Creatieve industrie – KIEM
Aanvraagformulier 2014

Algemeen
Voor het indienen van een KIEM-projectvoorstel dient u gebruik te maken van dit aanvraagformulier.
Dit Word-document vult u in gebruikmakend van de informatie en richtlijnen uit de call for proposals
en uploadt u vervolgens als pdf in Iris bij het factsheet. Om een goede verwerking van uw aanvraag te
garanderen mag de pdf niet beveiligd zijn. Aanvragen dienen in het Nederlands of in het Engels
opgesteld te worden, in een standaard font (minimaal 11 pt, met uitzondering van
literatuurreferenties waarvoor 9 pt toegestaan is).

Factsheet (Iris)
1. Titel project

Hackable Metropolis Amsterdam: investigating the future of city-making in urban lab Buiksloterham

2. Samenvatting (Max 250 woorden)

Words: 240

Our aim is to develop a research agenda and consortium that explores the role of digital media
technologies in new directions for urban planning and city making. How can citizens, design
professionals, local government institutions and others use digital technologies in collaborative
processes of urban planning and management?

This project seeks to connect two parallel yet largely separate developments. On the one hand city
municipalities worldwide embark on *smart city* policies, together with tech businesses and
knowledge institutions. They deploy digital technologies and big data to optimize services like traffic,
energy, environment, governance and health. On the other hand bottom-up *smart citizen* initiatives
in many cities blossom, consisting of networked people who engage in issues like neighborhood
livability, community building, energy provisioning, sharing resources and measuring and generating
environmental data. Often they employ sensor technologies, use open data or utilize digital media to
organize themselves around a common issue.

Since these two movements rarely interact, opportunities are wasted to combine capacities of
various stakeholders in city making with digital technologies. In this research by design project we
forward the notion of the 'hackable city' to investigate how new media technologies can open up
urban institutions and infrastructures to systemic change by citizens.

Buiksloterham in Amsterdam-Noord is our case and testing ground. Developers here have committed
to combining the two above-mentioned perspectives. The area functions as an urban laboratory to
study and experiment with opportunities, challenges and conditions for the 'hackable city'.

3. Hoofdaanvrager
Vermeld hier de naam van de hoofdaanvrager. NWO kent slechts één hoofdaanvrager. Deze geldt als
de eerstverantwoordelijke voor het project. Hij/zij draagt zowel de inhoudelijke als de financiële
verantwoordelijkheid voor het project.
Dr. Michiel De Lange (Utrecht University)

4. Mede-aanvrager(s)

Vermeld hier de naam van eventuele mede-aanvragers. Een KIEM-aanvraag kan maximaal twee mede-aanvragers hebben.

Dr. Martijn de Waal (University of Amsterdam)

Projectvoorstel

5. Looptijd project
Vermeld hier de totale looptijd van het project en de beoogde startdatum.
NB. De duur van het project is minimaal 6 maanden en maximaal 1 jaar. Het project start binnen 6 weken na honorering.

6 months (August 1 2014 – February 1 2015)

6. (Sub)disciplines
Kies op de site www.nwo.nl/financiering/nwo-disciplinecodes de hoofd- en subdiscipline(s) die aansluiten bij uw aanvraag. Geef in onderstaande tabel uw hoofddiscipline (bijv. Muziek, theater, uitvoerende kunsten en media). Vermeld vervolgens in volgorde van belangrijkheid de subdiscipline(s) en de daarbij behorende code(s) (bijv. Media studies, code 32.80.00) U kunt maximaal 3 subdisciplines aangeven.

Hoofddiscipline:	Muziek, theater, uitvoerende kunsten en media	
Subdiscipline	Disciplinecode	Omschrijving
subdiscipline 1	32.80.00	Mediastudies
subdiscipline 2	29.55.00	Stadsstudies
subdiscipline 3	49.11.00	Planning

7. Passendheid binnen Strategische Onderzoeks- en Innovatieagenda
Geef aan binnen welk van de zeven CLICKNL-netwerken uw projectvoorstel past (zie hoofdstuk 2). Motiveer waarom uw KIEM-aanvraag binnen dit onderdeel van de Strategische Onderzoeks- en Innovatieagenda van de Creatieve Industrie past. De maximale omvang van dit onderdeel is 400 woorden. Vermeld tevens het aantal woorden.

