

NTT East's Best-Mix Network Strategy and Wi-Fi HaLow Deployments

2026.6.3

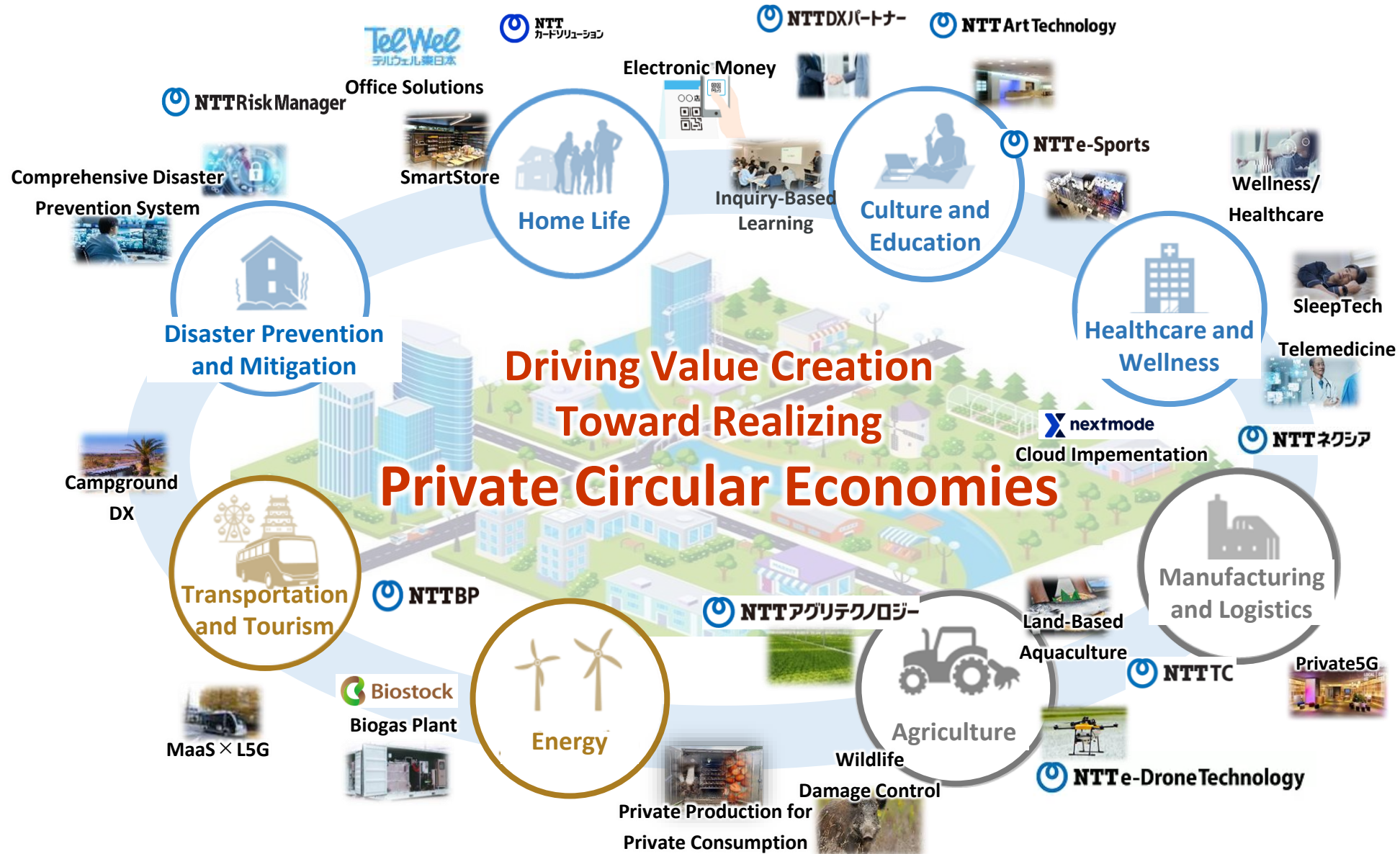
New Business Development Headquarters
Norikazu Watanabe

- I . Introduction to NTT East Inc.**
- II . NTT East Group's Wireless Lineup and Topics**
- III . Latest Case Studies of Wireless + DX Solutions**
- IV . Conclusion**



I . Introduction to NTT East Inc.





NTT East Group's wireless business

- Expanding into **IoT/robotics** with strengths in **connectivity** –especially optimized private wireless–.
- Solving labor shortages via **connectivity × AI/digital twins × on-site execution**.

■ Existing Capabilities
 ■ Core Domain (LAN/Wireless)
 ■ Growth Domains triggered by LAN/Wireless



- **Industrial demand → wireless usage & data volume growing.**
Advanced requirements (low latency, reliability) → single standard insufficient
- Carrier constraints + evolving standards.
- Need for private wireless deployment where needed.

Demand Trends

<Industry DX → rising wireless & data demand>

- **Expanding wireless demand**
 - **Mobility (robotics, autonomous driving)**
 - **Massive connections (sensors) + virtualized connectivity**
- **Advanced requirements**
 - Real-time control / Low latency / Handover
 - Network design for scale, coverage, and uplink traffic

Supply-side changes

<Carriers>

- Limited CapEx efficiency; full industrial coverage difficult
- **Shared public networks → variable QoS**
- **Higher frequency(5G/6G/7G) → shorter range, weaker coverage**

<Technology-specific challenges>

- Wi-Fi: QoS issues (interference, AP control limits, range)
- Satellite: indoor coverage limits (factories/buildings), mobility, capacity

Single standard limitations
Capacity constraints

**Need for
hybrid private wireless +
multi-RAT integration**

Carrier efforts alone fall short
of industrial requirements



II. NTT East Group's Wireless Lineup and Topics



Contributing to industrial DX and solving regional issues

through Private 5G/Wi-Fi HaLow and other multi-access private networks providing best network solutions combining wired and wireless networks.

Combine the best NW fitting the application



Cloud-based managed Wi-Fi service with **400,000 Aps in operation**,
One of the largest managed Wi-Fi services for enterprises in Japan.

ギガらくWi-Fi



Approximately
400,000 Aps
in operation
(March 2026)



Cloud-managed Wi-Fi 7 (IEEE 802.11be) with support 6GHz + Wi-Fi 7 features → stable in high-density environments

High-End 7 Features

- Wi-Fi 7: high throughput / high capacity (max 11.5Gbps, ~4×)
- Stable with many devices (~150 concurrent connections)^{※1}
- Plug & play via LAN (pre-configured AP, no onsite setup)^{※2}
- Daily support 9:00–21:00 (remote troubleshooting)

※1 Concurrency depends on environment and router performance
※2 Existing configs (e.g., static IP) may require changes; phone support available



Cisco/CW9174I

Wi-Fi 7 Key Features

6GHz Band Clean spectrum → stable connectivity

- Less interference (no overlap with legacy / DFS)
- Reduced contention → higher stability

MLO Multi-band use → low latency, stable

- Dynamic band selection (2.4/5/6GHz)
- Seamless failover → no session drops

320MHz Bandwidth Wider channel → higher throughput

- Higher data volume per transmission
- Smooth for HD video / large files

Multi-RU Efficient concurrent transmission

- Fine-grained RU allocation per user
- High concurrency → reduced congestion

Managed Private 5G: GigaRaku 5G

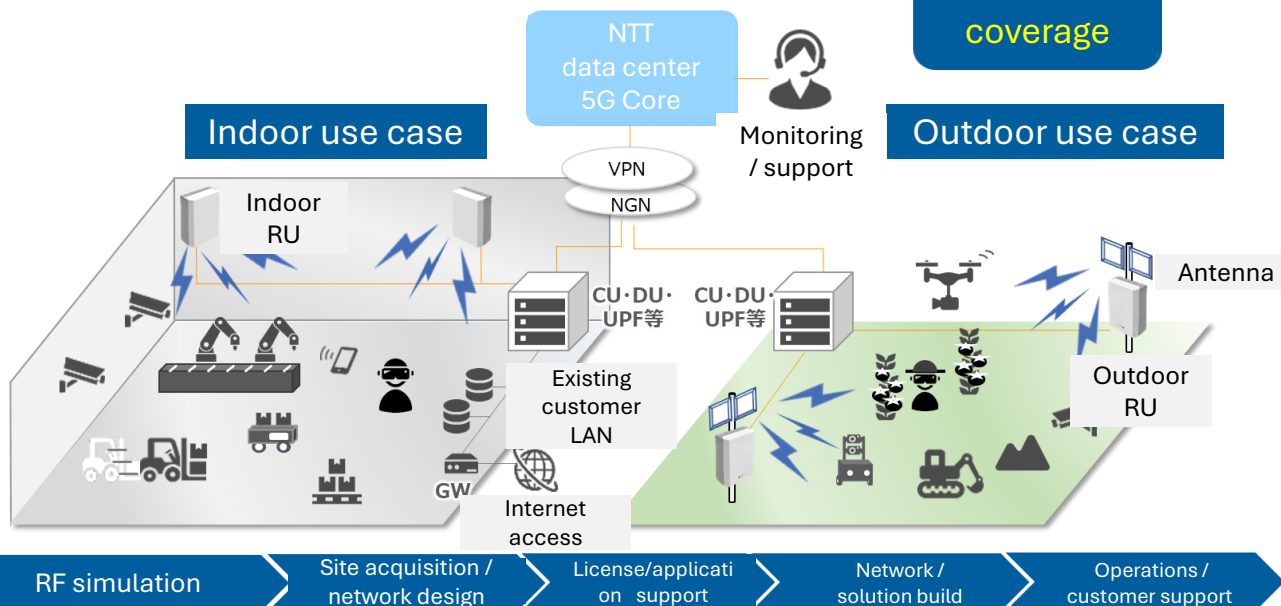
- **Leading Private 5G** package in Japan market.
- **Main + Select plan** (integrated compact base station).

