CHAPTER 5:'OUTSMARTING TRAFFIC, TOGETHER': DRIVING AS SOCIAL NAVIGATION

ALEX GEKKER AND SAM HIND

More than ever before city streets are a mesh of software and materiality.[1] As part of this and under the auspices of the 'smart city' and its underlying surveillances propositions, urbanization has been imbricated with technological control.[2] One aspect of such change that we wish to focus on in this chapter is tracing the way drivers interact with their own vehicles, the wider driving environment, and other road-users. Specifically, we highlight the ludic as an important factor in how this interaction takes place. Satellite navigation devices - perhaps the ultimate driving aids – are adept at capturing, storing, tracking, anticipating and visualizing the vast array of possible driving interactions, much more so than the traditional paper A-to-Z-style road atlas. This also opens up new playful affordances.

But just like the humble road atlas, such satellite navigation devices are called upon to adjudicate in everyday navigational matters. In this article we will look at how 'social navigation' – a term coined by the developers of a satellite navigation platform called Waze – is arguably changing the everyday nature of driving and translations between software and materialities through play. This work aims to build on an expansive literature that has interrogated the evolving socio-technical nature of automobility,[3] and continues with an interdisciplinary sensibility befitting a world in which engineers, technologists, advertisers, executives and lay people combine with pistons, onboard electronics, and social media campaigns to not only eradicate the clean distinctions between the production and consumption of such driving experiences, but also to prove further the emerging 'assemblage' of everyday mobility.[4]

Despite the propositions of some, especially those implicated in the automobile industry, such assemblages are always political[5] as seen in the deployment of fraudulent emission testing software by German auto-manufacturer Volkswagen. There, environmental, technological and economical concerns became interwoven into a scandal that affected the driving realities of more than 630,000 owners whose vehicles were recalled and subsequently

---

1   Rob Kitchin and Martin Dodge, *Code/Space: Software and Everyday Life*, Cambridge, MA: MIT Press, 2011.

2   Jennifer Gabrys, 'Programming Environments: Environmentality and Citizen Sensing in the Smart City', *Environment and Planning D: Society and Space* 32, 1 (2014): 30–48; Shannon Mattern, 'Mission Control: A History of the Urban Dashboard', *Places Journal*, 2015; Rob Kitchin, Tracey P. Lauriault, and Gavin McArdle, 'Knowing and Governing Cities through Urban Indicators, City Benchmarking and Real-Time Dashboards', *Regional Studies, Regional Science* 2, 1 (2015): 6–28.

3   Mike Featherstone, 'Automobilities: An Introduction', *Theory, Culture & Society* 21, 4–5 (2004): 1–24; 'Bodies, Cybercars and the Mundane Incorporation of Automated Mobilities', *Social & Cultural Geography* 8, 2 (2007): 175–97; Martin Dodge and Rob Kitchin, 'The Automatic Management of Drivers and Driving Spaces', *Geoforum* 38, 2 (2007): 264–75.

4   Tim Dant, 'The Driver-Car', *Theory, Culture & Society* 21, 4–5 (2004): 61–79.

5   Bruno Latour, 'From Realpolitik to Dingpolitik or How to Make Things Public', In *Making Things Public: Atmospheres of Democracy*, edited by Bruno Latour, 4-31. Cambridge, MA: MIT Press, 2005.

retrofitted. In the following pages we offer a conceptual framework to evaluate and analyze contemporary driving in terms of play and mapping. In order to do so, we proceed through three sections.

Firstly and close to the argument made in the first chapter of this book, we contend that 'ludic' approaches to analyzing digital technological networks can help to close lacunae in thinking on the possible reasons behind the insatiable take-up of new forms of cartographic displays by drivers around the world. By ludic approaches, we mean any analyses that take 'play' to be an inherent component in social relations. We then employ the notion of 'casual politicking' to orient new understandings of the ways in which drivers engage with digital interfaces. This term, we believe, appropriately encapsulates the kinds of moves being made in the automotive industry even ten years ago, when Nigel Thrift[6] made the claim that the experience of driving was slipping into our 'technological unconscious'. The naturalization of the mechanics of everyday driving has created the conditions for a subconscious, 'casual' form of politics; one formed through an interaction with digital devices. We then exemplify this in the next section with reference to the social navigation application mentioned above; Waze.

Here we take particular interest in three dynamics: the reporting of road hazards, the collaborative management of vehicle flow, and the addressing of latent map errors. Through this highlight the way ludic practices contribute to the emergence of a single ontological plane, that combines the map and the road. In the last section we anchor these exemplary cases in what Alexander Galloway calls 'ludic capitalism',[7] where social fabric of labor and compensation are threatened by utilizing play as a coercive device.[8]

Ludic Interaction: From Gamification to the Casual

The 'ludic turn' in new media studies has argued that play is a fundamental component of all human culture, even arising in the very domains often 'considered the opposite of play'[9] like education, politics, business and modern warfare. It is suggested that a ludic outlook pervades all manner of everyday practices and all kinds of interactions with digital devices, rather than being restricted to a specific game space, or 'magic circle'.[10] As Glas[11] suggests, after Consalvo,[12] this formalist separation between the play world and the 'real' world belies the pervasive nature of ludic activity throughout the whole of human life. Interaction with any kind of interface – be it a desktop computer in the workplace, a cash machine in a shopping

6   Nigel Thrift, 'Driving in the City,' *Theory, Culture & Society* 21, 4–5 (2004): 41–59.

7   Alexander R. Galloway, *The Interface Effect*, Cambridge: Polity Press, 2012, p. 40.

8   Tristan Harris, 'How Technology Hijacks People's Minds — from a Magician and Google's Design Ethicist — The Startup.' *Medium*, 18 May, 2016.

9   Joost Raessens, *Homo Ludens 2.0: The Ludic Turn in Media Theory*, Utrecht: Utrecht University, 2010.

10 Johan Huizinga, *Homo Ludens*, Boston, MA: Beacon Press, 1955; *The Game Design Reader: A Rules of Play Anthology*, Cambridge, MA: MIT Press, 2005.

