SMART POLES AND MICROGRIDS: *The Bar Keeps Rising*.

THERE IS NO FINISH LINE.
The literature, the examples and the case studies of cities across America and the globe leave one with the sense of never being current. Something new is always on-line.

The answer is to create a way of life in city hall. Expect constant change; create the skills necessary to find, evaluate and exploit the new technologies that are useful. Use downtown to introduce and test new systems and services.

CONSIDER THE POSSIBILITIES:

- The smart city developments from the big tech firms like IBM, Cisco, Google and the rest are expanding and infiltrating city hall. Understand their interest in contracting with cities to install and manage their hardware, software and migration to the cloud. Understand how determine the benefits, the costs and the exit path once the system has fulfilled, or not, its mission.
- Autonomous vehicles are coming fast. Find experts to help evaluate the impact of AVs on land use, street design, parking requirements and mass transit systems. The impact of autonomous buses, delivery trucks, ride-share services, freight trucks and private vehicles is hard to fathom.
- Electric vehicles are gaining ground; combinations with AVs will change travel habits. Free charging stations may be a downtown amenity or "perk".
- Economic development will depend on full access to high speed broadband internet service. Coordination and collaboration with business and academia is in the offing.
- The Cloud is the new service de jure.

- High speed broadband internet service is growing in its areal coverage. The digital divide lurks to exclude this service from low income neighborhoods. Equity distribution becomes an issue for cities. Approach internet service as a utility, not a commercial service.
- Connected Wireless Infrastructure Master Planning and Marketing for cities is happening with wireless mesh transceivers on "smart poles" [see next page]. Sensors are making data and communication ubiquitous with:
    - Alert Notification,
    - Communication systems (push & pull),
    - Concealed Placement Speaker,
    - Digital Signage, Dynamic Lighting,
    - Emergency Call Station, Security Systems,
    - Environmental Sensors,
    - Image Sensors and
    - Multiple charging systems.
- Solar and wind power are becoming more prevalent. The two-way movement of power is becoming controversial. Smart micro-grids are emerging in areas with special circumstances.

CONCLUSION – SMART POLES.
Many major cities worldwide including Paris, Copenhagen and Barcelona are launching smart city initiatives. Kansas City has demonstrated how real-time data gathered by sensors provides tangible benefits to citizens. Small cities and towns can use their downtowns to roll-out high tech services, such as smart poles, to provide business access to the global market place; to test reliability and usefulness.

Lumca Smartpole
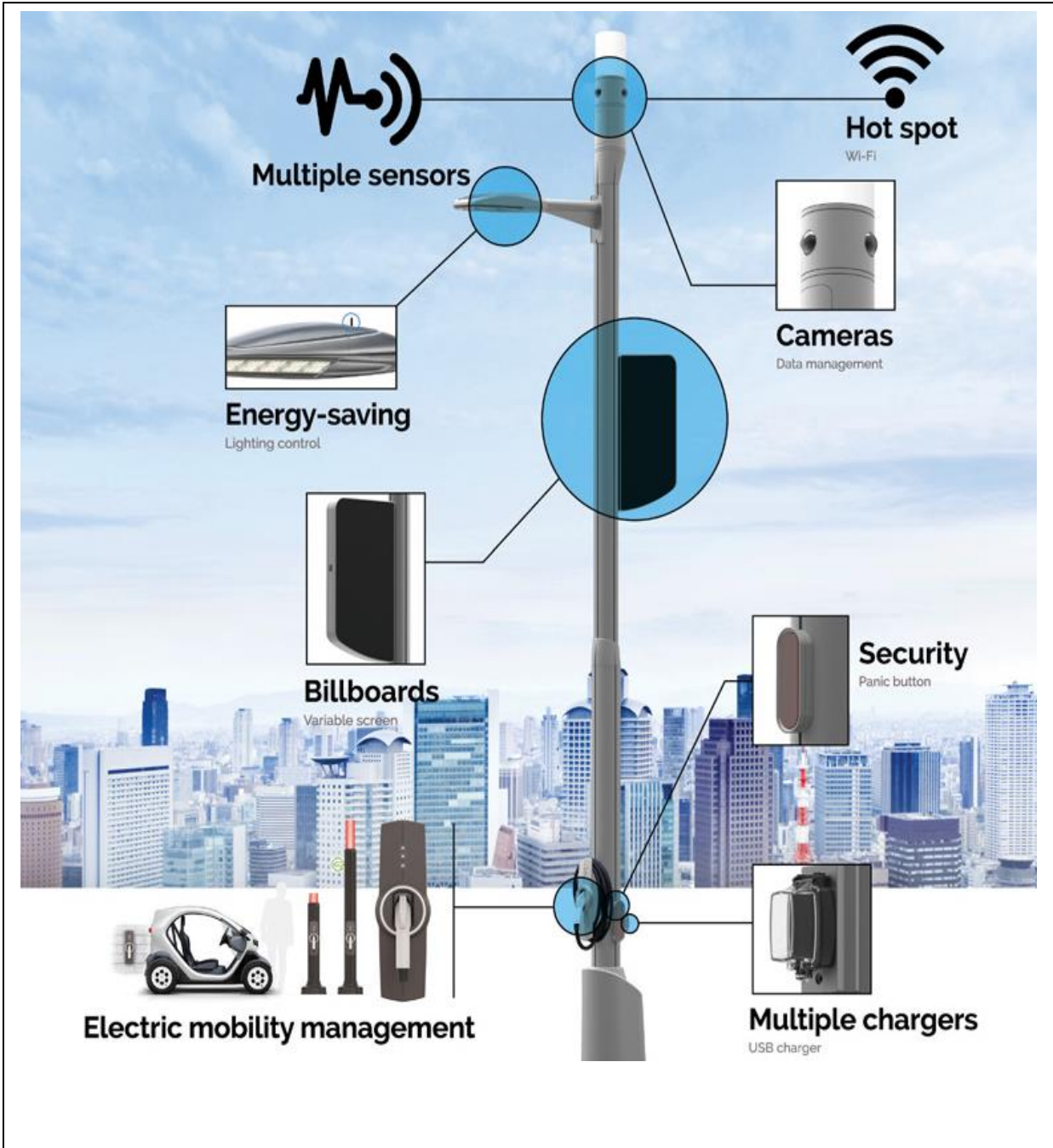
THE SYSTEM OF SMART POLES.
Technology needs to be downtown. Systems are being developed that provide security, communication, education, entertainment and energy for recharging, plus much more. The time is now for exploration of technology applications for downtowns, campuses, streets and neighborhoods. The systems exist, pioneering cities are appearing and therefore experiences are available for sharing.

