



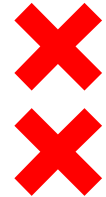
# Crowd Monitoring during *COVID-19*

## *V&OR, CTO, OOV & AMS*

*Eelco Thiellier Program Manager Crowd Monitoring V&OR*



# ❌ CMSA - Introduction Video



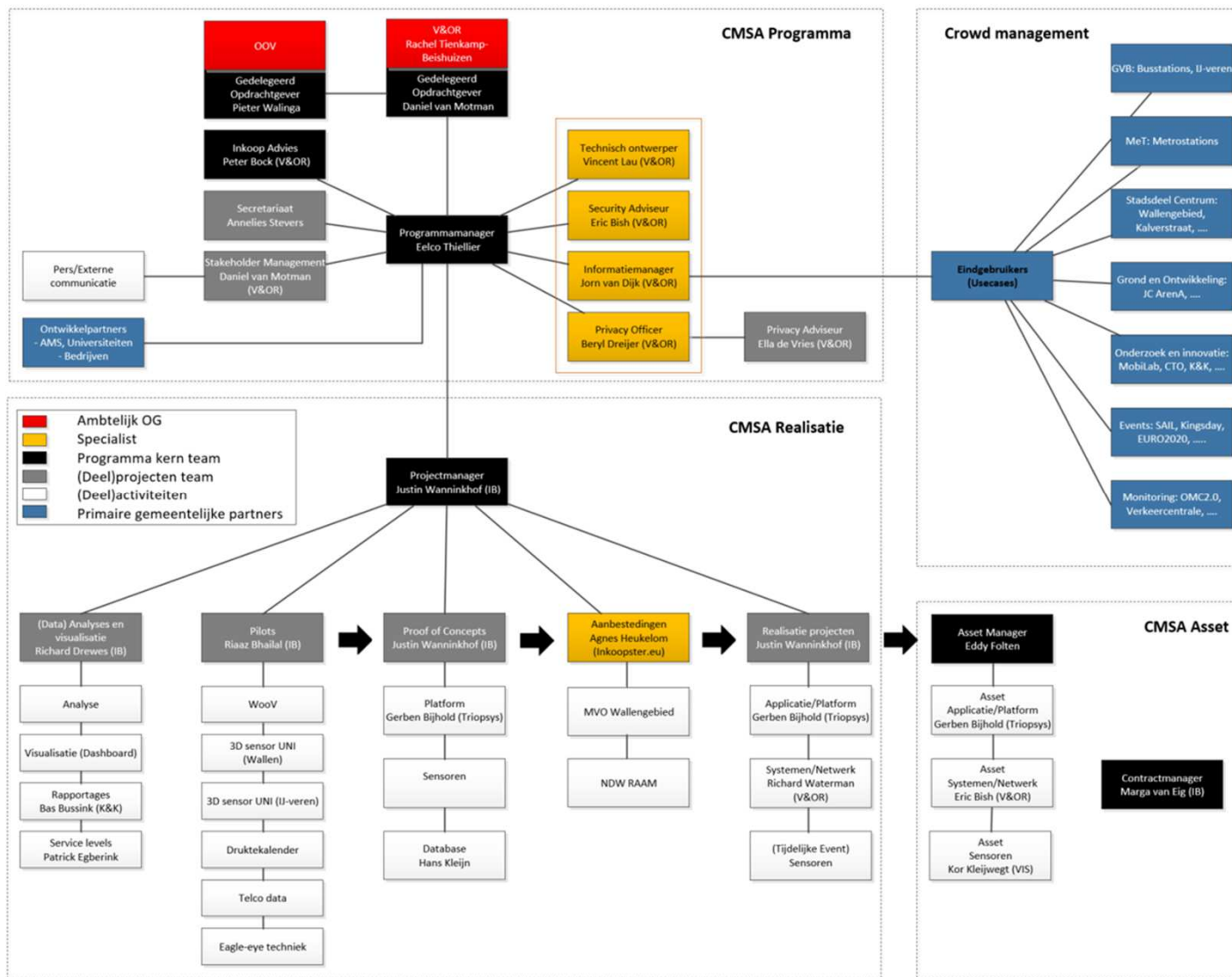
