

YOLO Model Analysis Report

Model:	yolo12s_finetuned_20251201
Model Size:	18.0 MB
Parameters:	9.3 M
FLOPs (640x640):	21.54 GFLOPs
Run Name:	yolo12s_finetuned_20251201_testing_20251201_064509
Timestamp:	2025-12-01 07:02:57
Dataset:	bdd100k_yolo_limited - test split
Images Processed:	20000
Total Execution Time	133.22s
IoU Threshold:	0.5

Inference Performance

Metric	Value
Average Inference Time	2.77 ms per image
FPS (Frames Per Second)	361.50

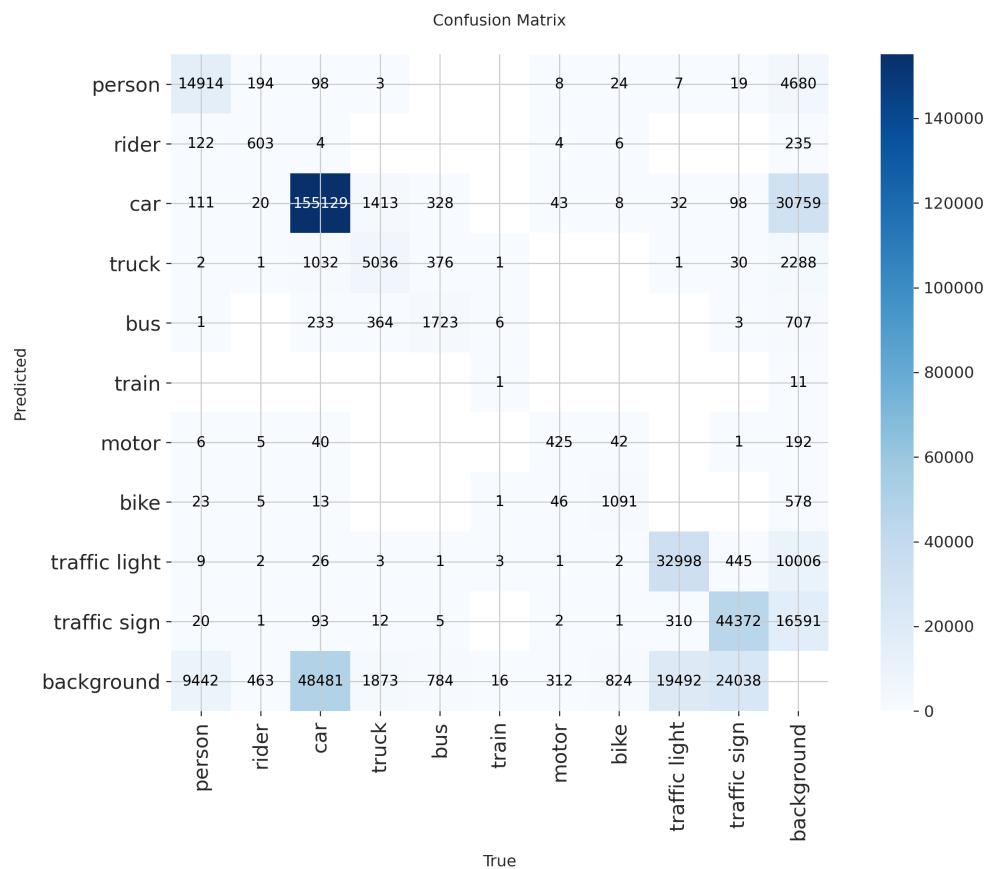
Note: Inference time includes preprocessing, model inference, and postprocessing.

Overall Accuracy Metrics

Metric	Value
Precision	0.6970
Recall	0.7813
F1-Score	0.7367
mAP@0.5	0.5563
mAP@0.5:0.95	0.3148
True Positives	256292
False Positives	111435
False Negatives	71757

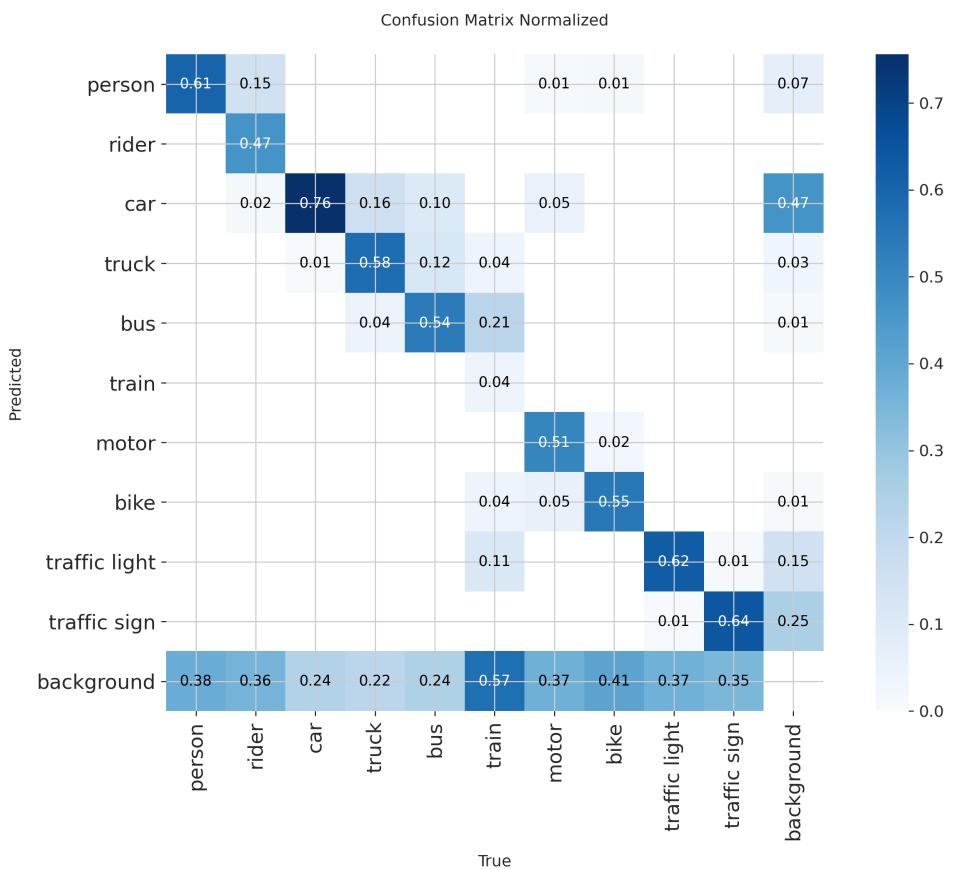
Confusion Matrices

Confusion Matrix (Counts)



Note: Shows raw prediction counts for each class combination.

