Smart Cities and Infrastructure for Michigan

Dong Zhao & Meltem Duva

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CONTENTS

ABSTRACT

Smart cities represent the future of urban and infrastructure development. This Co-Learning Plan aims to provide a holistic picture of the past, current, and future trends of smart cities while retaining a focus on economic development for the state of Michigan. Specifically, this Co-Learning Plan focuses on the concept and structure of smart cities, as well as the benefits to the people who live in the urban environment. To improve economic development, this Plan emphasizes infrastructure that builds a basis for supporting smart cities. The outcomes of this Co-Learning Plan provide quantifiable evidence on the development path of smart cities and infrastructure particularly for the state of Michigan. The conclusions will help policymakers, planners, entrepreneurs, scholars, and practitioners in Michigan consider strategies and practices to make Michigan a global leader in the smart city development.

INTRODUCTION

Smart cities and infrastructure represent the future of urban development. However, their scope and sophistication are unclear. Our understanding of smart cities and their benefits is inadequate. This Co-Learning Plan introduces the “smart city” from concept to recent applications using a global perspective. This Co-Learning Plan has two sections. First, a holistic overview of the evolution of smart cities is provided, including timeline, technologies, industries, policies, and featured cities. Second, the basis for smart mobility and electric and driverless car infrastructure is discussed. The infrastructure that supports smart mobility, a key component of smart cities, should be a future development focus for Michigan.

Autonomous vehicles provide many benefits to the urban environment and residents living there. For example, it is expected that autonomous vehicles will largely reduce traffic congestion. An increasing number of people who are unable to afford and operate personal vehicles will have access to a new form of mobility. Autonomous vehicles are able to wirelessly communicate with cities about roadway trash or potholes. According to the executive director of emerging technologies policy at General Motors (GM), autonomous vehicles are inextricably linked with electric vehicles. The Director of Policy at the National Association of City Transportation Officials (NACTO) has indicated that “electric and shared-use autonomous vehicles will be most effective when used to deliver shorter, intracity trips where occupancy can be maximized, and vehicles are less likely to be stranded away from charging stations.”

This Plan is produced through a comprehensive literature review and meta-analysis. The authors investigated multiple information sources including scholarly journal articles, conference proceedings, government documents, news, and organizational reports. Key stakeholders from administration, business, and industry were interviewed. The authors hope that policy implications drawn from this Co- Learning Plan will help leverage industrial powers, stimulate economic growth, and improve the well- being of Michigan residents.

WHAT IS A SMART CITY?

According to the United Nations, 55% of people worldwide live in urban areas. This number is expected to increase to 68% (an additional 2.5 billion people) by 2050 because of population growth and rural-to-urban migration (United Nations, 2018). To meet the demand of the growing urban population, many countries encounter housing, transportation, energy, infrastructure, employment, education, and health challenges. Smart cities, a new urban-development concept and strategy, can solve such challenges and enhance city performance and sustainability (Letaifa, 2015).

Table 1 outlines the relevant concepts for the non-human (i.e., digital) parts of smart cities through three dimensions, i.e., technology, people, and community (Albino, Berardi, and Dangelico, 2015; Nam and Pardo, 2011). Particularly, smart communities are those where the government, businesses, and residents understand the potential of information technology (IT) and make a conscious decision to use that technology to transform life and work in their region in significant and positive ways (Lindskog, 2004).

Table 1. Relevant Concepts of Smart Cities

CONCEPT	DEFINITION
Digital City	A digital city indicates a connected community that includes three components: 1) wide-band communications infrastructure; 2) a flexible and service-oriented computing infrastructure predicated on open industry standards; and 3) innovative services that fulfill the needs of citizens, businesses, governments, and government personnel (Yovanof and Hazapis, 2009).
Intelligent City	Intelligent cities refer to cities with a high capacity to promote learning and innovation via creativity of the city's population, knowledge creation by its institutions, and the establishment of infrastructure for communication and knowledge management (Komninos, 2006).
Ubiquitous City	Ubiquitous cities are urban areas where ubiquitous technologies are inserted into physical objects and structures in order to make urban functions more effective and ultimately advance the quality of life of citizens (S. H. Lee, 2009).
Wired City	Wired cities are places, in which all genres of information and communication services are provided to businesses and residences via information highways (Dutton, Blumler, and Kraemer, 1987).
Hybrid City	A hybrid city contains two components: 1) "A reality with physical entities and real population" (Nam and Pardo, 2011), and 2) "A parallel virtual city of counterparts of real entities and people" (Boulton, Brunn, and Devriendt, 2011).
Information City	Digital environments that gather official and unofficial information from local communities and convey it to the public through internet portals are called information cities (Anthopoulos and Fitsilis, 2013).
Creative City	The creative city concept emphasizes how local urban areas can be redesigned, revitalized and reshaped in a competitive and global context (Tay, 2005).
Learning City	A learning city appreciates and values the importance of learning in the development of welfare, social stability and self-fulfillment. As a result of this, it mobilizes resources (human, physical and financial) to improve the human potential of all its citizens (Longworth, 1999).