# ✘ Deployment of the CMSA



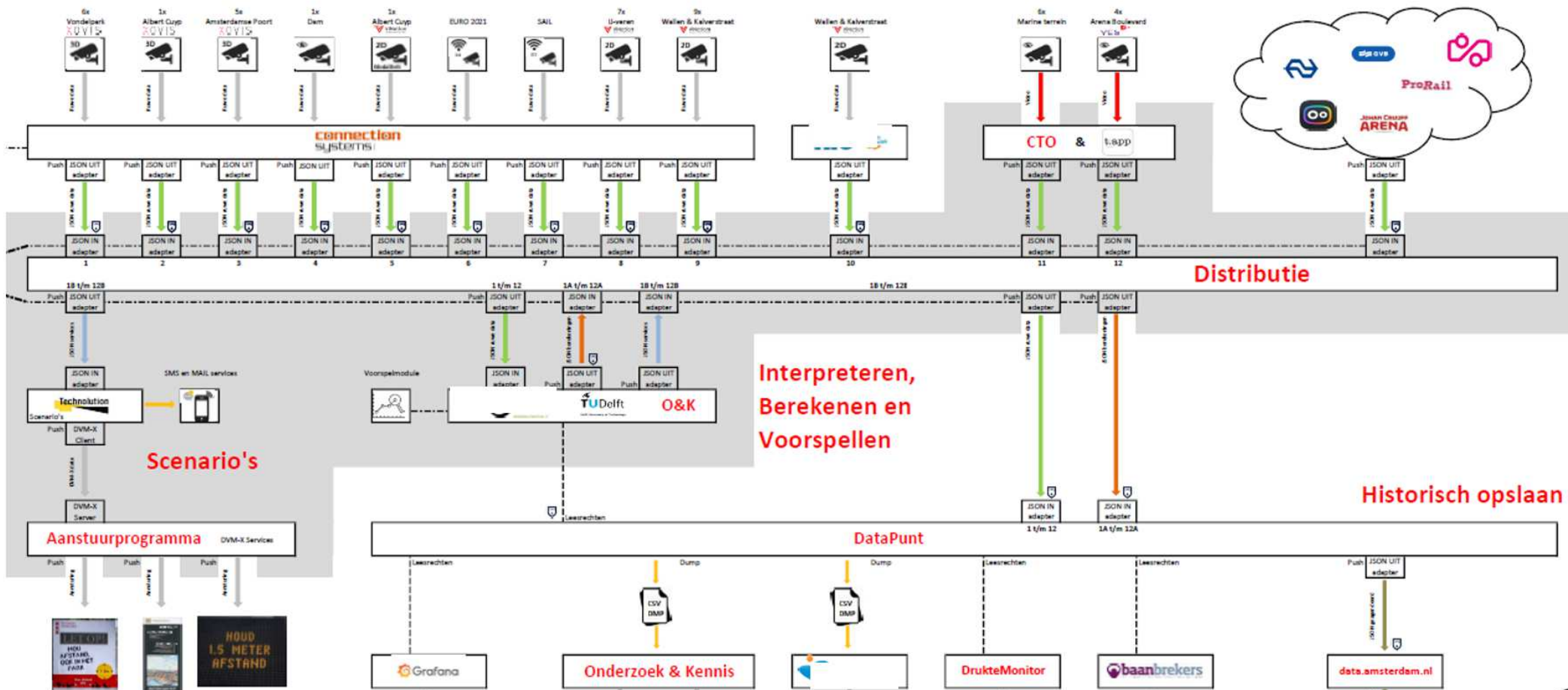
- Ferry's
- Shopping area's
- Red-light district
- Parks
- Markets
- Event locations



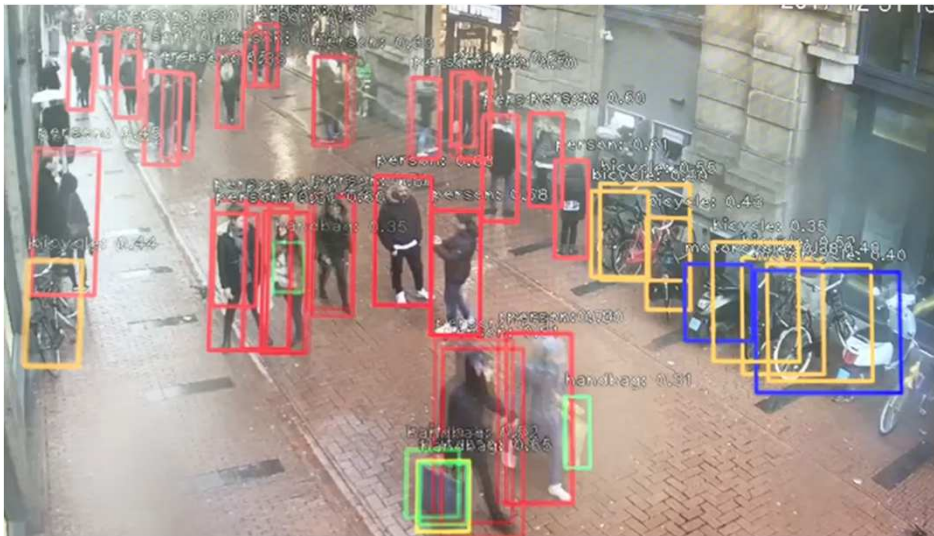
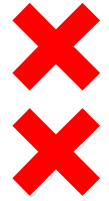
# Organized innovation



