

soarability

CitySense

Transforming Public Transport & Service Vehicles into Smart Environmental Sensing Network
Delivering massive, cost-effective and reliable environmental insights, CitySense empowers cities to become cleaner and more sustainable

Currently supporting CH₄, PM_{2.5}, PM₁₀, TSP, TVOC and CO₂ measurements



CitySense comprises a meticulously engineered sensing hardware that can be conveniently installed on various public transport systems and service vehicles to collect environmental data reliably.

Complemented by a robust software platform, the system transforms the gathered spatial-temporal big data into actionable insights.

Applications of CitySense

- Identifying natural gas leakages within urban areas
- Identifying areas of high air pollution for targeted mitigation efforts
- Monitoring changes in air quality over time to evaluate the effectiveness of environmental policies
- Providing real-time air quality data to the public for health and lifestyle decisions
- Mapping air quality across the city to inform urban planning and development
- Facilitating research in environmental science and public health by providing valuable data

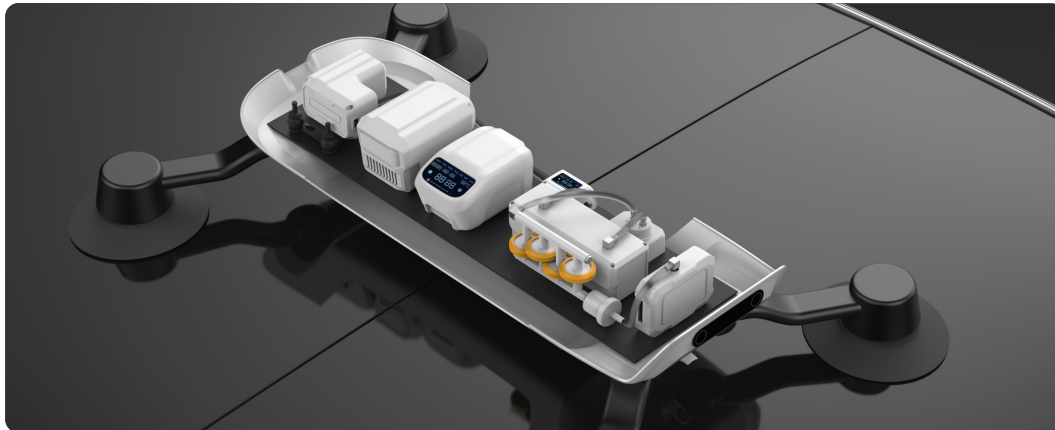
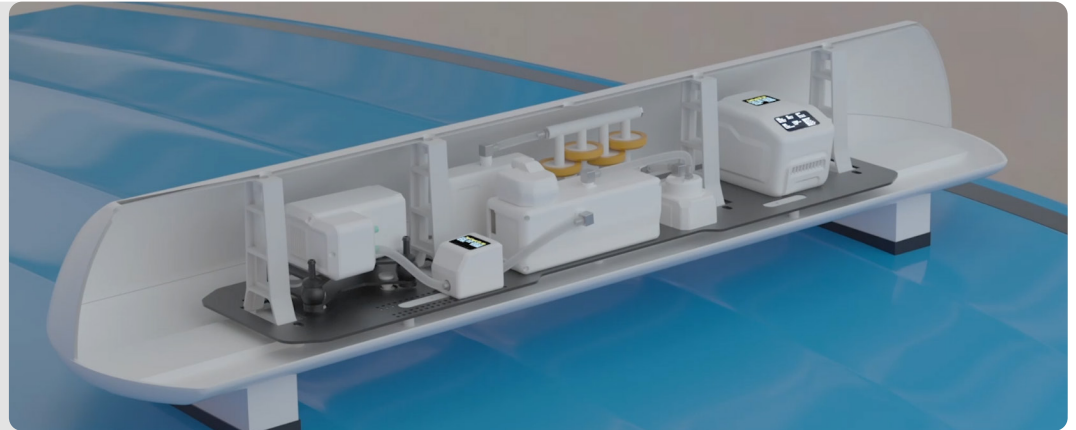


CitySense-X

Available in Two Form Factors, "CitySense-T" and "CitySense-X", to Suit Different Vehicle Systems

CitySense-T

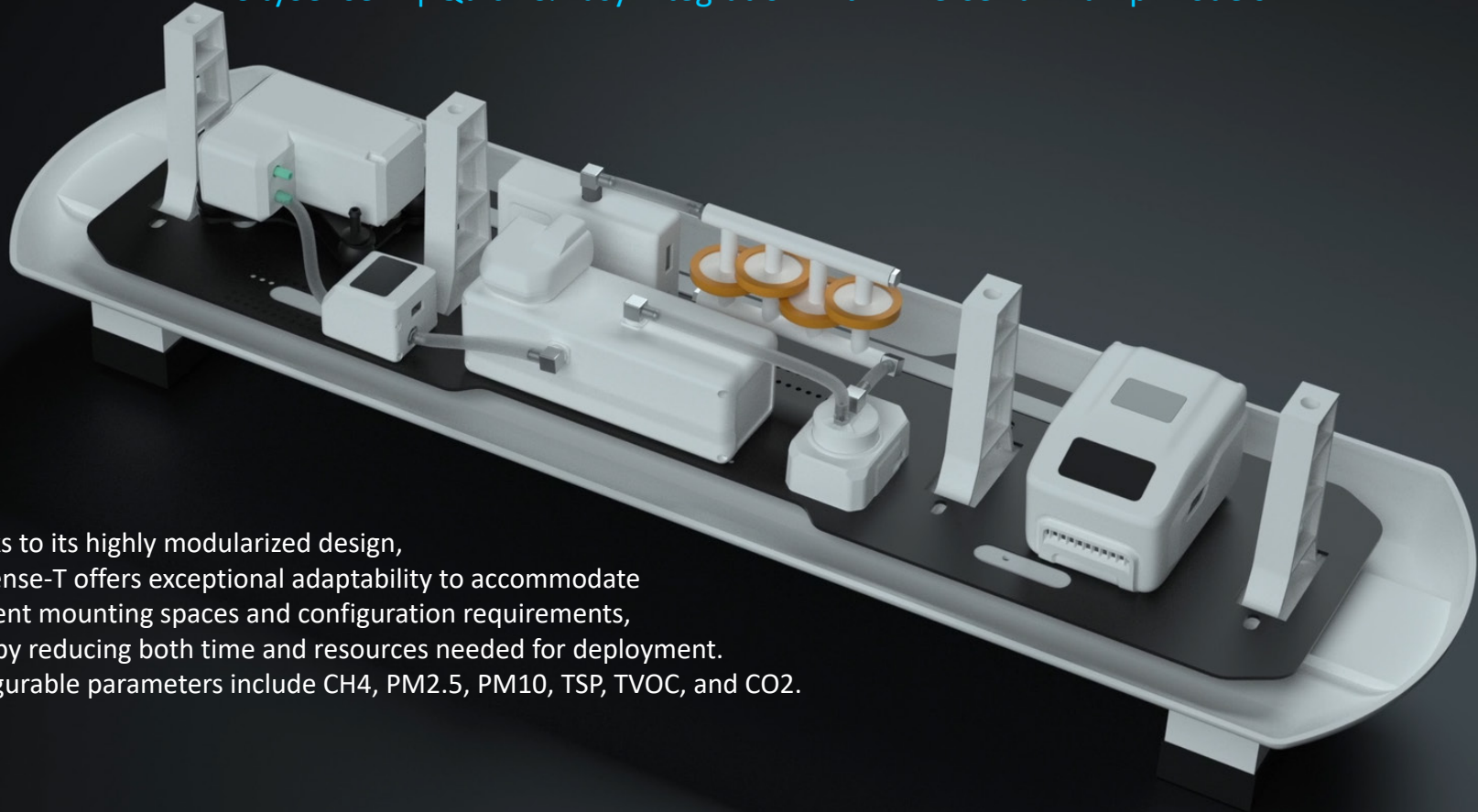
A compact and modularized version that seamlessly integrates into a variety of taxi lamp models atop conventional taxis. This offers minimal changes to the vehicle's appearance and does not interfere with the vehicle's functionality, making it an unobtrusive addition to any taxi.



CitySense-X

A robust, weather-proof version suitable for installation on a wide range of vehicles, including buses, garbage trucks, and e-hailing taxis. This version includes the option for omnidirectional cameras and LCD displays. It uses the same internal modules as CitySense-T.

CitySense-T | Quick & Easy Integration with Diverse Taxi Lamp Models



Thanks to its highly modularized design, CitySense-T offers exceptional adaptability to accommodate different mounting spaces and configuration requirements, thereby reducing both time and resources needed for deployment. Configurable parameters include CH₄, PM_{2.5}, PM₁₀, TSP, TVOC, and CO₂.