Words: 390

This project operates at the intersection of multiple strategic R&D networks. Primarily, we place the project in the **CLICKNL Media & ICT** network. Within this network the project touches on several agendas. Its multidiscipinary character and thematic width is explained below.

Smart & social media
The project investigates how smart city initiatives can be combined with citizen-driven social innovation. We observe that *smart* and *social media* stand for opposing perspectives and practices that involve digital media technologies in city making. In smart city initiatives, technologies tend to be used in utilitarian and impersonal ways as problem-solvers (e.g. to automate and manage traffic, energy, safety, etc.). By contrast, in what we call 'social city' initiatives, digital technologies are typically used in emotionally charged ways as part of people's everyday lives, relationships and sense of who they are. We seek to connect these divergent perspectives of city making: the smart city that is about control and efficiency, and the social city that is about ownership, publicness and identity.

Design thinking

This project explores and develops a 'research by design' approach to address complex urban problems. Some of the primary challenges of this project require 'design thinking' that applies a creative goal-oriented outlook and set of techniques from product and service design to 'wicked problems'. How can stakeholders with sometimes conflicting aims come together to pool resources, commit to the 'common good' and acquire a sense of collective ownership? How can trust be built? How can the project's sustainability be secured? These questions are central in the series of workshops that we will organize. In addition, we will seek alliances with experienced professionals in 'design thinking'.

Big data
What opportunities do open data provide to address urban issues, to forge networked publics, to engage people in complex issues, and to provide them with a horizon for action? This project shall seek to establish closer relationships with Dutch open data initiatives and trailblazers at local and national levels.

Business Innovation
Our project departs from the observed crisis in traditional urban planning models and practices. The project shall reflect on the changing role of the urban design professional and explore opportunities of digital media in new business models. Digital media may play a role in multiple stages of city making, for instance in alternative project funding, networked consortia, service delivery, end product, and maintenance schemes.

8. Consortium
a) Samenstelling consortium
Geef in onderstaande tabel een overzicht van de betrokken personen en de organisaties waaraan zij verbonden zijn. Maak daarbij een duidelijk onderscheid tussen de wetenschappelijke onderzoekers en de (vertegenwoordigers van) private partners, die de matching levert / leveren. Geef bij de private partner(s) ook het inschrijfnummer bij de Kamer van Koophandel. Geef aan welke eventuele overige partners betrokken zijn bij het project. Vermeld in dezelfde tabel op welke manier zij bij het project betrokken zijn.

Consortium		
Partners kennisinstelling		
Naam	*Instelling*	*Rol*
Michiel de Lange	Universiteit Utrecht	researcher
Martijn de Waal	Universiteit van Amsterdam	researcher
Private partners		
Naam	*Organisatie en KvK-nr.*	*Rol*
Mattijs Bouw	One Architecture, 34151712	Main private partner; designer
Frank Alsema	Vereniging Buiksloterham	Area trailblazer
Publieke partners		
Naam	*Organisatie*	*Rol*

b) Expertise
Beschrijf de deskundigheid van de verschillende betrokken partners. Denk bijvoorbeeld aan relevante inhoudelijke, praktische of methodologische ervaring of aan toepassingsmogelijkheden. Leg uit wat

de betrokken partijen aan elkaar kunnen hebben. De maximale omvang van dit onderdeel is 700 woorden. Vermeld tevens het aantal woorden.

Words: 433

One Architecture (onearchitecture.com) is an Amsterdam-based design office with broad international expertise in area development, both from the perspective of design, as well as from the perspective of development processes. In addition, the office is a stakeholder in Buiksloterham: it designs and develops one building complex in the area. One's principal, Matthijs Bouw, is member of a number of public and private think-tanks on urban development and urban transformation. Bouw teaches and publishes internationally.