Main Plan

- End-to-end ITO (design, build, operate) with 5G SA

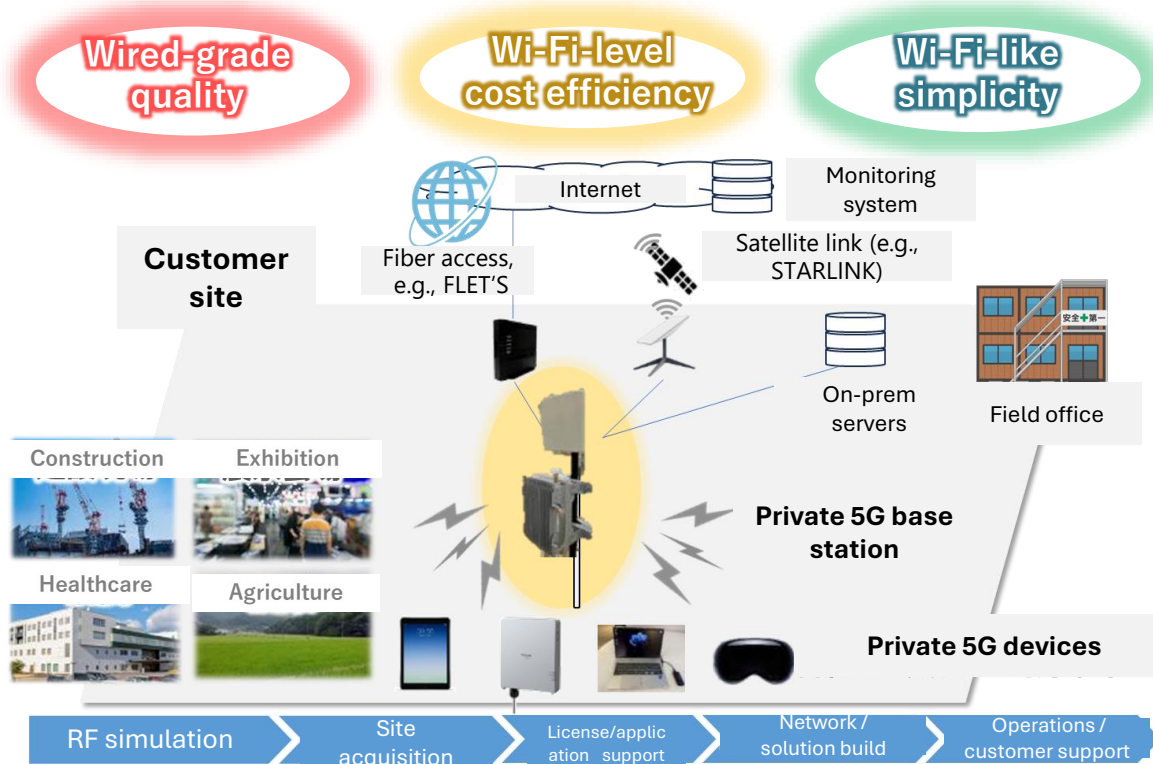


Nationwide coverage



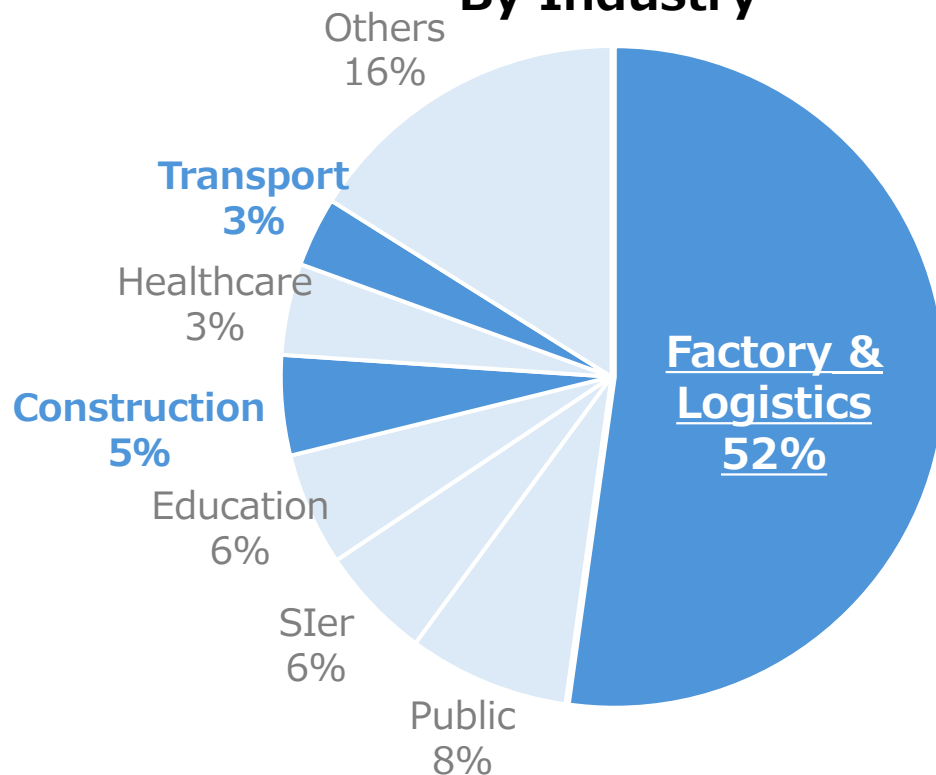
Select Plan

- Integrated base station (servers bundled) → simplified deployment

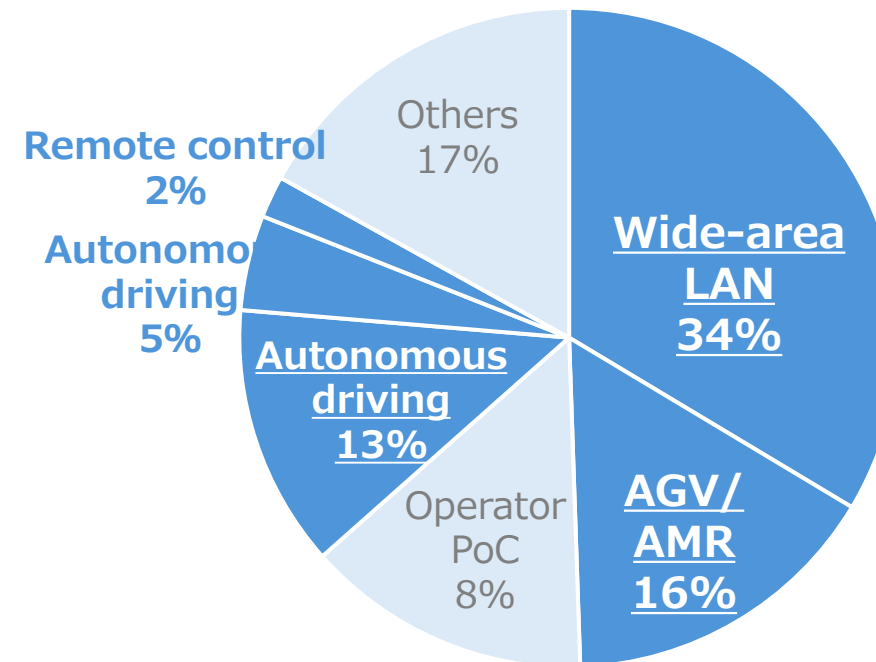


- **>1,000 inquiries**; ~50% Mfg & Logistics.
- **Trend shift**: cost down + advanced DX connectivity demand.
- **Use cases**: wide LAN → AGV/AMR control.
- **Expanding to robotics**: autonomous driving / remote ops.

By Industry



By Use Case



- Device ecosystem expansion + 850MHz band study → accelerating adoption.
- NTT East: ongoing R&D and field trials.

Device Ecosystem Expansion

Smartphone integration (Kyocera)



Mass production of modules (Murata)

長距離Wi-Fi部品量産

20-26 11月21日(金)

遠隔管理向け、村田製作所など普及にらむ

今後活用が見込まれる領域

監視	数百メートル離れた場所から工場の出入口や設備の映像を送信
設備管理	工場内の生産設備やロボットのソフトウェアの更新
情報収集	流量計や温度センサーなど、長距離での有線通信が難しい場でのデータ収集
自動運転	重機や建機の位置や映像、地図データの受送信

Expanding lineup (global vendors)



850 MHz Expansion Potential

Current : 920 MHz



New band: 850 MHz

- No duty cycle → higher throughput
- Up to 200 mW → extended coverage

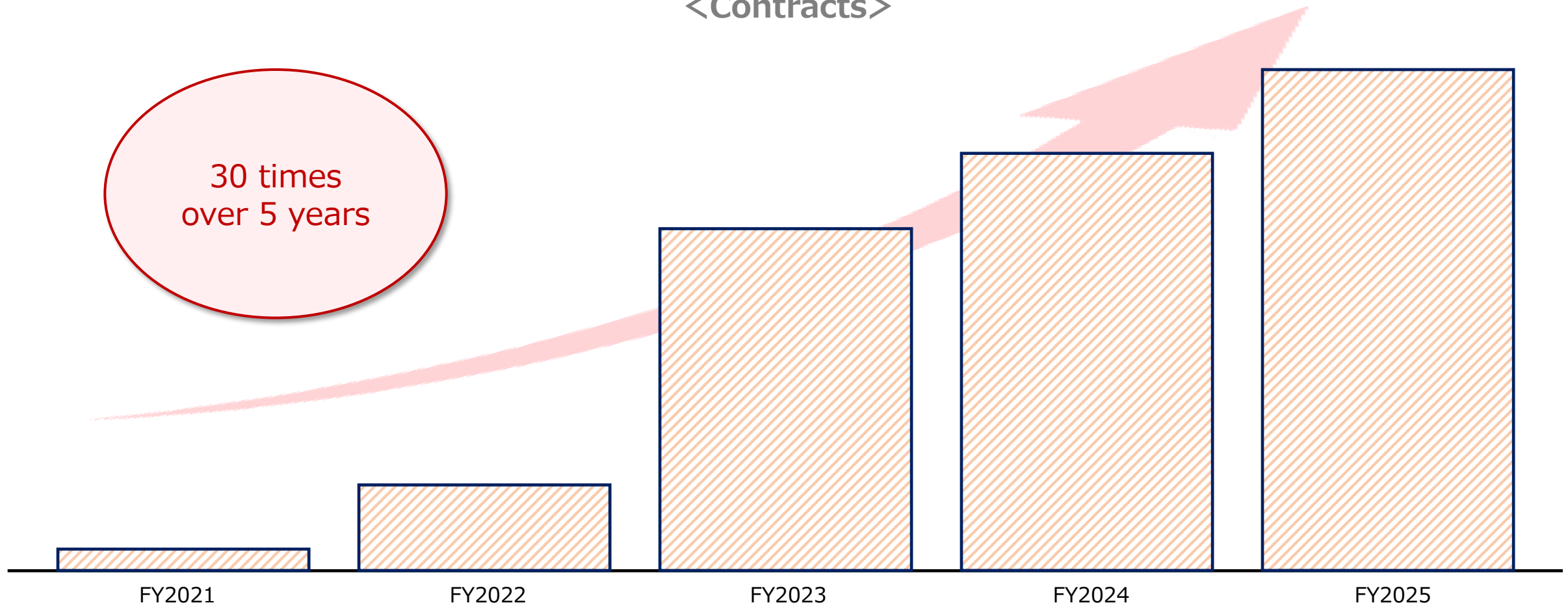
Expanded use cases



Wider coverage

- Providing **LPWA** (802.11ah, LoRaWAN, etc.) as **basic infrastructure to municipalities**.
- Since 2021, we have accumulated **many cases of municipal and wide-area IoT**.
- From 2023 after, projects utilizing 802.11ah (Wi-Fi HaLow) has been increasing.

<Contracts>



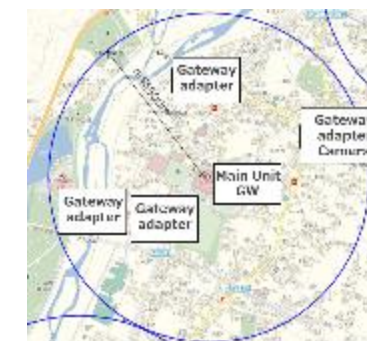
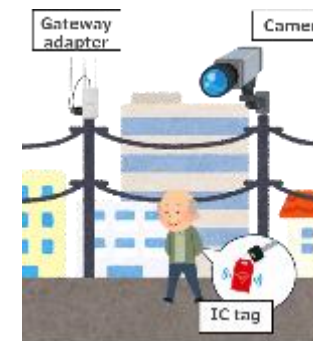
- Identified key use cases in **public and industrial environments**.
- Rising demand for **camera-based safety and efficient inspections in non-coverage areas**.

Public/wide-area

Remote monitoring

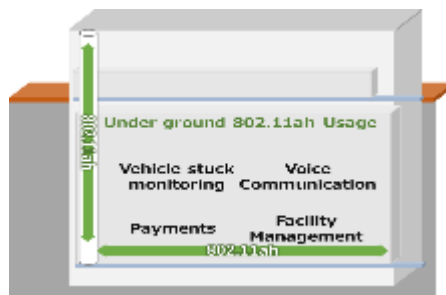


Watching over Private residents



Industrial/in-plant

In-building basement wireless



Facility Inspection DX





Ⅲ. Latest Case Studies of Wireless + DX Solutions



Manufacturing & Logistics

<Powered by Private 5G>

High
capacity

Wide
coverage

Seamless
handover

Ultra-low
latency

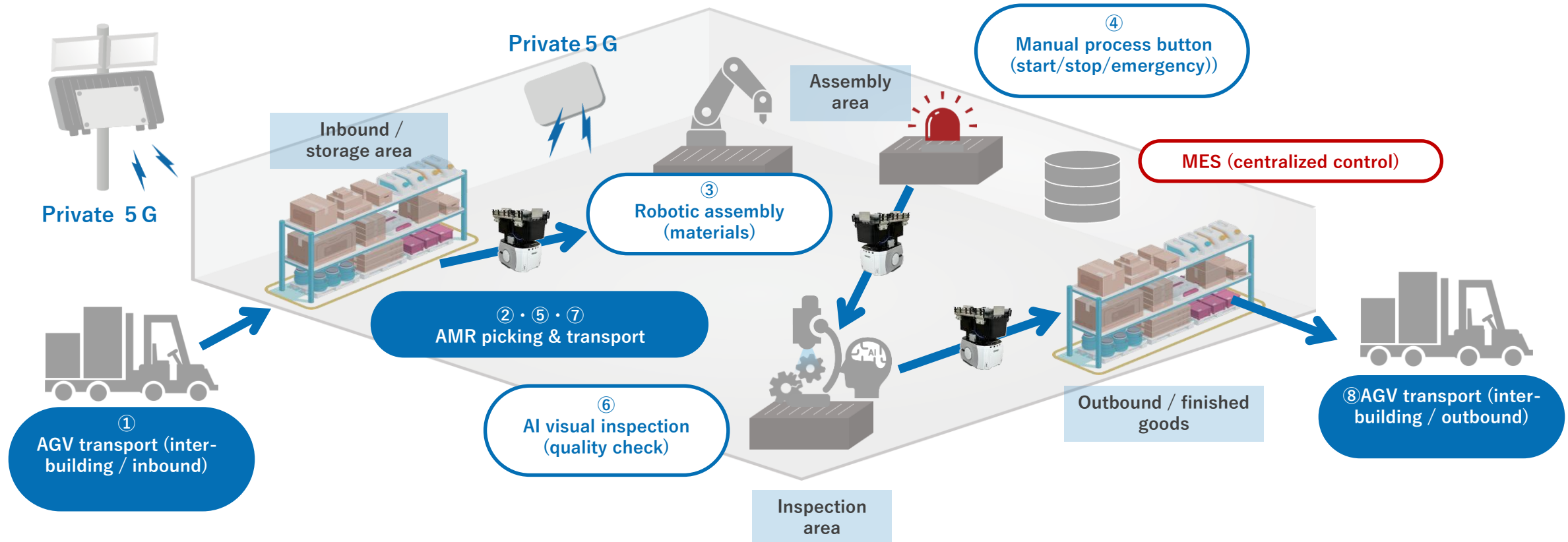
Smart Manufacturing & Logistics with GigaRaku 5G

- Frequent process changes for efficiency and competitiveness.
- Unified wireless infrastructure → **flexible operations & rapid response.**

Wireless factory/warehouse workflow (Private 5G)

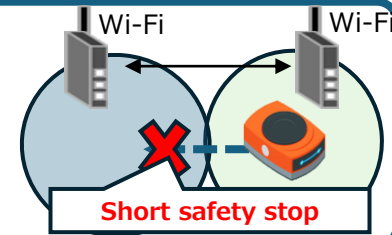
Wireless via Private 5G → agile process changes

5G #45K5G

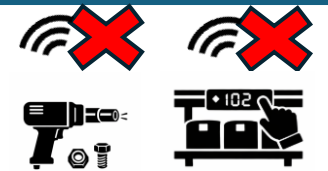


With increasing wireless use in smart factories, even brief connectivity losses can cause downtime. This slide summarizes four key causes.

