Los Angeles County & The Greater Los Angeles Metropolitan Area (including Long Beach City) As a "SMART CITY"

DESIGN BRIEF

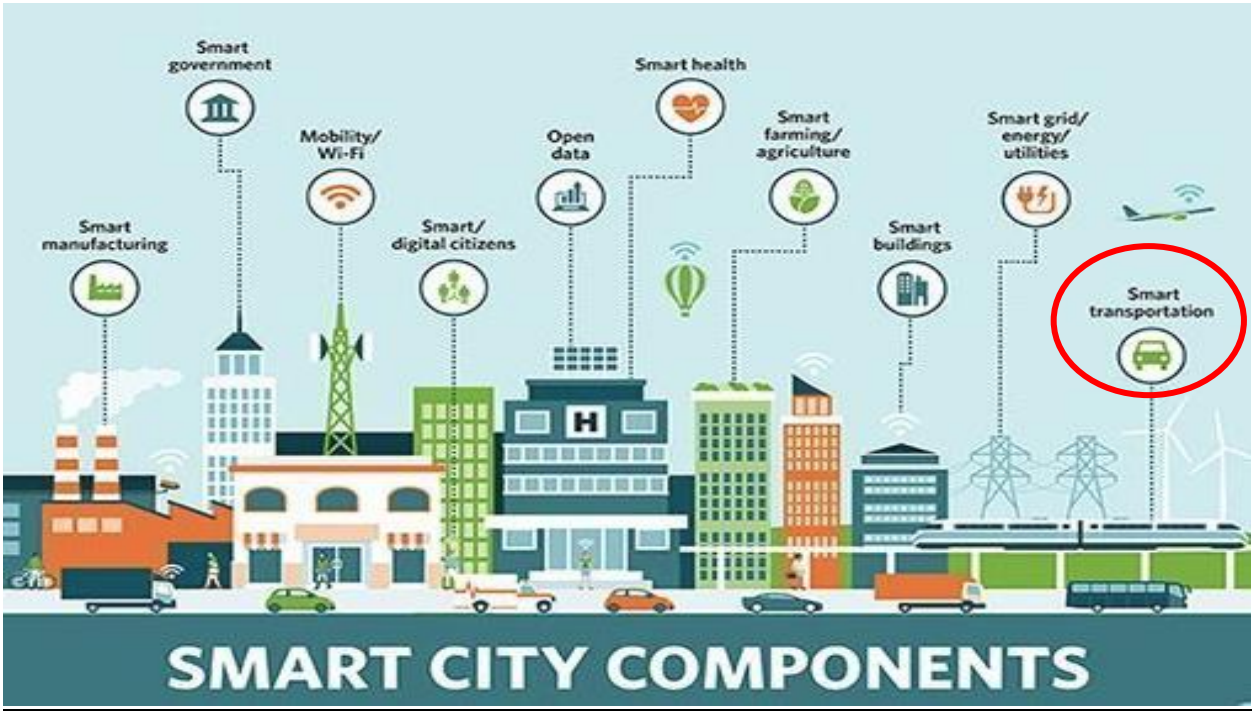
In the Friday session, we will be focusing on the development of a "complex system", namely, a SMART CITY, a development that has spread quickly in North America and around the world where, by the year 2050, 60% of the global population will live in urban environments. This fact contributes to the growing economic and social importance of cities, but also adds to the complexity of their already challenged environmental sustainability and other complex social problems. Nevertheless, cities can be powerful accelerators of learning - communities of value creation opportunities.