Michiel de Lange and Martijn de Waal are media researchers interested in urban culture and design. Through frequent collaborations in research and design projects they have studied the interplay between digital media technologies, urban culture (publicness, identity, etc.), and the physical design of cities. In 2007 they founded The Mobile City, a research platform for new media and urban design (www.themobilecity.nl).

With this proposal we build upon a pre-existing creative industries partnership between academic researchers and private partners in urban design and media, and wish to extend and expand this into a larger and longer-running partnership. The main deliverable within the KIEM framework is a proposal for a 'research by design' project about *Hackable Cities*. Our approach in this KIEM framework is to ground such a proposal in a combination of 'traditional' research methodologies in the humanities and social sciences (from discourse analysis to empirical fieldwork) and actual design interventions (a series of co-creation workshops). This so-called 'research by design' element allows us to explore, test, and if needed to amend in an early phase some of the underlying assumptions with what is actually going on. This will increase our theoretical understanding of the role of digital technologies and practices in the process of city making and result an operationable design practice for the *hackable city*. By studying and testing this potential future direction of 'hackable city making', the project is relevant and urgent for the private and public parties involved in this project and by extension for all stakeholders working in urban planning and management. All parties bring in complementary knowledge, skills and experiences in this process, and are deeply committed to transcend disciplinary boundaries.

Presently, the University of Amsterdam, One Architecture, and The Mobile City Foundation run a consortium and manage an 'embedded research' project. This project is funded by the Creative Industries Research Centre Amsterdam (CIRCA). This KIEM proposal is meant to take the results from this research project to a new level: to explore novel approaches to city making with new media in an actual concrete urban laboratory setting, to form a larger consortium and develop a research program that builds upon these findings.

9. Motivering publiek-private-samenwerking
Licht hier toe welke vraag of behoefte vanuit de private partner(s) en/of de kennisinstelling de vorming van een PPS-samenwerking zinvol maakt in het licht van de centrale doelstelling van KIEM (zie hoofdstuk 2 van de call for proposals). De maximale omvang voor dit onderdeel is 700 woorden. Vermeld tevens het aantal woorden.

Words: 583

In much of the Western world, the era of top down urban master planning has come to a standstill. This is not only due to the financial crisis but also due to societal changes that involve citizens as

amateur-experts, active participants and agents of change. Digital media provide people with tools to organize themselves around collective issues, mobilize publics, and manage social and infrastructural resources in collaborative ways. This occurs in multiple domains, from energy production to the organization of healthcare, from the management of public housing schemes to the appropriation of the urban public sphere. At least those are the promises of digital media technologies and the 'participatory society'.

Such developments challenge existing routines of 'city making', the ways in which governmental institutions, (urban) design professionals and citizens call their city into being through processes of top down planning and management together with bottom-up appropriation and social organization. Urban design professionals, tech businesses, governmental institutions and citizens are forced to rethink their stakes and roles.

This project's research agenda and design perspective focuses on the future of city making with digital media by exploring the notion of the 'hackable city'. With a hackable city we mean a city that opens its institutional workings and is open to systemic change initiated by its citizens. A hackable city functions as a platform that can be appropriated and incrementally improved upon by various stakeholders. For example, an energy grid may be designed technically and legally to treat citizens not just as consumers but to allow them to appropriate the grid cooperatively as energy producers. Another example is that institutional parties who generate and collect data about the city share this in an 'open source' way (free to use and reuse), which enables designers and citizens to create innovative applications based on these data.

The project revolves around the question how city making may include citizens as active change agents by becoming 'hackable'. From this main question a number of sub-questions are derived. What can we learn by porting the notion of hackability, which is derived from the world of digital technologies, to city making? What does this concept teach us about self-organization, open innovation, do-it-yourself ethics, accessibility, participation, legal matters, and so on? How can professional skills and expert knowledge be coupled with citizen interests? How can the often impromptu and fleeting character of bottom-up movements be reconciled with more robust long-term visions on urban development? How can small-scale, bottom-up social initiatives complement often top-down and closed *smart city* approaches? How can private parties and public institutions provide conditional frameworks and procedural directives that allow others to become involved in their activities? Can designers and institutions help in scaling up these initiatives and make them easier to replicate? From a political point of view, how do these often parochial initiatives match with democratic decision and the public interest? And from the point of view of urban culture and identity, how does this hackable city shape the ways in which urbanites in all their differences relate to their environment, to other people, and ultimately to themselves?