① Dropout during Wi-Fi AP handover



② Congestion from increased device connectivity

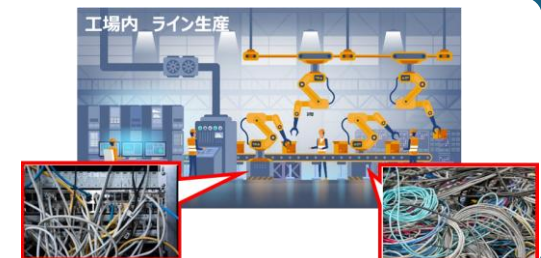


Hundreds of units

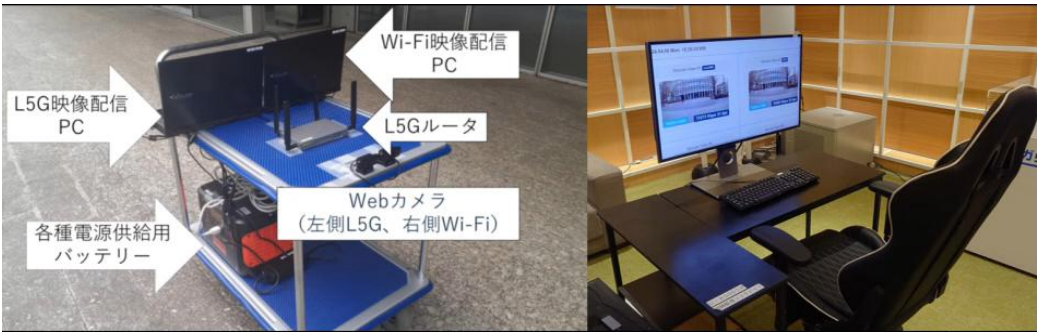
③ Areas without carrier signal coverage in factories



④ Layout constraints due to extensive cabling



Solution①: Private 5G-Wi-Fi AP Handover Test



台車構成と遠隔映像受信PC



俯瞰映像

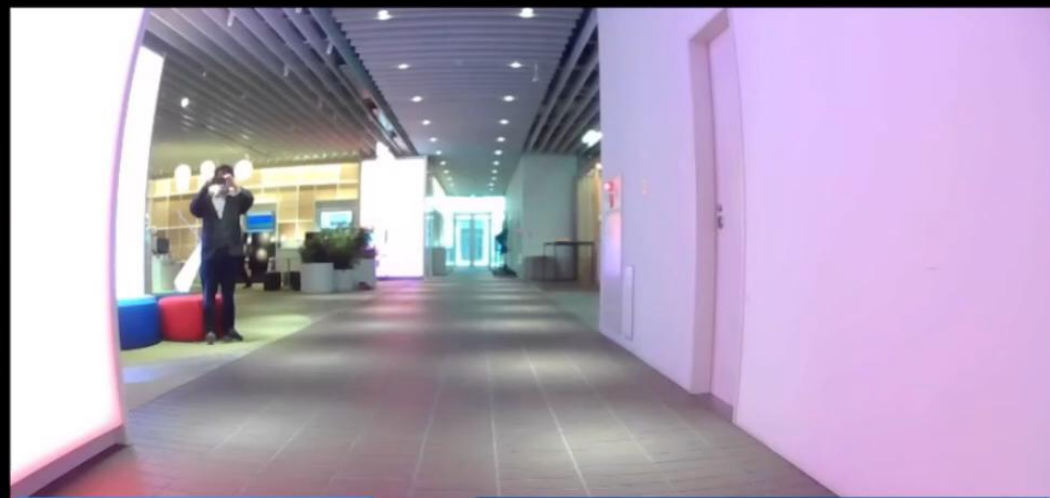
ローカル5G遠隔配信映像

Wi-Fi遠隔配信映像



1920x1080

11433 Kbps 29 fps



1920x1080

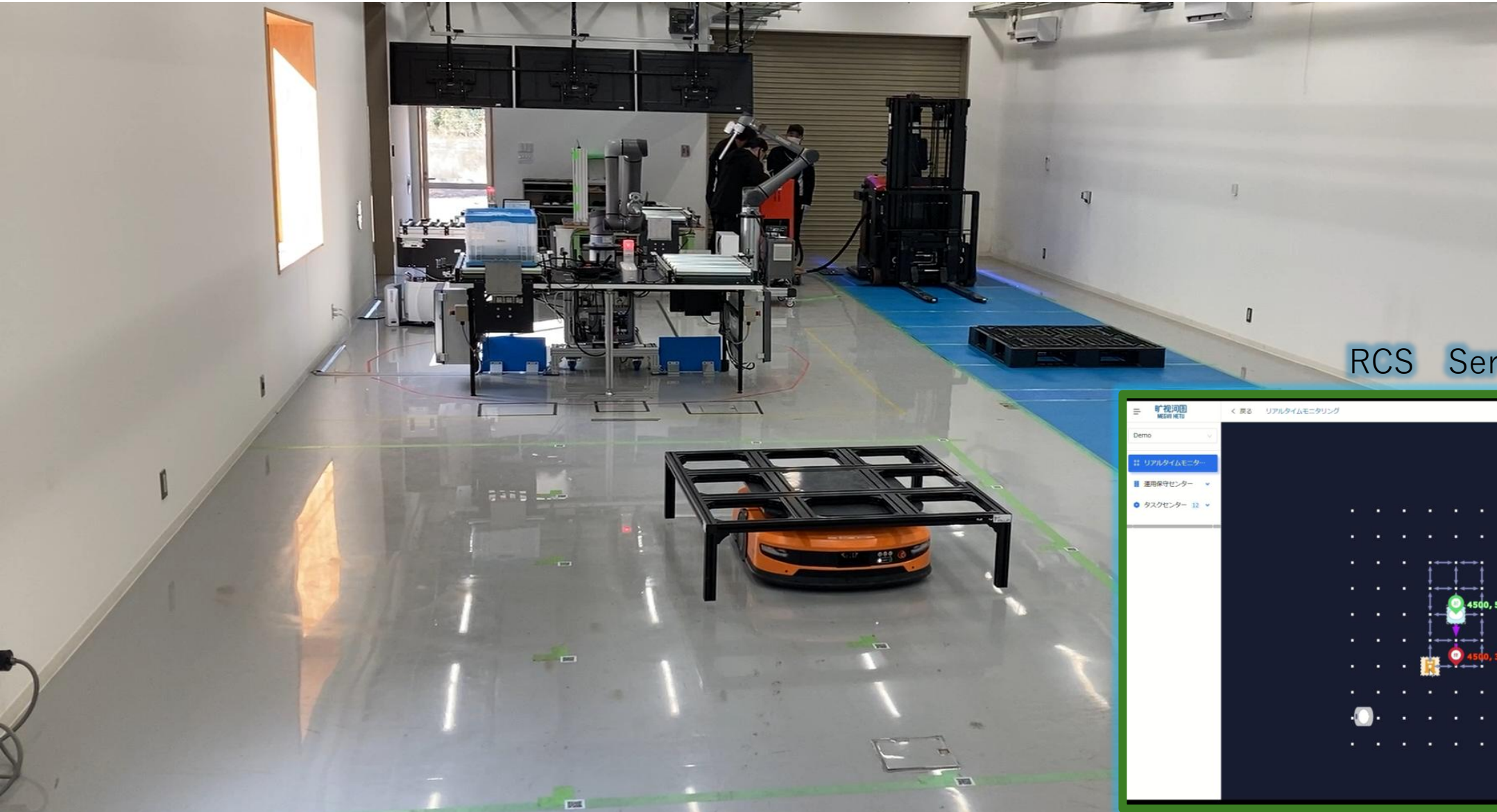
11789 Kbps 29 fps

Private 5G

Wi-Fi

Private 5G × AGV

Autonomous driving via local 5G connected to the vehicle's LAN port



RCS Server



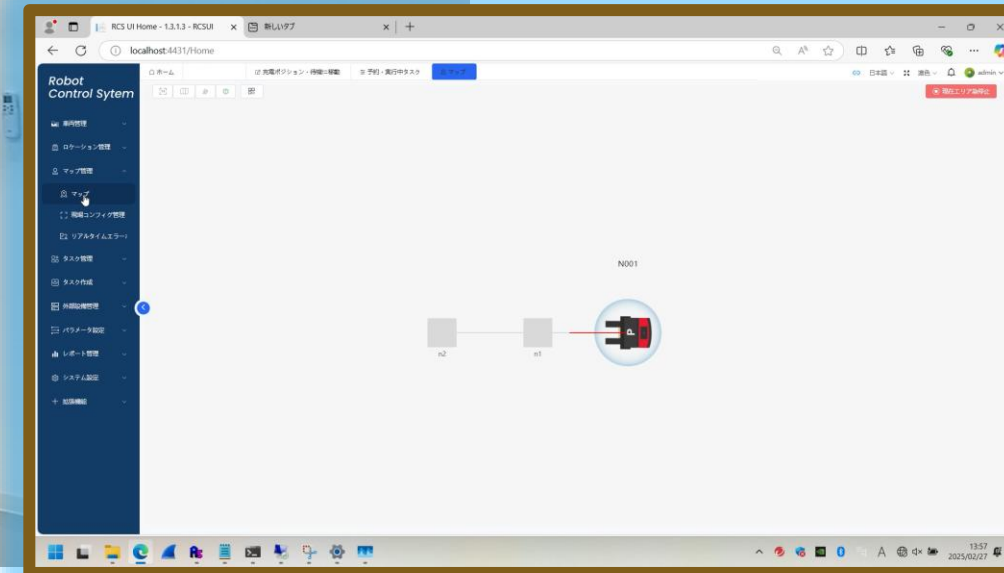
Private 5G x Smart Factory (AGF Validation)



AGF



RCS Server



- Testbed for end-to-end manufacturing with Private 5G.
- Opened Jan 2024; ~200 companies (visits & PoC).



Private 5G-enabled Equipment

Remote AGV

Inbound /
Outbound



eve autonomy Inc.

Nutrunner

Manual
assembly



Atlas Copco

AI visual inspection

Inspection



Brains Technology Inc.

Robotic arm

Transfer /
handling



OMRON

AMR

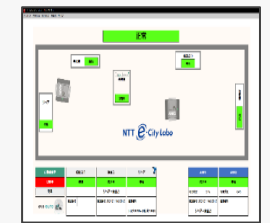
Inter-process
transport



OMRON

MES

Process
control



NTT East × Shin FA Corp.