Humane City	A humane city is an environment in which people enjoy their daily life and have many opportunities to utilize their human potential in order to spend a creative life (Streitz, 2011).
Knowledge City	A knowledge city emphasizes the importance of knowledge, in which knowledge is perpetually created. The system is allocated to produce, share and apply knowledge (Ergazakis, Metaxiotis, and Psarras, 2004).

Table 1 indicates that the concept of smart cities has become increasingly popular in scientific literature and international policies since the 1990s (Albino et al., 2015). There is no single agreed-upon definition for a smart city. For instance, while some researchers criticize the idea of smart cities as being only technology oriented, others define the concept as an instrumented, interconnected, and intelligent city within a technological context (Harrison et al., 2010).

Table 2 presents concepts and definitions of smart cities from the literature.

Table 2. Definitions of a Smart City

Literaure	Definition
(Caragliu, Del Bo, and Nijkamp, 2011)	A city is smart if it combines some merits: 1) Making investment in human capital and modern communication infrastructure to nourish sustainable economic growth and high living standards, 2) Managing natural resources wisely via participatory governance.
(Giffinger et al., 2007)	A smart city is a visionary city that combines endowments and activities of self-determinant, independent, and conscious citizens.
(Lazaroiu and Roscia, 2012)	A smart city offers an average technology size and an interconnected, sustainable, comfortable, attractive, and secure life.
(Washburn and Sindhu, 2010)	A smart city uses smart computer technologies to make important infrastructure components and services of a city more intelligent, interconnected, and efficient. These components are city administration, education, healthcare, public safety, real estate, transportation, and utilities.
(Lara, Moreira Da Costa, Furlani, and Yigitcanlar, 2016)	Smart city might be the ideal form for the cities of 21st Century, which represents a balanced and sustainable view by combining economic, societal, environmental and institutional development.

In summary, a smart city is an urban environment that has connected information and can make decisions for efficient, sustainable, and healthy lives through "three 'I's" (Harrison et al., 2010):

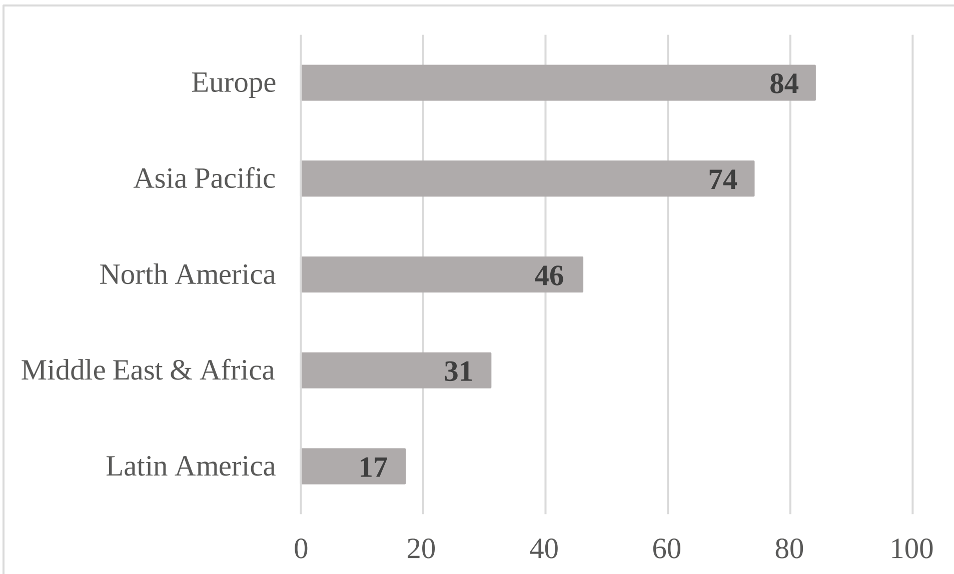
- Instrument: the ability to capture and integrate live real-world data using tools such as sensors, meters, appliances, and personal devices.
- Interconnection: the integration of these data into a computing platform that allows the information to communicate among various city services.
- Intelligence: the inclusion of complex analytics, modeling, optimization, and visualization services to make better operational decisions.

