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SPECIAL ISSUE ARTICLE

Governance and human rights implications of ASEAN's Smart Cities Network: a knowledge commons analysis

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Abstract
Launched in April 2018, the Association of Southeast Asian Nations' Smart Cities Network (ASCN) initiative raises important issues regarding the tensions between achieving smart city objectives on the one hand and protection of human rights on the other. The aim of this paper is to explore these tensions using a Knowledge Commons Framework analysis. I first analyse the three key pillars of the ASCN pilot city knowledge commons – knowledge resources, community attributes and governance 'rules in use' – using human rights criteria. I the apply the lessons of this analysis to two fundamental aspects of human experience in smart city contexts – mobility through transport systems and access to essential services through energy supply.

Keywords: ASEAN; smart cities; knowledge commons; artificial intelligence; human rights

1 Introduction

The problem explored in this paper is how best to protect basic human rights, especially of vulnerable and minority populations, while fulfilling key objectives of 'Smart City' projects in Southeast Asia. The Organisation for Economic Co-operation and Development (OECD) defines smart cities as 'initiatives or approaches that effectively leverage digitalisation to boost citizen well-being and deliver more efficient, sustainable and inclusive urban services and environments as part of a collaborative, multi-stakeholder process' (OECD, 2020). In Southeast Asia, Association of Southeast Asian Nations (ASEAN)'s Smart Cities Network (ASCN), launched at the 32nd ASEAN Summit on 28 April 2018, provides a forum for twenty-six pilot smart city projects to share lessons and resources towards a common goal of smart and sustainable urban environments (CLC, 2018).[1]

ASCN smart city policy and planning documents reflect the 'dominant vision of the smart city', as promoted by the corporate sector, international organizations, and national and local governments alike (Luque-Ayala and Marvin, 2020, p. 13). The vision is 'one of a digitally enhanced urbanity that combines intelligent infrastructure, high-tech urban development, the digital economy, and electronically enabled forms of citizenship' (Luque-Ayala and Marvin, 2020, p. 13). Focusing in their initial stages on interconnected transport, energy, water and waste management systems, ASCN pilot city projects are envisioned as highly intra-connected systems designed to maximise efficiencies in economic activity while minimising inefficiencies (CLC and ASEAN, 2018). The particular focus of this paper is on the human rights impacts of ASCN pilot city *transport* systems and *energy* systems.

[1]The twenty-six city locations selected for inclusion in the ASCN are Bandar Seri Begawan, Battambang, Phnom Penh, Siem Reap, Makassar, Banyuwangi, DKI Jakarta, Luang Prabang, Vientiane, Johor Bahru, Kuala Lumpur, Kota Kinabalu, Kuching, Nay Pyi Taw, Mandalay, Yangon, Cebu City, Davao City, Manila, Singapore, Bangkok, Chonburi, Phuket, Da Nang, Hanoi and Ho Chi Minh City.

These transport and energy systems use data, proprietary and non-proprietary information, and other knowledge resources to achieve agreed objectives. The creation and sharing of these knowledge resources are necessarily community-based, and thus will need to be governed by institutions and rules that are also community-based. ASCN pilot city projects thus give rise to typical 'knowledge commons' governance issues (Frischmann *et al*., 2014).

Taking inspiration from Ostrom's (1990) framework for studying commons arrangements in the natural environment, Frischmann *et al.* (2014) conceived of software sharing, data sharing and other knowledge sharing environments as 'knowledge commons' and developed a framework they called the Governing Knowledge Commons (GKC) framework for studying governance arrangements in these environments (Madison *et al*., 2010; Morell, 2014; Frischmann *et al*., 2014; Schweik and English, 2012). It is not within the intention or scope of this study to examine the GKC framework in detail. Rather, I draw inspiration from the GKC framework's understanding of knowledge as a commons. I argue that smart city environments can be understood as one type of knowledge commons, similar to online and other ecosystems within which creative and knowledge resources are shared. Knowledge commons need governance arrangements – a demand that arises from the community's need to overcome various social dilemmas associated with producing, preserving, sharing and using information, innovative technology and creative works.

Knowledge commons governance institutions and rules interact with, and are shaped by, the knowledge resources being created and shared. Governance institutions are also necessarily socially embedded within different geographical, historical, cultural and political contexts. The GKC framework is therefore built around three pillars – knowledge resources, community attributes and governance 'rules in use', as further explained below.

2 The Knowledge Commons Framework

This paper draws inspiration from the Knowledge Commons Framework (KCF), developed by Frischmann *et al.* (2014), which in turn was inspired in part by Ostrom's pioneering Institutional Analysis and Development (IAD) approach for studying commons arrangements in the natural environment (Ostrom, 2010; Hess and Ostrom, 2007). 'Knowledge commons' refers to an institutional approach (commons) to governing the production and management of a particular type of resource (knowledge). The ASCN pilot city project is understood here as a knowledge commons. The knowledge resources produced and managed within the ASCN pilot city project knowledge commons include the information, science, creative works, data and so on used and generated by the ASCN pilot city community. ASCN pilot city knowledge commons are thus understood here as built around three key pillars – knowledge resources, community attributes, and governance rules and institutions. These three pillars are interrelated and contingent. Interactions throughout the knowledge commons action arena create new intellectual resources, feeding back directly into resource characteristics, which in turn shapes community attributes and governance. The analysis presented below also incorporates the influences of external ASCN stakeholders, including higher-level governance institutions, external intellectual property owners and community member external connections (family members, knowledge-creation collaborators etc.).

The next part of this paper identifies human rights implications of smart city knowledge resources, ASC pilot city community attributes and ASC governance arrangements, respectively. Sections 3 and 4 then examine the human rights dilemmas that can and do arise specifically *within* smart city *transport* and *energy* systems, respectively. Reference is made throughout to specific ASCN pilot city projects, including those of Davao (ALMEC *et al*., 2018), New Yangon (AECOM, 2019) and Phnom Penh (Global Green Growth Institute, 2018), as well as to Siem Reap's sustainable city ambitions (Siem Reap Provisional Government *et al*., 2010). The analysis draws upon research relating to smart cities more broadly, as well as upon ASCN policy and planning documents available in English at the time of the research project (2019–2021). The ASCN policy and planning documents analysed include three key policy documents issued at the regional level (EAS, 2018; CLC, 2018; CLC and ASEAN, 2018); two

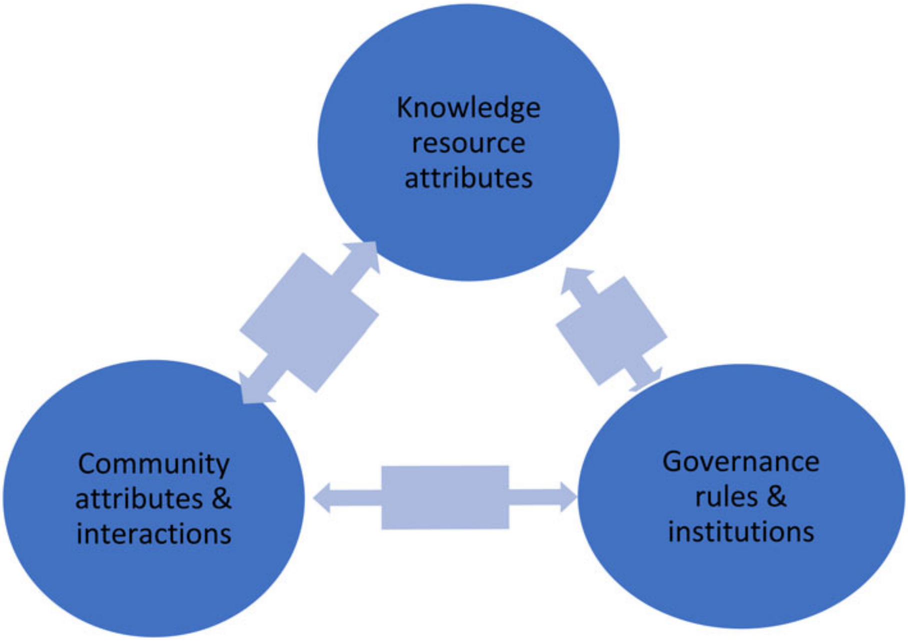

Figure 1. The Smart City Action Arena: diagram showing the interactions between knowledge resources, community and governance rules, and institutions in smart city ecosystems.

national-level smart city White Papers, focusing upon Phuket (Thailand: DEPA, 2019) and Kuching (Malaysia: KPKT, 2018), respectively; plus four city-level Master Plan documents: Myanmar's *New Yangon City Master Plan* (AECOM, 2019), Cambodia's sustainable city plans for Phnom Penh (Global Green Growth Institute, 2018) and Siem Reap (Siem Reap Provisional Government *et al.*, 2010) and the Philippines' Davao city development plan (ALMEC, 2018).

2.1 ASCN knowledge commons resources

A growing body of research examines different ways data-driven technologies are altering lives and cities. Patterns of living, working and movement in modern cities are increasingly shaped by technology-driven firms like Airbnb and Uber (Gurran and Phibbs, 2017; Gottlieb, 2013). So far, however, any beneficial effects of these transformations have accrued primarily to the already privileged, while the collateral damage has mostly been inflicted upon the vulnerable, rendering them homeless, unemployed and/or effectively isolated from essential services (Zuboff, 2019; Rainie and Anderson, 2017). More vulnerable, less privileged and minority communities have also borne the brunt of injustices wrought by algorithmically determined social security decisions (Alston, 2019), predictive policing and surveillance technologies (Shapiro, 2017; Rainie and Anderson, 2017; Chesterman, 2020).