CitySense-X | Additional Features



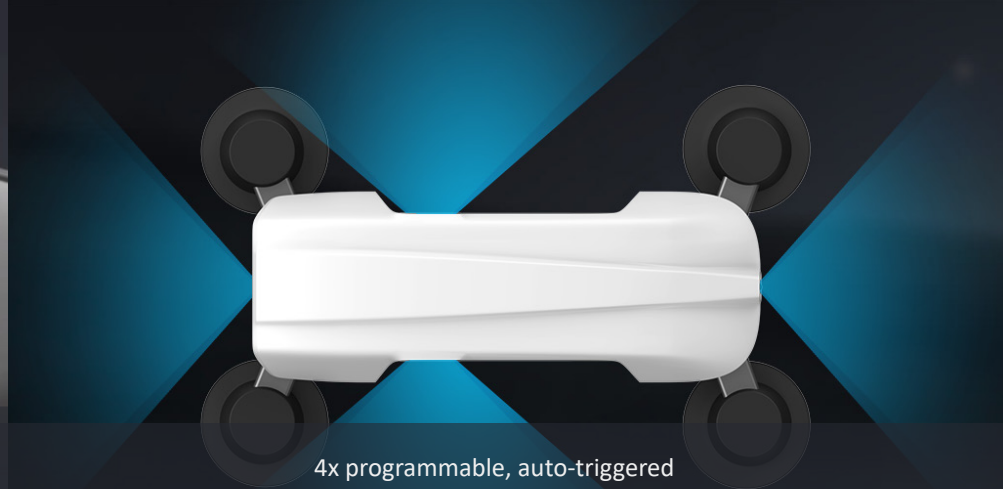
Streamlined, weather-proof enclosure
with heat reflective design



Electronically controlled automatic suction cups



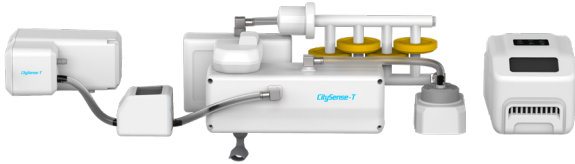
2x LCD displays for broadcasting real-time
data or tailored messages



4x programmable, auto-triggered
omnidirectional cameras

Reliable, Consistent, and Representative Measurement Data

Within its price range, CitySense delivers top-class measurement data quality by using state-of-the-art sensors.



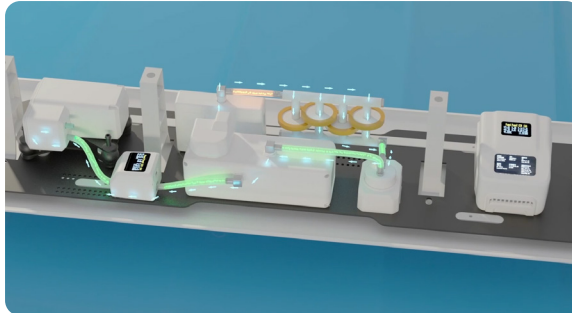
Parameter	Detection Method	Resolution
CH4	Tunable Diode Laser Absorption Spectroscopy (TDLAS)	1ppm
PM2.5, PM10, TSP	Laser Scattering	1ug/m3
TVOC	Photoionization Detection	10ppb (C4H8 equivalent)
CO2	Non-dispersive Infrared (NDIR)	1ppm

CitySense-X | Additional Features

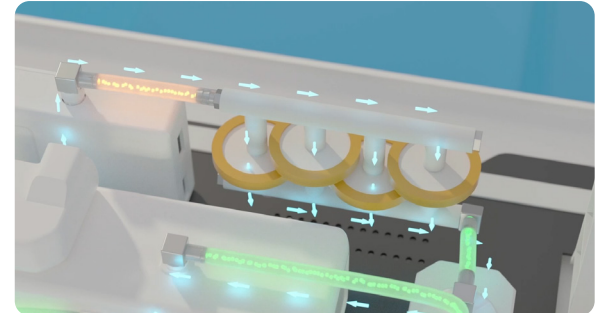
Isokinetic air intake ensuring representative air sampling under moving conditions



Auto-stop in rain or mist to protect precise optical parts and to avoid false PM readings

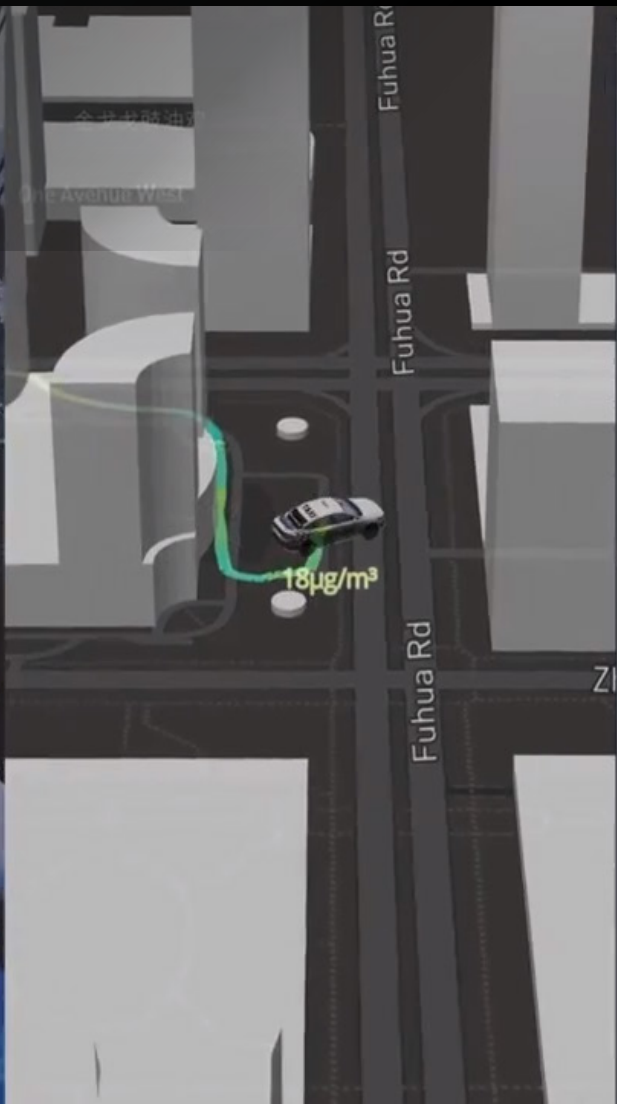


Multi-stage filtering and drying



GNSS+IMU Precise Location Tracking

Ensure reliable georeferencing for the measurement data even amidst high-rise urban environments.



Device Real-time Details

Auto Switch in 30s

SN: a8b6c9fd

Lat & Lon: 114.056960,22.537677

Localization: **GNSS+IMU Fusion**

IMU Status: **Precisely Calibrated**

Plate No.: 粤BDC2327

Speed: 9.6km/h

Remark: M6/0625/鑫恒阳

Real-time Value(s)

PM_{2.5}: 18 µg/m³

PM₁₀: 38 µg/m³

TVOC: 0.011 ppm

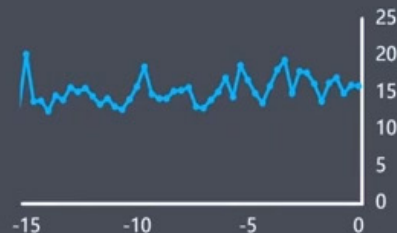
CO₂: 449 ppm

PCBA TEMP.: 41.5 °C

PCBA RH.: 39.3 %RH

[More Details](#)

PM_{2.5}(µg/m³) Trend in the Last 15 Mins



Advanced Self-monitoring Capability

Gain real-time access to CitySense's comprehensive operational status remotely, ensuring optimal functionality and ease of maintenance.



Central Control Module (CCM)

CPU Temp: 85.52 °C
 CPU Utilization: 5.47%
 Cooling Fan Off
 Cooling Fan Voltage Threshold: 15.07 V
 Fan Speed: 1000 RPM
 Fan Voltage: 12.75 V
 No. of ON/OFF Subunits: 17 pairs
 ON/OFF Subunit: 1, 2, 3
 Cellular Signal Strength: 95 dBm
 Max Only Localization Threshold: 200
 Max No. of ON/OFF Subunits: 100
 Max Sampling Rate: 111.11 Hz
 Allow BLE Only Localization:
 Max Only Localization Threshold: 200
 Allow Remote Access:
 Set Fan Threshold: 15
 Dry Fan Filtering:

Smart Power Module (SPM)

SPM Power Temp: 75.52 °C
 SPM Power: 2.35 W
 CCM V Current/Voltage/Power: 0.00 V, 0.00 A, 0.00 W
 PUMP1 V Current/Voltage/Power: 0.00 V, 0.00 A, 0.00 W
 PUMP2 V Current/Voltage/Power: 0.00 V, 0.00 A, 0.00 W
 CCM2 V Current/Voltage/Power: 0.00 V, 0.00 A, 0.00 W
 Auto Pump Control:
 PUMP1 Power Supply:
 PUMP2 Power Supply:
 PUMP3 Power Supply:
 PUMP4 Power Supply:
 CCM2A Power Supply:
 PM Power Supply:
 CO2 Power Supply:
 TVOC Power Supply:

Airway Monitoring Module (AMM)

Flow Rate: 1.35 SLM
 Flow Rate Zero Offset: 0.00 SLM
 Air Temp: 32.24 °C
 RH RH: 68.52 %RH
 PCMA Temp: 45.54 °C
 PCMA RH: 26.52 %RH
 PCMA Baromet: 95.477 kPa