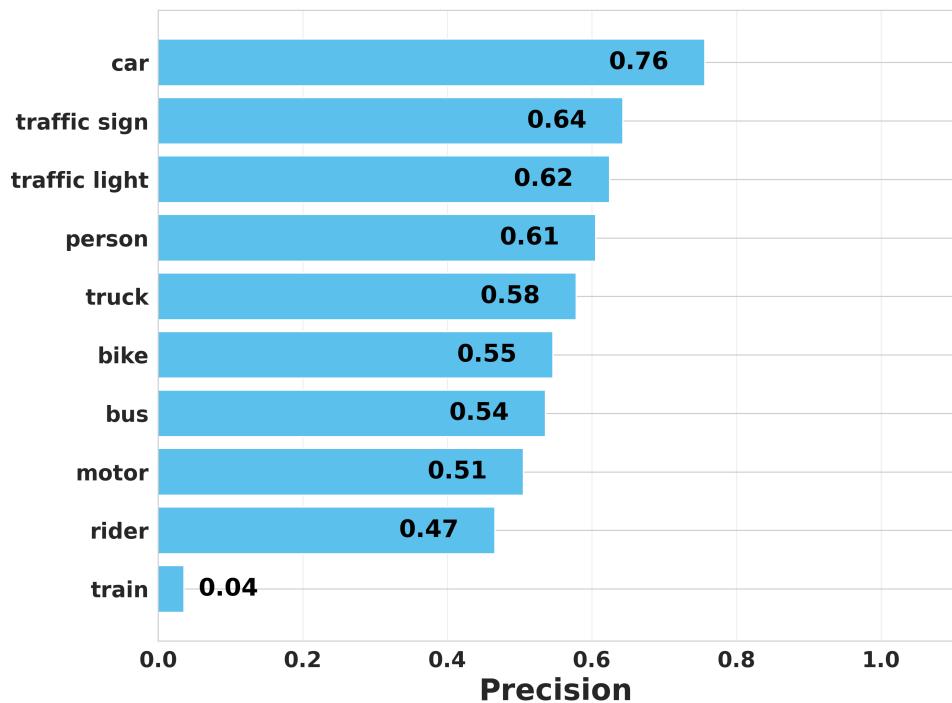
Confusion Matrix (Normalized)



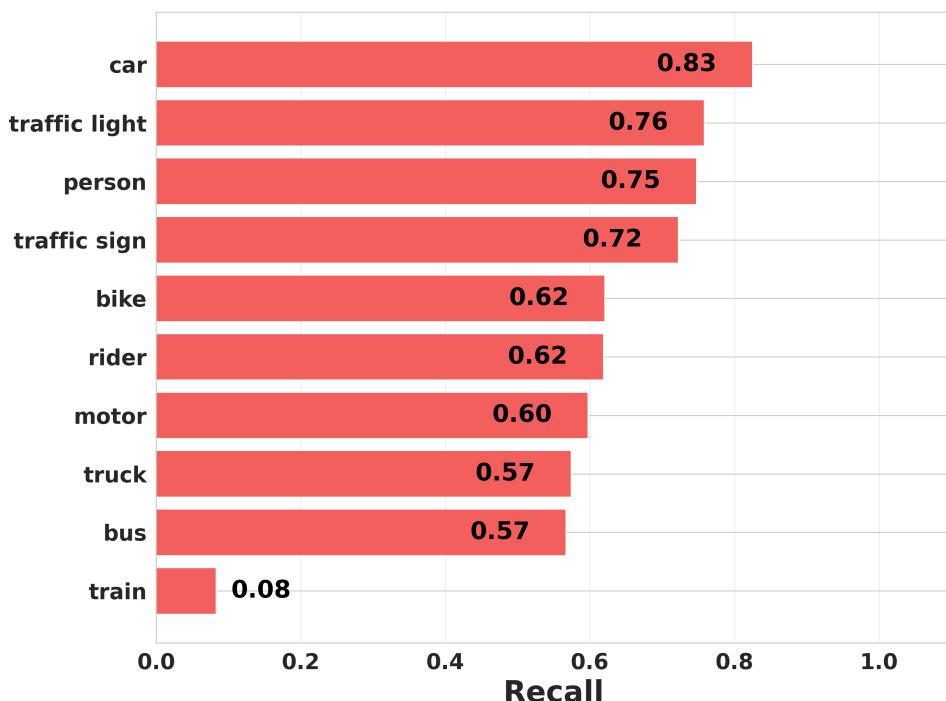
Note: Values are normalized by the number of ground truth instances per class. Shows the proportion of correct vs incorrect classifications.