Despite this growing body of evidence, however, investors and planners everywhere continue to promote the efficiency and other supposed benefits of utilising smart city technologies. This is as true of smart city projects in Southeast Asia as elsewhere. The language used in regional-level ASCN policy documents is of utilising new technologies to achieve goals of sustainability, inclusivity and growth. The idea is that ASEAN smart cities will 'invest in smart infrastructure to deliver multiple benefits across various stakeholders, … private, public [and] corporate…. [including] (i) smart utilities such as energy, … ; (ii) smart mobility and transportation' (CLC, 2018, p. 15). Key goals emphasised include efficiency, competitiveness and security. The *ASEAN Smart Cities Network* policy document (CLC, 2018) contains frequent mentions of efficiency (CLC, 2018: twenty-one times) and the need to be both competitive (CLC, 2018: thirteen times) and effective (CLC, 2018: thirteen times). Thailand's smart city framework and guidance document references the need for efficiency fifty-seven times, while the desire to develop 'a digital economy and society, in order to enhance … competitiveness' (DEPA, 2019, p. 5) is referred to on twenty-three occasions. In Malaysia, the government's 2018 smart cities framework policy document mentions efficiency seventy-seven times, effectiveness thirty-seven times and competitiveness thirty-one times (KPKT, 2018). The ASCN Smart City Action Plans document contains twenty-eight references to efficiency, eleven to effectiveness and seven references to competitiveness (CLC and ASEAN, 2018). Security is also defined as a key goal: smart cities 'can adopt effective technologies to solve urban security problems, strengthening … (ii) cybersecurity of networked infrastructure …, as well as (iii) public safety, city surveillance and crime prevention, among others' (CLC, 2018, p. 15).

Such vision statements, however, run the risk of ignoring the lessons of history when it comes to 'blank sheet' city planning in the name of efficiency. Green (2019/2020) highlights 'the significant challenges faced by early smart city efforts such as Masdar City in the UAE and Songdo, South Korea, both of which remain largely desolate, not to mention the failures of earlier *tabular rasa* cities such as Brasilia' (Green, 2019/2020, p. 154). Cities are not technological problems. Cities are complex ecosystems of human connections, needs and wants, shaped by culture, history and politics. Not surprisingly, therefore, successful smart city innovations have tended to be those that are cautious, tailored to meet specific local needs at a specific point in time – relating to a specific community event or local challenge (see e.g. Willis and Aurigi, 2018, pp. 160–161; Green, 2019/2020, pp. 121–125). When the main goal of smart city planning is to achieve idealised goals of competitiveness and efficiency, unintended social consequences, including perpetuation of pre-existing institutional bias, can result (Zuboff, 2019; Amis *et al.*, 2020; Bassett, 2013).

A key lesson of smart city experience is that any analysis of smart city knowledge resources must begin by recognising the interconnected and interacting nature of urban systems. Transport connections are designed to intersect with demand hubs (often sub-urban and outer-urban housing estates) and typically both overlap and interconnect with information and communications technology (ICT) networks. Housing hubs create demand for essential service infrastructure, including both transport and energy. Energy systems intersect with and help shape communications infrastructure, water and sanitation systems.

The intersected nature of smart city knowledge resources is itself a source of risks, related to both physical and human rights. When systems are interconnected, a failure in one part of one system can have escalating effects, causing system-wide then potentially even city-wide failures (WHO, 2009). When the distribution of these failures, or the allocation of repair priorities in their wake, are unevenly spread, human rights impacts are also unfairly felt. Similarly, the ways in which transport systems interconnect with communications and surveillance infrastructure can also shape individual encounters with the justice system in ways that can have disproportionate impacts on certain community sub-groups (Lyon, 2006; Morgan and Coughlan, 2018).

The creation, collection and sharing of data and other knowledge resources in smart city knowledge commons also raise issues of personal security and privacy that have significant human rights implications (Maria de Fuentes *et al.*, 2018; Huang *et al.*, 2017). Law enforcement arguments in favour of access to data relating to an individual's movements, energy consumption and/or health background must be weighed against the rights to privacy protect by human rights instruments (Klass and Wilson, 2016).

ASC knowledge commons will necessarily be constructed within the complex ecosystems of activities, practices and organisations that comprise the modern city. Each ASCN pilot city project will necessarily be located within a unique historical, cultural and political context. It is this context that shapes the relationship between the rights-related concerns of individuals living in ASCN pilot cities and their governance institutions. The next section of this paper thus explores the human rights concerns of ASCN pilot city communities in historical, social and political context.

2.2 ASCN pilot city community attributes

ASCN pilot city communities range from the most developed (Singapore, with USD$65,233 GDP/capita) to amongst the least prosperous (Yangon, less than USD$1,400 GDP/capita) within the ASEAN region (World Bank, 2020). ASCN pilot cities rank amongst the most heavily populated in SE Asia, including the region's largest cities of Ho Chi Minh City (population 13.3 million), Singapore (5.75 million) and Phnom Penh (2.18 million). New Yangon City will draw upon the 6.3 million current population of Yangon (AECOM, 2019). ASCN communities mostly share the attributes of the country within which they are located. Davao, for example, includes Muslim and other minority and tribal groups and languages not having any significant presence outside of the island of Mindanao, such as Maranao, Tagabawa, Matigsalog and Klata-Guiangan language groups. These include ethno-linguistic groups more closely related to those found in Sabah (Malaysia) or Indonesia (Kagan) than are found in central and northern Philippines. The population of the southern island of Mindanao, including Davao city, also includes a higher proportion of Islamic adherents than in the rest of the country, where Christianity remains the predominant religion (Garred, 2013). In contrast, the communities of Phnom Penh and Siem Reap reflect those of broader Cambodia, both cities being around 95 per cent Khmer and around 90 per cent Buddhist, and both, like Cambodia, having a young population with a median age of around twenty-five to twenty-six years. The main difference between the two Cambodian pilot cities lies in their relative levels of economic development, with Phnom Penh being amongst Cambodia's most prosperous cities, while Siem Reap remains amongst the poorest (World Bank, 2020).

An important characteristic of city communities relates to the level of social cohesion and social trust (social capital). Social capital is defined here as 'the features of social organisation, such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit' (Putnam, 1993, p. 36). Social capital can have negative as well as positive longer-term consequences. Examples include negative consequences highlighted by the COVID-19 pandemic (Schäfer *et al.*, 2020), where social networks have been both potential transmitting mechanisms for the virus and a source of strength in social resilience (see also Aldrich, 2017).

Social capital is often damaged or destroyed by warfare and can remain damaged for many years in post-conflict communities (Garred, 2013; Naoyuki, 2016). Davao, Phnom Penh and Siem Reap can all be considered post-conflict communities. Few community members in Davao remained untouched by the conflict between the Moro Islamic Liberation Front and Philippine government forces, not resolved until 2014 with the Bangsamoro Agreement (Garred, 2013; Naoyuki, 2016; Kovacs *et al.*, 2021). Davao's relatively greater level of ethno-linguistic and religious diversity also makes social capital linkages weaker at a city level. In Cambodia, while 'there was a strong sense of *samaki* (solidarity) and community spirit' following independence, these norms were torn apart when the country was plunged into prolonged civil armed conflict in 1970, made worse by Khmer Rouge genocide (Sen, 2012, p. 7). Especially in the urban city of Phnom Penh, the national government's seat of power, social capital remains severely damaged. This is less so in Siem Reap, located in a more rural context, where family bonds remain relatively strong, and which is located at a distance from national authorities. In Myanmar, the 2021 coup is having a devastating impact on the nation's relatively young population, including in Yangon.

Cities with low levels of social capital fared worst during the pandemic (Makridis and Wu, 2021). The ties existing throughout high social capital communities were instrumental in facilitating the effectiveness of public health measures. Social capital relationships were also instrumental in mobilising available reserves to overcome shortages of essential goods and personnel. 'Unnecessary' reserves, whether of personnel or supplies, have typically been considered inefficient 'redundancies' in supply chains and human resource management. Efforts have therefore been directed towards eliminating such reserves through 'just-in-time' sourcing and 'lean' staffing levels. These 'efficiencies', however, have resulted in fragile systems that have then broken down in times of crises. During the 2020 pandemic, supply chains collapsed, hospital and other essential public services were left under-staffed, and social trust in government messaging failed.

The resilient operation of smart city systems thus depends upon levels of shared trust amongst community members and between community members and local authorities. Local authorities, in turn, may well be tied into contractual relationships with private-sector owners and operators of public utilities and/or transport infrastructure. Only if system users trust those responsible for the operation of a system are they likely also to trust other users of the system. Conversely, loss of trust in one operator/aspect of the system can have destructive cascading impacts (Navarro-Carrillo *et al.*, 2018; Hasel, 2013; Ali, 2016; Aldrich, 2017). Social trust is intimately related to community member feelings of empowerment, involvement and engagement. Citizen involvement and engagement, in turn, are shaped by the institutions, rules and culture of city governance.