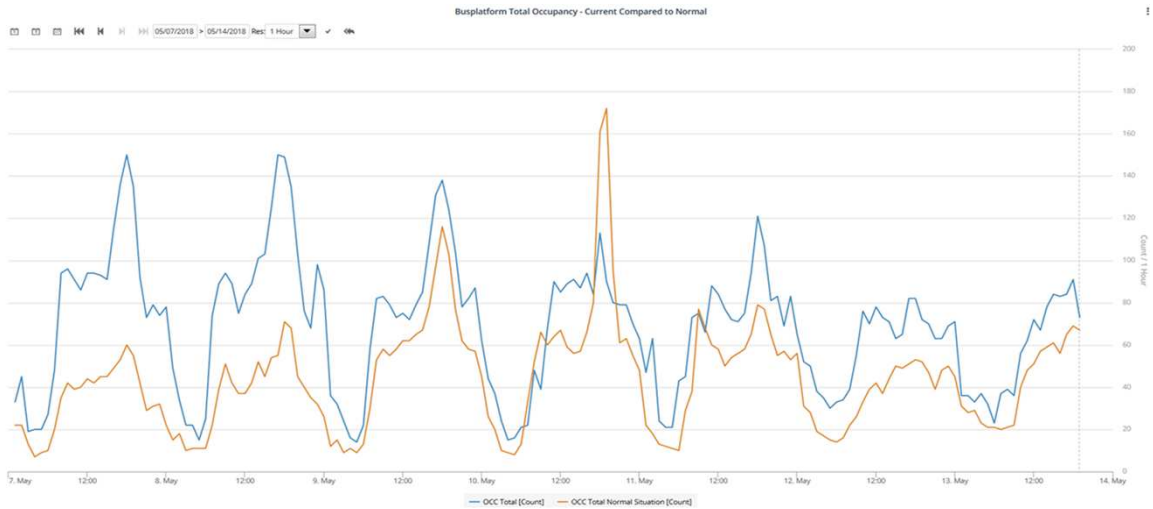
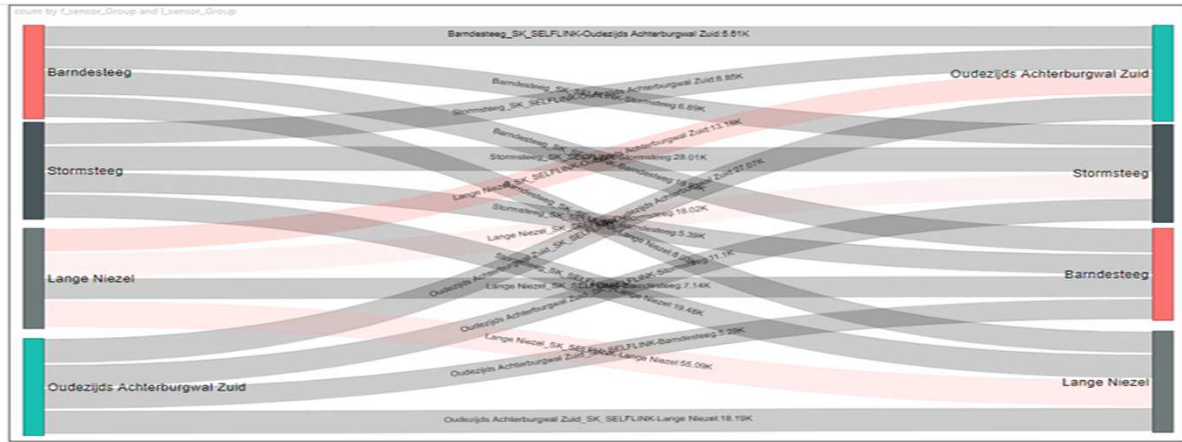
# ✘ ICT Architecture