Performance Visualizations

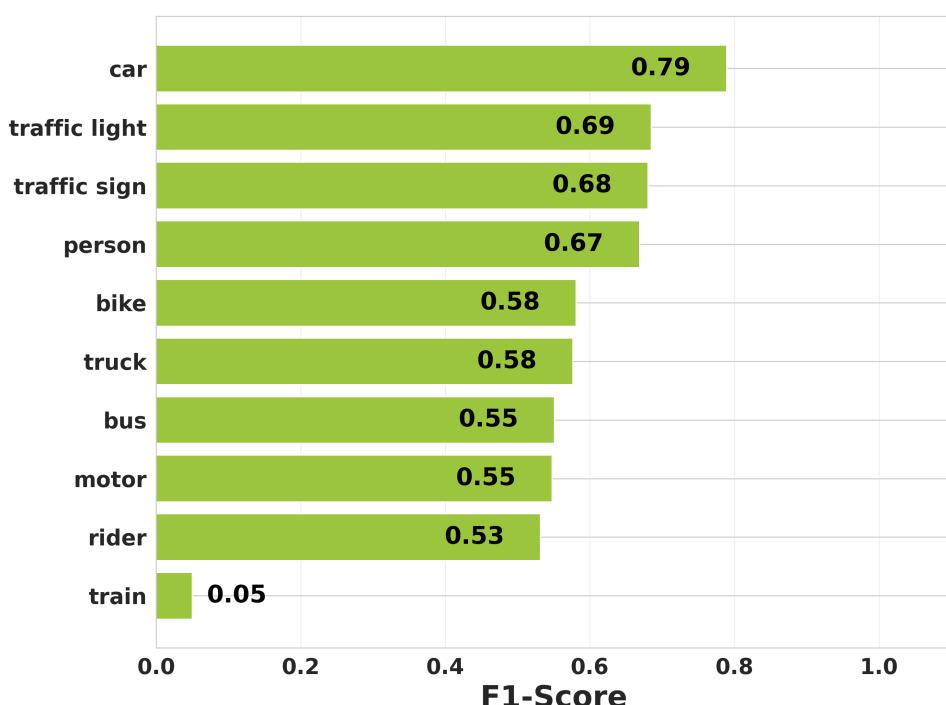
Precision by Class



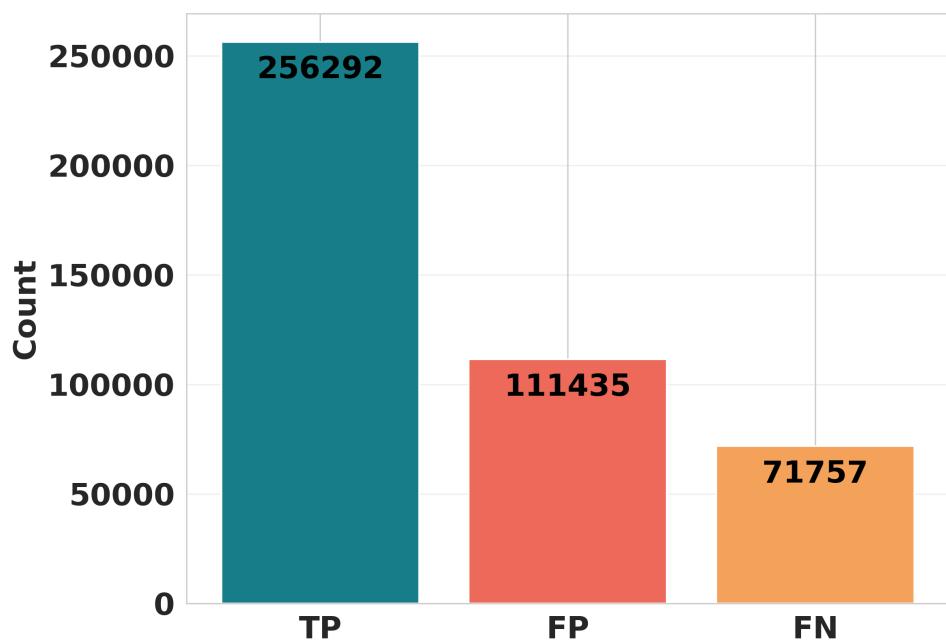
Recall by Class



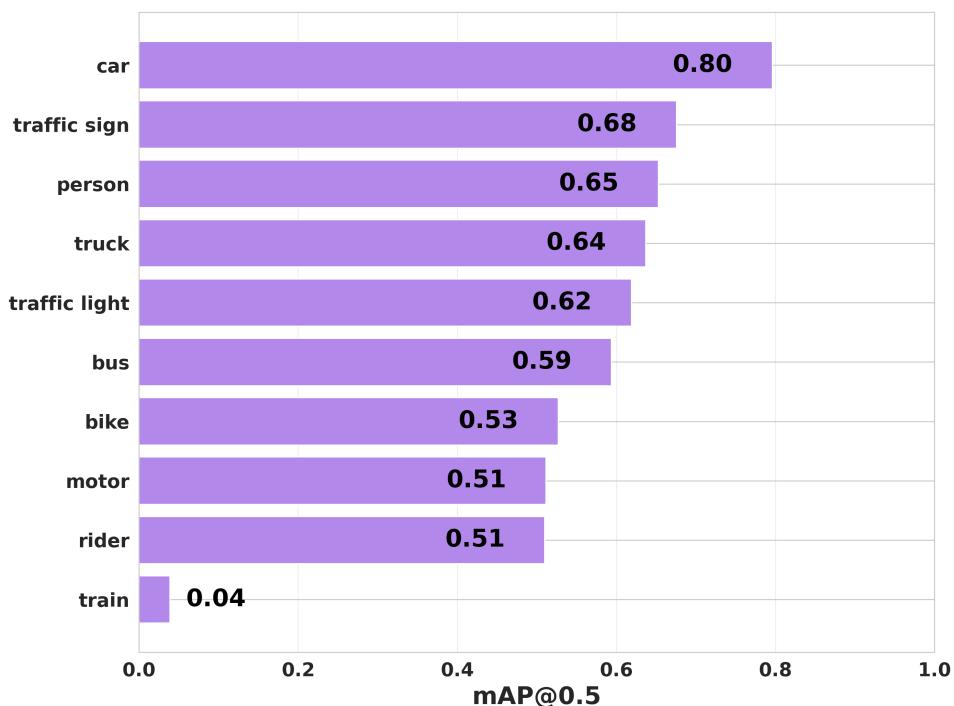
F1-Score by Class



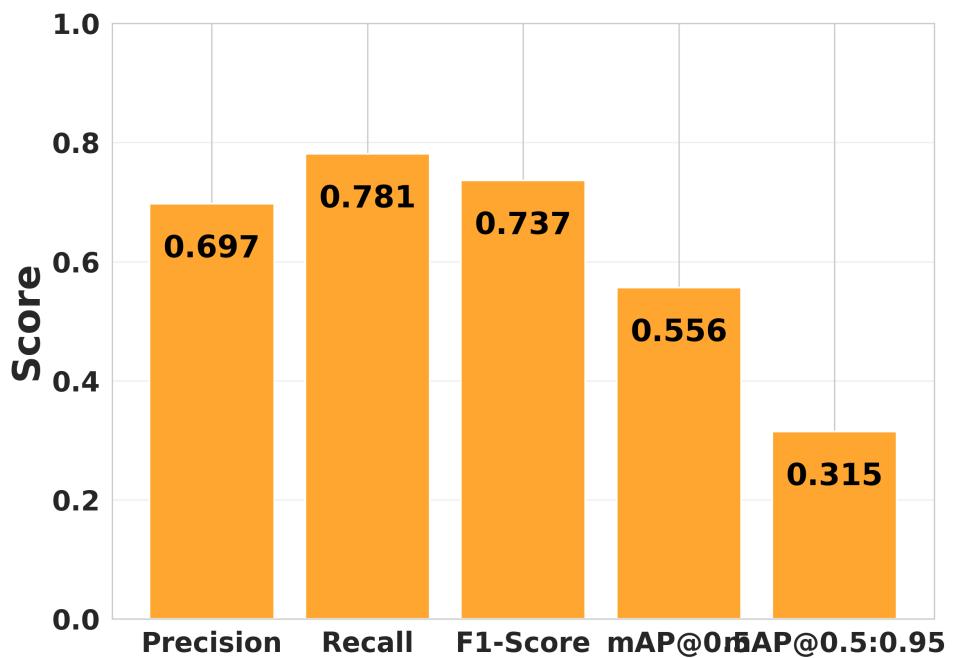
Overall Detection Outcomes



mAP@0.5 by Class



Overall Metrics



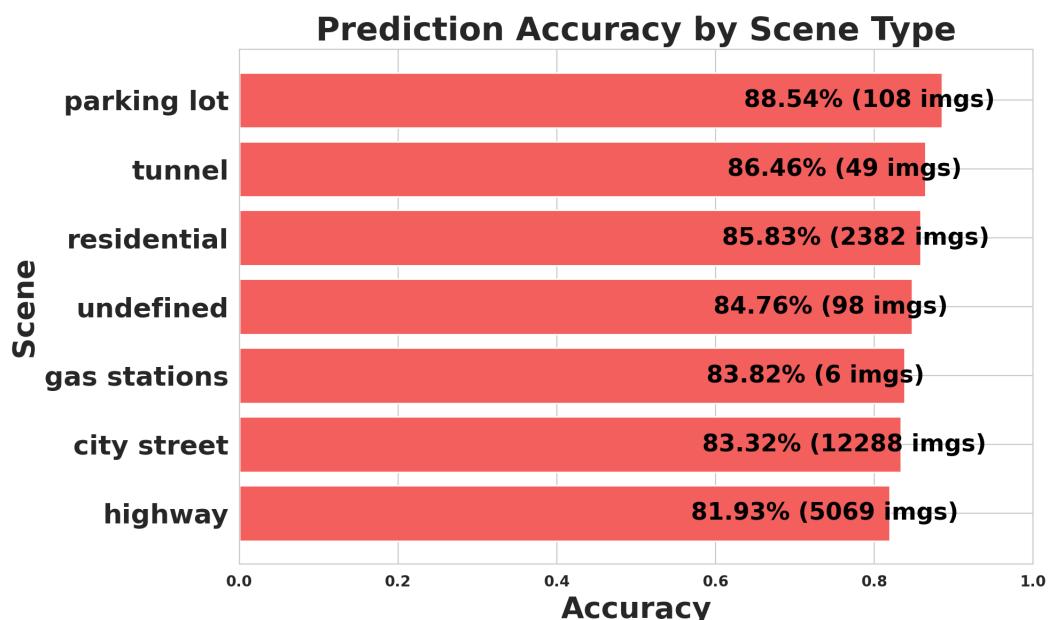
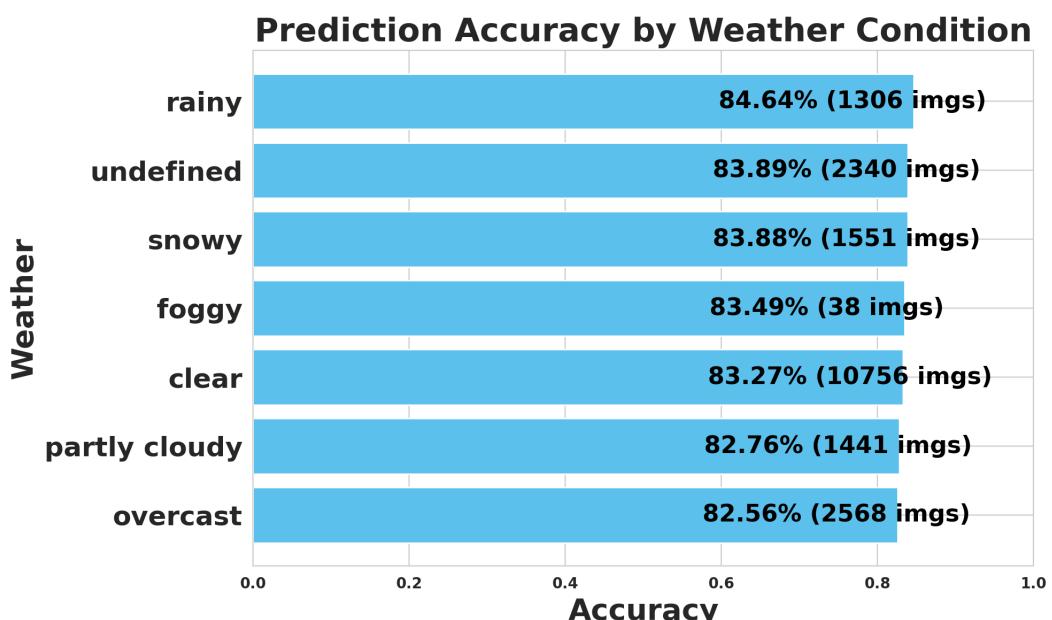
Per-Class Performance