2.3 Governance features of ASCN pilot projects

Smart city development is often seen as an opportunity to enable a new relationship between citizens and city governance. Even those most critical of algorithmic governance models on the basis of threats posed to human rights, democratic and rule-of-law principles are likely to use those same models in an effort to enhance compliance with those same principles (Backer and McQuilla, in this issue). Governance goals regularly appear as a theme in discussions of smart city planning, with social inclusion and participatory forms of governance increasingly popular since the mid-2010s (Malek *et al.*, 2021; Simonofski *et al.*, 2019; 2021; Willems *et al.*, 2017; Vácha *et al.*, 2016; Ansell and Gash, 2008; Romzek *et al.*, 2012; Davis, 2019; Renckens, 2020). Recent literature has placed particular emphasis on 'the importance of citizen's participation' and the need for 'active involvement of all stakeholders in the *smartification* of the city' (Vácha *et al.*, 2016, p. 1, emphasis in original). The belief is that 'smart cities often do not optimally reach their objectives if the citizens, the end-users, are not involved in their design' (Simonofski *et al.*, 2019).

In line with this trend, ASCN policy documents outline goals that ostensibly include 'multiple collaborative governance mechanisms that actively engage national, sub-national and local governments, all groups of society, including youth, women and grassroots organizations and particularly the excluded, vulnerable and disadvantaged groups' (KPKT, 2018, p. 9).

Both the Phnom Penh and the New Yangon City plans describe governance goals that include promotion of social inclusivity (Global Green Growth Institute, 2018; AECOM, 2019). The *Phnom Penh Sustainable City Plan 2018–2030* (2019) outlines goals that include the desire to 'increase social inclusion, reduce poverty levels and improve urban welfare' (Global Green Growth Institute, 2018, p. 2). Social inclusion is defined (in a footnote) as:

> 'the act of making all groups of people within a society feel valued and important. It is the process of improving the terms on which individuals and groups take part in society – improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity.' (Global Green Growth Institute, 2018, p. 1, n. 1)

However, evidence demonstrating that smart city systems in fact benefit the most disadvantaged is either absent from ASCN policy documents or ambiguous at best (e.g. Global Green Growth Institute, 2018, p. 10). Despite the positive rhetoric and ambitious aims, there is recognition of the negative impacts that profit-driven city development has had on the vulnerable 'continuation of privatized development remains a risk for Phnom Penh's urban land-use and the vulnerability of its urban poor' (Global Green Growth Institute, 2018, p. 2; see also p. 10).

Analysis of key ASCN policy and planning documents also reveals that governance aspects of ASCN pilot projects are driven by 'top-down' design approaches. The governance goals of ASCN pilot city projects are mostly couched in terms of 'economic efficiency, the evaluation of results, rational design of institutions and bureaucratic or discretionary modes of pursuing generalized public interests' (Morgan, 2007, p. 1). The risk is that governance rules and institutions shaped by such considerations of efficiency and the achievement of generalised city-level goals will result in 'social practice that restricts rights' (Morgan, 2007, p. 1).

The words 'growth', 'development' and 'efficiency' appear prominently in city Master Plans for Davao (ALMEC *et al.*, 2018), New Yangon City (AECOM, 2019), Phnom Penh (Global Green Growth Institute, 2018) and Phuket (DEPA, 2019). 'Participation' receives only passing mention, mostly in relation to the private sector. There is little, or typically no, mention of concerns more typical of human rights advocates and scholars: questions of citizen voice, mobilisation or social change receive no mention. When these latter concerns are not recognised and not adequately addressed, the danger is that ASCN governance goals will ignore the basic tension that exists between 'inclusive' or 'participatory' forms of governance and protection of minority rights. As Vácha *et al.* (2016) warn, this can result in 'misuse of participation', which 'can lead to more damage than no participation at all' (p. 1).

The absence of citizen participation initiatives in ASCN pilot projects is in line with findings by Malek *et al.* (2021) in their comprehensive survey of the literature on social inclusion indicators in smart city projects. The authors found that 'the acceptance of social inclusion indicators was mainly limited to the realm of democratic developed countries' (Malek *et al.*, 2021, p. 376). This finding is supported by studies of smart city projects in the developed democracies of Sweden and Belgium (Simonofski *et al.*, 2021), London (Willems *et al.*, 2017), the US (Halegoua, 2020) and Taiwan (Luque-Ayala and Marvin, 2020, chapter 8). In contrast, social inclusion indicators tend not to be welcomed in emerging and developing countries, including those of Southeast Asia (Malek *et al.*, 2021, p. 376). In the ASEAN context, governance, including governance perspectives on citizen engagement, is top-down, shaped by national and regional approaches, and by leaders' understanding of citizenship (Malek *et al.*, 2021; Renshaw, 2019).

City-level governance institutions interact with provincial and national-level governance rules and structures. These interactions can be close, as in Singapore, where the smart city overlaps with national boundaries, or more remote, such as in Davao City or Kota Kinabalu, where the seat of national government is relatively distant. Yet the very nature of knowledge resources means that even where geographically distant, national governments can remain connected to, and can influence and control, smart city governance institutions. In Southeast Asia, national government policies and priorities are, in turn, shaped by regional (ASEAN) inter-governmental arrangements and agreements.

At the regional level, ASEAN governance dynamics and institutions have not always been consistent with protection of human rights, including protection of minority group interests (Davies, 2013; Tan, 2011; Renshaw, 2013; 2019; Hara, 2019). Thus, when the ten state members of ASEAN adopted the ASEAN Human Rights Declaration in November 2012, they affirmed 'all the civil and political rights in the Universal Declaration of Human Rights', but did so subject to the qualification that 'the realisation of human must be considered in the regional and national context bearing in mind different political, economic, legal social, cultural, historical and religious backgrounds' (Art. 7).

Similarly, when affirming 'all the economic, social and cultural rights in the Universal Declaration of Human Rights', ASEAN leaders agreed that each Member State '*should* take steps, individually and through regional and international assistance and cooperation, …, with a view to achieving progressively the full realisation of economic, social and cultural rights recognised in this Declaration' (Art. 33, emphasis added), while at the same time reserving the right for individual national governments to 'determine the extent to which they would guarantee the economic and social rights found in this Declaration to non-nationals, with due regard to … the organisation and resources of their respective national economies' (Art. 34).

Examples of how these reservations give rise to tensions between national governance institutions and minority rights include laws excluding certain sections of the Rohingya population in Myanmar from enjoying citizenship rights. There has also been an increasing tendency in recent years to resort 'to repressive new laws that are said to protect national security but in practice imperil human rights' (Amnesty International, 2016; see also HRW, 2016; Pennington, 2020; Amnesty International, 2014). Even before pandemic emergency declarations were issued in 2020, increasingly oppressive blasphemy laws (Amnesty International, 2014) and a new National Security Council Act 2016 were introduced in Indonesia and Malaysia, respectively. Other ASEAN nations witnessing an increasingly authoritarian use of national security and censorship laws include Vietnam (Onishi, 2020; HRF, 2020), Myanmar (Official Secrets Act; Unlawful Associations Act; Al Jazeera, 2019; Mahla and Noor, 2020), the

Philippines (Anti-Terrorism Act 2020;[2] Amnesty International, 2020; McCarthy, 2020; Mendoza and Romano, 2020) and Cambodia (Louise, 2020; Rinith, 2020).

The limited version of human rights protection within broader ASEAN governance institutions (Hara, 2019; Renshaw, 2019) now forms an integral part of the ASCN vision. The umbrella ASCN planning document issued by ASEAN in 2018 states that '[t]he ASCN will adopt an inclusive approach to smart city development that is respectful of human rights and fundamental freedoms *as inscribed in the ASEAN Charter*' (CLC, 2018, p. 10, emphasis added). In this context, it is particularly important to identify tensions arising between declared ASCN governance objectives and protection of human rights, and to begin considering how those tensions might be resolved.

A focus on technology as a governance tool is one source of tension. While some studies find that technological change is one of the two most important drivers of inequality since 1970 (UNIDO, 2015; Jovanovic, 2009), others conclude that the effects of technological change are a more complex mixture of both good and bad (ESCAP, 2018). An EU proposal for regulation of artificial intelligence (AI) recognises these complexities (European Commission, 2018; 2020). It notes that different types of risks are posed by AI in different sectors – transport, energy, health care or law and order (European Commission, 2018; 2020; High Level Expert Group on Artificial Intelligence, 2019). AI applications that have human rights impacts (direct or indirect) include those affecting privacy, freedom of assembly, movement and expression, and access to essential services (like clean water and electricity).

The central principle put forward in the EU proposals is that the greater the risks posed to basic rights by an AI application, the greater should be the degree of regulation that application faces. Such regulation would cover everything from the data used to train the AI and how records are kept, to how transparent the creators and operators of the system must be, testing for robustness and accuracy, and requirements for independent human oversight. Mechanisms for human oversight should include certification and assurances not only that the AI system is safe, but also that it does not lead to discriminatory outcomes or outcomes that would otherwise constitute a breach of basic human rights. When it comes to managing the disruptive effects of new AI systems, the European Commission has emphasised the centrality of 'an ecosystem of trust' (European Commission, 2018; 2020; High Level Expert Group on Artificial Intelligence, 2019).