PM2.5 Monitoring Module

Real-time Value: 27.45 µg/m³
 PCMA Temp: 45.52 °C
 PCMA RH: 27.21 %RH
 PCMA Baromet: 100.551 kPa
 Zero Offset: 0.00 µg/m³
 Sensitivity Correction Factor: 1.000
 Set Zero Offset: 0
 Set Sensitivity Correction Factor: 1

PM10 Monitoring Module

Real-time Value: 28.02 µg/m³
 PCMA Temp: 45.50 °C
 PCMA RH: 26.58 %RH
 PCMA Baromet: 100.524 kPa
 Zero Offset: 0.00 µg/m³
 Sensitivity Correction Factor: 1.000
 Set Zero Offset: 0
 Set Sensitivity Correction Factor: 1

TVOC Monitoring Module

Real-time Value: 0.023 ppm
 PCMA Temp: 32.44 °C
 PCMA RH: 61.62 %RH
 PCMA Baromet: 100.550 kPa
 Zero Offset: 0.000 ppm
 Sensitivity Correction Factor: 0.985
 Set Zero Offset: 0.00
 Set Sensitivity Correction Factor: 0.985

Rain Detection Module (RDM)

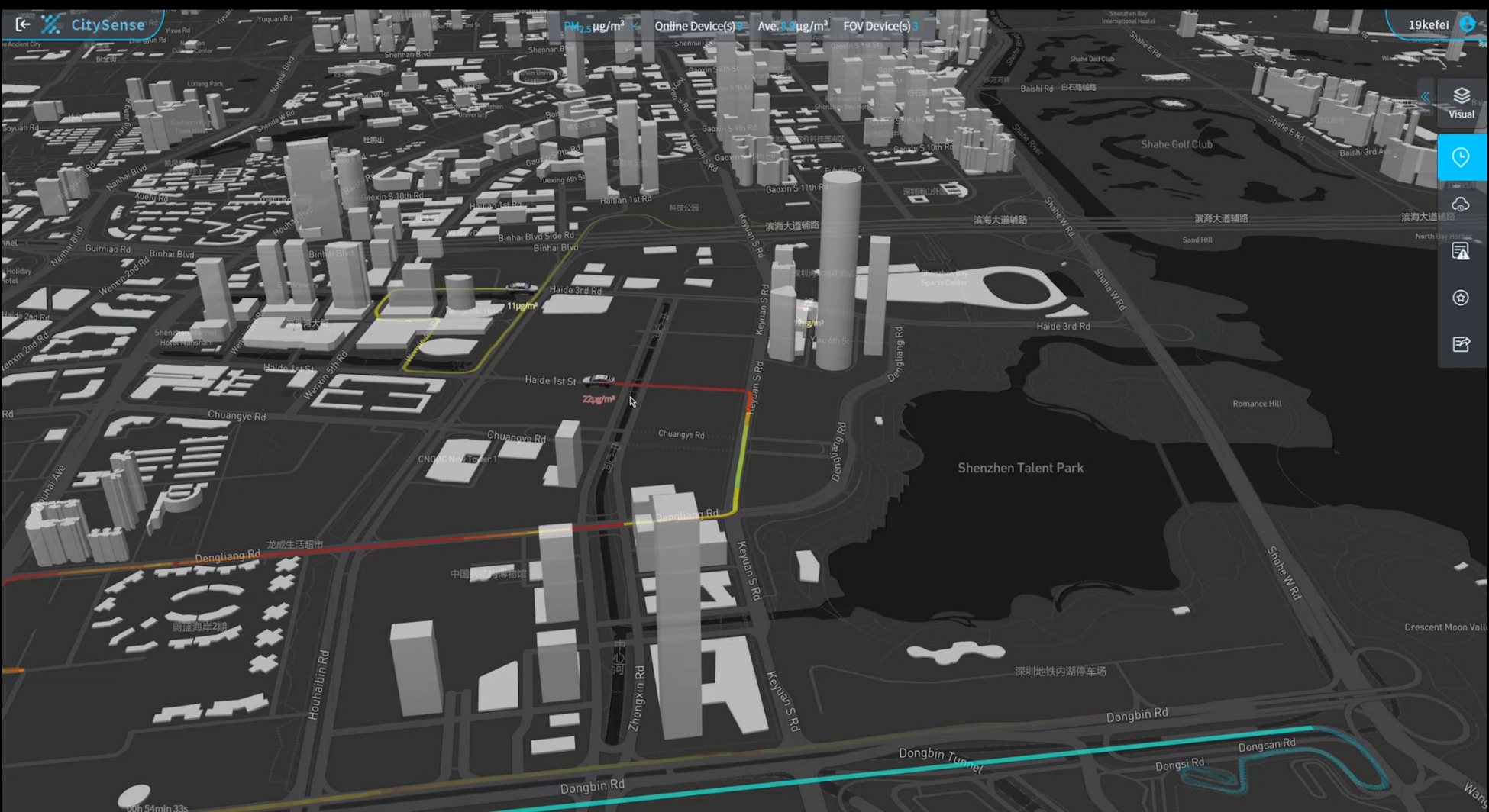
Rain Detected: 0
 Rain Sensor Value: 0.00
 Dry to Wet Threshold: 60.00
 Wet to Dry Threshold: 64.00
 Set Dry to Wet Threshold: 60
 Set Wet to Dry Threshold: 64



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Real-time Concentration Map

Showcase the moving trails of vehicles, illuminated with colour-coded concentration data from the past 15 minutes. This allows you to identify current high-concentration road segments and assess their impact on surrounding areas using real-time wind data.



