Web Display in the *Transparity TMS* software interface.



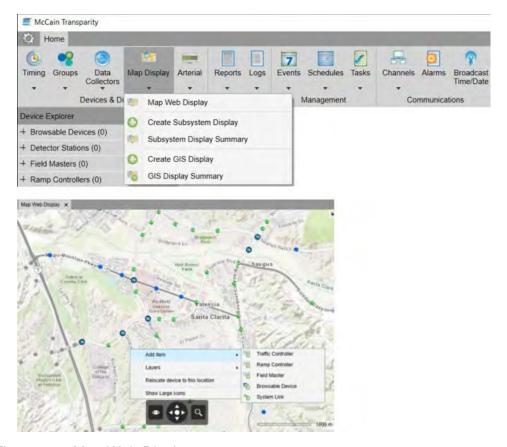


Figure 4-2: Map Web Display

4.1.2.1 Map Usage

- 1. Select: **Device Displays > Map Display > Map Web Display**.
 - a. The Map Web Display tab will appear in the primary workspace pane.
 - b. The Map Web Display provides the user with a graphical user interface to perform the following actions:
- 2. Create and Edit:
 - Traffic Controllers.
 - Ramp Controllers.
 - Field Masters.
 - Browsable Devices.
 - System Links.
 - 2. View Selected Map Layers (individually or ALL):
 - Intersections layer.
 - Ramp Controllers layer.



- Field Masters layer.
- Browsable Devices layer.
- System Links layer.
- 3. Relocate Devices:
 - Traffic Controllers.
 - Ramp Controllers.
 - Field Masters.
 - Browsable Devices.
- 4. Toggle between default and large icons.
- 5. Access a device's sub-context menu by right clicking on a device's icon.
- 6. Move the viewable area left, right, up, or down.
- 7. Select between one of the following pre-set views:
 - Topographic View (default).
 - Terrain Base View.
 - Road View.
 - Shaded Relief View.
 - Physical View.
 - Aerial View.
- 8. Zoom in or out on the map, or use one of the following pre-set zoom levels:
 - Region.
 - City.
 - Neighborhood.
- 9. Observe the LAT/LONG of the current position of the cursor.
- 10. Move the portion of the map currently being displayed by pulling it with the cursor, or by moving the rectangle in the high-level map displayed in the upper right-hand corner of the map currently being displayed.
- 11. View a key that displays the current zoom level of the map web display viewed in kilometers (km) or meters (m).
- 12. The Map Web Display in Product Information must be set by the user:
 - LAT / LONG.



- Default Zoom Level.
- Default Coordinate System.
- Shape File.

4.1.3 System Configuration for Maps

Set the default values that will be used each time the Map Web Display window is opened.

1. To set these default values: **Settings Icon > Options > Maps.**

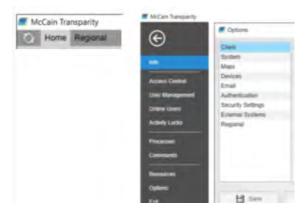


Figure 4-3: Map Configuration

- 2. Map Configuration.
- 3. Enter and Save the values that will remain consistent each time the Web Map Display screen is opened:
 - Latitude.
 - Longitude.
 - Default Zoom Level.
- 4. Shape File.



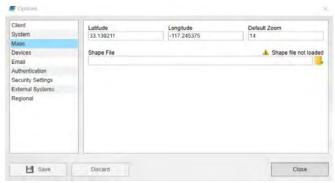


Figure 4-4: Configure Map Display

5. Click Finish.

4.1.4 Map Operational Status

When using the Map Web Display, different colored dots display based on the currentmode of the traffic Controller. Expand the black triangle in the corner of the map to show the status definitions.



Figure 4-5: Map Legend

Red	Offline – Active (not responding to polls)
Gray	Inactive (not polled)
Blue	Free mode
Green	Coordinated mode



 Pulsing Green 	Transition mode (Transition is the state when a Controller is moving from one coordinated pattern to another, or from free operations into coordination)
Yellow	Controllers in Flash - Software Flash (operational mode), Cabinet Flash (alarm)
Fuchsia	Controllers with active PREEMPT or POLICE CONTROL alarms are fuchsia
Turquoise	Controllers in Adaptive / CIC enabled are turquoise

4.1.5 Map Alarm Status

On the Map Web Display, pulsing colored rings display based on the current alarm of the traffic Controller. The meaning of each ring color is as follows:

Table 4-2: Map Alarm Status

Red 0	Major Alarms - cabinet flash, stop-time, police control Manual Control Enable, cycle fail, coordination fail
Yellow ⁰	External Alarms – Any external alarm bit active, any special function output active
Blue 0	Minor Alarms – Detector fail, keyboard entry, cycle fault, coordination fault, transaction in progress
Silver 0	All other alarms – Local Override / Manual Override
No Alarm	No outer indicator is visible

4.2 MAP GIS DISPLAY

4.2.1 Create a Map GIS Display

1. Select: Displays & Devices > Map Display > Create GIS Display.

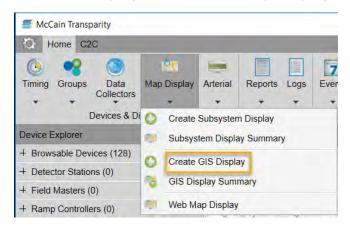


Figure 4-6: Map GIS Display



- 2. Complete the GIS Display Properties (see table below).
- 3. Click Save.

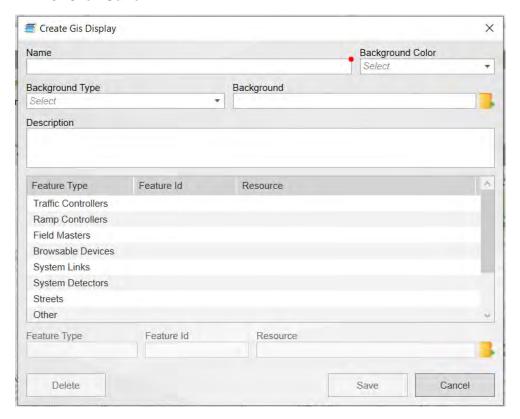


Figure 4-7: Create GIS Map Display

4.2.2 GIS Display Properties

Table 4-3: Map GIS Display Properties

Name	Name the Map GIS display.
Description	A short description to augment the name of the GIS Map Display name.
	Select the desired background type:
Background Type	Local Geocoded
	• None
	Online ArcGis Tiles (Aerial)
	Online ArcGis Ties (Physical)
	Online ArcGis Tiles (Shaded Relief)
	Online ArcGis Tiles (Street)
	Online (ArcGis) (Terrain)



	Online ArcGis Tiles (Topographic)
	Online Bing Tiles (Aerial)
	Online Bing Tiles (Birdseye)
	Online Bing Tiles (Road)
	Online OpenStreetMap Tiles
Background Color	Select the desired background color.
Background Resource Path	Specifies the location of the background file.
	One of the following feature types can be selected:
	Traffic Controllers,
	Ramp Controllers,
	• Field Masters,
Feature	Browsable Devices,
	System Links,
	System Detectors,
	• Streets,
	• Other
Feature	One of the above feature types (i.e. Traffic Controllers, Ramp Controllers.
Feature Id Field	A unique ID assigned to a GIS Feature and is mapped to the feature's System Id in the CSS.
	Image Layer – A layer potentially created by an Authority's GIS Map Department.
File Type	Vector Layer – Contains an array of points and lines that describe the features of that layer. The points can be Traffic Controllers, System Links, etc.
Layer Resource Path	File containing the data like the Feature Id Field used to map to the System Id fields of the Feature.

4.2.3 Set Default System Map

Once maps have been created, users can select one or more to view in the main work-space.



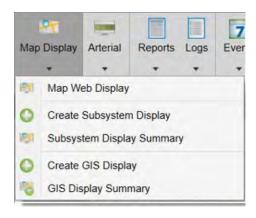


Figure 4-8: Default System Map

- 1. To select the maps: **Device & Displays > Map Display > GIS Display Summary.**
- 2. Single click the desired map then click "Map Display" to launch the map.
- 3. Repeat to display multiple maps.
- 4. Select the desired map and then click the Edit Display or Delete Display button, right click a desired map, and launch a context menu to Edit (Selection) or Delete (Selection) the map, or double click on the desired map.
- 5. Use the **Create** button, or right click any map in the Map GIS Display Summary screen to create a new GIS map display.



Figure 4-9: Map GIS Display Summary

6. Use the **Filter** to search and isolate a particular profile (See expansion arrow in graphic below).

4.2.4 Edit or Delete a Map GIS

- 1. To edit or delete a map: **Devices & Displays > Map Display > GIS Display Summary.**
- 2. Select the desired map.
- 3. Select Edit Display.

OR

3. Select **Delete Display** button to make necessary changes.



4.3 SUBSYSTEM DISPLAYS

Subsystem Displays provide users with the ability to view the status of select inter- sections on a custom background image. Each Summary (list) view in *Transparity* has a**Print** button. There, you can render data with custom columns, orders, and widths to format documents for printing or export.

There are three types of Subsystem Displays: Coordinated, Subsystem, and Field Master.



Figure 4-10: Subsystem Displays

- Coordinated: Displays type "coordinated" enable users to view the extended status
 of all intersections in a single view. In addition to alarm and operational status, this
 display may include cycle timers, detector actuations, and date/time ofthe
 Controller software.
- **Subsystem**: Displays of type "subsystem" are designed to provide users with discretely defined static maps of intersection alarms and operational status.
- **Field Master**: Displays of type "field master" were specifically developed to support legacy traffic Controller infrastructure (namely, the 170-traffic Controller with 210/245 software).



4.3.1 Create Subsystem Display

1. Select: Main Menu > Map Display > Create Subsystem Display.

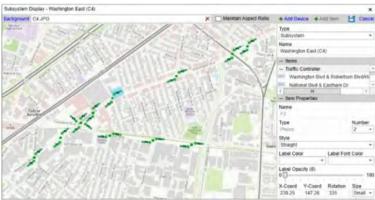


Figure 4-11: Subsystem Display Menu

- 2. Select the desired display type: Coordinated, Subsystem, or Field Master.
- 3. Provide a common Name for the display.



NOTE: If the desired background image is not found in the list of resources, you must add the image as a system resource. Click on theblue "Background" hyperlink to select a background image.

- 4. Select **Add Device** and choose the device of interest (i.e. a Traffic Controller).
- 5. Move the status dot of the **Device** to the appropriate location on the background image.
- 6. Add Items In order to add status items to the Subsystem Display:
 - a. Left click on the device status dot, then select **Add Item**.
 - b. Choose the status item to display, then place the object on the background image as desired.
 - b. Set the Item properties via the Item **Properties** window in the lower right of the Display.
 - c. Use the **Save** icon in order to save results and switch to viewing mode.



4.4 SUITCASE DISPLAY

The **Suitcase Display** emulates the functions and outputs of a suitcase tester. This display does not require configuration by the user and automatically plots the correct number of configured phases and/or system detectors.

1. To access Suitcase Display: Traffic Controller Sub-Context Menu > Displays. Suitcase Display.



REMEMBER: The Traffic Controller Sub-Context Menu can be accessed in the left-hand column of the main workspace by expanding Traffic Devices > Traffic Controllers > then right click the desired controller.

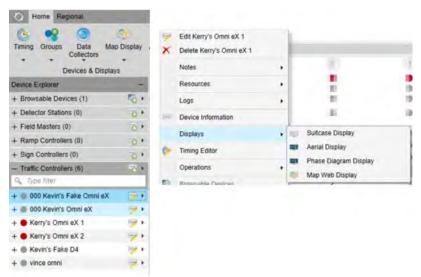


Figure 4-12: Access Suitcase Display

4.4.1 Understanding the Suitcase Display Showcases

The Suitcase Display shows real-time status of phases, pedestrians, overlaps, preemption, and detectors on a single display. The operational mode, pattern, alarms, cycle timers, current date/time, and number of active alarms are also shown.

Detector status includes the on/off state of the individual detector, fault state (stuck on/off/ erratic), volume and occupancy, and a command button for the cabinet detector reset function is also accessible.

Command buttons for phases, pedestrian movements, and preemption allow users to place calls on each of these objects.



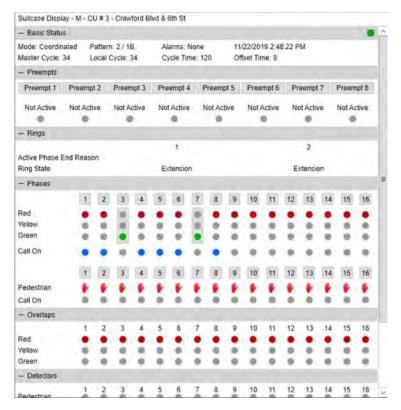


Figure 4-13: Suitcase Display

4.5 AERIAL DISPLAY

The Aerial Display provides the same functionality as the Suitcase Display with the added benefit of using a background image and device objects to represent the inter-section in its actual configuration. By default, the Aerial Display opens as an 8-phase intersection with a generic background image.

1. To access: Traffic Controllers Sub-Context Menu > Displays > Aerial Display.



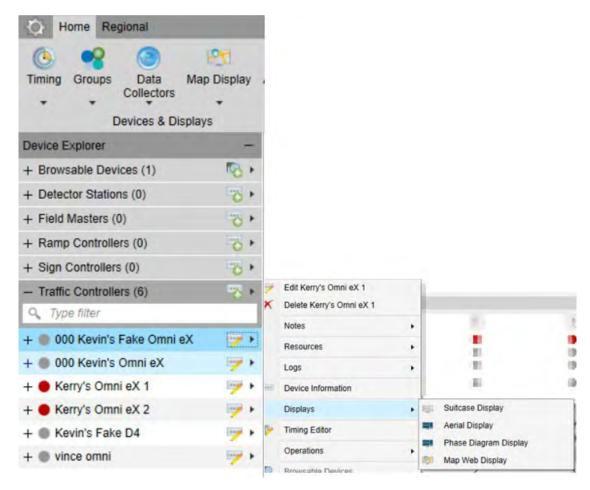


Figure 4-14: Access Aerial Display

4.5.1 Create Aerial Display

4.5.1.1 Aerial Display

- 1. Select: Device Explorer > Traffic Controllers.
- 2. Expand the Traffic Controllers device list in the Traffic Devices menu.
- 3. Locate the desired Controller.
- 4. Right-click the Controller.

OR

- 1. Click the expand arrow to the right of Controller name.
- 2. Select **Displays**.
- 3. Select Aerial Display.
- 4. Click the **Edit** button on the upper right-side of the aerial display to configure (Drag and drop functionality allows for an item



- to be selected and binds the item properties pane to the selected item's properties for viewing and editing).
- 5. Click on each of the expand buttons to ensure all entries are complete.
- 6. Select **Close** when done using the Aerial Display.

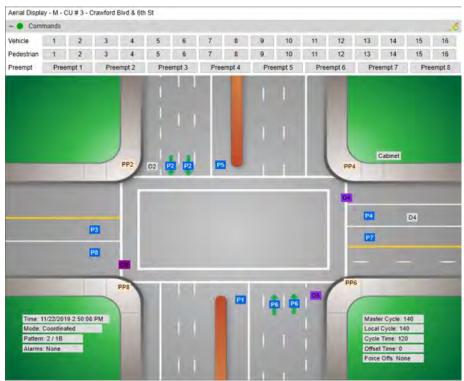


Figure 4-15: Configure Aerial Display Commands

4.5.1.2 **Commands**

Table 4-4: Aerial Display - Commands Table

Commands	Expand Commands + Commands to view Aerial Display commands
Vehicle	Places, or terminates Vehicle Calls Vehicle
Pedestrian	Places, or terminates Pedestrian Calls Pedestrian 1
Preempt	Places, or terminates Preempt Calls



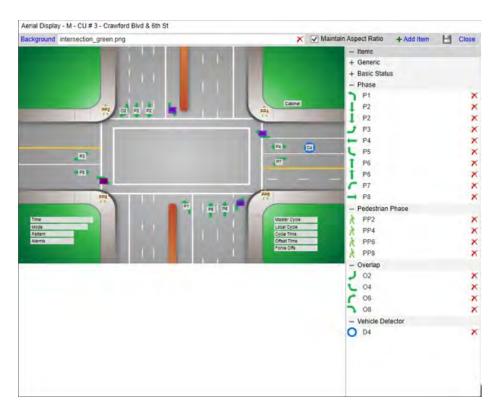


Figure 4-16: Aerial Display Commands

4.5.1.3 Edit

Table 4-5: Aerial Display Map - Edit Table

Edit	Selecting the icon launches the Edit Pane that allows the user to Modifyparameters that control the Aerial Display Map interface.
	Selecting the right mouse button + Items while hovering over the Aerial Display Map launches a Sub-Context menu that allows the user to Add a new Item to one of the Item Types (i.e. Generic, Pedestrian Phase, etc.). If the Item Type does not already exist for a new Item, it will be added when the new Item is added.
	Selecting + Items can also be used to launch the Sub-Context menu containing potential Item Types and their associated Items. All newly added Items will be into a new item repository located in the upper left-hand side of theAerial Display Map.
+ Add Item	The user must drag and drop each new item from the repository in the upper left corner of the Aerial Display Map. New Items will continue to populatethe Item repository and must be dragged and dropped to their desired permanent location on the Aerial Display Map.



Delete Item	Selecting an Item in the Type List that the user wishes to delete and then selecting the delete icon results in the Item being deleted. Selecting an Item on the Aerial Display Map and right-clicking on the mouse launches a menu that allows the user to delete the item.
Background	The icon displays the file name path for the version of the AerialDisplay Map the user is currently viewing/modifying.
Save	Selecting the icon saves all changes to the Aerial Display Map since thelast save to the location indicated by the icon.
Cancel	Selecting Cancel allows the user to throw away all changes made to the Aerial Display since the last save action.
Close	Selecting Close closes the Editor.
+ Items	Selecting + Items Iaunches a menu that contains a list of existing item Types for the Aerial Display that have been added using the icon.
	Selecting + Items expands an interface that allows the user to: AddNew Items: When adding a new Item to the Aerial Display graphic pane, the properties for the new Item are created using the interface. When the updates to the Item Properties fields are complete, the new Item can be saved using the save icon.
	Modify Existing Items: Selecting, for example, the Item Type results in the display of one or more existing Generic Items being displayed. Selecting one of these Items results in that items' properties being displayed in the
+ Item Properties	+ Items interface. This interface is then used to modify the properties of the Generic Item selected. Items, like the Generic Item that have had their
	properties modified can then be saved using the save
+ Generic	All Items (i.e. Cabinet, Camera) that have been added to the Aerial DisplayGraphics Pane.

4.5.2 Customize the Aerial Display

Transparity TMS makes it easy for users to Customize the Aerial Display including:

- Upload a custom background image.
- Add items to the map.



- View a list of all active map items.
- Modify properties of active map items.

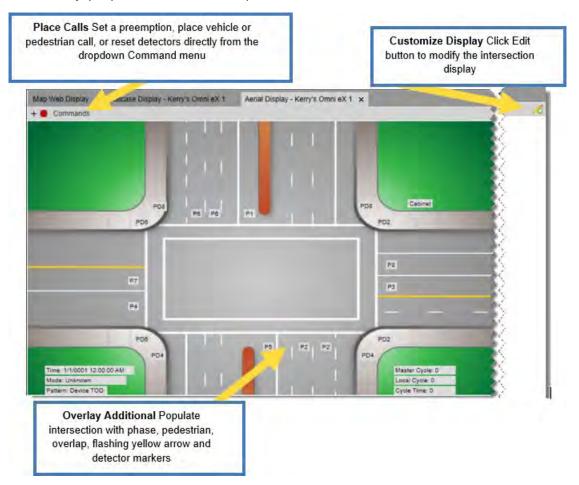
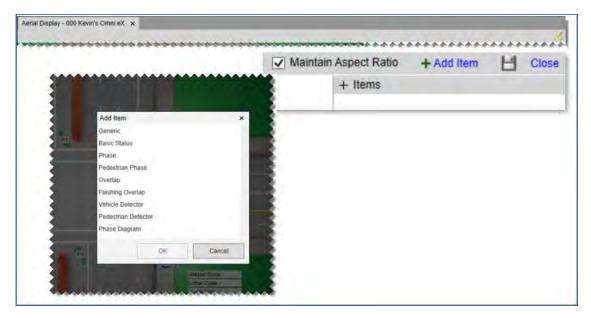


Figure 4-17: Suitcase Display

- 6. Click the **Edit** button in the upper right corner.
- 7. The menu that allows the user to **Add Items** will open.
- 8. Click + Add Item OR + Items





OR

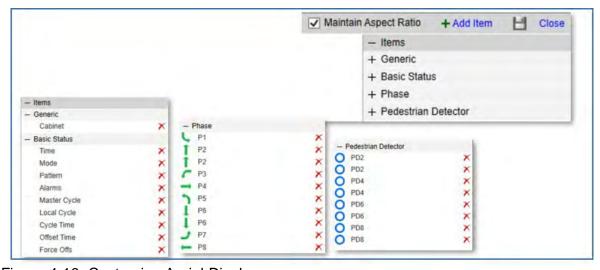


Figure 4-18: Customize Aerial Display

4.5.2.1 Customize the Background of Aerial Display

Display parameters are visible on the Aerial Display when you click the pencil icon in theupper right corner. When you select an object on the palette, you get the edit bar on the right, and you can see opacity, label color, and font color there. Aspect ratio is also visible in the upper right when in Edit mode.

1. Select: Edit > Generic. Cabinet > Item Properties.



Acceptable image types for the background are PNG, JPG, GIF, or TIFF. Use dropdown menus for Label Color and Label Font Color.

