

Statement of Work (SOW)

Title

Project "OrbitPath": Satellite-Based Sidewalk Quality Analysis for Urban Infrastructure.

Statement of Work Template

Abstract

This Statement of Work (SOW) outlines the collaboration between **Microsoft** (the "Client") and **Craig Frint** (the "Contractor") to develop a computer vision pipeline that utilizes high-resolution satellite imagery to assess and measure the quality of sidewalks across major American cities. The project aims to provide city planners and the Microsoft Urban Analytics team with automated, scalable data regarding infrastructure degradation, accessibility hurdles, and repair prioritization. The Contractor will be responsible for algorithm development, model training on multispectral data, and the delivery of a geo-referenced quality index map.

Value

The total estimated value of this engagement is **\$120,000**. This includes all professional services provided by Craig Frint, access to specialized GPU compute instances provided via Azure, and any necessary licensing for proprietary geospatial libraries. This investment is projected to save the Urban Analytics team over 1,500 manual auditing hours and provide Microsoft with a proprietary dataset valuable for municipal partnerships and sustainability reporting.

Scope

The scope of work includes the development of a Python-based analysis engine that consumes Maxar/Airbus satellite imagery and outputs a "Sidewalk Health Score" for five target cities: Seattle, Chicago, New York, San Francisco, and Austin. The project involves data preprocessing (orthorectification and cloud masking), the development of a Deep Learning model (U-Net or similar architecture) for sidewalk segmentation, and a classification layer to detect cracks, obstructions, and width compliance. The Contractor will provide bi-weekly technical updates and a final deployment package on Azure Machine Learning Services.

Type

This is a work-for-hire agreement as described by U.S. and Washington State law. Craig Frint is engaged as an independent contractor. All intellectual property, codebases, trained model weights, and derived datasets generated during this project shall be the sole property of

Microsoft.

Payment

The total project fee of \$120,000 will be paid according to the following milestone schedule:

- **Milestone 1: \$20,000** upon delivery of the Data Acquisition & Preprocessing Pipeline.
 - **Milestone 2: \$40,000** upon successful training and validation of the Segmentation Model (Target: >85% mIoU).
 - **Milestone 3: \$40,000** upon delivery of the Quality Classification Engine and 5-City Dataset.
 - **Milestone 4: \$20,000** upon final documentation, code handover, and 30 days of post-deployment support.
- Payments will be issued via wire transfer within 30 days of invoice approval.

Purpose

Objectives

- **Objective 1:** Achieve automated identification of sidewalk surfaces from satellite imagery with a precision of at least 90%.
- **Objective 2:** Categorize sidewalk quality into four tiers (Excellent, Good, Fair, Poor) based on surface texture and continuity.
- **Objective 3:** Integrate results into a Microsoft Azure Maps dashboard for stakeholder visualization.

Performance

Performance will be measured by:

- **Model Accuracy:** Intersection over Union (IoU) for sidewalk detection must exceed 0.85.
- **Processing Latency:** The pipeline must process a 10km x 10km urban area in under 12 hours of compute time.
- **Data Reliability:** 95% consistency when compared against ground-truth "feet-on-street" audit samples provided by the Microsoft Urban team.

Factors

- **Imagery Quality:** Success depends on the availability of 30cm or higher resolution imagery.
- **Stakeholder Access:** Timely access to Microsoft's internal "City-Sync" ground-truth database.
- **Compute Availability:** Uninterrupted access to Azure NDv4-series virtual machines.

Who Does What

People

- **Craig Frint:** Lead Software Engineer / Contractor. (craig.frint@example.com)
- **Sarah Chen:** Microsoft Project Lead / Work Authority. (schen@microsoft.com)
- **Marcus Thorne:** Azure Infrastructure Lead. (mthorne@microsoft.com)

Roles

- **Contractor (Craig Frint):** Responsible for algorithmic design, coding, model training, and technical documentation.
- **Work Authority (Sarah Chen):** Responsible for scope approval, milestone sign-off, and providing domain expertise in urban planning.

Responsibilities

Area of Responsibility	Craig Frint	Sarah Chen	Marcus Thorne
Algorithm Design	Accountable	Consultable	Omittable
Cloud Infrastructure	Responsible	Consultable	Accountable
Ground-Truth Provision	Consultable	Accountable	Omittable
Milestone Approval	Omittable	Accountable	Consultable

Context

Past

Microsoft has previously attempted sidewalk analysis using Bing Maps Street Side data, but found the coverage inconsistent in residential areas. Project OrbitPath shifts the perspective to "Top-Down" satellite analysis to ensure 100% geographic coverage.

Present

Current municipal data on sidewalk quality is fragmented and often decades out of date. Microsoft aims to standardize this data globally, starting with these five US cities.

Future

Success in this phase will lead to a global rollout of the "Infrastructure Health Monitor," a proposed feature for Microsoft’s enterprise sustainability suite.

Planning

Requirements

- The system must use Azure Blob Storage for raw imagery.
- The model must distinguish between sidewalks, bike lanes, and road shoulders.
- Output data must be in GeoJSON format.

Specifications

Deliverables will be accepted if they meet the Model Accuracy ($\text{IoU} > 0.85$) and can be successfully containerized using Docker for deployment on Azure Kubernetes Service (AKS).

Work Breakdown Structure (WBS)

1. **Phase 1: Data Engineering** (Weeks 1-3)
2. **Phase 2: Model Development & Training** (Weeks 4-10)
3. **Phase 3: Large-Scale Inference & Geospatial Export** (Weeks 11-14)
4. **Phase 4: Optimization & Handover** (Weeks 15-16)

Applicable Standards

- OGC (Open Geospatial Consortium) standards for GeoJSON.
- Microsoft Internal Coding Standards (Python/C++).
- GDPR and CCPA compliance for data handling.

Method and Source of Acceptance

All deliverables are subject to inspection by Sarah Chen. Code will be reviewed via GitHub Pull Requests. Model accuracy will be verified against a hidden test set of 500 urban blocks.

Other Terms and Conditions

Client's Obligations

Microsoft will provide:

- Access to the Azure subscription.
- Maxar Satellite Imagery API keys.
- Internal ground-truth datasets for training.

Contractor's Obligations

Craig Frint will:

- Adhere to Microsoft's security and NDA policies.
- Maintain weekly progress logs.
- Deliver all source code via the designated Microsoft-owned GitHub repository.

Location of Work

Work will be performed remotely. Occasional sync meetings will occur via Microsoft Teams during Pacific Standard Time (PST) business hours.

Schedule

Expected Start Date and Completion Date

- **Start Date:** March 1, 2025
- **Completion Date:** June 30, 2025

Wordbook

- **IoU:** Intersection over Union (Accuracy metric).
- **Orthorectification:** Process of removing geometric distortion from satellite imagery.
- **SOW:** Statement of Work.

Sign-off

NOTE: Before signing the Statement of Work, if you have any questions or concerns, please call the Work Authority indicated above to negotiate any issues.

If you agree to the requirements of this Statement of Work, please sign and date the document which will be accepted as your proposal by Client, and return to my attention.

Microsoft (Work Authority)

Printed Name: Sarah Chen

Signature: _____

Date: _____

Contractor

Printed Name: Craig Frint

Signature: _____

Date: _____