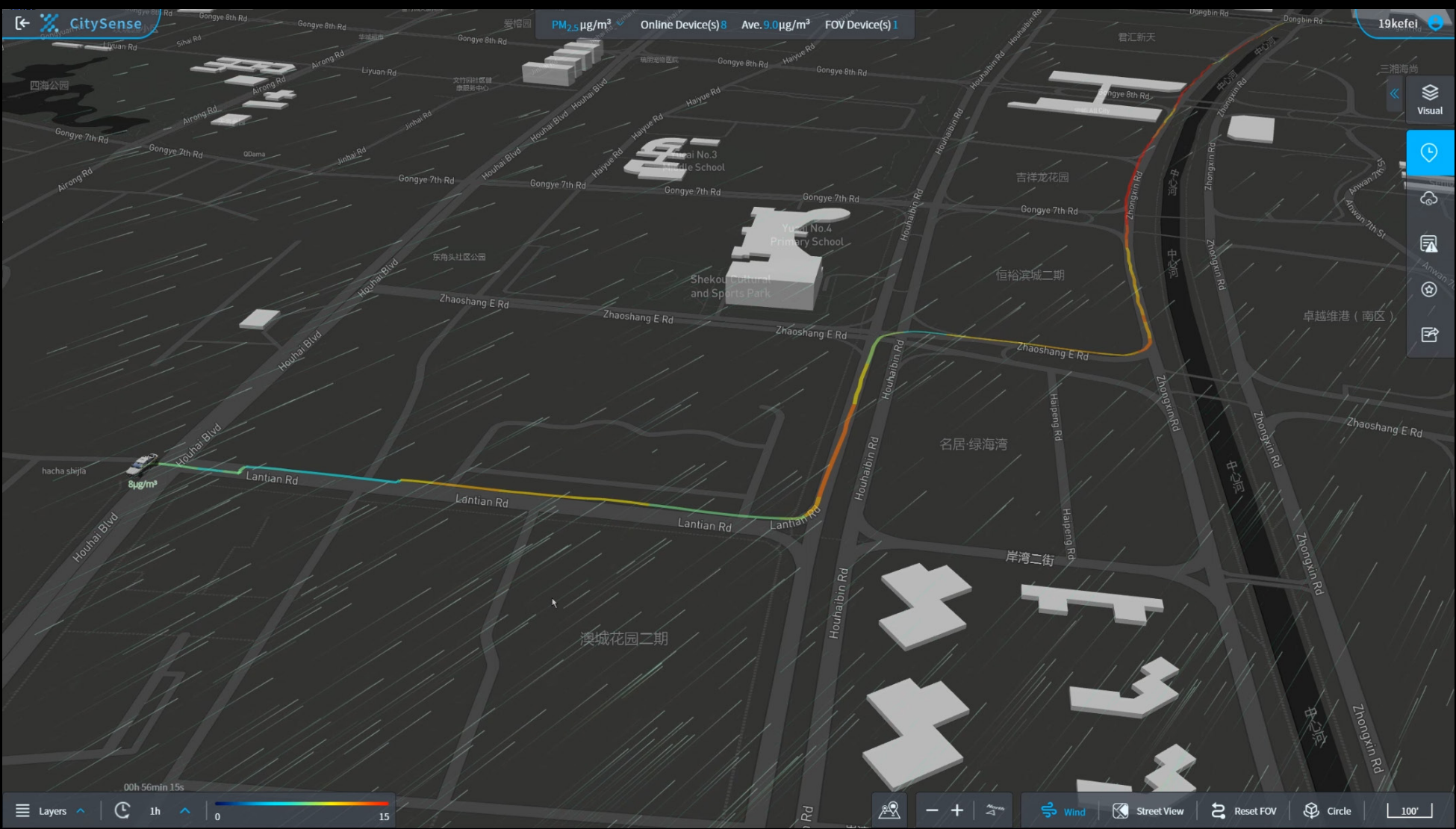
Visual

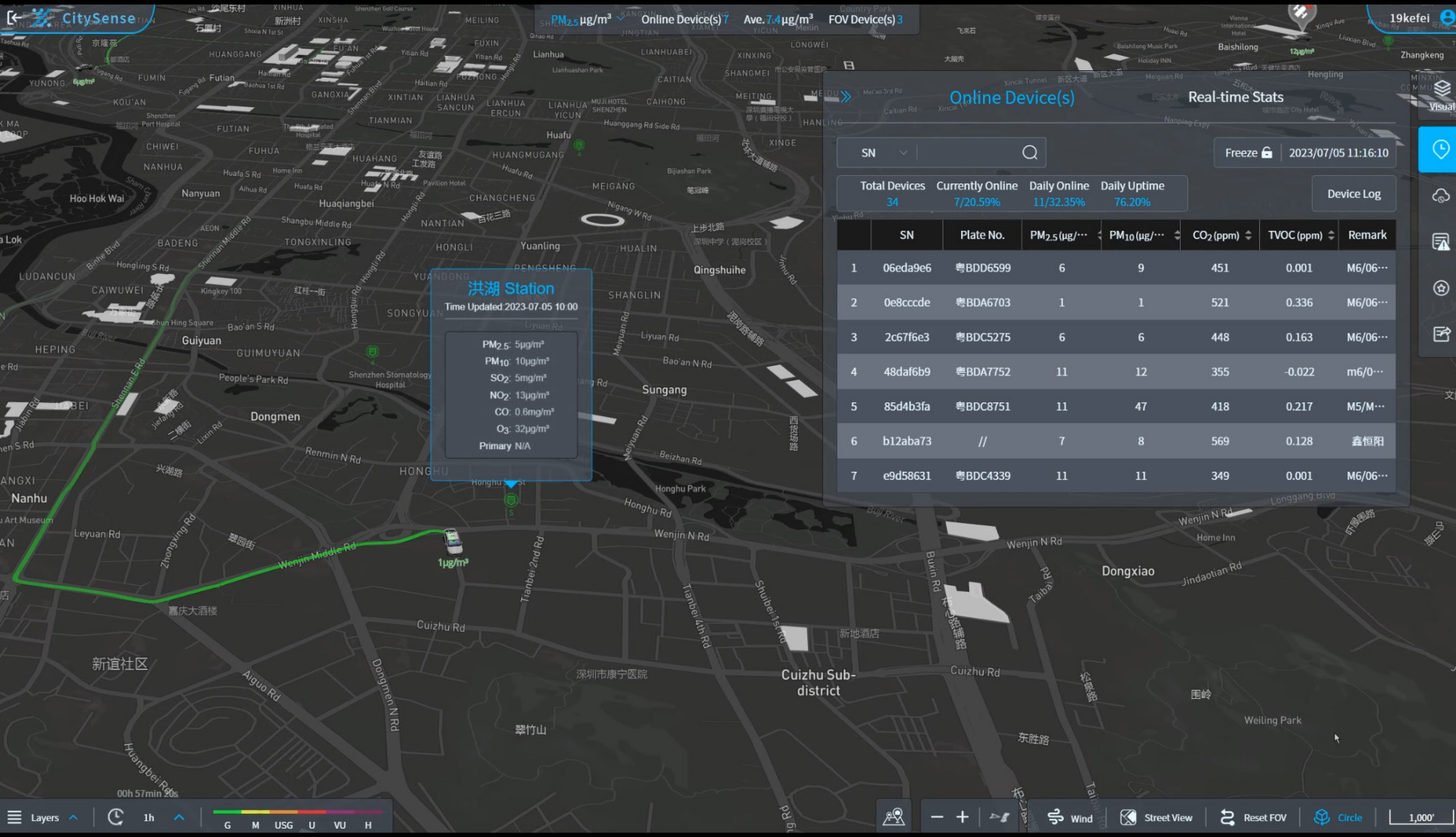
Timeline

Layers

Home

Share





洪湖 Station
 Time Updated 2023-07-05 10:00

PM_{2.5}: 5µg/m³
 PM₁₀: 10µg/m³
 SO₂: 5mg/m³
 NO₂: 13µg/m³
 CO: 0.6mg/m³
 O₃: 32µg/m³
 Primary N/A

Online Device(s) Real-time Stats

SN 2023/07/05 11:16:10

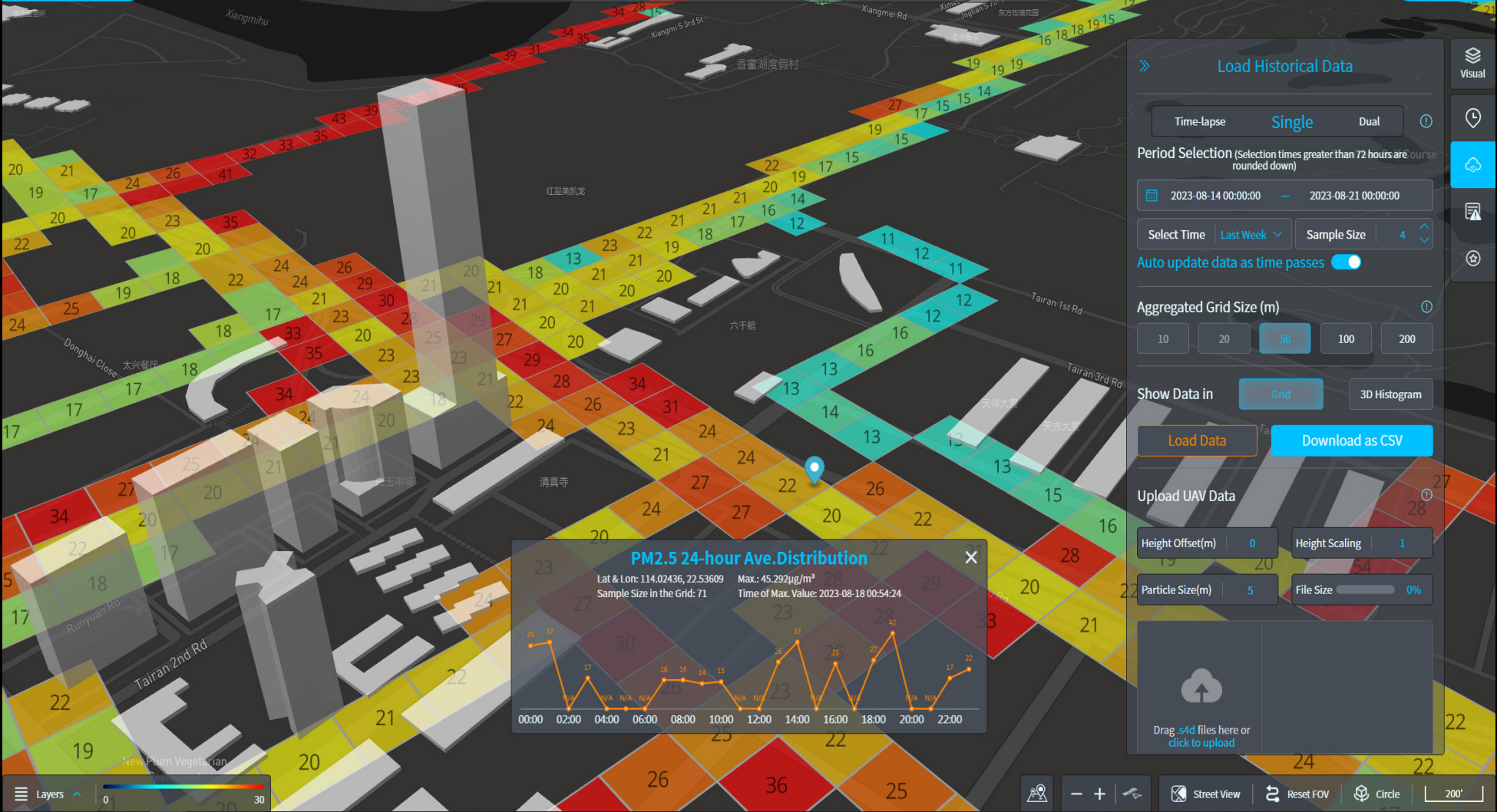
	Total Devices	Currently Online	Daily Online	Daily Uptime	Device Log
	34	7/20.59%	11/32.35%	76.20%	

	SN	Plate No.	PM _{2.5} (µg/...)	PM ₁₀ (µg/...)	CO ₂ (ppm)	TVOC (ppm)	Remark
1	06eda9e6	粤BDD6599	6	9	451	0.001	M6/06...
2	0e8ccdde	粤BDA6703	1	1	521	0.336	M6/06...
3	2c6f7fe3	粤BDC5275	6	6	448	0.163	M6/06...
4	48daf6b9	粤BDA7752	11	12	355	-0.022	m6/0...
5	85d4b3fa	粤BDC8751	11	47	418	0.217	M5/M...
6	b12aba73	//	7	8	569	0.128	鑫恒阳
7	e9d58631	粤BDC4339	11	11	349	0.001	M6/06...