11 Rene Glas, 'Breaking Reality: Exploring Pervasive Cheating in Foursquare', *Transactions of the Digital Games Research Association* 1, 1 (2013): 4.

12 Mia Consalvo, 'There Is No Magic Circle', *Games and Culture* 4, 4 (2009): 408–17.

center, a mobile phone on public transport, or a games console in the home - permits ludic behavior, contingent on the attitudes of the user and functionalities afforded by the machine's designer.[13] In many cases, as will be discussed, it is positively encouraged through the implementation of visual cues and feedback-rewarded behavioral loops that broadly fall into the realm of 'gamification'.[14] Advancing an understanding of how digital interfaces are being played with, and especially, as being played *casually and daily* (rather than in any 'magic' game space) has therefore become a primary scholarly concern. Interfaces are not simplistic windows into an isolated realm[15] but instead are enablers of general, social practices[16]. As such there is a politics to their design, functionality and deployment.

The notion of 'gamification' is a controversial term within the ludic turn, viewed by some as manipulation that takes into account the *appearance* of ludic activities without allowing for their *spirit*.[17] The adoption of game-like mechanics, rules, modes and structures for everyday tasks is now widespread, although only recently taken up in the field of digital mapping, for example. Those who contribute to collaborative mapping platforms such as *OpenStreetMap* (OSM) can use an application called Kort (figure 5.1) to carry out missions collecting 'koins' and badges to rise up a leaderboard, which in turn, improves the validity of the OSM database. Humanitarian volunteers looking to contribute in the aftermath of natural disasters can also now do so digitally via a platform called MicroMappers. Each case is a step-change from how the process of digital map editing has historically been performed.

But in the context of automotive practice, the possibility of 'cognitive distraction'[18] from mobile application interaction whilst driving has provided a level of concern not present in other debates,[19] even if legal rulings have deemed their use whilst driving acceptable under certain conditions[20]. Design prototypes such as Matthaeus Krenn's 'New Car UI'[21]

---

13   Miguel Sicart, *Play Matters*, Cambridge, Massachusetts: The Massachusetts Institute of Technology Press, 2014.

14   Sebastian Deterding, 'The Ambiguity of Games: Histories and Discourses of a Gameful World.' in Steffen P. Walz and Sebastian Deterding (eds), *The Gameful World. Approaches, Issues, Applications*, Cambridge, MA: MIT Press, 2015, 23–64.

15   Lev Manovich, *The Language of New Media*, Cambridge, MA: MIT Press, 2001.

16   Galloway, The Interface Effect.

17   Ian Bogost, 'Persuasive Games: Exploitationware,' *Gamasutra*, 3 May, 2011; Sebastian Deterding, Miguel Sicart, Lennet Nacke, Kenton O'Hara, Dan Dixon, 'Using Game-Design Elements in Non-Gaming Contexts', in *Proceedings of the 2011 Annual Conference on Human Factors in Computing Systems (extended abstracts)*: Vancouver: Association for Computing Machinery, 2011, pp. 2425-2428; Ivan Mosca, '+10! Gamification and deGamification', *G|A|M|E* 1, 1 (2012); Deterding, 'The Ambiguity of Games.'

18   AAA, 'Measuring Cognitive Distraction in the Automobile,' *AAA Foundation,* 1 June, 2013.

19   Kevin Roose, 'Did Google Just Buy a Dangerous Driving App?', *NY Mag*, 14 June, 2013; Matt Richtel and Bill Vlasic, 'Voice-Activated In-Car Systems Are Called Risky', *NY Times*, 12 June, 2013.

20   The Californian Court of Appeal overturned an earlier conviction of a man originally found guilty for using his Apple iPhone map application whilst driving. See: http://articles.latimes.com/2013/apr/25/local/la-me-abcarian-distracted-driving-20130426 on an initial appeal, and the final Court of Appeal decision here: http://www.courts.ca.gov/opinions/documents/F066927.PDF.

21   Matthaeus Krenn, 'A New Car UI - How Touch Screen Controls in Cars Should Really Work', 2014, http://www.matthaeuskrenn.com/new-car-ui/.

suggest that new modes of interaction are necessary to combat this perceived distraction whilst driving. Such attempts join the discourse within academia and industry in enlisting cognition and neuroscience into a competing framework of behavioral governance.[22] 'Social navigation', then, is perhaps a tentative evolution stretching the limits of current statutory frameworks, cultural norms and acceptable levels of bodily attention.
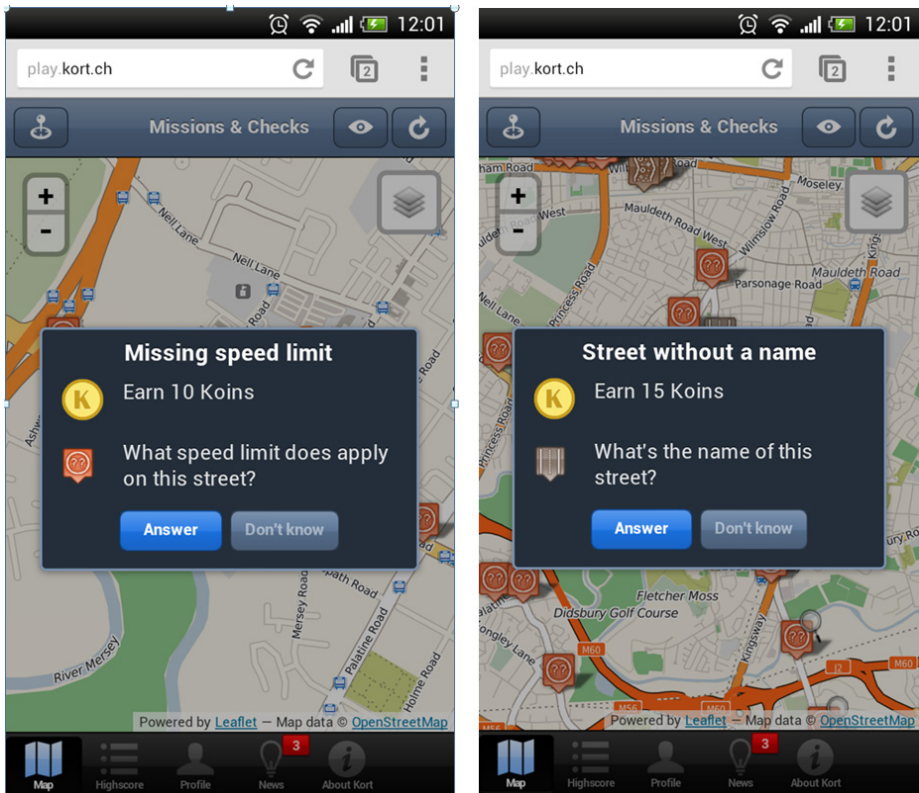

