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AN ECOSEMIOTIC ANALYSIS OF REPRESENTATIONS OF NATURE IN GREENFIELD SMART CITY PROMOTIONAL VIDEOS

Master's Thesis

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I have written the Master's Thesis myself, independently. All of the other authors' texts, main viewpoints and all data from other resources have been referred to.

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INTRODUCTION

Worldwide, urbanisation and technological penetration continue to grow year-on-year with no sign of slowing (CIA 2017, Sui 2016). Given that such urban and technological growth tends to run in parallel with environmental degradation (Hughes 2001), the models of nature promoted by the multinational corporate stakeholders that work at the intersection of these growth fields are of interest when considering future environmental concerns. Hence the aim of this work – to analyse the representations of nature in greenfield smart city promotional videos so as to determine how nature is modelled therein, and, furthermore, to determine why nature is modelled in such a manner by the stakeholders who produced said videos. In this work, models of nature are considered to encompass human-nature relations, culture-nature relations, technology-nature relations, and so on, given that nature is always modelled in relation to culture.

The definition of what constitutes a smart city is somewhat contentious (Albino et al. 2015) because the dominant discourse on the meaning of what makes a city "smart" has been in flux ever since the term's conception. However, at its most basic, pragmatic level, a smart city can be considered an urban environment that contains a data-collecting sensor network and a software stack that takes said data, processes it in real-time, and, according to the software's programming, tweaks city services and published information streams accordingly (Shelton et al. 2015: 16).

Such an urban environment can be deployed as one of two types: either as a brownfield augmentation (in which an already existing city could, say, deploy sensors that track the location of its public transport vehicles, thus allowing citizens to receive real-time notifications that tell them exactly when their bus will arrive) or as a ground-up, greenfield planning construct in which a brand new smart city is constructed to include ubiquitous sensor networks, infrastructure mechanisms and user interfaces, thus allowing related city services (such as environmental monitoring, traffic automation and waste management) to be centrally

managed and technologically-mediated before even the first citizens arrive (Hollands 2008: 303-304).

This work chooses to focus on the promotional discourse surrounding greenfield smart cities in order to analyse the smart city in its purest, most canonical form (Greenfield 2013: 14). This is because a *tabula rasa* deployment of smart city technology allows for an expression of design that is constrained primarily by concerns of budget, whereas the deployment of a brownfield smart city will also be constrained by elements such as existing infrastructure, citizen activism and governmental red tape. Furthermore, since the greenfield smart city has been typically deployed on what is often referred to as vacant, empty or reclaimed land (Choi 2015) and is often described as a form of sustainable or green urbanism (Hollands 2008: 310), there is also a clear ecosemiotic interest as to how its discourse models nature (a model being a relational structure that maps a network of meaningful semiotic units).

Since ecosemiotics "can be defined as the semiotics of relationships between nature and culture" (Kull 1998: 350), it follows that the semiotisation of nature in discourse is "dependent on the various contexts or situations" (Kull 1998: 351) therein. Thus, if the way in which nature is modelled is inherently cultural, then the models that informed those representations can be considered a reflection of the culture from which they emerged (Lotman 2005: 206).

By taking this approach, I assume two things: that all texts created by a culture (generated by the contexts and situations noted previously) are somehow informed by the dominant discourses of said culture and are therefore ideologically influenced (van Dijk 2006); and that culture is not monolithic but follows the pluralistic model of Lotman's semiosphere, a semiotic space that precedes and contains all possible sign processes (Lotman 2010: 197) in which other semiospheres nest like matryoshka dolls, each carrying their own sign systems and, therefore, unique sets of meaningful relations (Lotman 2005: 225). As such, even a multinational corporation can be considered to have its own semiosphere (or culture) and therefore its own dominant ideologies – especially pertinent given the corporation's centralised form of governance.

Therefore, by identifying the models of nature used and analysing how these models create meaning in greenfield smart city promotional videos, it is possible to uncover elements of their stakeholders' underlying ideological position. This effort is bolstered by the

historically contested and complex definition of nature (Williams 2015: 164), for it is due to such a nebulous definition that constructions of nature are perfect carriers for ideological leanings:

> It is the polysemy or semantic richness of 'nature'; i.e. the ability of the word and the concept to accommodate a multitude of contradictory meanings […] that makes constructions of nature so important, because herein also lies the power of nature as a rhetorical device or a frame for investing partisan arguments and interests with moral or universal authority and legitimacy. Uses of constructions of Nature are thus invariably 'ideological' in the sense that they ultimately serve the purpose, as all public discourse, of presenting particular views, understandings, and interests as being 'for the common good', 'universal', and 'right'. (Hansen 2002: 501)

The concept of the definition of nature will be further explored later in this work; a preliminary dichotomy found therein will provide theoretical fundamentals that will be applied to the interpretation of the analysis.

To date, no ecosemiotic works have been written about smart cities, nor on smart city discourse and its ideological basis that concerns models of nature. By leveraging a qualitative content analysis on the representations of nature in greenfield smart city promotional videos, I will first identify the models of nature used by smart city stakeholders. Then, using a multimodal critical discourse analysis, I will unpack how the dominant models previously identified were used to create explicit and latent meanings in the context of the research materials, after which I will interpret my findings using ecosemiotic theories to infer the ideological positioning of the smart city stakeholders.

Therefore, by analysing the discursive representations of nature in greenfield smart city promotional videos from an ecosemiotic perspective, it is proposed that this work will offer a better understanding of the ideological positioning of smart city stakeholders, a novel area of ecosemiotic study and a seeming matter of importance in a world that is increasingly urban and connected, and, according to some, in a state of environmental crisis due to human activities related to such development (Chapin et al. 2000).

Object of study and research questions

To date there are still relatively few greenfield smart city sites worldwide; hence, there exists a limited selection of promotional videos. Although a large number of such projects

have either already started or are slated to begin construction in Asia (Townsend 2013: 25), I have chosen to limit this work's object of study to representations of nature in promotional videos pertaining primarily to New Songdo City (henceforth referred to as Songdo) in South Korea and, to a lesser extent, to Masdar City (henceforth referred to as Masdar) in the United Arab Emirates.

Songdo, located just 50km from Seoul and part of the Incheon Free Economic Zone (IFEZ), can be considered the preeminent example of a greenfield smart city. The initial masterplan was designed by US-based urban planning firm Kohn Pedersen Fox, and the project became possible only after draining 169.5 km^2 tidal mudflats to create the new land mass on which Songdo and other projects in the IFEZ would be situated (Shin 2016: 89). Songdo's construction began in February 2004 with the announcement of a partnership between Gale International (a US-based developer) and POSCO E&C (the Korean engineering firm in charge of construction); together, they formed a development company known as New Songdo International City (NSIC) (Choi 2015:18).

News of the Songdo International Business District (Songdo IBD) construction project was first announced to the public in January 2008 by way of a global marketing campaign; completion of the first stage of development was announced in August 2009 with the expectation that the city would host 65,000 residents and 300,000 workers by 2014 (Kim 2010: 13). It was at this time that Cisco was brought on as the major technological stakeholder responsible for development of Songdo's smart city services through Cisco's Smart+Connected Communities programme. A USD$47 million investment into a company (U-Life Solutions) formed in conjunction with Cisco, the Korean electronics giant LG and NSIC soon followed (Choi 2015: 19).

Promotional videos began to be produced about Songdo, the first of which can be attributed to U-Life Solutions as an early homage to anticipated smart services (u. Life Solutions 2018). As development continued, a number of promotional videos featuring the city of Songdo were produced by Cisco between 2011 and 2016. Videos were also produced by POSCO E&C and IFEZ about Songdo IBD.

Given Songdo's status as a functional greenfield smart city with a significant number of promotional videos, it is clear why it is of primary interest to this work. Masdar, though built in the desert outside of Abu Dhabi, is also a greenfield smart city being constructed by local engineers and designed by foreign urban planners (Foster+Partners from the UK).

Announced in 2006, Masdar aimed to be the first "carbon-neutral, zero-waste, and car-free" greenfield smart city (Sze, Gambirazzio 2013: 293), although these goals appear to have been unrealistic in terms of the initial proposed completion date of 2016, a date which has been pushed back various times (and at which point the city was supposed to house 50,000 residents and 1,500 businesses) (Ibid). General Electric, Schneider Electric and Siemens are the technology leads on the Masdar project, with Siemens carrying the main role of smart city technological stakeholder (Cugurullo 2013: 28).

I could find only three promotional videos for Masdar (the majority of which are computer-generated due to the project's slow rate of development) – therefore, these materials serve a secondary role in this work, and provide a means to cross-reference the analysis on Songdo with that of another greenfield smart city with limited functionality.

Promotional videos were chosen as the object of study for this work for a number of reasons that will be discussed in greater detail in subchapter 1.4. In brief, given that one of the end goals of this work is to infer the ideological positioning of smart city stakeholders, it follows that looking to public discourse such as promotional videos (per Hansen's definition of ideology in the introduction) should be a fruitful avenue of inquiry given that ideologies are constructed, destroyed and manipulated through such channels (van Dijk 2006: 115).

Furthermore, promotional videos are multimodal. A mode can be considered to be any coded, mediated layer of signification that has been determined to have communicative relevance – and therefore, meaning – within a culture, and so can be subjected to semiotic analysis (Machin, Mayr 2012). Such modes can be media-centric, for example pertaining to visual or audio signs, and can even concern very specific forms of encoded meaning such as gestural movement. It is possible that different meanings are encoded and transmitted in different modes simultaneously, therefore creating new meanings via interpretation of their interaction. Therefore, the ideological positions that influence the encoding of different modes can be found via the critical analysis of discourse on a multimodal basis – a multimodal critical discourse analysis. Through application of such a methodology, it is possible to discover a group's encoded theory of "what types of objects exist in their world (categorisation); of the way that world works (causation); and of the values to be assigned to objects and processes (general propositions or paradigms)" (Fowler 2013: 11). Explicit and latent ideological positions can therefore be exposed, the latter often considered closely aligned with a group's ideological position (Machin, Mayr 2012: 25).

I have also already mentioned how, given its definitional breadth, the semiotisation of nature is a potent vehicle for ideological positioning. The way that nature is modelled in discourse, therefore, is inherently ideological. Both this and the issue of how nature will be recognised in the promotional videos are topics that will be explored at greater depth later in this work.

Finally, the fact that *greenfield* smart cities are the subjects of the promotional videos being analysed further exacerbates this potential for ideological infusion, given that such centrally planned, designed and built urban environments can be considered "where the ideology of the smart city finds its purest expression" (Greenfield 2013: 14). It follows that greenfield smart city promotional materials should be strong candidates for effective critical discourse analysis.

Thus, following the aim of this work, through the analysis of representations of nature found in greenfield smart city promotional videos I intend to answer the following research questions:

1) What models of nature are present in the research materials?
2) Which models of nature are most dominant in the research materials?
3) How are the dominant models of nature used to create explicit and latent meanings in the context of the research materials?
4) Given these meanings, what can be inferred about the ideology of smart city stakeholders?

Structure of the thesis

In the first chapter, "Historiographical Review And Theoretical Preliminaries", I provide examples of existing research (semiotic and non-semiotic) pertinent to the aims of the work, the research object and the research materials. Some theoretical concepts that will feature in the analysis are introduced, and I define various terms used throughout the work in greater detail.

In the second chapter, "Research Materials And Methodologies", I identify and describe all of the different research materials (greenfield smart city promotional videos)

analysed in this work. Due to the number of videos and various confusions with regard to their naming and dates of publication, I also provide a new in-text referencing rationale. I then proceed with an explanation of the methodologies that will be used to analyse the research materials, detailing why each methodology is appropriate (given the aims and research questions for this work) and how it will be completed.

In the third chapter, Analysis, I provide the results of the qualitative content analysis and the multimodal critical discourse analysis in separate subchapters before continuing with an ecosemiotic interpretation of these results. I then discuss possible future directions in which this work could be continued.

In the Conclusion I summarise the major findings of this work. References, an Estonian language summary and multiple Annexes can be found following the Conclusion.

1. HISTORIOGRAPHICAL REVIEW AND THEORETICAL PRELIMINARIES

1.1. On the smart city

1.1.1. The changing definition of the smart city

As mentioned previously in the introduction, the definition of the smart city has been and continues to be in flux (Albino et al. 2015; Hollands 2008). Whether the smart city being discussed is a brownfield or greenfield smart city matters not – rather, it is the overall conception of "smartness" that is up for definition, irrespective of the fact that it can be applied quite differently for each type (Glasmeier, Christopherson 2015; Carvalho 2014). Articles have already been produced that track the development of this concept of "smartness" in discourse about the smart city through time in commendable detail (Dameri, Cocchia 2013; Cocchia 2014), so, rather than repeat such an endeavour, I will limit the historical review of smart city definitions to a cursory journey through the significant "turns" that have emerged in response to changes in and the awareness of technological, institutional, environmental and human factors, all of which contribute to a chameleonic quality of the semantic understanding of the term "smart" (Nam, Pardo 2011a; Chourabi et al. 2012).

Of course, depending upon whom is doing the defining and the context in which such definitions are made, different elements are often emphasised over others or perhaps omitted completely. This is most visible when comparing, say, how a technology vendor defines the smart city as compared to an academic (Cocchia 2014: 31).

Regardless, various actors and key factors in smart city initiatives are driving the evolution of the smart city's definition, and, in the "race for smartness", an agile response towards incorporation of these semantic changes is necessary (Nam, Pardo 2011b). This is reflected primarily in historical shifts in smart city discourse. As such, it is important to note that each shift does not indicate a turning away from what has been defined or emphasised before, but, rather, adds a new layer to the existing definition, thus forming a layer cake of complementary forms of "smartness" (Nam, Pardo 2011a) that have been introduced sequentially. I will now list the formulations of those layers from oldest to most recent:

(1) Smart = Ubiquitous Cities

Historically linked to the concept of the "digital city" – a precursor of sorts to the smart city (though both terms were coined in 1994) (Dameri, Cocchia 2013: 4) that focused more so on the use and widespread proliferation of ICT products in an urban environment rather than their ability to monitor its activity (Cocchia 2014: 30) – ubiquitous computing heralded the concept of information and computer technology networks and services being omnipresent and embedded in cities (Cocchia 2014: 19). Over the course of the term's rise in popularity, internet services were growing in number and importance at a rapid rate, thus the desire to integrate such communicative channels into the fabric of the city "so that any citizen can get any service anywhere and anytime through any device" (Albino et al. 2015: 9). Primary concentration was placed on how such technologies could "transform key government processes towards citizens and businesses" (Albino et al. 2015: 11) by bringing digital access to previously offline services and processes.

(2) Smart = Efficient

Ubiquitous computing lacked a strong selling point for cities – if the old methods to access services worked well enough, why bother going to the enormous expense and inconvenience of installing a ubiquitous computing network? A couple of factors emerged that helped shift the definition towards one of efficiency and, therefore, profitability.

Firstly, with the rise of the first 'smart' mobile technologies (such as the launch of the Apple iPhone in 2007) it became clear that a sensor network did not need to be embedded in the urban landscape but could be mobile (Dameri, Cocchia 2013: 4). Therefore, a functional ubiquitous computing environment became something dynamic and deployable at a greatly reduced cost (Anderson 2002: 133).

Secondly, the rise of global economic competition (especially in light of the 2008 global financial crisis) forced cities to reconsider the strategies they followed to attract outside investment. The concept of the 'aerotropolis' (Townsend 2013: 24) – globalisation taken to its most competitive extreme in the form of a network of international cities linked by myriad air connections – suggested that cities were primarily a place of business, and that business needs should be prioritised over citizen needs if a city sought to be economically attractive (and therefore successful). This was taken to an extreme in Songdo whose existence has even been likened to "a weapon for fighting trade wars" (Ibid). Since a smart city's operations can be optimised for efficiency and greater efficiency is often pursued for greater profitability, the reformulation of the definition of 'smart' towards efficiency can be tied to the promise of economic development through smart urbanisation.

(3) Smart = Sustainable

It was only after 2010 that the term 'smart city' became widely known in academic circles, for 2010 was the first year the European Union labelled urban sustainability efforts with the term 'smart' (Dameri, Cocchia 2013: 4). Sustainability, like nature and the smart city, is another term that has various definitions. Its most basic, ecological formulation can be interpreted as:

> […] meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them, as a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity (Morelli 2011: 6)

However, when used in relation to the eco or smart city, sustainability tends to take on the form of "ecological modernisation" in which technology is able to save both the environment and the economy in equal measure, presenting itself as "both a commodity which can be commercialised through emerging, global clean-tech markets, and a tool of decarbonisation

meant to decrease the carbon emissions that the urbanisation of capital surpluses and the construction of new settlements generate" (Cugurullo 2015: 2421). Even prior to 2010, direct economic incentives existed (and still exist) in the form of subsidies for certain types of sustainable-designated technological development, such as the use of Leadership in Energy and Environmental Design (LEED) building technologies (Kim 2010: 18); the economic value of such incentives could be calculated by determining how an increased quality of life would affect other elements within the city, hopefully increasing happiness and, therefore, productivity (Kabisch et al. 2015). A city could be 'green' and profitable, and the smart city provided the unique ability to generate the data necessary to track variables related to sustainability and its various benefits. Thus the increased push for 'smartness' in the name of sustainability.

(4) Smart = Participatory Citizenship

The most recent definitional turn pertains to how a smart infrastructure enables direct, participatory action in city governance by a citizenry who bring a diversity of bottom-up feedback to a system that has often been imagined and deployed in a top-down manner (de Oliveira 2016). This desire for greater participation in the democratic process, to engage in problem solving at a human and city level, was first seemingly proposed in 2013 under the name of "The Human Smart Cities Manifesto" but only popularised a few years later (Ibid). Besides the creation of platforms that enable citizens to provide immediate feedback for city services and the like, this shift can also be realised through open data initiatives and public hackathons (Townsend 2013). However, the need to view citizens not only as smart but valuable can have a seemingly opposite outcome, for it has been shown that smart cities have been known to select for specific types of citizens by way of their policies (Benedikt 2016). For instance, earlier in its existence when it was being marketed as an international city, Songdo IBD wanted only 5% of residents to be Korean (Ibid). This means that centralised planning processes could exclude certain groups in an effort to control the variety of bottom-up participation by way of demographic predictions. Thus, this people-centric turn could be considered an extension of the sustainable turn from environmental sustainability to social sustainability (in the form of a diverse population) (Hollands 2008: 310).

By taking all of the above definitions into account, the layer cake definition of a smart city can be interpreted as describing an urban environment in which ubiquitous computing best practices are used to improve efficiency, profitability and sustainability – therefore elevating the quality of life – by harnessing the feedback and vision of a connected populace engaged in co-creation via data curation. Indeed, all of these qualities can be pointed to as having been or currently are "smart".

But this hybrid, comprehensive definition is not necessarily useful for this work, especially given that its research materials were produced and distributed squarely within the 'smart = sustainable' timeframe. In addition, given that the aim of this work is to infer the ideological positions of smart city stakeholders, it is vital to understand that the foundations and capabilities of the smart city are largely the vision of the major multinational technology and engineering vendors involved with such projects – the technological stakeholders:

> The most prominent parties involved in this work include the IBM Corporation of Armonk, New York; San Jose's Cisco Systems; and Munich-based Siemens AG. These global enterprises function as "systems-" or "solution integrators," laminating hardware and software into higher-level business propositions like Siemens' City Cockpit, IBM's Intelligent Operations Center software suite, or the various "intelligent digital infrastructure" projects Cisco markets under the Smart+Connected Communities label […] Beneath this, there is a second tier of activity, populated by concerns like Samsung, Intel, Philips and Hitachi. (Greenfield 2013: 14)

It is for this reason that I am most interested in the promotional videos produced by the technological stakeholders, such as Cisco in Songdo and, to a lesser extent, Siemens in Masdar. Popular trends alone do not shift the definition of the smart city; business goals and interests also play a major role. Therefore, it is important to consider that perhaps these technological stakeholders are "to a surprisingly great degree responsible for producing both the technical systems on which the smart city is founded and the rhetoric that binds them together in a conceptual whole" (Greenfield 2013: 15) – hence why this work focuses on discourse produced by such stakeholders.

Corporate interests are also favoured by way of competitiveness between cities who seek to be the 'smartest' or even to be considered 'smart'. The rubrics of 'smartness' that allow a city to gauge itself eligible for the label are generated by the same technology companies that profit from sales that enable 'smartness'. Therefore, as the definition of the smart city changes, new business opportunities emerge that ensure smart cities remain 'smart'

or become ‘smarter’; or perhaps they can even be crowned the ‘smartest’ of the smart cities by way of international rankings whose factors for performance are similarly created by technology stakeholders. Thus, it becomes apparent that there are multiple channels through which technology stakeholders are incentivised to follow trends or influence new directions of smart city definitions while simultaneously creating business opportunities for themselves (Albino et al. 2015: 13-15), the production of discourse being one such channel.

1.1.2. Semiotic studies of the smart city

To date, very little semiotic research has been conducted on smart cities, let alone smart city discourse. Perhaps this is due to the relative novelty of smart-specific subject matter; the field is nascent, especially given that the term ‘smart city’ was first coined in 1994 but didn’t rise to prominence until about 2010 (Dameri, Cocchia 2013: 4). It seems that the construct of the smart city has been more comfortably explored in the annals of science fiction than as applied research given its largely theoretical-over-practical status to date. Semiotics of the pre-smart urban landscape have been explored in years past by luminaries such as Roland Barthes, Mark Gottdiener, Alexandros P. Lagopoulos and Kevin Lynch (Jachna 2004), and, although elements of such works are undoubtedly relevant to the semiotics of a city environment (smart or otherwise), for the purposes of this work, literature that concerns the technologically-mediated nature of urban futures is more relevant. One exception is Gottdiener’s semiotic study “Disneyland: A Utopian Urban Space”, for the parallels between the promise of the smart city and the promise of Disneyland as carefully planned, purposefully utopian environments that reflect their social and physical milieu should not be overlooked (Gottdiener 1982).

Rather than concentrating on the smart city as a whole, semiotically relevant materials written about human-computer interactions on a wider-but-not-citywide scale are of interest to this work; for instance, the analysis of interfaces within smart cities and the theoretical constructs that drive the design of such things (Farkas 2015; 2016). Scholarship surrounding the semiotics of pervasive computing (also known as ubiquitous computing or embedded systems) environments is particularly interesting as it can be seen as a precursor to works dealing with the smart city. Pervasive computing can be defined as:

> a network of more or less specialized computational devices that interact among themselves and with us. These devices will be distributed in the physical space around us, they will have a higher degree of autonomy than we are used to, and they will increasingly serve as a medium for cooperation and communication among humans. Some of these devices will be moveable and travel together with humans while others will be stationary. […] The main point is that our relation to computers will no longer be distinct and separate from other activities: rather we will be "embedded in a sea of computation". (Andersen 2002: 133)

It is clear to see how the smart city is a natural scaling of this concept to encompass the totality of the urban environment, with the concept of the network being of primary importance.

Jachna's 2004 article "Cyburban Semiotics" can be considered a bridge between the semiotic analysis of pervasive computing environments and the classical urban semiotic theory of Lynch et al. He notes that the theories of the latter are no longer sufficient due to how "the day-to-day construction of meaning between urban inhabitants and their city involves a constant interweaving of mediated and unmediated communications and interactions" (Jachna 2004: 6). Jachna makes specific mention of how one-to-many messaging systems are being supplanted by "the many-to-many structure of the internet and the cellular phone network" (Ibid), an observation that can easily be extended to the pervasive computing environment of the smart city and its modern progeny, the Internet of Things (IoT), a fully networked constellation of appliances, vehicles, and infrastructure, all of which can be located, assessed, operated, upgraded or even locked remotely by a third party – a curious inversion of an apparently decentralised many-to-many communications infrastructure used to revert to a one-to-many construct of centralised control.

A noteworthy addendum to this last point can be found in O'Leary's 2013 paper that concerns the production of signs by way of the processing of "Big Data". Leary declares this to be a semi-processual term that refers to the enormous amount of data produced partly within the IoT pertaining to people, their online activities, "things" and the relationships between them, and how this data is analysed, contextualised and acted upon or published by autonomous software agents (O'Leary 2013). Although, like Jachna, O'Leary does not specifically mention the smart city, his article invites readers to question the process and consequences of the semiotisation of concrete objects within a networked, pervasive computing environment. Not only must one question the necessity and utility of the volume of data being produced by the IoT (and the myriad issues related to privacy that come with

managing this data), but one must also question the all-important "what" of the sign creation process – what deserves to be tokenised as a sign within the smart city? What does not? And who gets to decide this? O'Leary posits that "the 'Internet of Things' will evolve to become an 'Internet of People and Things', and 'Internet of Everything' […] the line is blurring between human-generated data and sensor-generated data" (O'Leary 2013: 63). As such, O'Leary's work suggests that within future smart city-esque networked, pervasive computing environments, all "things" – be they people, appliances, or otherwise – will be semiotised as elements to be tracked, contextualised and potentially acted upon by Big Data.

With regard to overt smart city references made by semioticians, I could only find three such papers that have been published at this time. Massimo Leone's conversational piece concerning the potential for development of a semiotics of innovation notes how semioticians – given their understanding of the creative intricacies of generative communication sensu Lotman (2010) – could help bring together a city's cultural heritage and its smart initiatives in a manner sensitive to the needs of various sectors, pushing, say, future tourism and economic growth while simultaneously amplifying and preserving a city's foundational collective character (Leone 2015: 387-388). Patrizia Violi's more recent article directly addresses the definition of the smart city, specifically, the use and meaning of the label 'smart' in terms of how smart-designated urban modifications and augmentations go about transforming public space and, in turn, transform human behaviour, providing "an interactive exchange between different categories of actors, some human some not" (Violi 2017: 1129). Both of these papers pay significant attention to the more human-oriented, creative aspect of interactions within the smart city space, and how the field of semiotics is in a unique position to participate in such conversations moving forward given the volume of semiotic scholarship devoted to communication as a generative, systemic process. The third paper about smart cities that contains semiotic theory, Kim's "Place promotion and symbolic characterisation of New Songdo City, South Korea" (Kim 2010) will be discussed later in this chapter for it pertains directly to Songdo's promotional materials.

1.2. On human-nature relations

1.2.1. Modelling nature and metamodels of nature

As mentioned earlier, this work aims to analyse the representations of nature in greenfield smart city promotional videos so as to determine how nature is modelled therein, and, furthermore, to determine why nature is modelled in such a manner by the stakeholders who produced said videos. In the Tartu-Moscow semiotics tradition, modelling systems are considered to be human sign systems that allow the incomplete but sufficient representation of a "certain phenomenon or process [that] is presented such that it can be understood, using (imaginary or material) representations which are at least partially based on analogy" (Maran 2014: 304).

Given the aforementioned complexity and number of definitions of nature – "perhaps the most complex word in the language" (Williams 2015: 164) – it therefore follows that the plurality of meanings of nature is due to the plurality of models of nature available. Williams notes that there are three primary meanings of the word "nature" to consider, each containing countless other meanings, but this work concerns itself only with the third meaning listed: "(i) the essential quality and character *of* something; (ii) the inherent force which directs either the world or human beings or both; (iii) the material world itself, taken as including or not including human beings" (Williams 2015: 164-165). The inherent binary opposition of this third meaning is alluded to by Hansen who recognises that such tensions are of great significance when attempting to define nature (Hansen 2002: 501). Indeed, "nature is first and foremost a concept, and one that is premised on a problematic opposition between nature and culture" (Elliot 2013: 8). Indeed, in the ecosemiotic paradigm, nature and culture are never truly separate but co-create each other at the level of sign processes – sometimes in oppositional terms, sometimes in ecological terms.

Models of nature can therefore be organised by way of this basic dichotomy of oppositional and ecological terms. In this work I use the term "metamodels of nature" to denote these rather simple, general and fundamental abstractions from which many more models of nature can be generated or under which models of nature can be categorised. The oppositional or dualistic metamodel of nature posits nature as semiotically separate from

culture (and thus nature and culture define each other by way of their opposition, by defining that which they are not, by showing clear boundaries of separation through semiotic cooperation); the ecological metamodel takes a systemic perspective that points to the interplay between nature and culture, positing that culture is and always will be a part of nature and that nature is a part of culture, with their semiotic interaction co-creating the ecosystem at large (Kull 1998: 345-346). Although the former of these two general abstractions is described as "a mistaken (illegal) dichotomy" (Maran, Kull 2014: 46) by ecosemioticians, that does not invalidate its existence and its continued application by others; indeed, its opposition to ecological principles ensures its continued relevance.

Regardless, it seems that all models of nature can be derived from or organised under these two metamodels of nature and the fundamental difference in how they conceive the "otherness" (or lack thereof) of nature, and, therefore, whether "Human semiotic systems are part of larger ecological systems, which contain both semiosic and non-semiosic components" (Maran, Kull 2014: 47) or considered separate. It is from this most basic dichotomy that this work will explore the meanings of the models of nature represented in the research materials, for, in such an opposition, one finds the roots of ideological construction: social identity realised by way of "a polarizing structure between US and THEM" (van Dijk 1995: 139). It is therefore through analysis of this position that I will primarily engage with this work's fourth research question concerning the ideology of smart city stakeholders.

1.2.2. The role of nature in the smart city

To date, relatively scant research has been conducted on the role of nature in the smart city and on the discourse that describes that role. *Integration of Nature and Technology for Smart Cities* (Ahuja 2016) takes a predominantly functionalist approach to the role of nature in smart cities, the first chapter of three concerning itself solely with engineering puzzles surrounding successful integration of nature (indirectly defined by the editor as energy flows that exist outside of the building's envelope and the humans that occupy its insides) into sustainable building systems (Ahuja 2016: v). The second chapter, however, brings up the concept of biophilia:

> Running in a park, cuddling with a pet and enjoying the views of the mountains or the seaside are common behaviors that define human beings' affinity for nature. It is this that constitutes the concept of biophilia —human beings' inherent relationship (or love from "philia") with the natural environment and other livings. Yet, biophilia goes beyond seemingly superficial interests to denote a human dependency on the natural environment for biological and physical existence. Human beings are part of the global biosphere and source essential resources to live and build our homes, businesses, and communities from nature. We are physically, economically, and socially intertwined with the natural environment for the air we breathe, raw materials we procure, and interactions we seek with other living species. (Ahuja 2016: 225)

This description (which sits firmly within the ecological metamodel of nature) is quickly enlarged by moving on to a discussion of biophilia's technological counterpart: "Technological biophilia is a new term being given to the simulations of nature (by technology) to induce the cognitive, sensory, emotional, and physiological reactions humans experience in the actual natural environment, although not to the same degree" (Ahuja 2016: 226). This is related to research conducted on the positive effects experienced by humans when immersed in natural settings: accelerated healing time, reduced levels of anxiety and depression and a general sense of wellbeing to name but a few (Howell et al. 2011; Mayer et al. 2009; Nisbet et al. 2009). Therefore, if a smart city incorporates policies of biophilia or technological biophilia in its design, then the role of nature in a smart city could be considered a means to improve the quality of life for all, whether as a natural part of the designed environment or as simulation.