As we find ourselves in the midst of a great upheaval in traditional ways of city making, we feel it is important to become an active stakeholder in order to help shape its future directions. We want to do so by forming a consortium of hitherto unlikely partners from the worlds of urban design, policy and digital media and collaboratively study and shape developments in the 'living lab' situation of Buiksloterham.

10. Resultaten
a) Overzicht resultaten
Geef in onderstaande tabel een overzicht van de beoogde resultaten, zoals: concrete plannen voor een financieringsaanvraag in het kader van een van de grotere NWO/TNO/CLICKNL-financieringsrondes, gezamenlijke projectvoorstellen, series bijeenkomsten, etc. Vermeld ook wanneer deze resultaten naar verwachting gerealiseerd zullen worden en wie de uitvoerders zijn.

Beoogde resultaten	Uitvoerder(s)	Realisatie (MM-JJJJ)
Desk & field research 'Hackable City' examples – blog and pdf-publication	Michiel de Lange, Martijn de Waal	09-2014
Workshop 'Energy & Water' + report	Michiel de Lange, Martijn de Waal, One Architecture	10-2014
Workshop 'Public Domain & Programming' + report	Michiel de Lange, Martijn de Waal, One Architecture	10-2014
Workshop 'Housing & Living' + report	Michiel de Lange, Martijn de Waal, One Architecture	11-2014
Workshop 'Mobilities' + report	Michiel de Lange, Martijn de Waal, One Architecture	11-2014
Opportunity Map 'The Hackable City'	Michiel de Lange, Martijn de Waal, One Architecture	12-2014
Research Agenda and Proposal 'The Hackable City'	Michiel de Lange, Martijn de Waal	01-2015
Forming consortium 'The Hackable City'	Michiel de Lange, Martijn de Waal, One Architecture	01-2015

b) Plan van aanpak
Beschrijf hoe de resultaten gerealiseerd gaan worden. Licht daarnaast inhoudelijk toe hoe de resultaten zullen leiden tot het opzetten, consolideren of versterken van een pps-samenwerking binnen het domein van de Creatieve Industrie. De maximale omvang van dit onderdeel is 700 woorden. Vermeld tevens het aantal woorden.

Words: 576

In this project we focus on Buiksloterham, an area in Amsterdam Noord where 'do-it-yourself' citizen-driven experiments meet with institutional policy-making and facilitation. In Buiksloterham innovations are emerging in flexible city making. They happen on the spatial level of urban design with do-it-yourself architecture and collective private commissionership. They happen on the social/organizational level, with self-organizing networked publics and the combination of centralized institutional rules and decentralized citizen-driven innovation. They happen on the technical level, with smart and social city initiatives. About 635 new inhabitants, and 400 new workers are estimated to move into Buiksloterham between 2013 – 2017.[1] The area is being redeveloped on all fronts, including designing private and collective housing and working spaces, planning public spaces and services, neighborhood community building, and establishing cultural initiatives. Digital technologies are being used extensively, from fostering a community of smart citizens (for example see community website http://bsh5.nl) through online platforms to turning Buiksloterham into a smart city with sensing and measuring technologies. Stakeholders include Waternet, Aliander, various

---

[1] Source: Eric de Ridder. 2013. *Urban analysis typology & morphology Buiksloterham*. Explore Lab 16 at Architecture Faculty TU Delft. Study commissioned by Stichting BSH.

architectural offices, citizens and the local government. We will use the development process of Buiksloterham to probe the opportunities for 'hackable city making' on this site.

This project builds upon a prior partnership between architecture office One Architecture and academic researchers Michiel de Lange and Martijn de Waal. We have collaborated in R&D projects about the future of urban design, among others in a workshop commissioned by Deltametropool that resulted in the publication "Eindhoven Hackable Wereldstad" (2012) [2], and in the CIRCA creative industries research project "Hackable Metropolis Amsterdam" (http://circa.uva.nl/projects-2013-2014/hackable-metropolis-amsterdam.html).

