



TNL Mobility Overview

Introduction and Service Overview

June 13, 2023



FlowCube: the sensor

Provides:

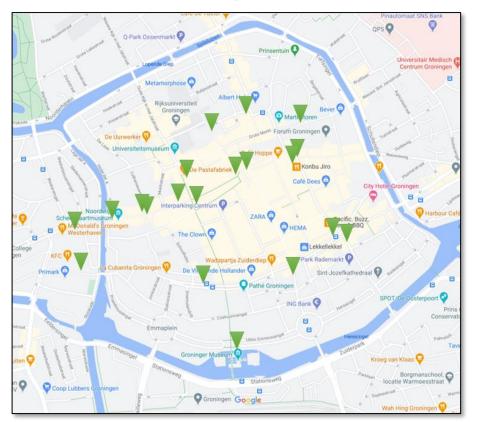
- Insight in the traveled path of all modes
- Volume counts by mode, over time
- Travel time, origin and destination in corridor
- Anonymous, only text leaves the sensor

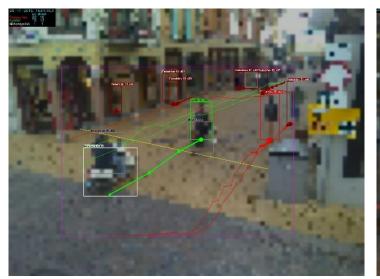


Case: City of Groningen

20 FlowCubes

1.2 M passage / week

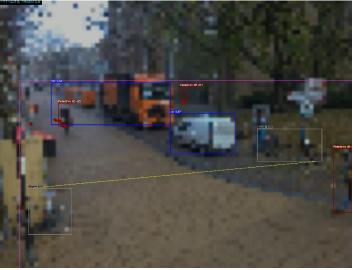


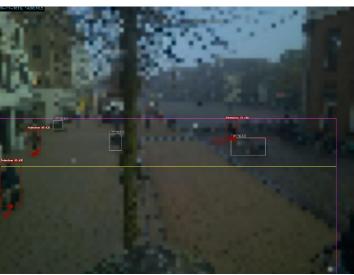






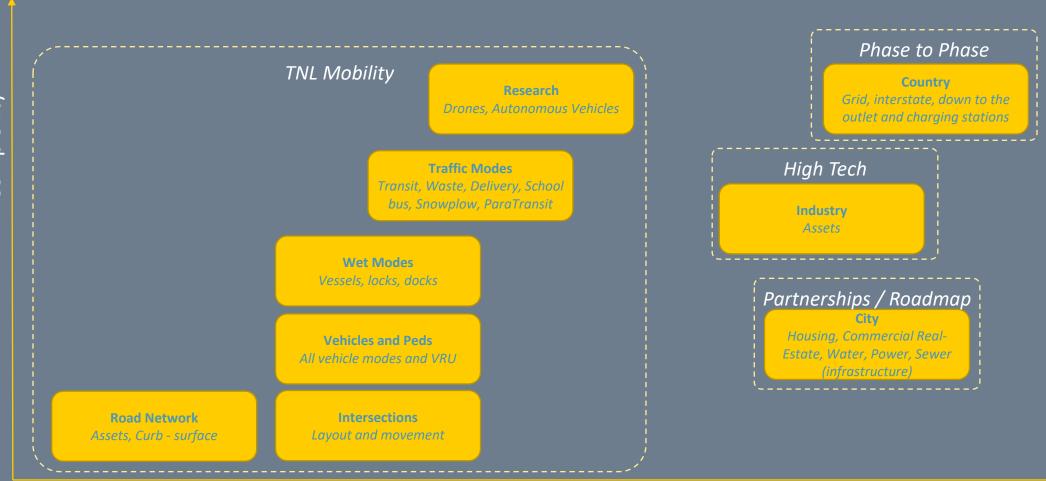








Digital Twins has many Twins