A somewhat complementary observation comes from Tan Yigitcanlar in his 2010 article "Managing ubiquitous eco cities" wherein he comments: "Eco City and Digital/Ubiquitous City constitute the two distinctive facades of a contemporary city. Eco City forms the visible facade, where [sic] Ubiquitous City is the hidden infrastructure facade supporting information and services in order to support lifestyles" (Yigitcanlar 2010: 2). Since Songdo was once declared an "ubiquitous eco-city" (Shwayri 2013: 40), I consider this formulation relevant in spite of the absence of the term 'smart city' from Yigitcanlar's paper. If the Eco City indeed "aims to change the city into a low-entropy regular structure with perfect functionalities, sustainable efficiency and high-level environmental quality" (Yigitcanlar 2010: 3) and yet its elements, though visible, do not directly support major systems within the city, then Yigitcanlar's claim that "The Eco City theory views urban

development from the point of ecosystem interactivity" (Yigitcanlar 2010: 3) seems superficial. The technology of the Digital/Ubiquitous City – not the Eco City – is actually performing in a networked, unseen fashion of "ecosystem interactivity". Therefore, if visible representations of nature (per the Eco City) are a casual observer's primary (or only) means of witnessing the smart city, then those representations mediate between technology and nature, and therefore act as a camouflage of sorts that hides the embedded "unnaturalness" of technologies in the open palm of living, natural forms.

1.3. Marketing nature and the smart city

1.3.1. Representations of nature in promotional materials

Given that this work concerns analysis of how representations of nature in greenfield smart city promotional videos are modelled, and why the creators of said videos chose to model them in such a fashion, it is necessary to delve into how nature has been represented in similar media historically and the models used in those mediations.

Existing semiotic studies into the mediation of nature have largely concentrated on written texts in the form of nature writing, the primary focus of ecocriticism, a literary genre that emerged in the 1970s to study the above conundrum (Maran 2014: 2), encompassed neatly by Umberto Eco in the deliberately ambiguous question: "Where does the truth of ecology lie?" (Eco 1986: 108). Maran recognises that, in nature writing, "each work [...] is essentially a model of the human-nature relationship, with respect to both the actual and the ideal state of that relationship" (Maran 2014: 9). Therefore, the primary quest in analysing mediated representations of nature becomes that of determining the model of nature leveraged therein by the text's author, and therefore, by extension, determining the author's relation to nature.

Since this work's research materials are promotional videos, it is important to recognise that promotional videos, as advertisements, are created under the auspices of a highly specific brand strategy and client approval process. Therefore, nature representations therein will reflect the corporate stakeholders' models of nature rather than those of the

agencies or creatives who produced such texts. Also, it's important to recognise that these promotional videos are unlike nature writing because they are multimodal – they feature "the interaction and combination of multiple modes [...] within single artefacts" (Bateman 2008: 1). Such multimodal texts do exhibit similarities to written texts per the general themes of ecocriticism, but, due to the difference in medium, there also exist significant differences. For example, in promotional videos, subtitles can appear on screen (providing the real-time translation of an audio track featuring Korean speech to a visual of English written text), as do intertitles that contain a written quote; similarly, in promotional videos, the ability to create a linear narrative is present by way of visual montage paired with the voiceover of a narrator that can be harmonious or dissonant in terms of how those modes interact. For example, a promotional video can contain a musical score that elicits a specific emotional context that does not match with the emotional context of the narrative unfolding via visual montage; clearly, this sort of effect cannot be created in nature writing. Ecocriticism acknowledges that there exist differences between different forms of media, and thus has been adapted to analyse film and other mass media (Elliot 2013; Ivakhiv 2008; Ingram 2010; Brereton 2005).

Given that the sites of production, content and consumption influence meaning making just as much as the communicative context (such as genre and medium conventions of advertising and promotional materials), cultural context (such as shared conventions and values) and historical context (such as the embedding of intertextual references) of the medium (Hansen, Machin 2013), it's necessary to be as judicious as possible when selecting existing research that will help me achieve the aims of this work. Therefore, research centred upon representations of nature in promotional materials is of primary interest.

Although conducted in 2002, Anders Hansen's empirical study titled "Discourses of nature in advertising" contains a content analysis of 467 UK primetime television commercials of which 132 (or 28%) contained "either an explicit environmental message and/or any visual or verbal reference to nature" (Hansen 2002: 504). Thus, nearly all of the features relevant to this work (except for the element of the greenfield smart city) are addressed directly. No other such study appears to have been made with this particular goal in mind, and other authors have concurred that Hansen's research is "probably the most informative and up-to-date study of the field" (Hartmann, Apaolaza-Ibáñez 2009: 721). This appears to remain the case, for prominent researchers continue to reference this study in works pertaining to visual analysis dating to the current year (Ledin, Machin 2018).

This work will use Hansen's collection of 15 models of nature as a starting point from which to delimit the elements of the research materials chosen as qualifying representations of nature by way of a qualitative content analysis. Further explanation for this choice of methodology, the rationale for how I will recognise representations of nature in the promotional materials, as well as an in-depth study of Hansen's models of nature and their suitability for this work's research materials will be presented later in this work.

1.3.2. Semiotic approach to promotional materials and branding

As already mentioned, since the research objects of this work are promotional videos, it is important to recognize that they, as advertisements, are created under the direction of a highly specific brand strategy. Branding is a primarily visual (Medway 2015) form of comprehensive identity creation most often extended to representations or works associated with a specific corporate vehicle (such as a product or service), a corporation, or a defined place such as a country, region or city (Warnaby, Medway 2010). There is an abundance of semiotic literature devoted to advertising (Beasley, Danesi 2002: v), so, by extension, branding is often mentioned in such works. This extends to branding's production and reception, as well as its transmedial, narrative nature, given that it often straddles many different modes of communication (therefore providing different modes of entry) whilst attempting to maintain a coherent whole in terms of the relatable characteristics, desired values and driving attributes communicated across said modes (Scolari 2009). Branding thus leverages a strategically-crafted, interoperable ecology of signs to create its desired effect: an organisation or entity possessing a defined, multidimensional personality intrinsically linked to intertextual connotations derived by a sign-interpreting audience (Warnaby, Medway 2010: 207-208).

Corporate branded communications can be divided into those concerning 'identity' (signs through which the audience is able to identify the brand in question, to recognise it, such as through visual recognition of a logo or colour scheme) and 'image' (the audience's accumulated perception of the entity itself, figured through the lens of the brand) (Warnaby, Medway 2010: 208). When dealing specifically with place branding the descriptors of 'identity' and 'image' shift slightly; it is recognised by place branding practitioners that the

‘identity’ of a place is its physicality – the ‘actual place’ – and the ‘image’ pertains to how said place is perceived, meaning that these two elements need to be carefully crafted so as to maintain a balance of realism when marketing a place (Warnaby, Medway 2010: 208-209). In this work, the latter concept of ‘image’ is more important, given that my aim is not to determine how people can recognise and name a smart city from its promotional materials but to analyse the discourse of nature therein; if nature appears in a promotional video carefully created to fit a specific brand strategy, then such representations of nature can be assumed to fall in-line with the ideologies that influenced said brand strategy. Representations of nature will therefore be modelled in a brand-specific manner, either explicitly or latently (given that the brand strategy will operate at various levels by way of intersemiotic meaning-making).

Digging deeper, it is important to distinguish between place marketing and place branding, given that the former (though always branded) “deals with the processes and techniques of promoting, selling and distributing the place or parts of it as products or services” while the latter “regards the purposeful symbolic embodiment of information about a place in order to create associations and expectations around it” – therefore, “the place marketing approach enables an understanding of place brands mainly with regard to their ‘functional’ aspects, while the ‘representational’ ones are downplayed” (Giovanardi et al. 2013: 367). As such, in this work, anticipation of both place marketing and place branding must be present during analysis, with an emphasis placed on the former, given the promotional nature of the research materials. Therefore, the nature representations modelled in greenfield smart city promotional videos are likely to appear as functional e.g. a bridge that was built to span an expanse of water. Analysis of nature representations that fit functional models of nature in discourse should therefore reveal core elements of the smart city’s place marketing strategy, and therefore, by extension, its branding strategy, thus aiding this work in moving toward its aim of inferring elements of stakeholder ideology.

Branding and marketing semiotic studies of what is known as the global city should be considered relevant to this work. A socioeconomic phenomenon that concerns the denationalisation and deterritorialisation of place due to globalisation (Sassen 1991; Gottdiener 2004), the greenfield smart city can be said to fit within the paradigm of the global city due to the shared dilemma of globalisation driving technologically-mediated generica, exemplified already by the creation of cookie-cutter international airports (Buchanan 1999). This is made explicit when one learns that Stan Gale, the chairman of Gale International, the

development company responsible for Songdo's construction, is a subscriber to the vision of 'aerotropolis' (see subchapter 1.1.1.). In Gale's own words: "We start from here and then we are going to build 20 new cities like this one, using this blueprint. Green! Growth! Export [...] China alone needs 500 cities the size of New Songdo" (Lindsay 2010).

Under such a blueprint, the function of the identity of place as "a relational system that integrates a people with a region or territory, their past with a present still to be fashioned, their sense of self with a future they are determined to live" (Buchanan 1999: 394) is brought into question. What is the identity of a place built from the ground-up (and so without a history) and planned to mimic "best practices" found in top-tier cities celebrated the world over (Choi 2015: 5)? Due to this conundrum of place and identity in the age of the global city, city branding and marketing are of prime importance in placemaking, especially given the competitiveness between cities vying for scarce resources such as business investment and highly-skilled immigrants (Warnaby, Medway 2010: 209).

In addition, per the most recent turn in the smart city's definition, citizens are now recognised as participants in the process of place branding. This could be on the basis of "individual place consumers who make place-related decisions […] as they use and experience the place" – residents, tourists or business visitors; or on the basis of "different groups of individuals [that] form different brands as they experience and appropriate the place and its brand in their own, particular ways"; or even on the basis of society, given that "societal views incorporate within individual-based or group-based views the influence of the social/cultural context" thus altering "individual meanings towards a more collective perspective" (Ashworth et al. 2015: 5-6). This concurs with Jachna's observations about the rise (enabled by technology) of many-to-many interactions in the city (2004). In 2018, for example, the flow of social media provides a canvas for anyone to share their impressions about a place, even to the extent of appropriating the place's visual branding for their own means. Such possibilities have challenged the traditional concept of place branding being a phenomenon managed solely by institutions. Even the comments published on YouTube videos created by city institutions allow for a bottom-up level of feedback that contributes to the possible model of a place's identity. It is for this reason that this work studies only those promotional videos produced by greenfield smart city stakeholders; if attempting to infer elements of ideological positioning of technological stakeholders from smart city discourse, it makes sense that such discourse should be unidirectional and authored only by technological

stakeholders (Greenfield 2013: 214).

1.3.3. Previous studies of greenfield smart city promotional materials

With regard to existing analyses of greenfield smart city promotional materials, one pamphlet and a number of articles have been written that either deal with this subject matter directly or mention it indirectly. The majority of such articles concern themselves with how the promotional approach to marketing greenfield smart cities has changed over time; they explore the socioeconomic and political history of such places alongside the history of the changing concept of what constitutes a smart city. Similar to this work, some also attempt to distil ideological implications from smart city promotional materials.

As mentioned earlier in this chapter, there is one article that examines Songdo's promotional materials from a semiotic perspective – Kim's 2010 paper "Place promotion and symbolic characterisation of New Songdo City, South Korea". Kim uses a sociosemiotic approach (based on the work of Lagopolous and Gottdiener) to better understand "how the real estate sector and government actors construct symbolic characterisation and legitimacy through certain representations of urban space" (Kim 2010: 13-14).

The work concentrates on "images, symbols and discourses pertaining to urban form, function and life in planning documents […] publicity and marketing materials […] media coverage […] and official websites […] including newsletters, brochures and fact sheets" (Kim 2010: 13). Unfortunately, only one promotional video (U. Life Solutions 2018) is included in this media mix and the study does not include promotional materials created independently by Cisco. Still, by making careful mention of Songdo's unique proposition of being a greenfield city – that "[nowhere] is the interplay of the political economy of urban development and the symbolic characterisation of place more evident than in the process of building a **new city**" (Kim 2010: 13 – emphasis added) – Kim is in accord with this work's assertion that texts associated with a greenfield smart city provide the most direct encoding of stakeholder ideology, unsaddled by elements of place-based cultural memory by way of the greenfield's tabula rasa beginnings. This is a view shared by the aptly named Adam Greenfield, author of *Against The Smart City,* a highly critical review of greenfield smart city promotional materials:

> I have chosen to focus my analysis primarily on the sites where the ideology of the smart city finds its purest expression. Whether or not these [Songdo, Masdar and PlanIT Valley] putative cities ever amount to much of anything at all […] if we want to learn what is currently considered the cutting edge of practice in the domain, acquaint ourselves with the assumptions, beliefs, commitments and valuations that are bound up in this framing of things, and perhaps learn what the future has in store for the cities we do live in, there's no better place to start than by carefully interrogating the proposition in its classic, self-contained and undiluted form. (Greenfield 2013: 14)

Greenfield's polemic can be considered a cutting study in smart city disdain with no kind words spared for Songdo nor Masdar. Aa human-centred urban designer by training, Greenfield positions himself against everything that the smart city appears to promise, with a perspective that appears to be in accord with other critics – the most well-known being Kitchin, Townsend and Hollands (Kitchin 2014: 132) – who have volunteered the smart city construct to be little more than a marketing vehicle for technology companies, a concrete form of corporate storytelling that hides a strict top-down, centralised form of governance and control (Söderström et al. 2014; Hollands 2015; Townsend 2013; Kitchin 2015). Indeed, Greenfield's research materials included all of the major Songdo and Masdar corporate stakeholders, and can be considered admirably comprehensive:

> This material included advertisement, website, promotional-video and exposition-booth copy; PDFs and printed brochures primarily intended for institutional partners; developer documentation; and the kind of cheap marketing collateral one picks up, as if by static attraction, in the course of any visit to a trade show or similar event. I combed through interviews and other public comments made by executives of the companies involved, digested reports issued by consultants analyzing the business case for the smart city and parsed the proposed technical standards promulgated by industry consortia. I tapped my way through interactive displays, lurked silently on conference calls, emailed sales reps and sent away for spec sheets. (Greenfield 2013: 19)

In his analysis, Greenfield included some of the promotional videos upon which this work focuses (such as Cisco's "Cities of the Future: Songdo, South Korea" series), but, unfortunately, Greenfield barely mentions nature save for a brief comment on how Songdo and Masdar were built from scratch, after which he notes that one of the Cisco videos declared Songdo's original site to be a "barren mudflat" (Greenfield 2013: 21). He does, however, observe that smart city stakeholders "labor to portray it [the smart city] as a **natural** or neutral stage in the evolution of human habitation" (Greenfield 2013: 107 – emphasis added), even though the promotional videos are often limited to "renderings and sleekly stylized animations […] [and] when we do get to see actual still or video photography, it's shot under tightly controlled circumstances, in showpiece blocks and model apartments"

(Greenfield 2013: 30).

If, indeed, human habitation has a changing, progressive character through time, then it does seem wise to note Kim's sociosemiotic approach to analysis. If abstract and concrete elements of society and culture are constantly in flux, each influencing the other, then the changing definition of the smart city in terms of socioeconomic, environmental and political response makes perfect sense – this adds a new complexity to previous comments made in this work regarding control of the the definition of 'smartness'. Kim's findings suggest that the publicity and marketing of New Songdo City is, like the definition of the smart city, chameleonic, in that changing economic, political and social conditions lead to modifications of the city's promotional materials that reposition the city to follow trends as necessary. Greenfield concurs, stating that "the smart city is something that can and will always be redefined as its enthusiasts deem necessary, and so remain forever just beyond our reach" (Greenfield 2013: 30-31). This modification of the city's identity over time has been noted by other researchers, also – for instance, that Songdo was first marketed as an eco-city, then later as a ubiquitous (or U-) city, and then a smart city, though sometimes all three monikers are used at once, declaring Songdo to be an eco-friendly ubiquitous smart city (Shwayri 2013; Kim 2010; Shin 2016).

Kim also recognises that the push to market Songdo as a green or eco-friendly city in its publicity and marketing campaigns came about only after the global economic crisis of 2007 (Kim 2010). Besides longstanding financial woes (Shin 2016), this push was grounded in South Korea's "Green Growth" plan, an effort to copy the Singapore model of a super-dense, super-vertical city with ample greenspace, first introduced by President Lee Myung Bak in August 2008 (Kim 2010: 17) and inspired by a "green urbanism" present in South Korea since the late 1980s (Shin 2016: 94). Additionally, South Korea had committed to "green" infrastructure development initiatives using funding from the International Monetary Fund (Kim 2010: 15), therefore helping the Songdo project make the leap to smart city sustainability rhetoric before it was popularised in Europe in 2010.

Songdo is very well marketed in terms of what it promises to deliver at the technological level, for instance:

> Technologies frequently marketed by proponents of Songdo include extensive fibre optic networks, Telepresence, embedded street sensors to monitor traffic, road conditions, weather, fire and safety risks, water level and quality in the canal, RFID tags on cars, LED traffic lights, city-wide Wi-Fi, pneumatic

> and automatic waster collection and disposal, grey water recycling systems, and finally, automatically monitored energy use in homes. (Choi 2015: 19)

But the utility of these technological marvels is often put into question when critics note that such conveniences are still not yet operational, favour private interests, disregard the needs of Songdo's citizens, or are stymied by wildly inappropriate planning decisions (Choi 2015; Greenfield 2013; Townsend 2013). For instance, subway stations in Songdo were placed over a kilometre away from the locations (by namesake) they were supposed to serve (James 2016, Choi 2015: 16); or, for example, how smart energy control interfaces originally only displayed the Korean language although Songdo was being marketed as an "international city" (Choi 2015: 20). It is likely that such follies occurred as a result of poor planning oversight brought on by financial woes. Late investors requested ten changes to Songdo's master plan between May 2008 and May 2010 (Shwayri 2013: 50), and it is likely that those investors were brought on board due to low sales of residential units to future international residents, sales that were expected to fuel Songdo's ongoing development (Shin 2016: 95-97).

In summary, existing studies about greenfield smart city promotional materials have been rather general in character with almost no mention of representations of nature nor the role of nature within the smart city. The most prominent findings appear to be in agreement with the earlier subchapter 1.1.1. concerning the ever-changing discourse of "smartness" – that the ways in which the smart city will be promoted will change with time and depend on a constellation of factors.

1.4. Discourse and ideology

In the introduction of this work I briefly introduce the concept of ideology by way of a definition provided by Hansen in which he states that it concerns "particular views, understandings, and interests as being 'for the common good', 'universal', and 'right'" (Hansen 2002: 501). I later remarked that the roots of ideological construction can be connected to a fundamental construction of social identity by way of "a polarizing structure between US and THEM" (van Dijk 1995: 139). By extension, ideologies "are primarily some kind of 'ideas', that is, *belief systems* [...] *socially shared* by the members of a *collectivity* of

social actors" (van Dijk 2006: 116) that help differentiate such social groups from each other, often by prescribing a way of relating to the world that becomes axiomatic:

> Ideologies, thus defined, have many cognitive and social *functions*. First of all [...] they organize and ground the social representations shared by the members of (ideological) groups. Secondly, they are the ultimate basis of the discourses and other social practices of the members of social groups as *group members*. Thirdly, they allow members to organize and coordinate their (joint) actions and interactions in view of the goals and interests of the group as a whole. Finally, they function as the part of the sociocognitive interface between social structures (conditions, etc.) of groups on the one hand, and their discourses and other social practices on the other hand. (van Dijk 2006: 117)

These sociocognitive functions of ideology can be extended into the corporate sphere due to the parallel of how both ideological positioning and branding contribute to identity formation of specific groups, and therefore, from a cultural semiotic perspective, the creation of a set of cultural codes that can be considered to have their own 'semiosphere', to use the concept introduced by Lotman (2005). This is not to say that each and every brand necessarily has a unique ideology, for

> […] in business corporations we may find more general corporate ideologies (or variations of them), and not so much the ideology of one specific business corporation. If such corporations are large, as is the case for multinationals like IBM, however, a common culture may develop, and such a culture of shared norms, values and goals might in a way be identified as the corporate ideology (van Dijk 1998: 145)

Such a "brand culture perspective" (Schroeder 2009) acknowledges that discourse produced by multinational brands such as IBM or Cisco can be considered ideological, given that they are "engaging and deceptive bearers of meaning, reflecting broad societal, cultural, and ideological codes" (Ibid, 124). This perspective therefore qualifies multinational corporate brands as "ideological referents that shape cultural rituals, economic activities, and social norms" (Ibid) through participation in the discursive, hegemonic construction of ideology (Gramsci 1971), a process through which different groups attempt to elevate their own "moral political and cultural values and institutions […] in such a way as to make them appear 'natural' and 'common sense'" (Machin, Mayr 2012: 24).

For a multinational corporation, all public-facing discourse is driven by brand strategy, and, therefore, encoded with the ideological positioning of the corporation. Since "people acquire, express and reproduce their ideologies largely by text or talk" (van Dijk 2006: 115), the connection between branded discourse and ideology becomes apparent and explains why this work intends to infer the ideological positioning of smart city technological

stakeholders from the ecosemiotic analysis of representations of nature in greenfield smart city promotional videos. Indeed:

> Ideological analysis of language and discourse is a widely practised scholarly and critical endeavour in the humanities and the social sciences. The presupposition of such analyses is that ideologies of speakers or writers may be uncovered by close reading, understanding or systematic analysis, if language users explicitly or unwittingly express their ideologies through language and communication. (van Dijk 1995: 135)

The models of nature I discuss in this work, like codes, consist of socially shared semiotic structures. Models help to organise semiotic relations within a culture through the expression and interpretation of meaningful relations in a communicable form or modelling system, such as language. If all meaningful representations in discourse are modelled, then it follows that, through the identification of models in a text, it is possible to infer the author's ideological position by way of critical analysis of how those models are used to create contextual meanings within the text. As neutral structures of meanings, models are not ideologies; rather, ideologies can be considered to consist of complexes of models whose values and meanings are determined, negotiated and enforced socially and culturally through a hegemonic process. This applies to corporate ideologies, also.

Therefore, by determining which models of nature were used most frequently in the smart city discourse presented in the research materials, it will be possible to use a multimodal critical discourse analysis to analyse how those models were leveraged to create explicit and latent meanings in the context of the research materials, and thus infer the ideological positioning of the smart city stakeholders who produced said materials. The next chapter will discuss the research materials specific to this work, as well as the methodologies that will be used to analyse them.

2. RESEARCH MATERIALS AND METHODOLOGY

2.1. Research materials

The research materials analysed in this work are promotional videos for greenfield smart cities, namely, Songdo (located in South Korea, as part of the Incheon Free Economic Zone) and Masdar (located in United Arab Emirates, as part of the Dubai metropolitan area). These videos were found by conducting online searches. In total, this work will analyse the contents of just over 61 minutes of promotional video footage spread across 16 videos for Songdo (containing 51:54 minutes of footage) and 3 videos for Masdar (containing 09:27 minutes of footage). Of primary interest will be the materials related to Songdo, produced by Cisco. This is partly because Cisco is a primary technological smart city stakeholder, partly because Songdo is fully operational and inhabited, and partly because the significant number of promotional videos made about Songdo offer a decent sample size on which to perform an analysis. The Masdar videos do not appear to be produced by a technological stakeholder but by the lead developer and the local municipality, hence why they're treated as secondary materials.

These promotional videos contain a mixture of place marketing and branding (given that they are promoting a specific location) and more general corporate branding for smart city offerings. In the case of Cisco (and Songdo), the latter is known as the Smart+Connected Communities initiative. Although it is not possible to access Cisco's brand strategy documents (given that such documents are generally considered corporate secrets and not made available to the public), other sources such as third-party case studies, annual reports and online blog posts provide information about the corporation's changing brand strategy and positioning. Findings from such sources will be introduced in the analysis to provide additional context from which to explore Cisco's "corporate ideology" sensu van Dijk (1998: 145).

In order to delimit the scope of this thesis I will not be focusing on the viewing context of the videos (such as the difference between viewing the video on a smartphone browser versus during a presentation at a smart city conference), nor the cultural context (such as the cultural background of the viewer and the creative leads who would direct and approve the final edit), nor the production context (such as the choices made by the production staff and the state of the shot location in that moment) as, given the total number of possible variables such concerns would inject into this study, it would be impossible to ascertain their effects. Therefore, I am most interested in the content of the promotional videos themselves – in particular, the models of nature used therein.

2.1.1. Primary research materials: promotional videos of New Songdo City, South Korea

The promotional videos related to Songdo can be grouped into 4 different categories – those produced by Cisco (the technology lead on the Songdo project and therefore, for reasons explored in the last chapter, the primary stakeholder of the greenfield smart city ideology) that are specifically about Songdo as part of their "Cities of the Future" series; Cisco-produced videos that reference or pertain to Songdo outside of the aforementioned series; a single Cisco video related to their Smart+Connected smart city program that directly mentions nature but does not mention Songdo; and videos produced by POSCO E&C and Songdo IBD (the engineering/construction and business development leads on the project, respectively). Full transcripts for these videos can be found in Annex 1.

(1) Cisco's "Cities of the Future: Songdo, South Korea" series

Their "Cities of the Future: Songdo, South Korea" series features 9 videos that were published on Cisco's YouTube channel between November 30 2011 and April 25 2012, and can be considered promotional by virtue of a call-to-action at the end of each video that directs the viewer to "Learn more at thenetwork.cisco.com/songdo". These videos are exclusively about Cisco's role in Songdo's development.

(2) Additional Cisco promotional videos pertaining to Songdo

Besides the "Cities of the Future: Songdo, South Korea" series, Cisco has been involved in the production of a number of other promotional videos related to Songdo's smart city functionality and connectivity: "Songdo – Cisco Connected City", "Songdo Innovation Centre", "The Smart City of Songdo Integrates Real-time Analytics" and "The Most Beautiful Life With Heartwarming People" (a video made under the U-Life Solutions subsidiary).

(3) Cisco promotional video pertaining to smart cities and nature

In addition, Cisco has produced a video ("What happens when trees connect to the Internet?") that directly addresses the incorporation of nature into Cisco's "Internet of Things" initiative (known as "Internet of Everything"). This video was produced as part of Cisco's Smart+Connected Communities program, the division responsible for smart city operations. Although neither Songdo nor smart cities are specifically mentioned, the subject matter makes the video an artefact relevant to this work.

(4) Non-technological stakeholder (POSCO E&C and Songdo IBD) promotional videos

As mentioned previously in this work, POSCO E&C is, as part of NSIC, the Korean engineering firm in charge of construction in Songdo, partnered with Gale International. The formation of the Songdo International Business District (Songdo IBD) consortium can be considered the next step in the evolution of the NSIC, in which the local municipality of Incheon Metropolitan City was brought on board as a public-sector partner (Shin 2016: 93).

The promotional videos attributed to POSCO E&C ("[Songdo] Quality of Life Greatest Values for My Life") and Songdo IBD ("Songdo IBD (International Business District) Official PR Film (ENG) -- Year 2014") and included in this analysis are therefore directly related to Songdo and indirectly linked to Cisco via its membership in the NSIC parent development company; in such videos, therefore, Songdo is promoted primarily as a place in which to either conduct business (per the core promotional mission of Songdo IBD)

or to live (per the core promotional mission of POSCO E&C), especially given that these organisations depended predominantly on ensuring the continued funding of the Songdo project by finding tenants and selling real estate (Shin 2016: 97). Since these videos are not produced directly by Cisco but in conjunction with Cisco, it may be important to keep these promotional differences in mind due to potentially different core ideologies and priorities. It should also be mentioned that these two videos see extensive content overlap, with the Songdo IBD video containing the entirety of the POSCO E&C video following a unique introduction.

2.1.2. Secondary research materials: promotional videos of Masdar City, United Arab Emirates

Given that the bulk of existing research and available promotional materials relates to Songdo, discourse about the greenfield smart city of Masdar is used as a supporting actor in this analysis, with Masdar's few promotional (and non-tech stakeholder produced) videos being used as secondary research materials. Full transcripts for these videos can be found in Annex 1.

(1) Foster + Partners promotional videos

As mentioned elsewhere in this work, Masdar remains far from the functional level of Songdo and so remains more of a conceptual smart city than a place in which one can actually reside and work. Two promotional videos ("Masdar Development, Abu Dhabi, UAE (4:20)" and "Masdar Development, Abu Dahabi, UAE (2:18)") have been created by Foster + Partners, the lead design firm on the Masdar project, though neither contain live action footage of Masdar itself – only its construction and some generic shots of solar panels and a distant skyline.

(2) Masdar City promotional video

The other promotional video available ("Masdar City Welcome Video (3 minutes, English") was released by Masdar City itself, and, in addition to computer generated renderings similar to those that appear in the Foster + Partners videos, it contains live action footage of what appears to be Masdar – however, since so little footage of Masdar exists, it is unknown whether this footage was indeed shot in Masdar City itself or on a soundstage built specifically for the video.

2.1.3. Video Referencing Shortcuts

Given the number of videos, the inconsistencies of their upload dates (if part of a series) and the length and format of their titles, it quickly becomes apparent that the default method of referencing them via the username of the YouTube channel on which they were published and their year of publication will likely be confusing to a reader of this work. As such, I volunteer an updated referencing rationale in order to help the reader better understand which video is being discussed at any given time. As such, from this point on, in-text references for video materials will differ from their end references. Table 1 pertains to all videos considered to be primary research materials:

Table 1: In-text video references for primary research materials

VIDEO TITLE	**END REFERENCE**	**IN-TEXT REFERENCE**
Episode 1 – Cities of the Future: Songdo, South Korea – Episode 1	Cisco 2011a	COTF1
Cities of the Future: Songdo, South Korea – Episode 2	Cisco 2011b	COTF2
Cities of the Future: Songdo, South Korea – Episode 3	Cisco 2012e	COTF3

Cities of the Future: Songdo, South Korea – Lifestyle & Leisure – Episode 4	Cisco 2012a	COTF4
Cities of the Future: Songdo, South Korea – Transportation – Episode 5	Cisco 2012b	COTF5
Cities of the Future, Songdo, South Korea – Water Conservation – Episode 6	Cisco 2012c	COTF6
Cities of the Future: Songdo, South Korea – Energy – Episode 7	Cisco 2012d	COTF7
Cities of the Future: Songdo, South Korea – Education – Episode 8	Cisco 2012f	COTF8
Cities of the Future: Songdo, South Korea – Roadmap for a New Community – Episode 9	Cisco 2012g	COTF9
Songdo Innovation Center	Cisco 2016a	Innovation Center
The Smart City of Songdo Integrates Real-time Analytics	Cisco 2016b	Real-time Analytics
Songdo City – Cisco Connected City	issongdo 2010	Connected City
Part-01-eng-U-Life.wmv	U. Life Solutions 2018	ULife
What happens when trees connect to the Internet?	Cisco 2013	Tree
[Songdo] Quality of Life Greatest Values for My Life	HelloPOSCOE NC 2015	Quality

Songdo IBD (International Business District) Official PR Film (ENG) -- Year 2014	Songdo IBD 2014	IBD

Table 2 pertains to all videos considered to be secondary research materials:

Table 2: In-text video references for secondary research materials

VIDEO TITLE	**END REFERENCE**	**IN-TEXT REFERENCE**
Masdar Development, Abu Dhabi, UAE	Foster + Partners 2013a	FP04:20
Masdar Development, Abu Dhabi, UAE	Foster + Partners 2013b	FP02:18
Masdar City Welcome Video (3 minutes, English)	Masdar 2014	Masdar

This improved logic should make comprehension of the analysis much more straightforward.

2.2. Methodology

The methodology by which I will answer the research questions for this work requires the consecutive pursuit of three stages in the analysis of the Songdo and Masdar greenfield smart city promotional videos: a qualitative content analysis, a multimodal critical discourse analysis, and an ecosemiotic analysis and interpretation of the findings from the first two stages. The next subchapters will focus on the methodology of the first two of those three stages, the qualitative content analysis and the multimodal critical discourse analysis, respectively. I will explain why such methodologies were chosen and how they were

conducted during the course of this work. I will not discuss the third stage regarding ecosemiotic analysis and interpretation of results because the validity of an ecosemiotic position for analysis has already been argued, and any theoretical elements not yet proposed will be introduced during the analytical discussion.