Historical Concentration Map - Single and Dual

Manage up to a billion data points to highlight high concentration areas and review 24-hour trends.

Utilize Dual Mode to contrast concentration maps displaying different periods or parameters for more in-depth insights, such as assessing the effectiveness of control policies, and finding correlations between pollutants.



Load Historical Data

Time-lapse: **Single** Dual

Period Selection (Selection times greater than 72 hours are rounded down)

2023-08-14 00:00:00 - 2023-08-21 00:00:00

Select Time: Last Week Sample Size: 4

Auto update data as time passes:

Aggregated Grid Size (m): 10 20 **50** 100 200

Show Data in: **Grid** 3D Histogram

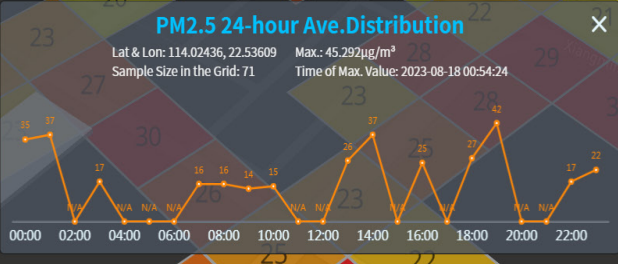
Load Data Download as CSV

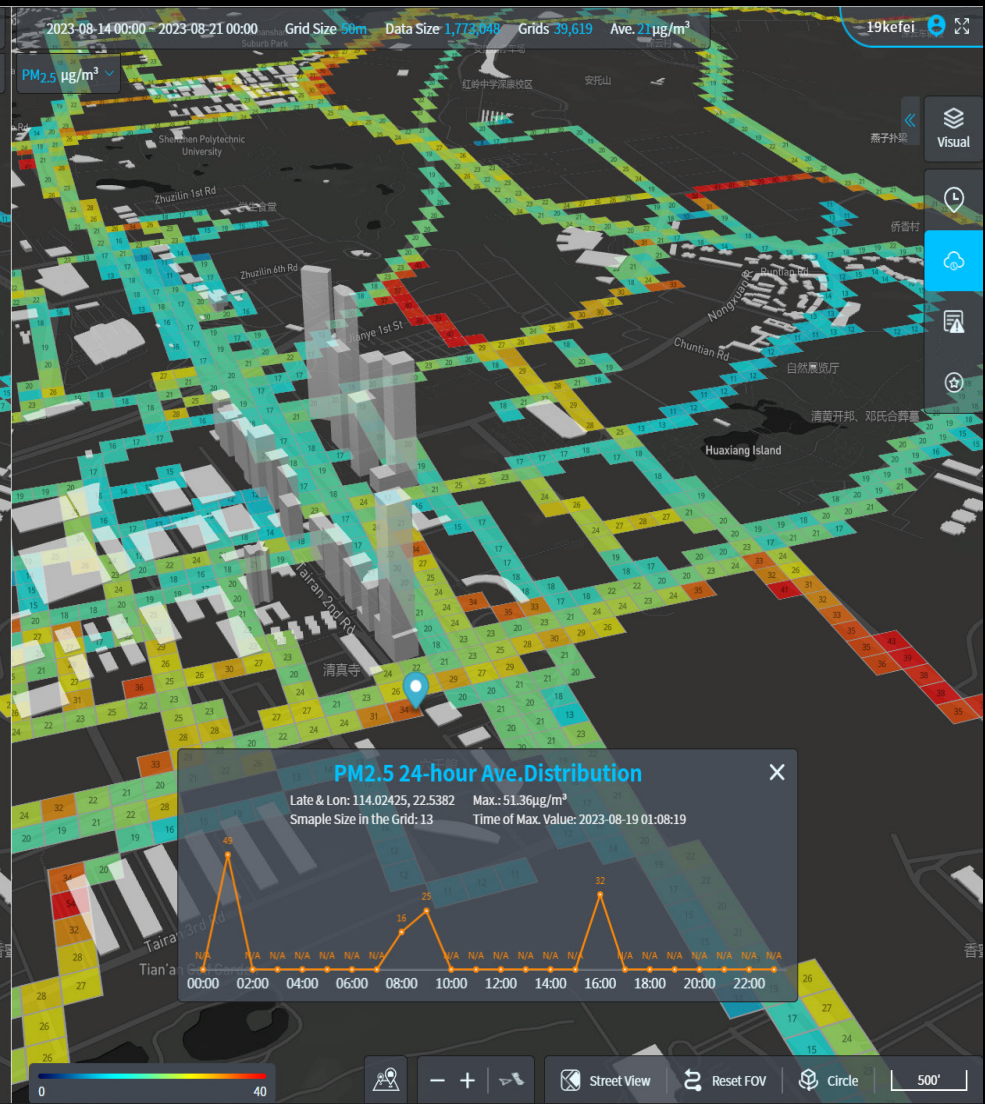
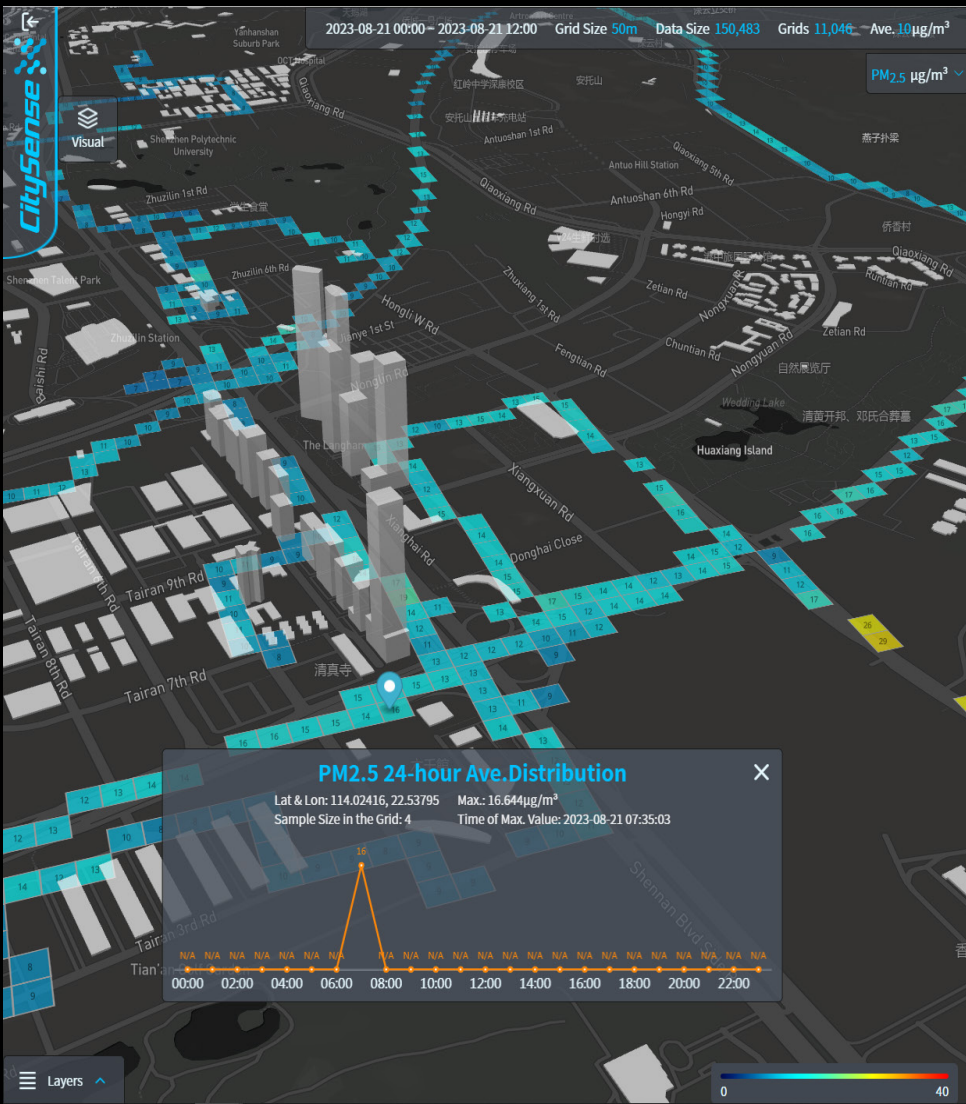
Upload UAV Data