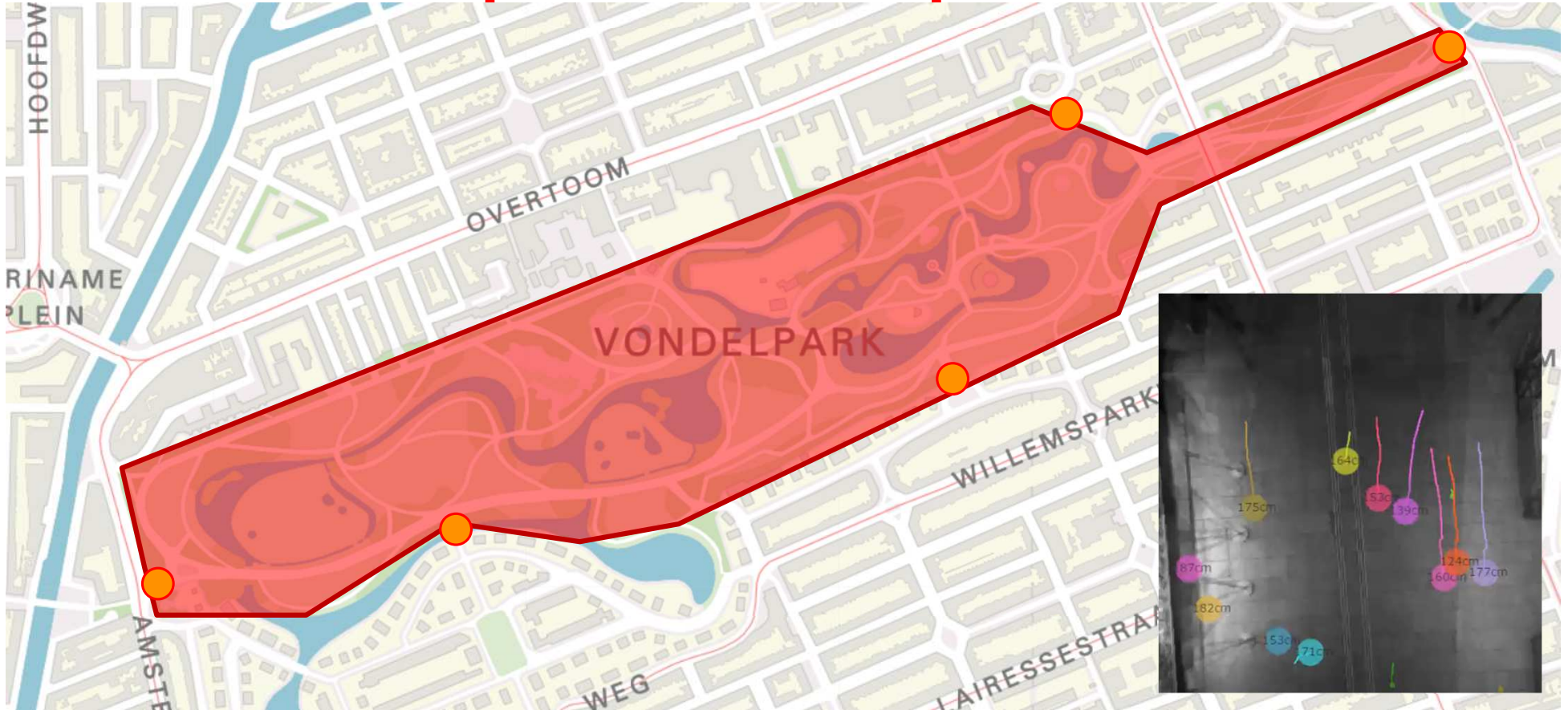
# ✘ Used techniques



# ✘ Used techniques



# ✘ ✘ ✘ Measurementplan - Vondelpark



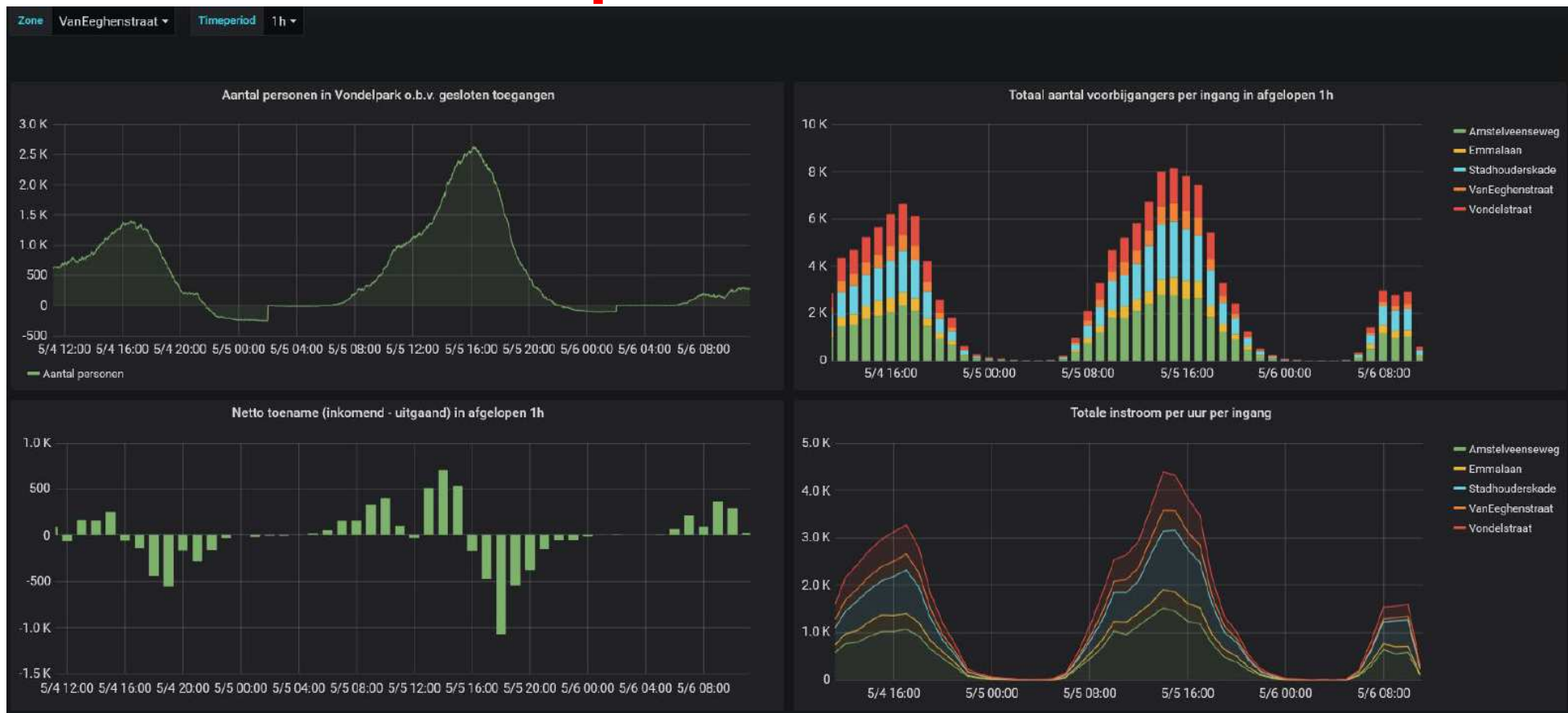
## Legenda

● 3D-sensor - D+A+S

D = Dichtheid  
A = Aantal  
S = Snelheid