A smart city is a holistic solution to urban problems created by rapid urbanization, dense population, and consumption growth. The smart city is a hybrid model that combines democratized open innovation with central city support, coordination, and monitoring (Letaifa, 2015). To make cities more livable, sustainable, and efficient, smart cities consider human factors as the focal point, take advantage of emerging information communication technologies (ICTs), and promote learning, developing, and participation of all stakeholders. In short, a smart city is a vision for urban development that aims to increase quality of life.

GROWTH OF SMART CITIES

Because various definitions for smart cities exist, the scope, scale, and style of smart city initiatives vary widely (J. Lee, Phaal, and Lee, 2013). By 2013, there were approximately 143 ongoing or completed smart city projects. Amongst these initiatives, 35 were in North America; 47 were in Europe; 50 were in Asia; 10 were in South America; and 10 were in the Middle East and Africa (J. H. Lee, Hancock, and Hu, 2014). Figure 1 shows that, more than 250 smart city projects in 178 cities were completed or ongoing worldwide by 2016 (Research, 2017).

Figure 1. Number of smart city projects worldwide in 2016, by region (Statista, 2018)



The number of smart city initiatives and investigations has been increasing, and many countries have established smart city strategies. Statistics from the Consumer Technology Association show that the global spending on smart city development was $14.85 billion in 2015 and this number is projected to reach $34.35 billion in 2020.

As one of the leaders in the smart city initiatives, China started the transformation of 500 Chinese cities into smart cities in 2017 (Daily, 2017). Similarly, the Indian government launched the program of Smart Cities Mission in 2015 to promote smart solutions for cities. One hundred Indian cities were selected to participate in the program. The Smart Cities Mission program aims to support cities in providing a baseline quality of life, sustainable environment, and essential infrastructure for their residents (Indian Ministry of Housing and Urban Affairs, 2018).

BENEFITS FROM SMART CITIES

Applications of smart cities benefit many stakeholders in the urban environment. As the number of smart city initiatives has been increasing, governments have applied the concept differently based on the needs of their stakeholders. These include owners, customers, employees, suppliers, governments, competitors, consumer advocates, environmentalists, special interest groups, and media (Freeman, 1984). According to Freeman's approach, many stakeholders benefit from the transition to a smart city, including citizens, governments, urban city planners, ICT providers, industries, academia, and financial organizations.

Table 3 presents an example of stakeholders, their role in the smart city environment, and their value propositions (Mayangsari and Novani, 2015).

Table 3. Stakeholder Value Co-Creation Roles (Adapted from Mayangsari and Novani, 2015)

Service Entity	Role in the Service System	Value Proposition
City Mayor Strategic Committee Smart City Alliance	**Enabler:** Create a vision, allocate resources, provide strategic leadership, and promote networking.	Avoid political bottleneck, balance authority, provide clear accountability, enhance synergy of city stakeholders, strengthen project foundation, and improve user experience.
University Research Institution City Work Unit Professional	**Provider:** Engage academics and professionals as innovators, provide innovative R&D methods, augment knowledge, and manage knowledge distribution systematically.	The city is not only a client in the market, but also a practice field for learning. Knowledge application and distribution to all service entities with attention to data security.
ICT Company Consulting Company Business Firms ICT Startup	**Utilizer:** Create suitable products and services, set small-scale objectives derived from the vision, learn new practices to produce accessible knowledge, and innovate.	Increase profitability and skill in the field, gain symbiotic mutualism through collaboration with city representatives. Platform is a basis for innovation, aggregation of data, and quality assurance.
Citizen NGO Company Visitor and Tourist	**User:** Participate in experiments, empower citizens through co-creation, and produce place-based experiences.	Realize the significance of engagement and participation in city development. Improve city experience using accessible information and services.