Construction

<Powered by Private 5G>

High
capacity

Wide
coverage

High
throughput

Ultra-low
latency

Low power
consumption

IOWN/APN + Private 5G (GigaRaku 5G Select) Ultra-remote teleoperation for heavy equipment Labor shortage + remote-site constraints addressed

< Challenges in mountain tunneling >

- High-risk worksite, aging workforce, labor shortage
- Network quality limits: video lag + image degradation poor depth perception, slower teleoperation

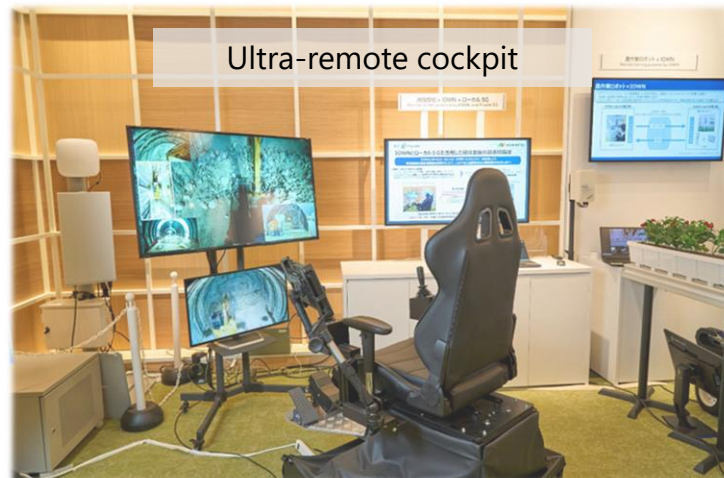


IOWN/APN × Private 5G

End-to-end low latency, high-capacity transport
Off-site operation without traveling to site
Video latency: 0.2sec

NTT Central Training Center (Chofu, Tokyo)

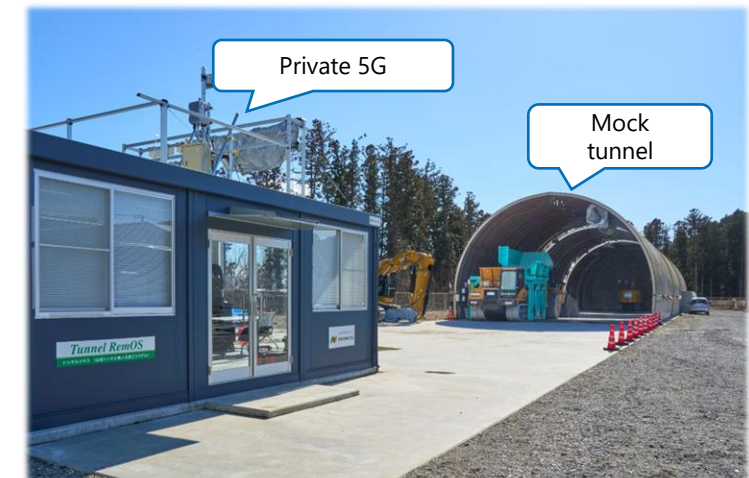
Nishimatsu test site "N-Field" (Nasu-Shiobara, Tochigi)



Ultra-remote teleoperation



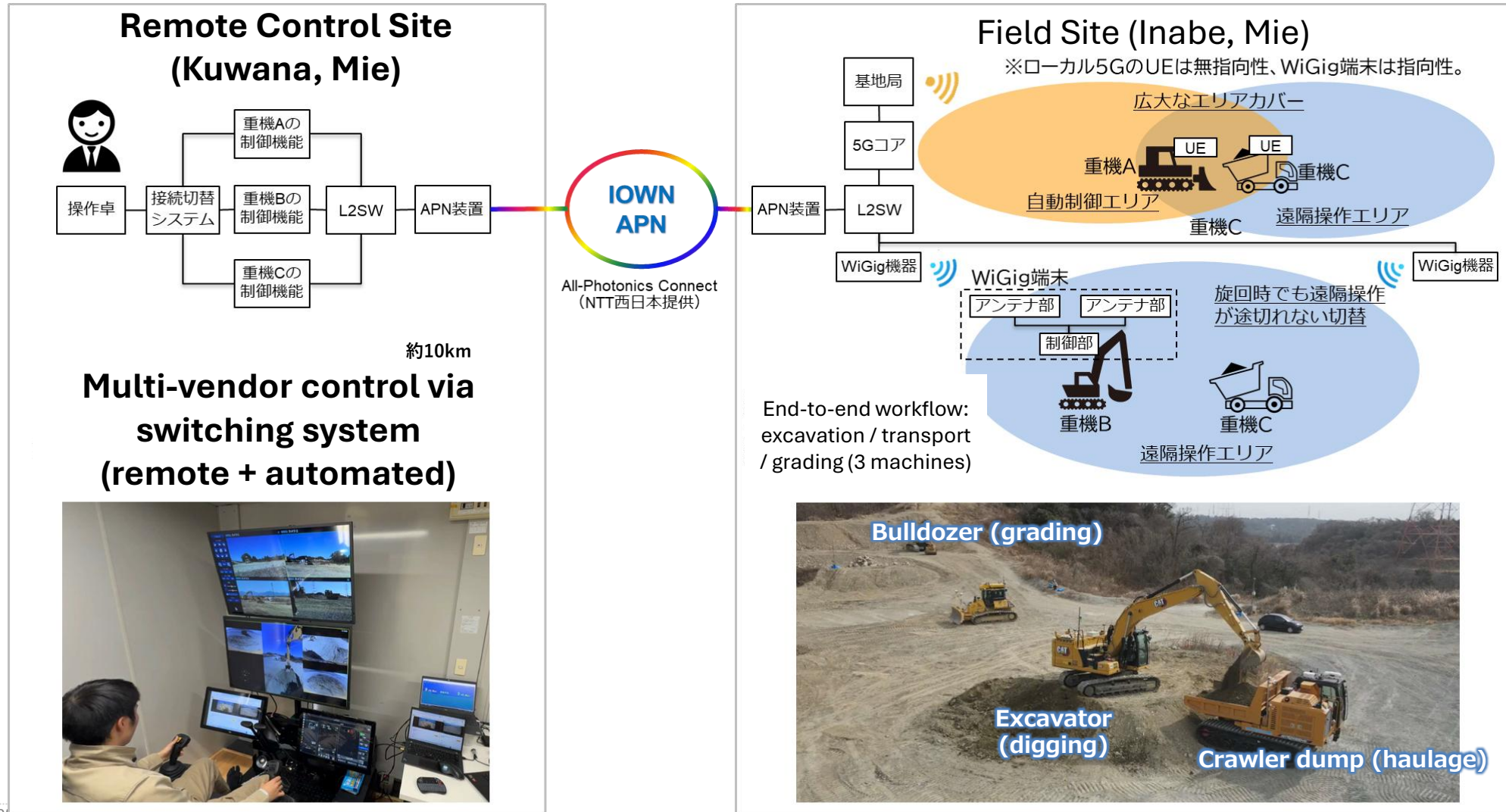
IOWN APN
All Photonics Network



Ultra-Remote Operation of Construction Equipment



- Remote heavy equipment via Private 5G × IOWN for labor shortage & remote operations.
- Equipment: excavator / crawler dump / bulldozer.



Remote Operation of 3 Heavy Machines



Autonomous Driving

<Powered by Private 5G>

High
capacity

Wide
coverage

High
throughput

Ultra-low
latency

Reliable in
congested
networks

NTT East Group: Autonomous Driving Initiatives

- **Route-specific autonomy: solving driver shortages + validating Local 5G use cases**
- **With municipalities: expansion to public roads → growth in 3D mapping, roadside infra sensing**

Local 5G × autonomous driving expertise

Outdoor (incl. underpass) Local 5G design
→ video QoS for AV monitoring

Narita Airport MIC PoC (FY2021–FY2023)



成田国際空港株式会社



FY2021–22: Local 5G feasibility PoC /
FY2023: Regional digital infra program

Level 4-equivalent AV shuttle

(restricted airport area)

Public-road Local 5G + road infrastructure expertise

Public-road QoS design + carrier offload
→ road data visualization (LiDAR, etc.)

Komae City Tokyo PoC (FY2024–)



東京都
狛江市



*令和6・7・8年度 地域デジタル基盤活用推進事業

レベル4自動運転移動サービスの
社会実装促進に向けた
通信システムの信頼性確保等に関する
モデル集
第1版
令和7年3月31日

Adopted in MIC model guidelines
(Level 4 AV comms reliability)

2030

AV site expansion

2027

採択

狛江市
総務省実証

2026

狛江市
総務省実証

MayMobility・TierIV
NTT実証拠点確立



2025

狛江市
総務省実証

MayMobility・TierIV
NTT実証拠点確立



敷地内走行

2024

成田国際空港
総務省実証

2023

NTT e-City Labo

Local 5G Open Lab
launch

成田国際空港
総務省実証

2022

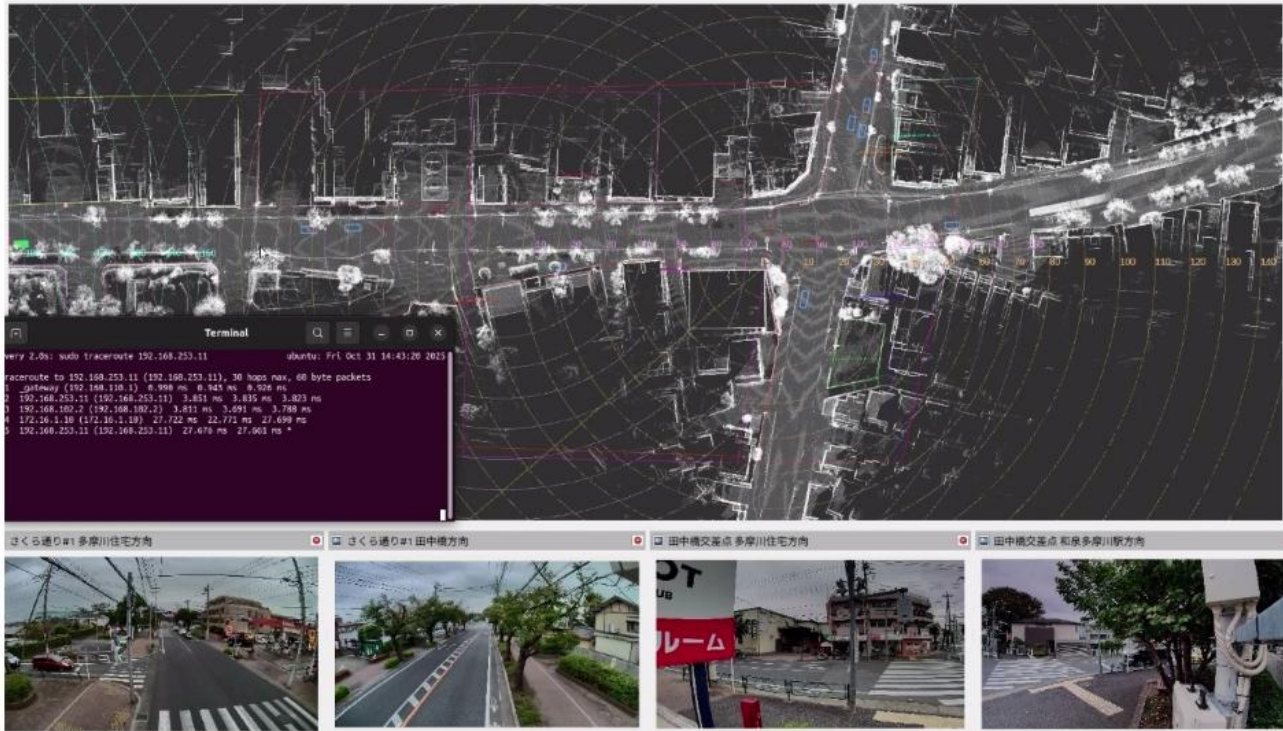


成田国際空港
総務省実証

2021



Infrastructure-Coordinated Autonomous Driving



Integrated Control Center (Top View)



Autonomous vehicle using roadside sensor data



Smart pole deployment & calibration (roadside infrastructure)

Compact smart pole calibration

Infrastructure (Telecom Construction)

<Powered by Private 5G>

High
capacity

Wide
coverage

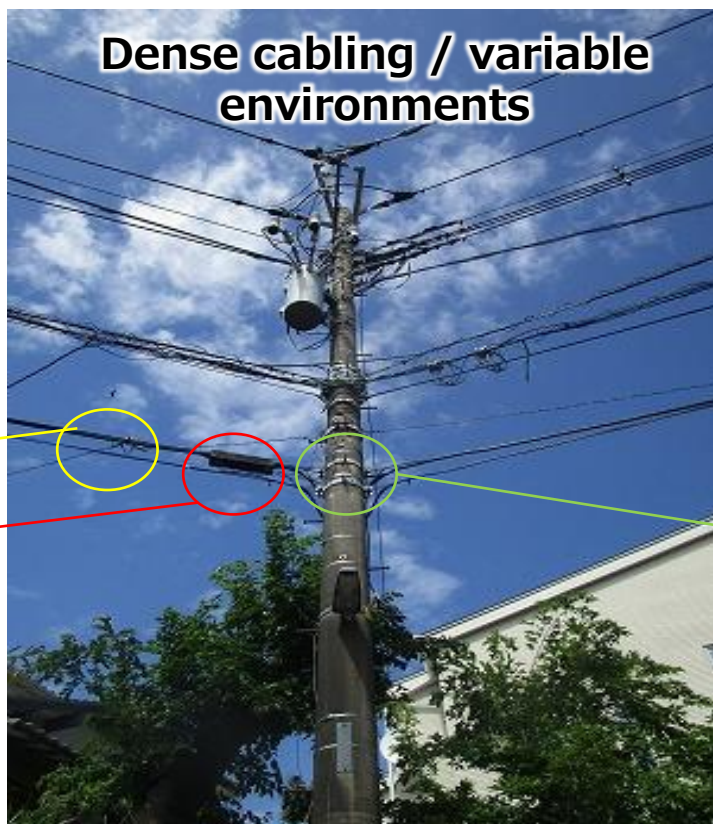
High
throughput

Ultra-low
latency

Reliable in
congested
networks

- **NTT field work** involves precise tasks from bucket trucks near utility poles.
- Exploring **robots and physical AI** to address future workforce shortages.
- Gradually assessing deployment due to complex, cable-dense on-site environments.