Source:
 https://www.engoplanet.com/single-post/2016/07/15/CONCEPT-OF-SMART-SOLAR-STREET-LIGHT

MICROGRIDS, SMART AND GREEN.

"A microgrid is a local energy grid with control capability, which means it can disconnect from the traditional grid and operate autonomously."
http://www.energy.gov/articles/how-microgrids-work

THE IDEA IN HOBOKEN.

The December 2015 edition of *American City and County* published an article entitled: *The Birth of a Resilient Microgrid: Hoboken's Journey.* The Sandia National Laboratory in conjunction with US DOE and US DOC did a study for the city.

The purpose of this article is to increase the awareness and applicability of this concept to small cities and towns, hospitals and education campuses and other small areas that want or need control over their supply of energy.

THE PROBLEM.

The City decided to pursue the microgrid concept in the aftermath of Superstorm Sandy. The storm-related catastrophe of power outages in hospitals, senior housing projects and other facilities with dependent populations inspired the City to find a way to better protect and respond to power outages regardless of their cause.

Smart microgrids, through technology, can provide discrete control of generation, distribution, hours of operation, pricing and automatic load control and allocation down to individual customers. Smart microsystems can also reduce greenhouse gas emissions and select from a wide range of energy sources.

THE TOOLKIT.

"To make the microgrid a reality, Hoboken hired Greener by Design, a private firm, as its energy consultant." Greener by Design engaged EDF Climate Corps to develop a toolkit to address Hoboken's situation and to serve as a "model to scale and adapt [the tools] to different types of buildings and different communities." *The American City and County* article goes on to present the three key features of the toolkit:
A centralized dashboard,
A customized timeline, and
A scorecard.

THE APPLICATION.

Every community has groups of dependent populations vulnerable to power outages. The use of microgrids, especially microgrids supported by alternative energy sources, offers a tremendous opportunity to avoid the misery caused by the lack of power and its many energy-dependent facilities and systems. The link to the study is:
http://www.hobokennj.org/washingtonstreet/files/hoboken-microgrid-report.pdf.

CONCLUSIONS – MICROGRIDS.

The strategic deployment of microgrids can build a city's resilience with grids designed to:
- To connect and disconnect from the central grid as appropriate,
- To access alternative energy sources to provide cheap power in normal times and emergency power when necessary,
- To provide power to critical facilities that need to be free-standing in an emergency,
- To serve as a back-up source of energy during emergencies for dependent populations.

This is not about the future, but about today. Try it, it might work. Check with your neighbors.