Smart cities benefit the people who live and work in a urban environment in many ways (Yovanof and Hazapis, 2009):

- One benefit is the improved urban environmental quality. The large scale of monitoring and inspection of indoor and outdoor air quality using ICT allows for smart green solutions that reduce energy consumption and urban waste landfills.

- Smart cities benefit urban transportation and logistics. The intelligent traffic stops or optimized traffic routes can improve public transportation management, save energy, and reduce pollutions.
- Smart cities improve public safety and security. The urban pre-alert system provides accurate and timely forecast of natural disasters and predicts behavioral crime including homicides.
- Arts and entertainment are benefited by nourishing multimedia-rich civilization, history and cultural events and activities.
- Smart cities benefit corporate and institutional communications: for example, offering free education for the community.
- Services for individuals are improved. Smart cities offer customized services such as shopping information or on demand multimedia content to individuals based on their location and personal needs.
- Smart cities provide automated and customizable services to self-identified groups with special needs, including the elderly, handicapped people, travelers, and tourists.

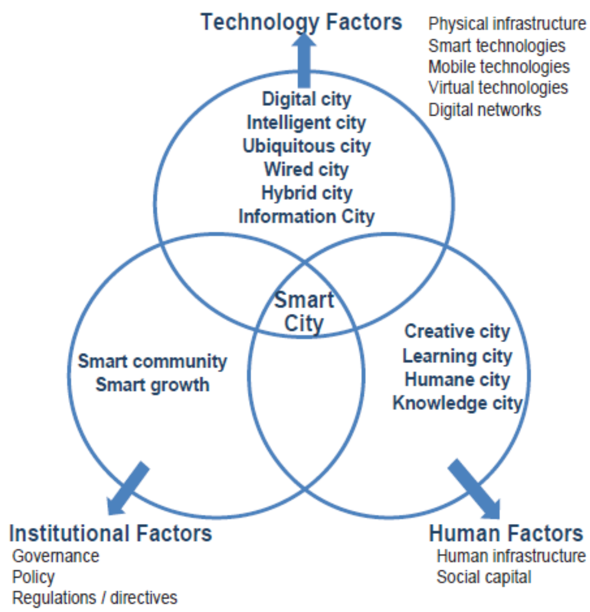
Smart cities also benefit the public administration and services. A smart city provides improved services for governance, business, healthcare, security, transportation, communication, education, and environment (Anthopoulos and Fitsilis, 2013):

- Smart government services for city administration and market-driven stakeholders can evaluate public concerns, create administrative procedures at local and national levels, and provide transparent public procurement.
- Smart democracy services for city administration market-driven stakeholders can determine city area issues, establish dialogue and consultation, conduct polls, and cast votes.
- Smart business services for real estate and market-driven stakeholders can support business start-ups and provide digital marketplaces.
- Smart health and telecare services for healthcare and similar market-driven stakeholders can offer support to citizens with special needs, such as the elderly or civilians with illnesses.
- Smart security services for public security and market-driven stakeholders can establish amber alert notifications, monitor schools, and provide hazard management systems for public safety improvement.
- Smart environmental services for utilities and market-driven stakeholders can provide recycling services and support enterprises managing waste, energy, and water.
- Smart transportation services for transportation departments and market-driven stakeholders can establish traffic monitoring and measurements to optimize traffic flows and controls.
- Smart communication services for housing and market-driven stakeholders can provide communication tools such as wide-band connections and digital TVs.
- Smart learning and education services for the education department and market-driven stakeholders can extend free education and career development to people who need it.

STRUCTURE AND COMPONENTS OF SMART CITIES

Figure 2 shows the structure of a smart city that incorporates technological, human, and institutional factors (Nam and Pardo, 2011). In a smart city, the first core includes technological factors such as physical infrastructure, smart technologies, mobile technologies, virtual technologies, and digital networks. The second core represents human factors including human infrastructure and social capital. The third core includes institutional factors such as governance, policies, and regulations. In this regard, investments in the technological and human cores in smart cities are achieved through participation in the institutional core, for example, by participating in governments and improving quality of life.