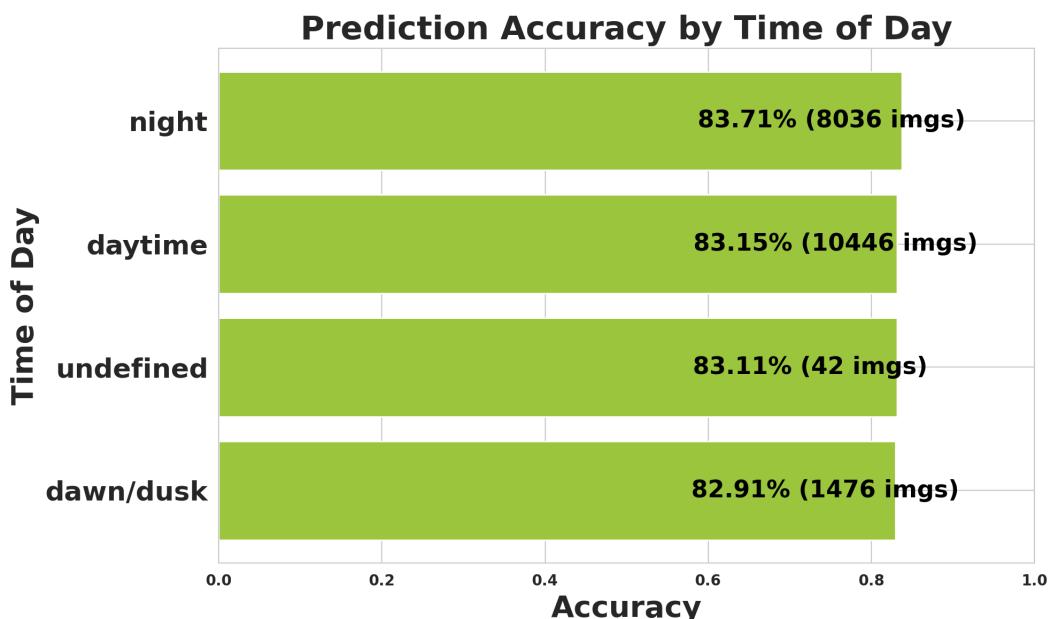
Class	TP	FP	FN	Precision	Recall	F1-Score	mAP@0.5
person	14914	9736	5033	0.6050	0.7477	0.6688	0.6529
rider	603	691	371	0.4660	0.6191	0.5317	0.5100
car	155129	50020	32812	0.7562	0.8254	0.7893	0.7962
truck	5036	3668	3731	0.5786	0.5744	0.5765	0.6371
bus	1723	1494	1314	0.5356	0.5673	0.5510	0.5941
train	1	27	11	0.0357	0.0833	0.0500	0.0389
motor	425	416	286	0.5054	0.5977	0.5477	0.5116
bike	1091	907	666	0.5460	0.6209	0.5811	0.5270
traffic light	32998	19842	10498	0.6245	0.7586	0.6851	0.6191
traffic sign	44372	24634	17035	0.6430	0.7226	0.6805	0.6758

Comprehensive Failure Analysis

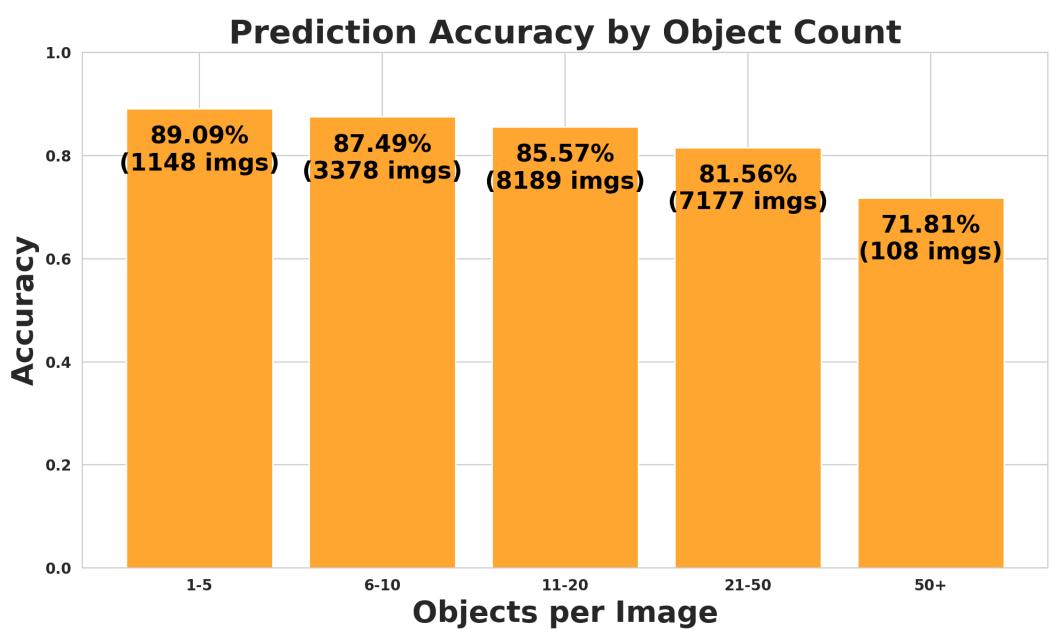
Metric	Value
Total Images Analyzed	20000
Total Expected Objects	367728
Total Matched Objects	306446
Overall Accuracy	83.33%