2.2.1. Qualitative content analysis

The first stage of the analysis will primarily serve to identify the units of content in the research materials that are relevant to this work's research questions. This delimitation is necessary due to the fact that the research materials consist of approximately 61 minutes of greenfield smart city promotional video footage – a volume unfeasible for the second stage of the analysis, a multimodal critical discourse analysis, especially since only signifying units associated with nature are of interest, and, by extension, the models of nature under which said representations can be categorised.

As a methodology, a qualitative content analysis can be considered a "systematic examination of communicative material" (Mayring 2004: 266) that allows for the subjective categorisation of signifying units of texts, paying attention to both discrete verbal and visual signs as well as "latent meanings […] intricately related to the objectives for which the analysis are undertaken" (Kracauer 1952: 634). A qualitative content analysis differs from a quantitative content analysis in that the latter is unable to derive "latent meanings" because it focuses only on discrete signs at the level of representation. Given that ideological meaning structures tend to be found in "implicit meanings which do not have direct surface structure representation" (Fowler 2013: 11) it is clear that a qualitative approach is a more suitable methodology for this work. Furthermore, though both qualitative and quantitative approaches use categorisation as an organising (and therefore delimiting) principle, only a qualitative approach allows the use of models as categories, given that models fall outside the realm of discrete verbal and visual units – indeed, models are latent or implicit meanings, given that they inform surface representations. Therefore, it follows that the set of categories used to delimit the materials in the analysis should indeed be models of nature.

Although not specific to greenfield smart cities, the list of 15 image-use categories of nature developed by Hansen (2002) mentioned in subchapter 1.3.1. can be considered models

of nature in promotional videos (specifically, television advertisements) given that they have been qualitatively derived, and thus will be employed in this work as a foundation for the qualitative content analysis. Therefore, for the purposes of this analysis, the terms categories and models will be equivalent and interchangeable going forward.

Table 3: Results from Hansen's study that lists the primary and secondary models of nature he found in his analysis of television advertisements as well as the frequency and distribution of those models

Categories	Count	Pct of Cases (cases = 132)
Nature as a nice place to be	53	40.2
Nature as intrinsically good (e. g. healthy, fresh)	50	37.9
Human mastery/power over nature	34	25.8
Recreational function of Nature	27	20.5
Nature as distance/space traversed/the in-between/obstacle	15	11.4
Nature as symbol of freedom	12	9.1
Nature as resource (production/recreation)	12	9.1
'Like nature' – metaphor	6	4.5
Nature as a threat	5	3.8
Nature as genuine and authentic	5	3.8
Nature as metaphor for life's journey	5	3.8
Nature as challenge/sport/manhood/endurance	4	3.0
Nature as spectacle, packaged (TV) spectacle	4	3.0
Nature as global, big, awesome, impressive	2	1.5
Nature as something to protect	1	.8
Total responses	235	178.0

(Hansen 2002: 506)

Hansen's list of models is reproduced in Table 3 (under the column labelled "Categories"), along with the total number of advertisements (cases) that fit a model (under the column labelled "Count"), the percentage of cases in which each model appeared (under the column labelled "Pct of Cases"), as well as totals for the "Count" and "Pct of Cases" columns (in the row labelled "Total responses"). I should note that this table is the second of two that Hansen uses to feature his results; I chose this table because it includes secondary image/use categories of nature in addition to primary, thus providing the full selection of Hansen's models of nature. Hansen differentiates between primary and secondary image/use categories of nature due to his observation of how advertisements tend to feature more than one model of nature, the primary category being considered the more prominent model and

the secondary being the less prominent. Hanson does not explain exactly how he made this distinction during his analysis; similarly, he does not explain how he recognised representations of "nature" as such, save that he included adverts for further analysis that contained "some reference, explicit or implicit, to the environment or nature" (Hansen 2002: 504-505). He does, however, include a list of product categories for the advertisements analysed that, amongst other things, features "Cars (incl. maintenance, accessories, etc)" and "Information technology" (Ibid, 508).

Hansen derived his categories by comparing "the images/uses [of nature] visible in the adverts themselves" (Hansen 2002: 505) to his own research on how the mediated uses and representations of nature have changed throughout history (Hansen 2002: 500-504), thus using a process of inductive category formation to create and refine his list of models. Such a process (see Figure 1) is designed to lessen the presence of the researcher's biases by way of recursive loops of category refinement, moving from general categories to ever more refined categories.

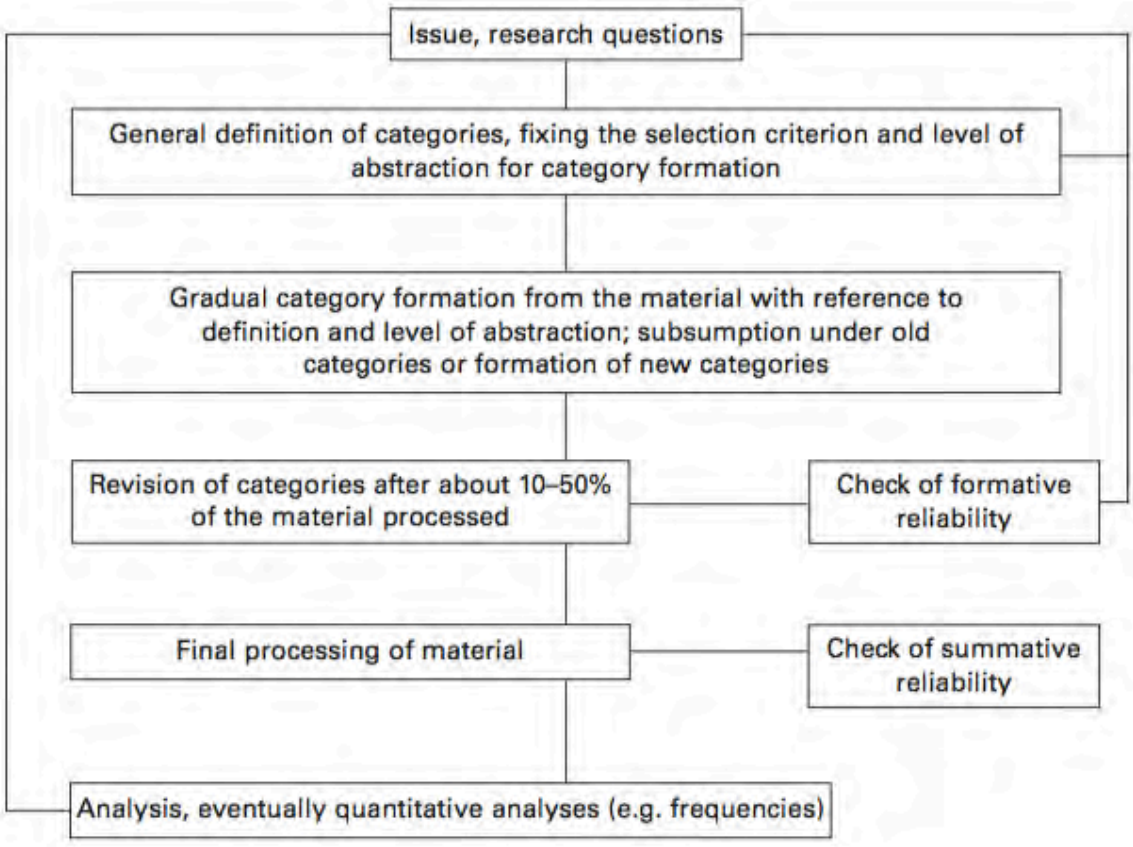

Figure 1: A flow-chart describing the process of qualitative content analysis and inductive category formation (Mayring 2004: 268)

Although Hansen does not describe his process in any great detail, he does mention that "there is little point in pretending that these categories 'suggested' themselves" (Hansen 2002: 505), therefore suggesting a self-awareness of the unavoidable presence of the researcher's subjectivity when engaging in such a qualitative process.

If Hansen's categories prove to be inadequate in representing the full range of models of nature observed in the research materials, then, similar to Hansen's original methodology, this work will also follow the procedural approach for inductive category formation as seen in Figure 1. Note that categorisation can occur across multiple modes simultaneously – for instance, the verbal content of the voiceover may evoke one particular model of nature while the visual image evokes a different model. Similarly, a single representation can be grouped under two different categories simultaneously.

Thus, this work's qualitative content analysis will use Hansen's list of 15 models of nature found in promotional videos as a foundation from which to delimit and categorise the representations of nature found within the research materials. This first stage of the analysis will consequently provide this work with a comprehensive list of the models of nature that appear in the research materials, a quantitative dataset that details the frequency of the appearance of said models as representations of nature, and, ultimately, a matrix of qualifying representations of nature (categorised by model) that will be used in the next stage of the analysis. Therefore, by conducting a qualitative content analysis I intend to answer the first two research questions: "What models of nature are present in the research materials?", and, "Which models of nature are most dominant in the research materials?"

2.2.2. Multimodal critical discourse analysis

Since this work aims to infer the ideological leanings of the smart city stakeholders that produced the research materials studied, it follows that, if signifying units found in discourse are indeed ideologically encoded (van Dijk 1998; Bateman 2008; Fowler 2013; Machin, Mayr 2012), I would be best served to employ a methodology of multimodal critical discourse analysis (henceforth MCDA) "to draw out ideologies, showing where they might be buried in texts." (Machin, Mayr 2012: 25). As explained previously, it is the contention of this work that such ideologies can be inferred by determining how models of nature are used to

create explicit and latent meanings in the context of the research materials. MCDA provides a method to contextually analyse abstract elements (like models), by studying how they are used as semiotic resources to construct representations, and therefore, to construct meaning. Although Koller's article "'The world in one city' – Semiotic and cognitive aspects of city branding" did not focus on models of nature, it provides a good example of how a critical discourse analysis methodology can be employed to analyse vision documents pertaining to cities in different countries in order to ascertain the adoption of global brand values – corporate ideologies – in local contexts (2008). Thus, an MCDA appears to be suited to the task at hand.

Developed by Kress and van Leeuwen, O'Halloran and Baldry and Thibault (Machin, Mayr 2012: 7), MCDA enables the dissection of possible meanings encoded within and between multiple modes (and therefore different sign systems) within a text, modes which interact with one another by virtue of their concurrent or consecutive transmission. The process through which this distillation occurs requires the analyst "to systematically link structures of discourse with structures of ideologies" (van Dijk 1995: 143). Some of these structures of discourse are very simple, as evidenced by the fact that even non-experts can capture the gist of a text – say, whether it can be considered racist, sexist or the like. But a correct and thorough analysis depends upon such intuitions being spelt out in such a way that the analyst can specify "what expressions or meanings of discourse give rise to what kind of inferences or other mental steps" (Ibid). Therefore, knowledge of the semiotic systems used within each mode and how meaning is constructed by the models therein is essential.

This work will delimit its MCDA to two modes – visual imagery (including cinematography and graphical elements such as title cards, interstitials, lower thirds and calls-to-action) and the verbal transcription of narrative voiceovers and the speech of talking heads on screen (including subtitled translations). This is a necessary distinction to make because, in its most thorough application, MCDA can be used to scrutinise even the mode of, for example, gestural motions of individuals appearing in conversation on screen (O'Halloran 2011). The content which provides a "normative base to discourse" (Fowler 2013: 11) will likely play a key role in containing or concealing ideological leanings; thus, I will primarily focus the MCDA on those shots categorised during the qualitative content analysis that were discovered to feature the most dominant models of nature. Similarly, if specific narratives appear multiple times (especially in different videos), it is wise to consider them as being

emphasised by the producers of the promotional videos and therefore of discursive importance. Careful attention will also be paid to instances where the different modes and models simultaneously at play can be interpreted to convey conflicting or oppositional messages, for it is in such discursive clashes that hidden or otherwise unintended intersemiotic meanings are communicated, which, in turn, can be considered key elements in the identification of ideological positions of smart city stakeholders (Carvalho 2008, O'Halloran 2011).

Therefore, by conducting an MCDA I intend to answer these final research questions: "How are the dominant models of nature used to create explicit and latent meanings in the context of the research materials?", and, "Given these meanings, what can be inferred about the ideology of smart city stakeholders?"

3. ANALYSIS

3.1. Qualitative content analysis

(1) Recognising nature, new category formation and category descriptions

As explained in subchapter 2.2.1., an effective MCDA for this work would first require an aggressive delimitation of analytical focus to accommodate the slightly more than 61 minutes of promotional videos that make up the research materials. Therefore, in the first stage of the analysis, a qualitative content analysis was used to filter for relevant representations of nature upon which to perform an MCDA. Relevance was initially predicated on Hansen's list of the 15 models of nature that he found in promotional videos (see Table 3 in subchapter 2.2.1.), a list that was dynamically revised during the qualitative content analysis by way of inductive category formation (see Figure 1 in subchapter 2.2.1.) so as to ensure that the list of models was consistent with those featured in the greenfield smart city promotional videos analysed in this work.

However, before performing such an analysis, it was first necessary to decide how I would recognise which signifying units in the research materials should be considered relevant when identifying representations of nature prior to their categorisation by model (or to declare a new model necessary). This was further complicated by the multimodality of the research materials and the fact that Hansen does not describe in detail how he identified representations of nature in his research and, given the complex definition of nature alluded to earlier in this work, creating a rationale for such recognition is a difficult task without guidance. Yet Hansen's list of models provides a key insight as to his rationale for recognising signifying units that represent nature: his categories can mostly be grouped under the

oppositional metamodel of nature that posits nature as an entity discrete from humans. By labelling his models as "image/use categories", Hansen suggests that humans interact with (or use) what Hansen considered to be nature in the representations he considered relevant. Therefore, the qualitative content analysis proceeded using the following composition of representations as being the primary selection criterion for visual representations eligible for analysis:

- instances in which at least one human and at least one entity of living or non-living nature (such as a tree, a lawn or a body of water) are featured

As for verbal representations or multimodally determined meanings that are perhaps more abstract in their formulation, I noted how Hansen considered "some reference, explicit or implicit, to the environment or nature" (Hansen 2002: 504-505) as qualifiable within his selection criteria. This incredibly broad statement provided me with a wide range of possibilities for identification of relevant verbal signifying units, but, given that the analysis was initially carried out using Hansen's list of 15 models, relevance was immediately restricted by way of association with said models. However, it was also because of these 15 models that the level of abstraction was set quite high – Hansen's work matched one model of nature to one advertisement at a minimum, or two models of nature (primary and secondary) to one advertisement at a maximum. Therefore, by running a qualitative content analysis at a more granular level (associating specific verbal or visual instances within a specific promotional video with specific models of nature) with the intention of discovering how the dominant models of nature therein were used to create explicit and latent meanings in the context of the research materials, it was necessary to scour the materials for verbal and visual representations of category-derived meanings versus attempting to generalise the whole video using only one or two categories.

Using the process of inductive category formation, my original selection criterion was challenged early on in the qualitative content analysis. It was observed that the research materials contained a large number of representations that featured combinations of nature and human-designed and created technologies (such as smart city buildings, infrastructure or computerised interfaces). Given the prominence of such representations it became apparent that the signifying unit of technology as previously described necessitated special inclusion as

another element that, similar to humans, can be considered separate from nature, but also in meaningful relation with nature. A closer look at Hansen's analysis showed me that he too included human-designed and created technologies as relevant signifying units, given that he makes specific mention of analysing car advertisements in which "the advertised car is generally the *only* vehicle to be seen on the roads or in the nature scenery shown" (2002: 509). Therefore, I reformulated the selection criteria to include this new signifying unit while retaining Hansen's separation of humans (and technology as a cultural artefact) from living and non-living nature, resulting in two additional qualifying formulations:

- instances in which at least one human-designed and created technology (such as smart city buildings, infrastructure or computerised interfaces) and at least one entity of living or non-living nature are featured;

- and instances in which at least one human, at least one human-designed and created technology and at least one entity of living or non-living nature are featured.

Using this adjusted rationale for category formation, a single model appeared to be missing from Hansen's list that I tentatively named "Harmony of technology and nature". Numerous representational compositions included under this new model came close to fitting Hansen's existing category of "Human mastery/power over nature", but semantics dictated that a new model was required. For example, a shot of electricity-generating windmills partially hidden amongst a stand of trees (COTF4: 00:46) referred to an equivalence of the two forms by way of iconic and symbolic means: both trees and windmills were similar in appearance given their vertical orientation and height, they appeared to co-exist without issue, and it is known that both engage in the activity of converting one form of energy to another. Concurrent to these indications of equivalence, it can be argued that a state of juxtaposition was made apparent by way of the fact that both a designed technology and a biological form were presented together. Given that the trees and windmills were framed by both the composition of the shot and the narrative of the promotional video, it can be argued that this inherent state of juxtaposition was forced into one of equivalence, such as through the persistent use of the word "green" in the voiceover whenever such images appeared. This

process always tended to err towards making the windmill equivalent to the tree rather than making the tree equivalent to the windmill. This is likely because the colour green is associated more closely with natural than unnatural things, and biological forms – such as trees – supersede technological and designed forms – such as windmills – in terms of closeness to that which is widely considered natural. Ergo, technology and nature were perceived as being presented in a state of harmony, with designed, technological forms being represented as analogous, even complementary, to biological forms. This inference is further cemented by voiceover verbalisations that make statements such as "…we're a green city…" (COTF4: 00:44).

Compare this to a recurring example of "Human mastery/power over nature" – the term "built from scratch" (COTF6: 00:19) is inseparable from Cisco's rhetoric about Songdo in terms of how the city was built on "a barren mudflat" (COTF9: 00:18) or on land that "had to be reclaimed from the sea" (COTF1: 00:51). These verbal semiotic units – in one instance heard while imagery of a team of triumphant, cheering engineers raise their fists to the sky on screen as part of a melodramatic verbal narrative of conquest – do not demonstrate a harmony between technology and nature but an engineered transformation in which wetlands (as living and non-living nature) are drained to make way for new construction (human-designed and created technology).

However, as I continued the analysis, it became clear that the proposed model of "Harmony of technology and nature" was problematic. Firstly, it introduced the factor of technology in the list of models. Hansen does not make this distinction in his work; although he recognises technological forms as relevant signifying units when formulating his categories, technology is not recognised as a separate element in his analysis and so is not named in any of his categories; his models solely describe the relations between humans and nature, even if such relations are technologically mediated. To introduce a third element would be inappropriate, even though it dominated my research materials. Secondly, the proposed model of "Harmony of technology and nature" became overwhelmingly dominant in terms of the frequency of its appearance. This is likely exacerbated by the fact that this work concentrates primarily on the promotional materials produced by Cisco, a multinational corporation that follows a specific brand strategy in its marketing materials. Compare this to Hansen's list of 132 television advertisements that were deemed to contain implicit or explicit references of nature (2002: 504) – a wide spread of brands brought a wide spread of 15

strategies for modelling nature, which means that Hansen's inductive category formation process had to accommodate a very wide range of selection criteria. My work does not have to accommodate such a wide spread of brands nor subject matter, and, as such, through inductive category formation, it was easy to propose a new model of nature that appeared to encompass the brand strategy of Cisco's greenfield smart city promotional materials (for it is common that a campaign should be weighted strategically in a certain direction). But the proposed model was far too general. This was confirmed when I finished the first pass of the research materials and discovered that the proposed new model of "Harmony of technology and nature" could be applied to nearly 47% of all instances recorded in my research materials.

Therefore, I decided to reformulate "Harmony of technology and nature" into two new models that appeared to better describe the human-nature relations observed within my research materials while also removing explicit references to technology. This allowed the implicit inclusion of technology as a signifying unit per Hansen's original formulations. The two new models were: "Human mimicry of nature" (constructed to be similar in phrasing to Hansen's model of "Human mastery/power over nature") and "Naturalising aesthetic function of nature" (which is constructed to be similar in phrasing to Hansen's model of "Recreational function of nature"). "Human mimicry of nature" refers to how living and non-living nature can act as a model in the design and appearance of human-made artefacts or technologies (mimetic or iconic mimicry), as well as a model for ecological values that the built environment can implement (functional mimicry). "Naturalising aesthetic function of nature" refers to how living and non-living nature can have an intersemiotic relation with man-made structures, providing an organic or naturalising aesthetic function that somehow makes the "unnatural" (such as the technological) appear more "natural". This differs from "Nature as a nice place to be" because it doesn't involve the identification of a spatially-limited environment dominated by living or non-living nature, just the presence of at least a single signifying unit of living or non-living nature to create the "naturalising aesthetic" effect. One important factor that had to be considered when selecting qualifying instances for categorisation under "Naturalising aesthetic function of nature" was the level at which the aforementioned "naturalising aesthetic" actually became noteworthy due to living and non-living nature appearing in the research materials almost constantly. Therefore, selection depended on an intuitive grasp of when the contrast between the living and non-living nature and the human-designed and created technology featured was sufficiently high enough to

deserve recognition of the foil effect. The same could be said for verbal instances – for example, when biological or green-marketing terms were used explicitly in conjunction with IT terminology in a way that seemed intuitively noteworthy, these instances deserved categorisation.

Another missing model created during the process of inductive category formation was "Nature as a limited resource" – a nuanced variant of Hansen's "Nature as resource (production/recreation)". For example, in some of the Cisco videos pertaining to Songdo, verbiage appeared that talked about "water-stressed countries" (COTF6: 00:05) and "non-renewable energy sources" (COTF7: 00:14) – constructions that specified limitations to natural resources. By contrast, representations that qualified for categorisation under "Nature as resource (production/recreation)" could mention how Songdo's systems reduced the amount of a resource used, but did not allude to this reduction being necessary due to a limited supply – only that there existed a resource that could be used. Indeed, such reductions were often framed in an economic, cost-saving sense. Further rationale for the inclusion of "Nature as a limited resource" can be found in the abrupt jump of Hansen's least used category – "Nature as something to protect" – from last place up to the 6th most prevalent category in this work's analysis. Hansen even made special mention that this category's conspicuously low ranking in his study showed that "the 'environment' is quite simply not present as a 'social problem' in British prime time television advertising" (2002: 506).

Finally, through the course of the qualitative content analysis, it became apparent that some of Hansen's categories were not present in the research materials whatsoever:

Nature as a threat
Nature as genuine and authentic
Nature as metaphor for life's journey
Nature as challenge/sport/manhood/endurance
Nature as spectacle, packaged (TV) spectacle
Nature as global, big, awesome, impressive

This is somewhat aligned with Hansen's own findings given that all of the above categories appeared very low in his analysis, hovering just above his least common category, "Nature as something to protect".

Thus, the first of this work's research questions ("What models of nature are represented in the research materials?") can be answered by way of this final list of 12 models of nature that were found to be present in the greenfield smart city promotional videos selected for this study (new categories are marked with an asterisk):

*Human mimicry of nature
*Naturalising aesthetic function of nature
Human mastery/power over nature
Nature as a nice place to be
*Nature as limited resource
Nature as something to protect
Recreational function of Nature
Nature as resource (production/recreation)
Nature as intrinsically good (e.g. healthy, fresh)
Nature as distance/space traversed/the in-between/obstacle
Nature as symbol of freedom
"Like nature" – metaphor

I will now give specific examples of how these models appear in the research materials, therefore providing an explication for the qualitative dimensions relevant in the identification and subsequent categorisation of qualifying representations. As noted before, some of these representations can fit in more than one category:

Human mimicry of nature

Voiceover*:* [Female Narrator] "Songdo, South Korea, a new city built entirely from scratch, is on the forefront."

Figure 2: example of "Human mimicry of nature" category (COTF7: 00:27)

In Figure 2 a bus shelter covered in photovoltaic cells provides shelter while turning sunglight into energy, similar to a tree. Thus the foundation of renewable energy (the transformation of natural, unlimited energy flows) as a sort of biomimicry – the "forefront" of development inspired by biophilia - is established.

Naturalising aesthetic function of nature

Voiceover*:* [Stan Gale] "…we're a green city…"

Figure 3: example of "Naturalising aesthetic function of nature" category (COTF4: 00:46)

Figure 3 shows how living nature in the form of trees act as a sort of naturalising camouflage for the electricity-generating windmills. The technological representation is therefore "softened" or "naturalised" by the organic representations of nature. The voiceover adds to the effect by describing the (smart) city as "green".

Human mastery/power over nature

Voiceover: [Female Narrator] "1500 acres had to be reclaimed from the sea."

Figure 4: example of "Human mastery/power over nature" category (COTF1: 00:58)

At over 20km long, the Incheon Bridge (shown in Figure 4) is an engineering marvel that was built to give humans the power to pass over the sea at will. When combined with the voiceover that mentions Songdo's ambitious land reclamation project, it is clear that the engineering know-how required to build Songdo and its infrastructure was a stunning example of human mastery over the sea, and therefore over nature.

Nature as a nice place to be

Voiceover: [Female Narrator] "...an exceptional quality of life."

Figure 5: example of "Nature as a nice place to be" category (IBD: 02:01)

In Figure 5 a natural, spatially-defined environment that can be entered and enjoyed – most often Songdo's Central Park – is displayed while the voiceover mentions the high quality of life experienced in Songdo.

Nature as limited resource

Voiceover: n/a (title card)

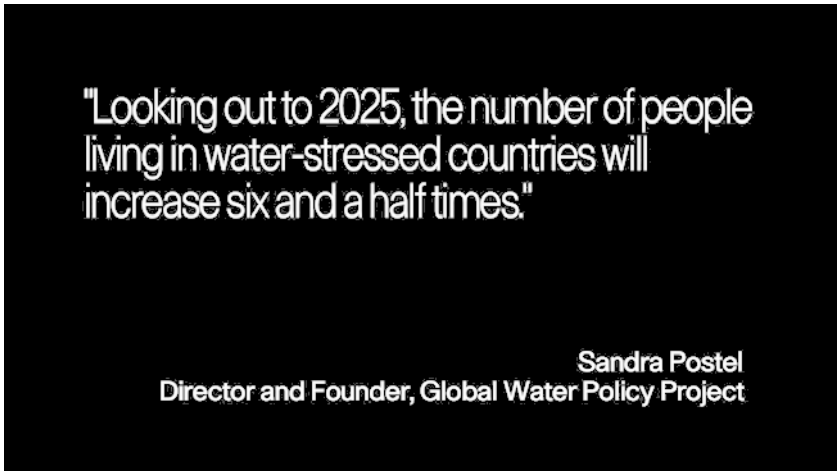

Figure 6: example of "Nature as limited resource" category (COTF6: 00:01)

By using the term "water-stressed countries", Figure 6 clearly demonstrates that water – and therefore (non-living) nature – is a limited resource.

Nature as something to protect

Voiceover: [Female Narrator] “The need to make existing cities more energy efficient and to build new sustainable cities is on the rise.”

Figure 7: example of “Nature as something to protect” category (COTF1: 00:16)

The verbal mode fits the model example here, stressing how the “need” to make new cities more sustainable and energy efficient is on the “rise”; the visual (Figure 7) is more referential to another model, “Nature as a limited resource”, given it shows a large number of humans alongside a small amount of produce, hinting, per the voiceover, at the future pressures of overpopulation and its stresses on nature and potential outcomes (for example, famine) if nature is not protected. Thus nature, becomes something that needs protection. This should be considered a more abstract and complex example.

Recreational function of Nature

Voiceover: [Lee Jong-Cheol] [Korean audio, English subtitle] “We have secured the maximum amount of space we can for parks.”

Figure 8: example of "Recreational function of Nature" category (COTF4: 01:06)

Figure 8 shows a cyclist and two people walking in Central Park, Songdo. This concept is echoed in the voiceover by way of mentioning parks, a place typically for recreation commonly associated with nature.

Nature as resource (production/recreation)

Voiceover: [Lee Jong-Cheol] [Korean audio, English subtitle] "We have invested heavily in growing a significant number of trees."

Figure 9: example of "Nature as resource (production/recreation)" category (COTF4: 01:00)

The voiceover mentions the act of investing in the "growing" of trees while showing trees on screen (Figure 9). Given Songdo's greenfield status, it can be inferred that the importation of living nature into Songdo (trees as natural resources grown and sourced from elsewhere) was

essential for the production of the city's carefully designed plan.

Nature as intrinsically good (e.g. healthy, fresh)

Voiceover: [Female Character] "...with clean air, green nature and thick woods."

Figure 10: example of "Nature as intrinsically good (e.g. healthy, fresh)" category (Quality: 03:25)

Figure 10 is part of a montage of shots that show children playing happily with other children and their families in a park (the connotation being that children are pure and intrinsically good). Combined with the voiceover that explicitly mentions "clean air, green nature and thick woods", the children's joy is associated with "nature", therefore showing nature, also, as intrinsically good.

Nature as distance/space traversed/the in-between/obstacle

Voiceover: [Female Narrator] "One day, they appeared at the ocean's edge."

Figure 11: example of "Nature as distance/space traversed/the in-between/obstacle" category (IBD: 00:31)

By depicting engineers standing "at the ocean's edge" (by way of the voiceover and the imagery in Figure 11), I am reminded that the land on which Songdo is built was once mudflats – a major obstacle.

Nature as symbol of freedom

Voiceover: [Stan Gale] "You can leave your car at home and you can walk to Central Park."

Figure 12: example of "Nature as symbol of freedom" category (COTF1: 01:30)

The concept of walking as expressed in the voiceover and simultaneously referenced in the image shown in Figure 12 is one of freedom – the walker is not constrained to roads or a vehicle but may wander at will. Songdo was designed purposefully so that Central Park is at most a 20-minute walk from all buildings within the business district so as to give residents a

sense of escape from the urban metropolis. Central Park itself, thus, is a symbol of freedom.

“Like nature” – metaphor

Voiceover: n/a

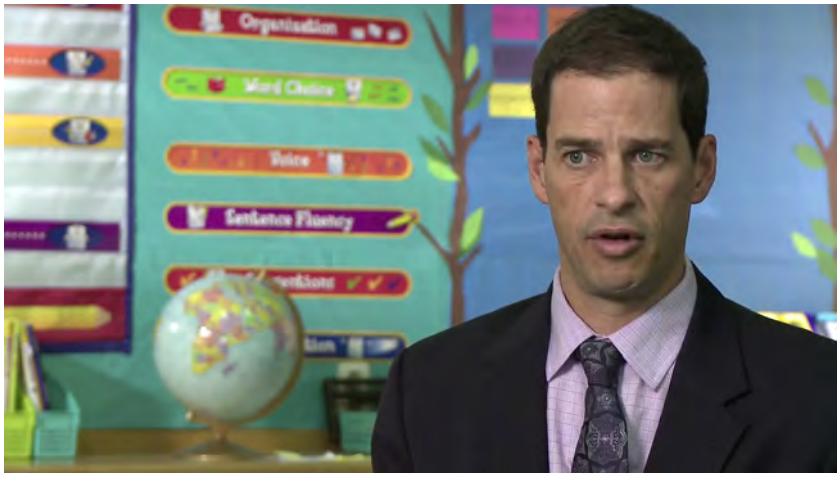

Figure 13: example of ““Like nature” – metaphor” category (COTF8: 01:26)

The background of Figure 13 shows representations of trees being used as decorative elements in a classroom that align with incremental acquisition of skills, thus learning and (natural) growth are connected, and so nature becomes a metaphor for the educational proccess.