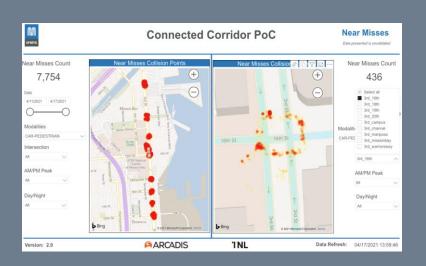


Service was tested on 10 intersections

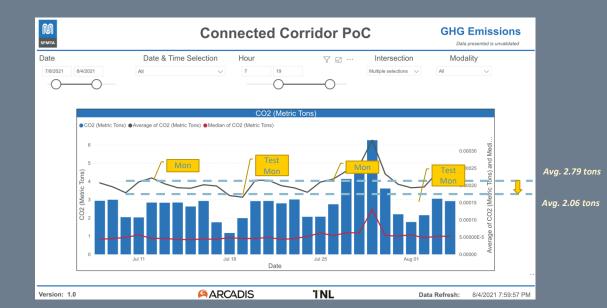
Results

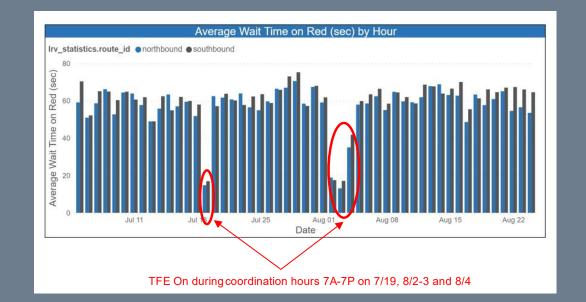






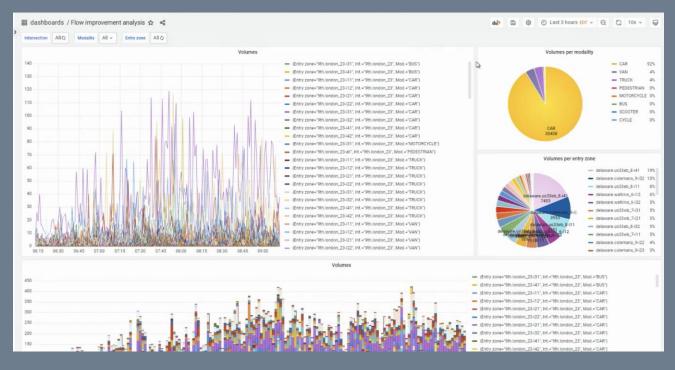
Mode	Metric	Before	After	Avg. Results
LRVs	Red Light Delay	60.3 sec	16.2 sec	73% reduced
	Travel Time	424.2 sec	358.2 sec	16% reduced
	Approach on Green	62.1%	85.8%	24% increased
	Average Speed	8.2 mph	9.9 mph	21% increased
Vehicles	Approach on Red	27.3%	26.3%	1% reduced
	CO ₂ Emissions (Channel + WW)	2.79 tons	2.06 tons	26.1% reduced
Pedestrians	Approach on Walk Symbol	76.4%	75.5%	0.9% reduced