The project consists of a number of steps:

1) We will start to collect examples of 'hackable city making' by desk research and a limited number of field visits as well as with a number of interviews with stakeholders in Buiksloterham. We will combine the insights from this research with the findings of our 'Hackable Metropolis Amsterdam' research project.

2) This will lead to a number of issues that we want to discuss in depth with a series of co-creation workshops with Buiksloterham stakeholders to explore and set the agenda on four issues: management of energy and water, public domain and programming, housing & living, and mobilities. In these workshops a number of questions are addressed: who is taking what roles in the current development of Buiksloterham? How can the to-be-developed infrastructures in Buiksloterham be opened up to citizens? How can bottom-up initiatives be given a place in the developments of these networks and their management? What conditional and procedural rules are needed? What inhibits and what facilitates the process of opening up? What kind of knowledge, practices and procedures are still unclear or lacking?

3) From these workshops and reports we will draw an 'opportunity map' that showcases the most promising areas and research trajectories for hackable city making. Steps 2 and 3 are explicitly meant to serve as 'research by design' actions by not only studying but also creating and intervening.

4) We conclude by compiling a research agenda for hackable city making. This research agenda takes the form of a brief scientific report with background, justification and research questions, plus a research proposal that can be submitted in various funding schemes such as NWO Creative Industries, Raak PRO, Horizon 2020.

5) The research agenda will also contain a manifesto or memorandum of understanding to be underwritten by various stakeholders that want to commit to this agenda and cooperate on further research into the theme of *hackable city making*.

11. Projectbudget
Gebruik voor het opstellen van het projectbudget de tabel op de subsidiepagina. U slaat de tabel op als PDF en kunt deze als aparte bijlage uploaden bij uw aanvraag.

In het budget vermeldt u:

---

[2] Bouw, Matthijs, Froukje van de Klundert, Michiel de Lange, and Martijn de Waal. 2013. *Eindhoven Hackable World City*. Amsterdam. http://bit.ly/1fipBcK.

- voor de gehele subsidieduur de bij NWO aangevraagde personele middelen (minimaal 1 vervangingssubsidie van minimaal 6 maanden en minimaal 0,1 fte (normbedrag: € 2.500,-))
- voor de gehele subsidieduur de bij NWO aangevraagde materiële middelen;
- de (omvang van de) bijdragen van de private partner(s)

Voorts wordt u verzocht:
a) alle aangevraagde middelen te motiveren.
b) te beschrijven waaruit de bijdragen van de partner(s) bestaan.

NB. Alleen kosten die uitsluitend en rechtstreeks aan het onderzoeksvoorstel zijn verbonden, kunnen bij NWO worden aangevraagd. NWO vergoedt per projectvoorstel altijd €15.000 van de totale begroting. De verplichte matchingsbijdrage van de private partner(s) is ten minste €3.000. Daarvan is minimaal €1.500 in cash. De totale begroting van het project is dus altijd minimaal €18.000.

12. Publiekssamenvatting

Stel in maximaal 50 woorden een Nederlandstalige publiekssamenvatting van uw project op, bedoeld voor een breed publiek. Voorzie deze samenvatting van een pakkende Nederlandse titel. Deze publiekssamenvatting kan door NWO gebruikt worden voor publicitaire doeleinden. Aanwijzingen en voorbeelden vindt u via www.nwo.nl/publiekssamenvatting.

Hack je stad: stedelijk ontwerp met nieuwe media

Hoe kunnen stedelingen en professionals met behulp van digitale mediatechnologieën een betekenisvolle rol spelen in het ontwerpen en beheren van hun leefomgeving? In dit project onderzoeken in Buiksloterham in Amsterdam Noord hoe de stad 'hackable' gemaakt kan worden, dat wil zeggen open en toegankelijk is voor systeemveranderingen door stadsbewoners zelf.