Figure 4-19: Customize Aerial Display



2. Click on any subject in **Edit** mode to open the **Properties** at the bottom of the page.

FIGURE 4-18: Edit Properties in Aerial Display

4.6 CABINET DISPLAY

The **Cabinet I/O Display** allows the user to monitor input actuations and load switch outputs as they appear in various traffic Controller cabinets. Graphic representations of the real-time status of the cabinet input and output files are displayed.

Input channels are identified according to detector number. Input activity is displayed as a solid bright-green LED simulation. Outputs are identified according to switch pack (load switch) number and color. Intersection identifiers - intersection name, location, system reference number, and communications addresses - are also shown.



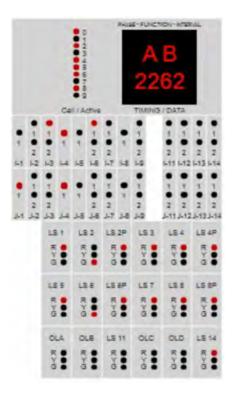


Figure 4-20: Cabinet Display



5. CHAPTER 5: TIMING

The *Transparity* Timing Editor enables users to view, edit, copy, and compare timingparameters for any intersection configured in the central system.

This section provides an overview of:

- "Introduction to the Timing Editor" below
- "Timing Editor Menu" on the next page
- "Change Tracking and Parameter Validation" on page 113
- "Timing Archives" on page 114
- "Timing Audit" on page 119
- "Import and Export Timing" on page 119
- "Group Timing Editor" on page 120
- "Synchro" on page 123

5.1 Introduction to the Timing Editor

The **Timing Editor** displays the number of phases, overlaps, detectors, patterns, and schedules to reduce the complexity of timing management and printed timing sheets.

The Timing Editor allows side-by-side comparison of data from different sources to allow users to perform a timing audit which produces a list of differences between the central system record of timing and the timing of the field device.

Copy Data refers to functionality added to the Timing Editor to allow an end user to copy an object's parameters to another object (like Phase 1's parameters copied to Phase 2). It also allows entire sets of data to be copied to another set (such as a Set, or a Bank, as a table of data). Phase Set 1 contains parameters for phases 1-16, and Phase Set 2 contains a second copy of all those parameters to be configured differently. Copy Data allows Phase Set 1 to be copied to Phase Set 2 so that the user doesn't have to hand punch all these values individually.

QuicComm[®] is McCain's legacy intersection control protocol. There are many different legacy programs that use this protocol. *Transparity* supports them, as they all have Timing Editor pages. If an intersection is upgraded from some legacy *QuicComm* program, *Transparity* will convert basic parameters from the *QuicComm* version to the corresponding *Omni eX* version. For example, phase minimum green time is between common programs, so those values are carried over.

Limited timing migrations and *QuicComm* to *Omni eX* are part of the same module. They deal with converting configuration from one device type to the other or from one version of a device to a different one.

The data on the timing pages saves to a timing database for each intersection. *Transparity* allows you to archive that timing database and call it up later to compare with what is currently configured for an intersection and copy values back to the current configuration or download the archived copy back to an intersection. Printing timing archives is a feature which allows you to print an archived timing



database directly instead of having to go through steps to override the current database just to print those archived values.

Omni eX Timing Editor previously had a maximum of 16 Day Plans. That has now been updated to a maximum of 64 Day Plans to match between *Transparity* and *Omni eX*.

Edited data can be saved to the central system database, saved to the field device data-base, exported, or archived for later use.

1. To access: Device Explorer > Timing > Editor.

5.1.1 Data Sources

The Timing Editor can be loaded with data from various sources including:

- Central system database.
- Field device database.
- Archives.
- External file.

5.2 TIMING EDITOR MENU

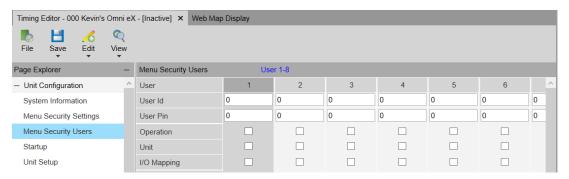


Figure 5-1: Timing Editor Menu



5.2.1 File Menu

- Use the File tab to view Device Information. The user may also access the following processes from the File or backstage menu:
 - Archive Store timing device timing.
 - Template Create and use templates.
 - Export Export Timing to use in other devices.
 - Save to the system or a device.
 - Audit From any stored device.
 - Print Print all manner of saved timing.

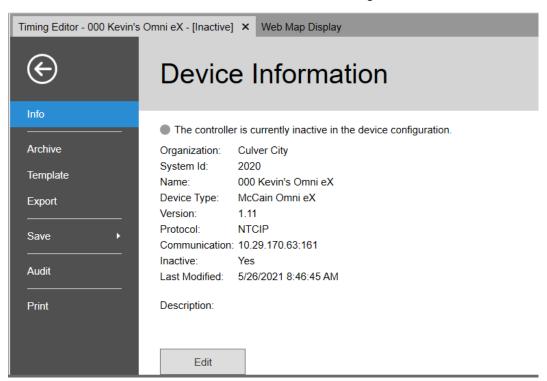


Figure 5-2: File Menu



5.2.2 Save Menu



Figure 5-3: Save Menu

The user may Save from the Save menu or the File menu, as shown in the previous step.

5.2.3 Edit Menu



Figure 5-4: Edit Menu

The user may Undo All Edits or Restore Defaults from the Edit menu.

5.2.4 View Menu



Figure 5-5: View Menu

The user may Compare Data and refresh comparison data from this menu.



5.3 PAGE EXPLORER MENU

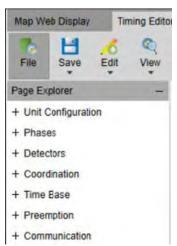


Figure 5-6: Page Explorer Menu

Each of the sub-context menus under the Page Explorer may be expanded to expose the tools needed to program various timing elements.

5.4 USE THE TIMING EDITOR

5.4.1 Phase Timing

1. Select: Device Explorer > Traffic Controllers > Traffic Controller Sub-Context Menu > Timing Editor > Page Explorer > Phases > Phase Timing.



Figure 5-7: Phase Timing Menu

2. The user may edit timing on this page.



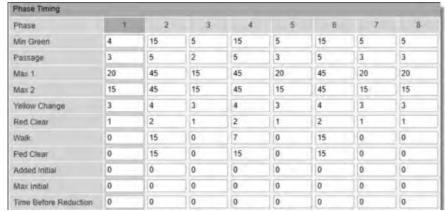


Figure 5-8: Edit Phase Timing

Users can easily overwrite working data fields with updated timing within the Timing Editor. Modifications are not committed to the central database or field device until a Save action is selected.

- 3. There are four options for saving data:
 - Save All to System.
 - Save Page to System.
 - Save All to Device.
 - Save Page to Device.

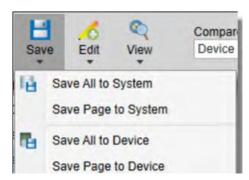


Figure 5-9: Save Edits

- 4. Saving the parameters to the *Transparity* central database helps preserve the synergy between central and field device timing parameters. If it is necessary to update the field device with temporary timing, the user should first preserve the permanent copy of timing in the form of an archive.
- 5. Controllers configured for more than eight phases:
 - a. The menu bar will show the current set and phase in view.



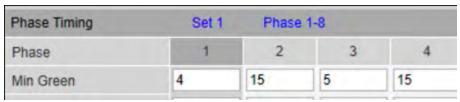


Figure 5-10: Additional Sets and Phases

b. Click on the Set or Phase to change the current view to the desired view.





Figure 5-11: Change Set / Phase View

5.4.2 Working Data vs. Comparison Data

The *Transparity* Timing Editor allows users to change the data source for both working and comparison data. This allows users to easily compare timing parameters from multiple origins such as timing archives, field data from another Controller, central database timing for another Controller, or external files exported directly from the field device.

Working Data— Editable data that can be saved to the central database, field device database, archived, or exported. By default, working data is the database record ofdevice timing.

Comparison Data – Read-only data from other data sources (referenced above).

1. Click View to compare data.

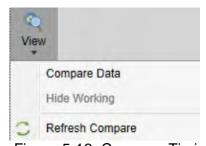


Figure 5-12: Compare Timing

- 2. Choose the **Source** from the dropdown menu.
- 3. Select the **Traffic Controller** to compare with from the file menu.



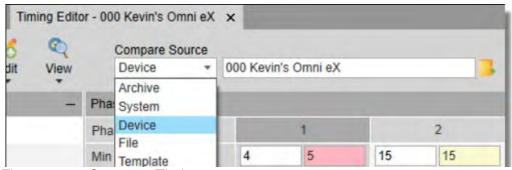


Figure 5-13: Compare Timing

 The comparison screen will load and show the **Original** source in white and the eight phases of the **Comparison** source in yellow. Any **Discrepancies** will appear in pink.

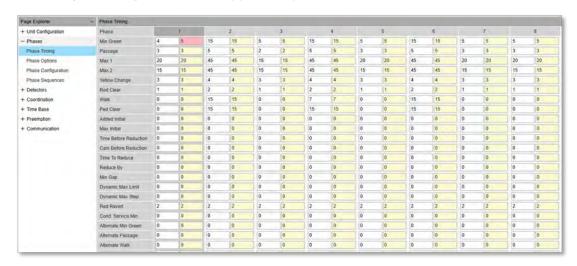


Figure 5-14: Timing Comparison

5. From this screen the user may edit, print, save or adjust any timing issues.

5.4.3 Hide Working Copy

To remove the view of the working comparison and show only the original source complete the following:

- 1. Click View.
- 2. Click Hide Working.



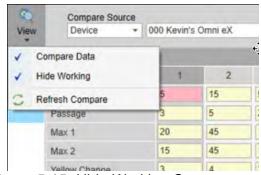


Figure 5-15: Hide Working Copy

5.4.4 Change Tracking and Parameter Validation

When editing timing parameters, the Timing Editor tracks all unsaved changes and per-forms validation checks against each edited field. Users cannot save changes until allvalidation errors have been resolved.

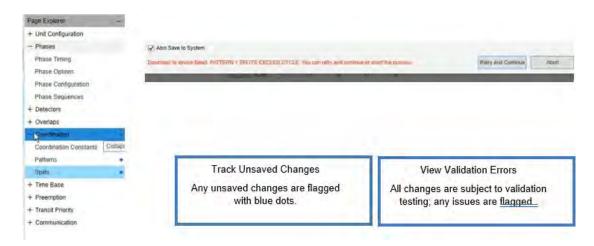


Figure 5-16: Timing Editor - Unsaved Changes and Validation Tracking

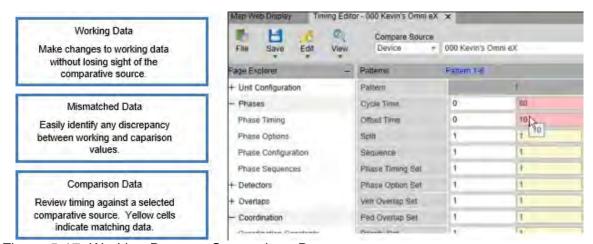


Figure 5-17: Working Data vs. Comparison Data



5.4.5 Phase Options

- 1. Select: Page Explorer > Phases > Phase Options.
- 2. Click Phase Options.

The graphics below show both the settings of the original and the comparison PhaseOptions.

3. Click in the desired box to activate any phase options.

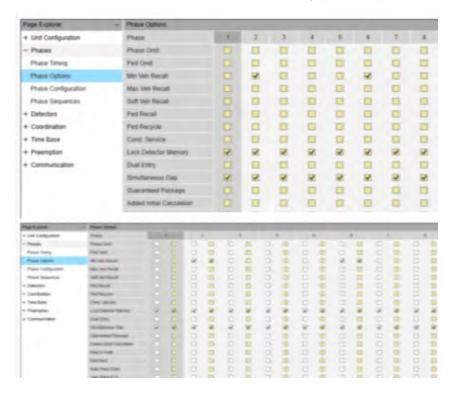


Figure 5-18: Phase Options

4. From this screen the user may edit, print, save or adjust any Phase Options.

5.5 TIMING ARCHIVES

The *Transparity* Timing Archive features allows users to easily create, restore, and manage archived timing.

All Timing Archive features are accessed through the Timing Editor.

5.5.1 Create/Edit a Timing Archive

To archive timing in the central database: Devices & Displays > Timing >
 Archives.



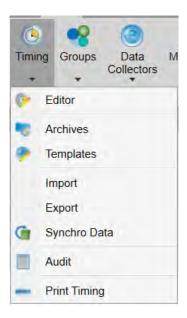


Figure 5-19: Access Timing Archives

2. Double-Click the desired archived Controller to view and/or delete.

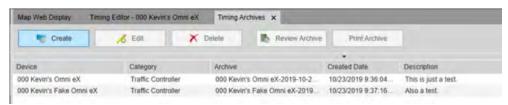


Figure 5-20: Timing Archives

3. Click on Create, to build a new archive.

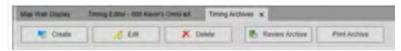


Figure 5-21: Create Archive

4. Select the desired Controller.



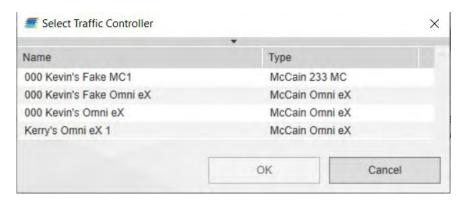


Figure 5-22: Select Controller for Archive

- 5. Click OK.
- 6. Complete the Timing Archive Properties.

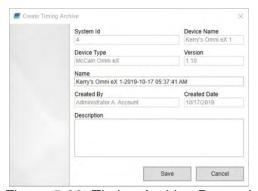


Figure 5-23: Timing Archive Properties

7. Click Save.

5.5.2 Restore Archived Timing

- 1. To restore a timing archive: **Devices & Displays > Timing > Archives.**
- 2. Locate the desired Controller.
- 3. Right-click to open the **Controller Sub-Context Menu**.
- 4. Select Timing Editor.
- 5. Click View > Compare Data.
- 6. Select Archive under Compare Source.
- 7. Select the desired archive timing from the window that will appear with a list of available timing archives.
- 8. Click **OK** to compare the current working data to the archived data.
- 9. Click the **Copy Comparison to Working** button to apply the archive timing parameters to the working data.



10. Click Save Timing to Database or Save Timing to Database and Send to Device to apply the changes.

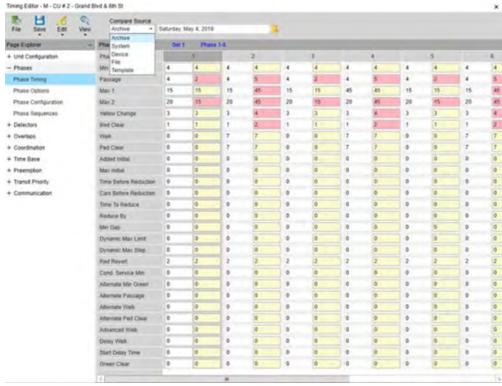


Figure 5-24: Restoring a Timing Archive

5.5.3 Download Timing

- To download timing, locate the desired Controller under Traffic Devices > Traffic Controllers.
- 2. Right-click to open the Controller Sub-Context Menu.
- 3. Select Timing Editor.
- 4. Click in the Timing Editor window:
 - a. **Save All Timing to Database** to save the archived timing to the central database.

OR

- a. Save All Timing Data to Database and Update Device to also update the field device.
- 5. Select the desired archive timing from the window that will appear with a list of available timing archives.



5.6 TIMING TEMPLATES

Timing Templates permit users to create pre-configured templates for common intersection phasing. Previously created templates can be applied to newly created intersections in order to populate a standard set of timing parameters or templates can be applied after creation of an intersection.

5.6.1 Creating a Timing Template

There are two options for creating a timing template:

Assign a user-friendly Name and Description for ease of use when implementing a template from the Main Menu > Timing > Templates >. Then select the traffic Controller from which you'd like to create the template.

OR

- 1. From the Timing Editor Menu of a **Controller > File > Templates.**
- 2. Once the Timing Template dialog has opened:

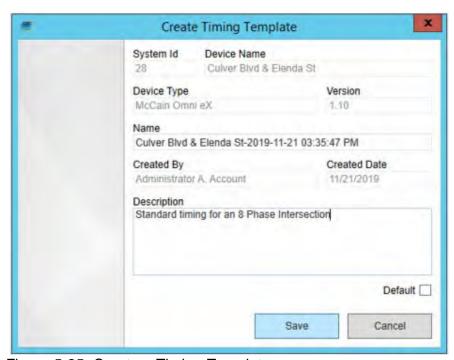


Figure 5-25: Create a Timing Template

3. Click Save.

5.6.2 Implementing a Timing Template



NOTE: See "Create a Traffic Controller" on page 45.



5.7 TIMING AUDIT

Quickly identify data mismatches between the central database and the traffic Controller timing parameter database with the *Transparity* Audit Timing feature.

1. Conduct an audit by doing the following: Devices & Display > Timing > Audit

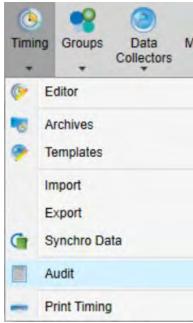


Figure 5-26: Timing Audit

- 2. Click the File icon to find and select the desired Controller.
- 3. Click **OK** once the desired Controller is highlighted.
 - a. The system will retrieve all timing parameters from the designated traffic Controller and compare the values to those of the central system database.
 - b. A detailed list will be produced identifying the differences.
- 4. Click on a mismatched item to open the Timing Editor in compare mode to update the traffic Controller or central dataset.

5.8 IMPORT AND EXPORT TIMING

When not directly connected to a traffic Controller, the exchange of timing parameters can be accomplished using the *Transparity* Import/Export feature.

Users may import records of timing records from Controller exports saved as files on the file system. Users may also export timing to file to be later applied to the traffic Controller via USB.



5.9 GROUP TIMING EDITOR

The Transparity Group Timing Editor allows users to view, upload, or download select timing parameters for Coordination or Adaptive Groups of traffic Controllers. This Editor allows the user to see related parameters for multiple Controllers side-by-side to make Time of Day coordination easier to review and implement.

There are two ways to launch the Editor.

Navigate to the following using the main menu: Devices & Displays > Groups
 > Group Timing Editor.

OR

- 1. Open the context menu of a Coordination Group and select: **Group Timing Editor**.
- 2. By navigating from the main menu, you are asked to select a group before the main view is loaded.

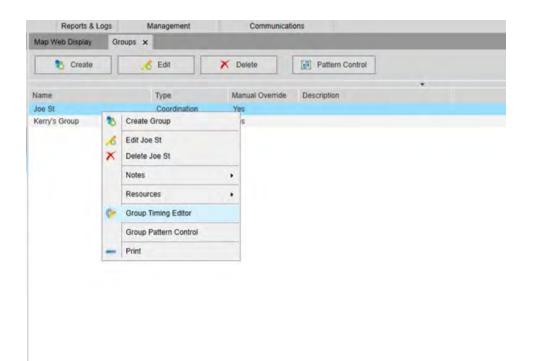


Figure 5-27: Launch Group Timing Editor from a Coordination Group Context Menu

Within the Group Timing Editor view you are presented with a navigation bar similar to the standard Timing Editor navigation bar. From here, you may select a group or pat- tern for which to modify timing. You are also given options to save timing changes to the system or to the devices.

5.9.1 File Menu

Within the main body of the backstage opened by this menu, basic information is displayed for the currently selected group as well as an Edit button to open the Edit Wizard for that group. The menu on the left allows saving timing to system or device.



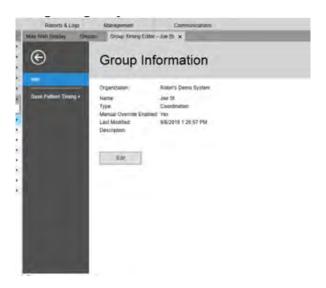


Figure 5-28: File Menu on Group Timing Editor

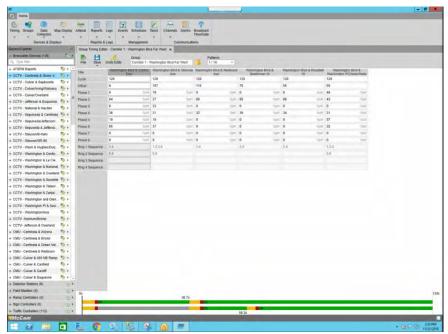


Figure 5-29: Group Timing Editor

5.9.2 Splits and Force Offs

Phase coordination pattern timing can be expressed in splits or force offs. The value displayed is a function of what value is native to the traffic control program.

For NTCIP-based programs, splits are displayed. For *QuicComm*-based programs, force offs are displayed. The type of value is displayed as background text right-justified within the input field.



Washington Blvd & Costco Dwy		Washington Bl Av		Washingto
120		120		120
6		107		118
0	Split	19	Split	0
84	Split	37	Split	88
0	Split	33	Split	0
36	Split	31	Split	32
19	Split	19	Split	0
65	Split	37	Split	0
0	Split	0	Split	0
0	Split	0	Split	0
2,4		1,2,3,4		2,4

Figure 5-30: View Coordination Parameters in Group Timing Editor

The *Transparity* Group Timing Editor also visualizes the cycle for the selected traffic con-troller via the Phase Split Diagram at the bottom of the view. You must first select a con-troller in order to view its cycle data. Select a Controller by clicking on its heading in the Title row or by clicking in any of the input fields under that Controller.

Figure 5-31: Phase Split Diagram in Group Timing Editor



Each ring in the cycle is shown in a stacked view with Ring 1 on top. Clearance times are visible, and phase green times are adorned with the phase number. The far-left bar marked 0s represents the local cycle zero point and the far-right dashed line indicates the length of the cycle.