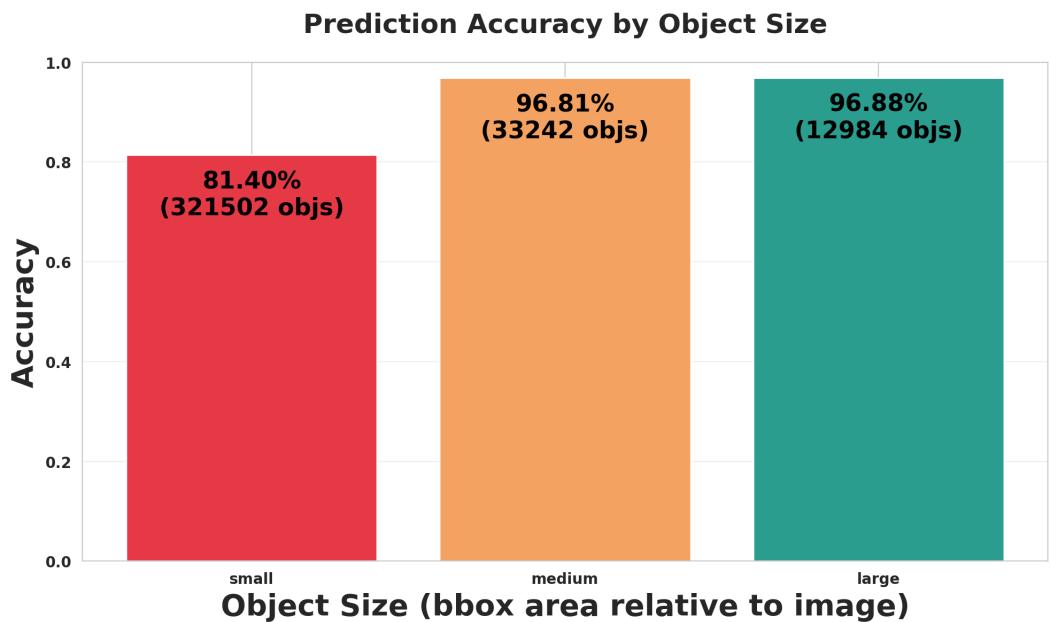
Accuracy by Environmental Attributes





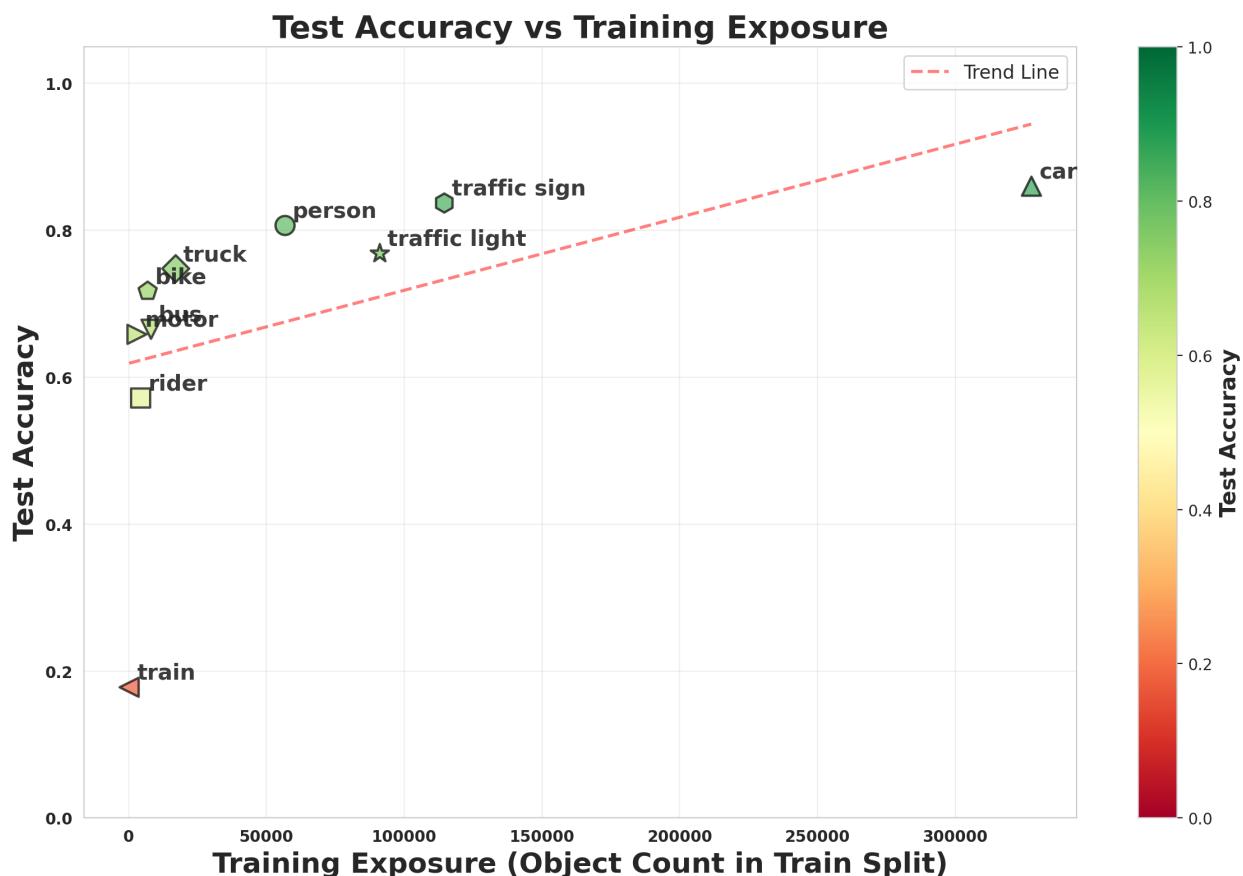