Figure 5.1 *Kort.* Screenshot[23] of Kort as smartphone-optimised OSM editing game.

A second, complimentary shift that the ludic turn has cast attention towards is the growing casualness of game-playing itself.[24] Distinguishing casual games from 'hardcore' games as Abt[25] and Ritterfeld et al.[26] have, has allowed for a deeper understanding of how 'gam-

22   Tiziana Terranova, 'Attention, Economy and the Brain', *Culture Machine* 13, 1 (2012): 1-19; *The Happiness Industry: How the Government and Big Business Sold Us Well-Being*, London: Verso Books, 2015.

23   All game screenshots are made by the author[s].

24   Jesper Juul, *A Casual Revolution: Reinventing Video Games and Their Players*, Cambridge, MA: MIT Press, 2009.

25   Clark C. Abt, *Serious Games*, Lanham, MD: University Press of America, 1987.

26   Ute Ritterfeld, Michael J. Cody, and Peter Vorderer (eds) *Serious Games: Mechanisms and Effects*, New York: Routledge, 2009.

ing capital' is built-up[27] and play conventions are acquired.[28] Typically, casual games are defined by low barriers to entry (easy to pick-up), incremental progress (lots of short levels), forgiveness towards player mistakes and the use of 'social mechanics', such as the option to invite or compare results with friends on social networking sites.[29] Additionally, they often include 'micro-payments' to unlock bonus content as opposed to traditional 'pay-once for everything' model.[30] The growth of mobile platforms – smartphones and tablets – has contributed greatly to their uptake. Playing the best-selling *Angry Birds* game for 2 hours a month, as creator Peter Vesterbacka suggests many did at the height of its success, would only amount to around 4 minutes of play a day.[31] A significantly lower figure than just almost any traditional console game, and one that suggests many simply play such games to 'kill time' in between other tasks, as Bouca[32] finds. As such, these casual gamers portray a relatively different set of attributes and interests to other long-form players. The titles they play stand at the far end of a long gaming continuum, with the vast, immersive (and 'hardcore') worlds of *Halo* and *Bioshock* at the other end.

Just as digital maps have allowed us to capture, track and store the records of quotidian interactions and expressions, so games have become embedded within, and arguably transformed, everyday life, constituting a gamification of common rituals (*Kort* as map editing *game*) and a casualness of the game-playing itself (*Kort* as a *smartphone optimised* editing platform). The fact that many games make use of maps as their playing boards (see Gekker or Perkins in this book), whether imagined (*Total War*, *Civilization*), through the utilization of location-based data (*Ingress*, *Zombies, Run!*) (see Lammes and Wilmott in this volume), or in the form of table top exercises (such as the fictional town of 'Sandford', discussed by Hind in this book), only underscores how digital mapping and gaming share common interface characteristics. The *Grand Theft Auto* (GTA) series is perhaps the most obvious example of this commonality. As Chesher[33] suggests, both satellite navigation interfaces and contemporary video games are primed to do three similar things; reify route-making, subjectively orientate action, and normalize the overlay of 'real-time' data. Gameplay in open world titles such as GTA is non-linear, allowing players to roam freely and complete tasks at will.

The adoption of touch-screen interfaces embodies a drastic turn in the nature of digital game-playing, map editing and technological driving assistance. The intuitive and ludic

27   Mia Consalvo, *Cheating: Gaining Advantage in Videogames*. Cambridge, MA: MIT Press, 2007.

28   Daniel Pargman and Peter Jakobsson, 'Do You Believe in Magic? Computer Games in Everyday Life', *European Journal of Cultural Studies* 11, 2 (2008): 225–44.

29   Jesper Juul, A Casual Revolution.

30   Holin Lin and Chuen-Tsai Sun, 'Cash Trade in Free-to-Play Online Games', *Games and Culture* 6, 3 (2011): 270–87; Elizabeth Evans, 'The Economics of Free Freemium Games, Branding and the Impatience Economy', *Convergence*, 1, 1 (2015): 1-18; David B. Nieborg, 'Crushing Candy: The Free-to-Play Game in Its Connective Commodity Form', *Social Media and Society* 1, 2 (2015): 1-12.

31   Elisabeth Braw, 'Angry Birds Creator Peter Vesterbacka.' *Metro*, 2011.

32   Bouça Maura, 'Angry Birds, Uncommitted Players,' *Proceedings of the International DiGRA Nordic Conference* 10 (2012): 1-13.

33   Chris Chesher, 'Navigating Sociotechnical Spaces: Comparing Computer Games and Sat Navs as Digital Spatial Media', *Convergence: The International Journal of Research into New Media Technologies* 18, no.3 (2012): 315-30.

nature of capacitive sensing technologies[34] as well as the possibility of tentative, probing and proximal interaction with such mobile devices[35] have led to their now-almost ubiquitous presence. In allowing for quicker and, arguably, more intuitive control in everyday situations (driving included) such interfaces utilize playful bodily action as a mechanism for increased coherence in habitual practices such as scrolling menus, issuing commands and selecting phenomena. A plethora of new tactile strokes, sweeps and taps are steadily and qualitatively replacing the metronymic and calculative clicks of computer mice, keys and other (car?) dashboard controls.