(2) Overall results of qualitative content analysis

In the qualitative content analysis, 230 qualifying representations of nature were categorised under the final list of 12 models of nature. Table 4 shows the frequency and distribution of these instances by model, sorted in descending order (new categories are marked with an asterisk):

Table 4: Overall quantitative results of qualitative content analysis

MODELS OF NATURE	**INSTANCES**	**INSTANCES AS %**
* Naturalising aesthetic function of nature	82	35.65%
* Human mimicry of nature	29	12.61%
Human mastery/power over nature	28	12.17%
Nature as a nice place to be	21	9.13%
* Nature as limited resource	20	8.70%
Nature as something to protect	15	6.52%
Recreational function of Nature	12	5.22%
Nature as resource (production/recreation)	11	4.78%
Nature as intrinsically good (e.g. healthy, fresh)	5	2.17%
Nature as distance/space traversed/ the in-between/obstacle	3	1.30%
Nature as symbol of freedom	3	1.30%
"Like nature" – metaphor	1	0.43%
TOTAL INSTANCES OF REPRESENTATIONS	230	

(list of models partially adapted from Hansen 2002: 506)

More than a third – 35.65% – of all recorded representations of nature belong to the new category "Naturalising aesthetic function of nature", which positions it as the most dominant model of nature present in the research materials. The second most prevalent (and also new) category, "Human mimicry of nature", shows only 12.61% in comparison, and the third most prevalent category, "Human mastery/power over nature" is a close runner-up with 12.17%. These results answer this work's second research question: "Which are the dominant models of nature represented in the research materials?" with the model "Naturalising aesthetic function of nature" being the most dominant by a significant margin.

Hansen also found “Human mastery/power over nature” to be the third most common category in his study. “Nature as a nice place to be”, Hansen’s dominant category, places fourth here with only 9.13% of the total distribution of instances of recorded models of nature. Hansen’s other dominant category, “Nature as intrinsically good (e.g. healthy, fresh)” places very low in this study with a distribution of only 2.17%. Also calling for attention in comparison to Hansen’s results is that, combined, the conservation-minded categories of “Nature as limited resource” (a new model) and “Nature as something to protect” make up 15.22% of all instances – a noteworthy result given Hansen’s circa-2002 observations mentioned earlier in this subchapter about the lack of promotional videos presenting the need for environmental protection and conservation.

If focus is placed upon how the models of nature are distributed across specific sets of research materials (such as only in primary or secondary research materials, or in specific collections therein), few differences are noteworthy. In the primary research materials (those only pertaining to Songdo), “Naturalising aesthetic function of nature” remained the dominant model, appearing at a percentage similar to that seen in the overall results in all of the video sets except for one (“Additional Cisco promotional videos pertaining to Songdo”) in which it accounted for 60.87% of all recorded representations of nature. Outside of the “Cisco’s “Cities of the Future: Songdo, South Korea” series” collection (which, at nine videos, is the video collection with the largest sample size in this work), the total number of models present in the materials dropped by varying amounts, although the dominant models in all primary collections largely retained the overall distribution trends. Similarly, in the secondary research materials (those only pertaining to Masdar), many models failed to be represented in all of the promotional videos yet the dominant categories largely followed the general, overall trends for frequency distribution. Tables showing granular results of the qualitative content analysis by video collection can be found in Annex 2.

In the next subchapter I will utilise an MCDA to provide contextual analysis of the dominant models of nature found during the qualitative content analysis. Understanding how such models are used to create meaning in the context of greenfield smart city promotional videos will serve as a guide to better distil Cisco’s brand strategy, and, by extension, its corporate ideology as a smart city technological stakeholder.

3.2. Multimodal critical discourse analysis

In this subchapter I will conduct an MCDA primarily using shots selected during the qualitative content analysis that were categorised under the most dominant models of nature present in the research materials: “Naturalising aesthetic function of nature”, “Human mimicry of nature” and “Human mastery/power over nature”. Together, these models accounted for 60.43% of all recorded instances of nature representations that met the selection criteria. Of course, some shots categorised under the less common models of nature will also be featured in this analysis. I also use some shots that were not selected in the qualitative content analysis, for, in attempting to extract explicit and implicit meanings of the aforementioned dominant models of nature, cross-analysis using contextual elements will be helpful. Video-by-video matrices containing a thorough list of shots categorised during the qualitative content analysis and used in the MCDA can be found in Annex 3.

(1) “Naturalising aesthetic function of nature”

Given that the most dominant category (“Naturalising aesthetic function of nature”) was featured in 35.65% of the qualifying instances, it is clear that the inclusion of living and non-living nature within the environs of Songdo and Masdar is an important part of the greenfield smart city promotional strategy, made all the more noticeable by the fact that such an environment is saturated with (networked) technology, most of which is unseen or implied and some of which is made explicit, either through visuals or voiceover. The most striking examples of this category were visuals in which representations of living and non-living nature appear alongside representations of technological elements that have proven controversial in past discourse concerning smart cities. A strong and memorable example is that of how representations of surveillance apparatus within the city are “naturalised”, for a common narrative in smart city criticism concerns the unavoidable creation of a comprehensive surveillance state given the smart city’s ubiquitous sensor network (Greenfield 2013; Townsend 2013). In discourse referring to such positions, the smart city’s sensor network is often referred to as a sort of panopticon, a term which carries an undeniably dystopian connotation. As such, it is interesting that surveillance is positioned as a vehicle for

child safety in two different Songdo-related videos, the latter of which features significant representations of nature across multiple modes (emphasis added):

> Innovation Center: 00:00 [Jimmy Kim]:
> **So, there's a missing child**. When a missing child alarm happens, not only will they show you where the incident happens, but also your GPS track where the child is moving. You can also change the digital signage of the whole city. You alert the police, you alert the general public. We can be more efficient and effective for city operations.
>
> Quality: 03:02 [Female Narrator]:
> High-tech systems that make everyday life more convenient and pleasant. **A state-of-the-art security system that protects my children's safety, anytime, anywhere, my child running around in the pleasant natural environment with clean air, green nature and thick woods. Nothing could make a Mom happier**.

In the first video clip referenced, a problem and solution is presented from the outset of the video (see Figure 14), the problem being a missing child, and the solution being a Cisco-branded networked surveillance system:

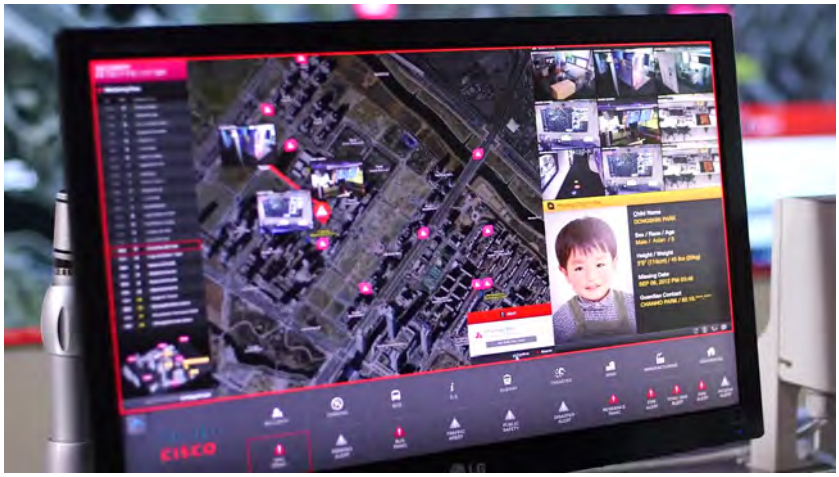

Figure 14 : Cisco-branded missing child interface
(Innovation Center: 00:02)

Overlooking the inanity of the narrative (a child tracked by GPS cannot be considered lost), surveillance of this sort has been considered contentious because of how it challenges the

balance between privacy and security for the smart city's citizens. Therefore, when introducing such subject matter in discourse such as the promotional videos studied, going so far as to leverage potential danger to children as an emotional plea for the necessity of surveillance technologies whilst simultaneously using the "Naturalising aesthetic function of nature" to "naturalize" and therefore neutralize (or even invert) the negative connotation of surveillance apparatus suggests a deliberate attempt to use representations of nature to sway the interpretation of discourse on technological surveillance, to make it seem softer, human, more natural.

Figure 15: "A state-of-the-art…"
(Quality: 03:09)

This is especially evident in the second video clip referenced when security cameras are shown against a backdrop of greenery and trees as shown in Figure 15. It is at the mention of the phrase "a state-of-the-art security system that protects my children's safety" that the shot in Figure 15 appears, followed by a variety of dim, interior shots of what is imagined to be a security command centre with people manipulating screens with satellite imagery of Songdo as shown in Figure 16.

Figure 16: "...security system that protects my children's safety, anytime, anywhere."
(Quality: 03:11)

Suddenly, as shown in Figure 17, the spoken and visual narrative shifts away from surveillance and features sunny outdoor shots of the Songdo canal system and Central Park as the narrator speaks the words "my child running around".

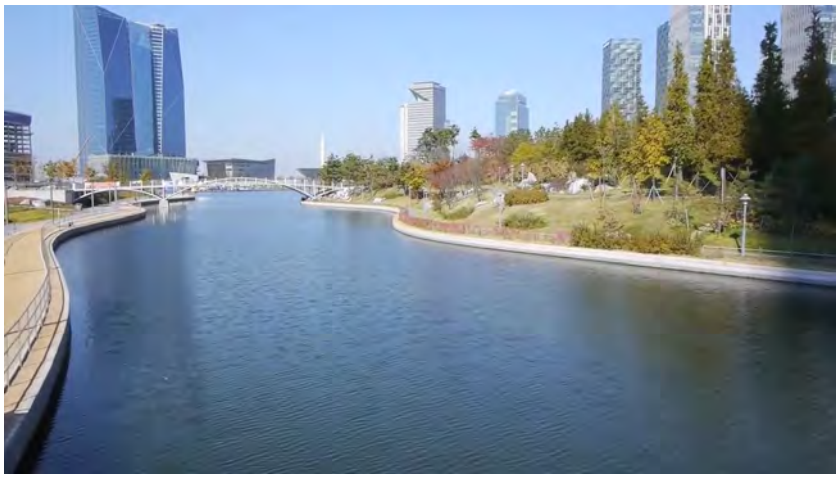

Figure 17: "My child running around in the..."
(Quality: 03:16)

Figure 18: "...pleasant natural environment..."
(Quality: 03:19)

Children do not appear until the words "pleasant natural environment" are spoken, at which point a montage of shots featuring smiling and laughing children and families playing in Central Park is introduced, the first of which is shown in Figure 18; indeed, "Nothing could make a Mom happier". Thus, the discourse's positive positioning of a "naturalised" surveillance has been paired with an idyllic demonstration of the model "Nature as a nice place to be" (the fourth most popular model carrying 9.13% of instances) – the negative connotations of a surveillance panopticon are therefore challenged by the presence of nature and the happiness of family life when situated in a natural environment – albeit one which is made possible by "a state-of-the-art security system". This is reinforced simultaneously across visual and verbal modes, including a voiceover that contains the only explicit instance of the word "nature" in all of this work's research materials.

The other most striking uses of the "Naturalising aesthetic function of nature" model concern how living and non-living forms are presented in conjunction with renewable energy generating technologies. I already described one of these instances (the shots of the electricity-generating windmills partly hidden amongst trees) in subchapter 3.1. Another example occurs in COTF8, in which shots of a Cisco field technician who is standing in a beautiful field of large-scale wind turbine power generators is shown speaking with excited schoolchildren via Cisco's TelePresence technology (video conferencing which is omnipresent throughout Songdo), as shown in Figure 19:

Figure 19: A Cisco technician in a beautiful natural location has a conversation with excited schoolchildren about wind turbines via Cisco-branded TelePresence video-conferencing technology (COTF8: 03:17)

Although this instance lacks the overtness of discursive control evidenced in the previous example, it is clear that the "Naturalising aesthetic function of nature" plays a part in softening or humanising the images of the enormous wind turbines, the installation of which are often protested wherever such projects are proposed due to feared changes to the local landscape (Pasqualetti 2011). Songdo's TelePresence video conferencing system also benefits from the "naturalization" effect given that, arguably, it can be considered another wing of Songdo's surveillance system – one that is sold to customers as a sustainability measure, due to how it reduces the need to travel within Songdo (Laszlo, Kelly 2013). That the scene is branded with a Cisco logo visible on the TelePresence unit means that this aura of "naturalization" is also extended to the technology company and its brand.

Of course, the majority of instances that fall under the "Naturalising aesthetic function of nature" model do not contain such strong or explicit contrasts between living or non-living nature and human-designed and created technology, nor are contained in such telling narratives. Many such generic examples consist of a compositional 'sandwich' form in which 3 visual elements appear on-screen simultaneously in a single shot. Such a composition of diverse representations allows for the symbolic understanding of their relatedness due to visual framing as an iconic text – when these elements appear together, their simultaneous appearance becomes a situation in which meaning can and will be generated, for any individually identifiable elements in iconic texts will always be understood in terms of their relations to one another (Lotman 1975). Therefore, such meaning is often context-dependent.

In the naturalising ‘sandwich’ compositional configuration, given its synchronic, snapshot-like nature, a message transmitted concurrently by another mode – such as a verbalised voiceover – can provide that affirming context, as can the framing of the overall subject of the promotional video: the greenfield smart city.

The naturalising ‘sandwich’ in its compositional configuration refers specifically to how three different signifying units can appear separately, in either the foreground, mid-ground or background. Given that the mid-ground layer is situated spatially in such a way that it connects the foreground with the background, it becomes apparent that this mid-ground layer can mediate the relations between the elements visible in the foreground and background. Representations of nature are frequently found in this mid-ground layer when the ‘sandwich’ composition is used in the greenfield smart city promotional videos. As such, these representations of nature can be said to play a “naturalising aesthetic function” via one of two compositional forms:

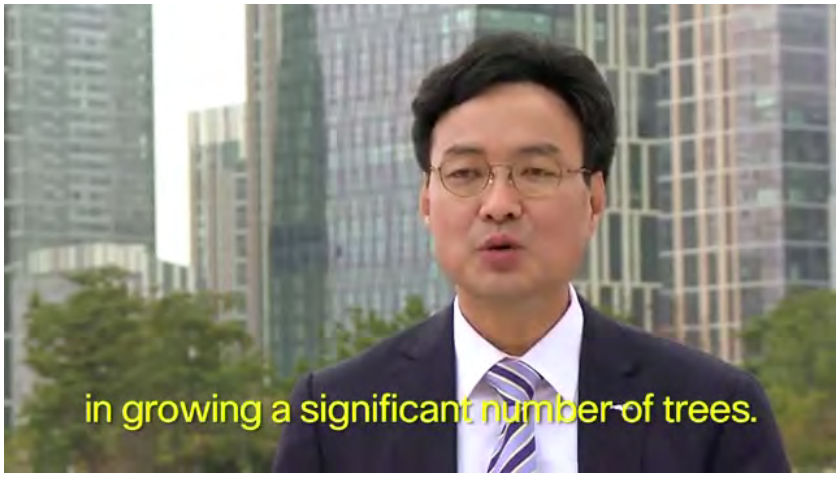

Figure 20: Naturalising ‘sandwich’ compositional configuration example 1 (COTF4: 00:58)

In the first example of the naturalising ‘sandwich’ compositional form, Figure 20, notice that a human appears in the foreground, trees (living nature) in the mid-ground and human-designed and created technology (smart city buildings of Songdo) in the background. The visual mode of this shot was categorised as an instance of the “Naturalising aesthetic function of nature” model, whereas the verbal mode (seen in Figure 20 as a subtitle) was categorised as an instance of the “Nature as resource (production/recreation)” model. The so-called naturalising ‘sandwich’ occurs at the visual level, with the representations of the trees acting

as a sort of mediating layer between people and the smart city, situating the high-tech buildings of the smart city in a natural setting and thus "naturalising" them compositionally, thus changing the relationship witnessed in discourse between people and the smart city, between people and technology. This configuration appears many times in the research materials (see Annex 4 for more examples).

Figure 21: Naturalising 'sandwich' compositional configuration example 2
Voiceover: "Ten percent of Songdo's land is dedicated to an enormous public park..."
(COTF4: 01:40)

In Figure 21 (the example of the second naturalising 'sandwich' compositional configuration), representations of living nature play a similar role, acting as a unifying element that mediates between the foreground and background. However, in this configuration, no humans are present in the foreground. Instead, the foreground contains traditional human-designed and created technologies (a canal, a water wheel and a gazebo). When compared to the smart city buildings of Songdo in the background, these technological representations come across as nostalgic and closer to nature, perhaps given their groundedness in traditional agricultural – a canal as a means for irrigation, a water wheel as a means for harnessing energy to process raw materials, and a gazebo as a shelter for workers. Therefore, it is common to see such representations in a natural setting; the greenfield smart city, on the other hand, does not have such associations. Therefore, the representations of nature serve to present a familiar grounding that can be extended to the smart city, hence naturalising its technological ungroundedness. Nature thus serves to be the common, harmonising element that brings the cultural past into the future, and vice versa. This is emphasised in the example given in Figure

21 by way of the verbal mode present. When the mention of an "enormous public park" is made in the voiceover (exemplifying the "Recreational function of nature" model), the context of the visual immediately gains a larger spatial dimension with a defined use-category. The scene therefore becomes more peaceful, more idyllic, more "naturalised". Again, other examples of this compositional configuration can be found in Annex 4.

A more complex variety of the naturalising 'sandwich' appears in the form of montage. As the name suggests, the montage variant of the naturalising 'sandwich' occurs when three consecutive shots are shown, thus inspiring diachronic meaning-creation by way of induction through linear narrative. The first shot can be considered the first slice of bread of the sandwich; the second shot, the filling; and the third shot, another slice of bread. As a meaning-making device, this "juxtaposition (contrast and integration) of heterogeneous elements" (Lotman 1976: 48) is incredibly effective, and one of the most common artistic tools; for when a narrative is constructed, expectations arise, and it is through such expectations that an irregular, unexpected element – say, the sandwich filling – can have its meaning subtly forced to align in accord with the common meaning carried by both of its bookends. Thus, in some of the promotional materials, narrative sequences exist in which shots of technology or humans using technology (absent of any representations of living or non-living nature) are sandwiched between shots categorised under "Naturalising aesthetic function of nature" that tend to feature humans in more natural settings. Simply by association through montage those 'sandwich filling' shots are similarly naturalised. This means that in such assemblages of shots, the "Naturalising aesthetic function of nature" is not just present in a compositional, spatial sense but in a narrative, temporal sense also.

Let me provide a more detailed analysis of a qualifying naturalising 'sandwich' montage from COTF4 that begins in the fifth shot, thus requiring a revisitation of the beginning of the episode in order to frame probable narrative expectations: by opening the episode with the title card containing the quote "A pedestrian city is the first measure of sustainability" (attributed to one of the principals of the architectural and urban planning firm that designed Songdo), and combining this simple white on black text with simple, upbeat music, an immediate sense of the personable is achieved. A viewer could be brought into the mindset of a simpler time – a time when walking was the primary mode of transport, for example – and an aspirational future that is framed by a word now often associated with promotional greenwashing: sustainability. These priming mentions of sustainability and

pedestrianism are revisited in the fifth shot (see Figure 22), when, paired with talk of "green space" and "accessibility" in the voiceover, three figures appear in the distance walking down a tree and bush enclosed paved boulevard, vaguely framed by nondescript buildings and infrastructure, and, given the lighting of the shot and the length of the shadows, likely starting their day, en route to work:

Figure 22: Naturalising 'sandwich' montage – Shot #1
(COTF4; 00:16)

As soon as the voiceover mentions "advanced technology", the shot changes to show a close-up of an office environment of glass, steel and concrete in which a person interacts with a touch-screen terminal in the foreground (see Figure 23):

Figure 23: Naturalising 'sandwich' montage – Shot #2
(COTF4; 00:18)

This is the first shot in the episode that features “smart technology” and its appearance is unexpected, yet, ushered in by the content of voiceover, can also be considered a perfectly reasonable element to include when considering “sustainability” because of the underlying general consensus that “advanced technology” can assist in pursuit of such things in the context of the smart city. As the voiceover continues and mentions an “improved way of life for all residents”, the shot changes again (see Figure 24):

Figure 24: Naturalising ‘sandwich’ montage – Shot #3
(COTF4; 00:20)

Again the scene features a natural setting, but one that is also culturally familiar: a park in which local residents can be seen talking and picnicking in a traditional Korean gazebo while the skyline peeks through in the background (another example of a naturalising ‘sandwich’ composition, though a version in which both configurations are present). So ends the naturalising ‘sandwich’ montage. In summary, by sandwiching a shot featuring only a human and technology between two shots categorised under the “Naturalising aesthetic function of nature” model, the middle shot – technology and its use by humans – is naturalised (or rather made to feel less unnatural) by way of narrative context, by montage; the predominant meanings of the bookend shots created a change in the meaning of the middle shot.

Thus, so concludes my initial analysis on how the most dominant model, the “Naturalising aesthetic function of nature”, is featured in this work’s research materials. With regard to the explicit meaning of this model of nature, it appears it was used within smart city discourse to manipulate discourse on technology within the smart city, for example, to

challenge the negative connotations that have been commonly associated with ubiquitous sensing networks and other controversial technologies. In its most common discursive applications, this model of nature can be said to normalize the idea of smartness as something mundane but pleasant, something natural and normal. Indeed, by naturalising elements of the smart city through the discursive strategies described, the unnatural – the technological – is made more natural and therefore can be trusted or at least better tolerated, panopticon and all. It is not surprising then, that, per the history of the changing definition of the smart city in subchapter 1.1.1., the majority of the promotional videos analysed in this work were produced during the "smart = sustainable" turn which occurred roughly between 2010 and 2016, a time at which general sentiment saw technology positioned as something that could save the environment and the economy simultaneously (Cugurullo 2015). Attempting to promote controversial technologies as beneficial to the environment, to the economy and to social elements (whether to lost children, colleagues on their way to work, or picnicking seniors) by making said technologies appear more natural appears to be a task to which these research materials are in service.

(2) "Human mimicry of nature"

The second-most dominant category, "Human mimicry of nature", accounted for 12.61% of all categorised instances relevant to the models of nature under which I conducted the qualitative content analysis of my research materials. I have already discussed elsewhere how such mimicry can occur on either an iconic level or at the level of function. One of the most persistent examples of this functional mimicry occurs at the verbal level, whereby the smart city is positioned as a networked entity made up of interdependent entities, similar, in fact, to the ecological metamodel of nature described in subchapter 1.2.1. (emphasis has been added):

> COTF1: 02:16 [Jean-Louis Massaut]:
> "The network that we deploy here is actually **connecting all of the components in the city**."

COTF2: 00:00 [Title Card]:
"Our cities are fast transforming into **ecosystems of interconnected, independent, intelligent digital organisms**."

COTF2: 02:40 [Lee Jong-Cheol]:
"Songdo international district is aiming to be the perfect model city. **The network communication technology will bind all the city services together**."

COTF3: 00:12 [Female Narrator]:
"A newly constructed city, it combines cutting edge urban planning with an **infrastructure built on state of the art network technology**."

Connected City: 00:13 [Male Narrator]:
"**Everything is connected, intelligent and green**, helping to realise environmental, economic and social sustainability."

Connected City: 02:39 [Male Narrator]:
"...and **everything that can be connected, can be intelligent, can be green**."

Connected City: 04:15 [Male Narrator]
"Cisco's smart connected communities can **transform physical communities into connected communities** that will realize economic growth, environmental sustainability and improved quality of life for residents."

Innovation Center: 02:42 [Ben Chung]:
"**Amazing things happen when you connect [the] previously unconnected**."

The concept of connecting the unconnected with the intention of transforming cities into "ecosystems of interconnected, independent intelligent digital organisms" is tightly tied to the philosophies of IoT and Big Data, taken to its logical extreme in the Cisco video, "What happens when trees connect to the Internet?", wherein Cisco's Smart+Connected Communities-affiliated campaign "Internet of Everything" is used as a platform to suggest

that connecting living nature to the internet would bring new and valuable sources of information to light:

> Tree: 00:06 [Dave Evans]:
> If a tree can connect to the internet, what could that tree tell us about what it's sensing, what's going on with the climate, and what's going on in the world?

Figure 25: "What happens if it were millions of trees?"
(Tree; 00:16)

By pairing these verbalised questions with rich visuals of living nature (besides the example in Figure 25, think: cows in a field, a close-up shot of a butterfly, the façade of an apartment complex whose balconies contain many plants), the possibility of nature as network, of network as natural becomes equivalent. The notion of an omnipresent and omniscient sensing network that is akin to an ecological system is far more palatable than the idea of mass surveillance, except there is perhaps little difference between the two.

A more directly applicable and realistic combined form and functional approach to the "Human mimicry of nature" model can be seen in the Masdar video created by Foster+Partners that lists some of the architectural elements in the buildings featured in their smart city plan. These design elements leverage material processes such as passive solar gain and ventilation channels driven by solar chimneys to reduce energy usage and create a more pleasant atmosphere for the citizens of the city (FP04:20).

Therefore, when attempting to define the explicit meaning of the model "human

mimicry of nature", it is apparent that instances of the model in the promotional videos positions the copying of nature and natural systems – specifically, ecological systems – as something both desirable and valuable. Nature is therefore modelled as something that technology should aspire to emulate, especially at the level of function, for such an approach suggests optimal efficiency; by mimicking nature, technology can be improved upon. However, the latent meaning created contextually points to a desired extension of Cisco's "Internet of Everything" IoT campaign in which networks – such as those within the smart city – are built to include every single physical object and variable, living, non-living and otherwise. This Big Data-driven, lucrative corporate goal of establishing comprehensive sensory networks – a globally scaled version of the smart city – can therefore be positioned as an ecologically-derived project that, through the mimicry of nature, will lead to better environmental, economic and social outcomes for all. Again, it would seem that the timing of production and publication of these greenfield smart city promotional videos was well-aligned with the "smart = sustainable" turn of the smart city definition, given the tight interplay expressed between the natural and the technological. By attempting to normalize the concept of an omnipresent sensory network by modelling it as functionally similar to an ecosystem, and vice versa, Cisco is again attempting to influence and exploit common beliefs about nature so as to create new business opportunities.

(3) "Human mastery/power over nature"

Accounting for 12.17% of the instances of representations of nature that were categorised during the qualitative content analysis, "Human mastery/power over nature" was also a highly-ranked Hansen category, with the model coming in as the third most common model of nature in both studies. As a model of nature, it is particularly relevant to the history of the greenfield smart city of Songdo. Per this work's introduction, the typological definition of a greenfield smart city is predicated upon being a newly built city as opposed to an existing city retrofitted with smart technology. This is mentioned many times and in many different ways throughout the research materials when the subject of Songdo's massive land reclamation program is mentioned (emphasis added):

COTF1: 00:51 [Female Narrator]:
"When the Songdo project began in 2001, **there was no available land to build it**. **1500 acres had to be reclaimed from the sea**."

COTF3: 00:12 [Female Narrator]:
"**A newly constructed city**, it combines cutting edge urban planning with an infrastructure built on state of the art network technology."

COTF4: 00:12 [Female Narrator]:
"The **new development**, **built from scratch**, brings together green space, accessibility and advanced technology to create an improved way of life for all its residents."

COTF5: 00:08 [Female Narrator]:
"Songdo, **a new city, is being built from the ground up**."

COTF6: 00:19 [Female Narrator]:
"In Songdo, South Korea, **a new city built from scratch**…"

COTF7: 00:22 [Female Narrator]:
"Songdo, South Korea, **a new city built entirely from scratch**, is on the forefront…"

COTF8: 00:23 [Female Narrator]:
"The **new city built from scratch**…"

COTF9: 00:18 [Female Narrator]:
"A decade ago this **was a barren mudflat**. Today, it is Songdo – **a city built entirely from scratch** in South Korea…"

COTF9: 01:16 [Scott Summers]:
"We had **a blank canvas** to work from…"

Connected City: 00:02 [Male Narrator]:

"Just 32 kilometers outside of Seoul **a new city is rising**."

Phrases like "from scratch" – used far more frequently than more descriptive options like "barren mudflats" – suggest that there was nothing "there" prior to construction of Songdo. What were tidal wetlands became a "blank canvas". This persistently glib rhetoric of land reclamation is interesting because of how such claims allow Songdo to sidestep around one of the defining features of sustainability as defined in subchapter 1.1.1. – the protection of biodiversity. That the mudflats are described as "barren" in the promotional materials and yet, prior to their protested "reclamation", the fact that they were the habitat for threatened bird species (and the site of employment for a sizeable number of local fisherman) (Moores et al. 2010) is never mentioned. Rather, some promotional materials take an almost melodramatic approach to the concept of land reclamation (emphasis added):

IBD: 00:13 [Female Voiceover]:
"**This land was once ocean. The ocean became land**. **A city in harmony with people."**

IBD: 00:31 [Female Narrator]
One day, they appeared at the ocean's edge. **They were builders and visionaries from all over the world. Their eyes were filled with passion, and their hearts housed a burning ambition.**

IBD: 00:52 [Female Narrator]
They promised to build the most vibrant land in the region, to build the most beautiful and liveable city in the world. **Gradually, the land began to take shape and in time became a city as these early pioneers had envisioned.**

IBD: 04:44 [Female Narrator]
This place was once ocean. The ocean became land and is now a city.

By painting the project as some sort of unified front towards a brighter future, the explicit meaning of the model of "Human mastery/power over nature" seems to suggest that, together

as a species, we can do anything – even control the ocean!

Figure 26: image of engineers cheering the process of land reclamation (IBD; 01:06)

This message is repeated throughout the promotional materials by showing representations of impressive engineering feats such as skyscrapers towering above man-made canals, or bridges spanning lengthy distances over water. But the reality is that "mastery/power over nature" does not have to be realised as a unified human effort; the whims of an individual developer or a small group with access to capital and political power is sufficient, regardless of their aims. This latent nod towards centralised power seems to directly counter the concepts of decentralisation espoused under the "Human mimicry of nature" model, and similarly goes against the ecological claim that (emphasis added):

> IBD: 05:25 [Title Card]:
> ""Songdo International City is **a model city for ecopolis**"
> Jacques Attali, French economist and futurologist"

Indeed, Songdo's construction was not a mythical, gilded account of "Human mastery/power over nature" but, at its most basic level, necessitated the controversial drainage of wetlands in order to develop and profit from a high-tech real estate project. Cisco's involvement in the Songdo project can be thought of in a similar manner – if, per the analysed uses of the first two most dominant categories, Cisco is able to normalise the implementation of smart and controversial technologies (especially widespread surveillance) and to connect all things to

everything else (per their "Internet of Everything" initiative), then they stand to generate enormous revenue streams, partly through their smart city package (and after-market) sales, and partly through the generation and sale of data streams. Thus, "Human mastery/power over nature" in Songdo does not lead to "A city in harmony with people" (IBD: 00:13) but a discrete, centralised power structure that makes choices in response to (and to create) market forces. Those choices include the creation of discourse in the form of promotional materials that promote nature as something to appreciate and value whilst simultaneously engaging in projects that often cause environmental damage for economic gain. This conflict of interest is made all the more apparent by the fact that the conservation-minded categories of "Nature as limited resource" (a newly created model) and "Nature as something to protect" made up 15.22% of all representations in the promotional materials analysed.

This brings the MCDA to a close. Over the course of this subchapter I have analysed the dominant models of nature discovered during the qualitative content analysis and theorised about how they were used to create explicit and latent meanings in the context of the research materials, thus answering the third research question. By moving on to perform an ecosemiotic analysis and interpretation, I will attempt to answer the final research question: that, given how these dominant models were used to create such meanings, what can be inferred about the ideology of smart city stakeholders?

3.3. Ecosemiotic analysis and interpretation

In the preceding subchapter I completed an MCDA on my research materials of greenfield smart city promotional videos, concentrating primarily on the shots that featured the dominant models of nature as categorised during the qualitative content analysis and theorising about how said dominant models created meaning in the context of the promotional videos. As explained earlier in this work, representations of nature (and the models of nature that can be derived from and generate such representations) are well-suited as vehicles to carry ideologies. Therefore, in this subchapter, I will attempt to infer the ideological leanings of the primary technological smart city stakeholder involved with Songdo's smart city

systems, Cisco, by approaching a further analysis of the meanings discovered using an ecosemiotic framework.