5.9.3 Save Timing

The **Save** menu provides options to save all to system and device. In this context, unlike the standard Timing Editor, "all" refers to the visible coordination timing parameters and not all timing parameters supported by the traffic Controller.



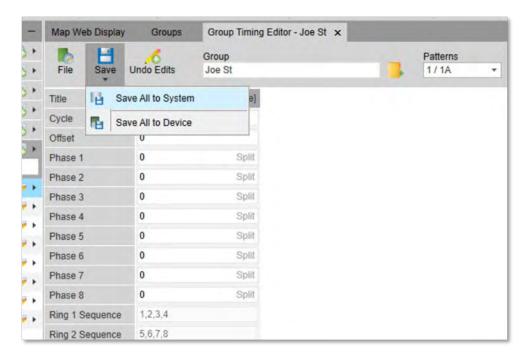


Figure 5-32: Save Timing

5.10 SYNCHRO

Transparity provides integration with **Synchro** versions 9 and later. This means a useroperating both systems can transfer timing data between them in order to study, optimize, and implement timing for a coordination plan for a group of intersections.

The user story around this integration is for customers running a Synchro system in theirtraffic management center who wish to optimize timing for a corridor. In order to do so, they must have a Synchro diagram with timing to match the intersection timing in the field. Once timing is optimized, the user must implement the plans in *Transparity TMS*.

This integration has been written to support this user story using the integration available off-the-shelf in Synchro 9 and above. From a high level, this looks like the following:

- 1. Configure a coordination group in *Transparity* representing an arterial.
- 2. Configure a diagram file in Synchro representing the same arterial.



NOTE: This arterial may also be contained in a network or city-wide diagram file. It is important that all intersections in the *Transparity* group are found in the diagram file.



- 3. Export the UTDF timing data in Synchro to CSV file. Refer to the Synchro manual for how to accomplish this.
- 4. Export timing in *Transparity* to Synchro.

5.10.1 Synchro Prerequisites

There are some important steps that must be performed first, both in Synchro and Transparity.

 Create a Synchro diagram file representing the desired intersections to coordinate. This may be a diagram of just the intersections along a coordinated arterial, but the diagram may also be a network or city-wide diagram file. It is important that all intersections in the *Transparity* group to be optimized are found in the diagram file.



NOTE: Refer to your Synchro manual for steps on how to perform this task.

- 2. Associate the Synchro-designated identifiers for each intersection with the corresponding Intersection in *Transparity*.
 - a. Open the Edit Traffic Controller wizard.
 - b. Navigate to the **Advanced** page.
 - c. Enter the identifier from Synchro into the **Synchro Id** field.

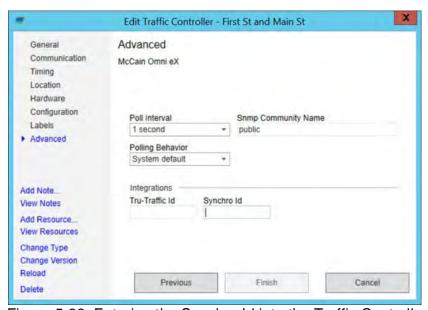


Figure 5-33: Entering the Synchro Id into the Traffic Controller



5.10.2 Export Timing from Synchro

Synchro writes data to CSV file in the UTDF format. There are many parameters inside this format used and managed by Synchro that are not utilized by *Transparity*. In order to send timing to Synchro over UTDF, *Transparity* must take a Synchro-exported file and overwrite the relevant timing parameters with data from *Transparity*. That is why,even when exporting timing from *Transparity*, the user must start with a file exported from Synchro.

5.10.3 Export Timing from *Transparity*

Using the file exported in the previous step:

- 1. Navigate to Timing > Synchro Data.
- 2. Specify the group, pattern, and Synchro UTDF file desired to export data to.
- 3. Click the **Export** button.

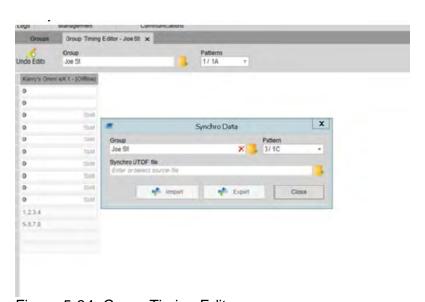


Figure 5-34: Group Timing Editor

5.10.4 Import Timing into *Transparity*



NOTE: This step assumes that the user has already taken the exported data from *Transparity*, imported it back into Synchro, optimized it according to their design, and exported the data back to the CSV file. This manual does not attempt to address these operations; the user must consult the Synchro manual for information on this process.

5.10.4.1 Import Timing into Transparity

1. Navigate to **Timing > Synchro Data** in *Transparity* using the file exported from Synchro containing the optimized timing data.



- 2. Specify the group, pattern, and Synchro UTDF file to export data to.
- 1. Click the **Import** button.
- 2. Timing will be imported into the Group Timing Editor where the specified and pattern are pre-selected. Nothing has been modified in the system at this time. The user can now view the optimized timing and make changes. From the Group Timing Editor, the user can save the timing to the system or devices.
- 3. Click **Update Diagram** to manually update the diagram.
 - a. If the Real-Time checkbox is checked, then this will occur automatically each time Pattern Update Interval is reached.



6. OPERATIONS AND MANAGEMENT

This section allows for oversight of notifications, planned operations, tasks, and time synchronization. This section provides an overview of how to create and manage:

- "Events" below
- "Schedules" on page 134.
- "Signal Pattern Control" on page 144.
- "Group Pattern Control" on page 145.
- "Time/Date Broadcast" on page 146.
- "Remote Downloads" on page 149.
- "Service Tasks" on page 152.

6.1 EVENTS

6.1.1 Create an Event Notification

Events are occurrences within the system that can trigger a user email notification.

- 1. Select: Management > Events > Create Event Notification.
- 2. Complete the **Event Notification Properties** (see table at "Event Notification Properties on page 128).
- 3. Click Save.

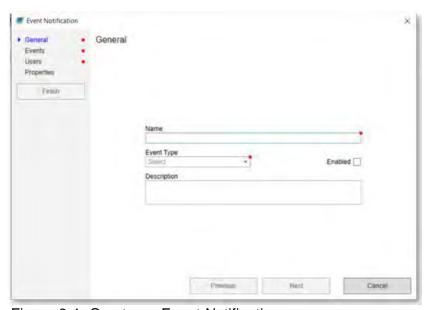


Figure 6-1: Create an Event Notification



6.2 EVENT NOTIFICATION PROPERTIES

6.2.1 General

Alarms may be set to monitor a select group of intersections or a particular intersection. One or many event alarms may be set.

Table 6-1: Event Notification - General - Table

Name	Unique Name assigned to the Event Notification scheduled task
Event Type	Traffic Event Link Event Ramp Event
Enabled	Without a check mark in this check box the Event Notification task will not run
Description	Allows the user to create a small description for the Event Notification task

6.2.2 Events

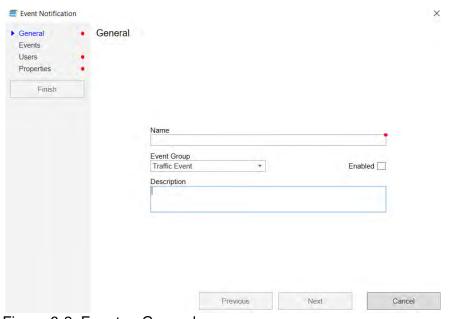


Figure 6-2: Events - General

Depending on the type of event (Traffic, Link, or Ramp), a different set of unique names is displayed.

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Table 6-2: Event Notification - Events

Name	Unique name assigned to the event
	Coordination Alarm
	Coordination Fail
	Coordination Fault
	Critical Alarm
	• Cycle Fail
Traffic Event	Cycle Fault
Traine Event	Detector Fault
	• External Alarm
	Local Override
	● Manual Plan
	• Preempt
	• TF Flash
	Congestion Occupancy Heavy
Link Event	Congestion Speed Heavy
	Congestion Volume Heavy
	• External Alarm
Ramp Event	Offline
	Ramp Alarm

The event is then either Added, Removed, or Added/Removed.



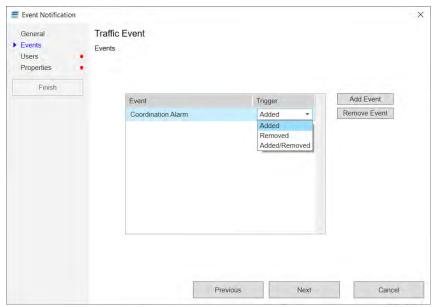


Figure 6-3: Events - Add, Remove, or Add/Remove

Table 6-3: Event Notification - Trigger

Added	Event is added
Removed	Event is removed
Added/Removed	Event is both added and removed

6.2.3 Users

The user and the event acknowledgement delay are selected next. There are three tiers of users and a checkbox to set if the event notification requires acknowledgement. The usernames are displayed according to tier. If an event alarm goes active and the user does not acknowledge the alarm within the selected time delay, the next tier of users is notified of the event. Tier 1 is notified of the event first. If there is a Delay Before Escalation set, the system waits that amount of time before moving to the name(s) in the next tier and notifying them. All users in the next Tier are notified after expiration of the acknowledgement period in the previous tier. This continues until Tier 3 is reached.

User(s) may acknowledge the event alarm notification by using the Unacknowledged Events screen and selecting the appropriate event(s). See Section "Unacknowledged Events" on page 133.

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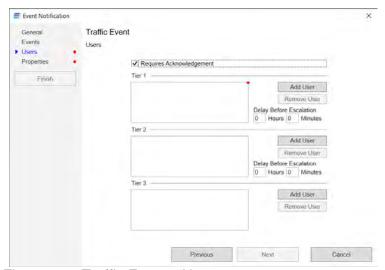


Figure 6-4: Traffic Event - Users

Table 6-4: Event Notification - Users

Requires Acknowledgment	Acknowledgment required from user(s) to avoid escalation.
Add User	Users in the <i>Transparity TMS</i> that have been selected to receive any or all Traffic, Link, and Event notifications.
Delay Before Execution	Number of Hours and Minutes to delay before notification.



6.2.4 Properties

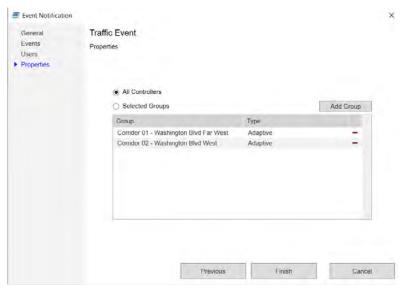


Figure 6-5: Event Notification - Properties

Table 6-5: Event Notification Properties

All Controllers	Available Traffic Controllers: All Traffic Controllers in the <i>Transparity TMS</i> that are available to send Traffic Event Notifications
Selected Groups	Available Ramp Controller Groups: All Ramp Controller Groups in the Transparity TMS that are available to send Ramp Event Notifications
Add Group	Select to add a particular group from a drop-down list.

6.2.5 Event Notification Summary

- 1. To view a summary of all event notifications, **Management > Events > Event Notification Summary.**
- 2. Right-click on a summary item, or selecting one of the summary buttons enables the following capabilities:
 - Create a new Event Notification.
 - Edit (selected) Traffic Event Notification.
 - **Delete** (selected) Traffic Event Notification.
- 2. Use the **Filter** to search and isolate a particular Event Notification profile.

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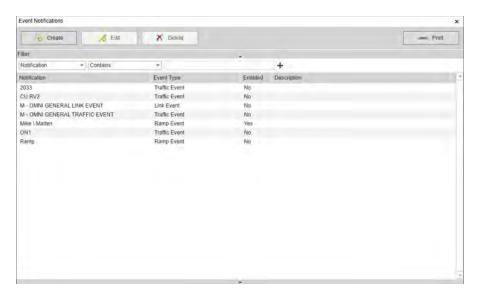


Figure 6-6: Event Notification Summary

6.1.2 Unacknowledged Events

This is the list of unacknowledged alarms which is where the user executes the "acknowledgement" and terminates the alarm notification escalation to the next tier.

- 1. To view a list of all unacknowledged events, **Management > Events > Unacknowledged Events.**
- 2. Select either:
 - Ack Event: to Acknowledge an event and terminate the alarm notification escalation.
 - Ack Selected Events: to Acknowledge selected events and terminate the alarm notification escalation.
 - Ack All Events: to Acknowledge all events and terminate the alarmnotification escalation.

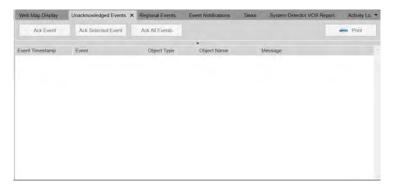


Figure 6-7: Unacknowledged Events

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6.3 SCHEDULES

The Transparity Scheduler is a wizard-style tool that walks users through a series of setup steps to capture all necessary configuration data for each category of schedule.

6.3.1 Types of Schedules

A variety of different schedules can be created in the *Transparity* Scheduler, including:

Table 6-6: Types of Schedules

System Maintenance	Delete Activity Logs
Traffic Data	Retrieve Controller Logs
Traffic Maintenance	Aggregate Detector
	Data Aggregate Detector Data
	Broadcast Time Check Time Drift Run
Traffic Operations	Traffic Command Set Pattern
	Run Timing Audit

6.1.3 Use the Scheduler

The *Transparity* Scheduler provides a single interface to provide users with a step-by-step process of creating a variety of new task schedules.

1. To create a schedule, select: Home > Schedules > Create Schedule.

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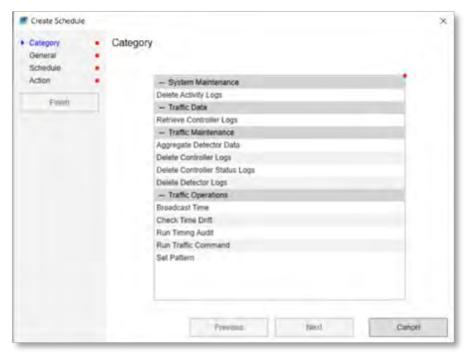


Figure 6-8: Create Schedule

- 2. Use the wizard to add the necessary data to create a schedule.
- 3. Click each of the expand buttons to ensure all entries are complete. All fieldsmarked with a red dot are mandatory.
- 4. Select the **Category** of the schedule you would like to create.
- 5. Click Next.
- 6. Follow the self-explanatory steps on the subsequent pages to create the desired schedule. Users may easily return and update any of these fields at a later date and time.
- 7. Click **Finish** to create the schedule.

6.3.2 Create a New Schedule

The *Transparity* Scheduler creation wizard makes it easy to create a new schedule.

- To create a schedule: Management > Schedules > Create Schedule
- 2. Use the wizard to walk through adding the necessary data to create a schedule.
- 3. Select the **Category** of the desired schedule.
- 4. Click Next.

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- 2. Follow the self-explanatory steps on the subsequent pages to create the desired schedule. Users may easily return and update any of these fields later.
- 3. Click **Finish** to create the schedule.

6.2.3.1 *Category*

Table 6-7: Creating a Schedule – Category

System Maintenance	Delete Activity Logs
Traffic Data	Retrieve Controller Logs
	Aggregate Detector Data
Traffic Maintenance	Delete Controller Logs
	Delete Controller Status Logs
	Delete Detector Logs
	Broadcast Time
	Check Time Drift
Traffic Operations	• Run Timing Audit
	Run Traffic Command
	Set Pattern

6.2.3.2 **General**

Table 6-8: Creating a Schedule - General

Name	The name of the scheduled activity
Schedule	Recurring DOM and DOW
	Special Date
	Place a check in the Enabled box if you want the scheduled task to execute. If unchecked, the scheduled task will not
Enabled	execute at the designated time and date
Description	A short description of the scheduled event

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6.3.2.1 Schedule

Table 6-9: Creating a Schedule - Option

	• The user must enter:
Recurring DOM	Days of the Month
andDOW (Option)	Months of the Year
	Days of the Week
	• Start Time
	The user must select:
Special Date (Option)	One day of a month
	• Start Time
	The user enters:
	Occurs Every (i.e. Enter min, hour, etc.)
Recurring Interval	Starting Date (i.e. Enter Starting Date)
(Usedfor Category: Traffic Data - Only)	• Has Ending Date (Check Mark in Check Box?)
	• No – No ending date
	Yes – Enter Ending Date
	Always Active (Check Mark in Check Box?)
	No – Enter Start Time & End Time
	Yes – No Start Time & End Time

6.2.3.3 Action

Table 6-10: Creating a Schedule – Active

System Maintenance:	Delete logs after <days> days.</days>
Delete Activity Logs	
	• The user can move whichever traffic Controller groups they wish to include inthe Controller log retrieval process from the 'Available Groups' pane to the 'Selected Groups' pane.
Traffic Data: RetrieveController Logs	The user can select the type of log to upload by placing a checkmark in the checkbox next to the following fields:
	• VOS
	• MOE
	• Speed

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	Controller
Traffic Maintenance: Aggregate Detector Data	Populate the following fields, or use the default data provided
	• 'Use aggregation period of <minutes> minutes'</minutes>
	• 'Aggregate data after <days> days'</days>
	Populate the following field, or use the default data provided
	• 'Delete logsafter <days> days</days>
Too (Co. Maria ta a a a a a	The user can select the type of log to delete by placing a checkmark in the checkbox next to the following fields:
Traffic Maintenance: Delete Controller	• VOS
Logs	• Speed
	• MOE
	Controller
Traffic Maintenance: Delete Controller Status Logs Traffic Maintenance: Delete Detector Logs	Populate the following field, or use the default data provided 'Delete logs after <days> days</days>
Traffic Operations: Broadcast Time - TrafficOperations: Check Time Drift	The user can move whichever traffic Controller groups they wish to include inthe 'Broadcast Time' process from the 'Available Groups' pane to the 'Selected Groups' pane
Traffic Operations: RunTiming Audit	The user can move whichever traffic Controller groups they wish to include in the 'Broadcast Time' process from the 'Available Groups' pane to the 'Selected Groups' pane.
	The user can move whichever Users they wish to include in the 'Run Timing
	Audit' process from the 'Available Users to Notify' pane to the 'Selected Users to Notify' pane.
- Traffic Operations: RunTraffic Command	The user can select a 'Command Profile' from a list of 'Available Profiles' (i.e.Advanced Adaptive, Basic Adaptive, etc.)
	The user can select the 'Priority' that the command profile will have in the queue. Priority levels from '1 Highest to 10 Lowest' can be selected from an expansion field.

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	'Pattern' – The user selects the pattern from the expansion list that theywould like to run.
	• 'Priority' – The user selects the priority from the expansion list that reflects the priority level they want the scheduled pattern action to run at. Priority levels from '1 Highest to 10 Lowest' can be selected from the expansion field.
	The user can move whichever traffic Controller groups they wish to include in the 'Broadcast Time' process from the 'Available Groups' pane to the 'Selected Groups' pane.

6.2.3.4 Schedule

Users will select when the desired schedule should run, for instance, by DOM, DOW, or by Special Dates as defined by the user.

There can be more than one Special Date created per schedule.

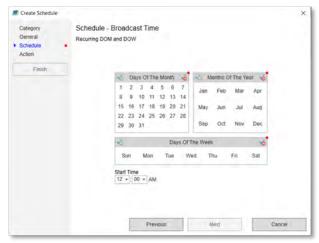


Figure 6-9: Create Special Date

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Table 6-11: Selecting Scheduler Dates

Recurring DOM and DOW(Option)	The user must enter:
	Days of the Month
	Months of the Year
	Days of the Week
	• Start Time
	The user must select:
Special Date (Option)	One day of a month
	• Start Time
Recurring Interval (Used forCategory: Traffic Data - Only)	The user enters:
	Occurs Every (i.e. Enter min, hour, etc.)
	Starting Date (i.e. Enter Starting Date)
	Has Ending Date (Check Mark in Check Box?)
	■ No – No ending date
	■ Yes – Enter Ending Date
	Always Active (Check Mark in Check Box?)
	■ No – Enter Start Time & End Time
	■ Yes – No Start Time & End Time



6.3.2.2 Action

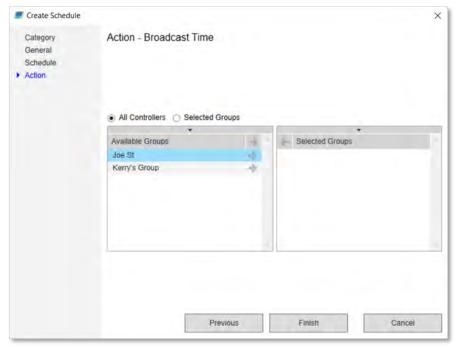


Figure 6-10: Creating a Schedule - Action

Select the particular action that a schedule will perform for each category selected.

For example, if the user selects the category of traffic maintenance, one of two actions (i.e.aggregate detector data or delete Controller logs) may be chosen.

There can be only be one category and one action per schedule.