Example: Aerial telecom work



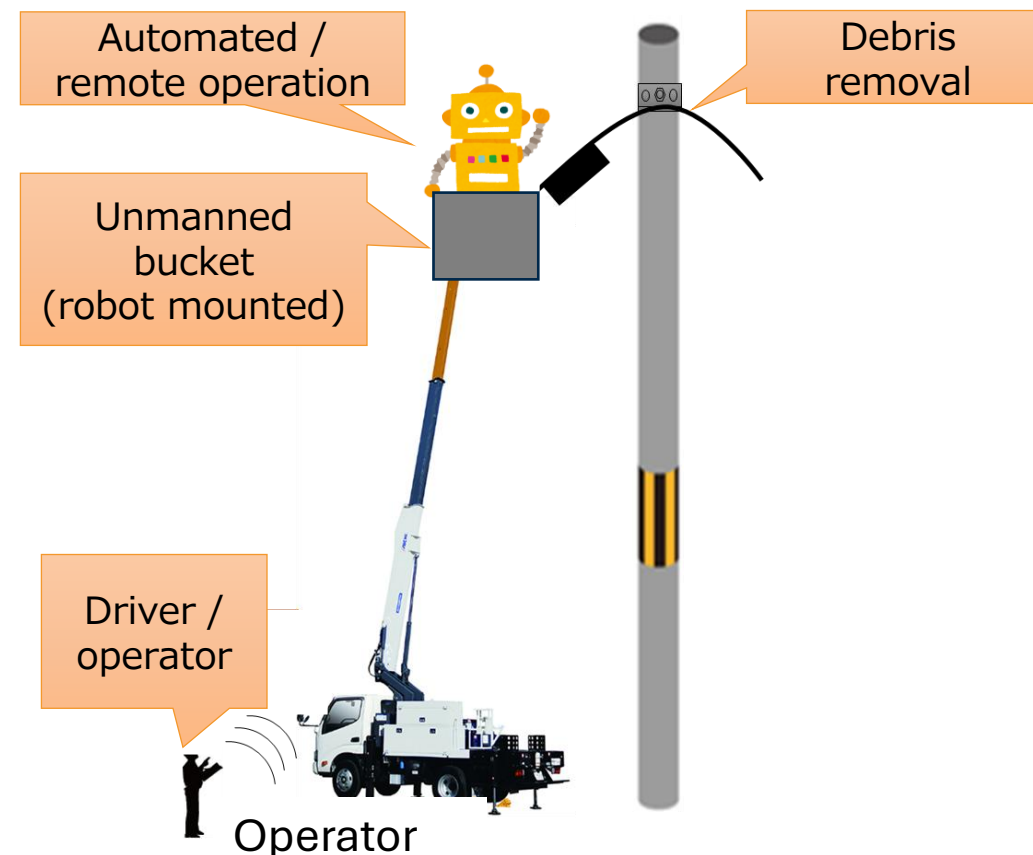
Dense cabling / variable environments

Cable install / removal
Hardware install / removal

Fiber / copper connection

Hardware removal during cable teardown

Robotics Use Case (Phase 1)



Automated / remote operation

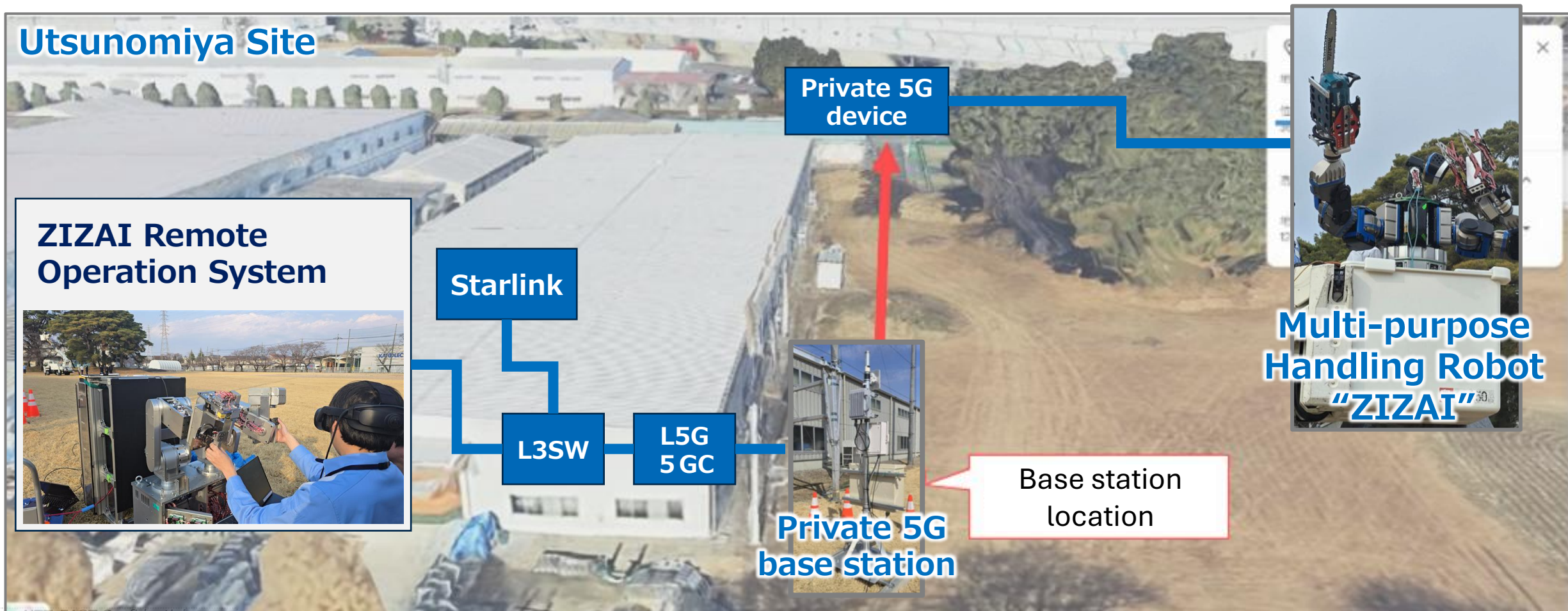
Unmanned bucket (robot mounted)

Driver / operator

Operator

Debris removal

- Remote operation of multi-purpose robot (ZIZAI) via Private 5G (with Nippon Signal).
 - ※ ZIZAI expanding to rail / civil / infrastructure use.
- Exploring Physical AI for telecom automation.



Buildings & Districts

<Powered by Private 5G & Wi-Fi>

High
capacity

Wide
coverage

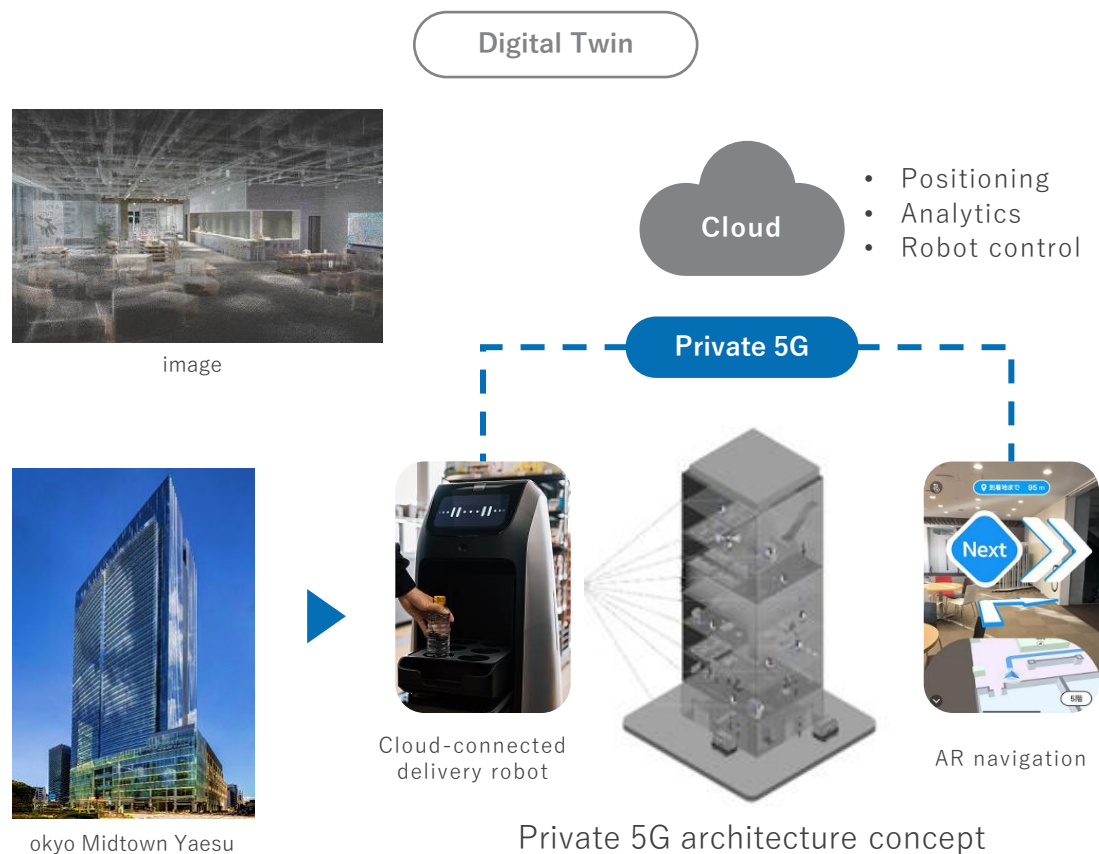
High
throughput

Ultra-low
latency

Reliable in
congested
networks

- Private 5G deployment + joint solution trial at Tokyo Midtown Yaesu.
- Digital twin-based use cases: delivery robots + AR promotion / attraction.

Architecture Overview



Use Case Scenarios

AR Promotion / AR Attraction

- AR content: coupons / navigation / visitor guidance
- Enhanced user experience via AR
- AR can run on Wi-Fi



Floor guide / store promotions (coupons)



AR Attraction

delivery service

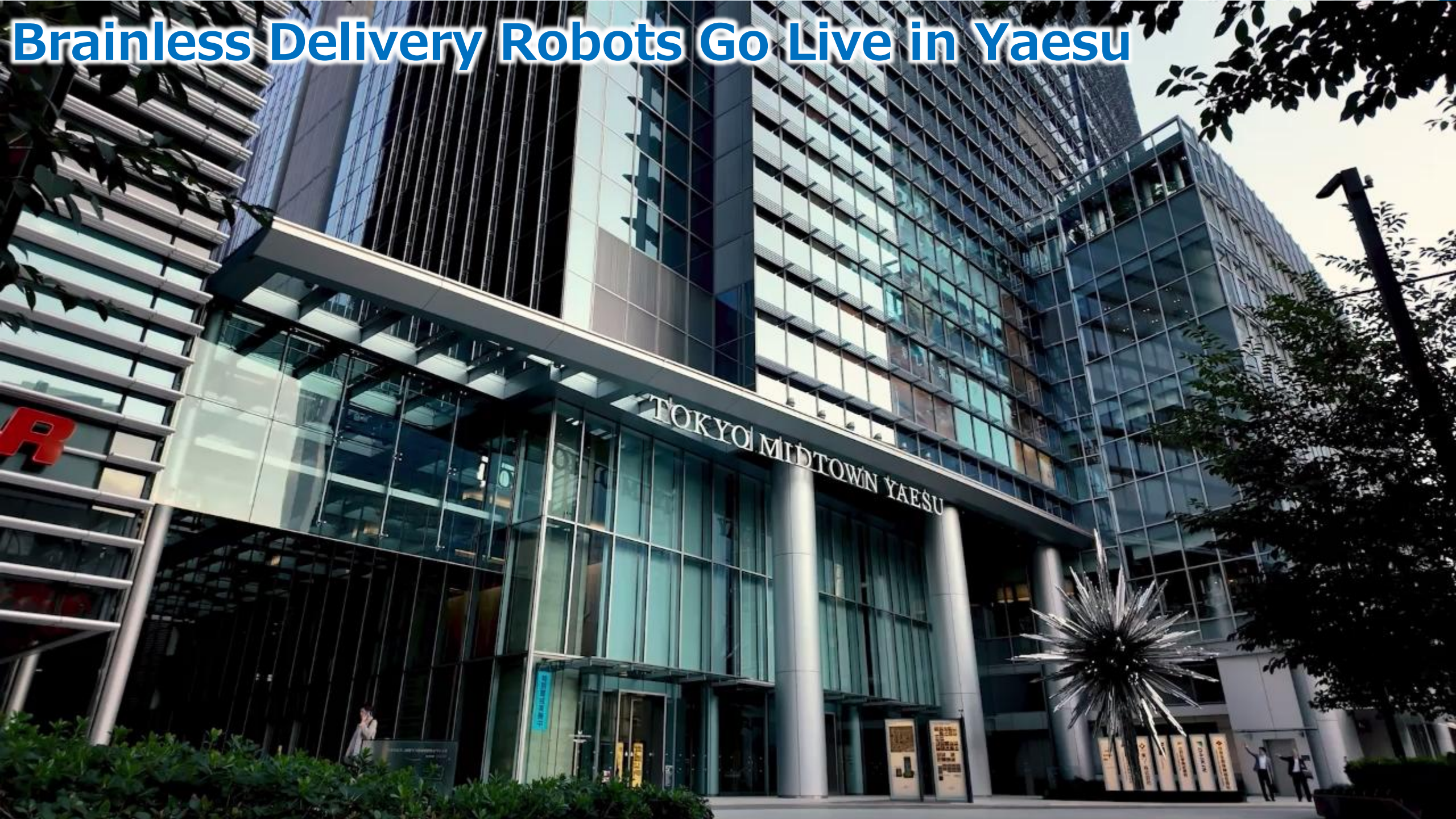
- Robot dispatch via app (e.g., LINE); delivery service
- Cloud-based system → control ~100 robots
- High-res video → scalable via Private 5G