Thus, arises the need for "**smart cities"** that uses information and communication technologies to increase operational efficiency, share information with the public and improve both the quality of government services and citizen welfare. Solutions characteristically include various aspects of a "CITY ECOSYSTEM", which represents a "community" of SMART SERVICE SYSTEMS, such as **smart** infrastructure, **smart** health systems, **smart** industry, **smart** education systems, **smart** security systems and **smart** transportation systems that reduce consumption, wastage and overall costs. All this depends on technology like ICT, IoT and data-driven technologies to collect and analyze data with the collective intelligence of all the members of the ecosystem so that mutual benefit occurs. Insights from that data is then communicated through appropriate processes and systems so that **people, in a diverse set of value creation roles, can act to make cities better places to live and work.**

According to Jim Spohrer (IBM), **a "SMART" Service System** is a *socio-economic-technical system* that is a dynamic configuration of people, technology, information, and organization(s) connected by value propositions in mutual value co-creation, AUGMENTED WITH COGNITIVE SYSTEMS (e.g. AI). Spohrer, J. et al., (2017) "Steps toward a science of service systems". Computer. 40 (1) & Spohrer, J., et al., (2017) What Makes a System Smart?; in "The Human Side of Service Engineering" (pp.23-24).

However, as identified by Jim Spohrer et al., "the current state of the art in smart service systems is MISSING a key component. All of the service system entities like 'people and organizations' have rights and responsibilities attached to them. However, not so for AI systems. Why is this important? Because "*rights and responsibilities*" are key to the development of TRUST, and trust is key to the development of collaborative interactions within a service system. So, what's missing in most smart service systems is a STABLE MEMBRANE that would encapsulate technology in a way favorable for co-operation of naturally intelligent and artificially intelligent systems. However, here in the metropolis of LA, a public-private consortium led by USC Marshall School of Business & Viterbi School of Engineering has

developed an **innovative platform called the Intelligent IoT Integrator (I3)** that addresses many of these issues and has thereby been a catalyst for SMART CITY development in LA. Our focus is on the urban environment that resides within Los Angeles County, known as the Greater Los Angeles Metropolitan Area, which is described in Appendix 1. For the purposes of this session, we are focusing on one SMART CITY component – SMART TRANSPORTATION – and within that on one SMART SERVICE SYSTEM – **SMART PARKING** – as the system to be designed.



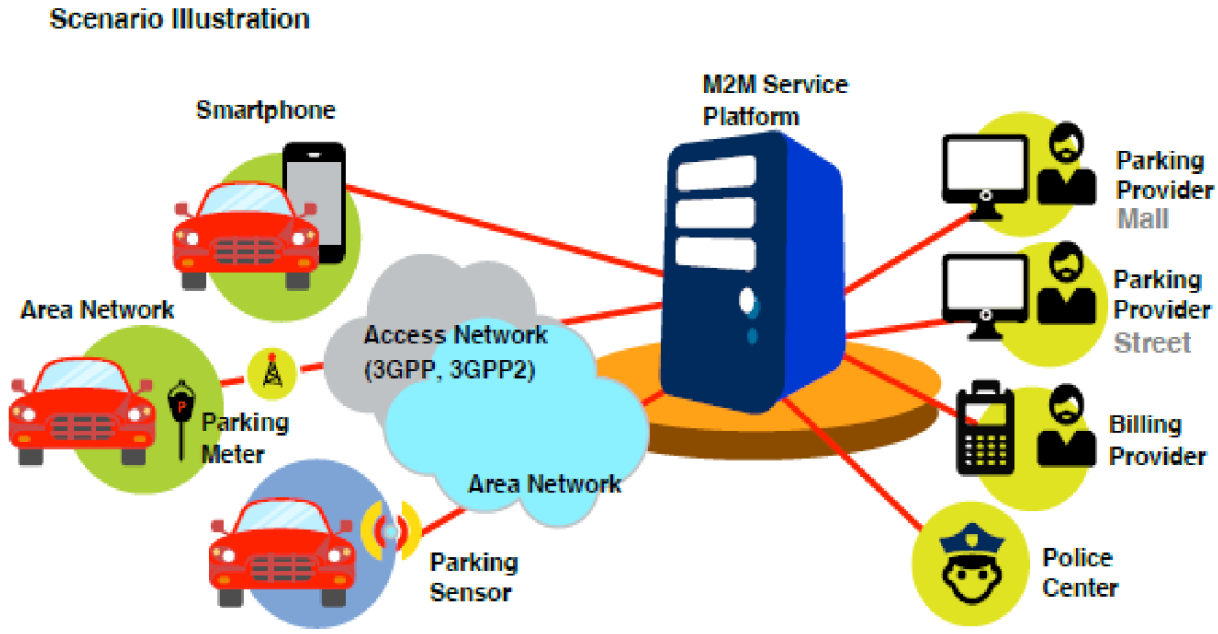
SMART PARKING

Why SMART Parking?

