Understanding automated wait time data

Checkpoint 2 analysis

Port of Seattle | BUSINESS INTELLIGENCE

Michael Drollinger
Daniela Shasha
Daniel Welles

May 22, 2018

Topics:

- How accurate are the predicted wait times?
- What are the drivers of high predicted wait time?
- Conclusions, recommendations and considerations

HOW ACCURATE ARE THE PREDICTED WAIT TIMES?

Findings

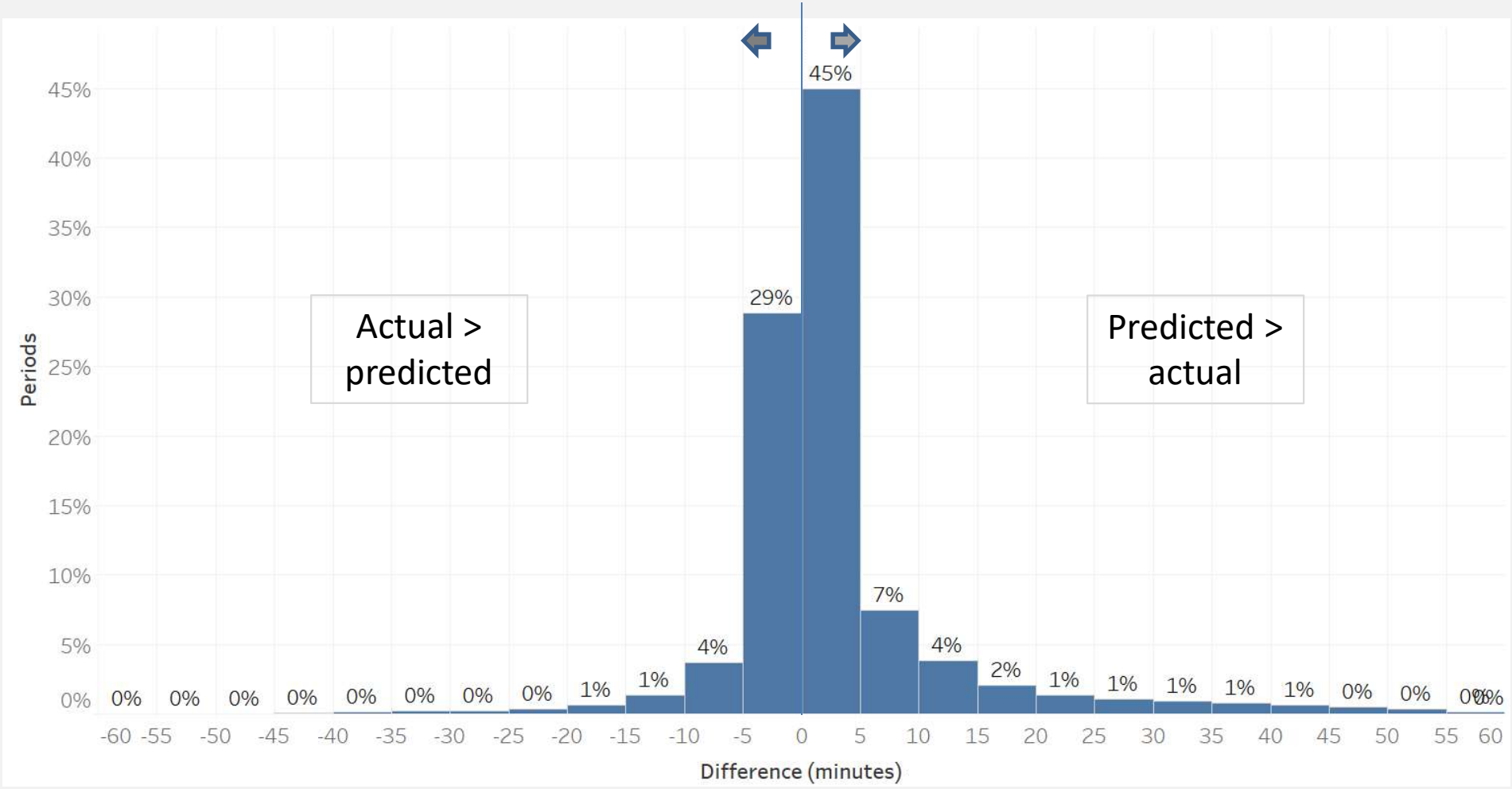
Wait times were within **five** minutes of prediction **74%** of time*

*System awaiting final configuration (XOVIS) and user acceptance testing/validation (Port of Seattle)

Analysis

- Analyzed data since Jan 2018 for Chkpt. 2
- Over 2,500 hours/152,000 minutes evaluated
- Compared actual and predicted times
- Tracked frequency of high line wait times and large differences between predicted and actual

Predicted time generally > actual wait, most often within five minutes



- 74% within (+/-) 5 minutes
- 85% within (+/-) 10 minutes
- 90% within (+/-) 15 minutes

Predicted vs. actual times

WHAT ARE THE DRIVERS OF HIGH PREDICTED WAIT TIMES?