Let me therefore retrace my steps and revisit the core of ecosemiotics as being "the semiotics of relationships between nature and culture" (Kull 1998: 350). The two metamodels of nature described in subchapter 1.2.1. represent the most general dichotomy of possible forms of relationship between nature and humans (and human culture by extension), thus providing a foundation from which an ecosemiotic analysis can proceed. Those two metamodels position nature as being either semiotically separate and oppositional from humans and culture (therefore presenting a strict dualism) or nature being inextricably semiotically linked with humans and culture (therefore presenting a systemic, dynamic and, above all, ecological perspective). It follows that ascertaining Cisco's dominant position with regard to these two metamodels of nature is a necessary first step towards attempting to infer the corporation's ideological positioning.

The divide between these metamodels indicates the existence of two vastly different yet complementary ways in which relations in-and-outside-of culture can be modelled, a difference that aligns with a typological feature of culture as described by Lotman and Uspensky, namely, a tendency for a culture to experience tension between the positions of isolationist preservation and dynamic adaptation. The former position, typically associated with a more mature culture – perhaps a culture in decline – exhibits a duality in which all-non cultural elements (generally labelled as "the other") are demonised; conversely, a culture that functions more from an ecological position of dynamic adaptation is often immature and associated with cultural ascendancy, given that it tends not to regard non-cultural elements as a threat but something to be organised and understood through dialogue, thus indicating the potential for generative growth (Lotman, Uspensky 1978; Lotman 2010).

From a technological standpoint, the concepts of centralisation and decentralisation, respectively, can also be aligned with these typologies of culture. As detailed in subchapter 1.1.2., Jachna's 2004 article "Cyburban Semiotics" makes specific note of how, in pervasive computing environments like the smart city, decentralised communications structures that follow the "many-to-many" model of the internet have circumvented the traditional "one-to-many" centralised communications networks of the past (Jachna 2004); this concept is echoed by developments in the IoT and Big Data space in which proponents claim that the goal to connect "everything to everything" will bring about a revolution in which the internet of

things will become the internet of everything, a decentralised network that will bring about explosive growth in the volume of communications and, potentially, the generation of new, valuable information (O'Leary 2013). Cisco, a multinational corporation that specialises in the development of network-based communications and technology products, has also publicly declared decentralisation as something that will bring countless new opportunities by "connecting the unconnected", epitomised by their global integrated marketing campaign "Internet of Everything" – the same campaign featured in several of the videos analysed earlier in this study – that ran from 2012 until 2016 (Cisco 2018b, Cisco 2018c).

Cisco's "Internet of Everything" campaign therefore coincided with the time period during which the "smart = sustainable" definition of the smart city was dominant (Dameri, Cocchia 2013) – also the time period during which the majority of this work's research materials were produced and published. As such, especially given that period's tendency to paint sustainability as possible through technologically intermediated "ecological modernisation" (Cugurullo 2015), it is not surprising that the promotional videos studied during the course of this work positioned Cisco's dominant public discourse around concepts of decentralisation, sustainability and connectedness. Thus, at a glance, it would appear that Cisco's brand positioning – and therefore its corporate ideology of "shared norms, values and goals" (van Dijk 1998) – was firmly positioned within the ecological metamodel of nature, reflecting an ideology that values open, generative communication through diverse, interdependent connection. But the results of my MCDA do not concur.

Prior to the MCDA and during the qualitative content analysis, I had attempted to construct new models of nature present in the research materials via the process of inductive category formation. For consistency, these new models were crafted in a form that mimicked Hansen's existing categories – not just in terms of syntactics but also in terms of how they could be grouped under the oppositional metamodel of nature (Hansen predominantly defined nature as an entity separate from humans). However, if taking the two new and dominant models of nature as examples ("Naturalising aesthetic function of nature" and "Human mimicry of nature"), it became clear that, although both models maintained Hansen's dominant basis of dualism, their explicit meanings as defined during the MCDA did not. Indeed, both models took on a decidedly ecological tone by way of how they blended living and non-living nature and human designed and created technology, which extended to a mixing or blurring of nature and culture, each influencing the other. As the two most

prominent models of nature in this study (accounting for nearly half of all instances of nature representations categorised during the qualitative content analysis), this would indeed suggest that Cisco's ideological positioning would be ecological and systemic at its core, per the metamodel of nature under which both of these models can be grouped.

However, closer analysis revealed that these two new and dominant models suggested the inverse – that, although Cisco may present its brand overtly in discourse as having a relationship to nature that is ecologically-aligned, Cisco's actual ideological positioning is more aligned with the oppositional metamodel of nature, suggesting a strict self-other (van Dijk 1995: 139) dualistic dichotomy. Indeed, in these research materials, Cisco appears to use representations of nature as a means to alter public discourse about technology, and therefore, leverages popular nature discourses to create or engage in new business opportunities that do not necessarily lead to decentralised, ecologically-coherent and compatible systems, but to centralised power structures that enable further "human mastery/power over nature" through the use of Cisco-manufactured and controlled technology. This double-layered system is reminiscent of Yigitcanlar's formulation of the ubiquitous eco city (2010) and suggests a leveraging of technological biophilia (Ahuja 2016: 226) as a means of ideological persuasion. This does not mean that Cisco is necessarily lying about any claims made in these promotional videos. For instance, Cisco may indeed have a mission of wanting to concretely "realise environmental, economic and social sustainability" (Connected City, 00:13) that exists outside of these discourses, but if such things were indeed realised, they would only be done on Cisco's very specific terms.

For instance, according to a Harvard Business Review case study, Cisco's first forays into sustainability and the launch of the Smart+Connected Communities program came about in 2006 after the Clinton Global Initiative challenged Cisco to "leverage technology against climate change and poverty" (Laszlo, Kelly 2013: 1) at a global scale. The big question at the time was how responsibility to shareholders could be resolved with the social responsibility of a program to fight climate change and poverty: "Would efforts to promote economic, social and environmental sustainability strain the company's profits, or could they provide a lens for innovation and new growth opportunities?" (Ibid, 2). Indeed, that question is indicative of Cisco's ideological position as a multinational corporation – business decisions should, above all, be profitable. Cisco is beholden firstly to shareholder expectations, and therefore must make all business decisions not from an ecological systems perspective but from a

competitive, dualistic profit-making perspective in which a zero-sum game attitude dominates.

Cisco's annual shareholder reports contain brief details about their corporate social responsibility position regarding environmental issues. Only those from 2016 and 2017 contained information relevant to the topic. Since the research materials analysed in this work that pertain to Songdo were published between 2011 and 2016, the utility of such reports is perhaps questionable. However, in the 2016 shareholder report, under the "Planet" section of Cisco's corporate social responsibility section, the stated goal is "Advancing environmentally sustainable growth in a connected world" through "Energy and greenhouse gas reduction" and "Product end of life" (Cisco 2018a: 16). This suggests that Cisco's environmental sustainability efforts could indeed be oriented to serve as growth opportunities – both of these efforts could possibly lead to tax breaks, reduced penalties or public relations coups. Profit for the corporation precedes all other concerns, with positive environmental outcomes being a pleasant side effect that can be leveraged in public discourse to further advance business goals.

Alf Hornborg, an anthropologist who integrates ecosemiotic perspectives in his work, would likely claim that the tendency for corporations to position themselves as separate from nature is a direct result of the structure of capitalism, and that the overall cultural distance from nature has grown commensurately with the economic (and therefore semiotic) abstraction of nature (1999). Hornborg describes a gradual cultural shift in the dominant forms of nature signification directly related to the successive "pre-modern," "modern" and "post-modern" forms of capitalism. He associates the "pre-modern" form with Peircean indexicality and "the unmediated and unreflexive being-in-the-world glorified by the phenomenologists" (Ibid, 147); the "modern" with the doubted symbolic via what he calls "reflexive uncertainty" (Ibid, 147); and the "post-modern" with a regressive form of indexicality in which the hope of truly experiencing and knowing the world has been exchanged for a sort of "structurally enforced, feigned gullibility" (Ibid, 148) in which "certainty has vanished... and pretence is as good as any other" (Ibid, 148). Indeed, the ultimate stage of Hornborg's progression aligns with how the greenfield smart city as a post-modern capitalist entity – a global city or "aerotropolis", denationalised and deterritorialised due to globalisation (Sassen 1991; Townsend 2013: 24; Gottdiener 2004) – precipitates this "disenchantment with nature" by granting it an entirely "constructed" (Ibid, 148) form. Kull's

typology of natures is a useful tool to help understand this observation; for instance, the "urban nature" of the greenfield smart city should be considered Kull's second nature, "the nature that we have materially interpreted, [...] materially translated nature, i.e. a changed nature, a produced nature" (Kull 1998: 355). David Harvey takes this observation even further in his 1993 work "The nature of environment: dialectics of social and environmental change" wherein he argues that the semantics of nature and the environment have been superseded by the activities of urbanisation, that cities can be termed "created ecosystems" and therefore insulated from nature, or, rather, they have become nature – they have replaced nature altogether (Harvey 1993: 27-28).

Therefore, to answer this work's final research question, the ideology of smart city stakeholders – specifically Cisco – can be directly linked to post-modern or late stage capitalism, expressed in the research materials through the leveraging of ecologically-oriented nature discourses as a semiotic tool with which the connotations surrounding the greenfield smart city – a carefully surveilled and planned system of centralised control that, like Disneyland, is promoted via its discourse as an urban utopia (Gottdiener 1982) – can be manipulated to create new business opportunities through centralised power structures. This finding is largely in accord with previous studies on the topic of smart city stakeholder ideology previously mentioned in subchapter 1.3.3. (Söderström et al. 2014; Hollands 2015; Townsend 2013; Kitchin 2015), but by pointing out how such a position was built from an ecosemiotic perspective, this work offers something novel to the field.

With regard to future extensions of this work, I am aware that the process of MCDA is fickle, and that "linking the surface of talk and text to underlying ideologies is a process fraught with complexities and contradictions" (van Dijk 1995: 142). Therefore, regardless of the safeguards inserted into the methodology, replication of the analysis conducted in this work by another researcher would be a useful and likely necessary addition to attain additional clarity and insight into the ideological positioning of smart city stakeholders.

Also, it would be interesting to repeat the analysis on a set of greenfield smart city promotional videos that were produced and published after 2016. As already mentioned, Cisco's "Internet of Everything" campaign ran until 2016, at which time there was a global brand refresh. The new brand platform, "There's never been a better time", provided a strong direction of tech optimism and utopianism that concentrated on showing the human impact of Cisco's business operations (Cisco 2018d). Its launch coincided with the popularisation of the

"smart = participatory citizenship" definition of the smart city (de Oliveira 2016). Since the "lost child" narrative mentioned in the MCDA was from a Cisco-produced Songdo promotional video published in 2016 (Innovation Center), it is possible that this is another example of how Cisco might semiotise an element of popular discourse in order to better promote their smart city offering. As Kim observed, "In the process of mobilising support [...] they modify these representations to adapt to the changing economic, political and social conditions" (Kim 2010: 13). Therefore, an analysis of materials produced solely post-2016 would be of interest.

Finally, and perhaps most ambitiously, it is one thing to perform analysis on smart city discourse – it is another thing entirely to perform analysis on the concrete reality of Songdo city itself. If an urban semiotics researcher were to use this study (the models of nature it found and its results and subsequent analysis) as a foundation for a study on the embedded ideologies of the material environment of Songdo, it would be most interesting to compare results. This could also be extended to analyse how Songdo is experienced by its residents. For instance, if someone were to survey the citizens of Songdo, what would their perception of nature be within their smart city? Given Songdo's international city status, how might these results differ between different demographics? Would the models of nature this study found to be present (and dominant) in smart city discourse also be present in the lived experience of the physical city itself? If not, how does the semiotic discursive construct of Songdo differ from its semiotic material construct?

CONCLUSION

Through the ecosemiotic analysis of representations of nature in greenfield smart city promotional videos, this work attempted to determine the models of nature used in said videos, the prevalence of those models, and how the most dominant models were used to create explicit and latent meanings in the context of the research materials. This provided a basis from which to infer the smart city stakeholders' ideological position with regard to human-nature relations – an issue of interest given the rise in the development of smart city projects and the environmental degradation that accompanies growing global urbanisation.

A qualitative content analysis was first used to delimit the research materials by categorising qualifying representations of nature by model. Of over 61 minutes of video materials analysed (mostly produced by Cisco, a major smart city technological stakeholder and the technological lead in the development of the greenfield smart city of New Songdo City, South Korea), 230 qualifying representations of nature across 12 of models of nature were found: 3 of these models of nature were created via the process of inductive category formation; 9 of the models were taken from Hansen's 2002 study on discourses of nature in television advertisements. Of the 12 models, the most dominant were "Naturalising aesthetic function of nature" (a new model accounting for 35.65% of all representations), "Human mimicry of nature" (another new model accounting for 12.61% of all representations) and "Human mastery/power over nature" (a model from Hansen's study that accounted for 12.17% of all representations).

"Naturalising aesthetic function of nature" refers to how living and non-living nature can have an intersemiotic relation with man-made structures, providing an organic or naturalising aesthetic function that somehow makes the "unnatural" (such as the technological) appear more "natural"; "Human mimicry of nature" refers to how living and non-living nature can act as a model in the design and appearance of human-made artefacts or technologies (mimetic or iconic mimicry), as well as a model for ecological values that the

built environment can implement (functional mimicry); and "Human mastery/power over nature" refers to how technological advances have enabled transformation of the material world in such a way as to make it primarily fit human needs, often to the detriment of the ecosystems in which such engineering feats occur.

Next, a multimodal critical discourse analysis was performed, primarily concentrating on the representations of nature categorised under the most dominant models of nature during the qualitative content analysis. It was determined that Cisco leveraged the top two dominant models to push ecologically-oriented representations of nature as a means to alter public discourse about technology. This was predominantly noticed with regard to how 'smart' technologies (including citywide surveillance systems and IoT networks) were 'naturalised' by presenting them in the context of popular ecological nature discourses, thus normalising their presence as something pleasant, natural and normal. Simultaneously, nature was modelled as something valuable that technology should – and does – emulate in a decentralised, networked and decidedly ecological fashion, confirming that human mastery over nature was for the common good. But such rhetoric rubs against the underlying fact that Songdo's construction was a centralised affair in which small groups of stakeholders chose to drain wetlands in order to profit from a high-tech real estate project. Therefore, it was determined that Cisco leveraged predominantly ecological models of nature as semiotic tools to create or engage in new, technologically-oriented business opportunities that stood to generate enormous revenue streams, partly through their smart city package (and after-market) sales, and partly through the generation and sale of data streams. It is postulated that such a position is indicative of a post-capitalist ideology in which economic success is predicated on the increasing abstraction of nature, a position dependent upon a competitive, dualistic and centralising ideology that believes natural resources and corporate success to be part of a zero-sum game determined by economic value.

It is volunteered that replication of this work as-is would be a valuable exercise in ascertaining accuracy of the analysis due to the complexity of its methodology; an additional analysis on greenfield smart city promotional videos produced after 2016 (roughly the year in which smart city discourse changed its primary focus from sustainability to citizen participation) is also suggested as a means to investigate the veracity of these results. Furthermore, performing a study on the material entity of Songdo city itself would be of value, presenting an opportunity to determine whether the models of nature found to be

dominant in its semiotic material construct are similar to those found in this work. Such a study could be extended, also, to include the lived experience of Songdo residents.

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Kokkuvõte

Looduse kujutamise ökosemiootiline analüüs *greenfield*[1] targa linna turundusvideotes

Üha urbaniseeruvas ja ühendatud maailmas on targad linnad tõusuteel. Need on linnad, mida teenindatakse kõikjal paiknevate sensorite võrgustiku ja tsentraliseeritud tarkvara abil, mis analüüsib ja reageerib reaalaja andmetele. Eeldades, et taoline kasv kipub olema paralleelne keskkonna lagunemisega, on targa linna tootjate huvipunktiks turundusvideote diskursuses looduse mudelite semiotiseerimine. Nende pinnalt võib tuletada tootjate ideoloogilist positsiooni looduse ja kultuuri suhetes. See pakub aga unikaalse teema, mis on sobilik ökosemiootiliseks uurimuseks.

Seega analüüsiti käesolevas töös looduse representeerimist *greenfield* targa linna turundusvideotes, et tuvastada neis kasutatud looduse mudelid. Täpsemalt, kuidas domineerivamaid mudeleid kasutati, et neid levitada ja luua eksplitsiitne ning latentne tähendus. Cisco on tootnud üle 61 minuti turundusvideoid ning on seega on üheks suurimaks targa linna tehnoloogiliseks tootjaks ning *greenfield* targa linna Uus Songdo (Lõuna-Korea) juhtivaks tehnoloogiliseks arendajaks. See on ühtlasi ka käesoleva töö peamine fookus, kuid lisaks on toetavate materjalidena kasutatud ka Masdar linna Araabia Ühendemiraatides, mis on teine, vähem arendatud *greenfield* linn.

Esmalt rakendati töös kvalitatiivset kontentanalüüsi, et limiteerida analüüsitavat materjali. Nimelt kategoriseeriti mudelite kaudu kvalifitseeruvad looduse representatsioonid. Keskendudes ainult visuaalsetele ja verbaalsetele aspektidele, tuvastati 12 looduse mudelit 230 representatsioonist. Neist kolm moodustati induktiivse kategooria loomise protsessi

[1] *Greenfield* on ala, mis on üles ehitatud eelneva infrastruktuuri ja ehitisteta.

kaudu ning üheksa pärinesid 2002. aasta uurimusest, kus analüüsiti looduse representeerimist telereklaamides. Neist 12 mudelist olid domineerivamad "looduse naturaliseerimise esteetiline funktsioon" (35,65% juhtumitest), "inimene loodust jäljendamas" (12,61%) ja "inimese võim looduse üle" (12,17%).

Järgnevalt teostati multimodaalset kriitilist diskursuseanalüüsi keskendudes looduse esituse kategooriatele domineerivamate looduse mudelite seast, mida peeti kvalitatiivse kontentanalüüsi tulemusena peamsteks. Nende esituste eksplitsiitsete ja latentsete tähenduste eraldamine turundusvideote seast oli püüe saada aru kuidas neid mudeleid võimendati semiootiliste tööriistadena. Tulemustest johtub, et Cisco kasutas kaht põhilist mudelit, et stimuleerida ökoloogiliselt orienteeritud looduse esitusi kui vahendeid, et muuta avalikku diskursust tehnoloogia osas. Seega võimendati populaarset looduse diskursust kui semiootilist tööriista, et luua uusi tehnoloogiliselt orienteeritud võimalusi äris. Postulaadiks on, et seesugune positsioon osutab järelkapitalistlikule ideoloogiale, kus looduse abstraheerituse tõus viitab majanduslikule edukusele. Antud positsioon sõltub võistluslikust, dualistlikust ideoloogiast, kus usutakse, et looduslikud varad ja majanduslik edukus on ühe või teise arvelt.

Analüüsi metodoloogilise keerukuse tõttu võiks selle töö replikatsioon olla väärtuslik ettevõtmine, et tuvastada teostatud analüüsi täpsust. Täiendavalt oleks kasulik analüüsida 2016 (umbes sel aastal muutus targa linna diskursuses fookus jätkusuutlikkuselt kodaniku osalusele) toodetud *greenfield* targa linna turundusmaterjale, et kinnitada käesolevate tulemuste õigsust. Veelgi enam, suureks lisaväärtuseks oleks teha uurimus Songo linna enda domineerivamatest mudelitest, mitte piirduda vaid selle diskursuse analüüsimisega. Seesugust uurimust saaks laiendada ning kaasata ka Songdo kodanike elatud kogemus.

ANNEXES

ANNEX 1: VIDEO TRANSCRIPTS

ANNEX 2: QUALITATIVE CONTENT ANALYSIS RESULTS

ANNEX 3: MCDA MATRICES

ANNEX 4: ADDITIONAL MCDA EXAMPLES

ANNEX 1: VIDEO TRANSCRIPTS

COTF1
00:00

Title card:

"If the 20th century was the era of nations, the 21st century is the era of cities."
Lee Myung-bak
President, South Korea

00:06
[FEMALE NARRATOR]
Today, the world holds 7 billion people.
Within the next fifty years, that number may climb to 9 billion.

00:15
The need to make existing cities more energy efficient
and to build new sustainable cities is on the rise.

00:23
Across the globe developers are building smart cities offering high quality eco-friendly living.

00:31
One of the most ambitious is South Korea's $35 billion dollar Songdo International Business District.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 1: A New Approach

00:46
South Korea is one of the world's most densely populated countries.

When the Songdo project began in 2001, there was no available land to build it.

00:58
1500 acres had to be reclaimed from the sea.

Today, some of the world's best planners, architects, builders and technology companies are creating Songdo from the ground up.

01:11
By 2016, more than 400 new buildings will stand, including South Korea’s tallest skyscraper.

01:19
[STAN GALE]
We took an approach that has the best elements of some of the finest cities in the world.

01:25
40% of the space is open space.

You can leave your car at home and you can walk to central park,
you can walk your child to school,
you can visit an office or a retail shopping center,
you can go to the golf course,
all within walking distance.

01:47
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
Once this infrastructure is complate it will set the standard for all future cities
how they're built and the "best practices" **(English, borrowed word!)** of city planning
--

02:06
[SCOTT SUMMERS]
The design of the buildings is something you don't see anywhere here in Korea and we've got state-of-the-art technology going into our buildings.

02:16
[JEAN-LOUIS MASSAUT]
The network that we deploy here is actually connecting all of the components in the city.

You know, all of the residences, offices, schools everywhere, all of the buildings.

02:29
[FEMALE NARRATOR]
In this networked community, residents will be able to control the functions of their homes remotely and everyone will be able to interact through video from anywhere.

02:41
New and old technology working together will create a truly sustainable city.

02:47
[Peter Lee]
We didn’t just look 10 years ahead; we looked at 50 years, 100 years from now.

If the city achieves half the things that we planned from the start, the quality of life will be unmatched.

03:01
[STAN GALE]
Songdo is being studied by many countries, many mayors, many governors err, as an example of a Smart and Connected Community and a more efficient way of organizing urban living. We're hoping we contribute to the global footprint in a positive way.

03:21
[FEMALE NARRATOR]
Songdo is one of more than 100 smart city projects underway worldwide.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--
[Cisco logo]

COTF2
00:00

Title card:

"Our cities are fast transforming into ecosystems of interconnected, independent intelligent digital organisms."

William J. Mitchell
Former Director
Smart Cities Research Group
MIT Media Lab

00:08
[FEMALE NARRATOR]
In Songdo, South Korea, city planners, architects, and builders are laying a foundation that goes far beyond bricks and mortar.

00:17
Its infrastructure uses advanced network technologies to improve the city's quality of life.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 2: Living in Songdo

00:35
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
Building a city and it's [sic]
technology at the same time

is both cost effective and efficient.
It also allows for the most ideal

information and communication
network to be built.
--

00:52
[JEAN-LOUIS MASSAUT]
We deploy technologies which is actually connecting all of the building subsystems together.

01:00
We connect, you know, power system, fire alarm systems, everything together so that we can bring the benefits of reduced maintenance cost of the building.

01:12
[FEMALE NARRATOR]
Developers call this a smart and connected community where technology places control in residents' hands.

01:20
With the touch of a button, they can manage their homes' energy use, adjusting everything from lights to air conditioning--even remotely.

01:29
[STAN GALE]
You touch the screen and an array of services and controls come up.

01:35
Intuitively the system goes through and seeks areas of energy use and reduces them.
I've met a reduction in my carbon footprint.

01:49
[FEMALE NARRATOR]
Songdo is taking energy efficiency even further by rolling out TelePresence in every home, office and school, allowing people to connect to each other through video.

02:00

This reduces the city's carbon footprint by curbing people's need to travel.

02:06
[JEAN-LOUIS MASSAUT]
The TelePresence system is actually quite critical for Songdo.
Once it’s deployed, we can offer the residents access to very innovative services where you really have a better service if you see the person face to face but don’t want to travel there.

02:22
[STAN GALE]
I think the way it’s going to change the life of people is take the anxiety out of "where do I need to be?" at this point in time. You’re always there.

02:42
[Lee Jong-cheol]
--SUBTITLES, Korean v/o--
Songdo international district is
aiming to be the perfect model city

The network communication technology

will bind all the city services together.
--

02:52
[FEMALE NARRATOR]
Like Songdo, smart city projects around the world are developing network technologies for managing energy demands and connecting to vital services.

03:03
By 2016, Songdo’s 65,000 residents will be among the first to experience this new way of living.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--
[Cisco logo]

COTF3
00:00

Title card:

"Designing an entirely new city from the ground up provides a unique opportunity to create an ideal technological infrastructure."

Bill Gates
Chairman, Microsoft

00:08
[FEMALE NARRATOR]
Songdo, South Korea is capturing the world's attention.

00:12
A newly constructed city, it combines cutting edge urban planning with an infrastructure built on state of the art network technology.

00:21
Developers hope Songdo will attract companies wanting to do business in the region.
It's already transforming the way people work, and providing a model for other cities everywhere.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 3: Working in Songdo

00:41
[STAN GALE]
The concept behind it is that this would become the central focal point and main alternative for large-scale companies looking to do business both in Japan, China and Korea.

00:55
[FEMALE NARRATOR]
Songdo's premier business address stands at 1000 feet, and is South Korea's tallest skyscraper.

01:03
[SCOTT SUMMERS]
The North East Asia Trade Tower... it's a mixed used building.
The idea that people can come in from overseas, live, work within that building. And the convention center behind it's really, from an architectural standpoint, it's one of the main features here in Songdo.

01:21
[FEMALE NARRATOR]

All of Songdo's commercial buildings are linked by an advanced citywide network, designed to help businesses operate with extreme efficiency.

01:31
[SCOTT SUMMERS]
The various systems in a building can now talk with each other within one command center to manage how the individual buildings function and save costs in terms of energy consumption.

01:43
[FEMALE NARRATOR]
Songdo’s network infrastructure also enables video technology that helps people communicate face to face with unprecedented ease.

01:55
[JOHN BAEKELMANS]
People have inside of every home, TelePresence capabilities so in the businesses, we have deployed enterprise TelePresence, to ensure people can connect from their home to their business or even from business to business. receptionists who are sitting remote can actually from remote open doors print badges.

02:16
[STAN GALE]
Having a fully connected presence and Smart and Connected Community cuts out the wasted time and energy that we all have during the day getting to and from places.

02:28
[FEMALE NARRATOR]
Across the globe, smart cities like Songdo are adopting telepresence technology to reduce costs and carbon footprints.

But by 2016, Songdo will outpace them all with more than 20,000 units deployed citywide.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

COTF4
00:00

Title card:

"A pedestrian city is the first measure of sustainability."

James von Klemperer
Principal, Kohn Pedersen Fox

00:08
[FEMALE NARRATOR]
Songdo, South Korea is fast becoming a model for cities around the world.

00:12
The new development, built from scratch, brings together green space, accessibility and advanced technology to create an improved way of life for all its residents.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 4: A New Way of Life

00:27
[STAN GALE]
The reason people are attracted to Songdo International Business District, is that it is adjacent to one third of the world's population, in terms of trade and business.
But the reason they enjoy living here is because it's a walking city.
We're a compact city; we're a green city.

00:53
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
We have invested heavily
in growing a significant number of trees.
We have secured the maximum
amount of space we can for parks.
We're planning to
develop a coastal paradise.
--

01:25
[SCOTT SUMMERS]
Of the 1,500 acres, 40 percent of that is dedicated to open space and you don't have to get in the car. We have 25 kilometers of bicycle lanes here in Songdo. It's faster to get on a bike.

01:39
[FEMALE NARRATOR]

Ten percent of Songdo's land is dedicated to an enormous public park, both inspired by and named after, the world renowned Central Park in New York City.

01:50
[SCOTT SUMMERS]
Central Park is a 100-acre park with a seawater canal.
We also have Canal Walk.
It's kind of modeled off of SoHo in New York.
It's a four-story building.
The lower two levels is retail, and the upper two levels is residential.
We've got a canal that flows through the middle.

02:09
[FEMALE NARRATOR]
Songdo also offers top attractions, like an 18 hole Jack Nicklaus championship golf course.
The site was designed by the golf pro himself.

02:20
[SCOTT SUMMERS]
The Jack Nicklaus signature course is one of 25 in the world.
And the only one in Asia.
We held our first PGA champions tour, which is a senior tour, in 2010.
And then just most recently held it for the second year.
It's a gorgeous course.

02:37
[FEMALE NARRATOR]
Perhaps the greatest amenity of Songdo life is the advanced technology that will connect everyone to each other from anywhere through video.

02:46
65,000 residents and 300,000 business commuters are expected to fill Songdo by 2016.
By that time, similar cities will be under construction across the globe.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

COTF5
00:00

Title card:

"In the 21st century, we need cities that are locally dense and globally connected, built around transit."

Greg Lindsay
Author, Aerotropolis: The Way We'll Live Next

00:08
[FEMALE NARRATOR]
Songdo, a new city, is being built from the ground up in South Korea.
By the year 2016, more than 365,000 people will live and commute here.

00:21
A major challenge to Songdo's success, is how will all those people get around?
The answer: a compact and accessible city designed so efficiently, planners across the globe are taking note.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 5: Transportation

00:39
[SCOTT SUMMERS]
This is an international city that is to attract people from overseas, as well as attract Koreans from other cities.

00:50
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
Nearly two billion people are living
just three hours away by plane.
We're directly facing China.
This is a great place for people to live and work.
--

01:10
[STAN GALE]
Where in the world can you get on a plane that's only 18 minutes from your doorstep and be in Shanghai in an hour and a half, have lunch, home in the evening?

01:23

[STAN GALE]
We're a walking city, we're a compact city.
We find if that if people need to walk more than 10-15 minutes they will tend to get in their car, so from Central Park all of our venues are within 15-minute walks.

01:42
[PETER LEE]
Sustainability was a critical feature for the city, so we maximize the err green space and place the parking spaces underground and give preferential parking spots to fuel efficient vehicles.

02:00
[SCOTT SUMMERS]
People can use multiple types of transportation.
We have 25 kilometers of bicycle lanes.
And by 2016, there'll be an express train that links our development with Seoul and we'll cut that travel time down to less than 30 minutes.

02:21
If you want to be part of the Northeast Asia hub, this is the location.
We offer a quality of life that is much different than other developments in Asia as well as other parts of the world.

02:32
[FEMALE NARRATOR]
As the world's population increases, the demand for newly constructed cities with highly efficient transportation systems will also rise.
Songdo shows what's possible.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

COTF6
00:00

Title card:

"Looking out to 2025, the number of people living in water-stressed countries will increase six and a half times."

Sandra Postel
Director and Founder, Global Water Policy Project

00:07
[FEMALE NARRATOR]
Across the globe, clean water resources are shrinking as the world's population expands.

00:16
Communities must find new ways to conserve water.

00:19
In Songdo, South Korea, a new city built from scratch, developers have come up with innovative solutions.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 7: Water Conservation

00:35
[PETER LEE]
We didn't just look 10 years ahead; we looked at 50 years, a hundred years from now.
And saving water is one of the key elements that we tried to pursue, in terms of sustainability.

00:53
[STAN GALE]
We trap the rainfall that comes into Songdo. We store it in containers, and then we use that gray water for all of the irrigation.

01:02
[SCOTT SUMMERS]
That gray water is used back into the city for commercial buildings, to flush our toilets, and it's used for washing down the streets.