Figure 2. Structure of a Smart City (Adapted from Nam and Pardo, 2011)



Literature has identified the components of a smart city, such as economy, environment, governance, infrastructure, and quality of life (Zubizarreta, Seravalli, and Arrizabalaga, 2016). For example, the work of Giffinger et al. (2007) states that a smart city has six characteristics and 33 descriptive factors. Each factor is described using several indicators to evaluate its performance. In total, 74 indicators are used to analyze the 33 descriptive factors.

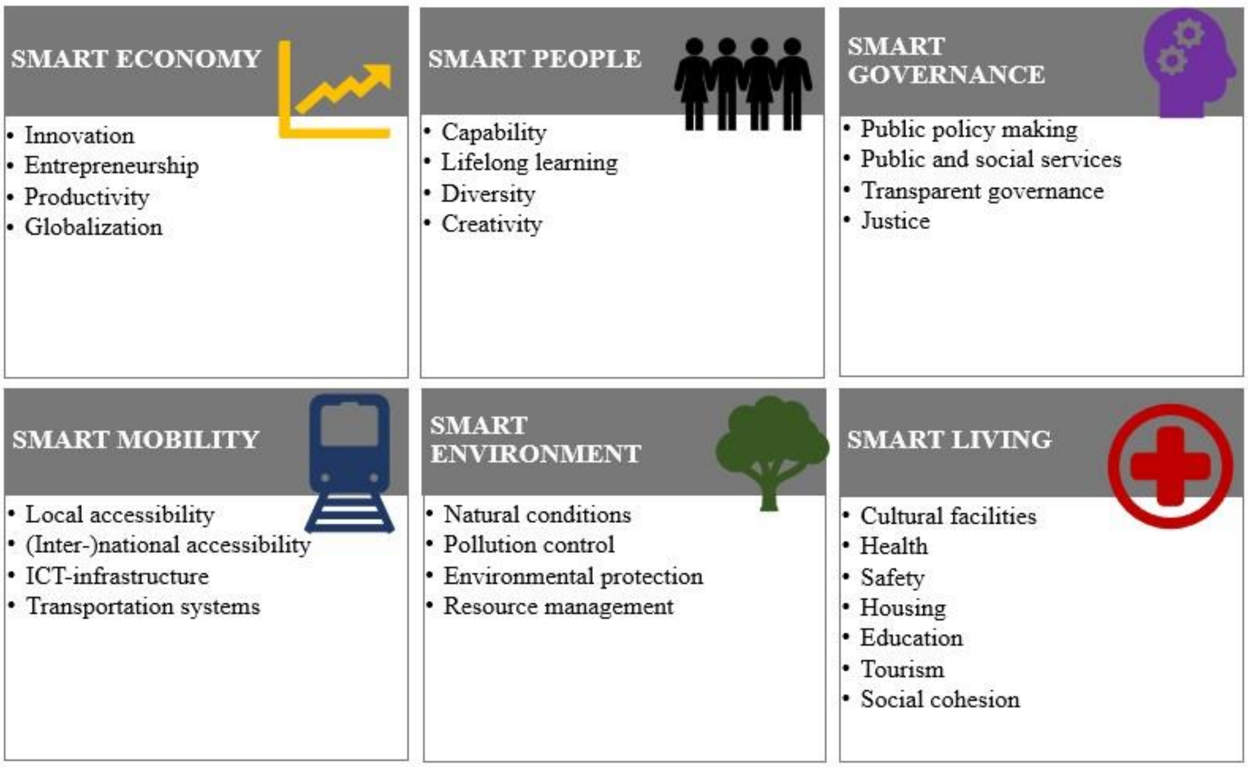
Figure 3 illustrates the six components of a smart city which are smart economy, smart people, smart governance, smart mobility, smart environment, and smart living.

Smart Economy includes factors of economic competitiveness, such as innovation, entrepreneurship, productivity, and globalization (Giffinger et al., 2007). Many activities and indicators of smart economy exist. For example, innovation is critical to a smart economy. New and innovative ideas might lead to new businesses, products, or services, which increase productivity and GDP per person and decrease the unemployment rate. Finally, in a smart economy, inhabitants' lives become easier and more prosperous.