# XXX Real time Vondelpark

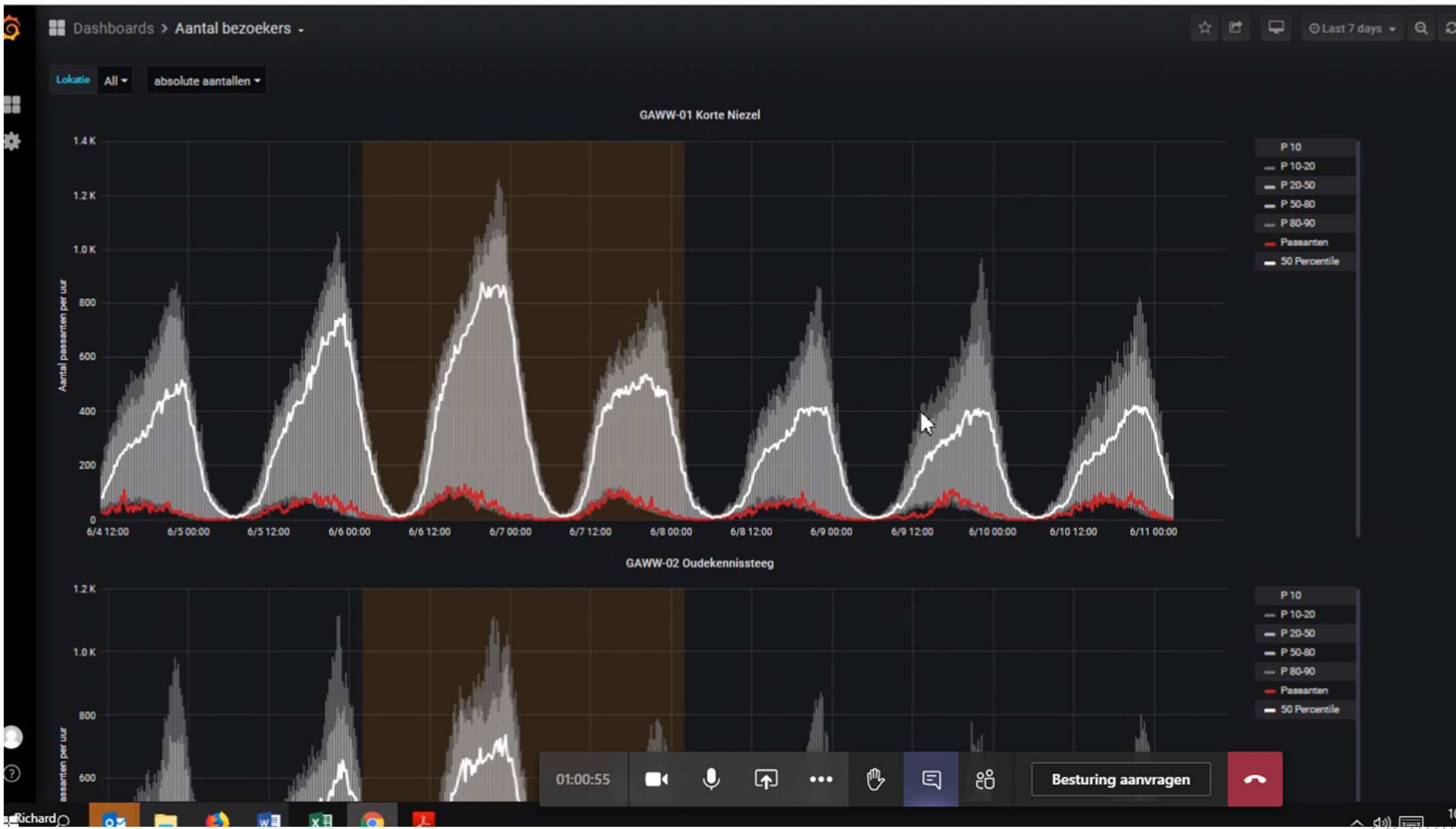


*"De data uit de 3D sensoren en het actuele dashboard is voor V&OR van grote waarde en gebruiken wij actief Binnen één dag na opdracht is een werkend dashboard opgeleverd inclusief 3D sensoren op meerdere locaties"*