Height Offset(m): 0 Height Scaling: 1

Particle Size(m): 5 File Size: 0%

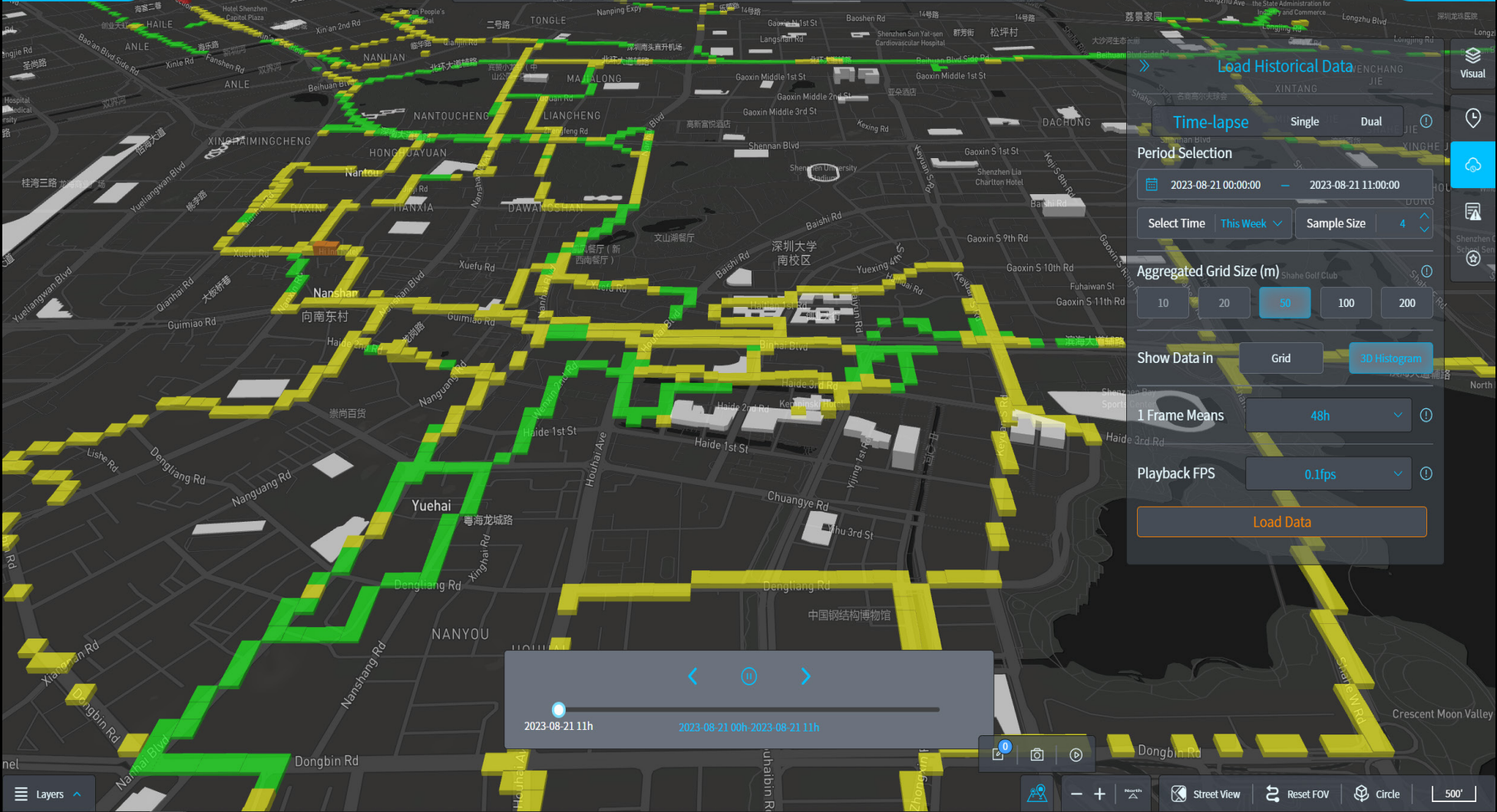
Drag .s4d files here or click to upload





Historical Concentration Map - Time-lapse Animation

Generate dynamic time-lapse animations depicting concentration trends within a chosen time period, providing an intuitive visualization of environmental changes over time.



Load Historical Data

Time-lapse Single Dual

Period Selection

2023-08-21 00:00:00 - 2023-08-21 11:00:00

Select Time This Week Sample Size 4

Aggregated Grid Size (m)

10 20 50 100 200

Show Data in Grid 3D Histogram

1 Frame Means 48h

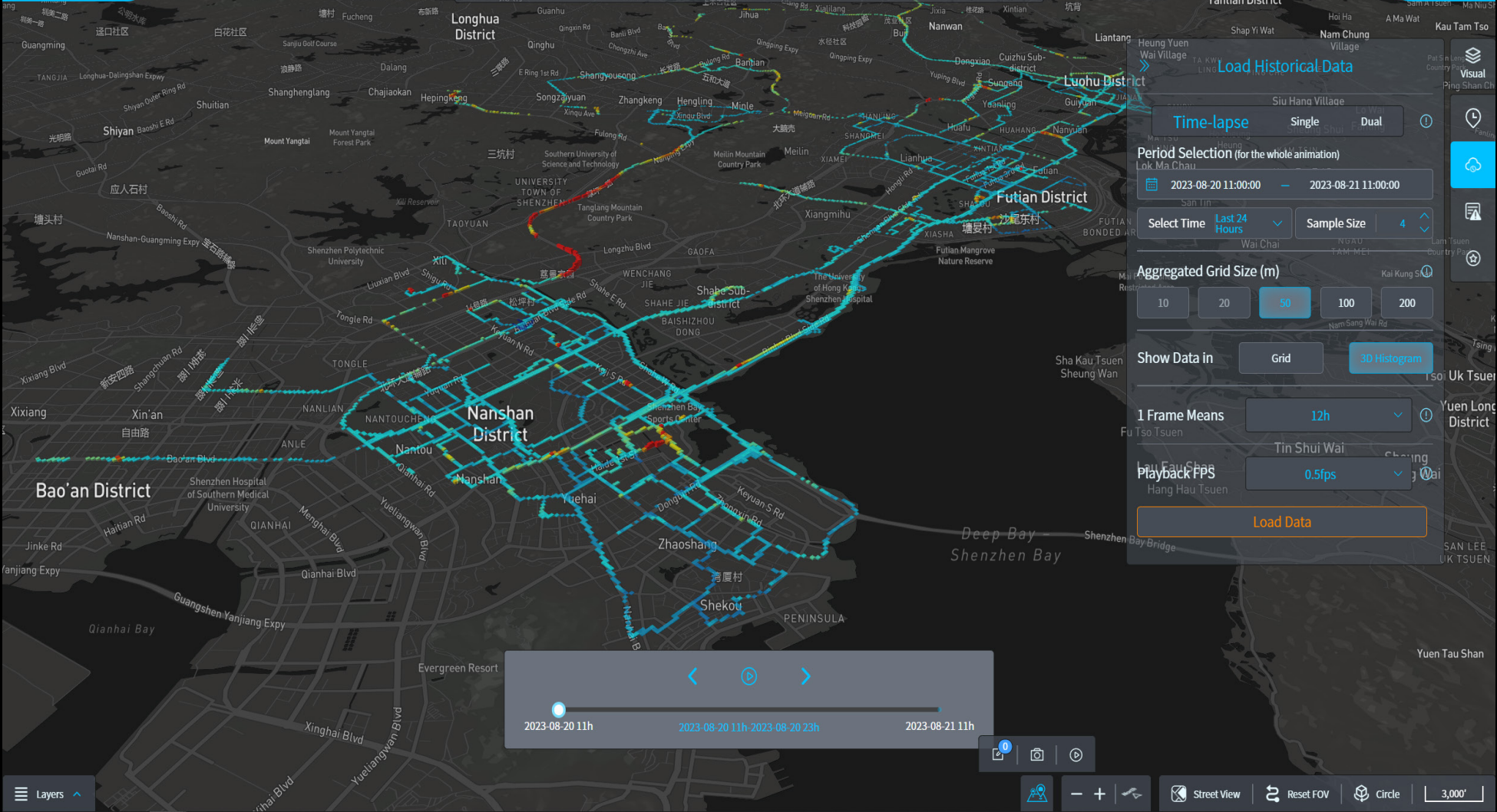
Playback FPS 0.1fps

Load Data

Timeline controls: Previous, Play/Pause, Next

2023-08-21 11h

2023-08-21 00h - 2023-08-21 11h



Load Historical Data

Time-lapse Single Dual

Period Selection (for the whole animation)

2023-08-20 11:00:00 - 2023-08-21 11:00:00

Select Time **Last 24 Hours** Sample Size **4**

Aggregated Grid Size (m)

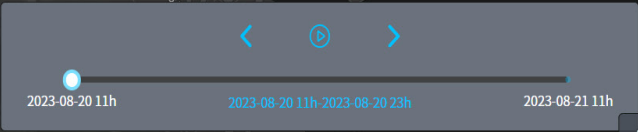
10 20 **50** 100 200

Show Data in Grid 3D Histogram

1 Frame Means **12h**

Playback FPS **0.5fps**

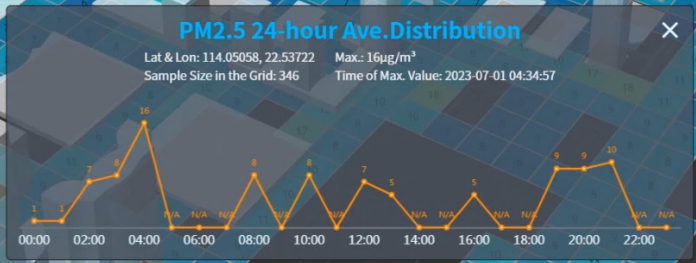
Load Data



Historical Concentration Map - Multi-source Data Analysis

Harness the power of diverse data sources, integrating ground measurement data from CitySense hardware, UAV-mounted Sniffer4D measurement data, and Street View imagery.