Table 6-12: Selecting Scheduler Dates

System Maintenance:	Delete logs after <days> days.</days>
Delete Activity Logs	
Traffic Data: Retrieve Controller Logs	The user can move whichever traffic Controller groups they wish to include inthe Controller log retrieval process from the 'Available Groups' pane to the 'Selected Groups' pane.
	• The user can select the type of log to upload by placing a checkmark in the
	checkbox next to the following fields:
	• VOS
	• MOE
	• Speed
	Controller

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Traffic Maintenance:	Populate the following fields, or use the default data provided
Aggregate Detector	• 'Use aggregation period of <minutes> minutes'</minutes>
Data	• 'Aggregate data after <days> days'</days>
Traffic Maintenance: Delete Controller Logs	Populate the following field, or use the default data provided
	• 'Delete logs after <days> days</days>
	 The user can select the type of log to delete by placing a checkmark in thecheckbox next to the following fields:
	• VOS
	• Speed
	• MOE
	Controller
Traffic Maintenance: Delete Controller Status Logs Traffic Maintenance:	Populate the following field, or use the default data provided 'Delete logs after <days> days</days>
Traffic Operations: Broadcast Time TrafficOperations: Check	The user can move whichever traffic Controller groups they wish to include in the 'Broadcast Time' process from the 'Available Groups' pane to the 'SelectedGroups' pane.
Time Drift	
Traffic Operations: RunTiming Audit	The user can move whichever traffic Controller groups they wish to include in the 'Broadcast Time' process from the 'Available Groups' pane to the 'SelectedGroups' pane.
	The user can move whichever Users they wish to include in the 'Run Timing
	Audit' process from the 'Available Users to Notify' pane to the 'Selected Users to Notify' pane.
Traffic Operations: RunTraffic Command	• The user can select a 'Command Profile' from a list of 'Available Profiles' (i.e. Advanced Adaptive, Basic Adaptive, etc.).
	The user can select the 'Priority' that the command profile will have in the queue. Priority levels from '1 Highest to 10 Lowest' can be selected from an expansion field.

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Traffic Operations: Set Pattern	• 'Pattern' – The user selects the pattern from the expansion list that they would like to run.
	• 'Priority' – The user selects the priority from the expansion list that reflects the priority level they want the scheduled pattern action to run at. Priority levels from '1 Highest to 10 Lowest' can be selected from the expansion field.
	 The user can move whichever traffic Controller groups they wish to include in the 'Broadcast Time' process from the 'Available Groups' pane to the 'SelectedGroups' pane.

6.3.3 View Schedule Summary

The **Schedule Summary** allows users to view and filter through existing schedules. It also provides an easy interface for creating, editing, deleting, or running schedules.

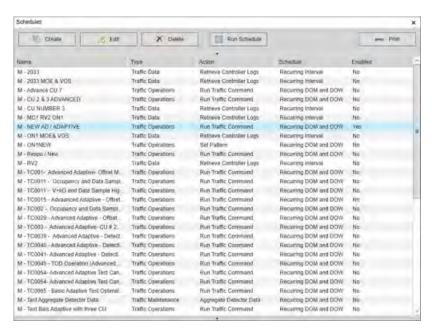


Figure 6-11: Schedule Summary View

6.3.3.1 Schedule Summary

- 1. To access the Schedule Summary: **Management > Schedules > Schedule Summary.**
- 2. Select a **Column Name** to sort column alphabetically by whatever criteria is located under the column.
- The default view showcases the name of a schedule, the type of schedule, the action to be performed by the schedule, the schedule frequency, whether the schedule is enabled or not, and the description, if provided by the user.

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4. Use the **Filter** to search and isolate any profile(s).

6.4 SIGNAL PATTERN CONTROL

The **Signal Pattern Control** window details the current operational status and all active sources of operational commands. In this manner, the user can better understand why asignal Controller is in the current operational mode. The Signal Pattern Control windowreveals the hierarchy of command sources by listing the command sources in categorical priority.

If two distinct command sources of equal category are set to issue conflicting operational patterns, the Signal Pattern Control issues the command issued by the source with the highest relative priority. The list of operational command sources includes: Current pattern and command source, manual pattern, regional patterns, special events, responsive patterns, Adaptive patterns, and time-of-day patterns.

6.4.1 View Signal Pattern Control

1. Select: Traffic Controller Sub-Context Menu > Operations > Signal Pattern Control.

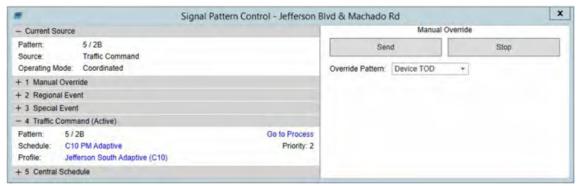


Figure 6-12: View Signal Pattern Control

6.4.2 Manual Override

Manual Override commands have the highest priority over all other sources of patterncontrol. Upon executing a manual override, all other command sources are ignored until the manual override is removed.

Table 6-13: Manual Override

Send	Selecting this button will result in the pattern selected in the override pattern dropdown being sent to the traffic Controller.
Stop	Selecting the stop button will remove the Manual Override Pattern. The trafficController will revert to the next pattern in the Signal Pattern Control hierarchyor if none, whatever the default local TOD schedule calls for.
Override Pattern	The pattern selected by the user to override the pattern currently running on a traffic Controller. After selection of the desired pattern, the Send button is selected to send it to the lane.

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6.4.3 Description of Signal Pattern Control Sources

6.4.3.1 Manual Override

As described above, a user initiated Manual Override overrides the established operational pattern of the selected intersection and continues this pattern until removed by the user.

Priority Level 1 – Manual override has a priority of one, which means it replaces all other categories as the active current source whenever activated.

6.4.3.2 Regional Event

This signal control source category can be initiated via the *Transparity* Center-to-Center (C2C) interface by a regional partner such as a Department of Transportation (DOT) that has legal jurisdiction over multiple agencies (e.g. FDOT and the Pensacola and Escambia agencies). This allows a DOT to join and coordinate the traffic Controllers on arterials belonging to multiple agencies to increase throughput for a disaster or sporting event.

Priority Level 2 – The regional event signal control source category has a priority of two which is higher than the category priority for the special events category, the traffic commands category, and the central schedule category.

6.4.3.3 Special Event

This signal control source category can be initiated via the *Transparity TMS* Scheduler by an agency if they need to coordinate the traffic Controllers on an arterial for a sporting event or disaster in the region which they have jurisdiction over.

Priority Level 3 – The special event signal control source category has a priority of three which is higher than the category priority for the traffic command and central schedule categories, respectively.

6.4.3.4 Traffic Command

This signal control source category can be initiated via the *Transparity TMS* Scheduler by an agency when they want to place a contiguous group of Controllers into an Adaptive, or Responsive mode.

Priority Level 4 – The traffic command signal control source category has a priority of four which is higher than the category priority for the central schedule category.

6.4.3.5 Central Schedule

This signal control source category can be initiated via the *Transparity* Scheduler by an agency to send a pattern to a traffic Controller or group of traffic Controllers.

Priority Level 5 – The central schedule signal control source category has a priority of five making it the lowest category priority and as such, must wait for all other categories to complete before it can execute its pattern as the current source.

6.5 GROUP PATTERN CONTROL

The **Group Pattern Control** window is similar to Signal Pattern Control; however, it details the current operational status for a Group of intersections rather than an individual intersection.

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This window enables users to confirm the operational pattern of each intersection within a group. Execution of Manual Override from this display issues a Manual Override Pattern to each intersection within the group.

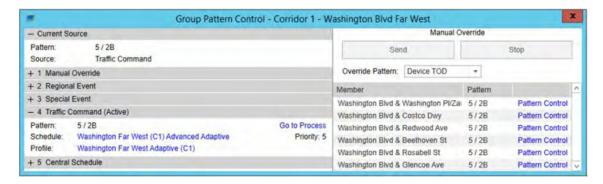


Figure 6-13: Group Pattern Control

6.6 TIME/DATE BROADCAST

The current time and date can be sent to a single traffic Controller, or multiple traffic con- trollers that belong to a coordinated control group:

6.6.1 Single Traffic Controller Broadcast

1. To broadcast the Time/Date to a single traffic Controller: **Device Explorer > Traffic Controllers dropdown menu > Operations > Broadcast Time/Date.**

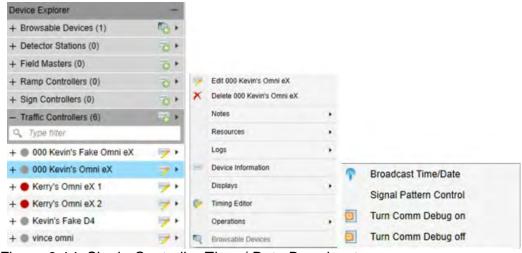


Figure 6-14: Single Controller Time / Date Broadcast

- 2. Right-click on the desired **Traffic Controller** to launch the sub-context menu.
- 3. Select **Operations** from the sub-context menu.
- 4. Select Broadcast Time/Date.

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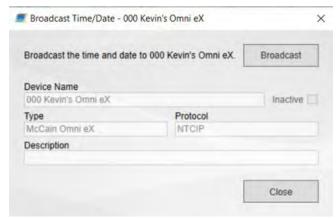


Figure 6-15: Single Controller Time / Date Broadcast

- 5. Click on the **Broadcast** button on the Time/Date Pop-up Box to send the currentTime/Date to the Traffic Controller.
- 6. Close the Broadcast Time/Date Pop-up Box.

6.6.2 Broadcast Time/Data to Individual Controllers

Table 6-14: Broadcast Time/Date to Single Controllers

Broadcast button	After selecting the Traffic Controller, the user wishes to send a time/date broadcast to, the 'Broadcast button' is selected to actuate the transmission.
Name	This is the name of the Traffic Controller for whom the user wishes to send the Time/Date Broadcast. The field is automatically populated when the user initiates the sub-context menu from the traffic Controller located under the '\Traffic Devices\Traffic Controllers'.
Туре	The type of traffic Controller. The field is automatically populated when the user initiates the sub-context menu from the traffic Controller located under the '\Traffic Devices\Traffic Controllers'.
Protocol	The NTCIP protocol used to communicate with the Traffic Controller.
Description	This contains the non-required description of the Traffic Controller.
Close button	After the Time/Date Broadcast has been sent, the user can close the popup window.

6.6.3 Multiple Traffic Controller Broadcast

 To broadcast the time/date to multiple traffic Controllers that belong to accordinated control group:
 Communications > Broadcast Time/Date Menu.

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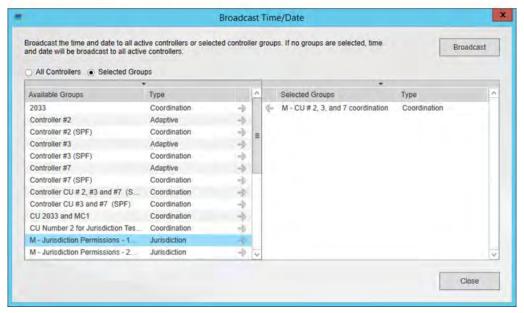


Figure 6-16: Multiple Controller Time / Date Broadcast

- 2. Launch the Broadcast Time/Date coordinated control group pop-up box.
- 3. Select all control groups.

OR

- 2. Select specific control groups for the broadcast.
- 3. Click on the **Broadcast** button to send the current Time/Date to the selected Traffic Controller Group(s).
- 4. Close the Broadcast Time/Date Pop-up Box.

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6.6.4 Broadcast Time/Data to Selected Groups

Table 6-15: System Administration – Broadcast Time/Data to Select Groups

All Controllers	Selecting this radio button will send the time/date broadcast to all Controllers listed in the Available Groups pane.
Select Groups	Selecting this radio button will send the time/date broadcast to select Controller groups.
Filter	A filter can be applied to help locate 'Available Groups' or Traffic Controllers, or "Selected Groups' of Traffic Controllers.
Traffic Controller Groups	Traffic Controllers Groups can be moved from the 'Available Groups' pane to the 'Selected Groups' pane to enable them to receive Time/Date Broadcasts.
Broadcast button	After selecting the Controller groups, the user who wishes to send a time/date broadcast to the 'Broadcast button' is selected to actuate the time/date transmission.
Close button	After the Time/Date Broadcast has been sent, the user can close the pop-up window.

6.7 REMOTE DOWNLOADS

Transparity TMS and supporting local Controller software permit users in the field to request a download of all timing parameters from the central system. This feature is referred to as "Remote Download."

During the remote download process, users of *Transparity TMS* are not permitted to update device timing (i.e. upon launching the Timing Editor the user is in "read only" mode). Once the process is complete, the activity lock on the select Controller is removed.

The instructions below provide guidance for requesting a remote timing download for each local Controller program type:

6.7.1 McCain Omni eX (version 1.9 and later)

1. From the Controller Front Panel navigate to: B. MISCELLANEOUS > 2. DB MANAGEMENT > 2. REQUEST DOWNLOAD

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2. Press Y to confirm the request

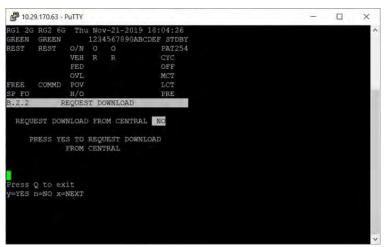


Figure 6-17: Omni eX Front Panel view through PuTTY

- 3. Omni eX will now wait for central to receive the request and begin the download. During this time, a timeout will be displayed on the screen.
- Once the download is complete, the Front Panel will indicate DOWNLOAD COMPLETED. Press ESC to return to Download Menu.

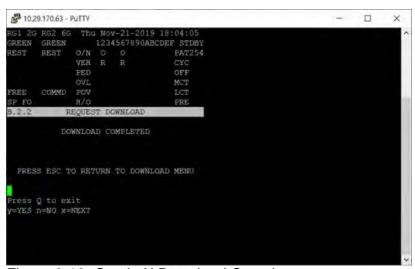


Figure 6-18: Omni eX Download Complete

6.7.2 McCain 2033

Supported version numbers are McCain 2033 RV, and McCain 2033 NY. From the Controller Front Panel:

1. From the Main Menu navigate to (9) Utilities.



- 2. Select **Option D** for Automatic Download.
- 3. Select **YES** to initiate the download.
- 4. The Front Panel will show "Download in Progress."
- 5. Upon completion, the front panel will indicate "Download Complete."

6.7.3 170 Programs (McCain 223, McCain 233 RV, McCain 233 MC)

Supported version numbers are McCain 233 RV 2.1E, and McCain 233 MC 1.H.From the Controller Front Panel:

- 1. Access memory location: C\0+0+4.
- 2. The **Front Panel** shall indicate a value of **zero** (0), by default.
- 3. Enter any value other than zero into the C\0+0+4 memory location.
- 4. The **Front Panel** shall indicate a value of **255** once the download process is initiated.
- 5. The **Front Panel** will indicate a value of **zero (0)** upon completion of the timing download.

6.3.2 Disable Remote Downloads

Transparity TMS provides a way to disable administratively at a system level the functionality to respond to such requests from the field devices. This is useful for administrators who wish to have more control over how and when timing is managed.

1. Open **Application Options** and navigate to **Devices**.

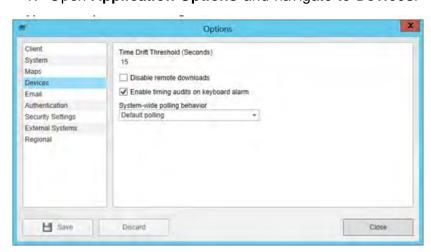


Figure 6-19: Disable Remote Downloads

- 2. Select Disable remote downloads.
- 3. Click Save.

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6.8 SERVICE TASKS

The *Transparity* Service Task window is used to create tasks for certain types of efforts that require scheduling and tracking to ensure they are started and completed by an established start and due date.

6.8.1 Create a Task

This window allows the user to enter all pertinent data related to a task they wish to schedule.

- 1. To create a service task: Home > Management > Tasks > Create Task.
- 2. Click each of the expand buttons to ensure all entries are complete. All fields marked with a red dot are mandatory.
- 3. Select the **Type** of the service task you would like to create.
- 4. Click Save after entering all required data into the 'Create Service Task" window.

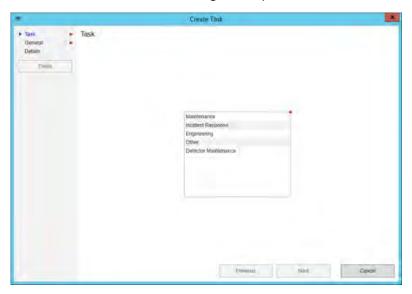


Figure 6-20: Select Task Type

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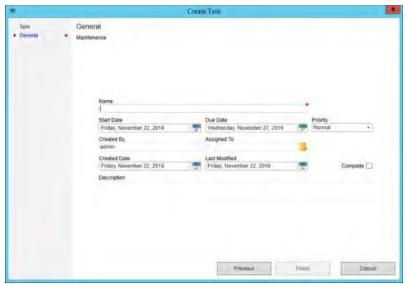


Figure 6-21: Create Service Task

6.8.2 Task Properties

Table 6-16: Create Task Properties

Name	Name assigned to the Service Task (i.e. Field Master Preventative Maintenance Service Task)
Туре	The type of service task being created: • Maintenance • Incidence Response • Engineering • Other • Detector Maintenance
Start Date	The weekday, month, month day and month year a service task is to start.
Due Date	The weekday, month, month day and month year a service task is to be completed.
Priority	The priority, or urgency assigned to the completion of the service task. Theuser can select from three levels of priority: • Low • Normal • High

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Created By	Designates the User that created the service task.
Assigned To	Launches a window that contains a list of users that can be assigned the service task.
Associated Device	The name of the traffic Controller, or field master that the service task is being created for.
Created Date	The weekday, month, month day and month year a service task is being created on.
Last Modified	The last weekday, month, month day and month year a service task was modified using the 'Edit Service Task – Incident Response Service Task' interface.
Completed Checkbox	When a service task has been completed a checkmark is placed into the completed check box

6.8.3 Task Summary

The Service Task Summary allows users to view and filter through existing service tasks. It also provides an easy interface for creating, editing, and deleting.

- 1. To access the Schedule Summary: Home > Tasks > Task Summary
- 2. Use buttons Create, Edit, or Delete.
- 3. Right-click on a summary item, or select one of the summary buttons enables thefollowing capabilities:
 - Create a Task,
 - Edit (Selected) Task,
 - Delete (Selected) Task.
- 4. Use the **Filter** to search and isolate a particular schedule profile(s).



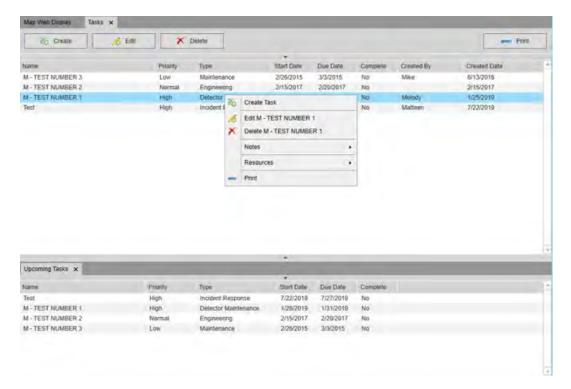


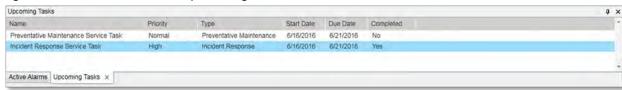
Figure 6-22: Task Summary with Upcoming Tasks Pane Open

6.8.4 Upcoming Tasks

The Upcoming Tasks window allows users to view existing service tasks.

- 1. To view the Upcoming Service Tasks: Home > Management > Tasks > Upcoming Tasks.
- 2. In the bottom workspace of the **Create Task** window the user may observe all completed and uncompleted Upcoming Tasks.
- 3. Tasks can be added and deleted in the Upcoming Task interface using the 'Create Task' and the 'Task Summary' interfaces and the following commands:
 - Edit (Selected) Task.
 - **Delete** (Selected) Task.

Figure 6-23: Service Task Upcoming Tasks



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7. COMMAND PROFILE

Command Profiles are configuration records describing some advanced traffic operation, i.e. forms of intersection coordination above and beyond what basic static intersection coordination configuration allows. There are three types of Command Profiles: Traffic Responsive, Basic Adaptive, and Advanced Adaptive.

Traffic Responsive, is an older style of advanced traffic operation. Instead of changing the cycle length and offset dynamically within a coordination plan, it can change coordination plans based on changing traffic volume (not speed). It doesn't have the fine tuning that Adaptive has, but if volumes drastically change, Traffic Responsive is better suited to adjusting. This is because it can change coordination plans which can be configured quite differently, whereas Adaptive just adjusts incrementally with an upper bound on how much it can adjust per cycle.

Adaptive is a traffic management strategy in which traffic signal timing changes, or adapts, based on actual traffic demand. This is accomplished using an Adaptive traffic control system consisting of both hardware and software. ADAPTIVE provides a set of tools that can be used to achieve Adaptive operations that adjust cycle length, splits, and offsets to real time trends in traffic. These tools use Adaptive profiles, which are a strategy that can be scheduled to run on a selected group of controllers.

There are two types of Adaptive profiles.

A basic Adaptive system adjusts cycle lengths, offsets, and splits based on demand as measured from standard detectors at individual intersections. The basic Adaptive profile does not require system detection. This type of profile starts by implementing a user configured base pattern and then incrementally adjusting the splits, offsets, and cycle length.

Basic Adaptive is sometimes referred to as Traffic Adaptive. It is a form of intersection coordination run around peak traffic hours to dynamically adjust the preconfigured cycle times so that as speed changes on a major street, the coordination plans adjust so that you can still make green lights, or that side streets aren't waiting overly long times for service.

An advanced Adaptive system uses the same split and cycle length calculation routines as the basic Adaptive system. The advanced system differs from the basic Adaptive system in that it uses system detectors to monitor for sudden changes in traffic volumes and directionality.

Between Basic and Advanced Adaptive, Advanced has more requirements in terms of up-front configuration and detection at the intersection. This is also where Advanced Adaptive shines. It grew from the realization of the limitations of traditional (i.e. Basic) Adaptive and Traffic Responsive. Not only does Advanced Adaptive require more detection than Basic, but it actually does a form of Traffic Responsive as well. It adjusts cycles and offsets within thresholds. But if a threshold (volume of traffic between intersections) changes drastically enough, it will call for a new coordination plan. In this way, you get the best of both worlds.

