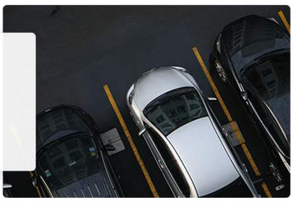
Mileisght Off-Grid Smart Parking Solution for Public Housing in Hong Kong

Location	Industry Segment	Related Products	
Hong Kong, China	Parking Management	4G Solar-powered ANPR Camera ›	4G Solar-powered Security Camera ›

Overview

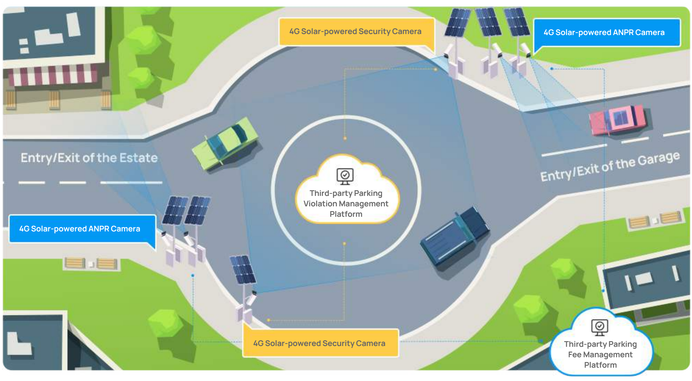
To modernize the parking experience in Hong Kong's public housing estates, Milesight deployed a smart, off-grid vehicle detection and license plate recognition system. The project required a solution that could operate without traditional infrastructure while maintaining high accuracy and seamless integration with the client's backend system. Milesight's 4G Solar-powered Series Camera delivered a flexible, solar-friendly solution tailored to Hong Kong's unique traffic and regulatory context.



Challenges

- No power or network at installation sites
- Need to identity various parking activities
  - Highly diverse and complex license plate formats
  - Strict accuracy requirement: ≥98% in all lighting and plate positions
  - Need to distinguish and exclude non-Hong Kong plates
  - Ungated, long-range ANPR for parking fee calculation
- Complex logic to coordinate data across multiple entry/exit points

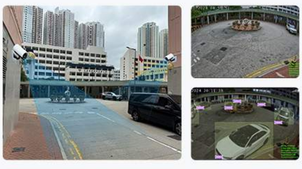
Solution



Scenario 1: Entry/Exit License Plate Recognition for Parking Fee Calculation

4 units of Milesight 4G Solar-powered ANPR Camera were deployed to capture license plates using line-crossing detection. ANPR data was transmitted via API to a third-party parking fee management platform.

- **Complex Billing Logic Support:** The monitored entry/exit points included the estate's main gate and a separately managed underground garage. Only vehicles entering the estate without proceeding to the garage needed to be charged.
- **Multi-Point Coordination:** By transmitting license plate data from both access points, the third-party platform could logically determine which vehicles should be billed, ensuring accuracy and fairness.



Scenario 2: Illegal Parking Detection in Restricted Zones

Another 4 units of Milesight 4G Solar-powered Security Camera were customized with Milesight's PMC algorithm to monitor illegal parking in designated circular zones.

- **Occupancy Detection with Timing Logic:** When a vehicle entered a restricted zone, the camera triggered a timer. If the allowed parking duration was exceeded, images were pushed via HTTP to the third-party violation management platform.
- **Automated Enforcement Assistance:** The system provided continuous monitoring and repeat push notifications, enabling staff to issue penalty tickets based on evidence, without constant manual inspection.

Application Highlights

- **Off-grid and Infrastructure-Free Deployment**
  Fully solar-powered and 4G-enabled, the cameras were ideal for sites with no access to electricity or wired internet. This allowed rapid deployment with minimal installation costs, supporting flexible repositioning and scalable expansion across estates.
- **Tailored OCR Model for Hong Kong Plate Diversity**
  The ANPR engine was optimized for Hong Kong's unique plate ecosystem - including custom, double-layer, front white/rear yellow formats. Locally trained datasets significantly enhanced recognition accuracy, meeting the minimum 98% requirement even under challenging lighting and angles.
- **Smart Vehicle Filtering and Multi-Plate Handling**
  The system intelligently filtered out cross-border and Macau plates, even in frames with multiple plates, ensuring only valid Hong Kong vehicles were processed. This reduced false positives and improved data quality for both billing and enforcement.
- **Long-Range and Barrier-Free Monitoring**
  With high-performance imaging and AI on edge, the cameras could recognize plates from a distance without needing boom gates or loops - ideal for public housing scenarios where contactless, seamless management was required.
- **Edge AI and Algorithm Portability**
  Both ANPR and PMC functionalities were powered on-device, enabling fast response times and customization flexibility. The same hardware platform could be adapted for different applications, reducing inventory complexity and improving cost-efficiency.

Conclusion

Through this project, Milesight successfully enabled a fully wireless, solar-compatible smart parking system tailored to the unique needs of Hong Kong's public housing estates. By integrating high-accuracy ANPR and violation detection with KEYTOP's backend system, the solution delivered clear and measurable results:

- **Significantly improved enforcement efficiency** at both gated and non-gated entry/exit points, with reliable 24/7 vehicle identification.
- **Reduced manual workload** through automated illegal parking detection and real-time push notifications, allowing timely intervention without constant on-site patrolling.
- **Increased data accuracy and billing fairness**, thanks to intelligent filtering of non-relevant license plates and logic-driven vehicle tracking across multiple access points.
- **Enhanced system scalability and sustainability**, with zero reliance on physical infrastructure like barriers, power lines, or wired networks.

This project exemplifies how Milesight's AI-driven edge technologies can transform traditional urban parking environments into intelligent, cost-effective, and sustainable systems - delivering long-term value to both operators and residents.

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