This comprehensive approach facilitates robust and thorough environmental analysis.



Load Historical Data

Animated Trend **Single** Dual

Period Selection
 2023-06-26 00:00:00 — 2023-07-03 00:00:00

Frequently Selected **Last Week**

Auto update data as time passes

Aggregated Grid Size (m)
 10 20 **50** 100 200

Show Data in **Grid** 3D Histogram

Load Data **Download as CSV**

Upload UAV Data

Height Offset(m) 0 Height Scaling 1

Particle Size(m) 5 File Size 0%

Drag .s4d files here or click to upload



Load Historical Data

Animated Trend: **Single** Dual

Period Selection: 2023-06-26 00:00:00 - 2023-07-03 00:00:00

Frequently Selected: Last Week

Auto update data as time passes:

Aggregated Grid Size (m): 10 20 **50** 100 200

Show Data in: Grid 3D Histogram

Load Data **Download as CSV**

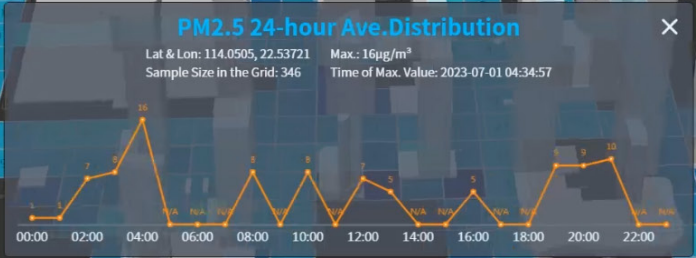
Upload UAV Data

Height Offset(m): 0 Height Scaling: 1

Particle Size(m): 5 File Size: 0%

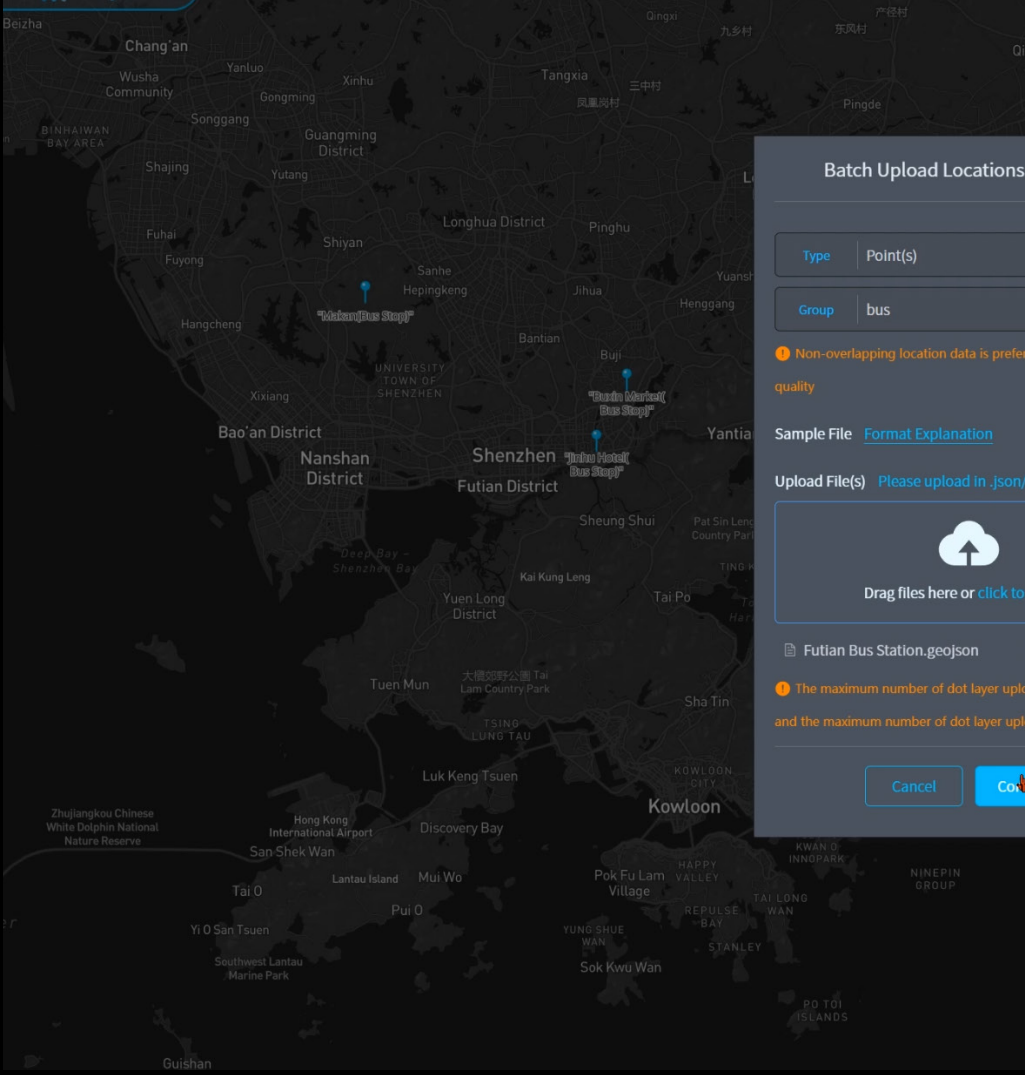
Pingan.s4d

Drag .s4d files here or click to upload



User-defined Locations of Interest: Points, Lines, and Areas

Define your points, lines, and areas of interest, rank them based on nearby concentration data, and view their 24-hour trends, offering tailored insights for specific locations of concern.



Batch Upload Locations of Interest


Type: Point(s)

Group: bus

Non-overlapping location data is preferred for best visual quality

Sample File [Format Explanation](#)

Upload File(s) Please upload in .json/.geojson format



Drag files here or click to upload

Futian Bus Station.geojson

The maximum number of dot layer uploads is 1000 per time, and the maximum number of dot layer uploads is 1000 per group

Locations of Interest

Line(s) Area(s) Group bus

2023-07-06 00:00 — 2023-07-06 10:00 Today

2023-07-05 00:00 — 2023-07-06 00:00 Yesterday

Dimension 1	PM _{2.5} Ave.(μg/m ³)			PM ₁₀ Ave.(μg/m ³)			TVC
	Dimension 2	Difference	Dimension 1	Dimension 2	Difference	Dimension 1	
6)	6.25	7.83	-1.58	7.5	9.11	-1.61	0.121
	7.58	6.54	1.04	8.58	7.88	0.7	0.127
	10.22	9.96	0.26	10.22	10.54	-0.32	0.155
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	N/A	11	N/A	N/A	11	N/A	N/A
	N/A	11	N/A	N/A	11	N/A	N/A
	N/A	11	N/A	N/A	11	N/A	N/A
8	"Makan(B...	N/A	N/A	N/A	N/A	N/A	N/A