# ✘ Personal distancing Dashboard Albert Cuyp



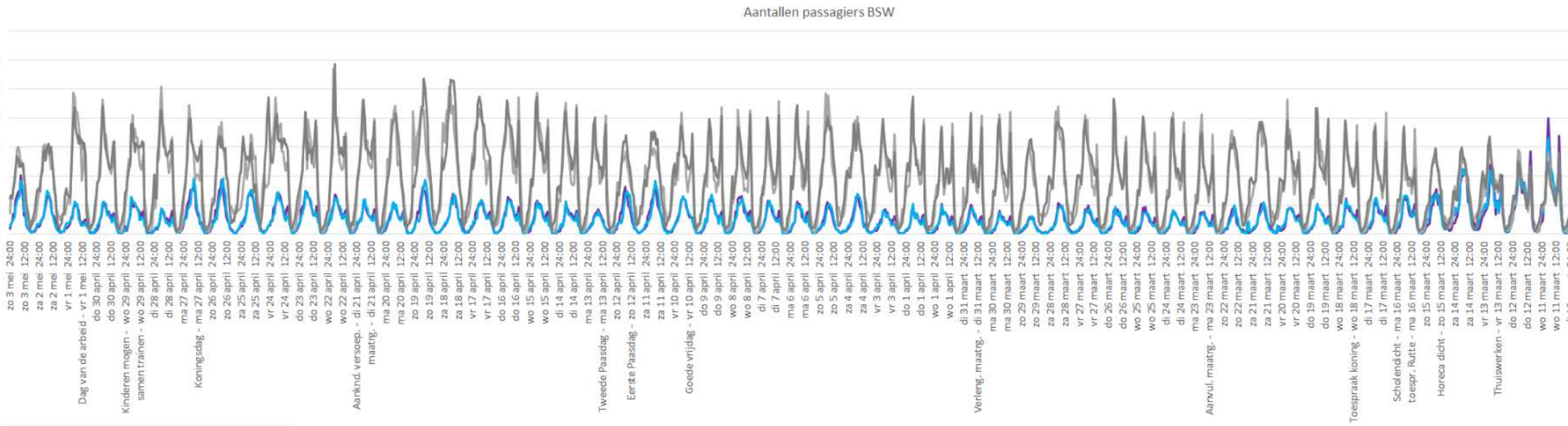
# ❌ Real time Wallen



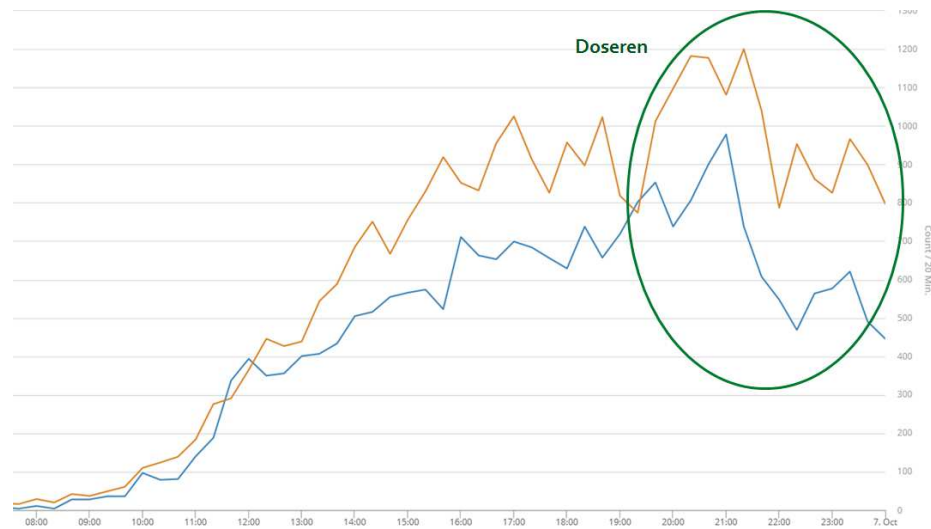
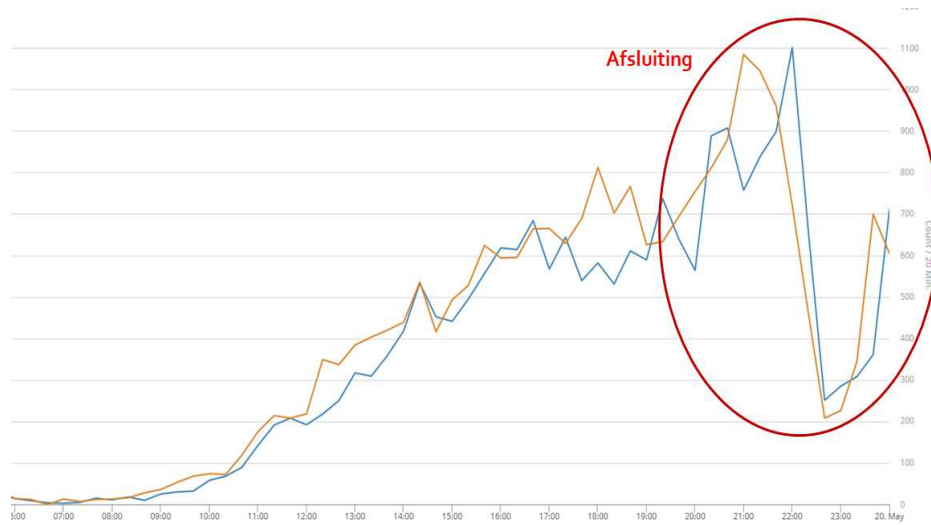
# ✘✘✘ From insight -> Crowd Management



