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# **Software Requirements Specification**

**For**

**Traffic Analytical System (TAS)**

**Version 1.0 approved**

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## Revision History

	Date	Reason for Change	Version
Jeremy Hall	2/3/2013	Creation	1.0

## 1. Introduction

### 1.1 Purpose

Traffic Analytical System (TAS) is a system to enable traffic engineers at the Rahall Transportation Institution (RTI) to better analyze data recorded at traffic intersections. The initial release of TAS will provide various reports that are accessible through Google Maps. These reports will help traffic engineers analyze recorded data in an efficient manner.

### 1.2 Document Conversions

Sections are headed in green and subsections are headed in bold.

### 1.3 Intended Audience and Reading Suggestions

The expected audience of this SRS document includes the traffic engineers who want to use and or expand upon TAS as well as any future developers who are involved with its expansion.

The most useful section for those who are using TAS is section 2, which gives a detailed overview of the system.

The most useful section for future developers is section 3, which defines all system features, and section 4 which describes all current system dependencies.

### 1.4 Project Scope

The scope of TAS is defined in the Traffic Analytical System Vision and Scope Document which can be found at <http://users.marshall.edu/~hall516/visionScope.pdf> as of 2/5/2013.

### 1.5 References

## 2. Overall Description

### 2.1 Product Perspective

The Rahall Transportation Institute has access to a staggering amount of data that has been recorded and is still being recorded at intersection throughout West Virginia. Data is

representative of events that occur at intersections; these events include but are not limited to individual light changes, vehicle arrivals, and pedestrian crossings.

TAS was commissioned by Dr. Andrew Nichols of the Marshall University Engineering Department in order to provide traffic engineers at the Rahall Transportation Institute with a way to analyze this data that is efficient, effective, expandable, and user friendly.

TAS is being developed with the focus of replacing the RTI's current system Centrac. While the Centrac is efficient and effective it is not optimized for user friendliness and is slow to expand.

## **2.2 Product Features**

TAS 1.0 will provide the following features

### **MF1. Expandability**

By building TAS in layers it will be able to be quickly expanded.

### **MF2. Reports**

Upon launch TAS will provide the critical reports provided by the Centrac system.

### **MF3. Google Maps**

By using Google Maps TAS will provide a user friendly way of selecting a particular intersection and its corresponding reports.

## **2.3 User Classes and Characteristics**

The current user class consists mostly of traffic engineers but may also include student workers that have a need to perform traffic analysis.

To operate TAS there are no skill requirements except for how to operate Google Maps, however training and/or education will be needed in order to effectively interpret the reports generated. For this reason TAS will be tailored towards traffic engineers who are capable or effectively analyzing the reports generated by the system.

Because TAS does not currently alter any data there will likely be little to no restrictions on who is authorized to use the system, but this is ultimately up to the RTI staff and Dr. Nichols.

## **2.4 Operating Environment**

TAS is a web based application and will function properly in any current browser except Internet Explorer. In order to use the system JavaScript must also be enabled.

## 2.5 Design and Implementation Constraints

Because TAS is a web based application built around Google Maps I was forced to use a combination of HTML, JavaScript, and either PHP or ASP.NET. I chose PHP due to its powerful time conversion functions.

## 2.6 User Documentation

User documentation will be provided at <http://users.marshall.edu/~hall516/TAS>

## 2.7 Assumptions and Dependencies

The following is a list of assumptions:

- A1. The user is familiar with Google Maps
- A2. The user has been trained to interpret the traffic reports

The following is a list of dependencies:

- D1. The user's browser is one of the following: Google Chrome, Firefox, Safari, or Opera
- D2. The user's browser has JavaScript turned on

# 3. System Features

## 3.1 User Friendly

### 3.1.1 Description and Priority

*Google Maps was used in order to make the application user friendly while maintaining the organization in report selection. Because user-friendliness is of high priority in this project I have gave this a rank of 9.*

### 3.1.2 Stimulus/Response Sequences

*The user can click on an intersection icon then simply select the report that they would like to generate. The light icon will bounce up and down to let the user know which intersection has been selected. Also the user may right click on an intersection to bring up the name and a description of the intersection.*

### 3.1.3 Functional Requirements

REQ-1: *The user must be using one of the following browsers: Google Chrome, Mozilla Firefox, Safari or Opera*

REQ-2: The user must have JavaScript enabled

## 3.2 Reports

### 3.2.1 Description and Priority

After the user selects an intersection they can select the type of report that they would like to view. Because the system's purpose is to help analyze traffic data this gets a priority of 10.

### 3.2.2 Stimulus/Response Sequences

When the report is generated the user can toggle checkboxes that will add and remove data sets, toggle between line and dot charts, and show averages by hour.

### 3.2.3 Functional Requirements

REQ-1: The user must be using one of the following browsers: Google Chrome, Mozilla Firefox, Safari or Opera

REQ-2: The user must have JavaScript enabled

## 3.3 Expandable

### 3.3.1 Description and Priority

The project is designed to be easily expandable in the future. This was one of the key problems with Centracs so this gets a priority of 7.

### 3.3.2 Stimulus/Response Sequences

In order to implement a new feature all that must be done is put write a new PHP script to feed the JavaScript the needed information, then write the JavaScript to output the data to the canvas in the desired way.

### 3.3.3 Functional Requirements

REQ-1: The developer must have knowledge of JavaScript, basic PHP, as well as working knowledge of data being displayed.

