Agenda…

- Introduction to Northeast Group;
- Smart Street Lighting Market Status;
- Benefits: Survey and Benchmark of Streetlight Projects;
- Beyond Street Lighting;

Ben Gardner
ben.gardner@northeast-group.com
Introduction to Northeast Group…

Market intelligence firm focused on smart infrastructure deployed at utilities and municipalities

- Northeast Group has been covering the smart infrastructure sector since 2010;
- Street lighting market coverage began in 2012; and
- Firm has also published extensively on smart metering, smart grid infrastructure and related topics.

Related research…

- Global Smart Street Lighting
- Oceania Smart Street Lighting
- Plus dozens of other in-depth studies, datasets and research notes covering the global smart infrastructure sector…

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Current status of smart street lighting market...

- Only “real” smart city segment (beyond smart metering) that is already scaling;
- Smart streetlights have moved past the pilot stages, with several large-scale (>50,000 streetlights) projects already underway or completed;
- Just as importantly, dozens of small and mid-sized cities have completed smart streetlight projects, showing benefits for cities of all sizes and market opportunities for diverse vendors.

NOTABLE US SMART STREETLIGHT PROJECTS*
Number of streetlights currently deployed, planned, or underway

*Non-exhaustive: in addition to these larger projects, there are dozens of other projects at smaller cities and municipalities (typically under 10,000 streetlights each)

Source: Northeast Group
Benefits: Survey and Benchmark of Streetlight Projects…

- All cities achieved at least 50% energy savings from LEDs, and typically a further 10-20% from dimming, depending on dimming schedule; and
- Costs varied significantly, which affects the payback period. Cities with longer payback periods typically had additional financing and overhead costs, or in some cases costs associated with purchasing their streetlights from utilities.

Cities are increasingly looking beyond street lighting…

### Smart city infrastructure potential by segment (global)

**Source: Northeast Group**

#### Near-term scalability

- **Developed, but with low ceiling**
  - EV charging
  - Gunshot detection
- **Scaling and growing**
  - Connected street lighting
  - Connected video monitoring
- **Niche markets**
  - Environmental management
  - Smart waste bins
- **Long-term target markets**
  - Smart parking

#### Current challenges to scalability

- **Gunshot detection**
- **Environmental management**
- **Smart waste bins**
- **Smart parking**

### Broader smart cities opportunities…

- Smart street lighting (or smart metering) is typically foundational layer of additional smart city applications;
- Additional applications can be layered on the same communications network and software/analytics platform;
- Smart parking is a leading candidate due to the high number of endpoints;
- EV charging is also growing but has a lower ceiling in terms of endpoint potential;
- Video monitoring is increasingly problematic, especially when paired with facial recognition; and
- Many initiatives remain at the pilot level.

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*This matrix describes the market opportunities for each segment:
  - **Potential number of endpoints**: this is the total potential market, not the expected market in any particular year (e.g. there are currently 300 million streetlights globally, which is the theoretical potential market);
  - **Near-term scalability**: related to penetration rate, but qualitatively scored on scalability. Top scoring segments are already scaling. Lower scoring segments face challenges of high prices, low customer demand, or technical issues.*
Covid-19 Recovery Scenarios...

More gradual “U” shaped recovery...

Best-case “hockey stick” recovery...

“V” shaped snap-back...

Worst-case “L” shaped depression...

Likely Scenarios

- Likely, given possibility that Covid-19 may come in “waves” spilling into 2021;
- Depth of market dislocation results in slower recovery.

Unlikely Scenarios

- Unlikely given the scale and severity of the crisis;
- In the early days, optimists argued for a “V” shaped recovery once supply chains were repaired.

Smart infrastructure sector likely to see a “U” or “hockey stick” recovery...

- “U” shaped recovery implies that some deployments that may have occurred in 2020 will be pushed to 2021 and 2022;
- “Hockey stick” recovery is also possible in the event of stimulus targeted at smart infrastructure, similar to that seen over a decade ago;
- “V” shaped recovery unlikely given overall scale of crisis, municipal budget pressures and supply chain disruptions; and

- Aggressive stimulus has all but eliminated the threat of a “L” type depression...although stimulus has not yet materialized for the infrastructure sector.