50/page

Visual

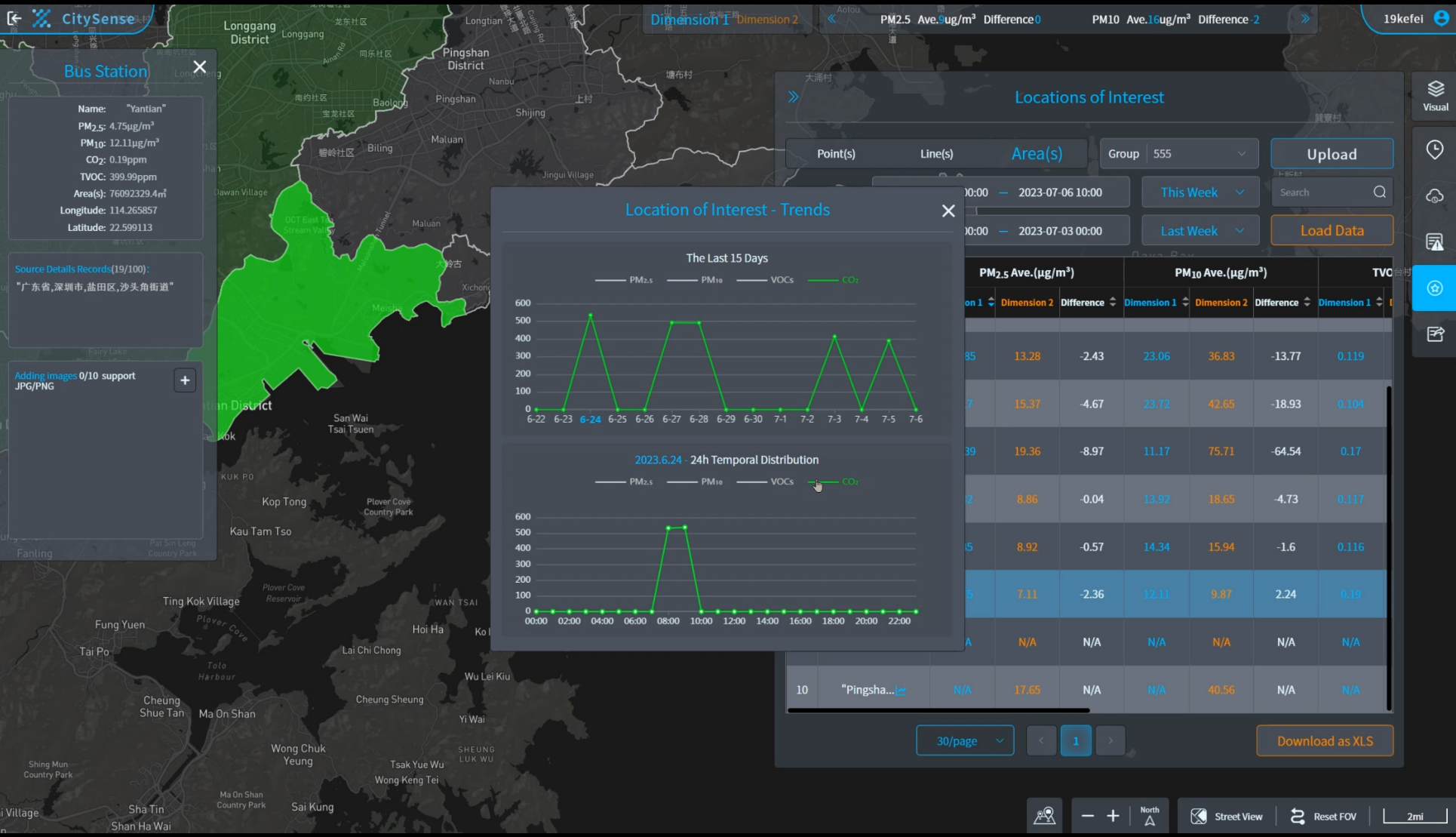
Bus Station

Name: "Yantian"
 PM_{2.5}: 4.75 $\mu\text{g}/\text{m}^3$
 PM₁₀: 12.11 $\mu\text{g}/\text{m}^3$
 CO₂: 0.19ppm
 TVOC: 399.99ppm
 Area(s): 76092329.4m²
 Longitude: 114.265857
 Latitude: 22.599113

Source Details Records(19/100):

"广东省,深圳市,盐田区,沙头角街道"

Adding images 0/10 support JPG/PNG



Locations of Interest

Point(s)

Line(s)

Area(s)

Group 555

Upload

2023-07-06 10:00

This Week

Search

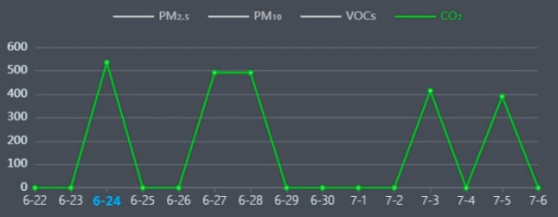
2023-07-03 00:00

Last Week

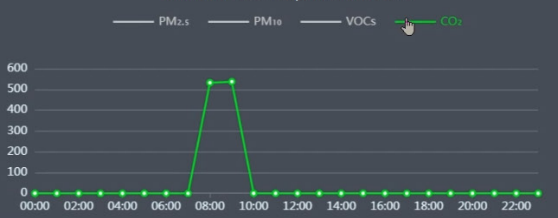
Load Data

Location of Interest - Trends

The Last 15 Days



2023.6.24 - 24h Temporal Distribution



	PM _{2.5} Ave. ($\mu\text{g}/\text{m}^3$)	Difference	PM ₁₀ Ave. ($\mu\text{g}/\text{m}^3$)	Difference	TVOC	
85	13.28	-2.43	23.06	36.83	-13.77	0.119
7	15.37	-4.67	23.72	42.65	-18.93	0.104
39	19.36	-8.97	11.17	75.71	-64.54	0.17
2	8.86	-0.04	13.92	18.65	-4.73	0.117
5	8.92	-0.57	14.34	15.94	-1.6	0.116
5	7.11	-2.36	12.11	9.87	2.24	0.19
A	N/A	N/A	N/A	N/A	N/A	N/A
10	"Pingsha..."	N/A	17.65	N/A	N/A	N/A

30/page

1

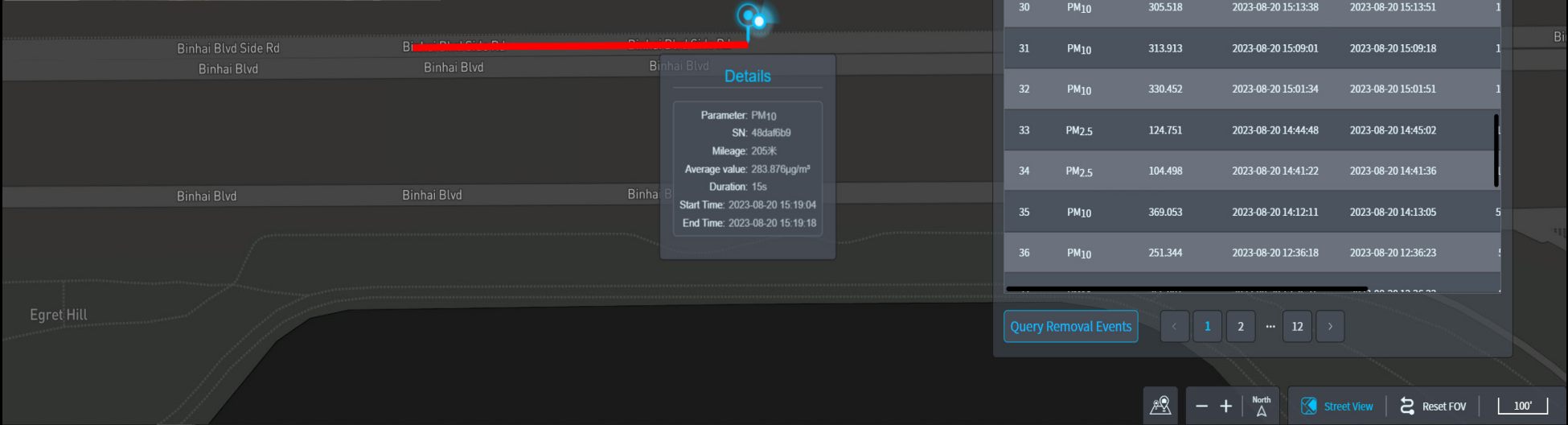
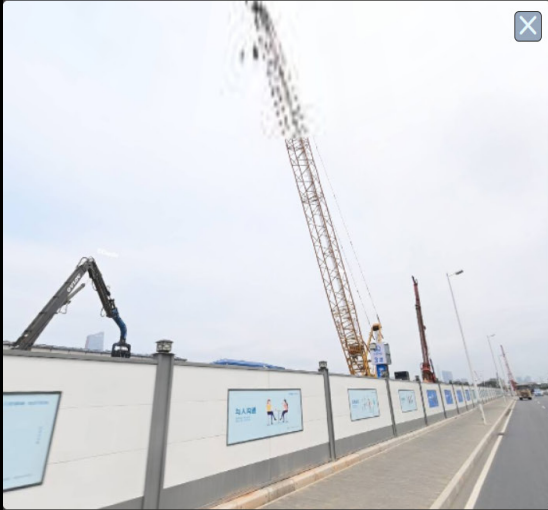
Download as XLS

Critical Events Tracking

Keep track of critical environmental events.

When concentration levels exceed predefined thresholds for a set duration, the system automatically records these events, capturing details such as average concentration, event duration, occurrence time, and location.

All recorded events are accessible for review.



Details

- Parameter: PM10
- SN: 48da16b9
- Mileage: 205米
- Average value: 283.876 $\mu\text{g}/\text{m}^3$
- Duration: 15s
- Start Time: 2023-08-20 15:19:04
- End Time: 2023-08-20 15:19:18

Critical Events

SN: All | Parameter: All | Area: All

Set time range: 2023-08-14 00:00 - 2023-08-21 00:00 | Last Week

Average: [] | Duration(s): []

Set Condition | Load Data

No.	Parameter	Average value (°C)	Start Time	End Time	Duration
28	PM10	283.876	2023-08-20 15:19:04	2023-08-20 15:19:18	15s
29	PM10	265.391	2023-08-20 15:18:41	2023-08-20 15:18:53	15s
30	PM10	305.518	2023-08-20 15:13:38	2023-08-20 15:13:51	15s
31	PM10	313.913	2023-08-20 15:09:01	2023-08-20 15:09:18	15s
32	PM10	330.452	2023-08-20 15:01:34	2023-08-20 15:01:51	15s
33	PM2.5	124.751	2023-08-20 14:44:48	2023-08-20 14:45:02	15s
34	PM2.5	104.498	2023-08-20 14:41:22	2023-08-20 14:41:36	15s
35	PM10	369.053	2023-08-20 14:12:11	2023-08-20 14:13:05	55s
36	PM10	251.344	2023-08-20 12:36:18	2023-08-20 12:36:23	5s

Query Removal Events | 1 2 ... 12



soarability

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linkedin: www.linkedin.com/company/soarabilitytech/

Address: 60 PAYA LEBAR ROAD #11-53 PAYA LEBAR SQUARE SINGAPORE (409051)



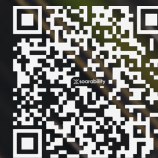
LinkedIn

<https://www.linkedin.com/company/soarabilitytech/>



YouTube

<https://www.youtube.com/@SoarabilityTechnologies>



CitySense

https://www.soarability.tech/citysense_en