



***VEHICLE DETECTION***

PROJECT CHARTER

Version *1.0*

*02.25.2024*





# VERSION HISTORY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Version #** | **Implemented By** | **Revision Date** | **Approved By** | **Approval Date** | **Reason** |
| 1.0 | Budnik Serhii | 27.02.2024 | Vitaliy Dorosh | 28.02.2024 |  |
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**UP Template Version:** 11/30/06





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## INTRODUCTION

### PURPOSE OF PROJECT CHARTER

The ”Vehicle Detection” project charter documents and tracks the necessary information required by decision maker(s) to approve the project for funding. The project charter should include the needs, scope, justification, and resource commitment as well as the project’s sponsor(s) decision to proceed or not to proceed with the project. It is created during the Initiating Phase of the project.

The intended audience of the ”Vehicle Detection” project charter is the project sponsor and senior leadership.

## PROJECT AND PRODUCT OVERVIEW

WHO: This project is spearheaded by a dedicated team comprising computer vision engineers, software developers, project managers, and quality assurance specialists. Key stakeholders include the project sponsor, site managers, and end-users of the vehicle detection system.

WHAT: The goal of the Test Plan for Site Vehicle Detection from Video project is to develop, implement, and validate a sophisticated system for detecting and tracking vehicles using video footage from surveillance cameras. The project focuses on creating a reliable software solution that leverages cutting-edge computer vision technology to enhance site security and operational efficiency.

WHEN: The estimated duration for this project is 18 months. This timeline includes phases for requirements gathering, design, development, testing, and deployment, ensuring thorough validation and optimization of the system.

WHERE: The project will be executed at our main development center, with testing conducted in both controlled environments and selected real-world sites to ensure the system’s robustness and adaptability to various conditions.

ESTIMATED PROJECT DURATION: 18 months

ESTIMATED PROJECT BUDGET: $1.5M

## JUSTIFICATION

### BUSINESS NEED

The Test Plan for Site Vehicle Detection from Video is crucial for enhancing site security, operational efficiency, and compliance with regulations. It provides real-time vehicle detection and tracking, aiding in monitoring unauthorized access, managing traffic flow, and collecting valuable data for optimizing site operations. This system ensures quick incident response and adapts to increasing traffic, delivering long-term value and improved site management.





## SCOPE

### OBJECTIVES

The objectives of the Site Vehicle Detection from Video project are as follows:

* + - Develop and refine computer vision algorithms for accurate vehicle detection and tracking.
    - Integrate the detection system seamlessly with existing site surveillance infrastructure.
    - Create a user-friendly interface for configuring and monitoring the vehicle detection system.
    - Conduct comprehensive testing to validate system performance across various environmental conditions and scenarios.
    - Deploy the vehicle detection system at selected pilot sites, followed by a broader rollout.
    - Provide detailed documentation and training materials to ensure effective use and maintenance of the system.
    - Collect and analyze data from the system to provide insights for improving site security and operational efficiency.

### HIGH-LEVEL REQUIREMENTS

Creating a comprehensive table of requirements is essential for the successful implementation and operation of the Site Vehicle Detection from Video project. Below is a structured overview that outlines the key requirements essential for achieving the project's objectives:

|  |  |
| --- | --- |
| **Req. #** | **Requirement Description** |
| Detection Accuracy | The system must accurately detect and classify vehicles with at least 95% accuracy under various environmental conditions (day/night, weather variations). |
| Real-Time Processing | The system should process video feeds in real-time, with a maximum latency of 2 seconds from detection to notification. |
| Integration | The vehicle detection system must seamlessly integrate with existing surveillance and security infrastructure, including video management systems (VMS) and alarm systems. |
| User Interface | Develop a user-friendly interface that allows site administrators to configure detection parameters, monitor real-time alerts, and access historical data. |

### MAJOR DELIVERABLES

The following table presents the major deliverables that the project’s product, service, or result must meet in order for the project objectives to be satisfied:

|  |  |
| --- | --- |
| **Major Deliverable** | **Deliverable Description** |
| Vehicle Detection Algorithm | Develop and implement an accurate vehicle detection algorithm capable of identifying and classifying vehicles in real-time video feeds. |
| User Interface | Create a user-friendly interface for configuring detection parameters, monitoring real-time alerts, and accessing historical data. |
| System Integration | Ensure seamless integration of the vehicle detection system with existing surveillance infrastructure, including VMS and alarm systems. |
| Testing and Validation | Conduct comprehensive testing to validate the accuracy, reliability, and performance of the vehicle detection system across various scenarios. |

### BOUNDARIES

**Inclusive Boundaries**:

* **Vehicle Detection and Tracking**: The project will include the development and implementation of algorithms to detect and track vehicles in real-time using video feeds from surveillance cameras.
* **Integration with Existing Systems**: The project will ensure that the vehicle detection system integrates seamlessly with existing surveillance and security infrastructure, including video management systems (VMS) and alarm systems.
* **User Interface Development**: A user-friendly interface will be developed to allow site administrators to configure detection parameters, monitor real-time alerts, and access historical data.
* **Testing and Validation**: Comprehensive testing and validation will be conducted to ensure the accuracy, reliability, and performance of the system under various environmental conditions and scenarios.
* **Training and Documentation**: The project will provide training and documentation for end-users and administrators to ensure effective use and maintenance of the system.