Smart People is concerned with the soft factors of a society, such as education and open-mindedness. That is, social capital is a significant component for nourishing the other components of a smart city. This component addresses educational issues that nurture the residents and improve their skills. For example, a smart city helps residents learn a foreign language, improve attitudes towards foreigners, and promote knowledge about the world. In turn, the open-minded, creative and lifelong learning residents become the social capital of the city and they can improve a smart city's other components such as the smart economy.

Smart Governance contains factors regarding administrative functions. Smart governance functions decently and clearly, recognizes the needs and wishes of citizens, provides proper public services, and secures justice. For example, residents who are satisfied with the quality of public schools or transparency of bureaucracy might participate in decision-making processes.

Figure 3. A Smart City's Six Components



Smart Mobility consists of technical factors related to internet communication technologies (ICT), sustainable transportation, and local and international accessibility. Smart mobility provides a sufficient public transportation network to residents and ensures they are satisfied with the quality and accessibility of public transportation. Smart mobility also covers ICT and wide-band internet technologies as well as innovative applications that make mobility greener for environment and safer for people.

Smart Environment addresses issues such as environmental sustainability and environmental protection. To reduce pollution and protect the environment, it promotes efficient use of resources and improves individual efforts in addressing pollution and diseases originating from pollution, such as lower respiratory diseases (Giffinger et al., 2007).

Smart Living concerns the residents' quality of life in a smart city. It aims to create a quality and prosperous living standard and provide a broad range of cultural, educational, touristic, or social activities. Smart living is focused on cinema, theater, and museum attendance per inhabitant, the number of doctors and hospitals, satisfaction with the health and educational system, improvement of touristic facilities, and poverty reduction. In other words, smart living promotes safe, healthy, happy, and successful lives for citizens (Giffinger et al., 2007).

HOW TO BUILD A SMART CITY

Although they largely rely on top-down approaches with a focus on building technology, smart cities are creative and intelligent. Building a smart city needs democratization, open innovation, central city support, coordination, and monitoring (Letaifa, 2015).

Experiences from the Intelligent Community Forum (ICF) selections indicate that infrastructure is fundamental to building smart cities. Infrastructure is also critical for Michigan's smart city strategy. Adequate and up-to-date infrastructure can facilitate the automobile industry's continued growth and also benefit the industry's relevant upstream sectors, such as suppliers. Smart cities promote smart mobility as a strategy which sheds light on the importance of electric vehicles (EVs). Smart mobility plays a vital role in smart cities and contributes to their other five components.

The World Health Organization (WHO, 2015) has determined that most of the world's population lives in urban areas and that global urban population is estimated to grow approximately 1.84% per year during 2015–2020; 1.63% per year during 2020–2025; and 1.44% per year during 2025–2030. In the future, mobility will be a major problem. The solutions to achieve sustainable, innovative, and safe transportation will be critical. EVs are expected to be the vehicles of future, and many companies are already involved in EV research and development activities. The companies also attempt to produce driverless EVs in order to increase their competitive edge. These innovations not only enable cleaner and faster mobility, but also affect the lives of citizens in the context of their environment, economic growth, and quality of life (Zubizarreta et al., 2015).

According to Lane et al. (2013), the government has two motivations to encourage the use of EVs: risk management and industrial policy. Risk management relies on the perception that EVs represent an opportunity to decrease the adverse effects of oil dependence. Industrial policy explains that EV technology can create innovative manufacturing industries for governments and improve the economy by improving one or more industrial sectors (Lane et al., 2013). To sustain a strong economy, opening new business areas, innovation, and new technologies are needed (Zubizarreta et al., 2016). As an emerging area, the EV sector is responsible for creating many sub-sectors which have led to innovations and inventions. The EV industry has also influenced the expansion of sub-sectors such as automotive batteries.

