1. Introduction
   * Societal Problem
   * Current Traffic Avoidance Methods
   * Statistics
   * Solution Overview
   1. Purpose (*Lab 1: Product Description)*

* Providing Customized Traffic Monitoring
* How It Will Be Used
* Who Will Use It (*Lab 1: Target Market Customer Base)*
* What It Will Do (*Lab 1: Product Features & Capabilities)*
  + Virtual Checkpoints (GPS)
  + Real-Time Data Exchange
  + Traffic Analysis
  + Driver Profiles
* What It Won’t Do
  + Prevent Traffic Congestion
  + Guarantee Decreased Delay
  + Guarantee Information Availability
  + Direct Obstruction Identification
  + Detect Emergency Response Vehicles
  + Provide Turn-by-turn Directions
  1. Scope
* Reduced Geographical Area
  + Old Dominion University
  + Select Highway Corridors
* Pre-determined Simulated Driver Data
* Pre-recorded Routes (Real GPS Data)
* Processing Simulated Travel Data on Server (Pseudo Real-Time)

*Table: Prototype Features Table*

* 1. Definitions and Acronyms

See *Glossary*

* 1. References

See *References (Lab 1)*, add CS 411/Lab 1

* 1. Overview

Summary of Product Specification Contents

1. General Description
   1. Prototype Architecture Description (*Lab 1: Prototype Architecture*)

* MFCD (Prototype)

*Figure: MFCD Phase 1*

* Prototype Algorithms

*Table: Algorithms* ……………………………………………………..(**TO DO**)

* Working Mobile Application
  + GUI Screens

*Figure: GUI Site Map*

* Virtual Machine Server
  + Apache
  + MySQL
  + PHP MyAdmin
  1. Prototype Functional Description
* Mobile Application
  + GUI: Login
  + GUI: New User
  + GUI: New/Edit Route
  + GUI: End of Trip
  + GUI: Delay Notification
  + GUI: Settings
* Driver Profile
  + Store/Edit Custom Routes
  + Set Pre-analysis Times
  + Track Statistics
* Virtual Checkpoints
* Traffic Wizard Process Flow

*Figure: Traffic Wizard Process Flow (Modified Process on website)*

* + Data Exchange Flow

*Figure: Checkpoint Algorithm (Dropbox->Web and Slide Images -> algorithms-checkpoint-flow)*

* + Server Communication (*Lab 1: Comm. Between. Smartphone and Server)*

*Figure: Data Exchange Flow (Data Flow on website)*

* Simulation Console

Figure: Simulation Console…………………………………..(**TO DO**)

* 1. External Interfaces
     1. Hardware Interfaces
  + Smartphone
  + GPS Module
  + 3G Internet Module
    1. Software Interfaces
  + MySQL Database Interface
  + PHP/Java/Python/Perl (TBD) Server Interface
  + Simulation Console Interface (.NET)
    1. User Interfaces
  + Smartphone App

*Figure: GUI Sitemap*

* + 1. Communication Protocols / Interfaces
  + TCP/IP
  + UDP

1. Specific Requirements (COLLABORATION)\*\*\*\*
   1. Functional Requirements
      1. Databases

*Figure: Database Schema*

* + - 1. Driver Profile Database

*Figure: Customer Database ERD (site)*

* + - 1. Virtual Checkpoint Database

*Figure: Route Database ERD (site)*

* + - 1. Speed Limit Database

*Figure: Speed Limit Database ERD*……………………(**TO DO**)

* + 1. Algorithms
       1. Aggregate Speeds
       2. Checkpoint Allocation
       3. Checkpoint Reallocation
       4. Route Analysis

*Figure: Route Analysis Algorithm (site)*

* + - 1. Next Checkpoint ETA
      2. Driver Generator
    1. Simulation Console
       1. Region Selection
       2. Traffic Scenario Selection
       3. Simulation Runtime Execution
       4. Traffic Activity Display
    2. GUI
       1. Smartphone Application (w/ *Figures (screenshots)*)
* GUI: Login
* GUI: New User
* GUI: New/Edit Route
* GUI: End of Trip
* GUI: Delay Notification
* GUI: Settings
  + - 1. Simulation Console(figures)……………….…..……….(**TO DO**)
  1. Performance Requirements
     1. Database Read/Write Speed
     2. Wireless Data Transmission Speed/Fidelity
     3. Algorithm Efficiency
  2. Assumptions and Constraints
     + Assumptions: Driver base

*Table: Assumptions Table*………………………………(**TO DO**)

* 1. Non-functional Requirements
     1. Security
     2. Maintainability
     3. Reliability
        1. Server Uptime/Redundancy