The touch-screen interface is a 'thin, but essential and visible membrane'[36] at once inviting seemingly inconsequential moves whilst actualizing wider cognitive, cultural and 'micro-political' potentialities. Both gamification and casualization are dependent upon this precept. The new driving landscapes that arise from such interaction are similarly transparent and innocuous, but nonetheless shape and direct the actions of everyday drivers. To illustrate, next we will examine the social navigation app Waze.

Hazards, Flows and Issues: Outsmarting Traffic Through Collaboration

Unlike standard GPS software, *Waze* populates the driving interface around a constellation of fellow drivers. As a smartphone application it competes with the standalone device market (*TomTom*, *Garmin* etc.) and other free turn-by-turn applications such as *Navfree*. In 2012, *Waze* had a global community of 36 million drivers, sharing a total of 90 million traffic reports, and driving a collective 6 billion miles. 65,000 map editors also made 500 million map edits, reflecting 1.7 million on-the-ground changes.[37] OSM by comparison, had just fewer than 100,000 editors in 2012 making 800 million edits.[38] By 2016, *Waze* – since then acquired by Google but kept as an independent entity – grew in size. The company claims to have 50 million monthly users, 360,000 map editors and maintains data-partnerships with 55 municipalities around the globe which provide real-time and expected traffic information.[39]

But it is not necessarily easy to make a clean split between those who 'produce' the map, those who 'edit' the map and those who 'consume' the map. It is easier, rather, to conceive of a kind of data feedback loop, where *Waze* users contribute – knowingly and unknowingly – through active driving, desktop editing and passive metadata collection. These feed back into future route-calculation. The data gleaned helps to not only build up a vast picture of the

---

34   Nanna Verhoeff, 'Grasping the Screen: Towards a Conceptualization of Touch, Mobility and Multiplicity,' in Ann-Sophie Lehmann, Joost Raessens, Mirko Tobias Schäfer and Sybille Lammes, *Digital Material: Tracing New Media in Everyday Life and Technology*, Amsterdam: Amsterdam University Press, 2009, 209–22.
35   Mark Paterson, *The Senses of Touch: Haptics, Affects, and Technologies*, Oxford: Berg, 2007.
36   Nanna Verhoeff, *Mobile Screens: The Visual Regime of Navigation*, Amsterdam: Amsterdam University Press, 2012.
37   Waze, '500 Million Map Edits in 2012,' *Waze Blog,* 2013.
38   OpenStreetMap, 'Editor Usage Stats - OpenStreetMap Wiki.' *OpenStreetMap*, 2013.
39   Waze, 'Waze Company Fact Sheet.' *Waze*, 2013.

journeys made with *Waze*, but also the state of the road network in general. It is this capability that is also driving the automated vehicle revolution, with rivals such as Tesla hoping to create a so-called 'fleet learning network'[40] comprised of a user-generated cartographic database.

The application's mechanics thus have a circulatory function, as user action builds a more comprehensive database. But as the database updates so does the digital map. The status of roads, the designation of speed limits, the set-up of junctions and vehicle restrictions are all changeable based on user data. Due to this active enrolment the digital map itself does not serve as a mere representation of the road ahead: it transforms the very driving world itself. It becomes a 'mutable mobile'[41] – an object capable of changing shape and moving across territory – rather than being an *im*mutable mobile (Latour, 1986) as maps have traditionally been conceived as. Other satellite navigation systems present the driving world as an immutable 'base map' upon which to plant the individual driver. But this world is bare and lifeless; phenomena are rendered foundational but unerringly quiet and impervious to change. The driver simply glides over the surface with no knowledge of what is 'below', let alone with the possibility of altering it. In the *Waze* world the digital map exists on the same ontological plane as the road environment itself – as a fluid, transportable object.

Road hazards, vehicle flow and map issues, for example – three dimensions of the *Waze* driving experience – all exist on this same active platform; open and malleable to the driver. They are dynamics that feed into this data loop between driver, database and map. Thus, this form of satellite-aided navigation is a performative act that does not relegate the map to a secondary level beneath the 'real driving world' of asphalt, traffic lights and junctions. Ludic mechanics are central to how our primary example encourages this performance with the mobile interface and reconfigures the act of driving. This reorganization, we argue, has a distinct political dimension as drivers are gifted the ability to fundamentally change the driving landscape as they travel through it, challenging the way in which we have historically relied on state agencies to provide us with information on road conditions.

Reporting Hazards

One of the main features of Waze is the ability to identify hazards. Spotting potential dangers for other users (or 'Wazers') is not just a handy addition to an otherwise social tool however, but a potentially valuable driving aid. These notifications ameliorate the disruption caused by three types of hazard: obstructions, distractions and anticipatory impediments. Obstructions provide direct dangers (debris, barriers), distractions are indirect and usually visual disturbances with the potential to become driving dangers (live animals, bad weather), whilst anticipatory impediments affect the ability of the driver to make upcoming judgments (stationary vehicles, missing road signs). Although these driving hazards are the product of loose interpretations, with their existence precarious, users are nevertheless instructed to

---

40   Chris Perkins, 'Tesla Is Mapping out Every Lane on Earth to Guide Self-Driving Cars,' *Mashable*, 14 October, 2015.
41   Rob Kitchin and Martin Dodge, 'Rethinking Maps', *Progress in Human Geography* 31, no. 3 (2007): 331-344; Sybille Lammes, 'Digital Mapping Interfaces: From Immutable Mobiles to Mutable Images', *New Media & Society* (2016): 1-15.

pin the incident down. Once submitted the hazard is placed on the map as a geo-located 'pop-up' message. This codification is vital for collective map use. It renders a (relatively) solid, isolated and verified incident upon which to act. As encouragement, *Waze* users receive a number of points for their contribution of a hazard, and similar to consumer reward schemes and videogame 'combo' moves, additional bonuses are available for greater contributions such as detailed descriptions, photo evidence and weekend notifications.[42]