High predicted wait times or big differences between predicted and actual waits largely the result of . . . .

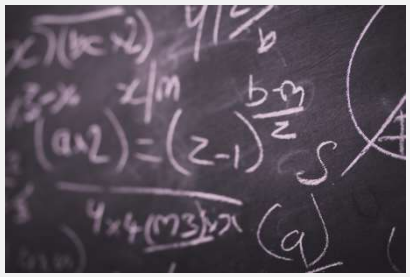
- System configuration issues
- Premium lane demand
- TSA staffing changes (lanes opening/closing; canines)
- Load balancing

Predictive Analysis

Identifying patterns to predict the probability of something happening.

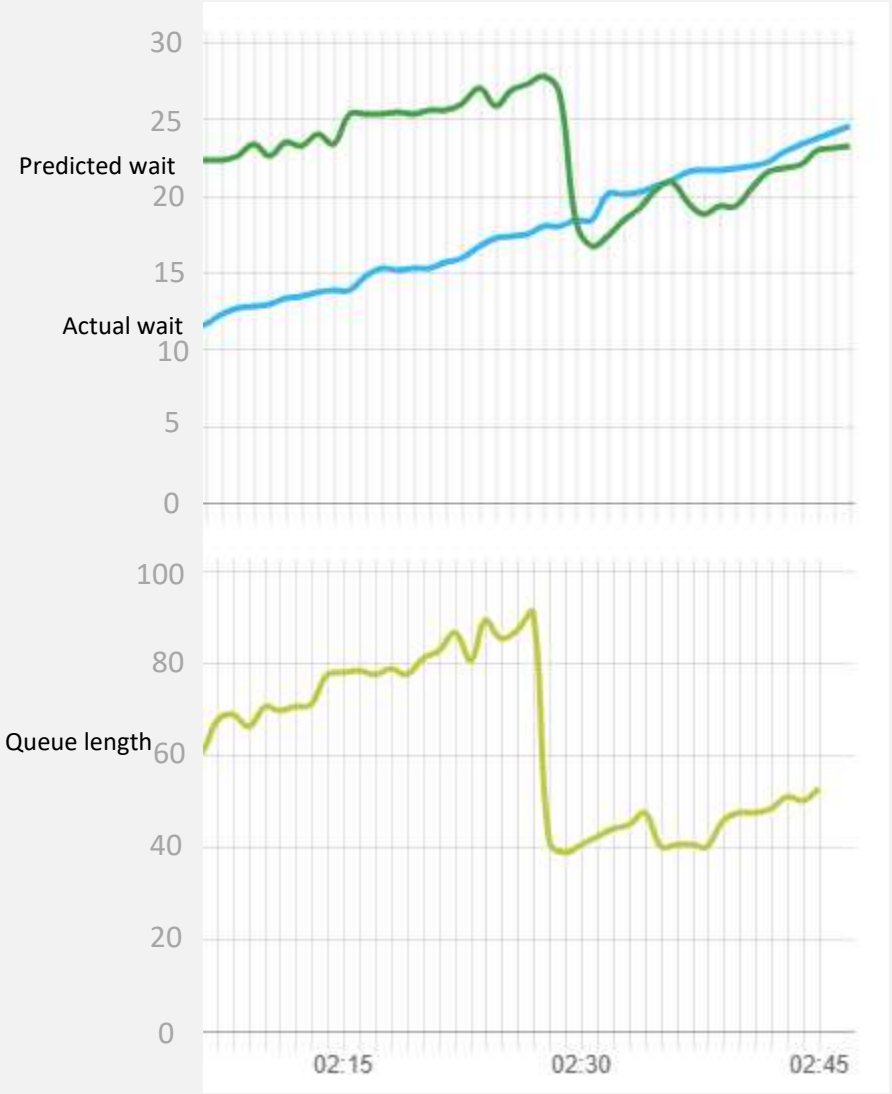
Data

Models

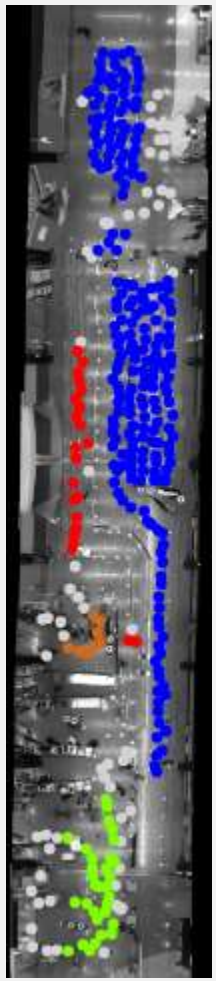