Order via app



Delivery robot operation



Brainless Delivery Robots Go Live in Yaesu

TOKYO MIDTOWN YAESU

R



Public Sector: Disaster Prevention & Multi-Use

<Powered by Wi-Fi HaLow>

High
capacity

Wide
coverage

Wireless
deployment

lower cost

Efficient
data rate

Low power
consumption

River Monitoring → Enhanced Disaster Resilience

- Performance comparison: LoRa vs Wi-Fi HaLow (heavy rain).
- Clear quality gap; Wi-Fi HaLow rated higher (especially night).
- **Update** : Budget approved; deployment under consideration (FY).

Test distance: ~480m from base stations

LoRa Camera

- Size : QVGA(320x240)
- Throughput : 5.47kbps

Configurable resolutions

VGA
(640x480)

XGA[max]
(1024x768)

Normal conditions



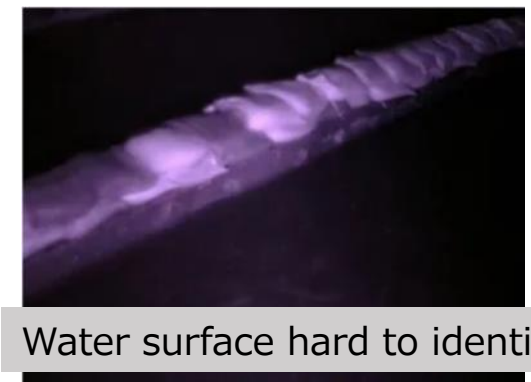
Blurry overall

Heavy rain



Flood level not visible

Nighttime (Light Rain)



Water surface hard to identify

Wi-Fi HaLow Camera

- Size : HD(1280x720)
- Throughput : 350kbps

Configurable resolutions

VGA[min]
(640x480)



Water level clearly visible



Flood depth visible



Clear visibility even at night

- A five-party partnership was established to advance disaster-focused digital twin initiatives.
- Water level conditions are visualized on a digital twin dashboard.

Source: NHK News Web (Aug 6)

山形 NEWS WEB

デジタル技術で3D地図作成し防災に活用 長井市と企業が協定

08月06日 18時17分

最新のデジタル技術を使って3D地図を作成し、住民の避難などに生かそうと、長井市と技術を持つ企業などが6日、連携協定を締結しました。

3年前の記録的な豪雨で、長井市を含む置賜地域で河川が氾濫した

(3) リアルタイムな現場状況の可視化・モニタリング

- 長井市を流れる河川の水位状況や氾濫状況など、水位センサーやカメラを組み合わせることで、危険度をリアルタイムに可視化し、モニタリングできるようにします。



Digital Twin for Disaster Resilience (Nagai City)

2026/01/23 15:51

- マップ (レイヤー) ×
- ベースマップ
- 可視化
- 流線
- LOD4
- 主観図
- 河川
- 流域図
- 行政区域図
- 排水路
- 排水路(3D)
- 地下管網
- 洪水ハザードマップ



LON - LAT - ELEV - m LV 3 km

Digital technologies to strengthen disaster response; partnership with 4 cities & 1 town

Agreement for disaster-resilient regional development

三浦半島4市1町とNTT東日本が災害に強い地域づくりに 関する協定を締結

東日本電信電話株式会社（代表取締役社長：澁谷 直樹、以下「NTT東日本」）は、神奈川県三浦半島に位置する横須賀市、鎌倉市、逗子市、三浦市、葉山町（以下「三浦半島4市1町」）と、半島地域特有の災害リスクに対応し、半島全体で災害に強い地域づくりを推進することを目的とした防災連携協定（以下「本協定」）を2025年5月21日（水）に締結します。

本協定は、三浦半島4市1町が掲げる「三浦半島に暮らす市民・町民の皆さんの安心な生活の実現」をめざし、災害時の孤立リスクなど半島地域特有の課題に官民連携で取り組む協定です。

本協定は三浦半島4市1町が民間企業と締結する初の防災連携協定となります。また、2025年4月に設置した当社「防災研究所」が自治体と締結する初の防災連携協定となります。

ICTや先端技術を活用して三浦半島4市1町の地域防災の高度化を図るとともに、人流データや道路の被災情報などを活用した避難行動・物流の最適化などの研究を進め、持続的な地域の防災力向上をめざします。

三浦半島防災力強化プロジェクトでの取り組みポイント

三浦半島に暮らす皆さんの安心な生活や幸せの実現



<p>通信の応急対策強化</p>	<p>防災力強化支援</p>	<p>次世代の防災DXの共同研究</p>
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Five priority initiatives for resilience

三浦半島4市1町とNTT東日本防災力強化に向けた5つの重点取り組みテーマを設定 ～自治体横断体制で災害に強い地域づくりを推進～

NTT東日本株式会社（代表取締役社長：澁谷 直樹、以下「NTT東日本」）は、神奈川県三浦半島に位置する横須賀市、鎌倉市、逗子市、三浦市、葉山町（以下「4市1町」）と、2025年5月21日に締結した防災連携協定（以下「本協定」）に基づき、5つの重点取り組みテーマを設定し、自治体横断体制で災害に強い地域づくりを推進します。

③ ライフライン強靱化	災害応急対応や避難生活を支えるための通信、エネルギーなどのライフライン確保・MCA（業務用無線）サービス終了に備え、Wi-Fi HaLowを活用した防災無線の実証を検討	逗子市
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【共通課題】

【重点取り組みテーマ】

Resilient Lifeline Infrastructure

Considering **Wi-Fi HaLow** for post-MAC emergency radio systems.



- Service to end May 31, 2029 (MCA Advanced: Mar 31, 2027).
- Used for emergency comms → alternative solutions required.

Use Cases of Disaster Radio

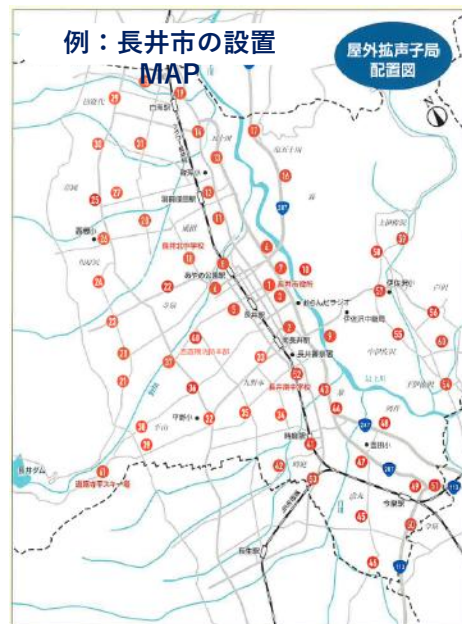
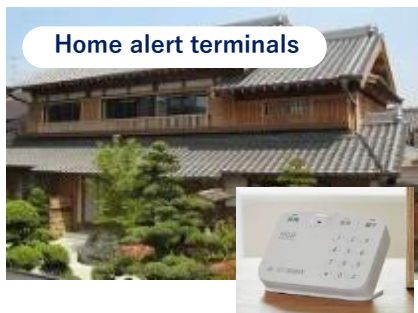
Broadcast: Public alerts

Reliable public information delivery

Outdoor speakers



Home alert terminals



Mobile: Staff communication

Stable comms during disasters

Field communication



BCP connectivity



Vehicle-mounted receivers



Disaster Radio +1 Solution package

- IP radio alternatives face congestion risk → demand for better resilience.
- Expanding use cases: wildlife / road / snow monitoring.
- 850 MHz (Wi-Fi HaLow) → congestion-free emergency + daily use.

① Independent of carrier networks

- No congestion in emergencies
- Low interference (850 MHz)