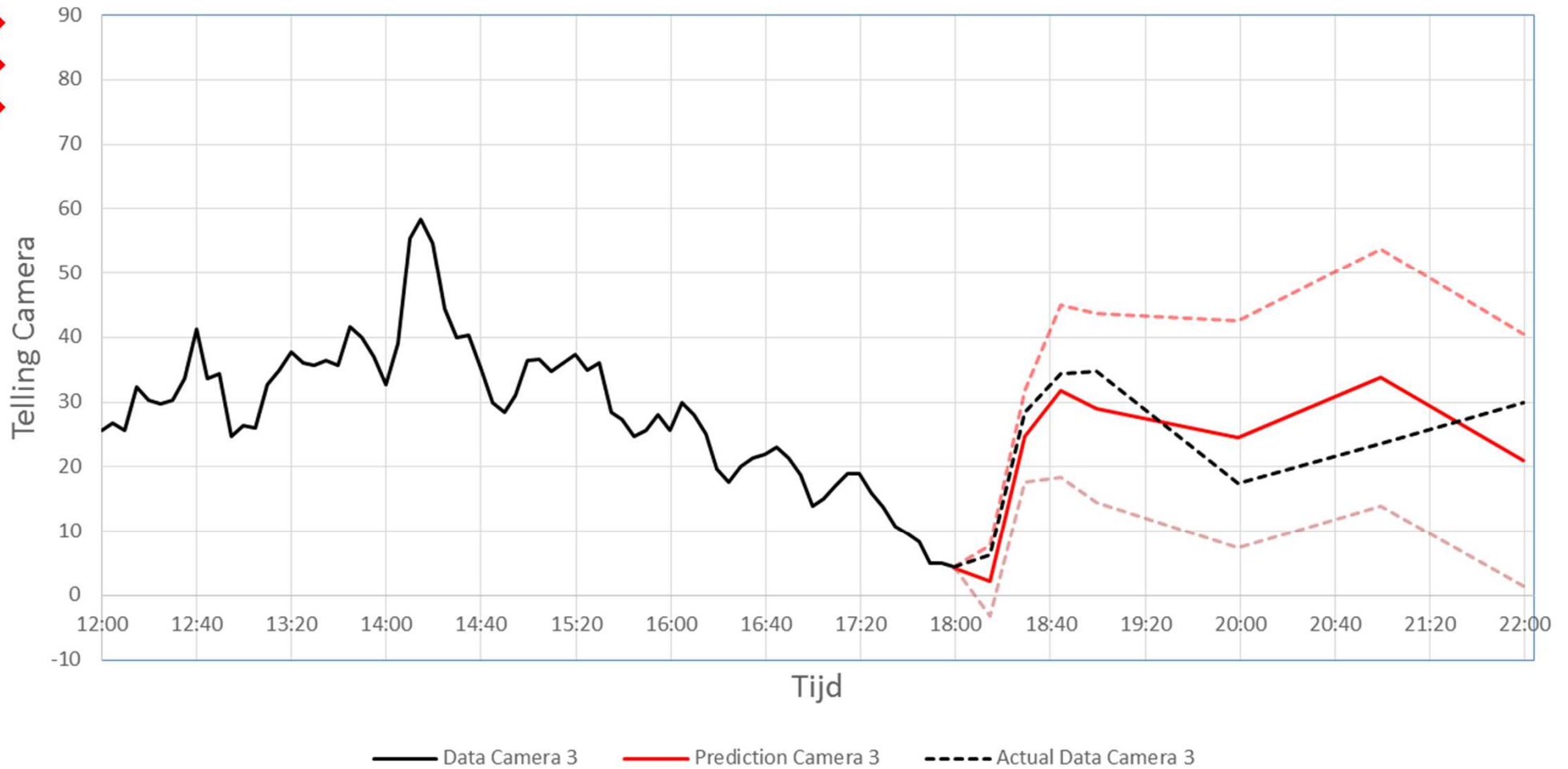
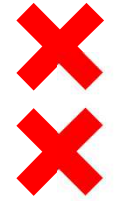
# XXX Historical data compared to COVID - Ferry's