Altering Flow

In addition, users can also collectively affect vehicle movement, direction and flow by closing existing roads, verifying nascent routes and opening up entirely new ones. Although traditional satellite navigation systems are capable of keeping users up-to-date with road information that adds to an already existing map (*TomTom*'s Live Traffic etc.), *Waze* is unique in its crowdsourcing of wholesale map recalibrations (figure 5.2). As mentioned earlier, users have to be live drivers to make changes, although passive (meta)data collection does, as mentioned earlier, take place.[43] Navigational assistance for other drivers is therefore grounded in the performative act of driving (or 'Wazing' as it is known), and alterations cannot be made either by desktop or without GPS and a data signal[44].
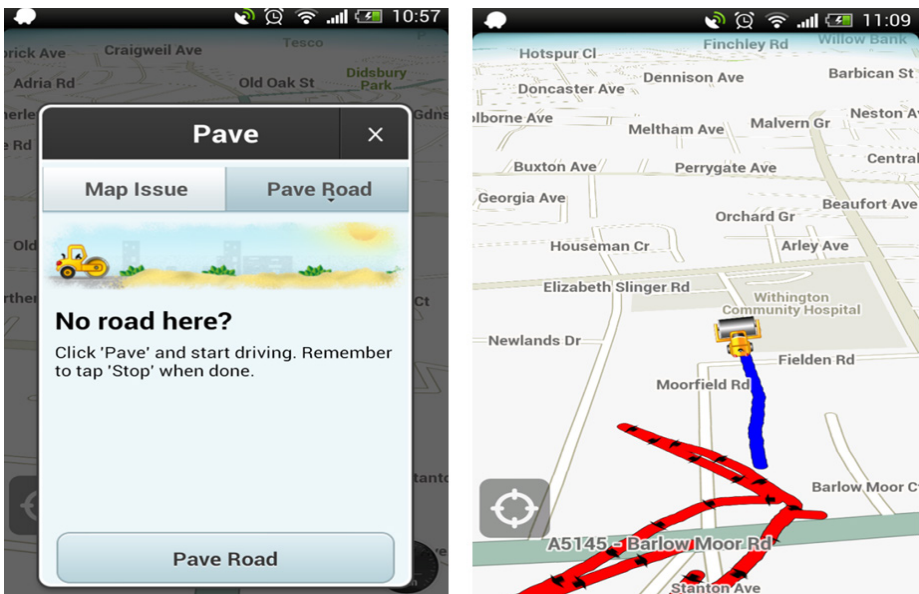

Figure 5.2 *Waze*. Screenshot of live road mapping in Waze.

42   Juho Hamari, 'Perspectives from Behavioral Economics to Analyzing Game Design Patterns: Loss Aversion in Social Games', *CHI 2011* (2011): 1-6.

43   Andrew Couts, 'Terms & Conditions: Waze Is a Privacy Accident Waiting to Happen', *Digital Trends*, 3 March, 2013.

44   Desktop edits can be made through the Waze Map Editor, but this is also dependent upon the locations driven in the past 3-4 months (Waze, 2013b).

This interaction between the existing (imperfect) map as noticed through the *Waze* interface and the unaligned driving world as seen through the vehicle windscreen, provides the catalyst for contribution. Road closures can be attributed to an on-road hazard (car crash, fallen tree), a construction job (road re-surfacing, underground repairs), or a local event (marathon, street party, protest march). Users make the selection by tapping the appropriate direction of the closure on the *Waze* driving map, and 'no entry' symbols notify others of the diversion. Unlike the previous hazard category, flow incidents are shown as linear overlays rather than isolated symbols. This allows active drivers to take heed of automatically re-calculated paths once the map is updated to reflect the changes. Wazers can also 'thank' the initial user reporting the issue in much the same way Facebook users can 'like' a post and Twitter users can 'favorite' messages. These tactile interactions on the smartphone screen render playful, casual interaction with the platform as default.

Wazers can bring new driving worlds into being directly through the 'road recording' function. Routes that have been imported into the *Waze* database or created in the *Waze* Map Editor can also be verified by drivers in a process called 'road munching'. In an unverified state these roads show up as sequential dots as opposed to a single, continuous line, but as drivers trace the route they 'munch' these dots akin to *Pacman* characters, successfully turning them into completed, verified and drivable routes for other users.[45] This in turn highlights the ludic attitude that the designer attempt to embed into the user interface, alongside the use of celebrity cameos in guidance voice packs, or the introduction of seasonal iconography for the driving screen. By comparison, OSM editors are required to do 'serious' work and use applications such as *OSMTracker* or a traditional GPS receiver to record new tracks, and edits still have to be uploaded through JOSM, *Potlach* or another OSM editor. Drivers using traditional satellite navigation devices do not possess this 'real-time' editorial capability, but *Waze* users are able to map new roads live and on the move.[46]

Wazing, road munching and road recording are actions populating, verifying and building a live navigational environment through collaborative driving performance. On this evidence *Waze* is more than simply an addition or 'aid' to the driving experience: it is a direct agent in the act of driving itself. The ability to open, close and verify roads on a map interface has heretofore existed as a preserve of either state agencies or satellite navigation companies. This shift in agency is therefore a significant one. Whilst many other aspects of society have been transformed by open, collaborative and citizen-led agendas, the driving world has come relatively late to the party. *Waze* represents the most advanced example of this shift to date.

Flagging Issues

As a final dynamic, users can also flag navigational issues. The *Waze* application allows users to report map errors whilst driving, with reports linked directly to the location of the error via GPS. These performative edits are based on the habitual know-how of drivers. If

---

45   Waze, 'FAQ,' *Waze* 2013.
46   Users are still prompted to add metadata via a desktop editor.

users believe the *Waze* map has a problem, they are permitted to raise a concern. Common issues ranging from forbidden turns and incorrect junctions to missing bridges, overpasses or exits are pre-listed, but users are also given space in order to detail a more specific, or irregular error. But unlike the 'external' hazards discussed previously, the 'internal' map issues function progressively updates the application itself.