Wetenschappelijke Integriteit

Bij het indienen van dit document verklaart de aanvrager te voldoen aan de nationaal en internationaal aanvaarde normen van wetenschappelijk handelen zoals neergelegd in de *Nederlandse Gedragscode Wetenschapschapsbeoefening* 2012 (VSNU).

Literature

Allwinkle, Sam, and Peter Cruickshank. "Creating Smart-Er Cities: An Overview." *Journal of urban technology* 18.2 (2011): 1-16. Print.

Aurigi, Alessandro. "Reflections Towards an Agenda for Urban-Designing the Digital City." *Urban Design International* 18.2 (2013): 131-44. Print.

Bleecker, Julian. *A Manifesto for Networked Objects — Cohabiting with Pigeons, Arphids and Aibos in the Internet of Things*. 2010 Vol. , 2006. Print.

Blokland, Talja, and Douglas Ray. "The End of Urbanism: How the Changing Spatial Structure of Cities Affected its Social Capital Potentials." *Networked Urbanism Social Capital in the City.* Eds. Talja Blokland and Mike Savage. Burlington: Ashgate, 2008. Print.

Blokland, Talja, and Mike Savage. "Social Capital and Networked Urbanism." *Networked Urbanism Social Capital in the City.* Eds. Talja Blokland and Mike Savage. Burlington: Ashgate, 2008. Print.

Boomkens, Rene. *Een Drempelwereld : Moderne Ervaring En Stedelijke Openbaarheid*. Rotterdam: NAi Uitgevers, 1998. Print.

Boomkens, Rene. "De Continuïteit Van De Plek. Van De Maakbare Naar De Mondiale Stad." *Open - Maakbaarheid*.15 (2008)Print.

Situated Advocacy. Eds. Omar Khan, Trebor Scholz, and Mark Shepard. New York: The Architectural League of New York, 2008. Print. Situated Technologies Pamphlets .

Brighenti, Andrea Mubi. "New Media and the Prolongations of Urban Environments." *Convergence: The International Journal of Research into New Media Technologies* 16.4 (2010): 471-87. Print.

Burgess, Jean, Marcus Foth, and Helen Klaebe. "Everyday Creativity as Civic Engagement: A Cultural Citizenship View of New Media". *Communications Policy & Research Forum.* September 25-26, Sydney. 2006. Print.

Calabrese, Francesco, Kristian Kloeckl, and Carlo Ratti. "WikiCity Real-Time Location-Sensitive Tools for the City." *Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City.* Ed. Marcus Foth. Hershey, New York,

London: Information Science Reference, 2008. Print.

de Lange, Michiel, and Martijn de Waal. "Owning the City: New Media and Citizen Engagement in Urban Design." *First Monday* 18.11 (2013)Print.

Engelsdorp Gastelaars, van, and David Hamers. *De Nieuwe Stad Stedelijke Centra Als Brandpunten Van Interactie*. Rotterdam: Nai Uitgevers, 2006. Print.

Forlano, Laura, and Dharma Dailey. "Community Wireless Networks as Situated Advocacy." *Situated Technologies Pamphlets 3: Situated Advocacy.* Eds. Omar Khan, Trebor Scholz, and Mark Shepard. New York: The Architectural League of New York, 2008. Print. Situated Technologies Pamphlets .

Foth, Marcus. *From Social Butterfly to Engaged Citizen: Urban Informatics, Social Media, Ubiquitous Computing, and Mobile Technology to Support Citizen Engagement*. MIT Press, 2011. Print.

---. "Participation, Animation, Design: A Tripartite Approach to Urban Community Networking." *AI & Society* (2010)Print.

---. *Urban Informatics. The Practice and Promise of the Real-Time City*. Hershey: Information Science Reference, 2008. Print.

Frei, Hans, and Marc Böhlen. *Situated Technologies Pamphlet 6: MicroPublicPlaces*. New York: The Architectural League of New York, 2010. Print. Situated Technologies Pamphlets .

Friedrich, Pirjo, Anja Karlsson, and Maija Federley. "Report 2.1 Boundary Conditions for Successful Urban Living Labs." Print.