The *Transparity* Command Profile walks the user through a series of setup steps to capture all the necessary configuration data to create a Command profile.

7.1 Initial Conditions

Robust communications are critical to the optimal performance of the Adaptive system. Make sure all Controllers are online and communicating in *Transparity*.

Timing: Make sure the timing in the system matches the timing in the field. The group that runs Adaptive should have at least one coordination pattern to use as a starting point, where all

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Controllers use the same pattern # and have the same cycle length.

Detection: Critical to the optimal performance of the Adaptive system. All detectors at each intersection should be identified by phase, location, approach, and lane, (i.e. Vehicle Detector 2 = Phase 2 EB Advance, lane 1).

System Detectors are used to monitor traffic volumes that are in a location where we get the best indication of traffic volume and speed on the corridor.

7.1.1 Detection

Map out your detectors at each intersection. The ideal detection for Adaptive is advanced detectors for through lanes, one discrete input per lane. If advanced detection is not available, limit line can be used.

Identify detectors on the corridor that can be used as System Detectors. For the best performance these should be midblock or advanced detectors on discrete inputs.

Designating Adaptive Detectors: Open the **Timing Editor** and go to the **VehicleDetectors** page. Check the detectors which have been identified as Adaptive detectors (ideally, advanced detectors).

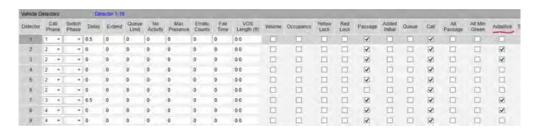


Figure 7-1: Designating Adaptive Detectors

7.1.2 Adaptive Group

1. Select: Groups > Create Group.

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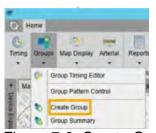


Figure 7-2: Create Group

2. Name the **Group** and select **Type Adaptive**.



Figure 7-3: Select Type Adaptive

3. Add Controllers to the Group.



Figure 7-4: Add Controllers to the Group

7.1.3 Create Arterial Route

1. Select: Arterial > Arterial Route Builder.

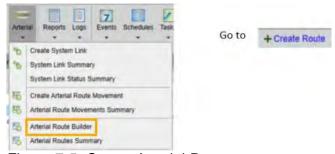


Figure 7-5: Create Arterial Route

2. Select the **Controllers** in your group along the corridor to be added to the Arterial Route in order. The selected Controllers (Arterial Route Nodes) will turn blue.

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Figure 7-6: Select Controllers in Group

3. As you select the **Nodes** in order, the Route Builder automatically creates **Forward System Links** on the left side.



Figure 7-7: Create Forward System Links

4. Open the **Details Pane** by clicking the grey ribbon at the bottom of the Window.



Figure 7-8: Open Details Pane

- Arterial Route Properties: Here you can name the Route.
 Make sure to select Two-Way. When Two-Way is selected it will create Reverse System Links.
- 6. Route Item Properties: As you click on Links on the left side above, you have the opportunity to select the Movement, Direction, Lanes, Design Speed, Capacity, and Length (in feet). You can also set Congestion Properties and Assign Detectors to the Link, but it is not necessary for Adaptive.

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Figure 7-9: Select Route Properties

7. **Arterial Route Movements:** An Arterial Route Movement specifies the phase (or overlap) that is traversed through when travelling from one system link to the next.

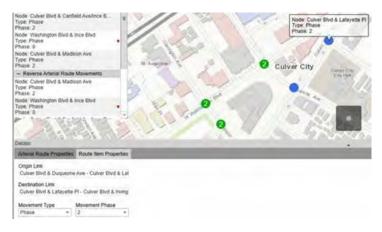


Figure 7-10: Arterial Route Movements

8. Save the Arterial Route.

7.1.4 Create System Detectors

1. Click Create System Detector under Data Collectors.



Figure 7-11: Create System Detector

2. Name the **Detector** and select the appropriate **Controller**. Assign the detector number in the Controller that is associated with the field detector.

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Figure 7-12: Name the Detector

3. Location can be left blank unless you want an icon on the map. Assign the Movement, Direction, Detector Type, and Lane. Lane Capacity relates to what is used as 100% Threshold. This number is multiplied by the Weighing Factor. Thresholds can be set to determine a reasonable range for valid data (usually leftdefault).



Figure 7-13: Configure Detector

- 4. To run Advanced Adaptive there must be at least 4 system detectors (2 per direction).
- 5. Any Controller detector using a system detector must be configured for Volume and Occupancy in the Controller timing.



Figure 7-14: Configure Volume and Occupancy

7.1.5 Configure the Tru-Traffic Diagram

- 1. First, create the a KML file in Google Earth.
- 2. Under Places > Right click My Places > Add > Folder.

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Figure 7-15: Add Places Folder

3. Once you have added and named the folder, click **Add Placemark** to begin adding intersections.

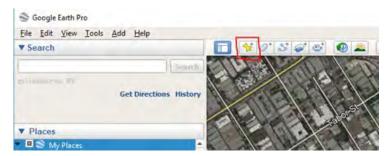


Figure 7-16: Add Placemark

4. Add a Placemark at each intersection in your corridor and name it appropriately. Once all placemarks have been added, use the Places section on the left to drag the new place marks into the folder you created in the previous step. Right Click on the folder and Save Place As. Name the file and save as type KML.

7.1.6 Tru-Traffic

1. First make sure each Controller in your corridor is assigned a unique **Tru-Traffic Id.**

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Figure 7-17: Assign Tru-Traffic ID

2. If not installed on the server already, download and install the latest Tru-Traffic software from www.tru-traffic.com. Make sure you obtain a valid license.

7.1.6.1 Creating the Tru-Traffic DGM File

- 1. Open Tru-Traffic and go to **File > Open**. Select type KML and open the file you created.
- 2. Connect dots to create arteries or click **Automatically Trace Routes** and **Create.**



Figure 7-18: Create Arteries

3. Click on View Network Parameters.



Figure 7-19: View Network Parameters

4. **Set the Cycle Length** (this should match the cycle length of the Adaptive base pattern).

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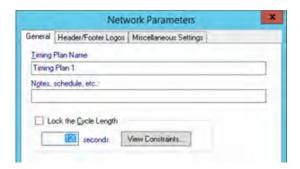


Figure 7-20: Set Cycle Length

5. Click on View Outline.

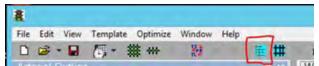


Figure 7-21: View Outline

6. Click on the first intersection in the Arterial Outline.

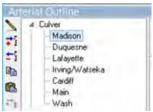


Figure 7-22: First Intersection

 Set the Id Number (this should match the TruTraffic Id in Transparity). Set the Reference Point to Start of first through movement yellow. Choose one of the intersections in the corridor to have Offset Locked.

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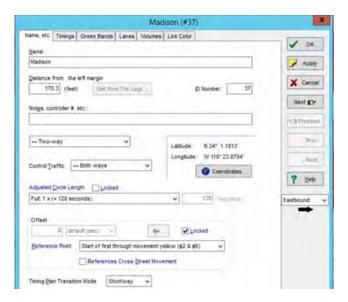


Figure 7-23: Configure ID Number

8. Open the **Timings** tab and set the phasing and split times. It helps to have the Group Timing Editor open.

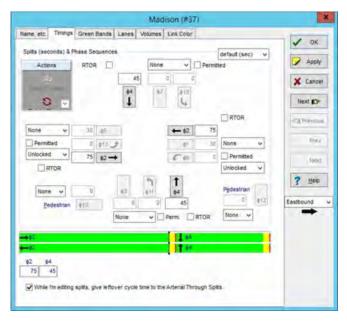


Figure 7-24: Configure Phasing and Split Times

9. Go to the **Green Bands** tab and set the **Speed** to your desired speed. The other tabs are not necessary.

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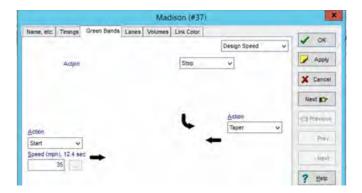


Figure 7-25: Set Speed

 Repeat for each intersection in the arterial. Once all changes have been applied, save the file as type DGM. DGM files should be saved to the Transparity Data folder.

7.2 Access the Command Profile

7.2.1 Create Command Profile

1. To access the Command Profile wizard, select: **Devices & Displays > Arterial** > **Create Command Profile**.

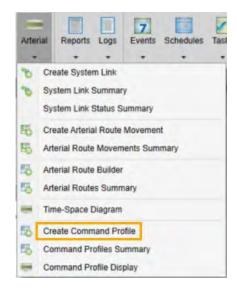


Figure 7-26: Create Command Profile

2. Use the wizard to walk through adding the necessary data to create a new **Command Profile**. Users may easily return and update any of these later.

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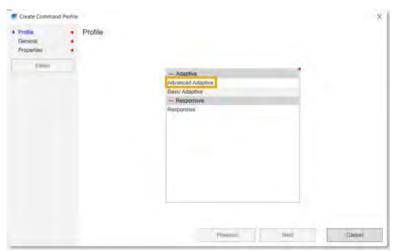


Figure 7-27: Create Advanced Adaptive Profile

- Use the wizard to walk through adding the necessary data to create a new Basic Advanced, Traffic Responsive, or Advanced Adaptive Profile. Users may easily return and update any of these later. In this example, we create an Advanced Adaptive Profile.
- 4. Complete the General fields
 - a. Name: Create a name for the Advanced Adaptive Profile.
 - Group: The control group created to represent the traffic Controllers included in the Advanced Adaptive Profile.
 - c. If desired, include a brief **Description** to help better identify the profile.
- 5. Click Next.

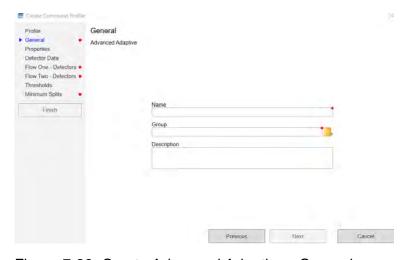


Figure 7-28: Create Advanced Adaptive - General

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7.2.2 Advanced Adaptive Properties

- 1. Enter the appropriate data in the **Advanced Adaptive Properties** window fields:
 - a. **Max. Cycle Delta (sec):** Max # of seconds the cycle length can change from previous. Default = 15 seconds.
 - b. **Consecutive Max Count:** # of times a phase must consecutively max out/force off before requesting more time.
 - c. Consecutive Gap Count: # of times a phase must consecutively gap out before requesting less time.
 - d. Optimal Gap Range (%): percentage of the split time in which a gap out is recognized for requesting a decrease, i.e. an Optimal Gap Range of 90% means that a gap is not considered for a split decrease if it happens within the last 10% of the split. Default = 90%.
 - e. Adaptive Phase Step (sec): max # of seconds by which the split can be increased/decreased. Default = 4.
 - f. Cycle Update Interval (#): minimum # of consecutive cycles between cyclechanges. Default = 1.

g. Offset Mode:

- Locked Pattern Offsets: The offsets do not change from the offsets in the base pattern.
- ii. **Optimize Fixed PWF**: The Tru-Traffic diagram uses a fixed Progression Weighting Factor.
- iii. **Optimize Calc PWF**: The Tru-Traffic DGM calculates PWF based on Flow1/Flow2 detectors. McCain Offset Optimization, or Tru-Traffic[®] Offset Optimization.
- 2. **Tru-Traffic Diagram (if applicable):** Browse to the diagram previously created you may need to add as a resource.



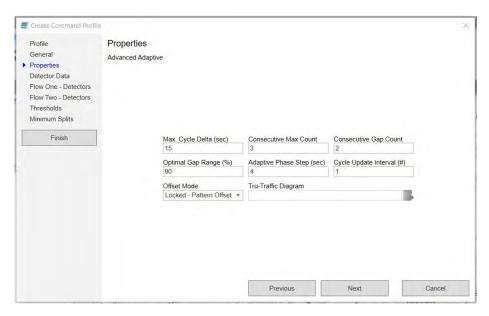


Figure 7-29: Advanced Adaptive - Properties

3. Click Next.

7.2.3 Detector Data

- 1. Select: Detector Data
 - a. Calculation Source.
 - b. Volume Capacity %: percentage of the Lane Capacity value configured in Detector Configuration.
 - c. Weighted Occupancy: percentage of Sys Detector Occupancy.
 - d. **V+kO**: Volume + (occupancy times a constant (k)).
 - e. Data Sample Mode: Average of all system detectors per flow or Highest system detector.
 - f. **Data Sample Period**: How often the data is aggregated and used for calculation.
 - g. Detector Fail Action: Determines what happens upon detector failure. Historical Data is last known good data, Terminate Adaptive returns the corridor to base pattern, Suspend Adaptive retains last Adaptive cycle and offset.
 - h. **Detector Fail Timeout**: # of minutes a detector is in a failed state before the Detector Fail Action is applied.



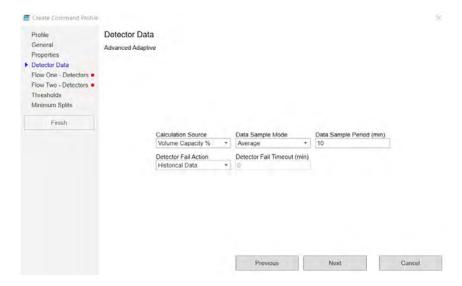


Figure 7-30: Advanced Adaptive - Detector Data

2. Click Next.

7.2.4 Flow One and Flow Two - Detectors

Flow One and Flow Two – Detectors: First, select the flow direction. Add the correct system detectors. You must have at least 2 Valid Detectors per flow. If the number of valid detectors drops below the Valid Detectors Threshold or if one of the detectors flagged as Critical has failed, the detector fail action is taken.



Figure 7-31: Flow One and Flow Two - Detectors

7.2.5 Thresholds

- 1. Click the **Add Threshold** button to add additional thresholds to the increasing or decreasing percentages.
- 2. Increasing: Threshold percentages entered by the user and the pattern numbers the user wishes to assign to them for increasing traffic volumes or occupancy levels. When the Flow One or Flow two detectors reach the configured percentage (defined by the Calculation Source configured in Detector Data) the specified pattern is commanded. Whenever a threshold is crossed, the system jumps to the base pattern specified and that base pattern begins to adapt from there. This allows the system to make cycle changes greater than the previously configured cycle max delta

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- when volumes or occupancy change quickly. The highest Flow is used. The cycle increase is limited to the max cycle value specified.
- 1. Decreasing: Threshold percentages entered by the user and the pattern numbers the user wishes to associate with them for increasing traffic volumes or occupancylevels. When the Flow One or Flow 2 Detectors drop below the configured percentage the specified pattern is commanded. It is advisable to use hysteresis by setting the decreasing threshold for a pattern to less than the increasing threshold for the next highest pattern to prevent the system from toggling back and forth ifthe measured data hovers around the threshold value.
- %: This indicates at what volume or occupancy level the pattern associated with it will be set as the current pattern running for all the traffic Controllers in the Traffic Responsive control group.
- 3. **Pattern:** Use the dropdown menu to select the pattern to be associated with the threshold percentage.
- Max: Cycle (sec): A number that represents the maximum cycle size in seconds.
- 5. **Deletes** a threshold.

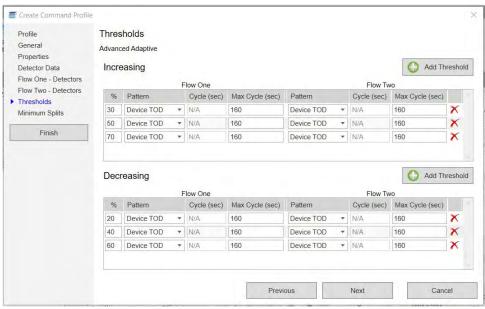


Figure 7-32: Advanced Adaptive Pattern Command Profile –Thresholds

6. Click Next.

7.2.6 Minimum Splits

For each Controller in the group this sets the lowest possible split that each phase can be reduced to in Adaptive. It is important to make sure the Min Split is not greater than the actual split

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in the Adaptive base pattern. It is helpful to have the Group Timing Editor open to verify split times. Also, it is important that the sum of split times for concurrent ring barrier groups add up to the same value, i.e. the sum of phases 1 & 2 should add up to the same as the sum of phases 5 & 6.

- 1. Select Minimum Splits.
- 2. **Group**: Pre-populated with the Adaptive Group selected in the General window.
- 3. **Controllers**: Pre-populated with the traffic Controllers that comprise the Adaptive Group selected in the General window.
- 4. Phase: Phase 1 through 8 is listed. Minimum Split values are listed for each.
- 5. **Min. Split (sec):** User enters the minimum split level for each phase (1 through 8) for each traffic Controller contained in the Controllers pane in the Splits window.
- 6. **Min. Cycle Time (sec):** Displays the minimum cycle time value rollup for all phases (1 through 8) on each traffic Controller displayed in the Controllers pane in the Splits window.

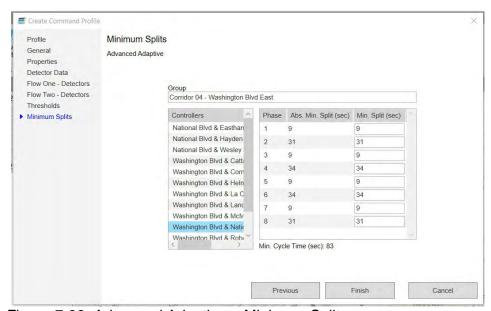


Figure 7-33: Advanced Adaptive - Minimum Splits

7.3 CREATE THE SCHEDULE

1. Select: Schedule > Create Schedule from the Home menu.

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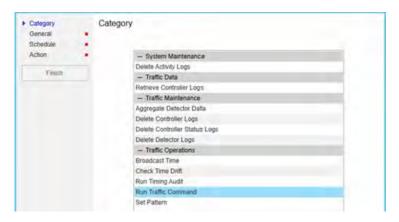


Figure 7-34: Create Schedule - Category

2. Select Run Traffic Command.

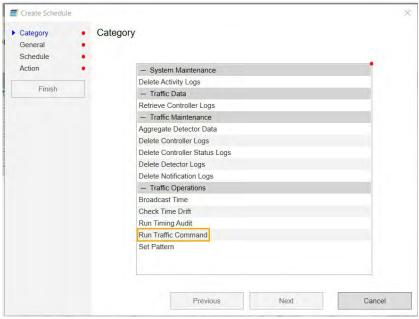


Figure 7-35: Run Traffic Command

7.3.1.1 Run Traffic Command

- 1. Name the Schedule, select Recurring TOD and DOW and make sure the schedule is Enabled.
- 2. Set the Days of Month, Months of Year and Days of Week, as well as the start time and end time.

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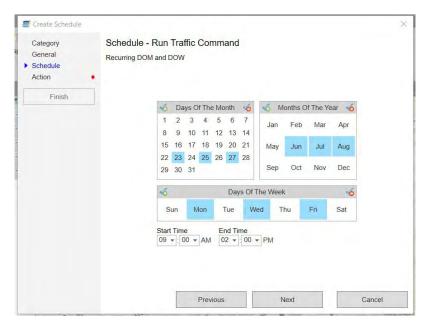


Figure 7-36: Schedule - Run Traffic Command

3. **Action:** Select the Traffic Command Profile that was previously created and set the Priority. If multiple traffic command profiles are active for a certain group at the same time, the Traffic Command with the highest priority will be the active one.

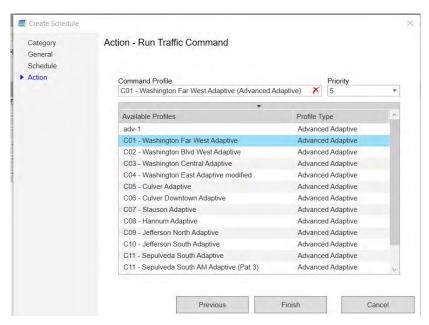


Figure 7-37: Action - Run Traffic Command

7.4 RUN ADAPTIVE MANUALLY

1. Select Schedules > Schedule Summary.



2. To immediately start the Adaptive profile, click on the schedule the runs the command profile and select **Run Schedule**.

7.5 TERMINATE ADAPTIVE MANUALLY

- 1. Select Settings in upper left corner next to Home and go to Processes.
- 2. Select the process that corresponds to the Command Profile and click **EndProcess.**

7.6 OBSERVING ADAPTIVE OPERATIONS

7.6.1 Command Profiles Summary

The Command Profiles Summary allows users to view a summary of all existing Com-mand Profiles as well as the basic information that describes the parameters that definetheir use. In addition, profiles may also be easily added, edited, or removed from this view.

- 1. Select Devices & Displays > Arterial > Command Profiles Summary.
- 2. All Command Profiles are listed in order by name
- 3. The default view also showcases the **Profile Type** (i.e. Advanced Adaptive, Traffic Responsive, or Basic Adaptive Pattern), name of the **Controller Group**, and any description information provided.
- 4. Use the **Filter** to search and isolate a profile(s).
- 5. From this view, users may easily create, edit, or delete existing profiles by selecting a command profile from the list and then click the button that corresponds withthe desired action.

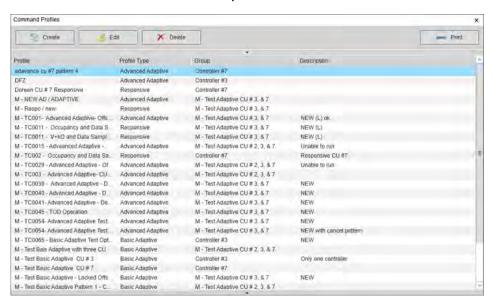


Figure 7-38: Command Profiles Summary View

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7.6.2 Command Profile Display

The **Command Profile Display** plots a trend line that indicates what the traffic volume oroccupancy percentage and is based on the last pattern update interval. Hovering thecursor over a plot point displays pertinent information related to the plot point.