- Traffic congestion caused by vehicles is an alarming problem at a global scale and it has been growing exponentially. Many megacities like Beijing, Los Angeles, Dubai, San Francisco, and New York are piloting new and trending parking solutions. Searching for parking **costs Americans $73 Billion** annually. **30% of traffic** is created in searching for parking spaces. **Germany gets the highest number of parking fines** a year amounting to €380 million.
- Searching for parking spaces in urban cities is a routine and often frustrating activity for many people in cities around the world that burns about one million barrels of the world's oil every day, impacting sustainability. Being late to every meeting or commitment has become an unspoken curse in big cities; even if you reach the place 10 minutes early, finding an empty parking spot would take almost 20 minutes, with an impact on productivity.
- With the global population continuing to urbanize, this requires a well-planned conjoined policy-and-market systems intervention that can scale with increasing urbanization.

What is SMART Parking?

A SMART PARKING SYSTEM typically obtains information about available parking spaces in a particular geographic area and processes it in real-time to place vehicles at available positions. It involves using IoT technology (low-cost sensors) and smart meters to track the occupancy or availability of parking spots, real-time data collection, and mobile-phone-enabled automated payment systems that allow people to reserve parking in advance or very accurately predict where they will likely find a spot. When deployed as a "system", smart parking reduces car emissions in urban centers by reducing the need for people to needlessly circle city blocks searching for parking while permitting cities to carefully manage their parking supply as well as better controlling illegal parking.



SMART PARKING Strategy

The key to a successful SMART CITY SERVICE strategy lies in realizing just how broad and impactful it can be – its breadth is also its downside as it is confusing to know where to start and how to integrate so many strategic and operational elements. SMART means being intentional about all the CHOICES – both technical and human – that are made to enable a thriving whole SYSTEM.

There are now a mix of producers and consumers in cities, often times playing both roles. Also there isn't one single technology, but a set of technologies that need to be interoperable. So a SMART CITY SERVICE is really one that leverages the connection and communication between all exciting new technologies with themselves and with empowered, creative, collaborative people and between companies, cities in the metropolis, and buildings and other physical