② Wi-Fi-based standard

- IP-based / highly interoperable
- Cost-efficient deployment

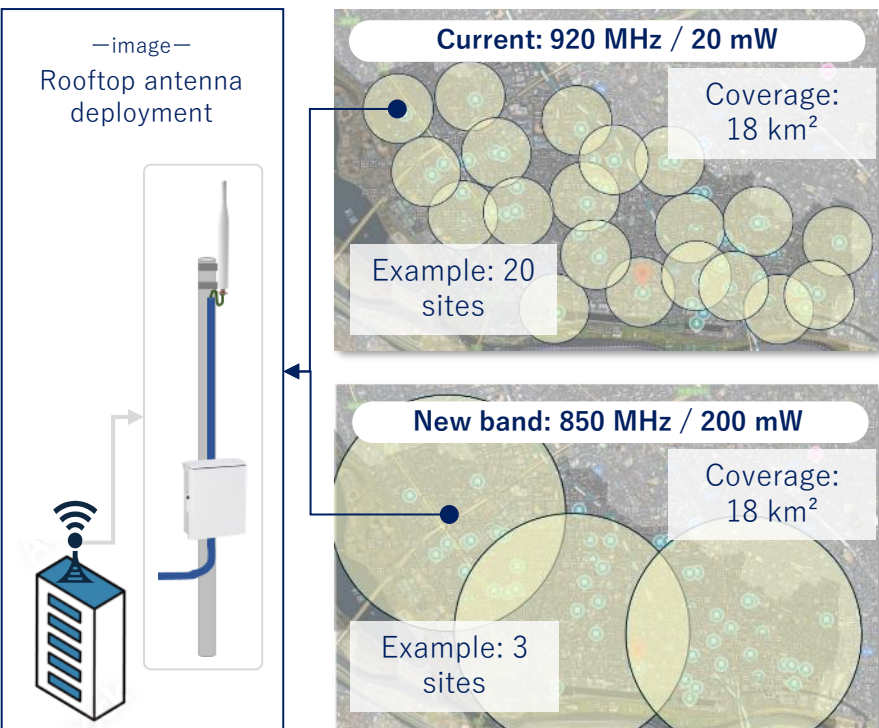
③ Wide-area coverage

- Expanded coverage via 850 MHz

④ マルチユース

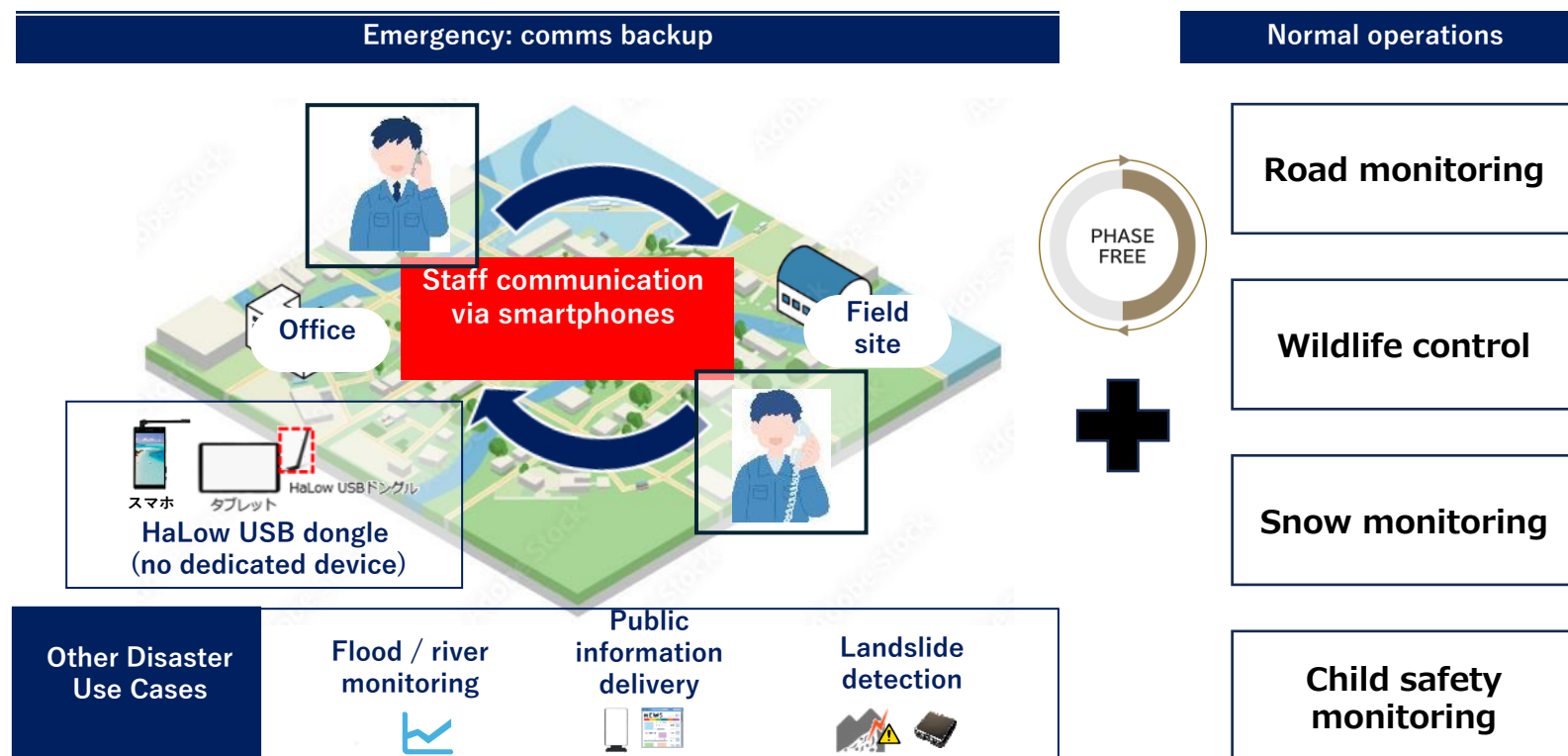
- Reusable across multiple use

< Wide-area coverage via Wi-Fi HaLow >

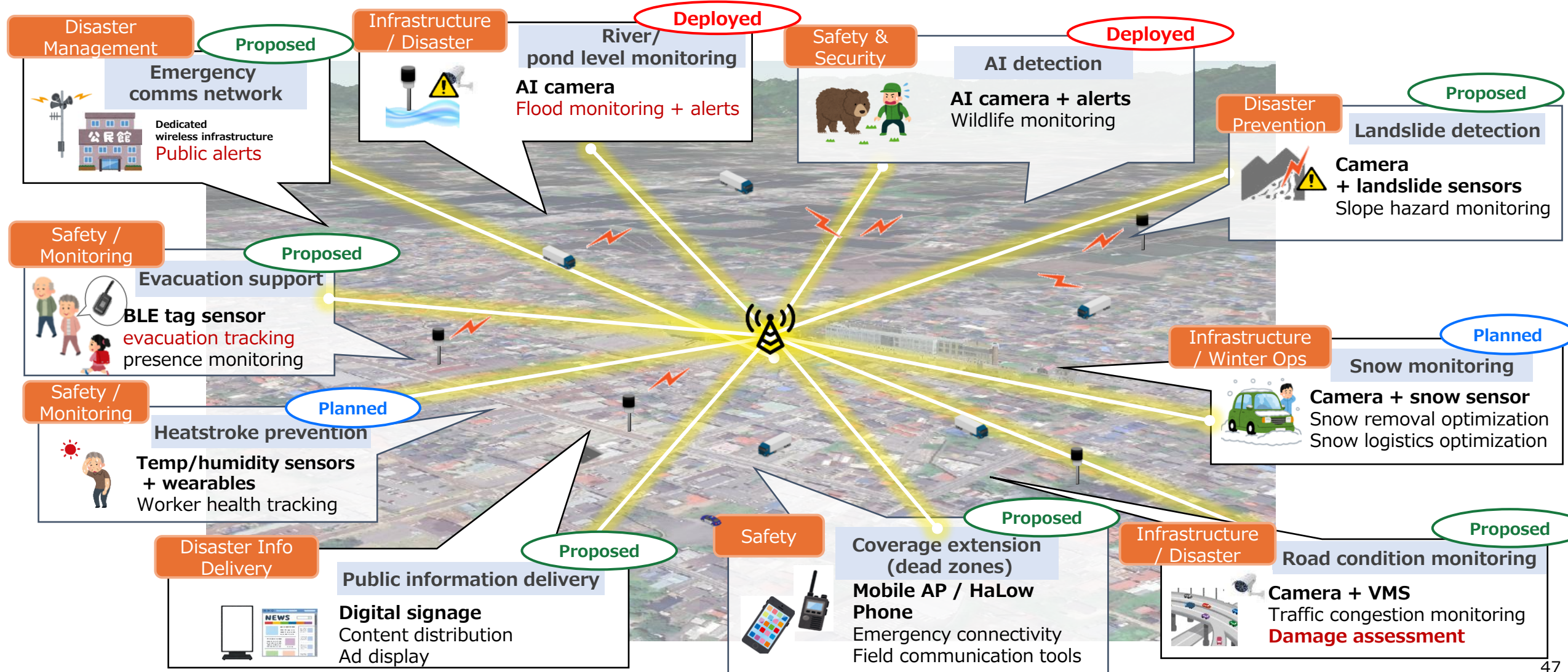


※新周波数帯は2026年4月に電波法改正見込み、カバーエリアは予測値

Use in wide HaLow network



Private networks enable communication even in emergencies



Water Infrastructure

<Powered by Wi-Fi HaLow>

High
capacity

Wide
coverage

Wireless /
cost efficient

Efficient
data rate

Reliable beyond
carrier coverage

Water Treatment Plant DX: Inspection Optimization

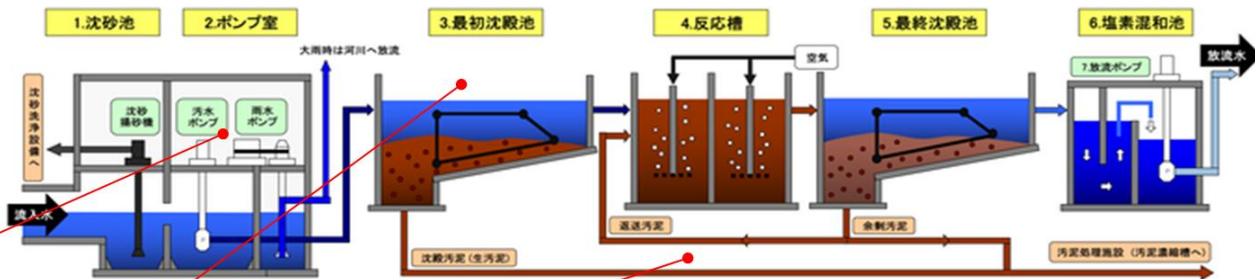
- Manual inspection across many assets (~3,000 checks/day).
- **Cameras / sensors / AI** → workload reduction (PoC in Utsunomiya).
- Scaling nationwide with Metawater.

Nikkei (Feb 23, 2026)

日本経済新聞 2026年2月23日

水道インフラ効率点検
メタウォーターAI使用6割時短へ

Water Infrastructure Inspection Efficiency

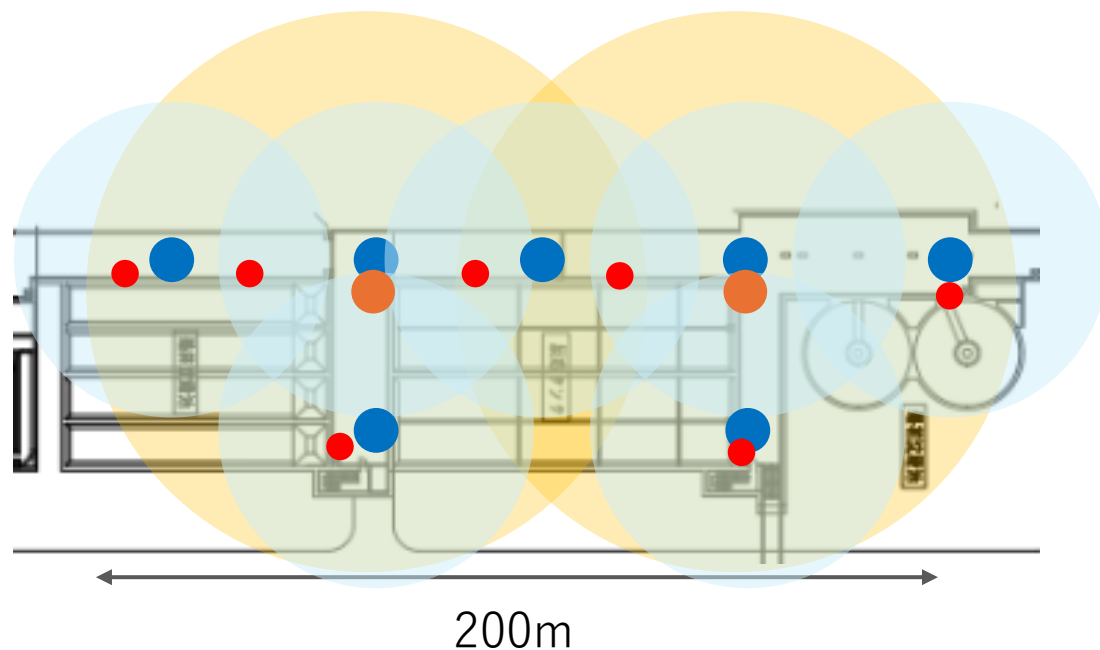


<p>Pump equipment</p> <ul style="list-style-type: none"> •Vibration monitoring •emperature check <p>Vibration / IR temperature sensors</p>	<p>Belt thickener</p> <ul style="list-style-type: none"> •Noise anomaly check <p>Acoustic / monitoring sensors</p>	<p>Pipelines</p> <ul style="list-style-type: none"> •Visual inspection (leaks / faults) <p>Camera / drone</p>	<p>Distributed assets</p> <p>Analog meters</p> <ul style="list-style-type: none"> •Normal/anomaly check <p>Fastener condition</p> <ul style="list-style-type: none"> •Loose fasteners <p>Camera / drone</p>
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- **Wi-Fi HaLow excels** in wide-area coverage across large facilities.
- Power constraints & scale → fewer, higher-quality APs via 850 MHz.
- Use cases: voice, tablets, drones → **migration to Wi-Fi HaLow**.

Wi-Fi HaLow Deployment in Water Facilities

Superior wide-area coverage for large inspection zones
Fewer base stations → lower wiring / piping / power costs



- inspection points
- Wi-Fi HaLow
- Wi-Fi



Large, dense structures → poor carrier coverage



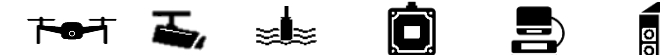
Complex layouts with distributed assets



Underground wiring challenges / vertical routing constraints



Power availability (cost reduction)



Similar inspection DX needs across manufacturing, real estate, and transport

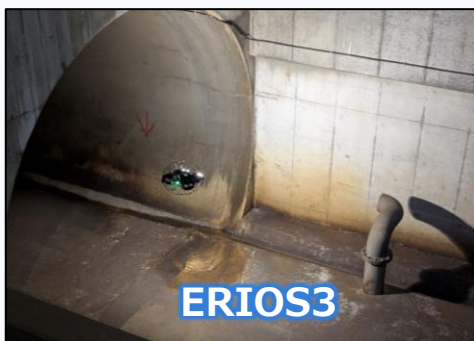
High-Resolution 3D Modeling & Field Visualization

- Aging infrastructure → urgent need for advanced maintenance (Yashio incident).
- Drone inspection in dark / confined sewers + AI damage detection (PoC).
- Integrated workflow (inspection → analysis → repair → data) for predictive maintenance.

Sewer Inspection DX (Kawasaki City)

Using ERIOS3 / Skydio X10

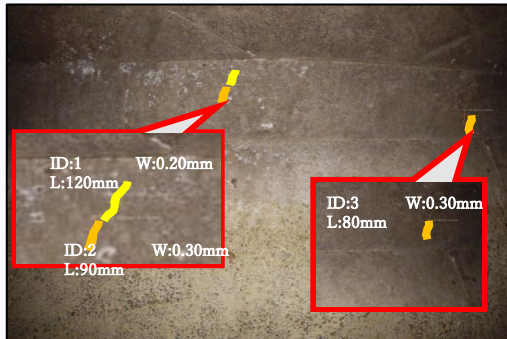
Field test



AI analysis



SkydioX10



End-to-End DX Model for Sewer Maintenance (Saitama)

2026–2027: validate end-to-end workflow



Apartment Buildings

<Powered by Wi-Fi HaLow>

High
capacity

Wide
coverage

Wireless /
cost efficient

Efficient
data rate

Low power
consumption

- Wi-Fi HaLow pilot to reduce property management workload.
- HaLow is “well-suited” for covering entire buildings and wide premises.