## 3.4 Web Based

### 3.4.1 Description and Priority

The project was designed as a web application so that traffic engineers don't have to be within range of a particular machine in order to use the system.

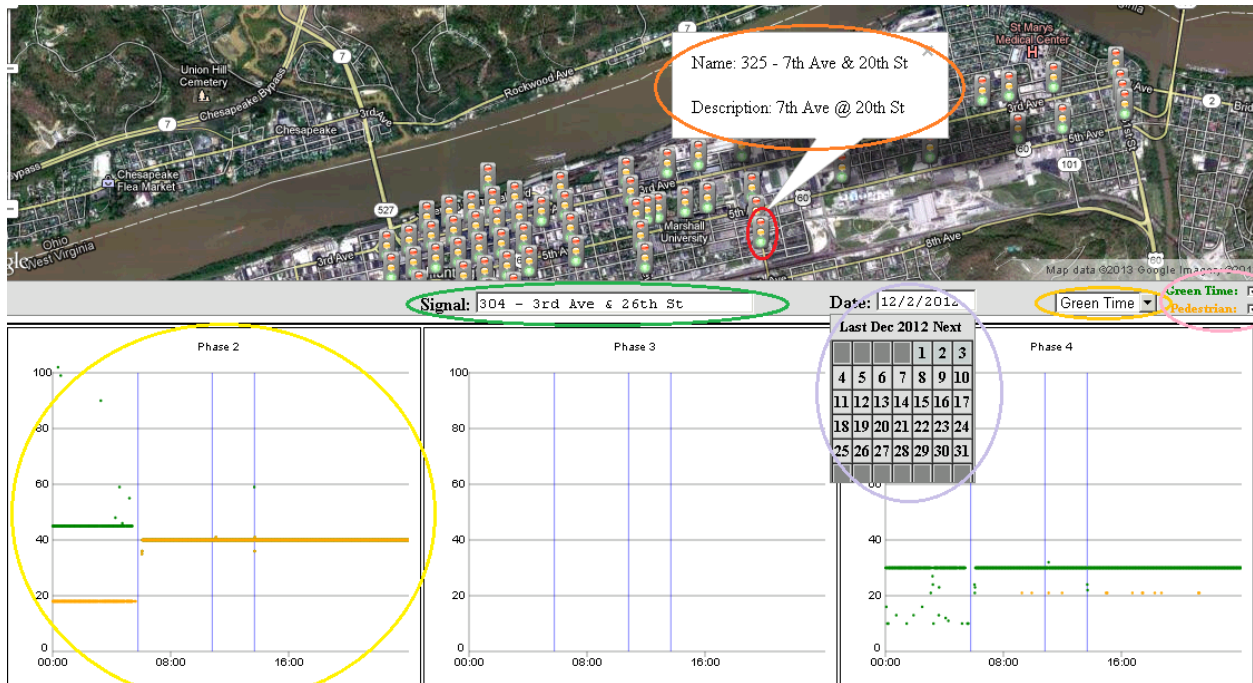
### 3.4.3 Functional Requirements

REQ-1: The user must be using one of the following browsers: Google Chrome, Mozilla Firefox, Safari, or Opera

REQ-2: The user must have JavaScript enabled

## 4.External Interface Requirements

### 4.1 User Interfaces



#### User Interface Features (by color)

- *Selected Intersection (In the application it the light icon bounces when selected)*
- *Indicates the name of the selected intersection*
- *Name and description of the intersection (appears on right click)*
- *Dates to select for report (light blue indicates data is available for the date)*
- *The actual report and the report selected*
- *Data that can be toggled on and off*

### 4.2 Hardware Interfaces

*TAS works on any machine that has an appropriate browser.*

### 4.3 Software Interfaces

SQL Server 2008 R2: Primary database

HTML: Used to display information

CSS: Used to style HTML

PHP: Used to retrieve information from SQL Server 2008 R2

JavaScript: Used to organize the information into reports

### 4.4 Communications Interfaces

TAS was designed to use PHP to retrieve data from the database and convert date times into a friendlier format before passing it to JavaScript. TAS retrieves the data from PHP using AJAX techniques then parses the returned sting into data that it can manipulate to generate a report.

## 5. Other Nonfunctional Requirements

### 5.1 Performance Requirements

TAS will need to be able to retrieve large amounts of data and process it quickly. The current the acceptable limit from when data is requested to when the report is displayed is four seconds.

### 5.2 Safety Requirements

TAS is not currently a safety risk as it doesn't have rights alter the database.

### 5.3 Security Requirements

TAS does not have any security risks except potential defacing of the website which must be prevented. TAS does not currently give users the ability to type in any fields. If text fields become necessary TAS does still not have privileges to perform alter the database.

### 5.4 Software Quality Attributes

Availability: TAS needs to be constantly running after deployment.

Usability: TAS must have an intuitive user interface.

Expandability: TAS must be easily expanded to incorporate more charts and features.



## 6. Other Requirements

### Appendix A: Glossary

<u>User:</u>	Any person using Traffic Analytical System.
<u>Developer:</u>	Person who is responsible for expanding or maintaining the project.
<u>Alter the Database:</u>	Any action that can change data in the database such as the update, insert, and delete operations.
<u>Usability:</u>	The level of intuitiveness when using the user interface.
<u>Expandable:</u>	Implies a relatively ease when adding new features and reports into the project .
<u>Web Based:</u>	An application or website that is not machine specific.

### Appendix C: Issues List

TBD