The Institute of Electrical and Electronics Engineers (IEEE) has also turned its collective mind to the ethics of autonomous and intelligent systems (A/IS), with a particular emphasis on large and interconnected systems such as those found in smart city ecosystems. *Ethically Aligned Design* (IEEE, 2019) is a publication of the IEEE Global Initiative on Ethics of A/IS. EAD 2019 outlines eight key principles for AI systems design, including, at the top of the list, human rights and human well-being. 'Political freedom and democracy' and 'government accountability' are both recognised as key elements of human well-being. Yet this recognition is subject to 'the cultural precepts of individual societies' (IEEE, 2019, p. 10). Issues of redistributive justice are not addressed but are left for determination by human actors living in local, relational and essentially political contexts.

Accountability and transparency are central challenges of smart city governance. Many of these issues arise from new and increasing divisions of labour built into algorithmic governance models, including the smart city model. Those who harvest data may not be the same as those who develop analytics (Backer and McQuilla, in this issue), while smart city infrastructures may be underwritten by national and local governments but owned and/or operated by private actors. Accountability gaps are then highlighted when network system failures or breakdown occur. Which level of government bears the cost of infrastructure network failures may then depend upon a federated nation's constitutional division of powers and responsibilities. In Sarawak, liability for the fallout from the illegal use of fake covers for smart electricity meters in Miri was assumed primarily by Sarawak Energy, the state government agency. Sarawak Energy and its utility arm Syarikat Sesco Berhad (Sesco) bore estimated annual losses of RM80 million in 2018 and 2019 arising from the fraud, as well as the costs of

[2]Republic Act No. 11479, signed by President Duterte on 3 July 2020, effectively replacing the Human Security Act of 2007 from 18 July 2020.

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conducting meter inspection operations across the state in an attempt to curb the public safety risks arising from the meter tampering (Sarawak Energy, 2018; 2019). The scale of the fraud was such, however, that national government agencies (including the Malaysian Anti-Corruption Commission, the Ministry of Utilities and the Polis Di Raja Malaysia) also became involved.

Beyond accountability, there are the longer-term governance risks that may arise from declining levels of public trust in government agencies. Simply increasing the amount of lighting and the number of CCTV cameras in public spaces, for example, is unlikely to change levels of reporting of personal crimes affecting women and/or minority groups without a simultaneous change in policing cultures. Moreover, while there may be short-term successes, CCTV's long-term effectiveness in deterring criminal behaviour is still inconclusive and disputed internationally (*Surveillance & Society, 2009*). CCTV instalment alone does not tackle the underlying causes of violence or crime. Crime prevention technologies may simply result in the displacement and relocation of crime and its consequences (Lim and Wilcox, 2017). Likewise, surveillance technologies used to address family violence may make the victim temporarily safer in one context while increasing the extent of her isolation or exposure to danger in other contexts (Overington, 2017).

Issues of accountability and transparency also arise in constructing the legal relationship between government agencies and commercial suppliers of infrastructure and services (Yuan, 2020). These relationships can become particularly fraught when the interests of foreign states are implicated (Strangio, 2020; Hiebert, 2020; Jamrisko, 2019). In the ASEAN smart city context, Japan's International Cooperation Agency has partnered with local actors to develop sustainable and smart city plans for Davao (ALMEC *et al.*, 2018), New Yangon City (AECOM, 2019), Phnom Penh (Global Green Growth Institute, 2018) and Siem Reap (Siem Reap Provisional Government *et al.*, 2010). All of these planning documents, not surprisingly, incorporate Japanese models of successful smart city infrastructure (including high-speed rail, sustainable water supply and waste management systems). Funding from the Japanese Overseas Development Agency supports water system development in Siem Reap (Siem Reap Provisional Government *et al.*, 2010). Davao has partnered with the Japanese External Trade Organization (JETRO) and the Japanese Chamber of Commerce in Mindanao (JCCM) and signed a Green Sister City Cooperation agreement with Kitakyushu, the northernmost city on Japan's Kyushu Island (ALMEC *et al.*, 2018, pp. 10–26, 10–32).

In Thailand, on the other hand, it is China's Huawei that has partnered with the national Digital Economy Promotion Agency (DEPA) to develop the 2018 White Paper on smart city development in Phuket. According to Huawei's 2018 *Annual Report*, the firm has played an active role, 'contributing ideas to Thailand's Digital Economy and Society Commission regarding new technologies such as 5G, cloud and big data and engaging in government flagship projects' (p. 63). Huawei's involvement in Southeast Asian infrastructure projects remains controversial (Thu, 2019), caught up in broader controversies surrounding China's regional statecraft (Parameswaran, 2019).

Competing bids from Japanese-backed investors and Chinese-backed investment for infrastructure projects have generated political controversy and dissension within and between ASEAN member nations (Jamrisko, 2019; Hiebert, 2020; Strangio, 2020). Both China and Japan have placed infrastructure at the heart of their regional strategies in a new era of infrastructure diplomacy. China's flagship Belt and Road Initiative (BRI) was launched in 2013, while Japan announced its 'Partnership for Quality Infrastructure' in 2015 (Abe, 2015). ASEAN nations, reorienting their growth strategies towards prioritising infrastructure, have proven receptive (Prasad, 2018). Japanese involvement is highest in Vietnam, which has proven most resistant to China's overtures, while Chinese bids have been far more successful in Indonesia, Thailand and the Philippines (Jamrisko, 2019; Strangio, 2020; Hiebert, 2020). There remains little consensus within ASEAN on how to deal with Chinese firms, including Huawei, that have been blocked from bidding for major infrastructure projects in the US and other major Western economies (Kaushik, 2020). Nor is there any indication that ASEAN nations will alter their traditional diplomatic balancing of great power and regional and domestic relationships (Strangio, 2020; Hiebert, 2020) and it remains unlikely that any united approach will be developed that might diffuse contentious political aspects of particular projects.

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The importance of a whole-of-society approach to smart city development is highlighted in a 2018 McKinsey Global Institute discussion paper (McKinsey & Company, 2018). Acknowledging the interconnected nature of all key domains of smart city infrastructure, the rest of this study takes a closer look at the domains of mobility (transport infrastructure) and energy supply.

3 Focus on mobility

A 2018 McKinsey report estimates that intelligent transit solutions in ASEAN smart cities 'could save up to eight million man-years in annual commuting time', as well as saving 'some 5,000 lives lost each year to traffic accidents' (McKinsey & Company, 2018, p. 16). Intelligent transit solutions include both traffic control systems and 'smart' improvements to public transport systems, such as harmonised electronic ticketing and improved timetable co-ordination. Based on a comprehensive survey of the literature, McPherson and Mladenović (2014) identify five core values for evaluating such systems:

- mobility and accessibility;
- safety;
- environmental sustainability;
- privacy;
- broadly aesthetic considerations.

From a transit systems perspective, mobility essentially refers to ease of movement on the transportation system and can be defined as 'the ability of people and goods to move quickly, easily and cheaply to where they are destined' (McPherson and Mladenović, 2014, p. 7). Accessibility refers to the ease of reaching a chosen destination and includes considerations of how easy it is for the traveller to enter and use the transport system at relevant time(s) and for relevant purpose(s), such that travel objectives are achieved within acceptable cost limits. Time and location of travel vary according to purpose of travel – commuting to and from work or education, shopping for food, visiting friends or travel for leisure, all involve different considerations of cost, planning and logistics. There are also questions of the appropriate balance between active vs. mechanised travel, with their different packages of costs and benefits in terms of time, financial, environmental and health considerations. Improvements in overall safety from measures such as lower speed limits may come at the cost of reduced mobility and accessibility overall. Technological tools are most useful in assessing the trade-offs involved, but there will always be a very human balancing between socially and politically acceptable levels of speed vs. accident risks. The trade-off will differ both across geographies inside cities (school districts vs. commuter highways) and between different cities, cultures and societies. Similarly, giving emergency vehicles priority of access may come at the cost of decreased mobility for the majority, with the acceptable trade-off differing across societies.

ASCN Master Plan documents incorporate these considerations into broader planning goals. The New Yangon City Final Master Plan Report, for example, uses a 'Sustainable Systems Integration Model' (SSIM™) to evaluate three alternative options for a New City. New Yangon City will form a natural expansion of what is now Greater Yangon, over the river towards the west and south (AECOM, 2019). The SSIM™ model uses twelve criteria to evaluate each planning option, of which four criteria relate to accessibility: access to transit, access to bicycle network, access to parks and open space, and access to waterfront). The option selected as the preferred option, however, was not the option that scored highest on these four accessibility criteria. Nor did the preferred option perform best on the 'jobs closeness' criterion (which can be seen as another accessibility criterion). The preferred option instead was the one that scored highest on each of the 'green infrastructure' criteria of 'park space per capita' and 'natural drainage' (AECOM, 2019), illustrating the trade-offs that can become necessary in smart city planning between accessibility and sustainability.