Rather than dedicating time and energy to large swathes of track uploads as is routine in many collaborative mapping projects, users can clean up map errors as they drive. Although missing roads can be live-mapped by Wazers desiring to travel the unpaved route, the map issue function allows drivers to flag up potential errors for others to investigate. Rewards range depending on prolificacy, offering users a reason to alert others to errors they might otherwise ignore. As a specific example, *Waze* offers up candy treats (figure 5.3) for drivers willing to verify map data; planting bonuses in cul-de-sacs and other side-roads to tempt them, with the points contributing to the same general scoreboard as hazard reports, distance milestones and road munches. Once again, the users' avatars gobble these 'goodies' up in a *Pacman*-fashion, with varying totals based on the scarcity of particular treats.
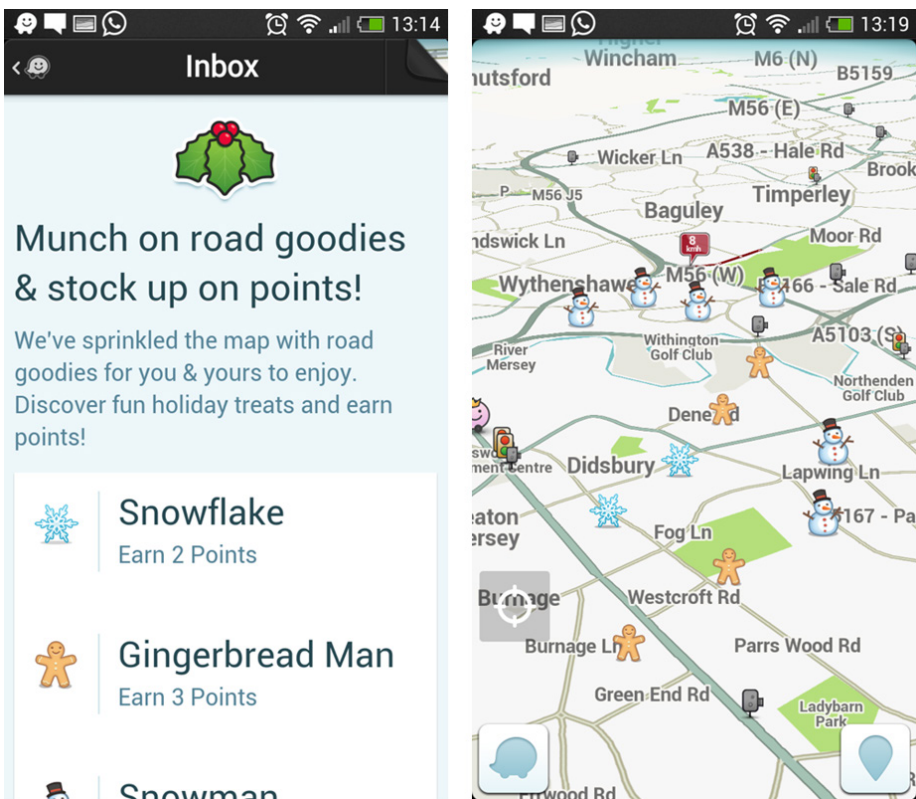

Figure 5.3 *Winter Waze*. Screenshot of festive-themed rewards for Waze users.

Casting a critical lens on this practice, it could be suggested that such 'gameful design',[47] rather than providing a kind of playful, emancipatory service, in fact simply masks a volunteered, mass data-collection practice for a major digital technology enterprise (*Waze* is now a division of Alphabet Inc., Google's umbrella corporation) as 'fun' and somehow socially rewarding. Participating in the mapping of road networks users are led to believe they are contributing to a common, driving public. Whilst messages received through the application imploring users to 'always drive with *Waze* open' might be characterized as helpful tips to aid use in the spirit of this common, driving public, they also, arguably, constitute efforts to ensure Wazers contribute full and extensive streams of driver data to the *Waze*/Google servers for exclusive advertising purposes.[48]

Alerting other drivers to accidents or hidden police vehicles, for example, are part of culturally ingrained driving practices. Such efforts to help collaboratively alert others to road accidents, render new routes, or flag map errors on a smartphone interface are simply seen as mere extensions of these historical actions. But courtesy of the game mechanics deployed in applications such as *Waze*, coupled with their casual use on a smartphone device, error reporting arguably becomes an embedded and naturalized interaction – a 'technological unconscious'[49] – rather than a forced action associated with traditional forms of labour. This hybrid practice being what Julian Kücklich[50] has famously termed 'playbour'. As a new field of politicized action, this ludic interactivity permits a wholly different – and perhaps pernicious – force.

Each of the above exemplifies a new kind of automobile tactic; a new way of attending to the disturbances, disruptions and hazards in the driving world. Historically drivers have been unable to have any effect on the collection, verification and visualization of road data, aside from passive participation in the network itself. But as applications such as *Waze* have embedded themselves into everyday spatial routines, collectively involving users in the creation of such publics, there have been radical alterations to the contemporary driving experience.

Mapping Futures

In this chapter we have suggested a rise of so-called social navigation. But as future driving worlds increasingly look fully-automated – with driverless vehicles, mechanical parking systems and all manner of sensor-mediated technologies – will this become somewhat oxymoronic? Or, as perhaps we argue, will the present technological preference for social platforms become further integrated into future driving experiences? Our two-fold analysis has enabled us to tease out the nascent dynamics. In the first instance, we have argued that ludic interaction is increasingly – thanks to the simultaneous rise of both touch-screen

---

47   Sebastian Deterding, Miguel Sicart, Lennet Nacke, Kenton O'Hara, Dan Dixon, 'Gamification. Using Game-Design Elements in Non-Gaming Contexts.'