Accuracy by Object Characteristics



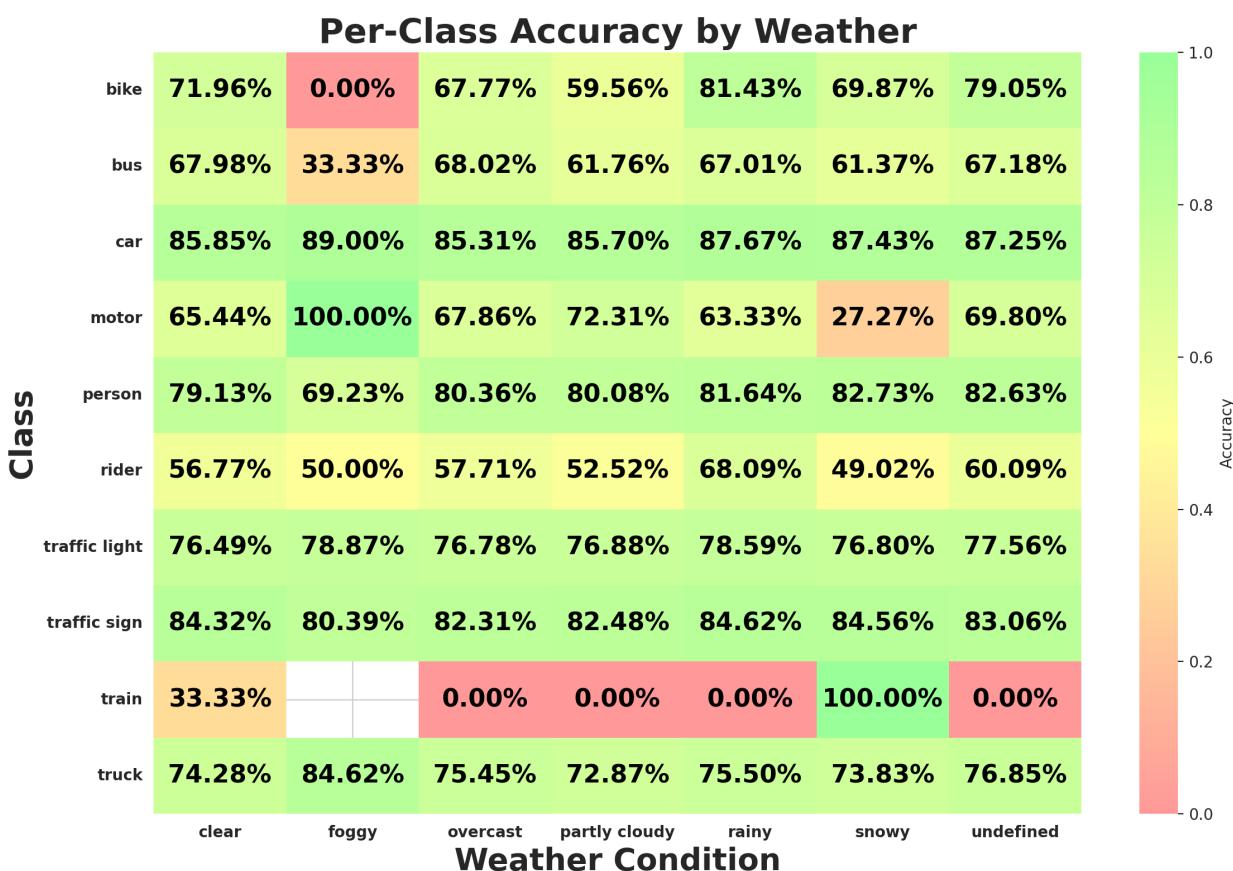
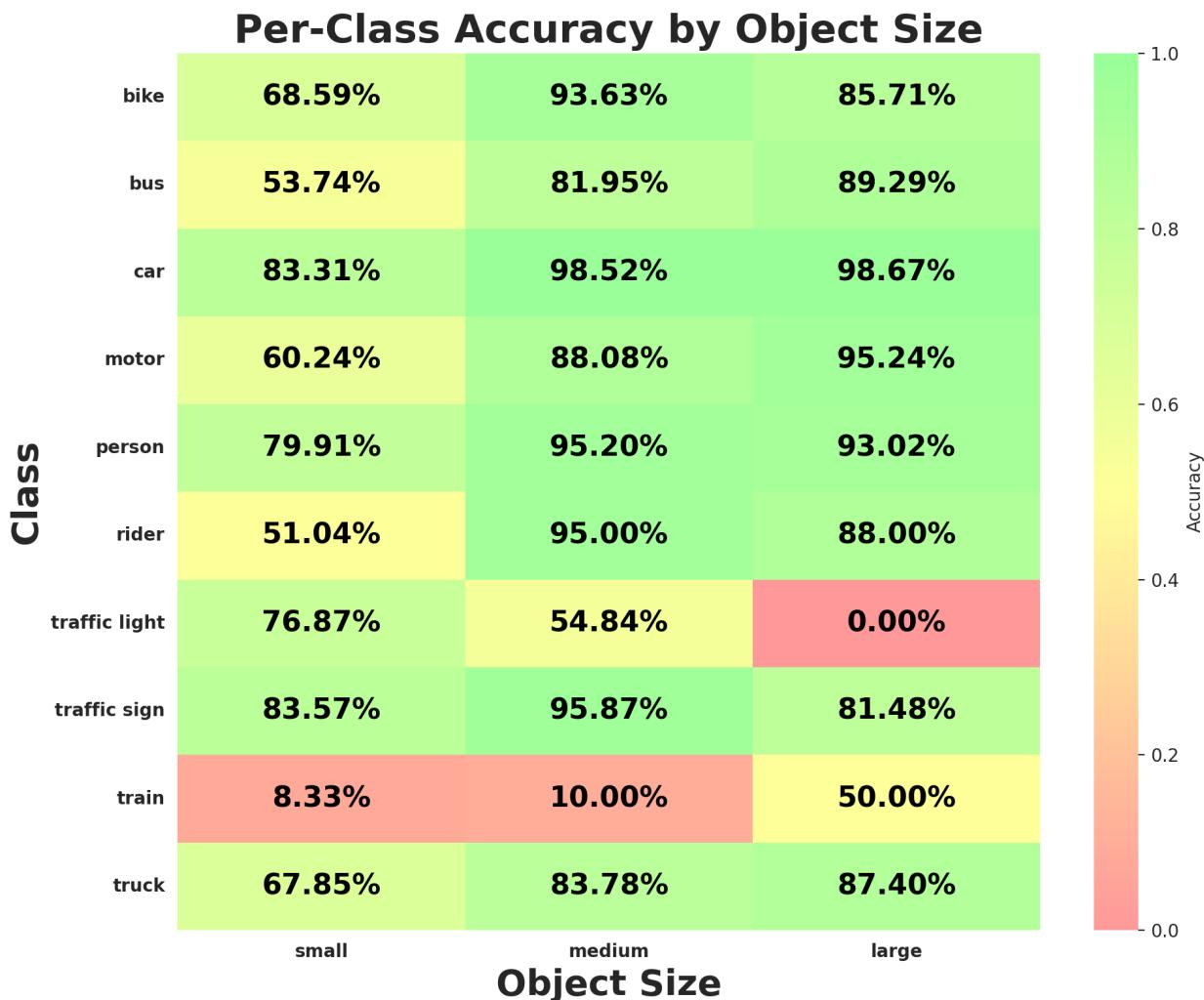