A similar trade-off balances desire for greater transport system capacity and speed, with the costs and benefits of rearranging activities to reduce, or even eliminate, the need for vehicle use in daily living. This is the essential idea behind the '15-minute city' (Sisson, 2020; Whittle, 2020). Smart technologies alone

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will not lead to a rethinking of planning and location decisions, and are unlikely to reform key features of modern transport networks, such as wide lanes and traffic segregation. Rather, it is for human planners, designers and policy-makers to consciously seek out new relationships to understand mobility from the perspective of the most dependent, such as carers (usually women) with no access to private transport. Expanding pedestrian space, decreasing pedestrian-crossing distances and making streets navigable for children, the elderly and the disabled are solutions based on political, social and cultural considerations, not algorithmic ones. AI makes a good tool, for example to identify where speed humps or cameras will have the greatest impact, or to calculate relative benefits of different car park locations. But it needs social actors to decide what policy-related questions should be asked in the first place. Likewise, no matter what the numbers may say about the benefits of a particular planning decision, it takes political will to ensure it is implemented.

Smart traffic light systems are a common feature in ASCN pilot city plans. Smart traffic light systems, like the original traffic signal, comprise a set of engineering solutions used to address the need to control traffic flow through intersections. The ethical dimensions of 'smart' traffic control technology design are often neglected. It can be hard to accurately identify the true winners and losers of traffic control. Traffic lights create gaps in the traffic, thereby allowing pedestrians to cross, at the cost of traffic delay. Some studies have sought to demonstrate fuel-saving benefits through co-ordinated timing of signals with vehicle speed. Clever design of AI transit systems can add value to the beneficial effects. For example, one innovative solution using AI technologies involves 'islanding' (also used in energy systems) for the purpose of isolating traffic accident areas and diverting traffic into alternative routes while the injured are cared for, the incident investigated and the area cleared. This can facilitate faster resumption of normal traffic flow and help to minimise the health-care and other costs of the accident.

The 2019 Smart City Framework and Guidance for Thailand White Paper, *Smart City Services for Phuket*, is typical in emphasising the benefits of a smart traffic light system without consideration of countervailing downsides. Benefits are said to include a 'reduction in average travelling time and the resulting reduction of traffic congestion hours', an improvement in air quality and a reduction in the city's increasing road accident rate. Analysis and fieldwork underpinning the Phuket White Paper (produced by Thailand's DEPA) was conducted by a joint Huawei and Roland Berger Team. The conclusion is reached that a successful smart traffic light system for Phuket will need 'a strong network to ensure smooth connections between sensors, receptors and end-user interface so that published information could be as real time as possible' (DEPA, 2019, p. 53). Noting the absence of any regulatory hurdles limiting the launch of such a service, the Phuket White Paper also concludes that 'the key challenge will lie in the high amount of financial support required … in order to [install] a large enough number of vehicle detection sensors [able to] operate collectively together' (DEPA, 2019, p. 53). Not surprisingly, observations and recommendations made throughout the Phuket White Paper are favourable to Huawei and its private-sector partners.

But such analyses, through their focus on continual improvements to transit systems design, can, counter-intuitively, lead to 'design inertia' by maintaining assumptions that are embedded into earlier technologies without questioning them. They do not allow a fundamental rethink of urban planning, such as how to resolve basic conflicts of interest between pedestrians and car and bicycle users. It was innovative policy thinking and political strategy, not AI, for example, that introduced parking-protected bike lanes in New York. Such lanes allow bikes to move alongside the curb, replacing the traditional curb-side car parking zone, which is moved across a full lane into the road. This allows cyclists to avoid having to dodge parked cars and their doors. In New York, such lanes led to sharp decreases in cyclist traffic incidents and fatalities. Nor can AI be used to communicate the ethical significance of traffic control technology. Politically also, irritation over traffic congestion is easier to sell than moral indignation over the ethical implications of a society where technology and the car are reified.

AI can be used to both protect and to breach individual traveller rights to privacy (Joh, 2019). The effective operation of traffic control systems requires ongoing data collection and analysis. Even the most basic forms of data collection (such as a traffic count) can provide potential for identifying individuals and their location and/or movements. Increasing data density and quality and/or levels of analysis may improve effectiveness of the system's operation, but at the expense of privacy (Joh, 2019). Again, different societies will reach different conclusions about the acceptable trade-off between public order/public safety on the one hand and individual privacy on the other.

Considerations of environmental sustainability and public-space aesthetics often involve a trade-off between short-term costs and longer-term benefits. The environmental externalities of transportation (costs of pollution) need to be internalised in the shift towards sustainability. These internalised costs must somehow be shared between public and private economic actors, and agreement reached on how best to distribute the economic burden of achieving sustainable mobility goals. Well-designed traffic control systems have the potential to lower the environmental costs of human movement, but decisions still need to be made about the balance between public and private investment in different forms of transport infrastructure (public transport – trams, light-rail, bus lanes – vs. private car roadways).

In contexts with a tradition of private transport hiring, drivers can fulfil a valuable, albeit informal, social function that would be lost during a shift to government-controlled public transport systems. Travelling throughout rural and urban Myanmar between 2009 and 2015, for example, Matthew Mullen found that:

> 'Bus and taxi drivers were quite literally the vehicles of shadow markets. They would transport people, resources and opportunities around the junta's reach. Their function in Myanmar mirrored dynamics described in Sopranzetti's work (2014). Investigating the role of motorcycle taxis' in different Bangkok protests he concludes that motor-taxi drivers held "multiple roles, both as transport operators and as political mobilizers" (ibid.: 120). Taxi drivers in military-ruled Myanmar could mobilize opportunities, making them literal vehicles of change. Locals knew how to work these shadow markets.' (Mullen, 2016, p. 78)

Introducing 'smart' transport systems may eliminate such valuable social roles performed within the context of traditional forms of transport and may disrupt or destroy grass-roots potential for social change.

Most of the twenty-six cities within the ASEAN Smart City Network initiative have plans for long-term development of public transport systems involving consideration of the appropriate balance between public and private finance, operational responsibility and regulatory control. In Davao, for example, there are two initiatives driving long-term development of road-based public transport – the Asian Development Bank (ADB) funded Davao Public Transport Modernization Project and the Department of Transportation PUV Modernization (PUVM) Project. Both Projects 'represent a major shift in policy – from "hands-off-leave-everything to the private sector" into direct intervention and investments in bus and paratransit operation' (ALMEC *et al.*, 2018, para. 13.29). The current network of over 7,000 private operators of non-standard jeepneys and multi-cabs is to be replaced by not more than six bus operator franchises under government contract. Each operator will be responsible for a fleet of several hundred buses, driven by salaried drivers, deployed by a central fleet manager. Franchise-operated buses will have signal priority at intersections to ensure shorter travel times. Supporting infrastructure, including depots, terminals and bus stops, will be provided and maintained by the city government. An automated fare collection system will operate across all operators, with revenues pooled and collected by the city. An ADB Project loan to the national government supports the purchase of new buses, infrastructure and institutional development and traffic signalisation.

Evidence relating to the social impacts of Davao's planned new transport system remains ambiguous. An Initial Poverty and Social Analysis conducted for an earlier phase public transport improvement project in Davao (Project 45296005, 2015) found that it was essentially neutral in its impact on women, indigenous populations and other vulnerable groups, with overall benefits for the poor, who are most reliant upon public forms of transport and who are most impacted when public transport is inaccessible, dangerous and/or uncomfortable (ALMEC *et al.*, 2018). Further privatisation/modernisation may have less-neutral impacts, particularly in Southeast Asian contexts, where a turn to large business models may force the region's many small entrepreneurs out of the market.

4 Focus on smart energy

Electricity has been recognised as an essential service and access to reliable energy has been recognised as a basic human right (Tully, 2006; Hesselman *et al.*, 2017; Kovacic and Giampietro, 2015). Yet discussions of emerging and future energy technologies and AI-related rights issues more broadly have so far largely failed to 'speak' to each other. Planning and design of energy infrastructure for smart cities will inevitably change this. Smart city energy grid planning is all about how to integrate new digital communication technologies with new energy technologies. As new technologies continue to emerge, smart city planning and design must remain flexible enough to incorporate new developments and changes. For example, while energy systems have traditionally been recognised as unidirectional, with electricity flowing from supplier to consumer, new technologies are already beginning to transform energy systems into multidirectional networks, more closely resembling transport and communication systems. Household solar generation, for example, can now be connected to supply the grid during periods of maximum sunlight while still allowing the same household to consume grid energy at night and in winter (Katsanevakis *et al.*, 2017).

Sustainability as a policy goal in ASCN policy statements requires both diversity of energy sources and a balance between interconnectedness and self-reliance at the local level. 'Islanding' in energy systems refers to grid-enabled independent operating and the automated sharing of backup sources. The backup source allows the energy network within the 'islanded' area to remain operational when city-wide grid failure occurs. In addition to allowing independent operation of microgrids, the island mode when used in city power systems also facilitates flexible access to backup (stored) sources of energy. Backup storage can be used to keep the energy network within the 'islanded' area operational when city-wide grid failure occurs. If supply failure occurs at the node level, the networked system can be used to bypass that node. Sustainability and resilience can thereby be built into the fabric of the network (Energy Networks Association, 2015, paras 5.4.5–5.4.6).