Prediction

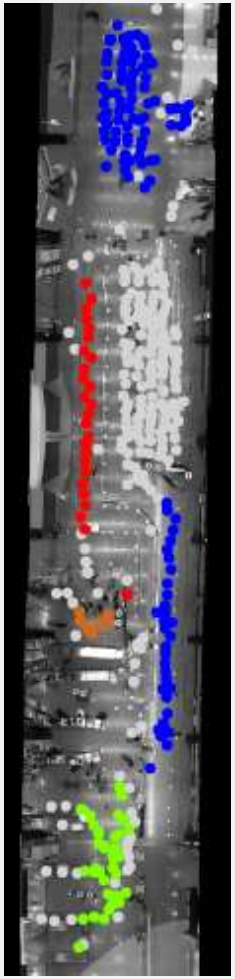
Configuration issues



@ 2:25pm



@ 2:27pm

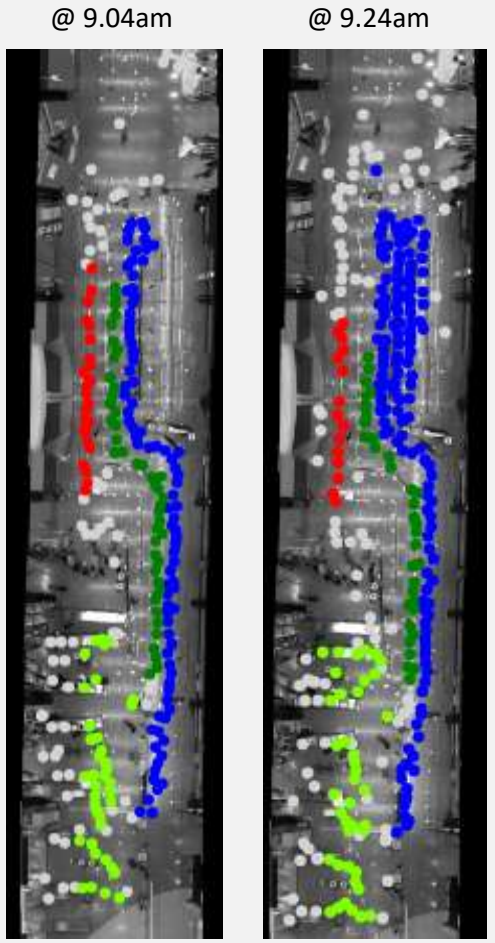


● General Queue ● TSA Pre check Queue

● Premium Queue ● General screening ● Premium Screening

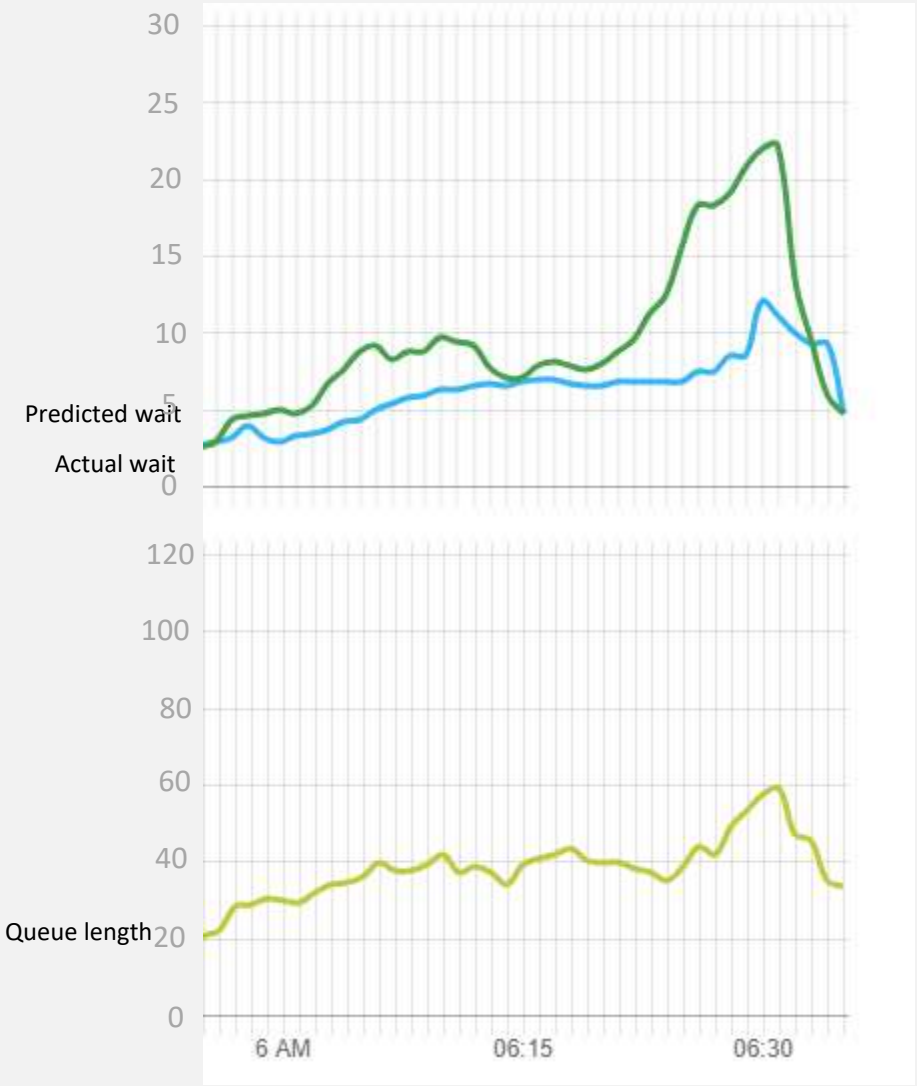
Premium queue

- Prioritization
- Premium demand drives up general screening wait times
- XOVIS predicted waits reflect scenario well
- Lane classification accuracy has opportunity for improvement