- To access the Command Profile Display: Devices & Displays > Arterial > Command Profile Display
- Select the Adaptive Command Profile you wish to observe, as well as the Date, Time, and Duration.
- 3. If the Adaptive Profile is **Advanced Adaptive** you can select **Cycle Length** or **Pattern Threshold**.
- 4. Click **Update Diagram** after selecting the **Command Profile** and **Date/Time/Duration**.
- 5. Checking the **Real Time** box causes the display to automatically update once every cycle.

7.6.3 Cycle Length Display

Selecting **Cycle Length** under **Display** on the Command Profile Display screen plots a trend line in black that indicates what the cycle time is at a given point within the start and stop time selected for observation. Hovering the cursor over a plot point displays pertinent information related to the plot point, as seen in Figure 7-39 below.

The display is updated once per cycle, at the Master Cycle Zero point. Clicking on any dot in the display shows the calculation results for that cycle. It also shows the max cycle and min cycle for the current Adaptive pattern.

The lower Data portion of the display shows what the calculated cycle time is for the chosen master cycle zero time. For that calculation point, it shows each Controller's cycle request, current, and next offset, and whether the Controllers were in Transition or Preemption. A Status of Active means that the Controller's Adaptive split calculation routine is running and Adaptive is engaged. Active Pending means the Controller has suspended split adjustment and is attempting to get back into active mode (usually due to recovery from a transition or preemption). Unknown means the Controller is not communicating.

Error Cycle or Error Split means that there was an error in the calculation; normally, this is due to a miscalculation when setting up the Min Splits.

Clicking on any Controller in the list will bring up the split calculation display on the right side. This will show for each phase what the previous Adaptive split was versus what the phase used, and the minimum split. Demand shows whether the demand has increased or decreased based on gap/max out. Trend shows once a phase has reached its consecutive max count or consecutive gap count. If an upward trend has been established, the system will increase the split time for that phase. Likewise, a decreasing trend decreases the split time. The new split time shows up in the Issued column.

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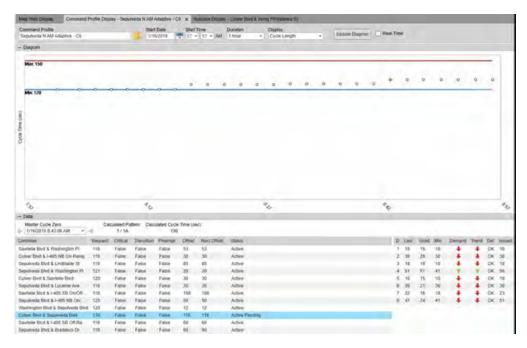


Figure 7-39: Adaptive Display - Cycle Data

7.6.4 Pattern Threshold Display

If running Advanced Adaptive mode, selecting **Pattern Threshold** under **Display** in the Command Profile Display screen shows the results of the system detector calculation. Each dot in the diagram corresponds to a calculation point (based on what was configured for Data Sample Period). The calculation point shows the percentage of the Lane Capacity value configured in Detector Configuration. This value is either the average of all flow detectors, or the highest of all flow detectors depending on what is configured in the profile. The calculation for each flow is shown.

You can observe where the calculation falls with respect to the configured thresholds for each pattern change. The yellow dotted lines represent increasing thresholds, while the blue dotted lines represent decreasing thresholds.

The data section below shows the primary directional flow for each calculation point, as well as the associated Pattern. The percentage of lane capacity for each flow is shown. The difference between flow one % and flow two % is used to determine the primary direction, as well as directional volume %.

The right display shows the data collected for each detector. The VOS period is configured in the Controller timing in Log Configuration.

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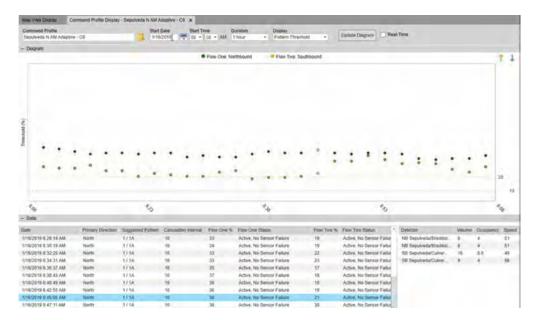


Figure 7-40: Pattern Threshold Display

7.6.5 Command Profile Logs

Refer to "Command Profile Log" on page 184 for details on viewing logs related to Command Profile operations.



8. ADVANCED SIGNAL PERFORMANCE MEASURES

Transparity TMS provides a mechanism for collecting and storing log data from the traffic Controller in addition to formatting the data and producing reports.

This section provides an overview of:

- "Use the Reports Interface" below
- "System Reports" below
- "Device Log Files" on page 183
- "Time-Space Diagram" on page 188

8.1 Use the Reports Interface

Transparity Reports allow users to select from a list of pre-configured reports. When a report is selected from the Reports menu, the user may customize the report data (such as desired traffic Controllers or detectors) and to select the desired date range.



NOTE: Remember that reports are run based on existing system data. Reports do not generate any new data.

Data comes from user activities, device configuration data, and device logs.

8.2 SYSTEM REPORTS

8.2.1 Split MOE Report

This report shows the time of each phase.

- To create the report: Reports & Logs > Reports > Split MOE Report.
- 2. Click the File icon to locate the desired Controller.
- 3. Double-click the desired traffic **Controller**.
- 4. Enter a Start Time and End Time.
- 5. Click Run.



Figure 8-1: Running a Split MOE Report



8.2.2 System Detector VOS Report

This report shows all VOS data collected by the system

- To create the report: Reports & Logs > Reports > System Detector VOS Report
- 2. Select the desired traffic Controller(s).
- Move the Controller(s) from Available Detectors > Selected Detectors by using the arrow buttons.

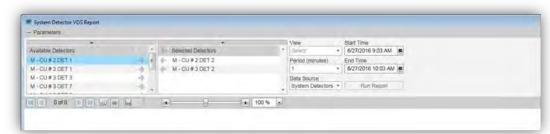


Figure 8-2: :System Detector VOS Report

- 4. Select the desired **View** from the dropdown menu occupancy (%), speed (mph), or volume (counts).
- 5. Select a **Period** (in minutes) from the dropdown menu.
- 6. Enter a Start Time and End Time.
- 7. Click Run Report.

8.2.3 Link Detector VOS Report

This report shows all VOS data collected for a set of links.

- To create the report: Reports & Logs > Reports > Link Detector VOS Report.
- 2. Select the desired link(s) by clicking Add Links.
- 3. Select the desired **View** from the dropdown menu **occupancy** (%), **speed** (mph), or **volume** (counts).
- 4. Select a **Period** (in minutes) from the dropdown menu.
- 5. Enter a Start Time and End Time.
- 6. Click Run Report.

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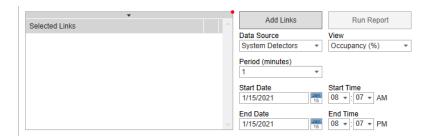


Figure 8-3: Link Detector VOS Report

8.2.4 Speed Trap Report

This report shows all Speed Traps collected by the system.

- 1. To create the report: Reports & Logs > Reports > Speed Trap.
- 2. Select the desired Speed Trap(s) by clicking Add Speed Traps.
- 3. Select a **Period** (in minutes) from the dropdown menu.
- 4. Enter a Start Time and End Time.
- 5. Click Run Report.

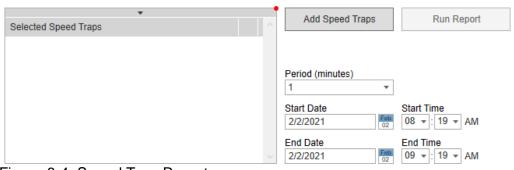


Figure 8-4: Speed Trap Report

8.2.5 Turning Movement Count

This report is part of a traditional Traffic management solution, so it is included in the *Transparity* desktop menus. It is a hyperlink to a report in the Web UI.

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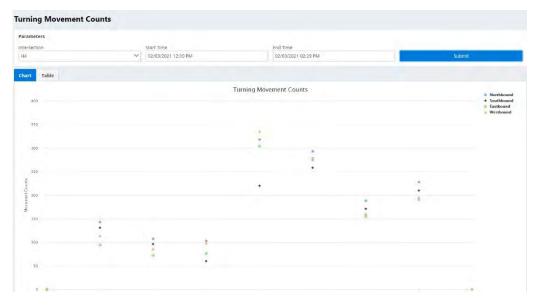


Figure 8-5: Turning Movement Count Report

8.2.6 Peak Hour

This report is part of a traditional Traffic management solution, so it is included in the *Transparity* desktop menus. It is a hyperlink to a report in the Web UI.

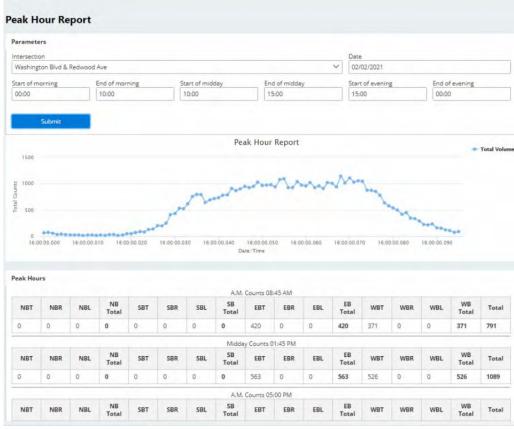


Figure 8-6: Peak Hour Report

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8.2.7 BlueTOAD Travel Time Report

This report shows the BlueTOAD Travel Time collected by the system.

1. To create the report: Reports & Logs > Reports > BlueTOAD Travel Time.



Figure 8-7: BlueTOAD Travel Time Report

8.3 DEVICE LOG FILES

8.3.1 Traffic Controller MOE Log

- 1. To view the log, select: Reports & Logs > Logs > Traffic Controller MOE.
- 2. Select the desired traffic Controller.
- 3. Enter a Start Time and End Time.
- 4. Click Run.



Figure 8-8: Traffic Controller MOE Log

8.3.2 Traffic Controller Log

- 1. To view the log: **Reports & Logs > Logs > Traffic Controller**.
- 2. Click the folder button to locate the desired Controller.
- 3. Select the desired traffic Controller.
- 4. Click OK.
- 5. Enter a Start Time and End Time.
- 6. Click Run.

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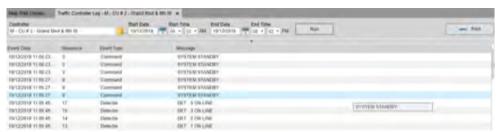


Figure 8-9: Traffic Controller Log

8.3.3 Command Profile Log

- 1. To view the Command Log: Home > Reports > Command Profile Log.
- 2. Select the desired Command Profile.
- 3. Enter a Start Time and End Time.
- 4. Select the Run button.
- 5. Use Filter (see expansion arrow) to refine search.
 - A. Select the **Print** button to print the summary listing.
 - B. When you click the **Print** button on any summary page, you get an options window before the Print Preview generates. On the Styles page, you can see the header background and foreground options.

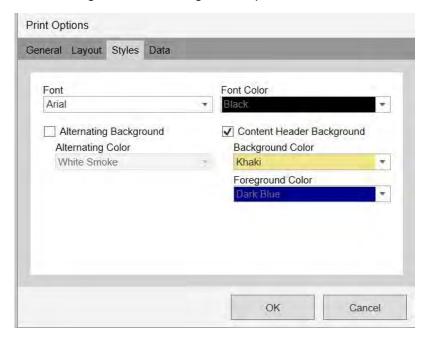


Figure 8-10: Print Options

You can see them applied on the print preview.

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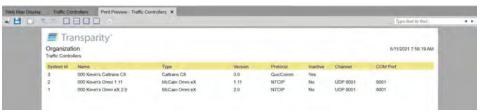


Figure 8-11: Print Preview

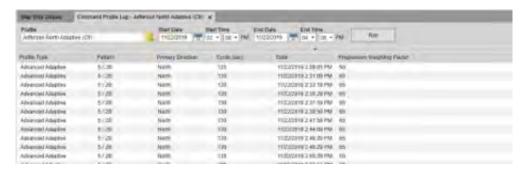


Figure 8-12: Command Profile Log

8.3.4 Command Threshold Log

- 1. To view the log: **Home > Reports > Command Threshold Log.**
- 2. Select the desired Command Profile.
- 3. Enter a Start Time and End Time.
- 4. Use **Filter** (see expansion arrow) to refine search.
- 5. Select the **Run** button to generate the Command Threshold Log.
- 6. Select the **Print** button to print the summary listing.



Figure 8-13: Command Threshold Log

8.3.5 Activity Log

- 1. To view the log: **Home > Reports > Activity Log.**
- 2. Enter a Start Time and End Time.
- 3. Select the **Run** button to generate the Activity Log.

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- 4. Use the **Filter** to search and isolate a particular profile (See expansion arrowin graphic below).
- 5. Select the **Print** button to print the summary listing.

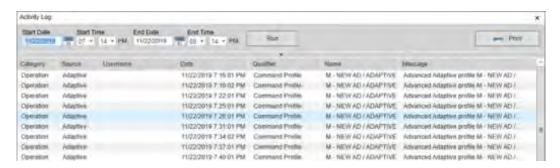


Figure 8-14: Activity Log

8.3.6 Comm Error Log

- 1. To view the log: Home > Reports > Comm Error Log.
- 2. Select the desired traffic Controller.
- 3. Enter a Start Time and End Time.
- 4. Click Run.
- 5. Use the **Filter** to search and isolate a particular profile.
- 6. Select the **Print** button to print the summary listing.



Figure 8-15: Comm Error Log

8.3.7 Vehicle Detector Speed Log

1. To view the log: Reports & Logs > Logs > Detector Speed.

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Figure 8-16: Detector Speed Log

- 1. Click the folder button to locate and select the desired traffic **Controller**.
- 2. Click OK.
- 3. Enter a Start Time and End Time.
- 4. Use **Filter** to refine search.
- 5. Click Run.
- 6. Select the **Update Speed Data** button to update the data.
- 7. Select the **Print** button to print the summary listing.

8.3.8 Vehicle Detector VOS Log

This report shows collected volume, occupancy, and speed (VOS) data.

- 1. To view the log: Reports & Logs > Logs > Detector VOS.
- 2. Click the folder button to locate the desired traffic **Controller**.
- 3. Select the desired traffic **Controller**.
- 4. Click OK.
- 5. Enter a Start Time and End Time.
- 6. Use Filter to refine search.
- 7. Click Run.
- 8. Select the Update VOS Data button to update the data.
- 9. Select the **Print** button to print the summary listing.
- 10. Click Run.

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Figure 8-17: Detector VOS Log

8.4 TIME-SPACE DIAGRAM

The Time-Space Diagram is a critical tool for Traffic Engineers in the ongoing operation of a traffic management center. It illustrates the bandwidth of coordinated movements over distance and time. In *Transparity TMS*, users may view the bandwidth of real-time status, historical data, or programmed signal timing data.

To open the Time-Space Diagram: Arterial > Time-Space Diagram.

Usage of the Time-Space Diagram assumes the user has already created a route using the Arterial Route Builder. This ensures the proper links and movements are used in plotting the used or programmed green times.

8.4.1 Use the Time-Space Diagram Interface

The Time-Space Diagram view is made up of two regions: a top horizontal parameters "header" bar and the main body directly below, used to visualize the green time for the phase movements specified in the arterial route.

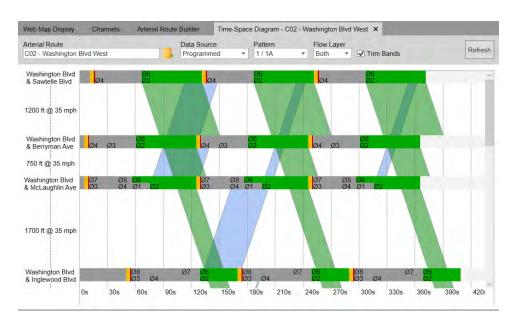


Figure 8-18: Time-Space Diagram

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The header bar parameters change based on the mode in which the Traffic Engineer wishes to work; that is, based on the Data Source selected, parameters may be hidden or shown. *In all cases the Arterial Route and DataSource parameters are shown and required.*

8.4.1.1 Parameters for Programmed Data Source

With this option checked, Pattern becomes a required parameter, displayed as a drop-down of available patterns. Parameters for other Data Sources are hidden.

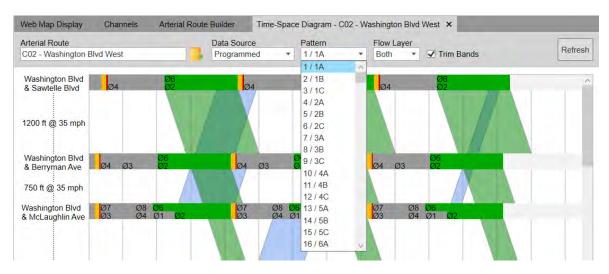


Figure 8-19: Dropdown of Available Patterns

8.4.1.2 Parameters for Historical (MOE) Data Source

With this option checked, Start Date, Start Time, and Duration become required parameters. Parameters for other Data Sources are hidden. Start Date default value is the current date, Start Time is 15 minutes prior to current time, and Duration default value is 15 minutes.

Duration is a dropdown of time increments from 1 minute to 15 minutes.

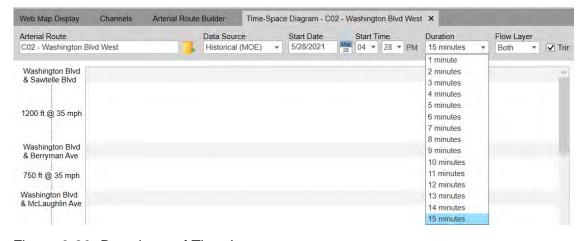


Figure 8-20: Dropdown of Time Increments

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8.4.1.3 Parameters for Real-Time Status Data Source

With this option checked, Start Date, Start Time, and Duration are disabled. New status data is retrieved by the view and rendered to the main body as updated bands.



Figure 8-21: Real-Time Status Data Source

8.4.1.4 View the Time-Space Diagram Graphics

The main body of the Time-Space Diagram is reserved for the rendered graphics of the green bands. It plots the relative distance between intersections and labels the distance and design speed per the user-defined link properties across the Y- axis. Along the X-axis is a time scale in seconds.

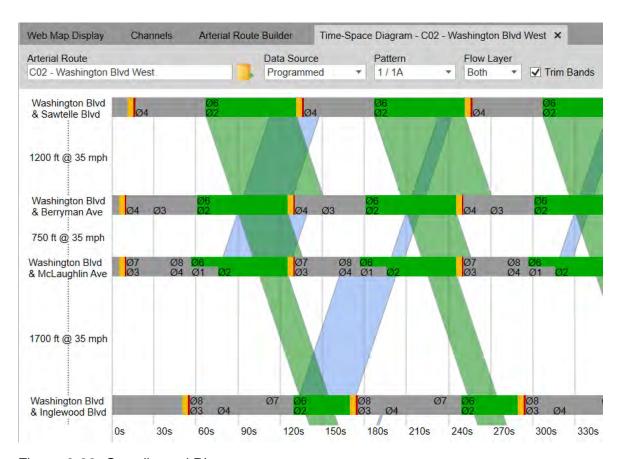


Figure 8-22: Coordinated Phases

The green, yellow and red duration of the coordinated phases is plotted and colorized on the timespace diagram. Clearance times are available on Programmed and Historical (MOE) views but may not be available on Real-Time Status.

Additionally, users can visualize the split duration of each non-coordinated phase. By hovering over a phase label, a tooltip appears that shows the green duration time for that phase.

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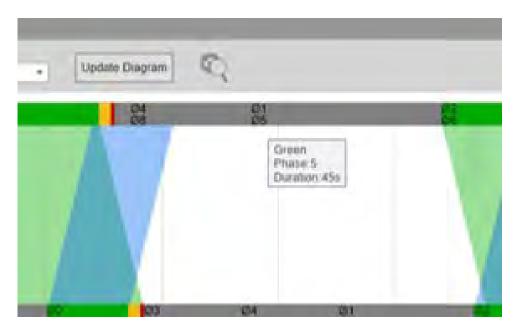
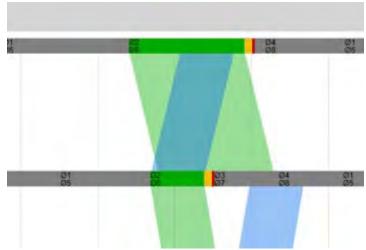


Figure 8-23: Green Duration Time

Just as distance between intersections is relative to the System Link distance between them, so is the slope of the bands according to the design speed of the link. The result of these two features is that the arrival of a green band on the next intersection should match real-world conditions, assuming actual speed matches design speed. Additionally, the band for the next link segment would visually line up if the engineer has designed for maximum throughput.





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EXAMPLE: In the above graphic, the green band of the head-end intersection (the top horizontal dark-grey bar) is given ample green time. You can see the travel projected with a slight skew, representing the speed over distance.

The green band from the arriving intersection (the next horizontal dark-grey bar) starts just prior to the anticipated arrival from the previous link, although it ends less than halfway through the green time of the prior movement. That means the remaining cars will encounter a red light when they arrive.

8.4.1.5 Colors on the Time-Space Diagram graphics

Forward flow bands are shown in green with a slight transparency. Reverse flow (the opposite direction) bands are shown in blue with a slight transparency. The two bands often overlap and are shown with a shaded blue-green color. A full accounting of the colors is shown in the following table.