48   Andrew Couts, 'Terms & Conditions.'

49   Nigel Thrift, 'Driving in the City.'

50   Julian Kücklich, 'Precarious Playbour: Modders and the Digital Games Industry', *Fibreculture* 5 (2005).

devices and social platforms – the default mode for automotive navigation. The multi-touch gestures routinely demanded by satellite navigation systems are replacing the metronomic clicks of plastic console buttons, or the circular motion of radio volume and airflow dials. As a way of engaging individuals, social navigation applications such as *Waze* incorporate many of the ludic features more commonly witnessed in the gaming world.

In the second, we have then contended that this ludic interactivity is breeding a new kind of political action; one premised on the everyday practice of driving-with-devices. Although we do not necessarily suggest that other political tropes (vehicle as inscribed status object, carbon emitter etc.) do not provide appropriate frameworks for automotive study, we do argue that the rise of social navigation is a novel development with the potential to provide rich empirically-focused work. As has been briefly detailed, *Waze* engages its user through a satellite navigation interface that prompts them to report hazards, alter flows and flag issues. Each dynamic affects the act of driving, as well as the constellation of other drivers. It brings new driving-worlds and 'driver-car' assemblages into being.[51] Thus it underlines the act of driving as materially political; as the practice of affecting the very geographical possibilities of automobile use through interactive play with the smartphone device.

It is through (active) playful user interaction, 'passive' fleet-level data collection, and municipal agreements that *Waze* generates capitalist value. Alexander Galloway[52] discusses a similar process in his critique of modern digital media assemblages. He notes the existence of:

> [a] new socio-economic landscape, one in which flexibility, play, creativity, and immaterial labor – call it ludic capitalism - have taken over from the old concepts of discipline, hierarchy, bureaucracy, and muscle. In particular, two historical trends stand out as essential in this new play economy. The first is a return to romanticism, from which today's concept of play receives an eternal endowment…. Game theory, ecology, systems theory, information theory, behaviourism – these many scientific disciplines point to the second element, that of cybernetics.

To him, the entwinement of the romantic elevation of play with the seemingly objective language of cybernetics can explain the rise of various ludic practices. The automotive world provides a clear example of this, as consumers are bombarded with seemingly non-conflicting messages of vehicle's technical prowess, coupled with lifestyle choice. The gradual diminishing of agency experienced by the human driver, and its transfer onto the broader socio-technical arrangements implicated in driving will, without a doubt, create new demands for ludic engagement. If we are no longer to drive our cars fully, those who wish to sell us such cars will need to come up with ways to sell us *the experience* of driving, without actually enrolling us into it.

To understand these nascent processes we require a different hybrid view on the nature of driving, navigation and the social; one that takes into account the casual, habitual and the playful.

---

51   Tim Dant, 'The Driver-Car.'
52   Alexander Galloway, *The Interface Effect*, 27.

Acknowledgements

References

AAA, 'Measuring Cognitive Distraction in the Automobile,' *AAA Foundation,* 2013, accessed 31 October, 2016. https://www.aaafoundation.org/sites/default/files/MeasuringCognitiveDistractions.pdf.

Abt, Clark C. *Serious Games*, Lanham, MD: University Press of America, 1987.

Bogost, Ian, 'Persuasive Games: Exploitationware,' *Gamasutra*, 3 May, 2011, accessed 31 October, 2016, http://www.gamasutra.com/view/feature/6366/persuasive_games_exploitationware.php/.

Braw, Elisabeth, 'Angry Birds Creator Peter Vesterbacka.' *Metro*, 2011, accessed 31 October, 2016, http://www.metro.lu/news/angry-birds-creator-peter-vesterbacka/.

Chesher, Chris, 'Navigating Sociotechnical Spaces: Comparing Computer Games and Sat Navs as Digital Spatial Media', *Convergence: The International Journal of Research into New Media Technologies* 18, no.3 (2012): 315-30.

Consalvo, Mia, *Cheating: Gaining Advantage in Videogames*. Cambridge, MA: MIT Press, 2007.

Consalvo, Mia, 'There Is No Magic Circle', *Games and Culture* 4, 4 (2009): 408–17.

Couts, Andrew, 'Terms & Conditions: Waze Is a Privacy Accident Waiting to Happen', *Digital Trends*, 3 March, 2013, accessed 31 October, 2016, http://www.digitaltrends.com/mobile/terms-conditions-waze-privacy-accident/.

Dant, Tim, 'The Driver-Car', *Theory, Culture & Society* 21, 4–5 (2004): 61–79.

Davies, William, *The Happiness Industry: How the Government and Big Business Sold Us Well-Being*, London: Verso Books, 2015.

Deterding, Sebastian, 'The Ambiguity of Games: Histories and Discourses of a Gameful World.' in Steffen P. Walz and Sebastian Deterding (eds), *The Gameful World. Approaches, Issues, Applications*, Cambridge, MA: MIT Press, 2015, 23–64.

Deterding, Sebastian, Miguel Sicart, Lennart Nacke, Kenton O'Hara and Dan Dixon, 'Gamification. Using Game-Design Elements in Non-Gaming Contexts', in *Proceedings of the 2011 Annual Conference on Human Factors in Computing Systems (extended abstracts)*: Vancouver: Association for Computing Machinery, 2011, pp. 2425-2428.

Dodge, Martin and Rob Kitchin, 'The Automatic Management of Drivers and Driving Spaces', *Geoforum* 38, 2 (2007): 264–75.

Evans, Elizabeth, 'The Economics of Free Freemium Games, Branding and the Impatience Economy', *Convergence*, 1, 1 (2015): 1-18.

Featherstone, Mike, 'Automobilities: An Introduction', *Theory, Culture & Society* 21, 4–5 (2004): 1–24.

Gabrys, Jennifer, 'Programming Environments: Environmentality and Citizen Sensing in the Smart City', *Environment and Planning D: Society and Space* 32, 1 (2014): 30–48.

Galloway, Alexander R. *The Interface Effect*, Cambridge: Polity Press, 2012.

Glas, Rene, 'Breaking Reality: Exploring Pervasive Cheating in Foursquare', *Transactions of the Digital Games Research Association* 1, 1 (2013): 1–14.