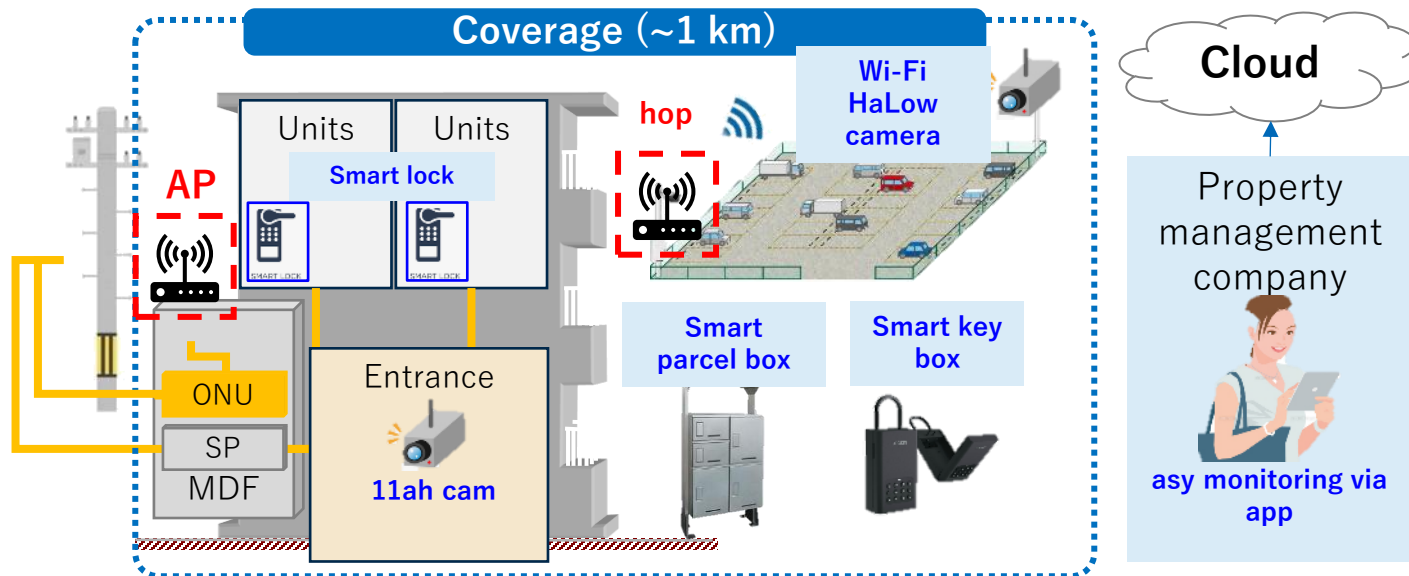
On-site response & asset value improvement → key DX challenges

Single AP covers entire building → remote monitoring

- Remote checks via tablets → fewer site visits
- No dedicated system → low-cost monitoring & security

Retrofit-ready wireless devices (low cost)

- IoT devices reduce onsite workload
- Improved tenant experience → higher asset value



Press Release: First in Real Estate —
Wide-Area Wi-Fi (IEEE 802.11ah) Pilot for Management Efficiency
& Asset Value Improvement (Nov 2024)



(報道発表資料)

2024年11月5日

武蔵コーポレーション株式会社
東日本電信電話株式会社 埼玉事業部

不動産業界初！広域 Wi-Fi“IEEE802.11ah”を活用した 管理業務の効率化および物件価値向上に向けた実証実験を開始

武蔵コーポレーション株式会社（代表取締役：大谷 義武、以下「武蔵コーポレーション」）と東日本電信電話株式会社 埼玉事業部（事業部長：市川 泰吾、以下「NTT 東日本」）は、不動産管理業務の効率化および物件付加価値の向上を目的として、武蔵コーポレーションが保有する賃貸管理物件 10 棟において、従来の Wi-Fi と比較して広範囲に電波が伝搬し、簡易な画像や映像転送も可能とする広域 Wi-Fi 『IEEE 802.11ah^{*1}（以下、「11ah」）』とカメラを活用した実証実験を 2024 年 11 月 19 日より開始します。これは不動産業界初^{*2}となります。

<実証イメージ>

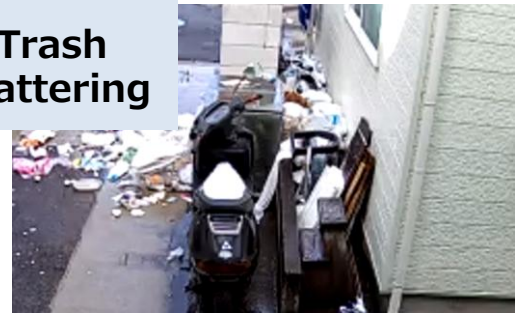


- **Wi-Fi HaLow pilot:** wireless coverage + reduced site visits.
- **Camera-based monitoring** → issue detection & prevention.
- **Next:** AI anomaly detection + compact solar devices under evaluation.

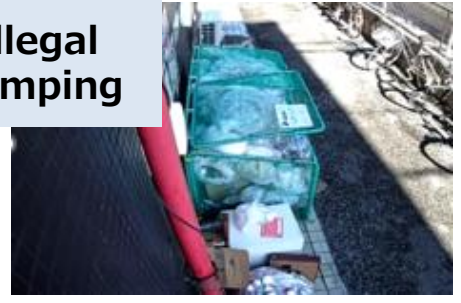
Results

Live video → remote resolution (no site visit)
→ ~48 hrs/year workload reduction per building

Trash scattering



Illegal dumping



Bicycle parking violations



Next Steps

Image-based detection with GenAI

Still images



Analysis

Trash area clutter → cleaning required

Alerts

- Pre-defined incidents
- AI detection → app alerts

Compact solar-powered devices



Mobile app access (remote use)



Property manager



IV. Conclusion

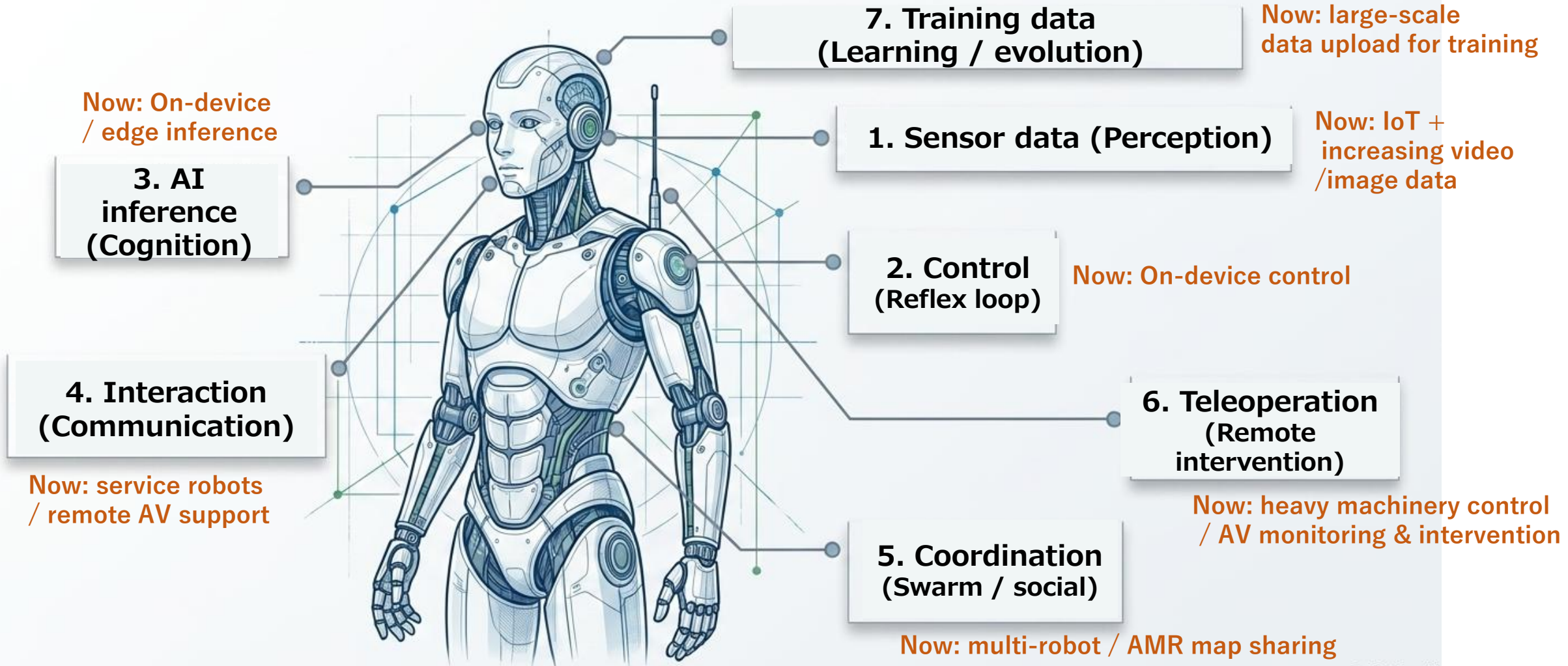


Conclusion

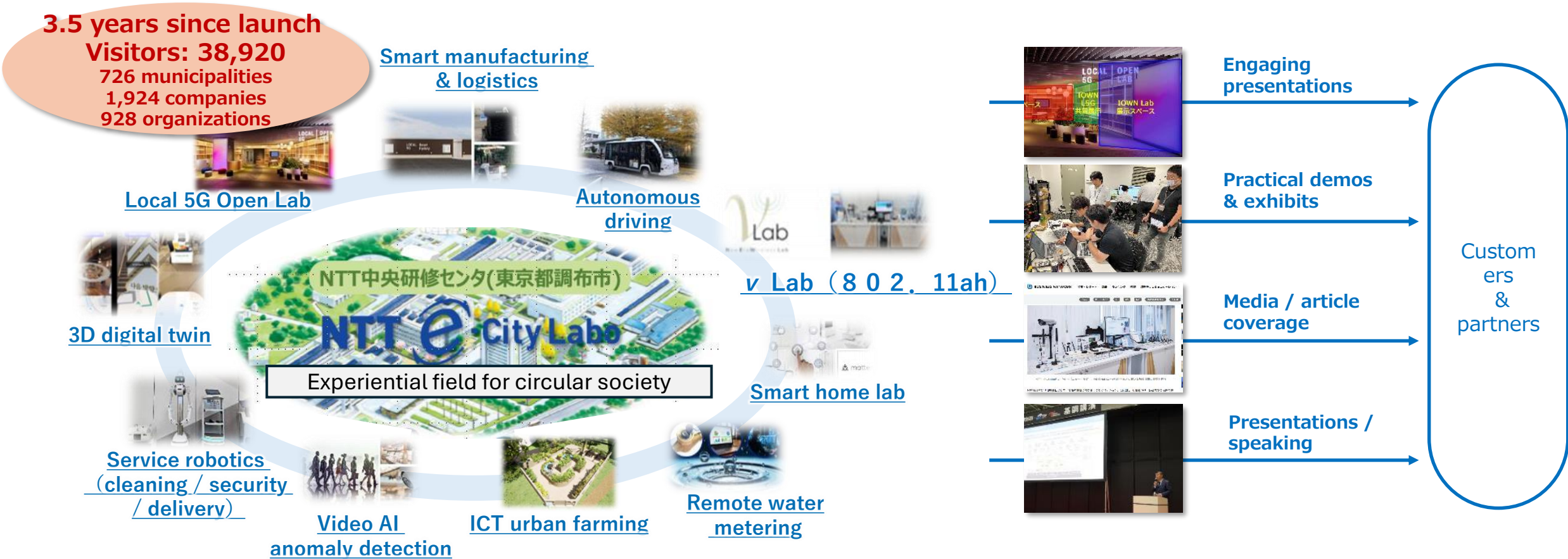
- Optimizing the **best mix of** carrier, Wi-Fi, satellite, and **private wireless**.
- **Private 5G**: **entering deployment**, but specs still vary.
→ “Giga Raku 5G” remains the most reliable choice.
- **Wi-Fi HaLow**: a **right-fit option** for wide-area IoT
→ Now moving into full-scale deployment.
- Toward the **Humanoid** era... (next page)

Communications in the Humanoid Era

- **Integrated stack: advanced + high-capacity technologies**
- **Single technology insufficient → optimized multi-network integration**



- **Wireless showcase + customer engagement; technology validation sites in operation**
- **Demo & validation hub; continuous updates; create new business opportunities**



地域の価値創造企業へ

**SOCIAL
INNOVATION
パートナー**

NTT東日本グループ