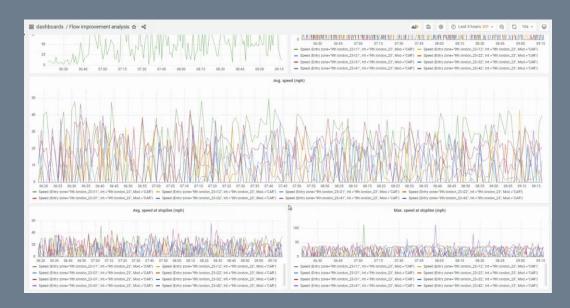




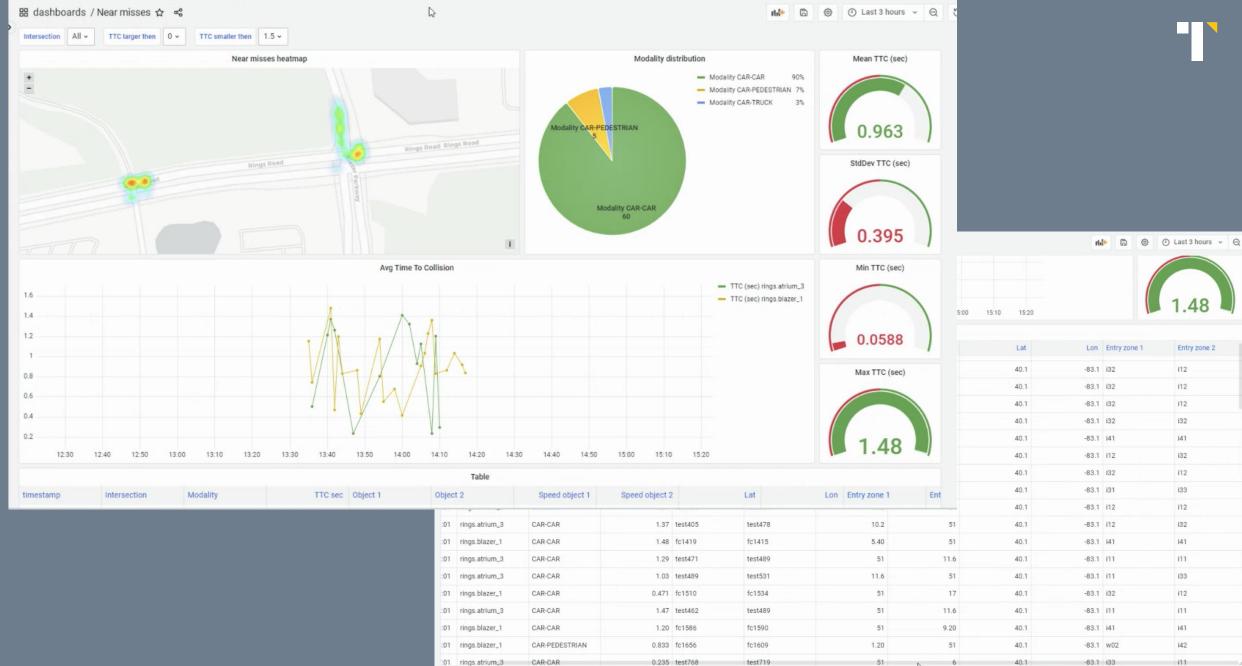
Dashboard Workshop 13 June '23







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dashboards / l	Raw data 🌣 🔩						Δ.		m 0 0	O Last 1 hour (DT -	Q 10s -	0
					Object	statistics aggregates	19					
timestamp	tag_intersection	tag, modality	tag_entry_zo	ne num pe	essing_objects value	avg_time_seen_o_v	alue_max_time_seen_r	value_max_95_percenti	value_avg_speed_ms	value_avg_speed_stopl	value_max_speed_	stopl
2023-06-02 10:47:00	delaware.us33wb_7	CAR	delaware.us1	33wb_7-(11	4	38.4	50,9	22.2	5.35		0	0
2023-06-02 10:48:00	delaware.us33wb_3	CAR	delaware.us	13wb_7-121	10	13.3	48.6	51	4.19	2.7	2	17.8
2023-06-02 10:46:00	delaware.us33wb_3	CAR	delaware.us1	33wb_7-i11	4	28.4	48.5	25.6	8.20	7.4	0	20.4
2023-06-02 10:45:00	delaware watkins_t	CAR	delaware.wa	tkins_6432	. 5	11.9	41	19.4	12.8	14.	9	16
2023-06-02 10-46:00	9th landon_23	CAR	9th london_2	3-111	2	20.6	34.1	29.2	8.70	7.9	0	13.4
2023-06-02 10:48:00	delaware.us33wb_1	VAN	delaware.us	33wb_7-121	7	8.94	32.1	4.40	0.285	0.25	7	1.40
2023-06-02 10:45:00	delaware.us33wb_1	CAR	delaware.us1	33wb_7-I21	24	8.40	29.5	51	4.84	4.1	0	40.4
2023-06-02 10:42:00	delaware watkins_6	CAR	delaware wa	tkins_6-(22	- 1	28.1	26.1	17.8	3.91	0.20	0	0.200
2023-06-02 10:46:00	delaware watkins_6	CAR	delaware wa	tkins_6-i22	12	7.87	27.3	28.6	3.11	1.7	3	12.4
2023-06-02 10:43:00	delaware watkins_t	CAR	delaware.wa	tkins_6-121	- 1	26.9	26.9	20.7	7.66	6.8	0	6.80
2023-06-02 10:46:00	delaware watkins, e	CAR	delaware wa	0kins_6-i12	10	6.54	26.8	12.0	5.29	6.0	0	11.6
2023-06-02 10:49:00	delaware watking of	CAR	delaware.wa	tkins 6-132	4	11.6	20.2	22.2	12.1	15.	4	19.2
					Objec	t statistics raw data						