01:12
[PETER LEE]
Each site has a district gray water storage tank, so it can actually reduce your water and sewage costs.

01:27
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
Wastewater is also processed
and reused in parks

and industrial facilities.
--

01:46
[STAN GALE]
Another area for water conservation is we have a mile and three quarter long canal.
It has millions and millions of gallons of water in it, but the seawater is plentiful.
We take the mud and sand out of the ocean water and our canal is recirculated with clean ocean water.

02:08
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
We're building an environmentally friendly system
that is unique to any other in the world.
--

02:21
[FEMALE NARRATOR]
Songdo's innovations will help the city reach its goal of using at least 30 percent less water in its commercial buildings.

02:28
As growing demand strains the world's natural resources, Songdo serves as a model for water conservation everywhere.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

COTF7
00:00

Title card:

"Technology can help bring about a
low-carbon industrial revolution--
global action is needed."

Richard Jones
Deputy Executive Director
International Energy Agency

00:08
[FEMALE NARRATOR]
As populations expand and economies grow, people are consuming more non-renewable energy sources than ever. The race is on to make cities radically more energy efficient.

00:22
Songdo, South Korea, a new city built entirely from scratch, is on the forefront.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 8: Energy

00:38
[FEMALE NARRATOR]
In Songdo, a revolutionary information technology network manages energy use in every building.

00:46
[JEAN-LOUIS MASSAUT]
The network that we deploy here is actually connecting all of the components in the city, all of the building subsystems together, so that we can bring energy savings.

00:57
[SCOTT SUMMERS]
We're improving the efficiencies of each of the buildings.
Our windows have low U value that reduces the amount of sunlight coming in and keeps the energy of the heat or cooling inside the building.
Another component to reduce energy consumption is we light up the buildings with LED lights.

01:14
[PETER LEE]
On the system level, we introduced water-cooled air conditioning system; it has never been applied to any Korean project before.
We also have central home network system through which you can control your electricity use to reduce the dependence on the energy.

01:37
[FEMALE NARRATOR]
These innovations are helping reduce energy consumption in each building by 30 percent.

The city is also tapping into renewable natural resources.

01:52
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
Sunlight, solar energy and wind force energy
are being currently used to operate the city.
Even human waste isn't simply disposed of.
It is processed through a recycling system
and a co-generation plan
producing necessary energy.
--

02:17
[SCOTT SUMMERS]
That powerplant uses natural gas to power electricity.
And the waste heat is in the form of hot water, and so we use that waste heat to run up our buildings and provide heating for our residential units.

02:33
[FEMALE NARRATOR]
By 2040, worldwide electricity demand is projected to be 80 percent higher than it is today.
Songdo is a model for cities trying to keep pace.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

COTF8
00:00

Title card:

"Our definition of educational excellence
must go beyond literacy and numeracy to
include knowledge of other parts of the world."

James B. Hunt, Jr.
Co-Chair, National Coalition on

Asia and International Studies in the Schools

00:06
[FEMALE NARRATOR]
Around the world, education reform has become a top priority.

00:11
Teachers are trying new approaches to provide a richer academic experience for their students.

00:17
Songdo, South Korea, is at the vanguard of education.
The new city built from scratch features a state of the art school at the forefront of innovation.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 8: Education

00:41
[JEFF MERCER]
The design and the purpose of Chadwick International School is to educate the children of the businessmen in New Songdo City.
We want to have a world-class international school in the area.
We have a student to teacher ratio of about seven to one.

00:59
[FEMALE NARRATOR]
The K-through-12 private school is linked to its founding campus in Palos Verdes, California.
Both schools use technology in every classroom to improve the learning experience.

01:12
[JEFF MERCER]
We are one of very few schools in the world who actually has laptops in the hands of first graders all the way up to the eighth grade.
The laptops are configured with all kinds of educational software, which is really one of the most critical things.
We want to make sure that any of the technology that we use is something that enables us to go deeper.

01:35
[FEMALE NARRATOR]
The centerpiece of Chadwick's technological infrastructure is video technology, which offers students a global education.

01:42
Children shouting and waving greetings at each other through video chat*

01:51
[Lee Jong-cheol]:
--SUBTITLES, Korean v/o--
Each student can attend meetings
or engage in dialog with professors
with people overseas.
Deep conversation can
take place over video technology.
--

02:14
[FEMALE STUDENT ON VIDEO CHAT]
So have you guys kinda collaborated about what you're gonna do?

02:17
[FEMALE STUDENT]
I am writing the differences and similarities between *inaudible* and *inaudible*.

02:24
[FEMALE STUDENT ON VIDEO CHAT]
OK!

02:25
[FEMALE STUDENT]
I wanna email you the *inaudible*

02:26
[FEMALE STUDENT ON VIDEO CHAT]
OK.

02:26
[FEMALE STUDENT]
Yes and I wanna type

02:27
[FEMALE STUDENT ON VIDEO CHAT]
And then email me the time you're gonna be on, because we have way different times, so.

02:30
[FEMALE STUDENT]
OK.

02:31
[JEFF MERCER]

It’s important for all students to connect to each other regardless of where they are in the world. Students need to learn to walk in other people’s shoes. They need to understand and appreciate other’s perspectives and opinions.

02:42
For instance the fifth grade on both campuses will be taking a look at the political process with elections coming up in both countries. This will enable the children to have a much deeper and richer understanding of their own system because they can compare it to something else.

02:58
The TelePresence technology will really revolutionize education and provide ways for students and teachers and other members of the educational community to communicate and collaborate.

03:10
[FEMALE NARRATOR]
Communities around the world are increasingly using video technology in the classroom, but Songdo is ahead of the curve.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

COTF9
00:00

Title card:

"Visionary leaders understand that the network
enables services that foster innovation and
improve the standard of living."

Wim Elfrink
Chief Globalization OFficer, Cisco

00:18
[FEMALE NARRATOR]

A decade ago this was a barren mudflat.
Today, it is Songdo - a city built entirely from scratch in South Korea.

00:28
Located just three hours from China, Songdo's developers describe it as a new, international business hub in northeast Asia.
It is also one of the most eco-friendly and technologically advanced cities in the world.

00:45
Getting Songdo off the ground required more than just big ideas.
Developers needed to find the right technology company to make songdo a reality.

Title card:

CITIES OF THE FUTURE: SONGDO, SOUTH KOREA
Episode 9: Roadmap for a New Community

01:01
[STAN GALE]
In 2001, at the time that Gale International was first contacted to be a partner in building this new city, we had to plan out and think out who were the critical players to be on the team.

01:16
[SCOTT SUMMERS]
We had a blank canvas to work from and there was a lot at stake, because there hasn't been a city like Songdo, where we've built something from scratch.
Cisco's involvement in the early phases of the project is critical.

01:38
[JEAN-LOUIS MASSAUT]
We map what user experience do you want to have for the people who are working in the city or people who are living in the city?
And we do master planning.
We decide on what technology needs to be deployed in the city.
And then we build it.

01:55
[FEMALE NARRATOR]
Today, Cisco's IT network enables telepresence to connect every home, office and school through video.
It also helps regulate electricity and water use in all the city's buildings, curbing waste and cutting operating costs.
The system even gives residents the power to control their own energy use.

02:17
[CASPER HERZBERG]

The underlying technology infrastructure that links all of these buildings together allows some dramatic benefits of 30% energy reduction.

02:27
[FEMALE NARRATOR]
Cisco's involvement didn't end once the technology was deployed.

02:32
[JOHN BAEKELMANS]
Once you've installed all the technology you want to roll out a managed services company, in this case, U-Life Solutions, to ensure all of the technology components keep on running on a 24 by 24 basis.

02:46
[STAN GALE]
The importance of having Cisco in Songdo as a partner is really a game-changer.
We have the finest hardware but we also have the extended lifestyle experience and that is invaluable.

03:01
[FEMALE NARRATOR]
Sondgo's developers view their city as a model for future cities everywhere.
Around the world, Cisco is already building dozens of Smart Connected communities that foster economic, social and environmental sustainability.

Title cards:

Learn more at
thenetwork.cisco.com/songdo/

--

[Cisco logo]

Innovation Center
00:00

[JIMMY KIM]
So, there's a missing child. When a missing child alarm happens, not only

--Lower Third--
INSIDE INNOVATION
--

00:06

will they show you where the incident happens, but also your GPS track where the child is moving. You can also change the digital signage of the whole city.

00:12
You alert the police, you alert the general public. We can be more efficient and effective for city operations.

Title card:
Where innovation happens
Cisco Innovation Centers

00:21
[RAJIV NILES]
South Korea is one of the most technologically advanced countries. You see tremendous innovation. It's a great place for companies like Cisco to bring new solutions into the market.

00:32
Songdo is one of the first smart cities worldwide that Cisco started working with. In the Songdo

--Lower Third--
Rajiv Niles
Songdo, Cisco Innovation Center
--

00:36
Innovation Center, we are focused around a

--Lower Third--
Smart Cities
--

00:39
number of verticals. We do quite a lot of work around healthcare and

--Lower Third--
Healthcare
Transportation
Manufacturing
--

00:42
transportation and manufacturing.

--Lower Third--
Ben Chung

Center Leader
Songdo, Cisco Innovation Center
--

00:44
[BEN CHUNG]
Our center is established in October 2013.

00:50
[RAJIV NILES]
We really innovate how people work, live and play.

Title card:

What innovation looks like
Cisco Innovation Centers

00:55
[BEN CHUNG]
All our residents use smart devices to control their home systems and use telepresence to communicate around the world.

01:04
[RAJIV NILES]
We reduce congestion in the city by allowing people now to stay in their homes and get access to a lot of these services. We also work with the exciting and vibrant partners. They're really disrupting the way innovation is done.

Title card:

How we power innovation
Cisco Innovation Centers
--

01:18
[JIMMY KIM]
N3N has developed IOT visualisation

--Lower Third--
Jimmy Kim
President N3N
--

01:21

technology. You have your video feeds, big data feeds, satellite maps, sensors - all integrated in a single interface. Everything is linked up into the network.

01:30
Cisco has provided their products, but a more global standard, and a more scalable way. You have cameras pointing in a parking space. He'll give you video analytics and where that person should park, and if it's not your number, they will take that picture into ticketing.

01:47
[RAJIV NILES]
The Namoo technology allows us to do a lot of work around manufacturing.

01:51
[DR. JASON NOH]
We work with local high-tech manufacturers to provide what we call

--Lower Third--
Dr. Jason Noh
CTO
Namoo
--

01:54
horizontal visibility: communication to and from devices. We collect all the data so that conventional IT applications would have a quite realistic view of day-to-day operations of their shop floors to the managers. Once the noodle get thicker, the productivity gets lower, so we're losing money. So if we hit the button to make it thinner so that would roll faster then you're not wasting any resources and productivity goes up.

Title card:

Data-driven, real-time analysis
saves manufacturer more than
$3M annually

02:24
We were trying to breach between small data and the big data. That's where Cisco comes in with the Fog Computing concept to port our software on top of the Fog Computing devices, to see the true seamless integration between operating technology and the IT. The sky is the limit.

Title card:

Amazing things happen...

02:42
[BEN CHUNG]
Amazing things happen when you connect previously unconnected.

02:48
[RAJIV NILES]
We have a safer environment to live in, better connectivity, lower energy footprints.

02:58
[BEN CHUNG]
I let anyone out there to utilize our Center to be a platform for innovation for execution of their dreams.

Title cards:

#InsideInnovation

Powering innovation to accelerate
digital transformation

cisco.com/go/innovationcenters

--

thenetwork.cisco.com

Real-time Analytics
00:00

[RAJIV NILES]
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--Lower Third--
Rajiv Niles
Songdo, Cisco IoE Innovation Center
--

00:02
that Cisco started working with.

--Lower Third--
Smart Cities

--

00:04
In the Songdo IoE Innovation Center we're focused around a number of verticals. We do quite a lot of work around health care and transportation and manufacturing.

--Lower Third--
Healthcare
Transportation
Manufacturing
--

00:13
[BEN CHUNG]
Our center is established in October 2013.

--Lower Third--
Ben Chung
Center Leader
Songdo, Cisco IoE Innovation Center
--

00:18
We accelerate our current IoS businesses and develop and support IoE ecosystem.

00:25
[RAJIV NILES]
We really innovate how people work live and play. We also work with exciting and vibrant partners. They're really disrupting the way innovation is done.

Title card:

How we power innovation
Cisco IoE Innovation Centers
--

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--Lower Third--
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Title cards:

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Powering innovation to accelerate
digital transformation

cisco.com/go/innovationcenters

--

thenetwork.cisco.com

Connected City
00:02

[MALE NARRATOR]
Just 32 kilometers outside of Seoul a new city is rising. A true smart connected community. Songdo is one of the most ambitious urban developments of its time. Everything is connected, intelligent and green, helping to realise environmental, economic and social sustainability.

00:21

The physical community becomes a smart, connected community, giving residents flexible access to information and services for their homes, schools, transportation and more, while enhancing the quality of life.

00:36
Let's look at how a resident of Songdo experiences life in an existing smart connected community at home, at work, and at school, and how such a city is enabled. This is "1st World", the first completed residential project in Songdo.

00:55
This luxury apartment complex provides housing for 1,596 residential units that sold out the same weekend they went on sale. Let's take a look at the founders suite on the 64th floor.

01:09
In this smart connected apartment your cell phone takes pictures, plays music and can now unlock your front door. From any digital panel you can easily access all of the systems in your home -

01:26
air-conditioning, home security or open the blinds and turn on the lights. Any connected device can be used to control your home or welcome your guests with custom art on any digital screen.

01:42
From the comfort of your den, connect with a variety of resident services all enabled through smart connected communities. These services could be provided by the government, hospitals, schools and even by smaller entrepreneurs. Connect with your doctor.

02:04
Learn from the English tutor at the International Songdo school after-hours, or from teachers from around the world.

02:18
We are increasingly living in an age of Internet of Things where every kind of device is IP enabled and connected on a global network. We are moving from a physically disparate world to one where everything can be connected -

02:33
laptops, mobile phones, cars, even traffic lights, utilities, smart grid, water management, and everything that can be connected, can be intelligent, can be green.

02:45
Let's see how smart connected communities changes the way you work. In the next generation office environment, efficient utilisation of resources and employees will be critical to remain competitive. A remotely located reception manager effectively manages multiple locations and welcomes visiting customers through a "Cisco Telepresence System 1000."

03:07

To thrive in today's economy you have to collaborate with colleagues, partners and customers around the globe and at a moment's notice.

03:16
You also have to conduct business to enhance the quality of your relationships.

03:20
Telepresence allows you to do this at the touch of a screen. You are responsible for managing the security for all of your employees in a global company with multiple sites across the world.

03:31
You need visibility locally and at remote locations to allow you to make the best informed decisions in critical moments.

03:38
Here is one real life, community exchange. This is Cisco's Bangalore Security and Facility Operations Center - one of five that provides centralised management for security, energy, utilities, building facilities and transportation around the world of Cisco's offices and 60,000 employees. From the same community exchange we can access and manage utility and building facilities.

04:03
Everything is connected over the IP network - security cameras, HVAC, elevators, lighting, transportation, and of course, all the IT in the city and community.

04:15
Cisco's smart connected communities can transform physical communities into connected communities that will realize economic growth, environmental sustainability and improved quality of life for residents. Thank you for joining us.

ULife
00:03

[FEMALE VOICEOVER]
The precious time of being with our loved ones.

00:07
Making our lives safer and more convenient, anytime, anywhere.

00:14
The future life of your dreams, created by U-Life's advanced ubiquitous technologies.

00:24

All year round, the most heartwarming days of life are being created at the world's first ubiquitous city.

Title card:

The Most Beautiful Life with Heartwarming People
U-LIFE

00:39
Though it seems like nothing has changed since yesterday,

--Lower Third--
A Convenient Life
Ubiquitous Life
--

00:42
there are actually so many changes that affect our present day lives.

00:46
U-Life is making our lives more heartwarming and convenient.

--Lower Third--
Home Portal Service
--

00:55
Convenient services such as bus and traffic information,

00:59
remote elevators you can call, using ubiquitous robots, are now a reality.

--Lower Third--
Remote Healthcare Service
--

01:11
Remote healthcare service makes it possible for your doctor to diagnose your illnesses, and prescribe medication from a distance.

--Lower Third--
Videophone Service
--

01:21
You can even see your lovely children's face while you talk to them on the phone.

--Lower Third--
One Card Service
--

01:35
One card with your personal information can provide various convenient functions such as identification recognition and credit card services.

--Lower Third--
Video Conferencing Service
--

01:49
Video conferencing service using high-speed networks will make your business environment more convenient.

Tree
00:00

Title card:
WHEN TREES CONNECT
How the Internet of Everything
will give us a new way
to view our world.

00:06
[DAVE EVANS]
If a tree can connect to the internet

--Lower Third--
Dave Evans
Cisco Chief Futurist
--

00:08
what could that tree tell us about what it's sensing, what's going on with the climate, and what's going on the world.

00:14
What happens if it were millions of trees? What happens if it was livestock and trees and other organic things?

00:21
What kind of insight might we have into the precious resources that we have on this planet? How might it affect how we consume things? How we recycle things?

00:29
It gives us a different level of empathy, understanding and insight into the world in which we live.

Title card:

Cisco
Tomorrow Starts Here

Quality
00:05

[MALE VOICEOVER]
For the happiness and future of my family I am going to a city that guarantees happiness and a bright future.

Title card:

Greatest Values for My Life
Songdo IBD

00:29
I remember the first time I visited Songdo - with an unblocked view in every direction, long stretches of roads, skyscrapers in pleasant parks, Songdo was a beautiful city.

00:47
The transportation to Seoul and the metropolitan area was also satisfying and the opening of number two Seoul beltway will bring Songdo closer to Seoul. Also, Songdo is only 15 minutes away from Incheon International Airport by car and that's why so many global companies have or are planning to relocate to Songdo.

01:16
Songdo will be home to 45,000 corporate executives and employees by 2016. In addition to corporations, various international organizations such as the GCF office and World Bank are located in Songdo which is why there are international conferences and numerous events held throughout the year.

01:37
It makes me proud to think that our family is living in an international city that competes with Brussels and Geneva. There is no other city like it. A city for the future of my family. I'm living in Songdo.

02:10
[FEMALE VOICEOVER]
A city that is prepared for my family's happiness and future, Songdo has exceeded my expectations in so many ways, from the canal walk and CQ shopping mall, to the Jack Nicklaus golf club and Incheon Art Center.

02:28:
But what impressed me the most was Songdo's educational environment. The educational environment that offers global education from kindergarten to graduate school was an advantage that can't be found anywhere else.

02:52
And, our precious home. Beautiful landscaping within the complex. High-tech systems that make everyday life more convenient and pleasant. A state-of-the-art security system that protects my children's safety, anytime, anywhere, my child running around in the pleasant natural environment with clean air, green nature and thick woods. Nothing could make a Mom happier. A city for my family's happiness.

03:33
I'm living in Songdo.

03:42
[MALE VOICEOVER]
A city built with those with great dreams.

03:44
[FEMALE VOICEOVER]
A city with beautiful natural surroundings and happy homes.

03:52
[MALE VOICEOVER]
For my family's happy future.

03:57
[MALE AND FEMALE VOICEOVER IN UNISON]
We are living in Songdo.

Title cards:

Songdo International Business District

--

Songdo IBD

--

Presented by
Gale International
POSCO E&C

IBD
00:00

Title card:

Those who dream for a long time ultimately
begin to resemble their dreams

Andre Malraux
--

00:13
This land was once ocean. The ocean became land. A city in harmony with people.

Title card:

The Vision for Songdo

00:31
One day, they appeared at the ocean's edge. They were builders and visionaries from all over the world. Their eyes were filled with passion, and their hearts housed a burning ambition.

00:51
They promised to build the most vibrant land in the region, to build the most beautiful and liveable city in the world. Gradually, the land began to take shape and in time became a city as these early pioneers had envisioned.

01:25
A city that was planned for the future by studying the world around us. An international city that sets a global standard. A city set within a green natural environment. A city with the highest level of safety and convenience.

01:56
A city that is home to thousands of residents who understand and appreciate an exceptional quality of life.

02:11
And a city that is praised and recognized by the world for its high standards.

02:34
People are now living in this city on this land.

02:41
Together, they aspire for great things.

02:49
They hope for greater happiness and a better future for all.

02:58
Each day they enjoy their work. Breathing in the fresh air, they stay active in the natural surroundings. Their hopes for the future are great.

03:32
The bright smiles of children who are growing up in the city. The heartbeats of young people who are working towards a brighter future. The delight of mothers as they see their children flourish.

04:11
Together, this community is building a dream. Each dream is part of a greater dream, a collective hope. Our dreams, our hopes, have only just begun. In the future we will stand at the center of the world - a beacon of hope and promise.

04:43
This place was once ocean. The ocean became land and is now a city.

05:02
Together we are taking another step toward the future.

05:07
A land built for new dreams. The most distinctive city in the world.

05:17
This is Songdo.

Title cards:

"Songdo International City is a model city for ecopolis"
Jacques Attali, French economist and futurologist

--

"Songdo will be a global city surpassing Dubai or Manhattan in New York"
Ban Ki-moon, Secretary-General of the United Nations

--

In 2008, Songdo IBD was named a winner of the annual Sustainable Cities Award from the Urban Land Institute and Financial Times

--

Songdo International Business District

--

Songdo IBD

--

Presented by
Gale International
POSCO E&C

FP04:20
NO SPOKEN OR TEXTUAL CONTENT TO TRANSCRIBE.

FP02:18
NO SPOKEN OR TEXTUAL CONTENT TO TRANSCRIBE.

Masdar
00:00

Title card:

Masdar City

00:05
Welcome to Masdar City - the city of possibilities, a daring and evolutionary journey to build the world's most advanced and sustainable community, a city we are shaping with an eye for a better future.

--Overlaid Graphics--
5 MINUTES
TO ABU DHABI INTERNATIONAL AIRPORT
-
20 MINUTES
TO ABU DHABI DOWNTOWN
-
60 MINUTES TO DUBAI
-
LONDON
7 HOURS
-
TOKYO
12 HOURS
--

00:17
Masdar City is centrally and strategically located next to Abu Dhabi Airport, from where major international markets can be reached within hours. The city is built using traditional Arabic architecture, combined with modern technology and design. Narrow walkways capture the wind and provide shade, making the perceived temperature 10 degrees cooler in Masdar City than elsewhere in Abu Dhabi, encouraging a healthy and comfortable lifestyle where everything is within walking distance.

0:47
The buildings are powered by clean energy, constructed using green building materials, and designed to reduce energy and water consumption by 40%.

00:57
This modern work-life space is made possible by the forward-thinking approach in designing every detail of Masdar City, making it the greenprint for cities across the world.

01:08
But this is just the beginning - Masdar City will grow one neighborhood at a time, adding new businesses, schools, restaurants, apartments and so much more. Eventually over 90,000 people will live and work in the city. Throughout the expansion, residential, cultural and commercial areas will be interwoven with parks and a wide variety of services and amenities.

01:32
Residents and visitors can leave their cars behind and enjoy the open and

--Overlaid Graphics--

LIGHT RAIL TRANSIT
PERSONAL RAPID TRANSIT
GROUP RAPID TRANSIT
BUS
--

01:37
pedestrian friendly neighborhoods. Integrated clean and smart transportation systems - including a fleet of electric vehicles and driverless cars - keep the city accessible and liveable as it grows.

01:48
Masdar City is a vibrant place. It brings together a diverse range of tenants and professionals creating a unique business climate. The city is a free zone that welcomes companies both large and small. With the Masdar Institute of Science and Technology at the city's core, they can count on highly skilled graduates and opportunities for research partnerships.

02:10
[BUSINESSMAN]
When we set up our company it was as simple as one two three - three steps and five days, that's all it took to startup in Masdar City. Office space is immediately available and taxes and import tariffs are non-existent. Setting up our company in Masdar City gave us a competitive edge in the Emirates and around the globe. Join us and the many other companies who have chosen Masdar City to be the home of their business.

Title card:

Masdar City
The City of Possibilities
www.masdar.ae

ANNEX 2: QUALITATIVE CONTENT ANALYSIS RESULTS

ALL VIDEOS

			COTF								
Categories	TOTALS	TOTALS as %	1	2	3	4	5	6	7	8	9
*Naturalizing aesthetic function of nature	82	35.65%	15	3	4	11	2	7	4	1	2
*Human mimicry of nature	29	12.61%	2	2	2	1	0	1	2	0	2
Human mastery/power over nature	28	12.17%	3	1	1	1	2	3	1	1	4
Nature as a nice place to be	21	9.13%	1	1	1	4	1	0	0	1	1
*Nature as limited resource	20	8.70%	1	2	2	0	1	7	4	0	0
Nature as something to protect	15	6.52%	2	2	1	0	1	4	1	0	1
Recreational function of Nature	12	5.22%	3	0	0	6	1	0	0	0	0
Nature as resource (production/recreation)	11	4.78%	1	0	0	1	0	2	2	0	3
Nature as intrinsically good (e.g. healthy, fresh)	5	2.17%	0	0	0	2	0	0	0	0	0
Nature as distance/space traversed/the in-between/obstacle	3	1.30%	0	0	0	0	2	0	0	0	0
Nature as symbol of freedom	3	1.30%	1	0	0	1	1	0	0	0	0
"Like nature" - metaphor	1	0.43%	0	0	0	0	0	0	0	1	0
OVERALL COUNT	230	100.00%	29	11	11	27	11	24	14	4	13

	Other Songdo/Cisco Videos						
Categories	Connected City	Innovation Center	Realtime Data	Tree	Quality	IBD	U-Life Solutions
*Naturalizing aesthetic function of nature	5	5	4	3	7	5	0
*Human mimicry of nature	3	1	1	3	0	2	0
Human mastery/power over nature	0	0	0	1	1	6	0
Nature as a nice place to be	0	0	0	1	5	1	1
*Nature as limited resource	0	1	1	1	0	0	0
Nature as something to protect	0	0	0	0	0	0	0
Recreational function of Nature	0	0	0	0	1	1	0
Nature as resource (production/recreation)	1	0	0	1	0	0	0
Nature as intrinsically good (e.g. healthy, fresh)	0	0	0	0	1	1	0
Nature as distance/space traversed/the in-between/obstacle	0	0	0	0	0	1	0
Nature as symbol of freedom	0	0	0	0	0	0	0
"Like nature" - metaphor	0	0	0	0	0	0	0
OVERALL COUNT	9	7	6	10	15	17	1

	Masdar Videos		
Categories	FP02:18	FP04:20	Masdar
*Naturalizing aesthetic function of nature	2	0	2
*Human mimicry of nature	2	5	0
Human mastery/power over nature	1	0	2
Nature as a nice place to be	0	2	1
*Nature as limited resource	0	0	0
Nature as something to protect	0	0	3
Recreational function of Nature	0	0	0
Nature as resource (production/recreation)	0	0	0
Nature as intrinsically good (e.g. healthy, fresh)	0	0	1
Nature as distance/space traversed/the in-between/obstacle	0	0	0
Nature as symbol of freedom	0	0	0
"Like nature" - metaphor	0	0	0
OVERALL COUNT	5	7	9

ALL PRIMARY VIDEOS

			COTF								
Categories	**TOTALS**	**TOTALS as %**	1	2	3	4	5	6	7	8	9	Connected City
*Naturalizing aesthetic function of nature	78	37.32%	15	3	4	11	2	7	4	1	2	5
Human mastery/power over nature	25	11.96%	3	1	1	1	2	3	1	1	4	0
*Human mimicry of nature	22	10.53%	2	2	2	1	0	1	2	0	2	3
*Nature as limited resource	20	9.57%	1	2	2	0	1	7	4	0	0	0
Nature as a nice place to be	18	8.61%	1	1	1	4	1	0	0	1	1	0
Nature as something to protect	12	5.74%	2	2	1	0	1	4	1	0	1	0
Recreational function of Nature	12	5.74%	3	0	0	6	1	0	0	0	0	0
Nature as resource (production/recreation)	11	5.26%	1	0	0	1	0	2	2	0	3	1
Nature as intrinsically good (e.g. healthy, fresh)	4	1.91%	0	0	0	2	0	0	0	0	0	0
Nature as distance/space traversed/the in-between/obstacle	3	1.44%	0	0	0	0	2	0	0	0	0	0
Nature as symbol of freedom	3	1.44%	1	0	0	1	1	0	0	0	0	0
"Like nature" - metaphor	1	0.48%	0	0	0	0	0	0	0	1	0	0
OVERALL COUNT	209											

	Other Songdo/Cisco Videos				
Categories	Innovation Center	Realtime Data	Tree	Quality	IBD
*Naturalizing aesthetic function of nature	5	4	3	7	5
Human mastery/power over nature	0	0	1	1	6
*Human mimicry of nature	1	1	3	0	2
*Nature as limited resource	1	1	1	0	0
Nature as a nice place to be	0	0	1	5	1
Nature as something to protect	0	0	0	0	0
Recreational function of Nature	0	0	0	1	1
Nature as resource (production/recreation)	0	0	1	0	0
Nature as intrinsically good (e.g. healthy, fresh)	0	0	0	1	1
Nature as distance/space traversed/the in-between/obstacle	0	0	0	0	1
Nature as symbol of freedom	0	0	0	0	0
"Like nature" - metaphor	0	0	0	0	0
OVERALL COUNT					

Categories	U-Life Solutions
*Naturalizing aesthetic function of nature	0
Human mastery/power over nature	0
*Human mimicry of nature	0
*Nature as limited resource	0
Nature as a nice place to be	1
Nature as something to protect	0
Recreational function of Nature	0
Nature as resource (production/recreation)	0
Nature as intrinsically good (e.g. healthy, fresh)	0
Nature as distance/space traversed/the in-between/obstacle	0
Nature as symbol of freedom	0
"Like nature" - metaphor	0
OVERALL COUNT	

PRIMARY: Cisco's "Cities of the Future: Songdo, South Korea" series

			COTF								
Categories	**TOTALS**	**TOTALS as %**	1	2	3	4	5	6	7	8	9
*Naturalizing aesthetic function of nature	49	34.03%	15	3	4	11	2	7	4	1	2
Human mastery/power over nature	17	11.81%	3	1	1	1	2	3	1	1	4
*Nature as limited resource	17	11.81%	1	2	2	0	1	7	4	0	0
*Human mimicry of nature	12	8.33%	2	2	2	1	0	1	2	0	2
Nature as something to protect	12	8.33%	2	2	1	0	1	4	1	0	1
Nature as a nice place to be	10	6.94%	1	1	1	4	1	0	0	1	1
Recreational function of Nature	10	6.94%	3	0	0	6	1	0	0	0	0
Nature as resource (production/recreation)	9	6.25%	1	0	0	1	0	2	2	0	3
Nature as symbol of freedom	3	2.08%	1	0	0	1	1	0	0	0	0
Nature as intrinsically good (e.g. healthy, fresh)	2	1.39%	0	0	0	2	0	0	0	0	0
Nature as distance/space traversed/the in-between/obstacle	2	1.39%	0	0	0	0	2	0	0	0	0
"Like nature" - metaphor	1	0.69%	0	0	0	0	0	0	0	1	0
OVERALL COUNT	144										