Barriers to cost-effective microgrids include the technological immaturity of energy storage and control solutions, as well as regulations and standards required for safe operation in island mode. So far, solar PV and diesel or gas generators provide the most readily available mature technology options for energy supply, while bespoke microgrid solutions are also available in the market (Energy Networks Association, 2015, para. 5.4.6). Urban microgrids promote network reliability – the same motivation that drives city networks designed with in-built levels of redundancy. Urban microgrids also enable energy service suppliers to offer premium reliability to targeted customers (e.g. data centres, hospitals, emergency services). Locations where the general grid is not sufficiently reliable to satisfy demand requirements have a history of investing in batteries and other storage technologies (Bell and Gill, 2018; Abdel-Wahab and Ali, 2013). Microgrids can extend storage surplus supplies to multiple users and automation can be used to ensure smooth transition from general grid to backup. The costs of built-in redundancies/backup supplies can partly be offset by establishing the embedded microgrid as a trading entity, which provides market access (Energy Networks Association, 2015, para. 5.4.6). Energy network redundancies/surpluses can also provide both improved network resilience and broader access to affordable energy.

Safety is a key concern of regulators and network operators. For example, the potential implications of widespread, uncontrolled islanding on a city grid need to be controlled. Safety issues arise in the event of uncontrolled islanding when field staff have no way of verifying whether a line is energised. Network instability, where significant ad hoc synchronisation occurs, can also create dangerous conditions. Mechanisms for managing the safety and stability implications of microgrids include proper planning and design, and implementing proper procedures for operational management, backed up by management and staff training. An international standard, IEEE Guide 1547.4 (2011a), approved in 2011, sets out best-practice guidelines for the design, operation and integration of electric microgrid systems. It describes the various ways of separating microgrids from a main grid, including intentional islanding, and for reconnecting without breaking power supply to the islanded grid. IEEE Standard 2030 (2011b) provides best-practice guidelines for smart grid

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interoperability of energy technology with information technology. More recent efforts by the IEEE to develop guidelines for *Ethically Aligned Design* (IEEE, 2019) were described above. Like other such attempts to develop 'universal' ethical guidelines, however, the EAD 2019 principles recognise, as they must, that questions of social and redistributive justice (such as the right of a commercial energy retailer to cut off energy supply to a non-paying user) can only be answered by human actors in relational and essentially political contexts.

Diversity and *flexibility* are key characteristics of evolving and future energy technologies. New forms of distributed energy resources offer a diverse range of options including solar PV systems (which may or may not be rooftop), battery storage systems, automated hot water systems and/or smart heating and/or cooling systems. Localised community-scale projects such as microgrids also offer alternative distributed energy options. There are also choices to be made when integrating the 'smart' city into the regional (not necessarily national) network. Questions of integration arise especially with wind generation (some sites are windier than others), but also with solar (it can be cheaper to install large ranks of solar panels in a sunny place than have them individually owned). Cities, as places of dense population, are logical zones wherein the 'mass systems' approach is economically preferable to the 'collection of individually owned technology' approach (Bennett and Chorley, 1978; Martine, 2009), but this gives rise to questions of boundaries and definitions. How far city networks should be allowed to extend beyond urban limits eventually becomes a political question of governance and territorial jurisdiction.

Diversity and *flexibility* are also important considerations in areas of regulatory concern for energy systems. Transparency and accountability are central to both diversity and flexibility. Energy regulators and suppliers now use an increasingly diverse range of communication strategies to engage with consumers and other stakeholders. Consumers, in turn, communicate and engage with other stakeholders for a diverse range of reasons and at differing levels of engagement:

- when they make choices about the energy retailer they deal with and the pricing package 'offer' they accept;
- when they pay their energy bill;
- when they notify the retailer/supplier of a change in service usage;
- when they lodge a complaint about billing or energy supply/service;
- when they respond to retailer/supplier/regulator market surveys.

Each of these forms of engagement can take place through a diverse range of communication channels – face to face (at retailer shop front level), by post and/or electronically. Some sectors of the energy consumer community, such as the disabled, may be precluded from one or more forms of communication.

Diverse communities also desire greater flexibility and a range of options for energy delivery. More vulnerable customers may require greater reliability of energy supply while being less able to pay. Decisions about how best to support such consumers are necessarily made by human actors in relational contexts, at the public policy, administrative and service supply levels. Demand–response systems can be used to allow diverse consumers to vary the timing of their consumption in response to variable pricing, rewards, penalties or other incentives. Centrally controlled demand–response management allows central administrators to handle peak demands by cutting supply to small groups of consumers for short periods of time instead of, for example, imposing city- or district-wide brownouts. Discount pricing can be offered to customers who agree to be switched off for agreed periods of time. New marketing arrangements and the potential for third-party platforms and vendors to enter the market also provide possibilities for peer-to-peer trading, demand–response aggregation and other market mechanisms. Both demand–response systems and tailored marketing depend for their effectiveness upon digital communication and AI technologies, and so provide possibly the clearest example of energy and digital technologies 'talking' to each other. An Australia-based study of 'the Future Grid' found that future energy grids will be characterised primarily by increasing distributed technology resources, demand–response and emerging market arrangements requiring complex grid-based communication (Nicholls *et al.*, 2019). The same study also emphasised the central role of an effective stakeholder engagement strategy.

Effective stakeholder engagement has several aspects. The first is co-ordination. There needs to be a lead organisation, which could be a public-sector organisation or a private-industry-sector organisation, able to accept responsibility for developing and implementing guiding principles. These guiding principles form the basis for increasing collaboration across energy-related organisations to ensure all share responsibility for building trust in the energy sector. Transparency and accountability in decision-making are central to building trust, which in turn is central to good consumer outcomes and behaviour. Transparency and accountability demand regulatory responses that address consumer concerns and priorities, make clear the grounds for decisions made and explain the limitations of alternative approaches. Natural language, not requiring familiarity with technical and/or legal terminology, should be used in all communications, using forms of engagement, electronic or otherwise, that are as simple and quick as the message allows. Consultation with all stakeholders should be early, recursive (two-way) and ongoing. Recursive engagement means engagement between stakeholders based on principles of reciprocity. It means that communications are never one-way, but always in a form that allows feedback, response and/or follow-up.

5 Conclusion

A central consideration underlying all smart city planning is the question of whether, overall and on balance, the quality of people's lived experience is improved. Quality of life is defined as the fullest enjoyment of all human rights. In this paper, I have argued that analysing the human rights impacts of smart city projects requires a perspective that recognises the interconnected, relational, evolving and contingent nature of city ecosystems. Like all living ecosystems, modern cities must find ways of addressing problems of the commons. The focus of this paper is on the smart city analysed as a knowledge commons and the question addressed is how problems of the commons can be addressed with due regard to human rights. The smart city knowledge commons comprises interconnected knowledge resources, community attributes and the governance framework for intra- and interrelationships between knowledge resources and community members. Each of these three pillars of the smart city knowledge commons interacts with, is shaped by and shapes the other elements.

Drawing inspiration from the GKC framework developed by Frischmann *et al.* (2014), this paper first analysed the interconnected constituent elements of ASCN smart city knowledge commons – ASCN city project knowledge resources, ASCN community characteristics and ASCN governance institutions. I then explored some of the governance and human rights issues arising in ASCN pilot city arrangements for 'smart mobility' and 'smart energy'. The top-down governance style and relatively weak influence of civil society on regulatory initiatives that characterise Southeast Asian polities was noted. AI-driven public participation in ASCN pilot city governance is not a feature of current ASCN pilot city projects. Yet the ASCN pilot city project can still be conceived of as living, evolving, relational and interrelated ecosystems. The future evolution of these ecosystems will be just as dependent upon the community as upon technology or governance institutions. Understanding smart city projects as living ecosystems facilitates the identification of human rights impacts of smart city developments and a pathway to understanding the effectiveness of different strategies for addressing systemic injustice.

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References

Abdel-Wahab M and Ali D (2013) A conceptual framework for the evaluation of fuel-cell energy systems in the UK built environment. *International Journal of Green Energy* **10**, 137–150.

https://doi.org/10.1017/S1744552322000441 Published online by Cambridge University Press

Abe (2015) *The Future of Asia: Be Innovative*. Speech by Prime Minister Shinzo Abe at the Banquet of the 21st International Conference on the Future of Asia, 21 May. Available at: https://japan.kantei.go.jp/97_abe/statement/201505/0521foas-peech.html (accessed 3 September 2022).

AECOM (2019) *New Yangon City Final Master Plan Report*. 24 May. New Yangon Development Company Ltd. Available at: https://www.nydc.com.mm/wp-content/uploads/2019/05/Master-Plan-Summary.pdf (accessed 9 November 2020).

Al Jazeera (2019) Myanmar using 'oppressive laws' against peaceful critics: *HRW*, 1 February.

Aldrich D (2017) The importance of Social Capital in Building Community Resilience. In Yan Wanglin and Galloway W (eds), *Rethinking Resilience, Adaptation and Transformation in a Time of Change*. New York: Springer International Publishing, pp. 357–364.

Ali S (2016) *Governing Disasters: Engaging Local Populations in Humanitarian Relief*. New York: Cambridge University Press.