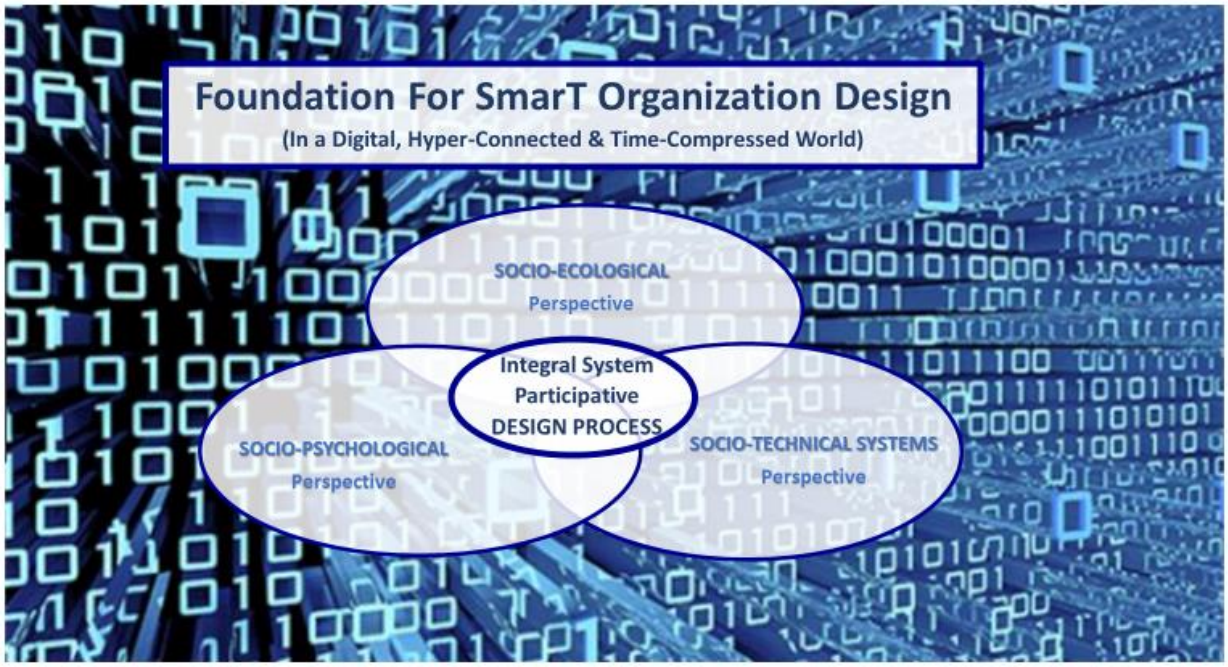
entities to build something fundamentally new, different and transformative. *The real "smart" piece of smart cities comes from the data and insights that come from making all those connections.*

What is needed for Strategic Design?

An organization's viability no longer resides on privileged access to technology or capital, as these are readily available to all. Instead, it depends on the organization's ability to quickly incorporate new technologies and knowledge to improve internal processes for efficiency and speed and to adapt to ever-changing customer/citizen demands. New technologies that augment cognitive processes will allow expert problem solvers to see and solve problems that others don't even know exist so that learning is now the new driver for viability.

This means to design strategically, i.e. make the right choices for the **system-in-its-environment**, you need to comprehend the whole system – its purpose/role in the environment and its ecosystem interrelationships, its technology and social options and its culture – to be able to rapidly scope down from the long-term vision to this week's next steps on a continuous basis, which is "active adaptation" for a VUCA world. Everyone is a "systems thinker", leveraging the power of the new technologies and all the connections for collective intelligence to benefit the whole.

SmarT Organization Design is founded on socio-technical systems theory and other participative technologies that enables this whole system approach for SMART CITY SERVICE design. We will be using the three perspectives/lenses of this approach to understand and design the LA SMART PARKING SERVICE.



We have identified **3 LA SMART PARKING ORGANIZATIONAL DESIGN CHALLENGES that match the 3 Perspectives for SmarT Organization Design and** that are framed as *how might we*:

1. Convene LA Smart City constituents to coalesce on Smart Parking purpose, system boundaries, and mutual benefit? [*SMART Organization Design socio-ecological perspective*]
2. Define the workflow and measures that are required for an effective work system that results in Smart Parking Value Creation with mutual benefit for all? [*SMART Organization Design socio-technical systems perspective*]
3. Enable the shift in IT to a larger strategic role regarding SMART Transportation within the LA ecosystem? [*SMART Organization Design socio-psychological perspective*]

The ideas for the design challenges are early phase development and prototyping and we do not expect a complete rollout of all phases during this exercise.

We begin with a PRESENTATION by Jerry Power on the **Intelligent IoT Integrator** (**I3**), followed by a PANEL [10 minutes/presenter and 15 minutes Q&A] with the 3 CIOs from LA County, LA City and Long Beach City who will provide an overview of the **SMART CITY vision** and in particular, the **SMART PARKING initiative and key challenges of digital transformation**.

3 ORGANIZATION DESIGN CHALLENGES

We will have **3 DESIGN GROUPS**, each working one of the design challenges; if there are more than 10 participants per DESIGN GROUP, we will have 2 subgroups within each DESIGN CHALLENGE GROUP. The CIOs and Jerry Power will act as resources to the DESIGN GROUPS.