Table 8-1: Time-Space Diagram Colors

Time-Space Diagram colors	
Forward flow bands	
Reverse flow bands	
Overlapping bands	
Yellow change	
Red clearance	
Split times	

8.4.2 View Programmed Data

In this mode, the user can look at the expected performance of a coordination plan on a pre-defined route using timing stored on the central server. The user can use the Timing Editor tools to ensure this timing data is sent to the intersections before the plan is put into effect.

- 1. Click the **File** icon to locate the arterial route.
- 2. Double-click the desired arterial route.
- Select the "Programmed" Data Source. The parameters will change to only show required fields for Programmed data.

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- 4. Select a pattern.
- 5. Click the **Update Diagram** button.



9. SPECIAL FUNCTIONS

Special Functions provide ultimate control over signal operations by enabling users to issue specific operational commands for a variety of applications. A special function may be simple, as a remote detector call or complicated, as a cascade of events triggered by a regional evacuation command.

9.1 CREATE A SPECIAL FUNCTION

- 1. Select: Special Functions > Create Special Function.
- 2. Input the general properties necessary to identify the Special Function.
 - a. Provide a common Name for the Special Function.
 - b. Utilize the **Description** field to provide more specific details.
 - c. Enter the **Timeout** value which terminates all affiliated commands upon expiration.



NOTE: Special Functions with Timeout value of 00:00:00 will run indefinitely until terminated by the user.

- d. Flag the **Disable** checkbox to disable the Special Function.
- e. Click Next.
- 2. Configure the Commands to be associated with the Special Function.
 - a. Regional Event (not required) This field is only utilized by Transparity TMS systems that have been regionally integrated. When a Special Function is assigned to a Regional Event, the Special Function can be initiated without user intervention.
 - b. Click the **Add Command** button.
 - i. Provide a common name for the command.
 - ii. Select one of the available functions.
 - iii. Assign the index of the function (for example, if the function is "Set VehDetector Control" the index would represent the detector number).
 - iv. Select the Target Controller or Group.
 - If the Special Function is intended to be utilized by any Controlleror Group, use the default setting of

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"TBD", indicating that the value will be determined in the next step.

- v. Select the **Control type** of the Command (Latch, Momentary, or Auto)
- vi. If desired, enter a **time duration** for Delay, Extend, and/or Timeout for the command.
- vii. Click Finish.
- c. Upon entering the first Command, use the previous steps to create another.
- d. Double click existing Commands, in the command list, to edit.
- e. Click **Next** when all Commands have been configured.
- 3. Assign Connections to the Special Function
 - Connections enable the user to manage which Controllers and/or Groupsshall display the Special Function in Real-Time Displays.
 - b. If no Connections are specified, the Special Function will only be accessible from the Special Function Interface and/or Special Function Summary.
- 4. Click **Finish** to complete the configuration of the Special Function.

9.2 EDIT A SPECIAL FUNCTION

- 1. Select: **Special Functions > Special Functions Summary.**
- 2. Configured Special Functions can be reviewed within the **Special Function Summary**
 - To edit a Special Function, select the target **Special Function** within the summary list and click the **Edit** button.
 - To delete a Special Function, select the target **Special Function** within the summary list and click the **Delete** button.

9.3 SPECIAL FUNCTION

Table 9-1: Special Function Properties

Name	A method to identify the Special Function
Name	A common name helps users quickly identify the purpose of the Special Function.
Description	The description can be used to augment the Name field and provide more details about the operation of the Special Function.

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Timeout	Enables the user to specify a global timeout for the Special Function in Hours, Minutes, and Seconds.
Disable	When selected, <i>Transparity TMS</i> will ensure the Special Function cannot be executed.
Regional Event	This option is only utilized in Regional <i>Transparity TMS</i> deployments. When a Regional Event is selected, the Special Function and associated Commands will execute upon activation of the Regional Event.
Commands	The output of a Special Function is one or more Commands.
Command Name	The command name helps users quickly identify the purpose of the command output.
Command Function	The command function is the control object to be implemented when the userand/or system initiates the Special Function Command. For example, the name of the Command may be "Manual Control Enable" while the function is "Special Function Output". In this case, the "Manual Control Enable" command shall issue a Special Function Output control to the target Controller (and the Controller Logic is then utilized to implement Manual Control Enable when the Special Function Output is active).
Command Target	The Command Target is the intended destination of the Command. This maybe a Controller or Group. If the Special Function is intended to be utilized by any Controller or Group, use the default setting of "TBD", meaning that the value will be determined in the next step.
	This option allows the user to select how to initialize the Command:
	1. Latch –persistent until the user "un-latches" the command.
Command Control	2. Momentary – sets the command active, then immediately deactivates the command.
	3. Auto – automatically initiated when the previous command completes.
Command Delay	User-specified duration of time to implement before initiating the command.
Command Extend	User-specified duration of time to extend an initiated command.
Command Timeout	User-specified duration of time before automatic termination of the command. This can be utilized as a failsafe.
Connections (Group)	One or more groups for which the Special Function shall appear on Real- Time Status Displays and group specific menu items.
Connections (Device)	One or more Controllers for which the Special Function shall appear on Real-Time Status Displays and Controller specific menu items.



10. SYSTEM ADMINISTRATION

This section provides an overview of:

- "Current User Information" above
- "User Management & Security" on the next page
- "Send User Messages" on page 206
- "Activity Locks" on page 207
- "System Processes" on page 208
- " Resources" on page 208
- "Options" on page 211

System administration functions are centrally located in the backstage or System Admin area of *Transparity TMS*.

To access the System Admin section, launch *Transparity TMS* and click the Transparity Settings icon.

10.1 CURRENT USER INFORMATION



Figure 10-1: Settings Icon

To quickly return to the main *Transparity* workspace from the System Admin view, click the **Back** arrow.

From the System Admin area, users with appropriate permission levels can edit or define user access, create, or delete users, monitor activity on the account, remove activity locks, check system processes, set user access levels, and define security options.

Information about the active user, as well as the version of *Transparity TMS* that is currently running is stored in the Account area. Users may also change their password or sign out from this page.

1. To access the Account area, select: System Admin> Info.

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Figure 10-2: Current User and System Specifications

10.2 USER MANAGEMENT & SECURITY

10.2.1 Manage User Accounts



NOTE: Only users with Manage Users access level may create new users or reset user passwords.

10.2.1.1 Creating Users

1. Select: System Admin > User Management.

Only users with Manage Users access level may create new user profiles.



NOTE: Transparity TMS is a multi-user system that enables numerous people to login to access the system. Each user can have a separate user account with unique permissions. User accounts control the amount of data the user can access and what type of changes they can make.

Most users will typically need standard account access. While users may interact with the system concurrently, sensitive actions are protected from interference by using Activity Locks.

2. Click the **Create** button on the Access Control page.

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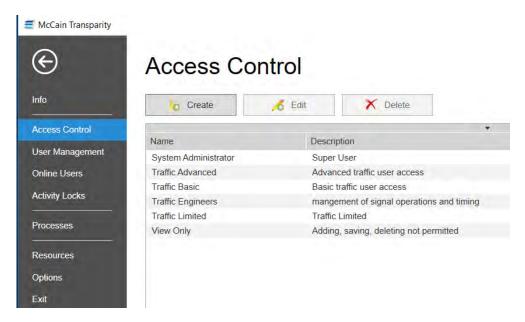


Figure 10-3: Access Control Create

- 3. Use the wizard to walk through adding the necessary data to create a new user.
- Complete all required fields in the User Setup screen (see Table at "User Setup Properties" below).
- 5. Click Next.
- 6. Complete all required fields in the **Password Setup** screen (see Table at "Password Set Up" on the next page).
- 7. Click Finish.

10.2.2 User Setup Properties

Table 10-1: User Setup Properties

User Setup	
First Name	The first name of the new user
MI	The middle initial of the new user
Last Name	The surname of the new user
E-Mail Address	The e-mail address assigned to the new user
Phone Number	The phone number assigned to the new user
Username	The username to be assigned to the new user

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	Access Levels are a system or user defined set of permissions that can then be assigned to any user. The access level assigned to the new user defines the system functionality the user can access and the types of datamanipulation that may be performed.
	System default permissions and default access levels are found in Tables "Access Level Permissions" on page 202 and "Default Access Levels" on page 204.
Access Level	Here are the Default Access Levels:
	Super User – Highest level of system privilege allowed to a <i>Transparity</i> system user.
	Traffic Advanced – Second highest level of system privilege allowed to a <i>Transparity</i> system user.
	Traffic Basic – Third highest level of system privilege allowed to a <i>Transparity</i> system user.
	Traffic Limited – Fourth highest level of system privilege allowed to a <i>Transparity</i> system user.
	View Only – Fifth highest level of system privilege allowed to a <i>Transparity</i> system user. The new user is allowed Read-Only privileges.
Expiration Date	A calendar date that may be selected to determine when the user account expires and will be disabled.
Never expire	Checking this box indicates that the user account should stay active indefinitely.
Inactive	A box that can be checked that results in the user account being inactivated and unavailable for use until the box is unchecked.
Password Setup	
Username	This field will be auto populated based on the username entered in the previous screen. To update, click the Previous button to go back to UserSetup.
New password	Enter a temporary password for the new user
Confirm password	Re-enter the password for the new user





NOTE: In *Transparity* TMS, the system administrator can set system-wide password requirements under **Options > Security**

Passwords provide the first line of defense against unauthorized access to the system. Strong passwords provide greater protection from potential hackers and malicious software.

Recommended password settings are:

- ** Minimum of eight characters long
- ** Does not contain the username, real name, or company name
- ** Does not contain a complete word
- ** Contains both uppercase and lowercase letters, numbers, and symbols

10.2.2.1 Password Setup

Table 10-2: Password Setup

Username	First name of the new user.
New password	Enter the new password for the new user. See Password Tips (above) forguidelines on generating a new password.
Confirm password	Confirm the new password for the new user

10.2.3 Reset a User Password

- 1. To reset a user password: **System Admin > User Management.**
- Click Reset Password button.



OR

- 1. Right-click the **Username** of the user requiring the password change.
- 2. Click Reset Password.
- 3. Enter the new password in the **Reset Password** window.

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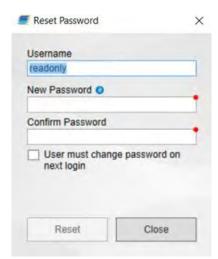


Figure 10-4: Reset User Password

4. Click Reset.

10.2.4 User Access & Security

Transparity has a native user database out of the box. However, it also has the ability to authenticate against an Active Directory domain so that your credentials come from the system managed by your IT department.

By default, *Transparity TMS* comes with preloaded security/access levels. *Transparity* comes with a set of default Access Levels, each configured with permissions, described below.

Table 10-3: Access Level Permissions

Permissions	Actions
Set Traffic Controller Manual Plans	Perform "manual override" pattern downloads to a traffic Controller (via Send Pattern Command)
Set Traffic Controller Group Manual Plans	Perform "manual override" pattern downloads to a traffic Controller group (via Group Command)
Set Device Preempts	Perform the following functions on a traffic Controller - Preempt call (via Intersection Displays)
	Perform the following functions on a traffic Controller
Set Device Commands	Vehicle call (via Intersection Displays)Pedestrian call (via Intersection Displays)
Save Timing to Database	Save timing parameters to the central database
Save Device Timing	Perform timing parameter downloads to a device
Manage Users	Add/Edit/Delete Users

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Manage Traffic Controller Groups	Add/Edit/Delete Traffic Controller Groups
Manage Tasks	Add/Edit/Delete Service Tasks
	Edit the following Application Options sections:
	- Devices
Manage System	- System
Configuration	- Mail
	- Security
Manage Schedules	Add/Edit/Delete Schedules
Manage Notifications	Add/Edit/Delete Event Notifications
Manage Map Displays	Add/Edit/Delete Map Displays
Manage Intersection Displays	Edit Intersection Displays
Manage Events	Add/Edit/Delete Events*
	Add/Edit/Delete the following devices:
	- Traffic Controller
Manage Device Configuration	- Ramp Controller
	- Detector
	- Browsable Device
Manage Channel Config	Add/Edit/Delete Channels
Manage Arterial Routes	Add/Edit/Delete Arterial Routes
Manage Access Levels	Add/Edit/Delete Access Levels
Import Device Timing	Import timing files into Transparity
Export Device Timing	Export timing files from <i>Transparity</i>
Detector Reset	Perform Detector Reset functions on a traffic Controller (via Intersection Displays)
Broadcast Time of Day	Perform "Broadcast Time/Date" functions

^{*} The Event module is currently disabled in v1.0 and v1.1 in *Transparity TMS*. It is related to Notifications by performing tasks based on device status changes, but it can also perform tasks beyond sending notification emails, such as pattern downloads or timing audits.

The default access levels are configured with the permissions shown in the table below.



Table 10-4: Default Access Levels

Access	Permission
Level	
	- ManageSystemConfig
	- ManageMapDisplays
	- ManageIntersectionDisplays
	- ManageUsers
	- ManageAccessLevels
	- ManageChannelConfig
	- BroadcastTimeOfDay
	- SetDeviceCommands
	- SetDevicePreempts
	- SetControllerManualPlans
	- ImportDeviceTiming
0	- ExportDeviceTiming
Super User	- SaveDeviceTiming
	- SaveDatabaseTiming
	- ManageTrafficControllerGroups
	- SetControllerGroupManualPlans
	- ManageDeviceConfig
	- ManageNotifications
	- ManageTasks
	- ManageSchedules
	- ManageEvents
	- ManageArterialRoutes
	- DetectorReset



	- ManageSystemConfig
	- ManageMapDisplays
	- ManageIntersectionDisplays
	- ManageChannelConfig
	- BroadcastTimeOfDay
Traffic	- SetDeviceCommands
Advanced	- SetDevicePreempts
	- SetControllerManualPlans
	- ImportDeviceTiming
	- ExportDeviceTiming
	- SaveDeviceTiming
	- SaveDatabaseTiming
	- ManageTrafficControllerGroups
	- SetControllerGroupManualPlans
	- ManageDeviceConfig
	- ManageNotifications
	- ManageTasks
	- ManageSchedules
	- ManageEvents
	- ManageArterialRoutes
	- DetectorReset
	- ManageMapDisplays
	- ManageIntersectionDisplays
	- BroadcastTimeOfDay
	- SetControllerManualPlans
	- ImportDeviceTiming
Traffic	- ExportDeviceTiming
Basic	- SaveDeviceTiming
	- SaveDatabaseTiming
	- ManageTrafficControllerGroups
	- SetControllerGroupManualPlans
<u> </u>	



	- ManageDeviceConfig
	- ManageNotifications
	- ManageTasks
	- ManageArterialRoutes
	- BroadcastTimeOfDay
Traffic Limited	- SaveDeviceTiming
	- ManageNotifications
	- ManageTasks
View Only	No permissions are set for this access level. The default behavior for <i>Transparity TMS</i> is togrant viewership rights to unprivileged users, but no configuration management or device command privileges.

10.2.4.1 Creating New Access Levels

Super Users or users with Manage Access Levels permissions can create or adjust access levels for all users.

- Users may also create custom access levels by: System Admin > Access Control > Create.
- 2. Click the Create button.
- 3. Complete the Access Level Properties.
 - a. Name.
 - b. Description.
 - c. Click Next.
 - d. Click Add Permissions.
 - e. Scroll to the desired Access.
- 4. Click Save.

10.3 SEND USER MESSAGES

Under the Online Users menu users can send messages to other users on the system.

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Figure 10-5: Sending Messages to System Users (Chat Feature)

10.3.1 Send Message

- 1. Click on the **Send Message** button.
 - a. A Messenger window will open in the bottom workspace.
- 2. Choose the desired **User** from the dropdown list.
- 3. Type the **Message** in this text box.
- 4. Click Send.
 - a. The message and reply will appear in the Messenger window.

10.4 ACTIVITY LOCKS

The user with Manage System Configuration has permissions to view activity locks that have been placed by user activity on the system and can manually remove any that the system did not automatically delete.

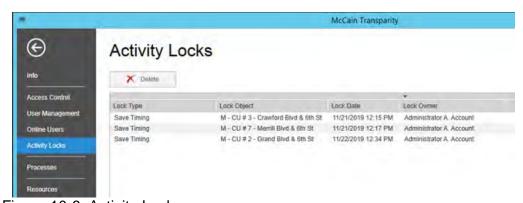


Figure 10-6: Activity Locks

10.4.1 Delete an Activity Lock

- 1. Click and highlight the **Lock** to be deleted.
- 2. Click Delete.

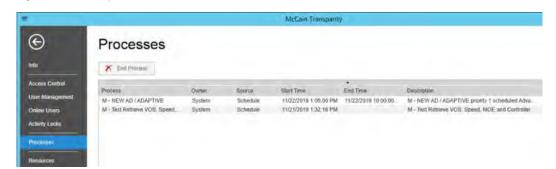
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10.5 SYSTEM PROCESSES

System Processes provides a snapshot of long-running processes such as responsive routines. Users with appropriate permissions can easily select and terminate any active process from this screen. Figure 10-7: System Processes



10.6 RESOURCES

Resources are a powerful way to capture content maintained by a traffic management center and track it within the *Transparity TMS* solution. A user can attach multiple types of content such as documents, geocoded images, or shape files to most objects in Transparity, such as traffic Controllers, system links, and subsystem displays.

Administration of Resources is found in the backstage under the gear icon.

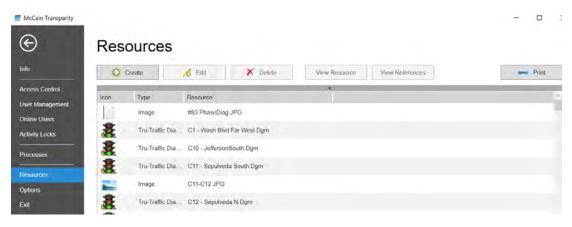


Figure 10-8: Resources

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10.6.1 Create a Resource

To create a resource, navigate either to the backstage **Resources** page and click **Create** or navigate to the context menu of an object, such as a traffic Controller, and go to **Resources** > **Add Reference...** followed by clicking the **Create** button on the resulting **Select Resource** view.

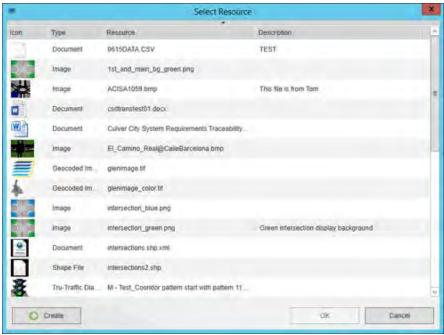


Figure 10-9: Select Resource View

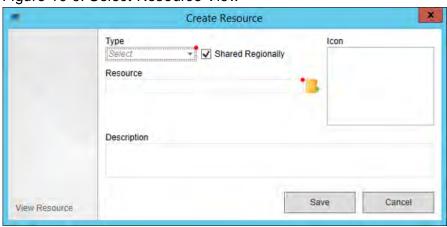


Figure 10-10: Create Resource

10.6.1.1 Resource Properties

Using the context menu of an object, navigate to **Resources** sub-menu to view or add resources on that object.

Table 10-5: Resource Properties

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Resources	
	Type can be one of the following:
	• Document
Туре	Geocoded Image
	• Image
	Shape File
	Tru-Traffic Diagram
Shared Regionally	A checkbox that allows this resource to be synchronized through Transparity TDX. This allows things like intersection backgrounds for Aerial Display to be shared while preventing more sensitive data from being shared.
Resource	A file selector specifying the file on disk to upload into the <i>Transparity</i> database.
Description	Non-mandatory description of the resource.

10.6.2 View Resources Attached to an Object

Using the context menu of an object, navigate to **Resources** sub-menu to view or add resources on that object.



Figure 10-11: Resources Sub-Context Menu on a Traffic Controller

10.6.3 Resources Summary for an Object

Click View All on the Resources sub-menu to view the Resources summary view for that object.



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Figure 10-12: Resources Summary for a Traffic Controller

10.7 OPTIONS

Several menus may be accessed from the **Options** page. Each one can be accessed by clicking on the expand button.

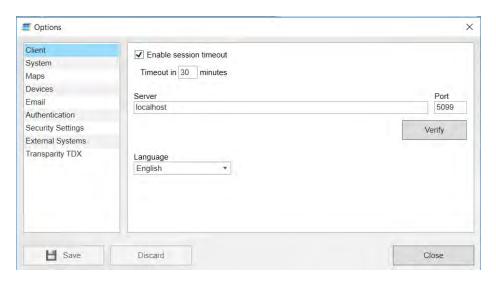


Figure 10-13: Options

10.7.1 Client

The Client allows the user to set up session timeout times (in minutes) or disable session timeout.

- If **Disable Session Timeout** is checked, the user will remain logged in until the user physically logs out.
- Click on the **Verify** button to verify the Root Server Path, Routing Service Path, and Polling Service Path.
- Click on Save Changes button to save changes.

10.7.2 System

The user can edit system settings such as **agency name**, **data path**, **agency logo** and **ECcom program file path** in this section.

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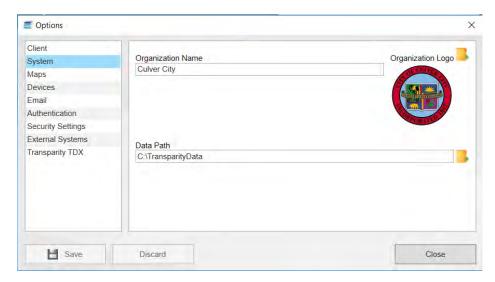


Figure 10-14: Current System Settings

10.7.3 Maps

The **latitude**, **longitude**, and **zoom level** is set for web-based maps. The map opens at the center of the latitude and longitude set here as well as at the zoom level.