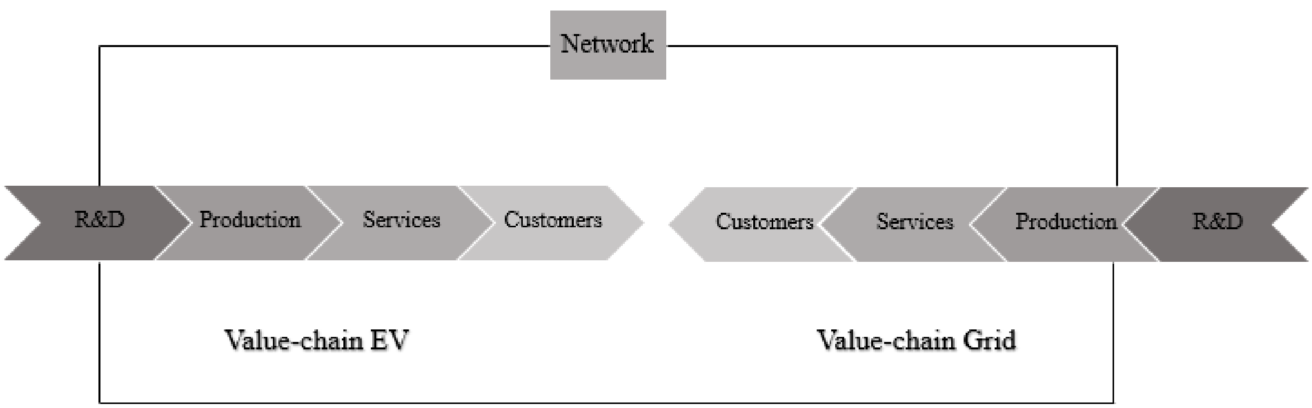
The EV industry is connected to multiple components of a smart city. The EV industry contributes to the *Smart Economy* by creating new employment positions which lead to promising economic benefits. Employment rate in knowledge-intensive sectors, new business registrations, GDP per employed person, and unemployment rate are all indicators of the *Smart Economy* (2007). EVs contribute to *Smart People* by promoting creative ideas, industries, and people. Creativity is identified as the "share of people working in creative industries" (Giffinger et al., 2007). EVs also contribute to the *Smart Environment* because of the reduction of CO2 emissions (Zubizarreta et al., 2016). Compared to conventional vehicles, EVs produce fewer emissions affecting climate change and smog (Wood, Rames, Muratori, Raghavan, and Melaina, 2017). EV technology is therefore a significant tool to meet the *Smart Living* goal by offering a better quality of life and more comfortable and sustainable living conditions (Zubizarreta et al., 2016). Finally, EVs must be promoted through policies implanted through *Smart Governance*, which includes participatory decision making, public and social services, transparent governance, and political strategies.

EVs have potential problems such as limited range, high vehicle and maintenance costs, long charging time, and a lack of infrastructure. Moreover, the resale value of EVs compared to gasoline cars are affected by a battery life of approximately 10 years and large renewal costs. An EV is an expensive and risky purchase that may affect consumer acceptance; therefore, policymakers need to use government power to promote the development of EVs at different levels (Lane et al., 2013).

A multi-level framework for EV policy exists. These policies are made from a transnational level down to a regional one: International Energy Agency agreements; integrated markets; bloc policies such as US federal programs; national policies such as California or EU member state initiatives; and regional policies (van der Steen, Van Schelven, Kotter, van Twist, and van Deventer Mpa, 2015). Small-scale policies cannot be considered independent from large-scale ones. For example, policies for the City of Detroit cannot be disconnected from Michigan or US ones (van der Steen et al., 2015).

The study of Steen Van Der et al. (2015) explores different strategies governments use to support EVs. The study defines and organizes government policies as legal, financial, communication, and organizational using the Hood's four tools (Hood, 2007). The study also defines the value chains of smart mobility, which represent a value network made of vehicles, charging, and the surroundings. Figure 4 displays this a value chain.

Figure 4. Three Value Chains of E-Mobility (Van Der Steen et al., 2015)



For vehicle and charging infrastructure value chains, Steen Van Der et al. (2015) determines the segments in each chain: R&D, production, services, and customers. Policies can target at least one, and possibly more, elements of the chain. For instance, a purchase subsidy targets the *vehicles value chain* and, within that, the *consumer* segment. The model was used for selected European countries and California as a comparative case to contrast the European findings. The value chain of charging infrastructure and network are listed in Table 4.