# ✘ Red Light District - Effect of measures



# ✘ Developments: Prediction models

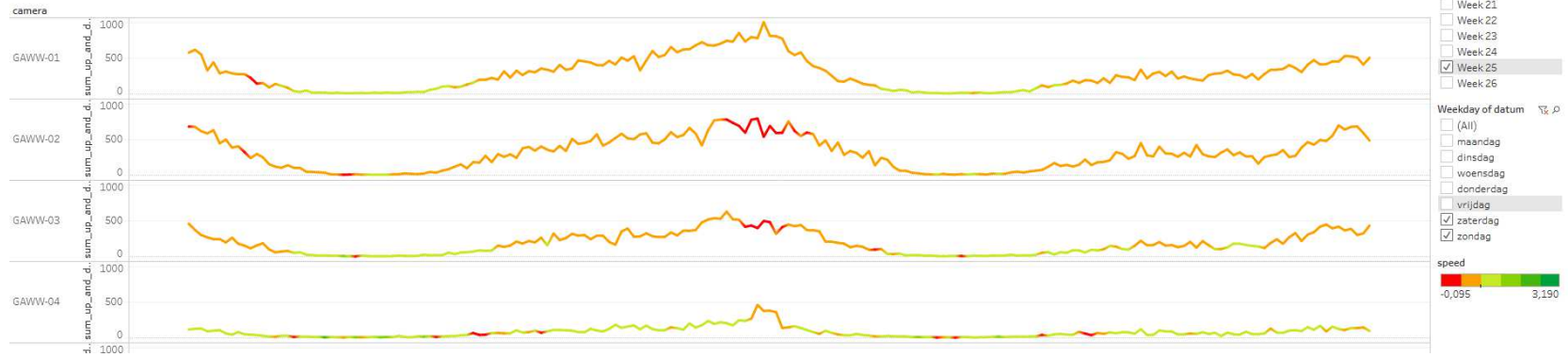


# ✘ Developments: Service Levels

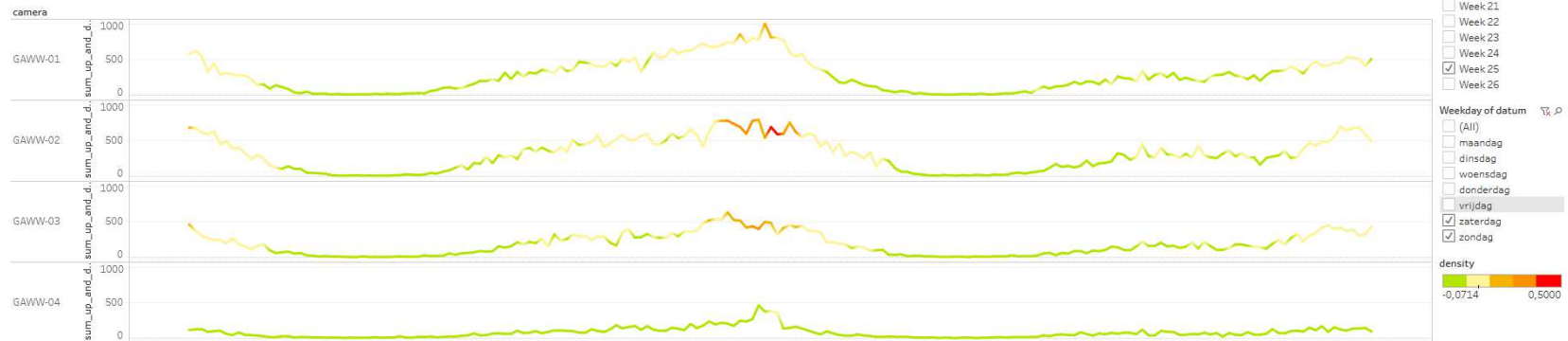
✘ Variables: density & speed



Wallen passenten (kleur speed)

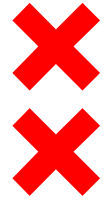


Wallen passenten (kleur density)





# ✘ Developments: covid tresholds (TU-Delft)



$$I_{max}(t) = \frac{q_{max} \frac{P_g * N_g}{\sum_g N_g * P_g} * \frac{N_g(N_g-1)}{2}}{N_g} = q_{max} \sum_g \frac{P_g}{\sum_g N_g * P_g} * \frac{N_g(N_g-1)}{2}$$

Differentiating:

- Density
- Groups
- Interactions

# ❌ Development Public Eye (Market, CTO & Tapp)



\* Footage of UDE



**x13**  
People Here Now



**88%**  
Safe Distancing Now



**x6**  
Contact moments



**0.5min**  
Ave. Contact Duration

\*Illustration

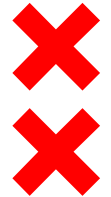
person? 91%  
person? 95%

person? 99%  
person? 88%

person? 93% person? 99%  
person? 99%

[Play Movie](#)

# ✘ Overall dashboard for the city (IGOR)



Data rond donderdag 11 juni 14:45 14 °C

Alle plekken (250 items) Hotspots ⚠

Winkels (198)  Parken (9)  OV (9)  Horeca (18)  Overig (35)

Naam	Huidig	Normaal	Verschil	Categorie
> BP	132	81	51	Overig, Winkels
> PLUS Vreeswijk	95	77	18	Winkels
> P+R Noord	90	53	37	Overig
> Praxis Bouwmarkt Amsterdam Westpoort	86	112	-26	Winkels
> Tanger Markt	85	71	14	Winkels
> HANOS Amsterdam	85	78	7	Horeca
> Gamma	82	96	-14	Winkels
> Praxis Bouwmarkt Amsterdam Zuid-Oost	80	103	-23	Winkels
> GAMMA	74	84	-10	Winkels
> Kriterion Studentenpomp (Shell)	74	56	18	Overig,

\* Example