ALMEC Corporation, Oriental Consultants Global Co., Ltd. and EX Research Institute Ltd (2018) *Davao City Infrastructure Development Plan and Capacity Building Project. IM4Davao: Infrastructure Modernization for Davao City, Final Report Vol. 2*. June. Japan International Cooperation Agency, National Economic and Development Authority (NEDA) and City Government of Davao.

Alston P (2019) *Report of the Special Rapporteur on Extreme Poverty and Human Rights: The Digital Welfare State*. UN Doc. A/74/48037. 11 October. New York: UN.

Amis J, Mairn J and Munir K (2020) The organizational reproduction of inequality. *Academy of Management Annuls* **14**, 195–230.

Amnesty International (2014) *Prosecuting Beliefs: Indonesia's Blasphemy Laws*. AI Index: ASA 21/018/2014, November.

Amnesty International (2016) Malaysia: National Security Council Act gives authorities unchecked and abusive powers. Press Release, 1 August.

Amnesty International (2020) Philippines: dangerous anti-terror law yet another setback for human rights. Press Release, 3 July.

Ansell C and Gash A (2008) Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, **18**, 543–571.

Bassett D (2013) Deconstruct and superstruct: examining bias across the legal system. *UC Davis Law Review* **46**, 1563–1582.

Bell K and Gill S (2018) Delivering a highly distributed electricity system: technical, regulatory and policy challenges. *Energy Policy* **113**, 765–777.

Bennett R and Chorley R (1978) *Environmental Systems: Philosophy, Analysis and Control*. Princeton, NJ: Princeton University Press.

Chesterman S (2020) Artificial intelligence and the limits of legal personality. *International and Comparative Law Quarterly* **69**, 819–844.

CLC (Centre for Liveable Cities) (2018) *ASEAN Smart Cities Network*. Singapore Ministry of Foreign Affairs: CLC Publications.

CLC and ASEAN (2018) *Annex E: ASEAN Smart Cities Network Focus Areas and Projects of Cities*. Updated 9 May 2018. Singapore.

Davies M (2013) ASEAN and human rights norms: constructivism, rational choice and the action-identity gap. *International Relations of the Asia-Pacific* **13**, 207–231.

Davis E (2019) Commentary on collaborative governance dynamics. In Butler WH and Schultz CA (eds), *A New Era for Collaborative Forest Management: Policy and Practice Insights from the Collaborative Forest Landscape Restoration Program*. Oxford: Routledge.

DEPA (Digital Economy Promotion Agency) (2019) *Smart City Framework and Guidance for Thailand: Smart City Services for Phuket*. Bangkok: DEPA.

EAS (East Asia Summit) (2018) *East Asia Summit Leaders' Statement on ASEAN Smart Cities*. 13th East Asia Summit, 15 November 2018. Available at: https://www.usascp.org/sites/default/files/Resources/document%20archive/EAS-Statement-on-ASEAN-Smart-Cities%2011-15-18.pdf (accessed 12 December 2020).

Energy Networks Association (2015) *Embedded Generation Project – Final Report (November)*. Prepared by CSIRO and Marchment Hill Consulting. Available at: https://www.energynetworks.com.au/resources/reports/the-embedded-generation-project-final-report/ (accessed 3 September 2022).

ESCAP (United Nations Economic and Social Commission for Asia and the Pacific) (2018) *Inequality in Asia and the Pacific in the Era of the 2030 Agenda for Sustainable Development*. 74th Commission Session. Bangkok: United Nations.

European Commission (2018) *Communication Artificial Intelligence for Europe*. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe. Brussels COM/2018/237 final.

European Commission (2020) *White Paper: On Artificial Intelligence: A European Approach to Excellence and Trust*. 19 February. Brussels. COM (2020).

Frischmann BM, Madison MJ and Strandberg KJ (eds) (2014) *Governing Knowledge Commons*. New York: OUP.

Garred M (2013) The power of mindsets: bridging, bonding, and associational change in deeply divided Mindanao. *Journal of Civil Society* **9**, 21–40.

Global Green Growth Institute (2018) *Phnom Penh Sustainable City Plan 2018–2030*. Phnom Penh: Global Green Growth Institute.

Gottlieb C (2013) Residential short-term rentals: should local governments regulate the 'industry'? *Planning and Environmental Law* **65**, 4–9.

Green B (2019/2020) *The Smart Enough City: Putting Technology in its Place to Reclaim Our Urban Future*. Cambridge, MA: The MIT Press.

Gurran N and Phibbs P (2017) When tourists move in: how should urban planners respond to Airbnb? *Journal of the American Planning Association* **83**, 80–92.

Halegoua G (2020) *The Digital City*. New York: New York University Press.

Hara A (2019) The struggle to uphold a regional human rights regime: the winding role of ASEAN Intergovernmental Commission on HR (AICHR). *Revista Brasileira de Politica Internacional* **e011**.

Hasel M (2013) A question of context: the influence of trust on leadership effectiveness during crisis'. *M@n@gement* **16**, 264–293.

Hess C and Ostrom E (2007) *Understanding Knowledge as Commons: From Theory to Practice*. Cambridge, MA: MIT Press.

Hesselman M *et al.* (eds) (2017) *Socio-economic Human Rights in Essential Public Services Provision*. New York: Routledge.

Hiebert M (2020) *Under Beijing's Shadow: Southeast Asia's China Challenge*. Washington: Center for Strategic & International Studies.

High Level Expert Group on Artificial Intelligence (2019) *Ethics Guidelines for Trustworthy Artificial Intelligence*. 8 April. European Commission, Brussels.

HRF (Human Rights Foundation) (2020) *Vietnam's COVID Success Belies Escalating Crackdown on Rights*. 10 August. Available at: https://hrf.org/press_posts/vietnams-covid-success-belies-escalating-crackdown-on-rights/ (accessed 9 November 2020).

HRW (Human Rights Watch) (2016) Malaysia: new law gives government sweeping power. Press Release, 2 August.

Huang Q *et al.* (2017) Secure and privacy-preserving data sharing and collaboration in mobile healthcare social networks of smart cities. *Security and Communication Networks* **2017**. Available at: https://doi.org/10.1155/2017/6426495 (accessed 23 August 2022).

Huawei Investment and Holding Co. Ltd (2018) *2018 Annual Report*. Shenzhen.

IEEE (Institute of Electrical and Electronics Engineers) (2011a) *IEEE 1547.4–2011-IEEE Guide for Design, Operation, and Integration of Distributed Resource Island Systems with Electric Power Systems*. Available at: https://standards.ieee.org/standard/1547_4-2011.html (accessed 2 November 2020).

IEEE (2011b) *IEEE 2030–2011-IEEE Guide for Smart Grid Interoperability of Energy Technology and Information Technology Operation with the Electric Power System (EPS), End-use Applications, and Loads*. Available at: https://standards.ieee.org/standard/2030-2011.html (accessed 17 November 2020).

IEEE (2019) *Ethically Aligned Design*. NJ: The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems.

Jamrisko M (2019) China no match for Japan in Southeast Asia infrastructure race. *Bloomberg News*, 23 June.

Joh E (2019) Policing the smart city. *International Journal of Law in Context* **15**, 177–182.

Jovanovic B (2009) The technology cycle and inequality. *Review of Economic Studies* **76**, 707–729.

Katsanevakis M, Stewart RA and Lu JW (2017) Aggregated applications and benefits of energy storage systems with application-specific control methods: a review. *Renewable and Sustainable Energy Reviews* **75**(C), 719–741.

Kaushik P (2020) What can Southeast Asia learn from the international Huawei debate? *ASEAN Today*, 10 February.

Klass AB and Wilson EJ (2016) Remaking energy: the critical role of energy consumption data. *California Law Review* **104**, 1095–1158.

Kovacic Z and Giampietro M (2015) Empty promises or promising futures? The case of smart grids. *Energy* **93**, 67–74.

Kovacs MS, Höglund K and Jiménez M (2021) Autonomous peace? The Bangsamoro region in the Philippines beyond the 2014 Agreement. *Journal of Peacebuilding and Development* **16**, 55–69.

KPKT Ministry of Housing and Local Government, Malaysia (2018) *Malaysia Smart City Framework: Executive Summary*. Kuala Lumpur. Available at: https://www.kpkt.gov.my/kpkt/resources/user_1/GALERI/PDF_PENERBITAN/FRAMEWORK/FRAMEWORK_SMART_CITY_EXECUTIVE_SUMMARY.pdf (accessed 3 August 2022).

Lim H and Wilcox P (2017) Crime reduction effects of open street CCTV: conditionality considerations. *Justice Quarterly* **34**, 597–626.

Louise J (2020) Covid-19 and Cambodia's human rights concerns. *Open Development Mekong*, 4 April.

Luque-Ayala A and Marvin S (2020) *Urban Operating Systems: Producing the Computational City*. Cambridge, MA: The MIT Press.

Lyon D (2006) *Theorizing Surveillance: The Panopticon and Beyond*, 1st edn. Devon: Willan Publishing.

Madison MJ, Frischmann BM and Strandburg KJ (2010) Constructing commons in the cultural environment. *Cornell Law Review* **95**, 657–710.

Mahla D and Noor H (2020) Rohingya are being left to die at sea: does anyone care? *NIKKEI Asia*, 16 September.