Galloway, Ann. "Expecting the Sentient City." *Sentient City: Ubiquitous Computing, Architecture, and the Future of Urban Space.* Ed. Mark Shepard. Cambridge, MA: MIT Press, 2011. Print.

Gordon, Eric, and A. De Souza e Silva. *Net Locality; Why Location Matters in a Networked World*. Malden, MA: Wiley-Blackwell, 2011. Print.

Graham, Stephen, and Simon Marvin. *Splintering Urbanism : Networked Infrastructures, Technological Mobilities and the Urban Condition*. London ; New York: Routledge, 2001. Print.

Hemment, Drew, and Anthony Townsend. *Smart Citizens*. 4 Vol. FutureEverything Publications, 2013. Print.

Hollands, Robert G. "Will the Real Smart City Please Stand Up? Intelligent, Progressive Or Entrepreneurial?" *City* 12.3 (2008): 303-20. Print.

Kitchin, Rob. "Big Data and Human Geography: Opportunities, Challenges and Risks." *Dialogues in Human Geography* 3.3 (2013): 262-7. Print.

---. "The Real-Time City? Big Data and Smart Urbanism." *GeoJournal* 79.1 (2014): 1-14. Print.

Latour, Bruno. *Making Things Public: Atmospheres of Democracy*. Cambridge MA: MIT Press, 2005. Print.

Leydesdorff, Loet, and Mark Deakin. "The Triple-Helix Model of Smart Cities: A Neo-Evolutionary Perspective." *Journal of Urban Technology* 18.2 (2011): 53-63. Print.

McCarthy, S. *The Designer as...: Author, Producer, Activist, Entrepreneur, Curator, and Collaborator - New Models for Communicating*. Bis B.V., Uitgeverij(BIS Publishers), 2013. Print.

Nabian, Nashid, et al. "Data Dimension: Accessing Urban Data and Making it Accessible." *Proceedings of the ICE-Urban Design and Planning* 166.1 (2013): 60-75. Print.

Offenhuber, Dietmar, and Katja Schechtner. *Accountability Technologies Tools for Asking Hard Questions*., 2013. Print.

---. *Inscribing a Square: Urban Data as Public Space*., 2012. Print.

Ostrom, E., et al. "Revisiting the Commons: Local Lessons, Global Challenges." *Science (New York, N.Y.)* 284.5412 (1999): 278-82. Print.

Paulos, Eric, RJ Honicky, and B. Hooker. "Citizen Science: Enabling Participatory Urbanism." *Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City.* Ed. Marcus Foth. Hershey, New York, London: Information Science Reference, 2008. Print.

Powell, Alison. "Democratizing Production through Open Source Knowledge: From Open Software to Open Hardware." *Media, culture & society* 34.6 (2012): 691-708. Print.

Reijndorp, A. "Een Samenloop Van Omstandigheden. Stedelijke Vernieuwing in De Netwerkstad." *Ruimte in Debat* 2003: 2-11. Print.

Seltzer, Ethan, and Dillon Mahmoudi. "Citizen Participation, Open Innovation, and Crowdsourcing Challenges and Opportunities for Planning." *Journal of Planning Literature* 28.1 (2013): 3-18. Print.

Shepard, Mark. *Sentient City: Ubiquitous Computing, Architecture, and the Future of Urban Space*., 2011. Print.

Townsend, Anthony M. *Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia*. WW Norton & Company, 2013. Print.

Townsend, Anthony. "Life in the Real-Time City: Mobile Telephones and Urban Metabolism." *Journal of Urban Technology* 7.2 (2000): 85-104. Print.

Varnelis, Kazys. *Networked Publics*. Cambridge, MA: MIT Press, 2008. Print.

Waal, Martijn de. *The City as Interface*. Rotterdam: Nai010 Publishers, 2013. Print.

---. "The Urban Culture of Sentient Cities: From an Internet of Things to a Public Sphere of Things." *Sentient City: Ubiquitous Computing, Architecture, and the Future of Urban Space.* Ed. Mark Shepard. Cambridge, MA: MIT Press, 2011. Print.