PRIMARY: Additional Cisco promotional videos pertaining to Songdo

			Other Songdo/Cisco Videos			
Categories	**TOTALS**	**TOTALS as %**	Connected City	Innovation Center	Realtime Data	U-Life Solutions
*Naturalizing aesthetic function of nature	14	60.87%	5	5	4	0
*Human mimicry of nature	5	21.74%	3	1	1	0
*Nature as limited resource	2	8.70%	0	1	1	0
Nature as a nice place to be	1	4.35%	0	0	0	1
Nature as resource (production/recreation)	1	4.35%	1	0	0	0
Human mastery/power over nature	0	0.00%	0	0	0	0
Nature as something to protect	0	0.00%	0	0	0	0
Recreational function of Nature	0	0.00%	0	0	0	0
Nature as intrinsically good (e.g. healthy, fresh)	0	0.00%	0	0	0	0
Nature as distance/space traversed/the in-between/obstacle	0	0.00%	0	0	0	0
Nature as symbol of freedom	0	0.00%	0	0	0	0
"Like nature" - metaphor	0	0.00%	0	0	0	0
OVERALL COUNT	23					

PRIMARY: Cisco promotional video pertaining to smart cities and nature

Categories	**TOTALS**	**TOTALS as %**	Tree
*Naturalizing aesthetic function of nature	3	30.00%	3
*Human mimicry of nature	3	30.00%	3
Human mastery/power over nature	1	10.00%	1
Nature as a nice place to be	1	10.00%	1
*Nature as limited resource	1	10.00%	1
Nature as resource (production/recreation)	1	10.00%	1
Nature as something to protect	0	0.00%	0
Recreational function of Nature	0	0.00%	0
Nature as intrinsically good (e.g. healthy, fresh)	0	0.00%	0
Nature as distance/space traversed/the in-between/obstacle	0	0.00%	0
Nature as symbol of freedom	0	0.00%	0
"Like nature" - metaphor	0	0.00%	0
OVERALL COUNT	10		

PRIMARY: **Non-technological stakeholder (POSCO E&C and Songdo IBD) promotional videos**

Categories	TOTALS	TOTALS as %	Quality	IBD
*Naturalizing aesthetic function of nature	12	37.50%	7	5
Human mastery/power over nature	7	21.88%	1	6
Nature as a nice place to be	6	18.75%	5	1
*Human mimicry of nature	2	6.25%	0	2
Recreational function of Nature	2	6.25%	1	1
Nature as intrinsically good (e.g. healthy, fresh)	2	6.25%	1	1
Nature as distance/space traversed/the in-between/obstacle	1	3.13%	0	1
*Nature as limited resource	0	0.00%	0	0
Nature as something to protect	0	0.00%	0	0
Nature as resource (production/recreation)	0	0.00%	0	0
Nature as symbol of freedom	0	0.00%	0	0
"Like nature" - metaphor	0	0.00%	0	0
OVERALL COUNT	32			

ALL SECONDARY VIDEOS

			Masdar Videos		
Categories	**TOTALS**	**TOTALS as %**	FP02:18	FP04:20	Masdar
*Human mimicry of nature	7	33.33%	2	5	0
*Naturalizing aesthetic function of nature	4	19.05%	2	0	2
Human mastery/power over nature	3	14.29%	1	0	2
Nature as a nice place to be	3	14.29%	0	2	1
Nature as something to protect	3	14.29%	0	0	3
Nature as intrinsically good (e.g. healthy, fresh)	1	4.76%	0	0	1
*Nature as limited resource	0	0.00%	0	0	0
Recreational function of Nature	0	0.00%	0	0	0
Nature as resource (production/recreation)	0	0.00%	0	0	0
Nature as distance/space traversed/the in-between/obstacle	0	0.00%	0	0	0
Nature as symbol of freedom	0	0.00%	0	0	0
"Like nature" - metaphor	0	0.00%	0	0	0
OVERALL COUNT	21				

SECONDARY: Foster + Partners promotional videos

			Foster + Partners	
Categories	**TOTALS**	**TOTALS as %**	FP02:18	FP04:20
*Human mimicry of nature	7	58.33%	2	5
*Naturalizing aesthetic function of nature	2	16.67%	2	0
Nature as a nice place to be	2	16.67%	0	2
Human mastery/power over nature	1	8.33%	1	0
Nature as something to protect	0	0.00%	0	0
Nature as intrinsically good (e.g. healthy, fresh)	0	0.00%	0	0
*Nature as limited resource	0	0.00%	0	0
Recreational function of Nature	0	0.00%	0	0
Nature as resource (production/recreation)	0	0.00%	0	0
Nature as distance/space traversed/the in-between/obstacle	0	0.00%	0	0
Nature as symbol of freedom	0	0.00%	0	0
"Like nature" - metaphor	0	0.00%	0	0
OVERALL COUNT	12			

SECONDARY: Masdar City promotional video

			Masdar City
Categories	**TOTALS**	**TOTALS as %**	Masdar
Nature as something to protect	3	33.33%	3
*Naturalizing aesthetic function of nature	2	22.22%	2
Human mastery/power over nature	2	22.22%	2
Nature as a nice place to be	1	11.11%	1
Nature as intrinsically good (e.g. healthy, fresh)	1	11.11%	1
*Human mimicry of nature	0	0.00%	0
*Nature as limited resource	0	0.00%	0
Recreational function of Nature	0	0.00%	0
Nature as resource (production/recreation)	0	0.00%	0
Nature as distance/space traversed/the in-between/obstacle	0	0.00%	0
Nature as symbol of freedom	0	0.00%	0
"Like nature" - metaphor	0	0.00%	0
OVERALL COUNT	9		

ANNEX 3: MCDA MATRICES

COTF1

CATEGORIES	# OF REPRESENTATIONS										
Nature as a nice place to be	1			00:46-00:49 (pleasing visual of trees in near empty pedestrian shopping street) / "SOUTH KOREA IS ONE OF THE WORLD'S MOST DENSELY POPULATED COUNTRIES."							
Nature as intrinsically good (e.g. healthy, fresh)	0										
Human mastery/power over nature	3					00:56-01:02 (image of 21km long Incheon Bridge) / "1500 ACRES HAD TO BE RECLAIMED FROM THE SEA."		01:11-01:18 "BY 2016, MORE THAN 400 NEW BUILDINGS WILL STAND, INCLUDING SOUTH KOREA'S TALLEST SKYSCRAPER."			
Recreational function of Nature	3							01:25 "We took an approach that has the best elements of some of the finest cities in the world." / image: people cycling and walking in park			
Nature as distance/space traversed/the in-between/obstacle	0										
Nature as symbol of freedom	1				00:56 "THERE WAS NO AVAILABLE LAND TO BUILD IT."					01:29-01:32 "40% of the space is open space. You can leave your car at home and you can walk to central park" / image: people crossing street on bike, closeup of people walking in park	
Nature as resource (production/recreation)	1										
"Like nature" - metaphor	0										
Nature as a threat	0										
Nature as genuine and authentic	0										
Nature as metaphor for life's journey	0										
Nature as challenge/sport/manhood/endurance	0										
Nature as spectacle, packaged (TV) spectacle	0										
Nature as global, big, awesome, impressive	0										
Nature as something to protect	2	00:15 ("THE **NEED** TO MAKE EXISTING CITIES MORE ENERGY EFFICIENT AND TO BUILD NEW **SUSTAINABLE** CITIES IS ON THE RISE.")		00:23 (ACROSS THE GLOBE DEVELOPERS ARE BUILDING SMART CITIES OFFERING HIGH QUALITY **ECO-FRIENDLY** LIVING.)							
*Nature as limited resource	1	image: lots of people, small amount of fruit on display for sale, few trees									
*Human mimicry of nature	2							image: model of Songdo with flashing lights, green hills			
*Naturalizing aesthetic function of nature	15		image: ocean in background, construction and buildings in foreground			image: tranquil shots of ocean with massive fishing trawlers, massive bridge spanning 21km!			image: park shot has city buildings in the background	image: city buildings in background of park. // **V/O enters and cuts audio of automobiles**	

CATEGORIES									
Nature as a nice place to be									
Nature as intrinsically good (e.g. healthy, fresh)									
Human mastery/power over nature									02:55 "The quality of life will be unmatched" / image: Incheon bridge on a dreary day with bay and ships
Recreational function of Nature	01:37 "you can visit an office or a retail shopping center" / image: NO OFFICE OR SHOPPING SHOWN, just walking and biking with trees in shot in urban area	01:39 "you can go to the golf course"							
Nature as distance/space traversed/the in-between/obstacle									
Nature as symbol of freedom									
Nature as resource (production/recreation)									
"Like nature" - metaphor									
Nature as a threat									
Nature as genuine and authentic									
Nature as metaphor for life's journey									
Nature as challenge/sport/manhood/endurance									
Nature as spectacle, packaged (TV) spectacle									
Nature as global, big, awesome, impressive									
Nature as something to protect									
*Nature as limited resource									
*Human mimicry of nature						02:22 "[The network that we deploy here is] actually connecting all of the components in the city. You know, all of the residences, offices..." / image: apartment with control panel interface			
*Naturalizing aesthetic function of nature	image: city buildings in background, trees in foreground	image: city buildings in background		02:01 image: cars driving past reflecting pool of water with trees and lawn in shot, then shot with trees in foreground, city buildings in background	02:13 "we've got state-of-the-art technology going into our buildings." / image: trees in lobby of futuristic, glass-fronted office building.		02:41 "NEW AND OLD TECHNOLOGY WORKING TOGETHER WILL CREATE A TRULY SUSTAINABLE CITY." / image: closeup of Korean waterwheel in action, trees in background; closer shot to see water falling; then pull back for shot with city in background	02:52 "[We didn't just look 10 years ahead; we looked at 50 years, 100 years from now.] If the city..." / image: shot of trees in foreground, traditional Korean gazebo in midground, then city buildings in background	image: calm shot with natural and human-built elements in frame

CATEGORIES				
Nature as a nice place to be				
Nature as intrinsically good (e.g. healthy, fresh)				
Human mastery/power over nature				
Recreational function of Nature				
Nature as distance/space traversed/the in-between/obstacle				
Nature as symbol of freedom				
Nature as resource (production/recreation)				
"Like nature" - metaphor				
Nature as a threat				
Nature as genuine and authentic				
Nature as metaphor for life's journey				
Nature as challenge/sport/manhood/endurance				
Nature as spectacle, packaged (TV) spectacle				
Nature as global, big, awesome, impressive				
Nature as something to protect				
*Nature as limited resource				
*Human mimicry of nature				
*Naturalizing aesthetic function of nature	03:01 "Songdo is being studied by many countries" / image: park and river in foreground, city buildings in background, sun is setting, BUILDINGS LIGHTING UP, time lapse	03:08 "...as an example of a Smart and Connected Community" / image: again, tech elements (lights, buildings) are reflected in the river, now lighting up the sky too	03:18 "We're hoping we contribute to the global footprint [in a positive way.]" / image: closeup on Incheon bridge lit up at night, lights reflected in water, cars rushing past (time lapse)	03:21: "SONGDO IS ONE OF MORE THAN 100 SMART CITY PROJECTS UNDERWAY WORLDWIDE." / image: buildings illuminated with massive "X" "0" light displays at dusk, reflecting in the river water, see the tidal nature rise

CATEGORIES	# OF REPRESENTATIONS								
Nature as a nice place to be	1						02:24 STAN GALE: "I think the way it's going to change the life of people..." - image: Songdo IBD is represented as a green area on the inteactive map that shows travel time from Incheon airport		
Nature as intrinsically good (e.g. healthy, fresh)	0								
Human mastery/power over nature	1		00:17 (Its infrastructure uses advanced network technologies to improve the city's quality of life.)						
Recreational function of Nature	0								
Nature as distance/space traversed/the in-between/obstacle	0								
Nature as symbol of freedom	0								
Nature as resource (production/recreation)	0								
"Like nature" - metaphor	0								
Nature as a threat	0								
Nature as genuine and authentic	0								
Nature as metaphor for life's journey	0								
Nature as challenge/sport/manhood/endurance	0								
Nature as spectacle, packaged (TV) spectacle	0								
Nature as global, big, awesome, impressive	0								
Nature as something to protect	2				01:35 STAN GALE: "Intuitively the system goes through and seeks areas of energy use and reduces them. I've met a reduction in my carbon footprint."	02:00 "This reduces the city's carbon footprint by curbing people's need to travel."			
*Nature as limited resource	2			01:24 "With the touch of a button, they can manage their homes' energy use"					02:52 "Like Songdo, smart city projects around the world are developing network technologies for managing energy demands and connecting to vital services."
*Human mimicry of nature	2	0:00 Titlecard: "Our cities are fast transforming into ecosystems of interconnected, independent intelligent digital organisms."						02:40-02:49 - LEE JONG-CHEOL: "Songdo international district is aiming to be the perfect model city. The network communication technology will bind all the city services together."	
*Naturalizing aesthetic function of nature	3		image: city in foreground, open land, ocean and beautiful sky in background - followed by CGI title card for the episode (Living in Songdo) that includes green and white rounded columnar/organic elements		image: Stan Gale interacts with touchscreen energy saving interface that shows green, grassy globe populated with smart buildings			image: talking head in foreground, trees in midground, buildings in background; then panning aerial shot of heavily landscaped golf course in foreground with buildings in background; then aerial shot of buildings in foreground alongside open green space.	

CATEGORIES	# OF REPRESENTATIONS								
Nature as a nice place to be	1			00:29 "and providing a model for other cities everywhere." - image: shot of city buildings and riverside park/seating from river (can see reflections of buildings in water)					
Nature as intrinsically good (e.g. healthy, fresh)	0								
Human mastery/power over nature	1	0:00 Title card: "Designing an entirely new city from the ground up provides a unique opportunity to create an ideal technological infrastructure." Bill Gates Chairman, Microsoft							
Recreational function of Nature	0								
Nature as distance/space traversed/the in-between/obstacle	0								
Nature as symbol of freedom	0								
Nature as resource (production/recreation)	0								
"Like nature" - metaphor	0								
Nature as a threat	0								
Nature as genuine and authentic	0								
Nature as metaphor for life's journey	0								
Nature as challenge/sport/manhood/endurance	0								
Nature as spectacle, packaged (TV) spectacle	0								
Nature as global, big, awesome, impressive	0								
Nature as something to protect	1							02:30 "...adopting telepresence technology to reduce costs and carbon footprints."	
*Nature as limited resource	2				01:40 SCOTT SUMMERS "...and save costs in terms of energy consumption." - image: aerial shot with buildings in foreground (one with signage: CENTRAL PARK I) and hills in background.		02:21 [STAN GALE] "...cuts out the wasted time and energy that we all have during the day getting to and from places.		
*Human mimicry of nature	2		00:12 "A newly constructed city, it combines cutting edge urban planning with an infrastructure built on state of the art network technology."		01:43 "Songdo's network infrastructure..."				
*Naturalizing aesthetic function of nature	4		image: buildings in foreground and background, forested hills in midground		image: POSCO branded big screen TV inside glass-walled foyer (image on screen shows the earth from space and the title "THINK FORWARD: 2020 GLOBAL TOP 10") while a variety of trees, shrubbery and grass are visible outside, with more buidlings in the background; reflections of trees can be seen in the polished floor	02:16 [STAN GALE] "Having a fully connected presence and Smart and Connected Community..." - image: children in classroom videoconferencing with Cisco employee at a windfarm with photogenic lush, green grassy hills			02:36 "But by 2016, Songdo will outpace them all with more than 20,000 units deployed citywide." - image: timelapse night shot of illuminated building, floodlit park, lots of lights reflecting in water, illuminated bridge in background with busy traffic; cuts to another timelapse shot of illuminated building now as a silhouette against a sunset sky - trees (not illuminated) also silhouetted against sky - fades to black

CATEGORIES	# OF REPRESENTATIONS											
Nature as a nice place to be	4										image: trees in foreground, Korean gazebo in midground, building in background	01:50 [SCOTT SUMMERS] "Central Park is a 100-acre park with a seawater canal."
Nature as intrinsically good (e.g. healthy, fresh)	2		00:15 "...brings together green space..." - image: 3 ladies walking down a landscaped city street with numerous trees and bushes									
Human mastery/power over nature	1							01:17 [LEE JONG-CHEOL] "We're planning to develop a coastal paradise."				
Recreational function of Nature	6						01:06 [LEE JONG-CHEOL] "We have secured the maximum amount of space we can for parks." - image: cyclist riding through park while 2 pedestrians walk nearby, buildings in background; cut to shot of woman standing with umbrella by river with greenery all around; cuts to another shot of the same scene, now with trees and a bridge in the midground and an iconic Songdo building in the background		01:26 [SCOTT SUMMERS] "Of the 1,500 acres, 40 percent of that is dedicated to open space and you don't have to get in the car. " - image: Jack Niclaus golf course, overlaid with "40% Open space" graphic (fades in and out)	01:36 [SCOTT SUMMERS] "We have 25 kilometers of bicycle lanes here in Songdo. It's faster to get on a bike."	01:39-01:49 "Ten percent of Songdo's land is dedicated to an enormous public park, both inspired by and named after, the world renowned Central Park in New York City." - image: man cycling on bike through park, trees in the foreground	
Nature as distance/space traversed/the in-between/obstacle	0											
Nature as symbol of freedom	1	0:00 - Title card: "A pedestrian city is the first measure of sustainability." James von Klemperer Principal, Kohn Pedersen Fox										
Nature as resource (production/recreation)	1					01:00 [LEE JONG-CHEOL] "We have invested heavily in growing a significant number of trees."						
"Like nature" - metaphor	0											
Nature as a threat	0											
Nature as genuine and authentic	0											
Nature as metaphor for life's journey	0											
Nature as challenge/sport/manhood/endurance	0											
Nature as spectacle, packaged (TV) spectacle	0											
Nature as global, big, awesome, impressive	0											
Nature as something to protect	0											
*Nature as limited resource	0											
*Human mimicry of nature	1				00:44 - 00:48 [STAN GALE] - "...we're a green city..." - image: electricity windmill behind trees; cut to zoomed out shot now showing 5 windmills hidden/merged with trees							
*Naturalizing aesthetic function of nature	11			00:15-00:20 - "...brings together green space, accessibility and advanced technology to create an improved way of life for all its residents..." - image: jump between people walking down landscaped street, to man interfacing with touchscreen terminal in glass business building, to traditional Korean gazebo in which 3 people are siting and perhaps picnicing, with trees in the midground and buildings in the background	00:44 - 00:48 [STAN GALE] - "...we're a green city..." - image: electricity windmill behind trees; cut to zoomed out shot now showing 5 windmills hidden/merged with trees	image: sizeable stand of trees with buildings in background	image: small park with traditional Korean gazebo in foreground, buildings in background	image: Incheon bridge spanning bay, airplane landing in background; cuts to shot of boats in bay during beautiful sunset		image: trees in midground as people bike across a busy street with buildings in the background	image: turning water wheel and gazebo by the riverfront in the foreground, with green space in the midground and buildings in the background; zoom in to show close up of traditional Korean water wheel in operation with trees in background	image: seawater canal/river in foreground, park in midground, buildings in background

CATEGORIES				
Nature as a nice place to be	image: pedestrians and cyclist moving through landscaped "canal walk" area in flattering twilight lighting		image: "body of water ringed by rocks and trees"	
Nature as intrinsically good (e.g. healthy, fresh)	01:50 [SCOTT SUMMERS] "We also have Canal Walk. It's kind of modeled off of SoHo in New York. It's a four-story building. The lower two levels is retail, and the upper two levels is residential. We've got a canal that flows through the middle."			
Human mastery/power over nature				
Recreational function of Nature		02:09 "Songdo also offers top attractions, like an 18 hole Jack Nicklaus championship golf course. The site was designed by the golf pro himself." - image: people playing golf (city buildings in background)	02:28 [SCOTT SUMMERS] - "We held our first PGA champions tour..."	
Nature as distance/space traversed/the in-between/obstacle				
Nature as symbol of freedom				
Nature as resource (production/recreation)				
"Like nature" - metaphor				
Nature as a threat				
Nature as genuine and authentic				
Nature as metaphor for life's journey				
Nature as challenge/sport/manhood/endurance				
Nature as spectacle, packaged (TV) spectacle				
Nature as global, big, awesome, impressive				
Nature as something to protect				
*Nature as limited resource				
*Human mimicry of nature				
*Naturalizing aesthetic function of nature	image: shot of artificial canal lined by trees, which in turn are overlooked by buildings	image: moving car reflected in body of water, ringed by greenspace with buildings in background		02:46 "65,000 residents and 300,000 business commuters are expected to fill Songdo by 2016. By that time, similar cities will be under construction across the globe." - image: night shots of illuminated building and bridge again

CATEGORIES	# OF REPRESENTATIONS							
Nature as a nice place to be	1		00:13 "By the year 2016, more than 365,000 people will live and commute here." - image: pedestrians walking along tree-lined shopping street in twilight lighting					
Nature as intrinsically good (e.g. healthy, fresh)	0							
Human mastery/power over nature	2	00:08 "Songdo, a new city, is being built from the ground up in South Korea." - image: buildings under construction in foreground, cranes in midground, ocean and hills in background			01:06 [LEE JONG-CHEOL] "This is a great place for people to live and work." - image: shot of Incheon bridge			
Recreational function of Nature	1					image: cyclist and pedestrians in park with buildings in background; cut to close up on pedestrians with trees in background		
Nature as distance/space traversed/the in-between/obstacle	2			00:24 "...how will all those people get around?"		01:35 [STAN GALE] "...so from Central Park all of our venues are within 15-minute walks."		
Nature as symbol of freedom	1						image: aerial shot of canal and greenspace with open roads running through it	
Nature as resource (production/recreation)	0							
"Like nature" - metaphor	0							
Nature as a threat	0							
Nature as genuine and authentic	0							
Nature as metaphor for life's journey	0							
Nature as challenge/sport/manhood/endurance	0							
Nature as spectacle, packaged (TV) spectacle	0							
Nature as global, big, awesome, impressive	0							
Nature as something to protect	1						01:42 [PETER LEE] "Sustainability was a critical feature for the city, so we maximize the err green space..."	
*Nature as limited resource	1							01:52 [PETER LEE] "...preferential parking spots to fuel efficient vehicles." image: vacant parking spot for fuel efficient vehicle painted green
*Human mimicry of nature	0							
*Naturalizing aesthetic function of nature	2			image: subway station surrounded by landscaped garden. Building is organic in appearance but glass covered, trees reflected in its windows.				

CATEGORIES	
Nature as a nice place to be	
Nature as intrinsically good (e.g. healthy, fresh)	
Human mastery/power over nature	
Recreational function of Nature	
Nature as distance/space traversed/the in-between/obstacle	
Nature as symbol of freedom	
Nature as resource (production/recreation)	
"Like nature" - metaphor	
Nature as a threat	
Nature as genuine and authentic	
Nature as metaphor for life's journey	
Nature as challenge/sport/manhood/endurance	
Nature as spectacle, packaged (TV) spectacle	
Nature as global, big, awesome, impressive	
Nature as something to protect	
*Nature as limited resource	
*Human mimicry of nature	
*Naturalizing aesthetic function of nature	02:30 [SCOTT SUMMERS] "We offer a quality of life that is much different than other developments in Asia as well as other parts of the world." - image: busy pedestrian street with trees in center frame in background (prior shot was of high speed train)

CATEGORIES	# OF REPRESENTATIONS								
Nature as a nice place to be	0								
Nature as intrinsically good (e.g. healthy, fresh)	0								
Human mastery/power over nature	3			image: Incheon bridge spanning bay, airplane landing in background	00:19 "In Songdo, South Korea, a new city built from scratch, developers have come up with innovative solutions."				
Recreational function of Nature	0								
Nature as distance/space traversed/the in-between/obstacle	0								
Nature as symbol of freedom	0								
Nature as resource (production/recreation)	2								
"Like nature" - metaphor	0								
Nature as a threat	0								
Nature as genuine and authentic	0								
Nature as metaphor for life's journey	0								
Nature as challenge/sport/manhood/endurance	0								
Nature as spectacle, packaged (TV) spectacle	0								
Nature as global, big, awesome, impressive	0								
Nature as something to protect	4			00:16 "Communities must find new ways to conserve water."		0:32 "Title card: CITIES OF THE FUTURE: SONGDO, SOUTH KOREA Episode 7: Water Conservation"			
*Nature as limited resource	7	00:00 "Title Card "Looking out to 2025, the number of people living in water-stressed countries will increase six and a half times." Sandra Postel Director and Founder, Global Water Policy Project"	00:07 "Across the globe, clean water resources are shrinking as the world's population expands."				00:43 [PETER LEE] "...saving water is one of the key elements that we tried to pursue, in terms of sustainability."	00:53 [STAN GALE] "We trap the rainfall that comes into Songdo."	01:02 [SCOTT SUMMERS] "That gray water is used back into the city for commercial buildings, to flush our toilets, and it's used for washing down the streets."
*Human mimicry of nature	1								
*Naturalizing aesthetic function of nature	7		image: shots of sea with boats, sun reflecting off water		image: shot of artificial canal lined by trees, which in turn are overlooked by buildings; cut to aerial shot of heavily landscaped central park and saltwater canal in foreground with buildings in background; cut to moving shot of water wheel and pagoda with buildings in background		image: closeup shot of perfectly square concrete block in one of the saltwater canals	image: Gale manipulating icon of raincloud on video screen, dragging it into the heart of a representation of Songdo; at 01:02, see this action trigger an animation in which water reservoirs are filled and trees grow	

CATEGORIES							
Nature as a nice place to be							
Nature as intrinsically good (e.g. healthy, fresh)							
Human mastery/power over nature				01:46 [STAN GALE] "We take the mud and sand out of the ocean water and our canal is recirculated with clean ocean water."			
Recreational function of Nature							
Nature as distance/space traversed/the in-between/obstacle							
Nature as symbol of freedom							
Nature as resource (production/recreation)	01:12 [PETER LEE] Each site has a district gray water storage tank, so it can actually reduce your water and sewage costs.					02:21 "SONGDO'S INNOVATIONS WILL HELP THE CITY REACH ITS GOAL OF USING AT LEAST 30 PERCENT LESS WATER IN ITS COMMERCIAL BUILDINGS."	
"Like nature" - metaphor							
Nature as a threat							
Nature as genuine and authentic							
Nature as metaphor for life's journey							
Nature as challenge/sport/manhood/endurance							
Nature as spectacle, packaged (TV) spectacle							
Nature as global, big, awesome, impressive							
Nature as something to protect			01:46 [STAN GALE] "Another area for water conservation is we have a mile and three quarter long canal."		02:08 [LEE JONG-CHEOL] "We're building an environmentally friendly system that is unique to any other in the world."		
*Nature as limited resource		01:27 [LEE JONG-CHEOL] "Wastewater is also processed and reused in parks..."					02:28 "AS GROWING DEMAND STRAINS THE WORLD'S NATURAL RESOURCES, SONGDO SERVES AS A MODEL FOR WATER CONSERVATION EVERYWHERE."
*Human mimicry of nature						image: shot pans up from reflection of building in water to show the entire height of the buildings, surrounded by trees	
*Naturalizing aesthetic function of nature				image: aerial shot of traditional Korean waterwheel and gazebo followed by series of close ups of waterwheel, and then a final shot of the waterwheel and gazebo and the canal in the foreground, the park in the midground, and buildings in the background	image: shot of water shows gradually stabilizing reflections of buildings; cut to another shot with the largest building in Songdo being reflected in the water; cut to shots from water of park in midground and buildings in background (buildings look organic in shape)		image: night time lapse shot of building lights reflecting off each other while the tops of trees are visible in foreground; cut to time lapse video of buildings illuminated with massive diagonal line light displays at dusk, reflecting in the river water, see the tidal canal rise

CATEGORIES	# OF REPRESENTATIONS						
Nature as a nice place to be	0						
Nature as intrinsically good (e.g. healthy, fresh)	0						
Human mastery/power over nature	1			00:22 "Songdo, South Korea, a new city built entirely from scratch, is on the forefront."			
Recreational function of Nature	0						
Nature as distance/space traversed/the in-between/obstacle	0						
Nature as symbol of freedom	0						
Nature as resource (production/recreation)	2				00:55 [JEAN-LOUIS MASSAUT] "...so that we can bring energy savings."		01:08 [SCOTT SUMMERS] "Another component to reduce energy consumption is we light up the buildings with LED lights."
"Like nature" - metaphor	0						
Nature as a threat	0						
Nature as genuine and authentic	0						
Nature as metaphor for life's journey	0						
Nature as challenge/sport/manhood/endurance	0						
Nature as spectacle, packaged (TV) spectacle	0						
Nature as global, big, awesome, impressive	0						
Nature as something to protect	1	00:00 "--Title card-- "Technology can help bring about a low-carbon industrial revolution-- global action is needed." Richard Jones Deputy Executive Director International Energy Agency"					
*Nature as limited resource	4		00:08 "As populations expand and economies grow, people are consuming more non-renewable energy sources than ever."			00:57 [SCOTT SUMMERS] "We're improving the efficiencies of each of the buildings."	
*Human mimicry of nature	2			image: solar panel covered curved shelter in foreground, trees in midground, buildings in background			
*Naturalizing aesthetic function of nature	4			image: solar panel covered curved shelter in foreground, trees in midground, buildings in background			image: night time lapse shot of building lights reflecting off each other while the tops of trees are visible in foreground; cut to time lapse video of buildings illuminated with massive diagonal line light displays at dusk, reflecting in the river water

CATEGORIES		
Nature as a nice place to be		
Nature as intrinsically good (e.g. healthy, fresh)		
Human mastery/power over nature		
Recreational function of Nature		
Nature as distance/space traversed/the in-between/obstacle		
Nature as symbol of freedom		
Nature as resource (production/recreation)		
"Like nature" - metaphor		
Nature as a threat		
Nature as genuine and authentic		
Nature as metaphor for life's journey		
Nature as challenge/sport/manhood/endurance		
Nature as spectacle, packaged (TV) spectacle		
Nature as global, big, awesome, impressive		
Nature as something to protect		
*Nature as limited resource	01:14 [PETER LEE] "We also have central home network system through which you can control your electricity use to reduce the dependence on the energy." /	01:43 "The city is also tapping into renewable natural resources."
*Human mimicry of nature		01:52 [LEE JONG-CHEOL] "Sunlight, solar energy and wind force energy are being currently used to operate the city."
*Naturalizing aesthetic function of nature	image: Stan Gale interacts with touchscreen energy saving interface that shows green, grassy globe populated with smart buildings	image: shots of wind turbines partially hidden by trees

CATEGORIES	# OF REPRESENTATIONS				
Nature as a nice place to be	1		00:59 image: Chadwick school sign with logo and name, surrounded by trees and flower beds		
Nature as intrinsically good (e.g. healthy, fresh)	0				
Human mastery/power over nature	1	00:23 "THE NEW CITY BUILT FROM SCRATCH"			
Recreational function of Nature	0				
Nature as distance/space traversed/the in-between/obstacle	0				
Nature as symbol of freedom	0				
Nature as resource (production/recreation)	0				
"Like nature" - metaphor	1			01:26: image: tree imagery used in classroom decoration	
Nature as a threat	0				
Nature as genuine and authentic	0				
Nature as metaphor for life's journey	0				
Nature as challenge/sport/manhood/endurance	0				
Nature as spectacle, packaged (TV) spectacle	0				
Nature as global, big, awesome, impressive	0				
Nature as something to protect	0				
*Nature as limited resource	0				
*Human mimicry of nature	0				
*Naturalizing aesthetic function of nature	1				03:05-03:17 image: various shots showing Cisco technician in a beautiful field of wind power generators, video chatting with students who become very excited.