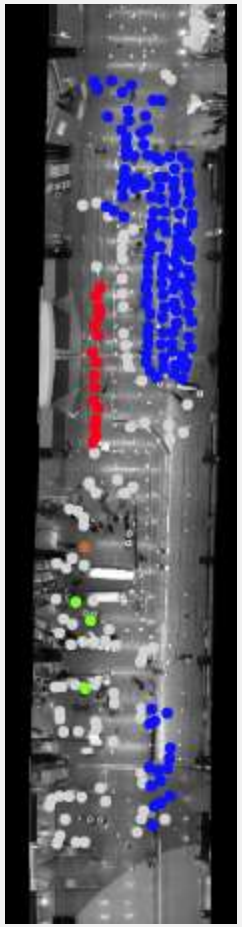


SD1

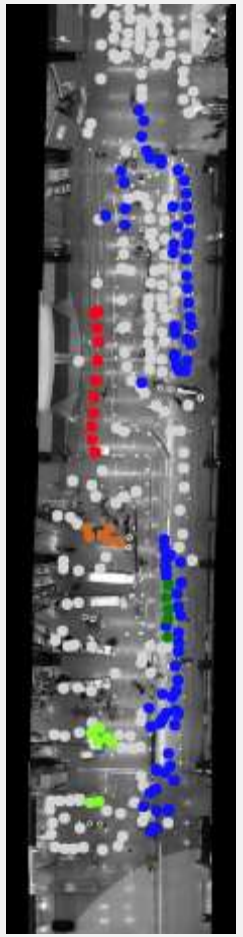
TSA canine



6:31am



6:35am

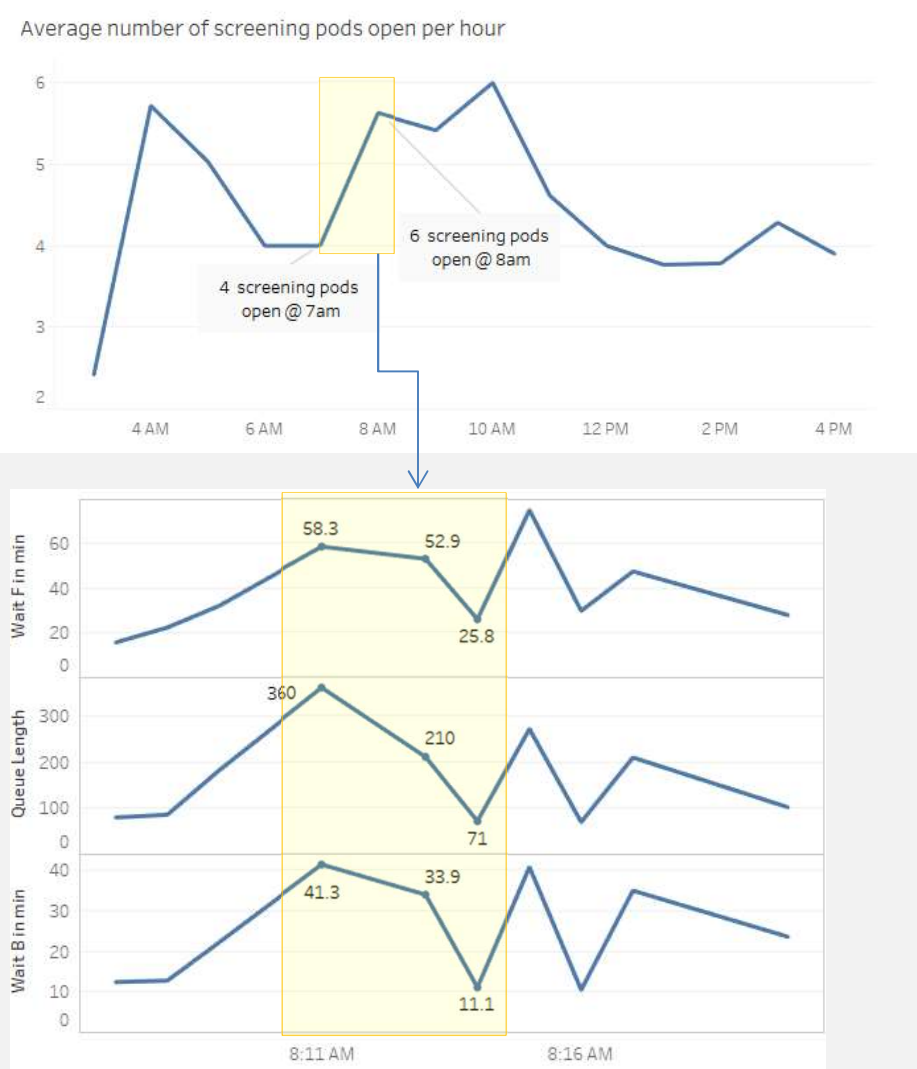


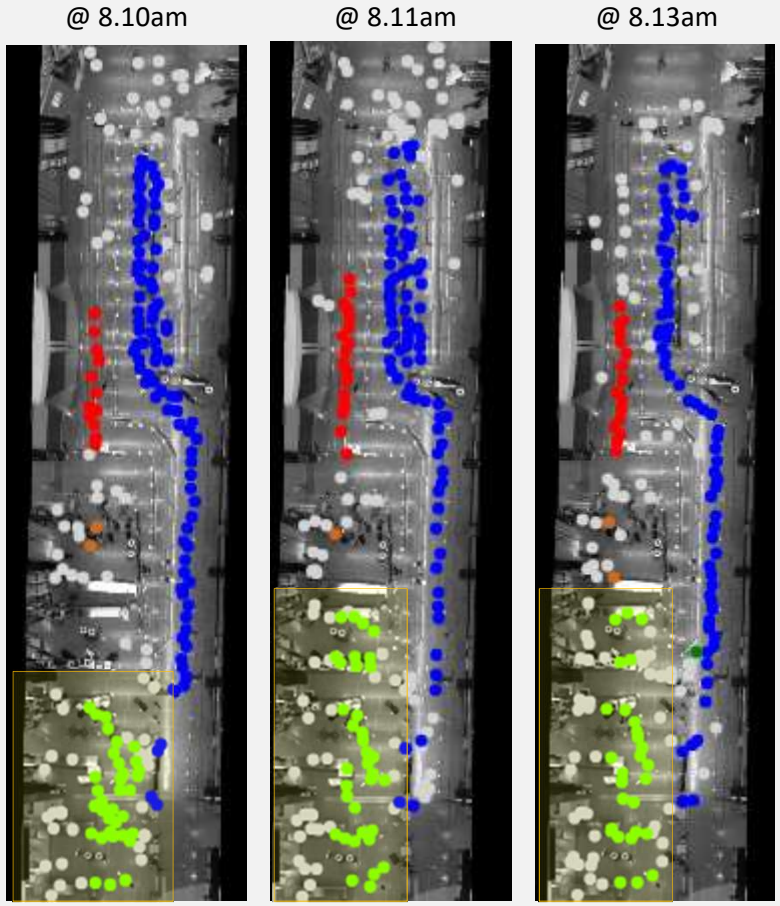
- General Queue
- Premium Queue
- TSA Pre check Queue
- General screening
- Premium Screening