The groups will have **90 minutes to design.** We offer the following design process format:

1. Use the first 20 MINUTES of your 90 MINUTES WORK TIME, to develop your common understanding of the LA SMART PARKING context. We have provided some questions to quickly generate a common understanding from the presentation, panel and this design brief. If there are subgroups within your Design Group, this work can be done by the subgroups together to maximize information input.
2. Use the NEXT 30 MINUTES to carry out the design task that addresses the specific LA design challenge assigned to your subgroup. For each challenge, we have described its SmarT Organization Design perspective/focus, i.e. what you should "see" or be looking for that you will shape in your design**.** Use your subgroup's understanding of the LA context, your experience in design and your group's creativity to carry out the design task.
3. In the NEXT 15 MINUTES, carry out two parallel tasks:
    a. Each SUBGROUP designates TWO SCOUTS to go to the other TWO DESIGN CHALLENGE GROUPS to learn how they are addressing the SMART PARKING initiative from their perspective and the scouts bring back a summary to their own subgroup.

b. While the SCOUTS are out, each subgroup can begin to converge its design ideas into a presentation for the plenary session after lunch. This presentation should reflect (1) an understanding of the context of their challenge and (2) specific design ideas in response to the design task questions.

4. In the FINAL 25 MINUTES of your 90 MINUTES WORK TIME, review the SCOUTS' reports and determine what, if anything, needs to be iterated in your design or changed in the presentation based on this learning from the other perspectives. Be prepared to present on flipcharts after lunch in the plenary session.

Plenary Session

After lunch, the DESIGN GROUPS will share their results by challenge/perspective. This will be followed by feedback from the CIOs and Jerry Power as to their learning about SMART Organization Design and a short Q&A, followed by a future perspective by Jim Spohrer (IBM) from his wider view of Smart Service Systems Design.

DESIGN CHALLENGES – QUESTIONS AND DESIGN TASKS

I. How might we assemble LA Smart City constituents to coalesce on Smart Parking purpose, system boundaries, and mutual benefit?