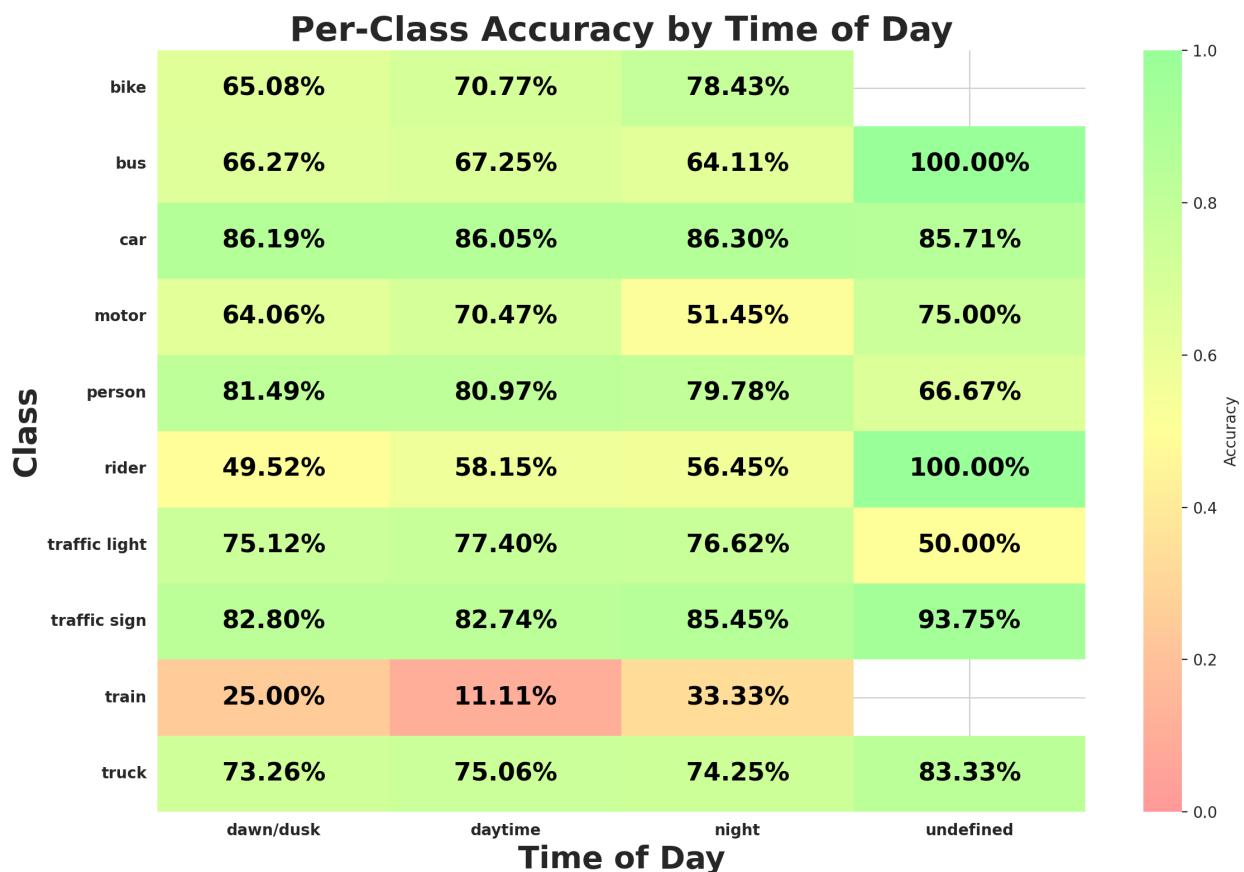
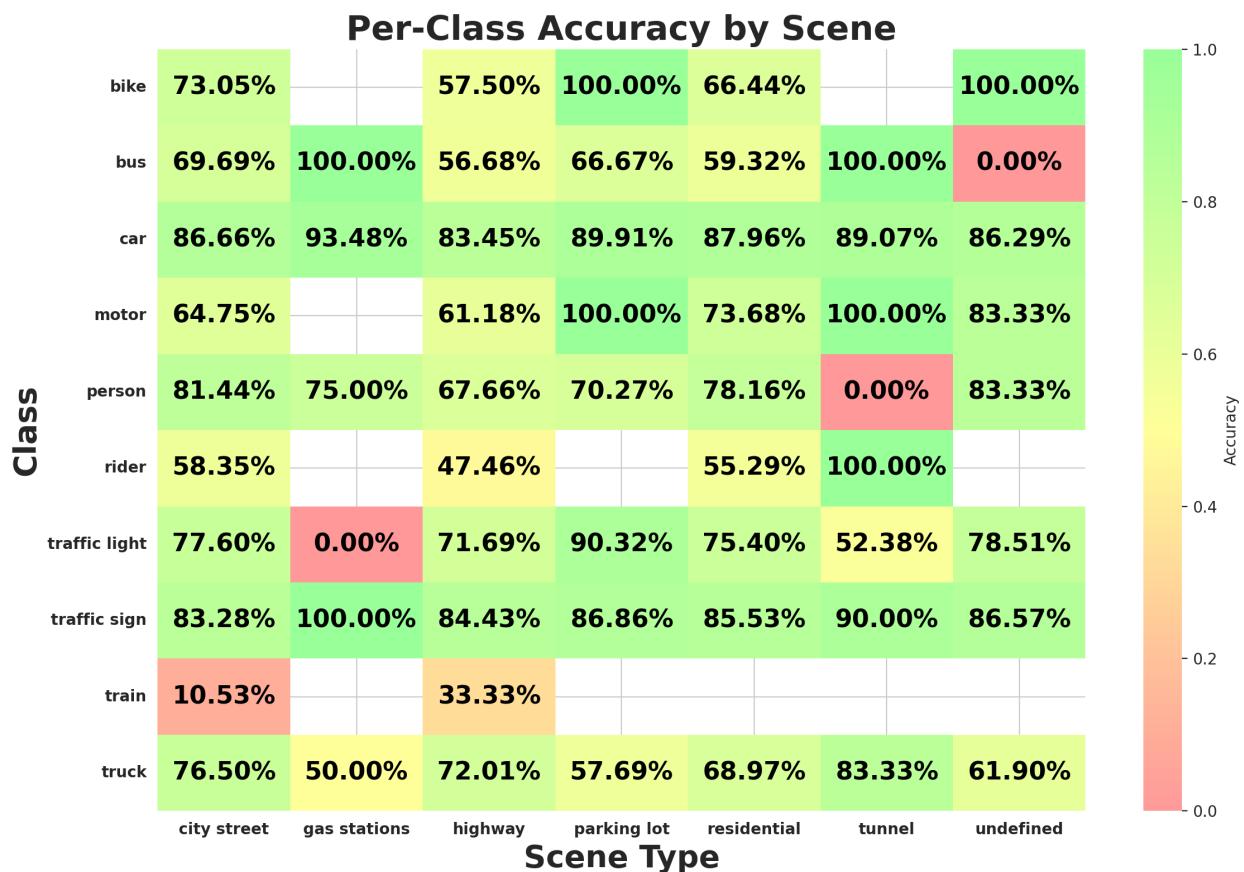
Note: Object size categories are defined based on bounding box area as a percentage of total image area: **Small** objects occupy less than 1% of the image (typically distant or small objects), **Medium** objects occupy between 1% and 5% of the image (moderate-sized objects at medium distances), and **Large** objects occupy more than 5% of the image (close or large objects). These thresholds help identify how object scale affects detection accuracy.

