Project Plan Scope— Gathering Bus Pad Locations using Machine Learning

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Change Log

#	Version No.	Revision Date	Summary of Changes	Updated By
1	V1.0	10/02/2025	Initial Draft Document Submitted to Asset Management team for review	
2	V2.0			

PROJECT NO.	DATE SUBMITTED
BP2025	10/2/2025

Introduction, Scope & Goals

BUSINESS CASE

- The NYC DOT Resilience Unit is responsible for ensuring that current assets are safe from untimely deterioration. NYC DOT has requested that we create an application to help the agency map out cooler streets and find what streets are in danger of deterioration by heat, to aid in deciding future projects aimed at installing structures that will aid in cooling those streets.

PROJECT

- Develop a machine learning workflow to detect and map bus pad locations.

- Use aerial and street-level imagery plus existing bus stop records.

- Generate a GIS dataset of bus pad locations with attributes such as bus stop ID and detection confidence.

- Create QA/QC reports and provide documentation for repeatable use.

HIGH LEVEL GOALS/OBJECTIVES:

- **Build a reliable machine learning model for bus pad detection**

  The team will train a computer vision model that can identify bus pads from aerial and street-level imagery with acceptable accuracy.

- **Deliver a GIS dataset of bus pad locations**

  The project will produce a map-ready dataset that links detected bus pads to bus stop records and includes confidence scores for each detection.

- **Provide a repeatable workflow with documentation**

  A documented process will be created so DOT staff can update the dataset in the future without starting from scratch.

- **Communicate results through a final presentation**

  The team will summarize the project's purpose, methods, and outcomes in a clear presentation with visual examples of detected bus pads.

Out of Scope:

- No field surveys or on-site inspections.

- No evaluation of bus pad condition (only location).

- No inventory of other bus stop assets (shelters, signage, benches).

Project Deliverables

No.	Description
1	**Trained Machine Learning Model** – A computer vision model capable of detecting bus pads from imagery. Includes trained weights, scripts, and performance statistics.
2	**Spatial Dataset of Bus pad Locations** – GIS dataset with geographic coordinates, linked bus stops IDs, and confidence scores. Usable in DOT's asset management systems.
3	**QA/QC Report** – A written report summarizing detection accuracy, error rates, and low-confidence results requiring manual review.

4	**Workflow Documentation** – Technical notes describing the full process (data preparation, model training, dataset creation). Provides steps for future replication and updates.
5	**Final Presentation** – Slide deck and demonstration that communicates the project background, methods, and outputs to both technical and non-technical audiences.

Project Tasks

Work Breakdown

TASK NO.	DESCRIPTION	FOR DELIVERABLE NO. … ENTER TASK #
1	Identify viable datasets (imagery and bus stop data)	Deliverable: 1
2	Label imagery and prepare training data	Deliverable: 1
3	Write preprocessing scripts to clean and format data	Deliverable: 1
4	Train machine learning model for bus pad detection	Deliverable: 1
5	Validate model accuracy with test dataset	Deliverable: 1
6	Convert detections into GIS-compatible formats	Deliverable: 2
7	Link bus pad detections to bus stop ID's	Deliverable: 2
8	Add attributes such as confidence scores	Deliverable: 2
9	Store GIS dataset in database	Deliverable: 2
10	Test dataset usability with queries	Deliverable: 2
11	Create QA/QC scripts to flag low-confidence results	Deliverable: 3
12	Produce QA/QC report with findings	Deliverable: 3
13	Write technical workflow documentation	Deliverable: 4
14	Provide retraining guide for DOT staff	Deliverable: 4
15	Create final presentation slides	Deliverable: 5
16	Demonstrate project results to DOT audience	Deliverable: 5