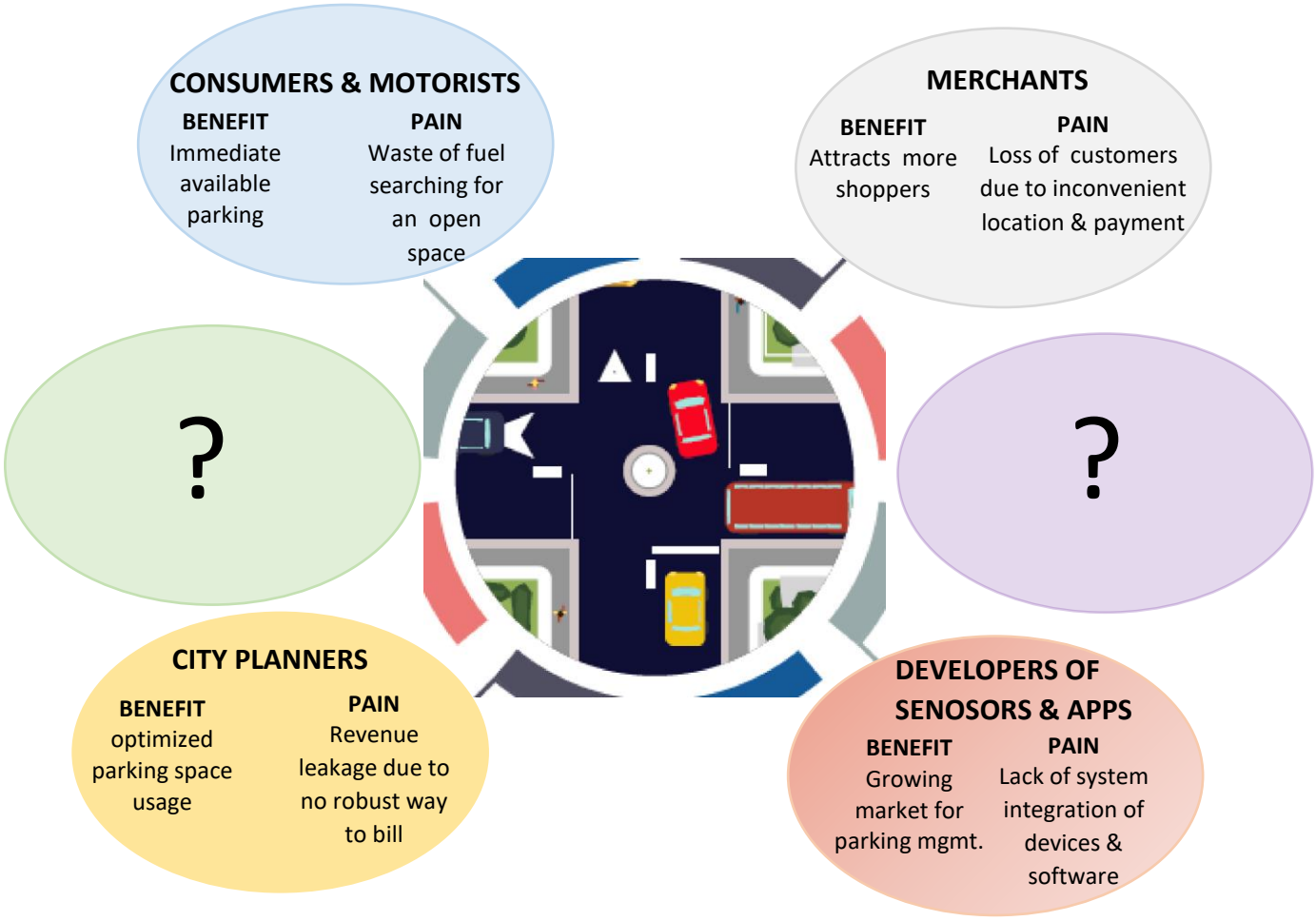
SmarT Organization Design socio-ecological perspective is about BOTH *continuously evolving a NEGOTIATED ORDER of system boundary and purpose among diverse interacting institutional actors AND simultaneous pursuit by those actors of ALTERNATE FUTURES*

Questions for Understanding the LA Metropolis Ecosystem

1. Who are the constituents LA SMART PARKING has already considered – see an example in the graphic below of how to identify constituents and their pain points with parking and benefits from Smart Parking that each may experience?

2. What steps have been taken so far to convene these constituents? And what has been agreed to so far?

SMART PARKING ECOSYSTEM



DESIGN TASK

How might we design the FURTHER engagement of these LA ecosystem members to agree on broad parameters of the SMART PARKING initiative – scope, timing, resources, etc. AND actively adapt the overall design as new opportunities + technologies present themselves?

Specifically:

- Do any additional participants need to be in these dialogues?
- What additional topics or questions might be key for these dialogues?
- What different forums could exist for these dialogues?
- What kind of engagement methodologies (e.g. how is I3 being used for trust-building) would augment collaboration and increase trust?
- How would the ecosystem members explore together their own distinctive alternative futures that inform the initiative as it progresses?

II. How might we define the workflow and the measures that are required for an effective work system that results in Smart Parking Value Creation with mutual benefit for all?

SmarT Organization Design socio-technical systems perspective is about BOTH *SELF-ORGANIZING WORK SYSTEMS with an optimal combination of human and technical capability for value creation AND a LEARNING INFRASTRUCTURE for scaling learning to the entire ecosystem to maintain rapid innovation*

Questions for Understanding the LA Metropolis Socio-technical System

1. What are the key outcomes that would define value creation for the Smart Parking service system?

2. What are key activities in the process of Smart Parking value creation?
   e.g. parking inventory management, searching for available parking, parking of vehicles, payment for parking, maintenance of parking infrastructure, etc.