**Exclusive Boundaries** (Out of Scope):

* **Non-Vehicle Detection**: Detection of non-vehicle entities, such as pedestrians or animals, is not included in this project.
* **Hardware Procurement**: The procurement and installation of new surveillance cameras and other hardware components are not part of this project. The project will only work with existing infrastructure.
* **Infrastructure Upgrades**: Upgrades or modifications to the site's existing network or electrical infrastructure required to support the new system are not within the scope.
* **Long-Term Data Storage**: While the system will store detection data for analysis, long-term archival storage beyond the specified period (6 months) is not included.
* **Post-Deployment Support**: Ongoing post-deployment support and maintenance beyond the initial training and handover period are not part of this project.
* **Third-Party System Integration**: Integration with third-party systems beyond the specified surveillance and security systems is not included.

## DURATION

### TIMELINE



### EXECUTIVE MILESTONES

The table below lists the high-level Executive Milestones of the project and their estimated completion timeframe.

|  |  |
| --- | --- |
| **Executive Milestones** | **Estimated Completion Timeframe** |
| Completed Product Concept. | Three weeks after task is define |
| Alpha Version Presentation. | Month after main concepts is approved |

|  |  |
| --- | --- |
| **Executive Milestones** | **Estimated Completion Timeframe** |
| Beta Version Presentation. | Month after alpha version is released |

## HIGH-LEVEL ALTERNATIVES ANALYSIS

In conducting the high-level alternatives analysis for the Site Vehicle Detection from Video project, several factors were considered to determine the most suitable approach for achieving the project objectives. These factors included:

* **Custom Development**: Developing a custom vehicle detection system tailored to the specific requirements and challenges of the project.
* **Commercial Off-The-Shelf (COTS) Solutions**: Exploring existing commercial solutions for vehicle detection and tracking that could potentially meet the project's needs.
* **Integration with Existing Systems**: Evaluating the feasibility of integrating with pre-existing surveillance and security infrastructure to leverage existing investments.
* **Outsourcing Development**: Considering the option of outsourcing the development and implementation of the vehicle detection system to specialized vendors or contractors.

## ASSUMPTIONS, CONSTRAINTS AND RISKS

### ASSUMPTIONS

This section identifies the statements believed to be true and from which conclusions were drawn to define this project charter:

1. **Assumption 1**: The surveillance cameras installed at the site are capable of capturing clear and high-quality video footage suitable for vehicle detection and tracking algorithms.
2. **Assumption 2**: Sufficient network bandwidth and storage capacity are available to support the transmission and storage of video data from the surveillance cameras to the vehicle detection system.

### CONSTRAINTS

This section identifies any limitations that must be taken into consideration prior to the initiation of the project:

1. **Constraint 1**: There might be time constraints imposed by regulatory approvals or site-specific requirements that could impact the development and deployment timeline of the vehicle detection system.
2. **Constraint 2**: Budget constraints may limit the resources available for the project, potentially affecting the scope and quality of the vehicle detection solution.
   1. **RISKS**

|  |  |
| --- | --- |
| **Risk** | **Mitigation** |
| Hardware Compatibility Issues | Conduct thorough compatibility testing with various surveillance camera models to identify and address any compatibility issues early in the development process. |
| Data Privacy and Security Concerns | Implement robust encryption and access control measures to safeguard sensitive video data from unauthorized access or breaches. Conduct regular security audits and updates to mitigate potential risks. |
| Environmental Variability | Perform extensive testing under diverse environmental conditions (e.g., different lighting, weather) to ensure the system's reliability and accuracy across various scenarios. |
| Resource Shortages | Maintain open communication with stakeholders to identify resource constraints early and explore alternative solutions, such as outsourcing certain tasks or adjusting project timelines and scope accordingly. |

## PROJECT ORGANIZATION

### ROLES AND RESPONSIBILITIES

This section describes the key roles supporting the project.

|  |  |  |
| --- | --- | --- |
| **Name & Organization** | **Project Role** | **Project Responsibilities** |
| Vitaliy Dorosh | Project Sponsor | - Develop project plans, timelines, and budgets - Coordinate tasks and resources - Monitor progress and ensure project milestones are met - Manage communication among team members and stakeholders - Ensure adherence to project requirements and objectives |
|  |  |  |
| Vasylchuk | Computer Vision | Development and implementation of vehicle |
| Oleksandr | Engineer | detection algorithms |
|  |  | Optimization of algorithms for accuracy and |
|  |  | performance |
|  |  | Testing and validation of detection algorithms |
|  |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| **Name & Organization** | **Project Role** | **Project Responsibilities** |
| Bukevich Ilya | Software Developer | Design and development of software components for the detection system  Integration of the detection system with existing infrastructure  Implementation of user interface and system functionality |
| Budnik Sergiy | Quality Assurance Specialist | Creation and execution of test cases to ensure system reliability and accuracy  Identification and reporting of software bugs and issues  Validation of system performance against defined requirements and specifications |
| Yednak Ivan | Site Administrator  Assurance Tester | Configuration and management of the vehicle detection system settings and parameters  Monitoring and troubleshooting system performance  User training and support |

## PROJECT CHARTER APPROVAL

The undersigned acknowledge they have reviewed the project charter and authorize and fund the ”Vehicle detection” project. Changes to this project charter will be coordinated with and approved by the undersigned or their designated representatives.

Signature: Date: 28.02.2024

Print Name: Vitaliy Dorosh



Role: Project Sponsor

Signature: Date:

Print Name: Role:

## APPENDIX A: REFERENCES

The following table summarizes the documents referenced in this document:

|  |  |  |
| --- | --- | --- |
| **Document Name and Version** | **Description** | **Location** |
| CDC\_UP\_Proje ct\_Charter\_Vehicle\_Detection  version 1.0 | The *”Vehicle Detection”* detailed specification of the vehicle detection algorithm including requirements, design, and performance criteria. |  |