Makridis CA and Wu C (2021) How social capital helps communities weather the COVID-19 pandemic. *PLoS ONE* **16**, e0245135.

Malek J *et al.* (2021) Social inclusion indicators for building citizen-centric smart cities: a systematic literature review. *Sustainability* **13**, 376–395.

https://doi.org/10.1017/S1744552322000441 Published online by Cambridge University Press

Maria de Fuentes J *et al.* (2018). Attribute-based credentials for privacy-aware smart health services in IoT-based smart cities. *Computer* **51**, 44–53.
Martine G (2009) Population dynamics and policies in the context of global climate change. In Guzman JM *et al.* (eds), *Population Dynamics and Climate Change*. London: UNFPA and IIED, pp. 9–30.
McCarthy J (2020) Why rights groups worry about the Philippines' new Anti-Terrorism Law. NPR, www.npr.org, 21 July.
McKinsey & Company (2018) *Smart Cities in Southeast Asia*. Discussion Paper, McKinsey Global Institute for the World Cities Summit, Singapore, July.
McPherson T and Mladenović M (2014) *Ethical Principles for the Design of Next-generation Traffic Control Technology*. 1 September. Virginia Tech ISCE Applied Ethics Initiative Sponsored Paper. Available at: https://philarchive.org/archive/MLAEPF (accessed 13 November 2020).
Mendoza R and Romano D (2020) The Philippines Anti-Terrorism Act: who guards the guardians? *The Diplomat*, 6 July.
Morell MF (2014) Governance of online creation communities for the building of digital commons: viewed through the framework of the institutional analysis and development. In Frischmann BM, Madison MJ and Strandberg KJ (eds), *Governing Knowledge Commons*. New York: OUP, pp. 281–312.
Morgan A and Coughlan M (2018) Police use of CCTV on the rail network. *Trends & Issues in Crime and Criminal Justice* **561**, Canberra: Australian Institute of Criminology.
Morgan B (2007) *The Intersection of Rights and Regulation: New Directions in Sociolegal Scholarship*. Aldershot: Taylor & Francis.
Mullen M (2016) *Pathways that Changed Myanmar*. London: Zed Books.
Naoyuki O (2016) The Mindanao conflict: efforts for building peace through development. *Asia-Pacific Review* **23**, 37–59.
Navarro-Carrillo G *et al.* (2018) Do economic crises always undermine trust in others? The case of generalized, interpersonal, and in-group trust. *Frontiers in Psychology* **9**, article 1955.
Nicholls L *et al.* (2019) *Engaging Households Toward the Future Grid: Experiences, Expectations and Emerging Trends*. Melbourne: Center for Urban Research, RMIT University.
OECD (2020). *Smart Cities and Inclusive Growth*. Policy Paper. Paris: OECD. Available at: https://www.oecd.org/cfe/cities/OECD_Policy_Paper_Smart_Cities_and_Inclusive_Growth.pdf (accessed 3 September 2022).
Onishi T (2020) Hanoi's 'train street' cafes quietly reopen for business. *NIKKEI Asia*, 8 November.
Ostrom E (1990) *Governing the Commons: The Evolution of Institutions for Collective Action*. New York: OUP.
Ostrom E (2010) The institutional analysis and development framework and the commons. *Cornell Law Review* **95**, 807–815.
Overington C (2017) We need to be cautious when assuming CCTV will prevent family violence. *The Conversation*, 20 June. Available at https://theconversation.com/we-need-to-be-cautious-when-assuming-cctv-will-prevent-family-violence-78250 (accessed November 2020).
Parameswaran P (2019) US-China 5 G war: Southeast Asia battleground in focus with Huawei's first test bed launch. *The Diplomat*, 22 February.
Pennington J (2020) Lèste Majesté in Thailand: the junta's most effective tool of oppression? *ASEAN Today*, 14 June.
Prasad R (2018) The China-Japan infrastructure nexus: competition or collaboration? *The Diplomat*, 18 May.
Putnam RD (1993) The prosperous community. *The American Prospect* **4**, 35–42.
Rainie L and Anderson J (2017) *Code-dependent: Pros and Cons of the Algorithm Age*. Washington, DC: Pew Research Center.
Renckens S (2020) *Private Governance and Public Authority: Regulating Sustainability in a Global Economy*. Cambridge: Cambridge University Press.
Renshaw C (2013) The ASEAN Human Rights Declaration 2012. *Human Rights Law Review* **13**, 557–559.
Renshaw C (2019) *Human Rights and Participatory Politics in Southeast Asia*. Philadelphia: University of Pennsylvania Press.
Rinith T (2020) Human rights amid Covid-19 in Cambodia. *Open Development Mekong*, 12 June.
Romzek B *et al.* (2012) A preliminary theory of informal accountability among network organisational actors. *The American Society for Public Administration* **72**, 442–453.
Sarawak Energy (2018) SESCO-MACC joint operation busts largest meter tampering syndicate in Miri. Media release, 29 August, Kuching. Available at: https://www.sarawakenergy.com/media-info/media-releases/2018/sesco-macc-joint-operation-busts-largest-meter-tampering-syndicate-in-miri (accessed 3 September 2022).
Sarawak Energy (2019) More tampered electricity meters with face covers in Miri. Media release, 18 June, Kuching. Available at: https://www.sarawakenergy.com/media-info/media-releases/2019/more-tampered-electricity-meters-with-fake-covers-in-miri (accessed 23 August 2022).
Schäfer SK *et al.* (2020) Impact of COVID-19 on public mental health and the buffering effect of a sense of coherence. *Psychotherapy and Psychosomatics* **89**, 386–392.
Schweik CM and English RC (2012). *Internet Success: A Study of Open-source Software Commons*. Cambridge, MA: The MIT Press.
Sen V (2012) Social capital in an urban and a rural community in Cambodia. *Cambodia Development Review* **16**, 6–10.
Shapiro A (2017) Reform predictive policing. *Nature* **54**, 458–460.
Siem Reap Provisional Government, JICA, Pacet Corporation and Nippon Koei Co. Ltd (2010) *The Follow-up Study on Integrated Master Plan for Sustainable Development of Siem Reap City in the Kingdom of Cambodia, Final Report*. June. Tokyo: Japan International Cooperation Agency (JICA).

Simonofski A *et al.* (2017) *Citizen Participation in Smart Cities: Evaluation Framework Proposal,* 2017 IEEE 19th Conference on Business Informatics (CBI), Thessaloniki, Greece, 24–27 July, pp. 227–236, doi: 10.1109/CBI.2017.21.
Simonofski A *et al.* (2019) Hearing the voice of citizens in smart city design: the CitiVoice Framework. *Business & Information Systems Engineering* **61**, 665–678.
Simonofski A *et al.* (2021) Investigating context factors in citizen participation strategies: a comparative analysis of Swedish and Belgian smart cities. *International Journal of Information Management* **56**, 10211.
Sisson P (2020) What is a 15-minute city? *City Monitor*, 21 September.
Strangio S (2020) *In the Dragon's Shadow: Southeast Asia in the Chinese Century*. New Haven: Yale University Press.
Surveillance & Society (2009) Relaunch Issue: Revisiting video surveillance. Available at: https://ojs.library.queensu.ca/index.php/surveillance-and-society/issue/view/Relaunch (accessed 2 November 2020).
Tan HL (2011) *The ASEAN Intergovernmental Commission on Human Rights: Institutionalising Human Rights in Southeast Asia*. Cambridge: Cambridge University Press.
Thu HL (2019) Cybersecurity and geopolitics: why Southeast Asia is wary of a Huawei ban. *The Strategist*, 5 October.
Tully S (2006) Access to electricity as a human right. *Netherlands Quarterly of Human Rights* **24**, 557–587.
UNIDO (United Nations Industrial Development Organization) (2015) *Industrialization, Innovation, Inclusion*. Inclusive and Sustainable Industrial Development Working Paper Series WP No. 15. Vienna: UNIDO.
Vácha T *et al.* (2016) *Involving Citizens in Smart City Projects: Systems Engineering Meets Participation*, IEEE Smart Cities Symposium, Prague. Available at: https://www.researchgate.net/publication/303805585_Involving_Citizens_in_Smart_City_Projects_System_Engineering_Meets_Participation (accessed 7 August 2022).
Whittle N (2020) Welcome to the 15-minute city. *Financial Times*, July 17.
Willems J *et al.* (2017) Smart city projects and citizen participation: the case of London. In Andeßner R, Greiling D and Vogel R (eds), *Public Sector Management in a Globalized World*. Wiesbaden: Springer Gabler, pp. 249–266.
Willis K and Aurigi A (2018) *Digital and Smart Cities*. Abingdon, Oxon: Routledge.
WHO (World Health Organization) (2009) *Whole-of-Society Pandemic Readiness: WHO Guidelines for Pandemic Preparedness and Response in the Non-health Sector*. Geneva: WHO.
World Bank (2020) Available at: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD (accessed 15 March 2021). See also https://data.worldbank.org/country/myanmar.
Yuan Y (2020) Hangzhou court rules in landmark facial recognition case. *Sixth Tone*, 21 November.
Zuboff S (2019) *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. London: Profile Books.

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