Slide 13

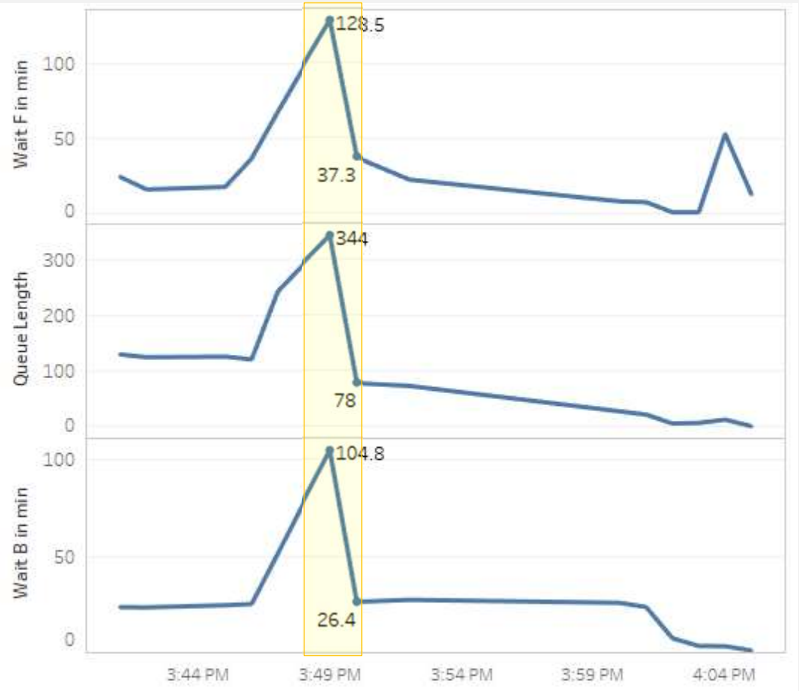
SD1 Decided against lables on Xovis images
Was too cluttered
See talking points
Shasha, Daniela, 5/18/2018