For GIS maps, set the default coordinate of any imported GIS layers, and select the **Shape File** that corresponds to the Default Coordinate System.

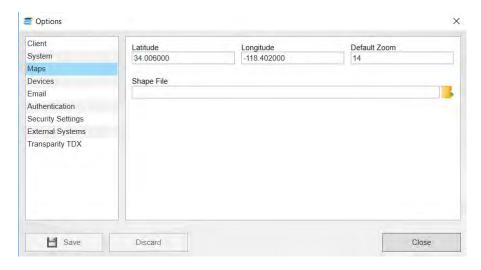


Figure 10-15: Current Map Settings

10.7.4 Devices

The schedulers check time drift action using the time drift threshold to determine if date/time clock of a traffic Controller has drifted. The setting here is the **amount of time**, in seconds, a clock would be allowed to drift before a log and/or an update for the Controller is generated.

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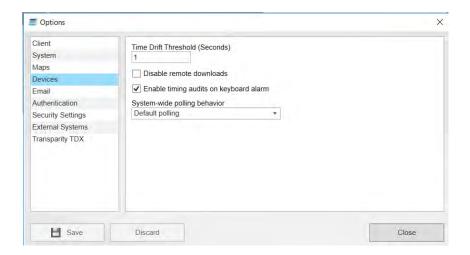


Figure 10-16: Devices

10.7.5 Email

Email server address, port, username, and password are stored here.

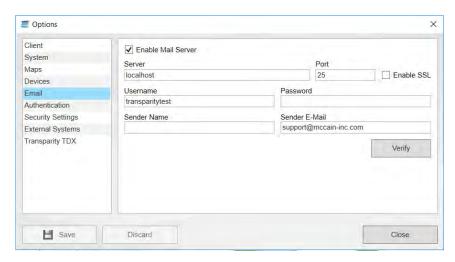


Figure 10-17: Current Email Settings

10.7.6 Security

Preset **Security** options can be used or the user with security permissions may change the options in the area of **Username Settings**, **Password Settings**, and **Password Expiration** (Months).

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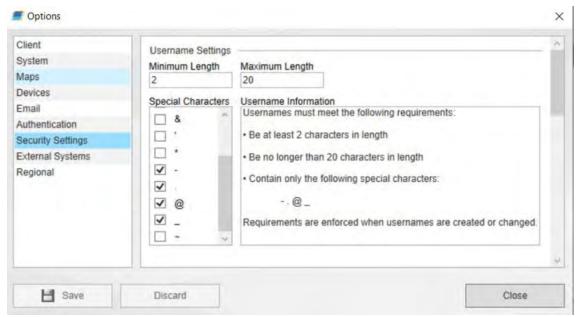


Figure 10-18: User Security Settings

10.7.7 External Systems

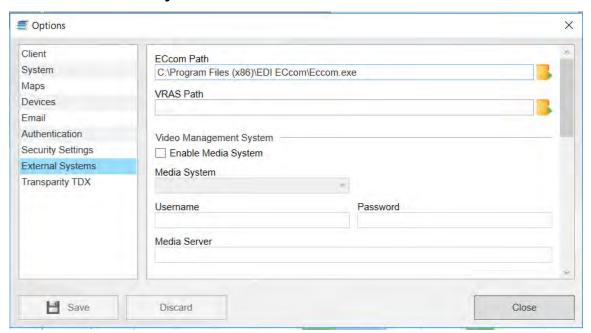


Figure 10-19: External Systems



10.7.8 Transparity TDX

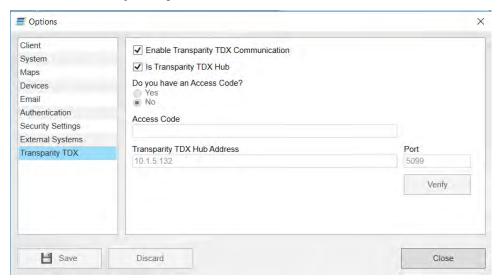


Figure 10-20: Transparity TDX



11. CENTER TO CENTER (C2C) DATA SUBSCRIPTIONS

This section provides an overview of:

- "TTS Data Subscriptions" on page 218
- "TMDD Subscriptions" on page 221
- "Create Bulk TTS PSA Subscriptions" on page 224
- "Data Subscriptions Summary" on page 224

McCain *Transparity TMS* offers multiple ways to share traffic data with external solution providers, agencies, and regional DOTs. The first, and most beneficial to most agencies, is Transparity Transportation Data Exchange (TDX). This allows agency traffic data to be sent securely and reliably to a McCain Transparity TDX web service, where the data is available for the customer's cloud-hosted Signal Performance Measures (SPMs).

For an on-premise deployment, this is often all the customer needs. To support integrations with Integrated Corridor Management Systems (ICMS) or other solution providers, the agency data can be made available directly from Transparity TDX, not the on-premise server, upon agency approval. The advantage with this approach over sharing agency data with external partners directly from the agency network, is that the agency's network firewall rules do not need to be modified to allow more partner systems in or out of the network. Keeping an agency's network surface area as small as possible is a critical goal for reducing its exposure to threat actors across the internet, which is why agency IT departments uniformly prefer Transparity TDX for enabling external integrations.

A data subscription is a contract to share a certain type of data at a specified frequency with an external party. Transparity supports two types of subscriptions: Traffic Management Data Dictionary (TMDD) style External Center integrations, and Traffic Technology Services (TTS) Personal Signal Assistant (PSA) integration. TMDD subscriptions can be requested at-will by an approved partner using a TMDD client for any dialog Transparity supports. This data is then sent at the frequency requested to the specified remote External Center service using the Transparity TMDD Subscriptions service. The TTS PSA data subscriptions, in contrast, are created by the Transparity TDX administrator upon notification of an agreement between TTS and the agency.

The Center to Center (C2C) User Interface (UI) allows the operator to manage Data Subscriptions between organizations directly, including the creation of new TMDD and TTS subscriptions.

- 1. To bring up the C2C UI, select: **Settings Icon** Options > Transparity TDX.
- 2. Select Enable Transparity TDX Communication in the popup box.

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3. Click Save.



Figure 11-1: C2C Profile Popup Menu

4. The C2C menu appears like this:

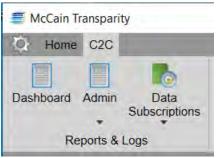


Figure 11-2: C2C Menu

11.1 DASHBOARD MENU

The **C2C Dashboard** menu shows the current organizations (centers) in a graphical format. The organizations are created using the Admin icon on the C2C UI.

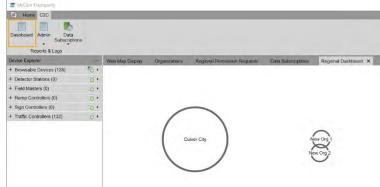


Figure 11-3: C2C Dashboard Menu

11.2 C2C ADMIN MENU

The **C2C Admin** menu offers an Organization Summary screen, Regional Permission Request Screen, and Regional Permission Request Summary screen.

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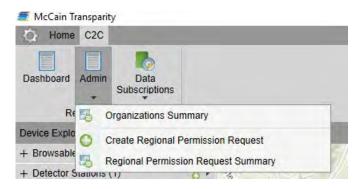


Figure 11-4: C2C Admin Menu

11.3 DATA SUBSCRIPTIONS MENU

The Data Subscriptions menu offers Create Data Subscription, Data Subscription Summary, and Create Bulk TTS PSA Subscriptions.



Figure 11-5: Data Subscriptions Menu

11.3.1 TTS Data Subscriptions

11.3.1.1 Enabling TTS Personal Signal Assistant

To create TTS data subscriptions, you must enable the TTS integration. Otherwise, options to create these subscriptions individually or through the bulk view will be disabled.

- 1. To enable TTS Data Subscriptions, select: Settings Icon S > Options > External Systems.
- Scroll down to the bottom of the popup menu and under TTS Personal Signal Assistant, select Enable Personal Signal Assistant.
- Click Save.

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The Username, Password, and TTS PSA address fields are incorporated into the individual Data Subscription records.

Checking the "Enable Personal Signal Assistant" box causes a new Organization for TTS to be created. This is viewable on the C2C > Admin > Organizations

Summary screen. This is the "Requesting Organization" specified on TTS subscriptions. Please do not delete this Organization.





Figure 11-6: TTS Organization Record

Once this integration is enabled, the **TTS PSA subscription type** in the Selector menu of a new subscription is enabled.



Figure 11-7: TTS PSA Data Subscription is Enabled

11.3.1.2 Create TTS Data Subscription

The **Create Data Subscription** wizard, accessible either via the menu or from the Summary view, has two contexts. One is for **TTS** subscriptions and the other for **TMDD** subscriptions. Both are very similar but with some key differences, described below.

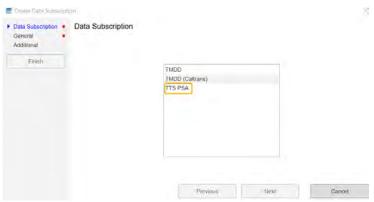


Figure 11-8: Create TTS Data Subscription

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On the General page, the Requesting Organization shows **TTS** selected by default, and the selector button is disabled. You are required to select the Target Organization, which is the agency with whom you will share traffic data with TTS.

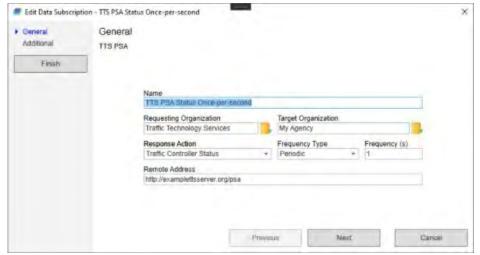


Figure 11-9: Create TTS Data Subscription - General

Two types of Response Actions are available. These are the two types of data the subscription module acts upon to send to PSA: **Traffic Controller Status** and **Traffic Controller Timing**.

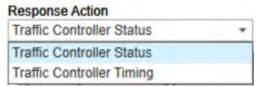


Figure 11-10: TTS Data Subscription - Response Action

The **Remote Address** will be the TTS PSA endpoint that TTS will provide.

On the Additional page, the operator enters the **Username** and **Password** provided by TTS for the specified agency. Note that each agency has its own provided credentials.

Enter the **start time** you wish a Periodic subscription to be fulfilled from. For example, if you have a once-a-day Periodic subscription starting at 9:15 am, then that is the time the subscription is fulfilled each day.

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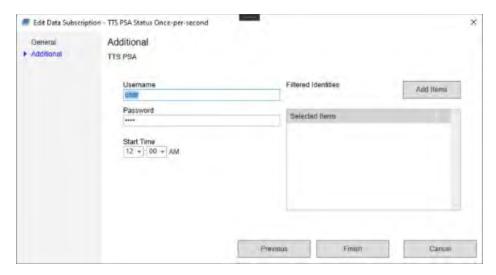


Figure 11-11: Create TTS Data Subscription - Additional

You may optionally select only some traffic Controllers for the subscription to filter using the Add Items on this page. By default, no items in the list means the subscription sends data for all traffic Controllers in the system.

11.3.2 TMDD Subscriptions

TMDD is a web service (actually a federal USDOT specification), of which McCain has a compliant implementation. *Transparity* supports a handful of web service methods (dialogues) relevant to traffic management systems. Two of those dialogs have to do with intersection control - telling intersections to implement a specific coordination plan. The first dialog specifies the intersection by device-id, the second specifies a group of intersections by group-id.

TMDD subscriptions can be requested at-will by an approved partner using a TMDD client for any dialog Transparity supports. This data is then sent at the frequency requested to the specified remote External Center service using the Transparity TMDD Subscriptions service.

The TTS PSA data subscriptions, in contrast, are created by the Transparity TDX administrator upon notification of an agreement between TTS and the agency. TTS has a requirement that different agencies send their data with unique credentials.

TMDD subscriptions are created through requests to any of the Subscription dialogs in the TMDD Owner Center Service. They are fulfilled (data is sent) through the TMDD Subscriptions Service. They may be created at-will by TMDD clients, such as ICMS partners, for any of the following dialogs:

- **Center Active Verification** (changes to an Organization, such as Organization name).
- **Organization Information** (changes to an Organization, such as Organization name).
- **Detector Data** (updates to periodic volume, occupancy, speed collection).
- **Detector Inventory** (new, modified, or removed detectors).
- Detector Status (updates to detector fault status).
- Intersection Signal Inventory (new, modified, or removed traffic Controllers).

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- Intersection Signal Status (updates to traffic Controller status).
- Intersection Signal Timing Patterns (updates to traffic Controller coordinationtiming).
- Intersection Signal Control Schedules (updates to traffic Controller TOD timing).
- Section Status (updates to Controller groups, such as name or membership).
- Section Control Schedules (updates to Set Pattern schedules).

Aspects of C2C communications include regionally connected systems like the SANDAG RAMS network in San Diego County, or the TTS Personal Signal Assistant integration over the cloud using Transparity TDX.

11.3.2.1 Create TMDD & TMDD (Caltrans) Data Subscription

There are the two types of TMDD data subscriptions available: **TMDD**' and **'TMDD (Cal-trans)**'. 'TMDD' refers to a TMDD v3.03d/3.04 compliant interface with support for the dialogs specified in the *Transparity C2C Interface Control Document*.

TMDD (Caltrans)' refers to a Caltrans-specific Web Services Description Language (WSDL) based on TMDD v3.03d/3.04 which redefines the input and output messages on certain dialogs, particularly subscription-related ones in the Owner Center and External Center interfaces. The Caltrans WSDL also adds some custom elements to certain dialogs. The changes are further described in the *Caltrans I-210 C2C McCain TMDD 1.2 HLD and SDD* documentation for the Caltrans I-210 ICMS Pilot Project, scheduled to be completed in Q1 2021. At this time, the only deployment of this interface is planned for the City of Pasadena, CA.

On the General page, select the Requesting Organization, i.e. the partner asking forTMDD data, and the Target Organization, i.e. the agency whose data has been requested. Select the appropriate Response Action based on the partner's request. Remote Address should be the External Center endpoint hosted by the partner. **This web service must be accessible by the** *Transparity* **server.**

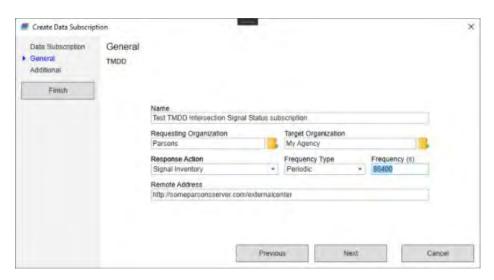


Figure 11-12: TMDD Data Subscription - General

On the Additional page, a user-supplied Subscription Id must be supplied. This value is normally generated by the partner's application in the TMDD request message. If you are manually creating a

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subscription on the partner's behalf, enter a unique value for each subscription. The value is a free form text string. The user-supplied Requesting Organization Id is also generated by the partner's application in the TMDD request message. This value is not required and is informational only. It is also a free form text string. Subscription Information correlates to the information-text field from a TMDD subscription's request message. This value is a free form text string and is also not required.



Figure 11-13: TMDD Data Subscription - Additional

You may optionally select only some traffic Controllers for the subscription to filter using the Add Items on this page. By default, no items in the list means the subscription sends data for all traffic Controllers in the system.

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11.4 CREATE BULK TTS PSA SUBSCRIPTIONS

Because the three TTS PSA subscriptions are typically pre-defined, a simple form is provided to create the three based on the three pieces of information TTS provides: Username, Password, and TTS PSA endpoint. This form is found in the Data Subscription menu. The additional piece of information the user must supply is the Target Organization.

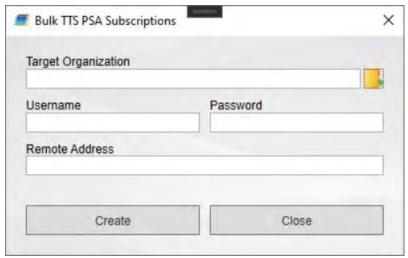


Figure 11-14: Create Bulk TTS PSA Subscriptions

11.5 DATA SUBSCRIPTIONS SUMMARY

The Data Subscriptions Summary contains the same basic functionality as all summaryviews in *Transparity* Desktop, including management tools and print features.



Figure 11-15: Data Subscriptions Summary

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APPENDIX A: GLOSSARY

Access Levels	The permissions given to users for levels of use and authorization in the system
Added per vehicle	Amount of time added when a car passes over an extension detector
Adv / Delay Walk	Advance or delay ped walk phase:
	Advance – ability to allow ped movement before its associated vehiclephase
	Delay – ability to prevent ped movement for a duration of time during associated vehicle phase
C2C	Center-to-center, e.g. server-to-server
C2F	Center-to-field, e.g. communication between a server at city hall and a traffic Controller at an intersection
Central Data	Device timing data stored at the central server
Cond. Service	Re-services a compatible phase if demand exists and enough is left over from previous phase
Cond. Service Check	Amount of time that must be left on the cycle time for conditional service to occur
DOT	Department of Transportation
DSS	Decision support system, typically a vendor solution orchestrating multiple systems to support an organization's decision-making activities
Dual Entry	Will place a call on a phase w/o demand if a compatible phase in the same ring receives a call
EVA Delay/Clear	Amount of time a phase will be delayed during preemption and associated clearance time exiting preemption
Field Data	Device timing data stored locally at the device
First Phases	Phases go first during startup
Green Band	A period of phase green time plotted against speed through one or more coordinated intersections. Under ideal conditions, green bands between intersections would be aligned, allowing drivers to drive continuously without stopping through the coordinated corridor.
ICMS	Integrated Corridor Management System, a type of DSS often operated by a regional or statewide MPO
IEN	Information Exchange Network (alternative C2C standard)



ITS	Intelligent Transportation Systems, generally describing the segment of the transportation industry tackling computational challenges, data distribution, and analysis
Man. Control calls	Calls for manual control on selected phases
Max Gap	Amount of time allowed without detection before going to yellow
Max Initial	Maximum amount of green time required before reduction
	Maximum amount of green time allotted to a phase. Max 2 can be used as a
Max Limit/2	TOD function and can also define the maximum amount of time allowed duringextension
Max Recall	Places a constant call on a phase to ensure it reaches its MAX green time
Min Gap	Amount of time allowed between detection before gapping out
Min Recall	Places a minimum call on a phase, thereby ensure it always reaches its min green time prior to termination, (same as VEH Recall)
МОЕ	Measure of Effectiveness
MPO	Metropolitan planning organization (e.g. SANDAG)
NTCIP	National Transportation Communications for Intelligent Transportation SystemProtocol – a family of standards defined by the US DOT for the transportationindustry, defining a set of common data models for both C2C and C2F communications
PE Min Ped FDW	Minimum FDW assigned to Ped movement during preemption
Ped FDW	Amount of time allotted to a ped phase's flash don't walk
Ped recall	Places a ped call on assigned phase
Ped Walk	Amount of time allotted to a ped phase before FDW
Permit	Which phases can be serviced
Red Clear	Amount of time allotted to a phase's red clearance before another phase is serviced
Red Lock	Locks a call when placed on a red phase. This ensures that in places where people may creep out of the detection zone (usually to see), their call will remain regardless of presence.
Red Rest	Causes a phase to terminate even in the absence of an opposing call. Will not work if any recall values are set to this phase
Reduce Every	Amount of time required before reducing by value is applied to extension timer
Rest in Walk	Ped phase holds in walk until a call on an opposing phase is made
	<u>l</u>



RR-1 Delay/Clear	Amount of time a phase will be delayed during preemption and associated clearance time exiting preemption
SANDAG	San Diego Association of Governments
SPM	Signal Performance Measures – a term referring to the reporting solution built upon the collection and processing of high-resolution event data logged by modern traffic Controllers.
Soft Recall	Places a call on a phase, but does not start max/gap reduction timers on other phases unlike the other 3 recall methods
Time-Space	Diagram – a visual display for green band status and manipulation
TMDD	Traffic Management Data Dictionary – a schema of data models for center-to-center (C2C) communication in ITS applications, defined under NTCIP 2306
Traffic Adaptive	A mode of arterial route coordination by which a system responds in near real-time to changing traffic conditions, often by manipulating the cycle lengths and offsets of running coordinated patterns
Traffic Responsive	A mode of arterial route coordination by which a system responds in near real-time to changing traffic conditions by selecting appropriate coordinated patterns
Transparity TDX	Transparity Transportation Data Exchange – a solution deployed and typicallymanaged by McCain as a central hub in a star topology which facilitates the distribution of agency traffic data from their <i>Transparity TMS</i> server to approved partners.
Transparity TMS	Transparity Traffic Management System – a central software solution used by an agency to configure, monitor, and control their network of traffic intersections.
TTS	Traffic Technology Services, Inc.
Type 3 Disconnect	ONLY when type 3 is being used. Type 3 is a detector configuration setting usedwith Quadrupole detectors. A Quadrupole detector is a large detector that takesup most of a lane (rectangular). When Type 3 is set to a detector, the Quadrupole detector will hold the extension timer until it gaps out. Type 3 disconnect defines the amount of time to hold the extension timer BEFORE it is allowed to gap out
UDP	Universal Datagram Protocol – a connectionless Internet Protocol
Vehicle Extension	Amount of time allotted to the extension timer (counts down to 0)
vos	Volume, Occupancy, Speed
WSDL	Web Services Description, the schema used for the most common types of webservices in the late 90s and 2000's. It is based on XML and is how US DOT C2C standards are described.

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	Amount of time allotted for yellow in any phase. If a value less than 3 or greater than 6 is entered, the Controller will automatically use 3 and 6.
k	Locks a call when placed on a yellow phase. This ensures that vehicles stopping at a yellow will be serviced at the next cycle if they go completely over the detector.
Yellow Start	Selected phases will be yellow on startup