Training Exposure vs Test Performance



Per-Class Performance Analysis



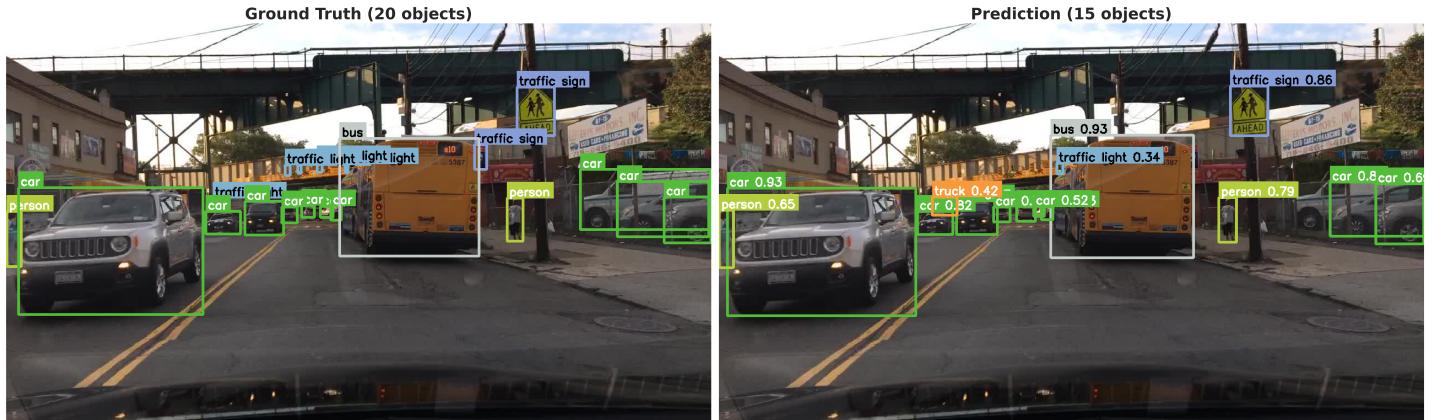


Sample Predictions: Ground Truth vs Model

Sample #1: db1385a4-91f2756a.jpg

Ground Truth Objects: 20 | Predicted Objects: 15

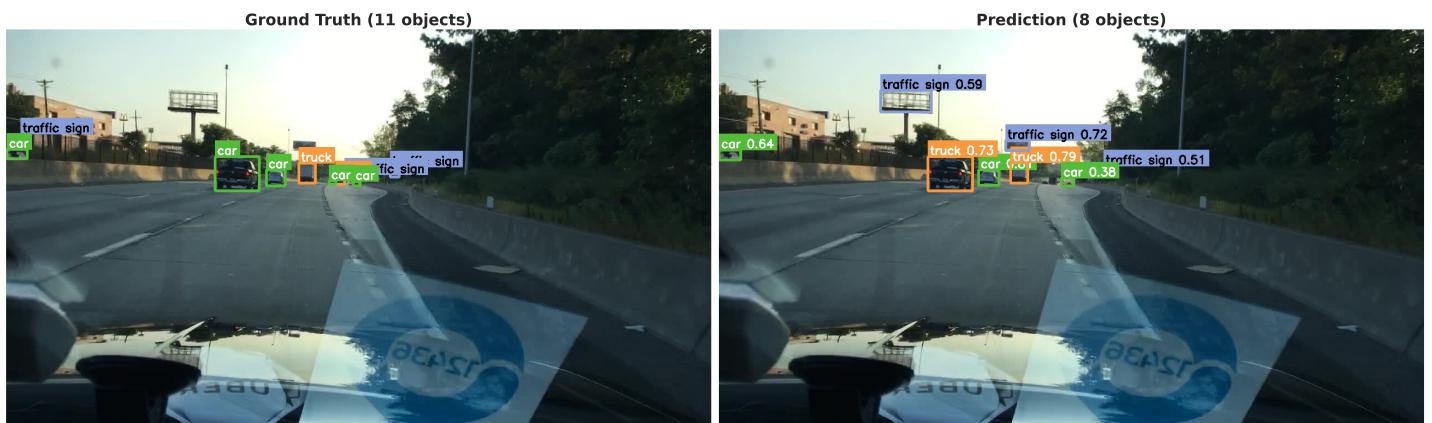
Weather: partly cloudy | Scene: city street | Time of Day: daytime



Sample #2: f8549008-f4b7323c.jpg

Ground Truth Objects: 11 | Predicted Objects: 8

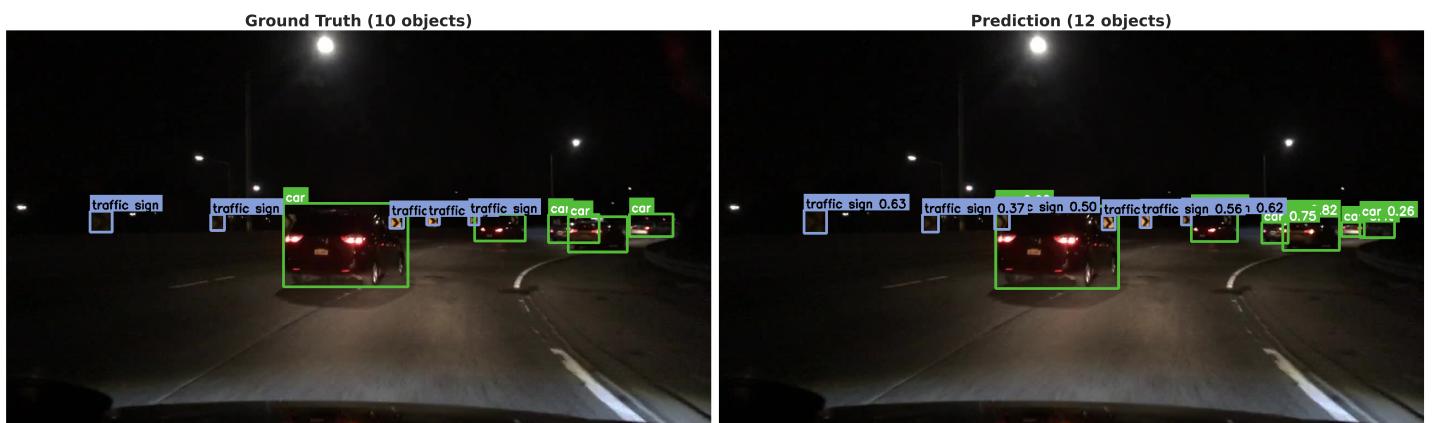
Weather: clear | Scene: city street | Time of Day: dawn/dusk



Sample #3: edc30ef4-f0fa105a.jpg

Ground Truth Objects: 10 | Predicted Objects: 12

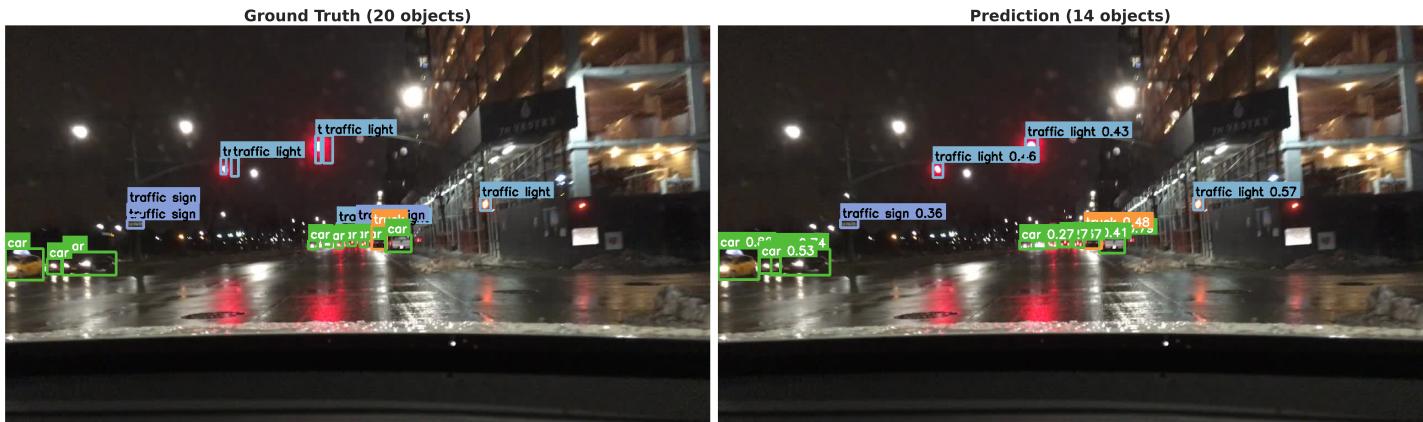
Weather: clear | Scene: highway | Time of Day: night



Sample #4: dcf6de94-b7bf0ce4.jpg

Ground Truth Objects: 20 | Predicted Objects: 14

Weather: rainy | Scene: city street | Time of Day: night



Sample #5: f0220287-62a98a7b.jpg

Ground Truth Objects: 35 | Predicted Objects: 21
Weather: clear | Scene: highway | Time of Day: daytime



Sample #6: fc0517d2-112ed733.jpg

Ground Truth Objects: 22 | Predicted Objects: 18
Weather: clear | Scene: city street | Time of Day: night



Generated by YOLO Testing Pipeline