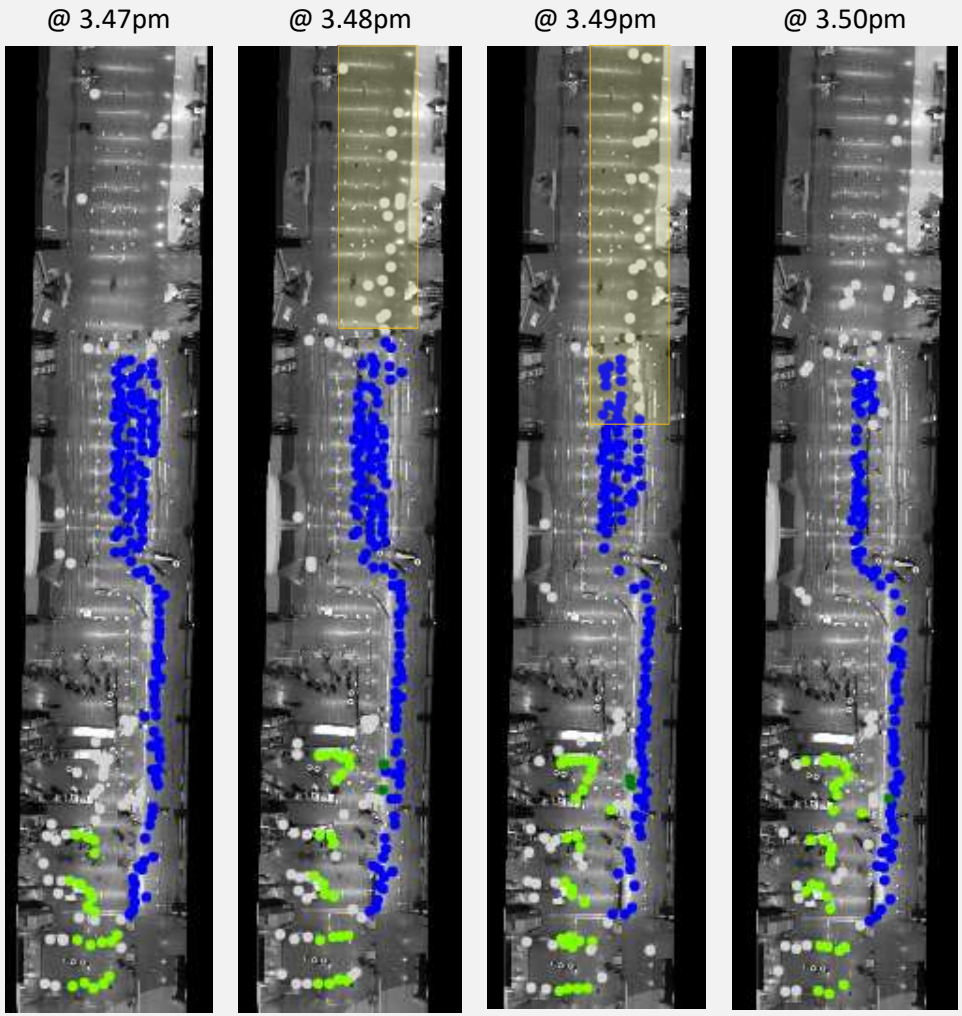
TSA staffing changes





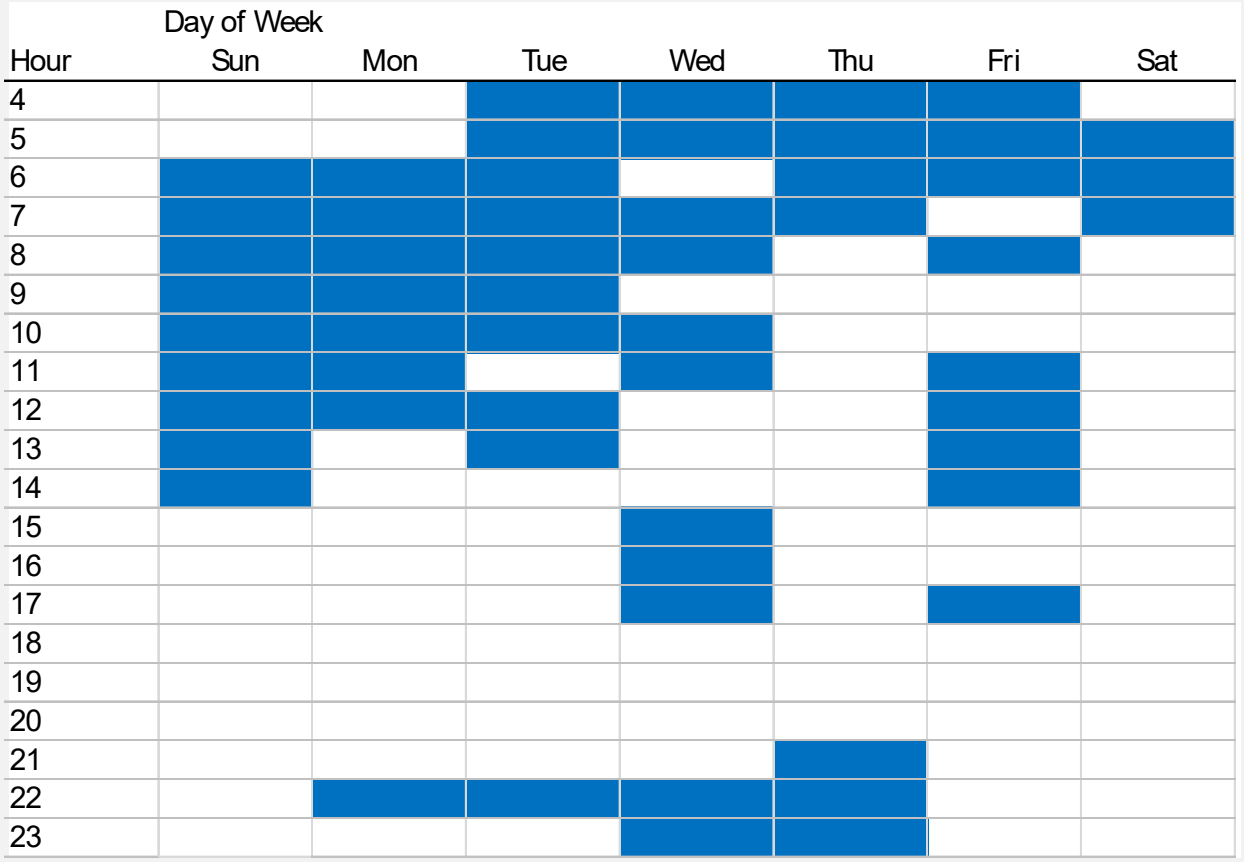
Load balancing





Busy periods = more occurrences

Large differences in predicted vs. actual wait times occur most often during high demand periods.



Source: analysis by Port Business Intelligence

CONCLUSIONS, RECOMMENDATIONS AND ITEMS FOR CONSIDERATION

Conclusions

- Technology is largely working as intended
- Configuration adjustments will further improve predictive and actual wait measures
- Certain types of checkpoint events (e.g. TSA staffing level changes, load balancing) will cause spikes/volatility in wait times.

Recommendations

- Have XOVIS proceed with final system configuration with Port input and have BI rerun analysis
- Have BI validate actual waits as part of UAT process.