value_object_id	tag_intersection	tag_modality	tag_entry_zone	tag_exit_zone	value_timestamp.	firr value_time_seen	_sec_value_average_sp	eet value_95_percentile_	value_speed_at_stop	value_first_position	value_last_position	vals.
fc_mv_9th landon_s	9th london_23	BUS	9th.london_23-i11	9th london_23-e31	2023-06-02 11:37	05	17.9	16.7 28.7	15.8	0101000020E6100	0101000020E6100_	010
fc_mv_9th.london_s	9th.london_23	BUS	9th.london_23-i11	9th.london_23-e31	2023-06-03 11:12	44	5.30	13.2 16.7	13	0101000020E6100.	0101000020E6100	. 010
fc_mv_9th.london_s_	9th.london_23	BUS	9th.london_23-i11	9th london_23-	2023-06-03 21:30	35	3.30	17.0 24.4	12.8	0101000020E610G	0101000020E6100_	. 010
fc_mv_9th london_s	9th london_23	BUS	9th.london_23-i11	9th Jondon_23-e41	2023-06-05 15:42	43	4.50	7.68 9.94	11.2	0101000020E6100	0101000020E6100	010
fc_mv_9th.london_s	9th.london_23	BUS	9th.london_23-(11	9th london_23-e31	2023-06-05 18:02	32	11.6	17.4 34.1	12.6	0101000020E6100	0101000020E6100	010
fc_mv_9th.landon_s	9th.london_23	BUS	9th.london_23-i11	9th london_23-e31	2023-06-06 08:23	51	9.30	13.3 22.0	11	0101000020E6100	0101000020E6100_	. 010
fc_mv_9th.london_s	9th london_23	BUS	9th.london_23-i11	9th.london_23-e31	2023-06-06 10:11	49	7.50	17.3 27.6	15.2	0101000020E6100	0101000020E6100_	. 010
fc_mv_9th.london_s	9th london_23	BUS	9th.london_23-i11	9th london, 23-e31	2023-06-06 11:04	41	8.70	8.94 11.3	8.60	0101000020E6100	0101000020E6100	010
fc_mv_9th.london_s	9th.london_23	BUS	9th.london_23-i11	9th.london_23-e31	2023-06-06 13:55	51	5.50	10.9 12.7	11	0101000020E6100	0101000020E6100_	010
fc_mv_9th landon_s	9th london_23	BUS	9th.london_23-i11	9th london_23-	2023-06-07 08:40	02	5.10	11.0 12.4	11.2	0101000020E6100	0101000020E6100	010



Redefining solutions