Table 4. Charging Infrastructure Value Chain (Van Der Steen et al., 2015)

Value chain—Charging infrastructure	
R&D	Practices aim to promote R&D processes of charging infrastructure.
Production	Practices aim to support the production of charging stations and EV charging infrastructure components such as networks and energy grids.
Services	Practices aim to support service providers for charging stations: energy suppliers, power plants, or grid managers.
Customers	Practices aim to support customers of charging stations. Customer refers to the users and owners of charging stations, that is, consumers, companies, public authorities, and governments.
Value chain—Network	
Network	Network practices aim to connect stakeholders of EV and infrastructure value chains. "For instance, efforts intended to intensify contacts between different stakeholders, in order to improve value chain alignment and a more efficient functioning of the entire value chain."

The interest in EVs is rising because of their advantages. The first electric car was invented in the 1830s, many years before the invention of gasoline and diesel engines. In the United States, the number of automobiles using electricity in the turn of the 20th century was nearly twice that powered by gasoline (Transport Electrification Panel Member, 2011). However, by the 1920s, electric cars began to disappear owing to range anxiety, a decline in oil prices, and innovations in gasoline engines. Although the interest in electric cars was revived in the 1960s, most EVs have been low-range neighborhood electrics. In the early 2000s, Tesla Motors launched the first highway electric car. In the last decade, companies have been conducting R&D activities on electric cars to improve their efficiency.

There are different genres of EVs, such as plug-in hybrid EVs (PHEVs) or battery EVs (BEVs)—collectively known as plug-in EVs (PEVs). PEVs provide various environmental benefits by reducing reliance on fossil fuels, which accounts for over 90% of the total US transportation energy consumption (Wood et al., 2017). PEV sales in the United States increased by 40% in 2016, reaching a total stock of over 500,000 vehicles. However, widespread market adoption of PEVs remains hindered by many factors, including limited availability of models and styles, higher cost than conventional vehicles, and the lack of a convenient and ubiquitous network of charging stations (Wood et al., 2017). Deploying widespread and efficient PEV charging stations is critical to promoting PEVs, alleviating range anxiety of drivers, and providing an opportunity for long-distance travel.

To promote PEVs, policymakers have implemented laws for vehicles and their charging infrastructure. Charging infrastructure, whether at home, at work, or in public locations, is indispensable for operating EVs (Agency, Ministerial, and Initiative, 2017). At the present, three different types of EV charging infrastructures are available: AC Level 1 (residential), AC Level 2 (non-residential) and DC (fast charging or FC). AC Level 1 residential charging requires a long charging time and provides a low range. AC Level 1 is typically used for charging when only a 120V outlet is available and charges 2 to 5 miles of range per hour of charging. L2 charging is faster than Level 1 and provides 10 to 20 miles of range per hour. Both AC Level 1 and AC Level 2 equipment use the same SAE J1772 connector and charge port. The prime advantage of DCFC charging is that it drastically reduces charging time and adds 60−80 miles of range in approximately 20 minutes (Thakur, 2017; Wood et al., 2017). There are three types of DCFC systems depending on the type of charge port on the vehicle: a J1772 combo, CHAdeMO, or Tesla (Wood et al., 2017).

The importance of the charging infrastructure availability to EV market growth calls for continued support and deployment of electronic charging supply equipment (Agency et al., 2017). Moreover, current charging infrastructure information and estimations can be found for different levels. For example, the Detroit Area needs to provide world-class fast charging stations to support the use of EVs, especially driverless EVs. Once the infrastructure is ready, the Detroit area can enjoy the benefits that the EV industry brings to the urban environment. Michigan, a global engine of the automobile industry, will have more smart cities and, in the future, become the global leader of smart mobility.

CONCLUSION AND RECOMMENDATIONS

Smart transportation is critical to Michigan and its economic development. The government, researchers, and industries have spent considerable effort to make Michigan the global leader in EV and autonomous vehicle industries. Based on a recent article in the MIT Technology Review, Morgan Stanley estimates that $2.7 trillion of charging infrastructure will be needed to support 500 million EVs. The rise of smart and green transport implies a critical need for public charging stations. The federal government has committed to building a series of national EV charging corridors countrywide. Michigan, as an automotive industry leader, can approach smart cities by understanding and implementing the planning, design, and construction of smart infrastructure. Many steps are needed to build smart cities for Michigan and its economic growth, and the first step would be to establish energy and transportation infrastructure that can fully support EV usage and the EV industry across the state.

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