Considerations

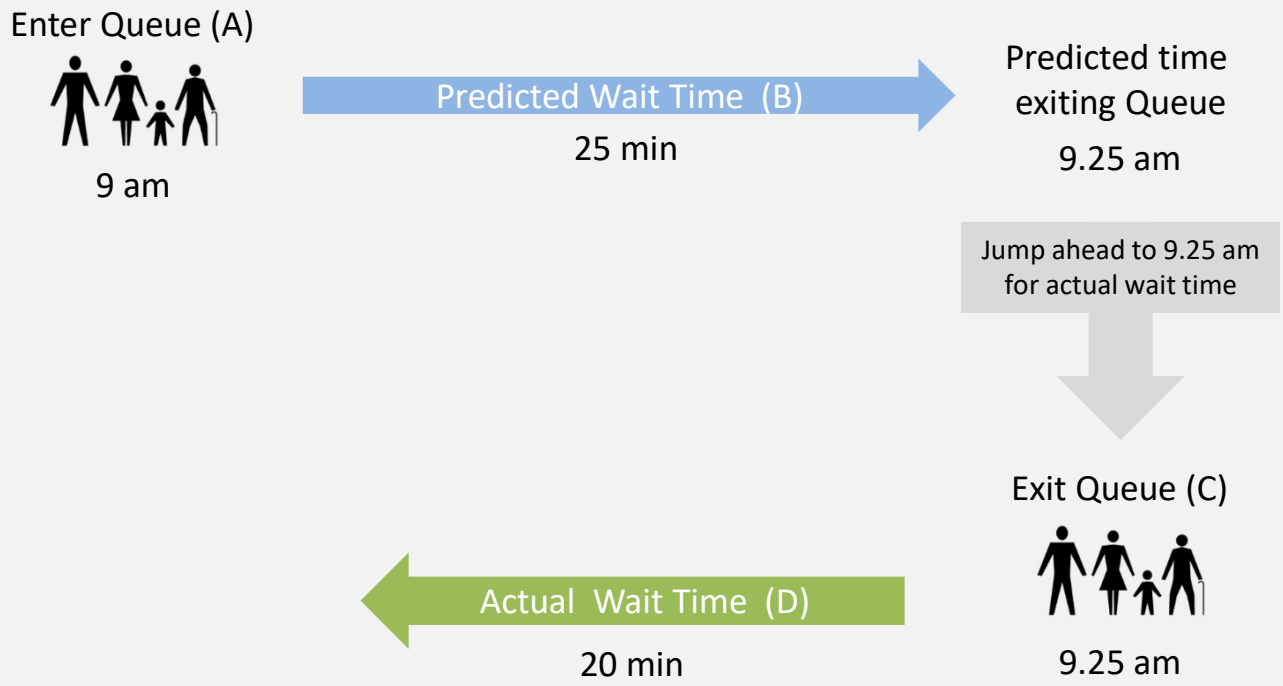
- XOVIS deployment is designed to promote self-load balancing by informing travelers of wait time – is the Port's deployment able to fully leverage this function?

Thank you

Appendix

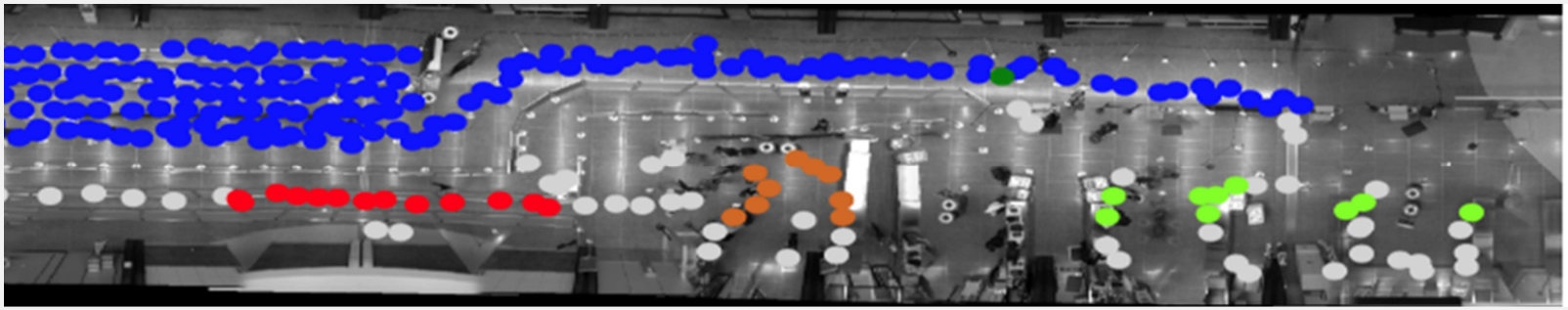
Methodology

Forecast Variance = Predicted (B) - Actual (D)



Enter Queue (A)

Predicted Wait Time (B)



Exit Queue (C)

Actual Wait Time (D)

A + B = Exiting Time Period to Observe

Actual (D) - Predicted (B) = Forecast Variance

Enter Queue (A)

9 am

Predicted Wait Time (B)

25 min

Predicted time exiting Queue

9.25 am

Jump ahead to 9.25 am to get actual wait time

9.25 am

Exit Queue (C)

20 min

Actual Wait Time (D)

Forecast Variance = Actual (D) - Predicted (B)

Data

- Source_name = WT_CP2_new
- Configname= General Queue
- WaitB = actual time waited
- WaitF = predicted wait time
- Data filtered to 4am to 11pm in Tableau

Clarifications

- Account for empty line/staff? (Validate in client)
- Include upper limit in histogram? Up to 15min
- Considerations for using pax and processing rate, counters for further analysis