3. Who are the major actors – human and technical – in the system?
   e.g. see example of actors and their respective roles in the graphic below

4. How does information get transferred among these roles? What are the feedback loops?

DESIGN TASK

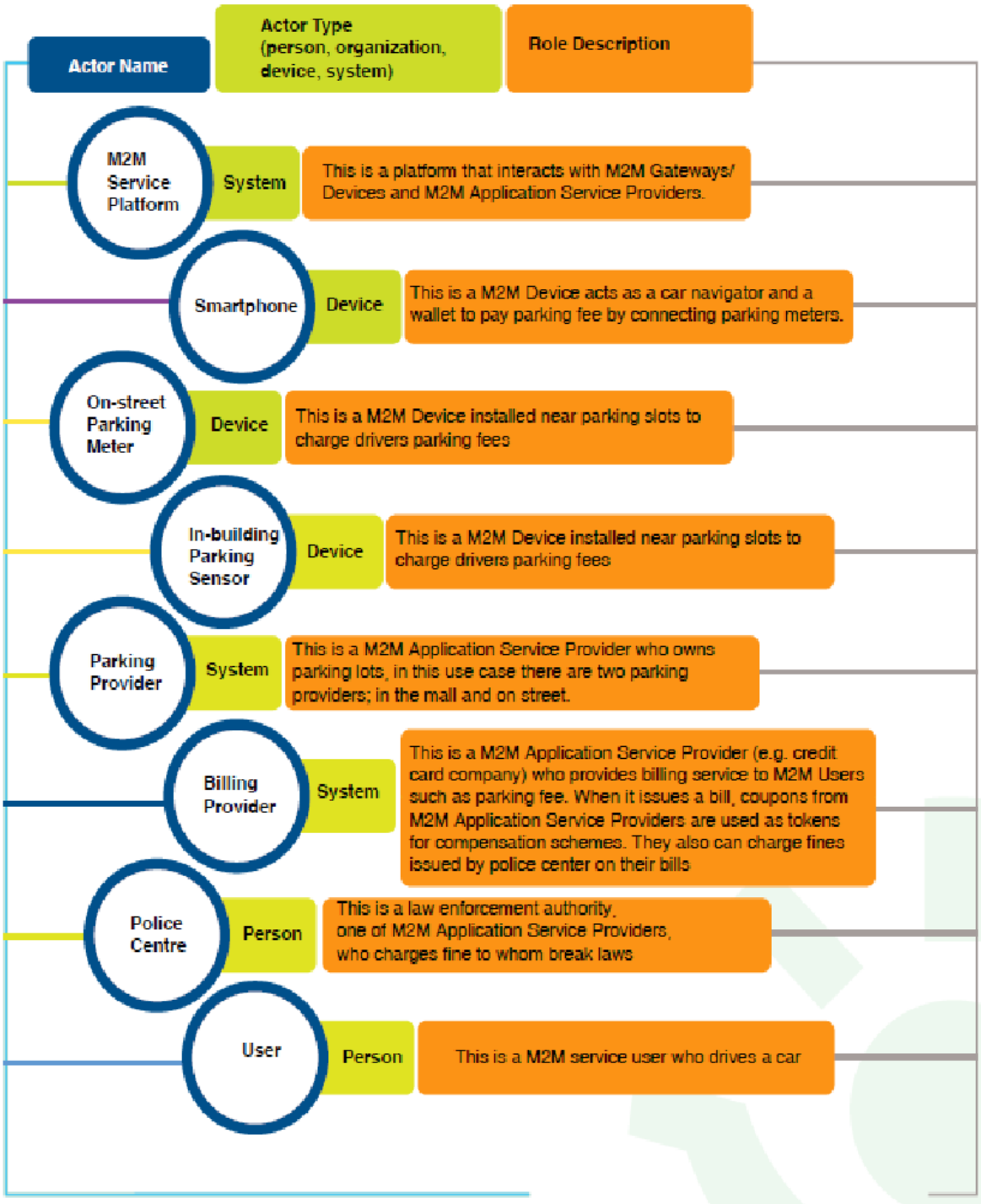
- How might we design a workflow for key activities that jointly optimizes constituents needs and make optimal use of technology?