CATEGORIES	# OF REPRESENTATIONS						
Nature as a nice place to be	1		00:28 image: pedestrians walking on busy shopping street with trees in flattering twilight				
Nature as intrinsically good (e.g. healthy, fresh)	0						
Human mastery/power over nature	4	00:18 "A DECADE AGO THIS WAS A BARREN MUDFLAT. TODAY, IT IS SONGDO - A CITY BUILT ENTIRELY FROM SCRATCH IN SOUTH KOREA."		01:06 [STAN GALE] "...contacted to be a partner in building this new city..."	01:16 [SCOTT SUMMERS] "We had a blank canvas to work from..." / image: land reclamation area for Songdo IBD shown	01:21 [SCOTT SUMMERS] "...there hasn't been a city like Songdo, where we've built something from scratch."	
Recreational function of Nature	0						
Nature as distance/space traversed/the in-between/obstacle	0						
Nature as symbol of freedom	0						
Nature as resource (production/recreation)	3						
"Like nature" - metaphor	0						
Nature as a threat	0						
Nature as genuine and authentic	0						
Nature as metaphor for life's journey	0						
Nature as challenge/sport/manhood/endurance	0						
Nature as spectacle, packaged (TV) spectacle	0						
Nature as global, big, awesome, impressive	0						
Nature as something to protect	1						
*Nature as limited resource	0						
*Human mimicry of nature	2		00:37 "IT IS ALSO ONE OF THE MOST ECO-FRIENDLY AND TECHNOLOGICALLY ADVANCED CITIES IN THE WORLD."	image: model of Songdo with flashing lights, green hills			
*Naturalizing aesthetic function of nature	2		image: wind power generators partially hidden behind trees				

CATEGORIES					
Nature as a nice place to be					
Nature as intrinsically good (e.g. healthy, fresh)					
Human mastery/power over nature					
Recreational function of Nature					
Nature as distance/space traversed/the in-between/obstacle					
Nature as symbol of freedom					
Nature as resource (production/recreation)	02:04 "IT ALSO HELPS REGULATE ELECTRICITY AND WATER USE IN ALL THE CITY'S BUILDINGS, CURBING WASTE AND CUTTING OPERATING COSTS."	02:12 "THE SYSTEM EVEN GIVES RESIDENTS THE POWER TO CONTROL THEIR OWN ENERGY USE."	02:17 [CASPER HERZBERG] "The underlying technology infrastructure that links all of these buildings together allows some dramatic benefits of 30% energy reduction."		
"Like nature" - metaphor					
Nature as a threat					
Nature as genuine and authentic					
Nature as metaphor for life's journey					
Nature as challenge/sport/manhood/endurance					
Nature as spectacle, packaged (TV) spectacle					
Nature as global, big, awesome, impressive					
Nature as something to protect					03:09 "...CISCO IS ALREADY BUILDING DOZENS OF SMART CONNECTED COMMUNITIES THAT FOSTER ECONOMIC, SOCIAL AND ENVIRONMENTAL SUSTAINABILITY."
*Nature as limited resource					
*Human mimicry of nature					
*Naturalizing aesthetic function of nature				02:27 "CISCO'S INVOLVEMENT DIDN'T END ONCE THE TECHNOLOGY WAS DEPLOYED." / image: timelapse night shot of illuminated building, floodlit park, lots of lights reflecting in water, illuminated bridge in background with busy traffic	

CATEGORIES	# OF REPRESENTATIONS			
Nature as a nice place to be	0			
Nature as intrinsically good (e.g. healthy, fresh)	0			
Human mastery/power over nature	0			
Recreational function of Nature	0			
Nature as distance/space traversed/the in-between/obstacle	0			
Nature as symbol of freedom	0			
Nature as resource (production/recreation)	0			
"Like nature" - metaphor	0			
Nature as a threat	0			
Nature as genuine and authentic	0			
Nature as metaphor for life's journey	0			
Nature as challenge/sport/manhood/endurance	0			
Nature as spectacle, packaged (TV) spectacle	0			
Nature as global, big, awesome, impressive	0			
Nature as something to protect	0			
*Nature as limited resource	1			
*Human mimicry of nature	1			02:42 [BEN CHUNG "Amazing things happen when you connect previously unconnected."
*Naturalizing aesthetic function of nature	5	00:31 [RAJIV NILES]"Songdo is one of the first smart cities worldwide that Cisco started working with." / image: shots of people using touchscreen interfaces; shot of people riding bicycles across busy urban street with trees in midground and buildings in background; shot of trees with buildings in background; shot of sleek interior of innovation center	02:35 [DR. JASON NOH]"to see the true seamless integration between operating technology and the IT." / image: aerial shot of Songdo Central Park and buildings in background	image: very fast montage of shots - aerial shot of city with park elements in foreground; aerial shot of boat motoring down canal towards bridge with park on both banks; shot of cyclists crossing busy urban street with trees in midground and buildings in background; shot of people standing in park next to water feature with trees in midground and buildings in background.

CATEGORIES		
Nature as a nice place to be		
Nature as intrinsically good (e.g. healthy, fresh)		
Human mastery/power over nature		
Recreational function of Nature		
Nature as distance/space traversed/the in-between/obstacle		
Nature as symbol of freedom		
Nature as resource (production/recreation)		
"Like nature" - metaphor		
Nature as a threat		
Nature as genuine and authentic		
Nature as metaphor for life's journey		
Nature as challenge/sport/manhood/endurance		
Nature as spectacle, packaged (TV) spectacle		
Nature as global, big, awesome, impressive		
Nature as something to protect		
*Nature as limited resource		02:55 [RAJIV NILES] "...lower energy footprints..."
*Human mimicry of nature		
*Naturalizing aesthetic function of nature	02:52 [RAJIV NILES] "We have a better environment to live in, better connectivity..." / image: shot of interior sleek office with talking head; shot of cyclist and pedestrians in park with trees in the midground and buildings in the background; shot of use of touchscreen interface	image: traditional Korean waterwheel and gazebo and canal in foreground, park in midground, buildings in background; closeup shot of waterwheel functioning

CATEGORIES	# OF REPRESENTATIONS			
Nature as a nice place to be	0			
Nature as intrinsically good (e.g. healthy, fresh)	0			
Human mastery/power over nature	0			
Recreational function of Nature	0			
Nature as distance/space traversed/the in-between/obstacle	0			
Nature as symbol of freedom	0			
Nature as resource (production/recreation)	0			
"Like nature" - metaphor	0			
Nature as a threat	0			
Nature as genuine and authentic	0			
Nature as metaphor for life's journey	0			
Nature as challenge/sport/manhood/endurance	0			
Nature as spectacle, packaged (TV) spectacle	0			
Nature as global, big, awesome, impressive	0			
Nature as something to protect	0			
*Nature as limited resource	1			
*Human mimicry of nature	1		01:58 [BEN CHUNG "Amazing things happen when you connect previously unconnected."	
*Naturalizing aesthetic function of nature	4	01:50 "...Fog Computing devices to see the true seamless integration between operating technology and the IT." / image: split screen showing aerial shot of Songdo Central Park and buildings in background, Dr. Jason Noh talking head, and user interacting with touchscreen panel.	image: very fast montage of shots - aerial shot of city with park elements in foreground; aerial shot of boat motoring down canal towards bridge with park on both banks; shot of cyclists crossing busy urban street with trees in midground and buildings in background; shot of people standing in park next to water feature with trees in midground and buildings in background.	02:06 [RAJIV NILES] "We have a better environment to live in, better connectivity..." / image: shot of interior sleek office with talking head; shot of cyclist and pedestrians in park with trees in the midground and buildings in the background; shot of use of touchscreen interface

CATEGORIES	
Nature as a nice place to be	
Nature as intrinsically good (e.g. healthy, fresh)	
Human mastery/power over nature	
Recreational function of Nature	
Nature as distance/space traversed/the in-between/obstacle	
Nature as symbol of freedom	
Nature as resource (production/recreation)	
"Like nature" - metaphor	
Nature as a threat	
Nature as genuine and authentic	
Nature as metaphor for life's journey	
Nature as challenge/sport/manhood/endurance	
Nature as spectacle, packaged (TV) spectacle	
Nature as global, big, awesome, impressive	
Nature as something to protect	
*Nature as limited resource	02:09 [RAJIV NILES] "...lower energy footprints..."
*Human mimicry of nature	
*Naturalizing aesthetic function of nature	image: traditional Korean waterwheel and gazebo and canal in foreground, park in midground, buildings in background; closeup shot of waterwheel functioning

CATEGORIES	# OF REPRESENTATIONS				
Nature as a nice place to be	0				
Nature as intrinsically good (e.g. healthy, fresh)	0				
Human mastery/power over nature	0				
Recreational function of Nature	0				
Nature as distance/space traversed/the in-between/obstacle	0				
Nature as symbol of freedom	0				
Nature as resource (production/recreation)	1				02:48 "In the next generation office environment, efficient utilisation of resources and employees will be critical to remain competitive." / image: plant appears in foreground of shot with videoscreen in background as the word "resources" is said in the VO
"Like nature" - metaphor	0				
Nature as a threat	0				
Nature as genuine and authentic	0				
Nature as metaphor for life's journey	0				
Nature as challenge/sport/manhood/endurance	0				
Nature as spectacle, packaged (TV) spectacle	0				
Nature as global, big, awesome, impressive	0				
Nature as something to protect	0				
*Nature as limited resource	0				
*Human mimicry of nature	3	00:13 "Everything is connected, intelligent and green, helping to realise environmental, economic and social sustainability."		02:39 "...and everything that can be connected, can be intelligent, can be green."	
*Naturalizing aesthetic function of nature	5	image: wind power generators close up; next shot shows them in foreground, trees in midground, and buildings in background; next shot shows energy-saving interfaces on a terminal	00:27 "...giving residents flexible access to information and services for their homes..." / image: interface showing home energy usage with "trees" indicating low usage	image: wind power generators close up; next shot shows them in foreground, trees in midground, and buildings in background; next shot shows energy-saving interfaces on a terminal	

CATEGORIES		
Nature as a nice place to be		
Nature as intrinsically good (e.g. healthy, fresh)		
Human mastery/power over nature		
Recreational function of Nature		
Nature as distance/space traversed/the in-between/obstacle		
Nature as symbol of freedom		
Nature as resource (production/recreation)		
"Like nature" - metaphor		
Nature as a threat		
Nature as genuine and authentic		
Nature as metaphor for life's journey		
Nature as challenge/sport/manhood/endurance		
Nature as spectacle, packaged (TV) spectacle		
Nature as global, big, awesome, impressive		
Nature as something to protect		
*Nature as limited resource		
*Human mimicry of nature		04:15 "Cisco's smart connected communities can transform physical communities into connected communities that will realize economic growth, environmental sustainability and improved quality of life for residents."
*Naturalizing aesthetic function of nature	04:10 "...all the IT in the city and community." / image: shot of roadside electronic sign with trees immediately behind, and then buildings in the background.	image: people walking in foreground, trees in midground, buildings in background

U-LIFE

CATEGORIES	# OF REPRESENTATIONS	
Nature as a nice place to be	1	00:14 "The future life of your dreams, created by U-Life's advanced ubiquitous technologies." / image: composition shows multiple frames at once, some of which show aerial flyover shots of parks
Nature as intrinsically good (e.g. healthy, fresh)	0	
Human mastery/power over nature	0	
Recreational function of Nature	0	
Nature as distance/space traversed/the in-between/obstacle	0	
Nature as symbol of freedom	0	
Nature as resource (production/recreation)	0	
"Like nature" - metaphor	0	
Nature as a threat	0	
Nature as genuine and authentic	0	
Nature as metaphor for life's journey	0	
Nature as challenge/sport/manhood/endurance	0	
Nature as spectacle, packaged (TV) spectacle	0	
Nature as global, big, awesome, impressive	0	
Nature as something to protect	0	
*Nature as limited resource	0	
*Human mimicry of nature	0	
*Naturalizing aesthetic function of nature	0	

CATEGORIES	# OF REPRESENTATIONS				
Nature as a nice place to be	1		image: person jogging across a field in front of a solitary tree		
Nature as intrinsically good (e.g. healthy, fresh)	0				
Human mastery/power over nature	1				
Recreational function of Nature	0				
Nature as distance/space traversed/the in-between/obstacle	0				
Nature as symbol of freedom	0				
Nature as resource (production/recreation)	1				00:21 [DAVE EVANS] "What kind of insight might we have into the precious resources that we have on this planet?"
"Like nature" - metaphor	0				
Nature as a threat	0				
Nature as genuine and authentic	0				
Nature as metaphor for life's journey	0				
Nature as challenge/sport/manhood/endurance	0				
Nature as spectacle, packaged (TV) spectacle	0				
Nature as global, big, awesome, impressive	0				
Nature as something to protect	0				
*Nature as limited resource	1				
*Human mimicry of nature	3	00:00 "--Title Card-- WHEN TREES CONNECT How the Internet of Everything will give us a new way to view our world. --"	00:06 [DAVE EVANS] "If a tree can connect to the internet..."		image: solar panels in foreground, trees in midground
*Naturalizing aesthetic function of nature	3			00:14 [DAVE EVANS] "What happens if it were millions of trees? What happens if it was livestock and trees and other organic things?" / image: overhead shot of tree-heavy suburbia; shot of cows in a field; shot of butterfly	image: solar panels in foreground, trees in midground

CATEGORIES		
Nature as a nice place to be		
Nature as intrinsically good (e.g. healthy, fresh)		
Human mastery/power over nature	image: overhead shot of huge, complex highway spaghetti junction	
Recreational function of Nature		
Nature as distance/space traversed/the in-between/obstacle		
Nature as symbol of freedom		
Nature as resource (production/recreation)		
"Like nature" - metaphor		
Nature as a threat		
Nature as genuine and authentic		
Nature as metaphor for life's journey		
Nature as challenge/sport/manhood/endurance		
Nature as spectacle, packaged (TV) spectacle		
Nature as global, big, awesome, impressive		
Nature as something to protect		
*Nature as limited resource	00:25 [DAVE EVANS] "How might it affect how we consume things?"	
*Human mimicry of nature		
*Naturalizing aesthetic function of nature		00:29 [DAVE EVANS] "It gives us a different level of empathy, understanding and insight into the world in which we live."

CATEGORIES	# OF REPRESENTATIONS								
Nature as a nice place to be	5	00:05 [MALE VOICEOVER] "For the happiness and future of my family." / image: photo of little girl with flowers (appears on the word "future")							02:44 [FEMALE] "The educational environment that offers global education..." / image: Yonsei University garden with beautiful traditional landscaping
Nature as intrinsically good (e.g. healthy, fresh)	1								
Human mastery/power over nature	1								
Recreational function of Nature	1							02:24 [FEMALE] "...to the Jack Nicklaus golf club..." / image: aerial shot of lush gold course with city in background; shot then broke into 3 frames showing the golf course aerial view, a Jack Nicklaus hole marker with the city in the background, and a car driving past a pool of water, its reflection visible in the water	
Nature as distance/space traversed/the in-between/obstacle	0								
Nature as symbol of freedom	0								
Nature as resource (production/recreation)	0								
"Like nature" - metaphor	0								
Nature as a threat	0								
Nature as genuine and authentic	0								
Nature as metaphor for life's journey	0								
Nature as challenge/sport/manhood/endurance	0								
Nature as spectacle, packaged (TV) spectacle	0								
Nature as global, big, awesome, impressive	0								
Nature as something to protect	0								
*Nature as limited resource	0								
*Human mimicry of nature	0								
*Naturalizing aesthetic function of nature	7		00:09 [MALE] "I am going to a city that guarantees happiness and a bright future."/ image: shot of cars driving on a highway with thick, lush forest on either side.	00:34 [MALE] "With an unblocked view in every direction" / image: aerial shot of Central Park with buildings in background	00:40 [MALE] "skyscrapers in pleasant parks" / image: aerial shot of the canal and Central Park with buildings in the background	02:00 image: mother tracking child's location on phone (display superimposed on shot) with canal and landscaped areas in background	02:20 [FEMALE] "A city that is prepared for my family's happiness and future, Songdo has exceeded my expectations in so many ways..." / image: time lapse shot of canal walk, buildings reflected in water (framed by bridge) as the light changes and people swarm by		

CATEGORIES							
Nature as a nice place to be	03:00 [FEMALE] "Beautiful landscaping within the complex." / image: shot of the ground from the apartment window, garden in sight		03:15 [FEMALE] "...my child running around in the pleasant natural environment..." / image: kids playing with water guns		03:27 [FEMALE] "A city for my family's happiness." / image: timelapse shot of people walking by an avenue of trees swaying in the wind, the city in the background		
Nature as intrinsically good (e.g. healthy, fresh)				03:18 [FEMALE] "...with clean air, green nature and thick woods." / image: multiple family scenes involving kids playing and painting (but no sign of green nature/thick woods)			
Human mastery/power over nature						03:44 [FEMALE VOICEOVER] "A city with beautiful natural surroundings and happy homes." / image: father throws a yellow paper plane from the family's apartment balcony	
Recreational function of Nature							
Nature as distance/space traversed/the in-between/obstacle							
Nature as symbol of freedom							
Nature as resource (production/recreation)							
"Like nature" - metaphor							
Nature as a threat							
Nature as genuine and authentic							
Nature as metaphor for life's journey							
Nature as challenge/sport/manhood/endurance							
Nature as spectacle, packaged (TV) spectacle							
Nature as global, big, awesome, impressive							
Nature as something to protect							
*Nature as limited resource							
*Human mimicry of nature							
*Naturalizing aesthetic function of nature		03:10 [FEMALE] "A state-of-the-art security system that protects my children's safety, anytime, anywhere..." / image: CCTV cameras in the foreground, trees in the midground, city buildings in the background; cut to control room; cut to aerial shot of canal in central park with buildings in background					03:57 [MALE AND FEMALE VOICEOVER IN UNISON] "We are living in Songdo." / image: night timelapse shot of illuminated buildings and bridge reflecting in water, with park lit up by floodlights in foreground; night timelapse shot of well-lit trees and a streetlamp in the foreground, and buildings in the background, the moon full in the sky

CATEGORIES	# OF REPRESENTATIONS									
Nature as a nice place to be	1							02:01 "...an exceptional quality of life." / image: multiple shots of central park and water with buildings in background		
Nature as intrinsically good (e.g. healthy, fresh)	1									03:04 "Breathing in the fresh air, they stay active in the natural surroundings." / image: aerial shot of golf course with city in the background
Human mastery/power over nature	6	00:13 "This land was once ocean. The ocean became land. A city in harmony with people." / image: CGI shot rushing towards Songdo skyline flying low over the ocean		00:52 "They promised to build the most vibrant land in the region..." / image: closeup of engineers in hard hats looking at plans; cut to shot of mudflats and the reclaimed Songdo IBD area	01:06 image: shot of 3 engineers cheering, fists held high	01:09 "Gradually, the land began to take shape and in time became a city as these early pioneers had envisioned..." / image: mudflats at low tide, Songdo IBD in background; shot showing chronological photos of major building and development milestones from 2010-2013				
Recreational function of Nature	1								02:34 "People are now living in this city on this land." / image: timelapse shot of people boating on the canal and walking in the park with buildings in the background; timelapse of sidewalk with people walking by while we see a clock on a lamppost moving quickly forward and various examples of chess piece topiary	
Nature as distance/space traversed/the in-between/obstacle	1		00:31 "One day, they appeared at the ocean's edge." / image: animated photo of engineers looking over mudflats							
Nature as symbol of freedom	0									
Nature as resource (production/recreation)	0									
"Like nature" - metaphor	0									
Nature as a threat	0									
Nature as genuine and authentic	0									
Nature as metaphor for life's journey	0									
Nature as challenge/sport/manhood/endurance	0									
Nature as spectacle, packaged (TV) spectacle	0									
Nature as global, big, awesome, impressive	0									
Nature as something to protect	0									
*Nature as limited resource	0									
*Human mimicry of nature	2									
*Naturalizing aesthetic function of nature	5						01:40 "A city set within a green natural environment." / image: 3-way splitscreen #1 (aerial shot of buildings, people jogging by the canal, aerial shot of central park); 3-way splitscreen #1 (aerial shot of buildings, people cycling and walking through a park, aerial view of a large pond)			

CATEGORIES							
Nature as a nice place to be							
Nature as intrinsically good (e.g. healthy, fresh)							
Human mastery/power over nature		04:11 "Together, this community is building a dream." / image: family throws yellow paper plane from apartment balcony; in various shots we see it fly through different areas of Songdo; ends by shooting up into the clouds.		04:44 "This place was once ocean. The ocean became land and is now a city." / image: timelapse shot of sunset over the bay while the Incheon bridge buzzes with activity; cut to aerial timelapse shots of city at night, fully illuminated; timelapse shot of people walking through central park at night.			
Recreational function of Nature							
Nature as distance/space traversed/the in-between/obstacle							
Nature as symbol of freedom							
Nature as resource (production/recreation)							
"Like nature" - metaphor							
Nature as a threat							
Nature as genuine and authentic							
Nature as metaphor for life's journey							
Nature as challenge/sport/manhood/endurance							
Nature as spectacle, packaged (TV) spectacle							
Nature as global, big, awesome, impressive							
Nature as something to protect							
*Nature as limited resource							
*Human mimicry of nature						05:26 "--Title Card montage-- "Songdo International City is a model city for ecopolis" Jacques Attali, French economist and futurologist --"	05:38 "--Title Card-- In 2008, Songdo IBD was named a winner of the annual Sustainable Cities Award from the Urban Land Institute and Financial Times"
*Naturalizing aesthetic function of nature	04:02 image: night shot of illuminated buildings and fireworks reflecting in the canal water, with people walking through a park like area in the foreground		04:33 "In the future we will stand at the center of the world - a beacon of hope and promise." / image: various timelapse shots of natural settings in the foreground and city buildings in the background	image: Central Park people shot only possible because of lighting at night	05:02 "Together we are taking another step toward the future. A land built for new dreams." / image: timelapse shot of cranes working with park in foreground, cranes in midground, city buildings in background		

CATEGORIES	# OF REPRESENTATIONS				
Nature as a nice place to be	0				
Nature as intrinsically good (e.g. healthy, fresh)	0				
Human mastery/power over nature	1			01:41 image: cut up montage of construction work	
Recreational function of Nature	0				
Nature as distance/space traversed/the in-between/obstacle	0				
Nature as symbol of freedom	0				
Nature as resource (production/recreation)	0				
"Like nature" - metaphor	0				
Nature as a threat	0				
Nature as genuine and authentic	0				
Nature as metaphor for life's journey	0				
Nature as challenge/sport/manhood/endurance	0				
Nature as spectacle, packaged (TV) spectacle	0				
Nature as global, big, awesome, impressive	0				
Nature as something to protect	0				
*Nature as limited resource	0				
*Human mimicry of nature	2		01:18 image: aerial shot of palm trees and solar panel array		02:08 image: concrete rebar pillar with rebar splayed out, resembling palm tree
*Naturalizing aesthetic function of nature	2	00:08 image: monorail speeding through landscaped gardens	01:18 image: aerial shot of palm trees and solar panel array		

CATEGORIES	# OF REPRESENTATIONS				
Nature as a nice place to be	2		01:20 image: overlay states "Communal Gardens", CGI display of people walking through residential area filled with plants		02:05 image: overlay states "Communal Gardens", CGI display of people walking through residential area filled with plants
Nature as intrinsically good (e.g. healthy, fresh)	0				
Human mastery/power over nature	0				
Recreational function of Nature	0				
Nature as distance/space traversed/the in-between/obstacle	0				
Nature as symbol of freedom	0				
Nature as resource (production/recreation)	0				
"Like nature" - metaphor	0				
Nature as a threat	0				
Nature as genuine and authentic	0				
Nature as metaphor for life's journey	0				
Nature as challenge/sport/manhood/endurance	0				
Nature as spectacle, packaged (TV) spectacle	0				
Nature as global, big, awesome, impressive	0				
Nature as something to protect	0				
*Nature as limited resource	0				
*Human mimicry of nature	5	01:16 image: overlay states "Deep Cuts bring Natural Ventilation: Courtyard acts as Solar Chimney"		01:58 image: overlay states "Natural Ventilation"	
*Naturalizing aesthetic function of nature	0				

CATEGORIES			
Nature as a nice place to be			
Nature as intrinsically good (e.g. healthy, fresh)			
Human mastery/power over nature			
Recreational function of Nature			
Nature as distance/space traversed/the in-between/obstacle			
Nature as symbol of freedom			
Nature as resource (production/recreation)			
"Like nature" - metaphor			
Nature as a threat			
Nature as genuine and authentic			
Nature as metaphor for life's journey			
Nature as challenge/sport/manhood/endurance			
Nature as spectacle, packaged (TV) spectacle			
Nature as global, big, awesome, impressive			
Nature as something to protect			
*Nature as limited resource			
*Human mimicry of nature	02:36 image: overlays states "Naturally Ventilated Courtyards"	03:08 image: overlay states "Building Massing: Inclined Façade to Minimize Solar Gain"	03:11 image: overlays states "Natural Ventilation"
*Naturalizing aesthetic function of nature			

CATEGORIES	# OF REPRESENTATIONS						
Nature as a nice place to be	1						
Nature as intrinsically good (e.g. healthy, fresh)	1					00:41 "encouraging a healthy and comfortable lifestyle" / image: shot of people sitting outside at a café	
Human mastery/power over nature	2			00:34 "Narrow walkways capture the wind and provide shade" / image: sweeping shot of building exterior corner			
Recreational function of Nature	0						
Nature as distance/space traversed/the in-between/obstacle	0						
Nature as symbol of freedom	0						
Nature as resource (production/recreation)	0						
"Like nature" - metaphor	0						
Nature as a threat	0						
Nature as genuine and authentic	0						
Nature as metaphor for life's journey	0						
Nature as challenge/sport/manhood/endurance	0						
Nature as spectacle, packaged (TV) spectacle	0						
Nature as global, big, awesome, impressive	0						
Nature as something to protect	3						0:47 "The buildings are powered by clean energy..." / image: aerial shot of massive solar array
*Nature as limited resource	0						
*Human mimicry of nature	0						
*Naturalizing aesthetic function of nature	2	00:12 "the world's most advanced and sustainable community" / image: trees and foliage in foreground, city buildings in background; cut to two men walking across a stone floor reflected in glass windows	00:27 "The city is built using traditional Arabic architecture, combined with modern technology and design." / image: Frangipani flowers in foreground, buildings in background; shot of sun shining through organic shaped shade wall				

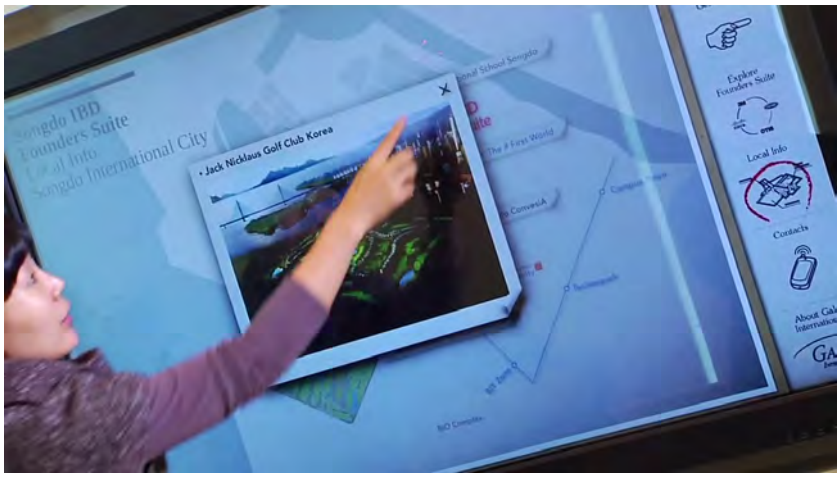
CATEGORIES				
Nature as a nice place to be			01:26 "...cultural and commercial areas will be interwoven with parks..." / image: aerial CGI shot of city plan with parks interspersed	
Nature as intrinsically good (e.g. healthy, fresh)				
Human mastery/power over nature		01:06 "Making it the greenprint for cities across the world" / image: timelapse shot of sun shining through shadewall, casting moving shadows on the ground		
Recreational function of Nature				
Nature as distance/space traversed/the in-between/obstacle				
Nature as symbol of freedom				
Nature as resource (production/recreation)				
"Like nature" - metaphor				
Nature as a threat				
Nature as genuine and authentic				
Nature as metaphor for life's journey				
Nature as challenge/sport/manhood/endurance				
Nature as spectacle, packaged (TV) spectacle				
Nature as global, big, awesome, impressive				
Nature as something to protect	00:48 "...constructed using green building materials and designed to reduce energy and water consumption by 40%." / image: shot of courtyard with fountain in foreground, people walking in midground, buildings in background			01:39 "Integrated clean and smart transportation systems..." / image: shot of automated vehicle driving
*Nature as limited resource				
*Human mimicry of nature				
*Naturalizing aesthetic function of nature				

ANNEX 4: ADDITIONAL MCDA EXAMPLES

Naturalising 'sandwich' compositional form #1

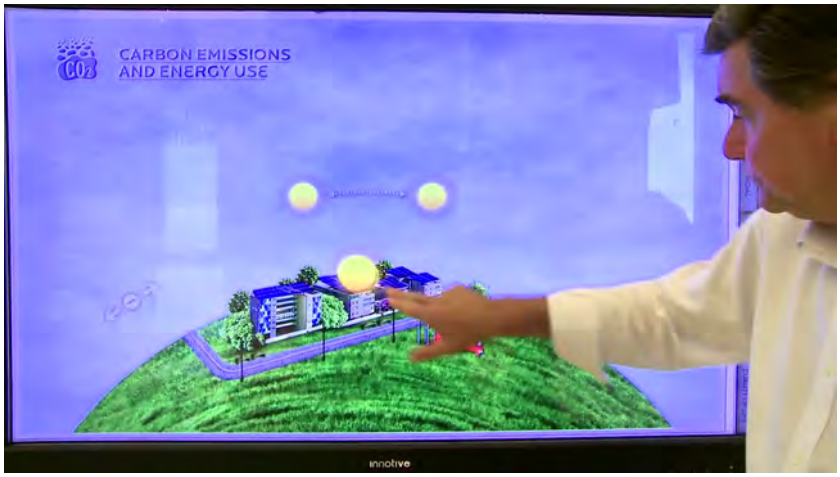
(COTF5: 00.49)


(COTF8: 00.22)



(COTF9: 02.39)

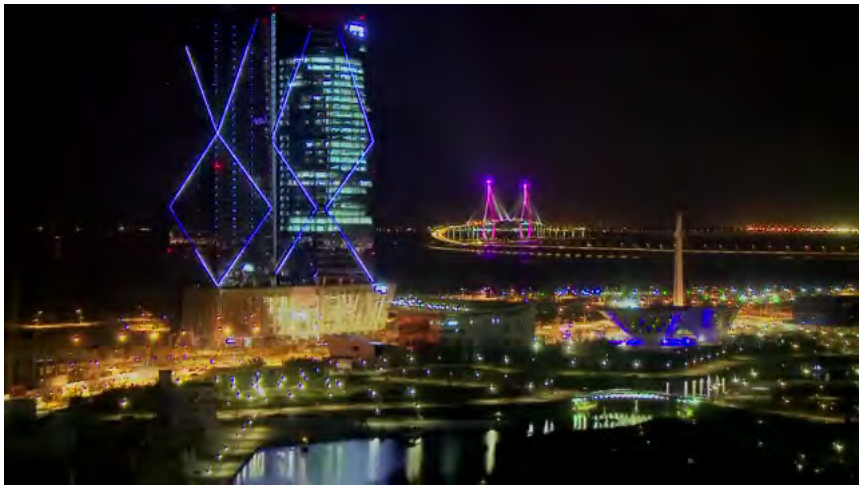
(COTF9: 02.39)



(COTF2: 01.43)


(COTF4: 01.15)

Naturalising 'sandwich' compositional form #2:



(COTF4: 02.55)

(COTF5: 01.34)

(IBD: 02.46)

(IBD: 04.15)

(INNOVATION: 02.14)

(COTF4: 01.57)

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