  (e.g. allow for customer agency, i.e. preferences for parking indoors or out vs. prescribed by an algorithm according to parking vendors' need to fill to capacity)

- How might we measure in a way that learning can be scaled to the entire SMART PARKING ecosystem for rapid innovation?

  (e.g. Are we maximizing the revenue potential of facilities? What is the convenience that drivers' experience from this initiative?)

Actors involved



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III. How might we enable the shift in IT to a larger strategic role regarding SMART Transportation within the LA ecosystem?

SmarT Organization Design socio-psychological perspective is about BOTH culture enactment as a 'STABLE BRIDGE' for continuous development and growth of trust among diverse individuals and groups within bounded organizations and their ecosystem AND culture enactment as a 'DISRUPTIVE FORCE' to build new bridges to people with different thinking for a rapid pace of innovation.

Questions for Understanding the LA Metropolis Leadership and Culture

1. Who are the leaders who are driving the SMART PARKING initiative?
2. What is their "story" to the ecosystem? How is it communicated? By whom?
3. How do they bring in new ideas?

DESIGN TASK

- How might we design a new role/identity/persona that would help IT staff and departments engage in a larger strategic way with the LA municipal government and the wider LA ecosystem regarding SMART CITY transportation?
- What new (people, business, or technical) skills do IT staff and other Operational staff need to develop to work together in a larger strategic capacity?
- What, if any, new culture (vision and behavioral patterns) does the IT department need to develop in the mindset of the Los Angeles Metropolitan Areas governments, in order for IT to play a larger strategic role regarding SMART city transportation?

APPENDIX 1 – Greater Los Angeles Metropolitan Area (Wikipedia)

Los Angeles County, officially the **County of Los Angeles**,[7] in the Los Angeles metropolitan area of the U.S. state of California, is the most populous county in the United States,[8] with more than 10 million inhabitants as of 2018.[9] As such, it is the largest non–state level government entity in the United States. Its population is larger than that of 41 individual U.S. states. It is the third-largest metropolitan economy in the world, with a Nominal GDP of over $700 billion—larger than the GDPs of Belgium, Norway, and Taiwan.[10] It has 88 incorporated cities and many unincorporated areas and, at 4,083 square miles (10,570 km^2), it is larger than the combined areas of Delaware and Rhode Island. The county is home to more than one-quarter of California residents and is one of the most ethnically diverse counties in the U.S.[11]

Los Angeles City is one of the world's centers of media, business, and international trade. It is the second most populous city in the United States (Pop. 3,971,883). It is the county seat for Los Angeles County and is also California's most populous city. It is home to renowned institutions covering a broad range of educational and professional fields, and it is one of the most substantial economic engines of the United States. Los Angeles (and its Hollywood district) leads the world in producing entertainment such as motion pictures, television, and recorded music. Los Angeles has developed into one of the premier centers of economic and cultural activity in the world. It is also home to the Wilshire Grand Center, California's tallest building, standing at 1,100 feet tall.

Long Beach City is a coastal city in the Greater Los Angeles metropolitan area and is the seventh-most-populous city in California (Pop. 474,140). Long Beach partially borders the city of Los Angeles to its west and is home to the Grand Prix of Long Beach and the RMS *Queen Mary*, which is docked in Long Beach Harbor. The Port of Long Beach is one of the world's largest shipping ports. The city has a large oil industry and manufacturers of aircraft, automobile parts, electronic and audiovisual equipment. Long Beach has grown with the development of high-technology and aerospace industries in the area. The California State University system headquarters are in Long Beach, as is the second largest campus of the 23-school system, California State University, Long Beach.