Hamari, Juho, 'Perspectives from Behavioral Economics to Analyzing Game Design Patterns: Loss Aversion in Social Games', *CHI 2011* (2011): 1-6.

Harris, Tristan, 'How Technology Hijacks People's Minds — from a Magician and Google's Design Ethicist – The Startup.' *Medium*, 18 May, 2016, accessed 31 October, 2016. https://medium.com/swlh/how-technology-hijacks-peoples-minds-from-a-magician-and-google-s-design-ethicist-56d62ef5edf3.

Huizinga, Johan, *Homo Ludens*, Boston, MA: Beacon Press, 1955.

Juul, Jesper, *A Casual Revolution: Reinventing Video Games and Their Players*, Cambridge, MA: MIT Press, 2009.

Kitchin, Rob and Martin Dodge, 'Rethinking Maps', *Progress in Human Geography* 31, no. 3 (2007): 331-344.

Kitchin, Rob and Martin Dodge, *Code/Space: Software and Everyday Life*, Cambridge, MA: MIT Press, 2011.

Kitchin, Rob, Tracy P. Lauriault and Gavin McArdle, 'Knowing and Governing Cities through Urban Indicators, City Benchmarking and Real-Time Dashboards', *Regional Studies, Regional Science* 2, 1 (2015): 6–28.

Krenn, Matthaeus, 'A New Car UI - How Touch Screen Controls in Cars Should Really Work', 2014, http://www.matthaeuskrenn.com/new-car-ui/.

Kücklich, Julian, 'Precarious Playbour: Modders and the Digital Games Industry', *Fibreculture* 5 (2005).

Lammes, Sybille, 'Digital Mapping Interfaces: From Immutable Mobiles to Mutable Images', *New Media & Society* (2016).

Latour, Bruno, 'From Realpolitik to Dingpolitik or How to Make Things Public', In *Making Things Public: Atmospheres of Democracy*, edited by Bruno Latour, 4-31. Cambridge, MA: MIT Press, 2005.

Lin, Holin, and Chuen-Tsai Sun, 'Cash Trade in Free-to-Play Online Games', *Games and Culture* 6, 3 (2011): 270–87.

Manovich, Lev, *The Language of New Media*, Cambridge, MA: MIT Press, 2001.

Matt Richtel and Bill Vlasic, 'Voice-Activated In-Car Systems Are Called Risky', *NY Times*, 12 June, 2013, accessed 31 October, 2016. http://www.nytimes.com/2013/06/13/business/voice-activated-in-car-systems-are-called-risky.html.

Mattern, Shannon, 'Mission Control: A History of the Urban Dashboard', *Places Journal*, 2015, accessed 31 October, 2016, https://placesjournal.org/article/mission-control-a-history-of-the-urban-dashboard/.

Maura, Bouça, 'Angry Birds, Uncommitted Players,' *Proceedings of the International DiGRA Nordic Conference* 10 (2012): 1-13.

Mosca, Ivan, '+10! Gamification and deGamification', *G|A|M|E* 1, 1 (2012).

Nieborg, David B. 'Crushing Candy: The Free-to-Play Game in Its Connective Commodity Form', *Social Media and Society* 1, 2 (2015): 1-12.

OpenStreetMap, 'Editor Usage Stats - OpenStreetMap Wiki.' *OpenStreetMap*, 2013, accessed 31 October, 2016, http://wiki.openstreetmap.org/wiki/Editor_usage_stats.

Pargman, Daniel, and Peter Jakobsson, 'Do You Believe in Magic? Computer Games in Everyday Life', *European Journal of Cultural Studies* 11, 2 (2008): 225–44.

Paterson, Mark, *The Senses of Touch: Haptics, Affects, and Technologies*, Oxford: Berg, 2007.

Perkins, Chris, 'Tesla Is Mapping out Every Lane on Earth to Guide Self-Driving Cars', *Mashable*, 14 October, 2015, accessed 31 October, 2016, http://mashable.com/2015/10/14/tesla-high-precision-digital-maps/.

Raessens, Joost, *Homo Ludens 2.0: The Ludic Turn in Media Theory*, Utrecht: Utrecht University, 2010.

Ritterfeld, Ute, Michael J. Cody, and Peter Vorderer (eds) *Serious Games: Mechanisms and Effects*, New York: Routledge, 2009.

Roose, Kevin, 'Did Google Just Buy a Dangerous Driving App?', *NY Mag*, 14 June, 2013, accessed 31 October, 2016, http://nymag.com/daily/intelligencer/2013/06/did-google-just-buy-a-dangerous-driving-app.html.

Salen, Katie and Eric Zimmerman (eds) *The Game Design Reader: A Rules of Play Anthology*, Cambridge, MA: MIT Press, 2005.

Sheller, Mimi, 'Bodies, Cybercars and the Mundane Incorporation of Automated Mobilities', *Social & Cultural Geography* 8, 2 (2007): 175–97.

Sicart, Miguel, *Play Matters*, Cambridge, Massachusetts: The Massachusetts Institute of Technology Press, 2014.

Terranova, Tiziana, 'Attention, Economy and the Brain', *Culture Machine* 13, 1 (2012): 1-19.

Thrift, Nigel, 'Driving in the City,' *Theory, Culture & Society* 21, 4–5 (2004): 41–59.

Verhoeff, Nanna, 'Grasping the Screen: Towards a Conceptualization of Touch, Mobility and Multiplicity,' in Ann-Sopie Lehmann, Joost Raessens, Mirko Tobias Schäfer and Sybille Lammes, *Digital Material: Tracing New Media in Everyday Life and Technology*, Amsterdam: Amsterdam University Press, 2009, 209–22.

Verhoeff, Nanna, *Mobile Screens: The Visual Regime of Navigation*, Amsterdam: Amsterdam University Press, 2012.

Waze, '500 Million Map Edits in 2012,' *Waze Blog,* 2013, accessed 16 December, 2013, http://www.waze.com/blog/500-million-map-edits-in-2012/.

Waze, 'FAQ,' *Waze*, 2013, 16 December, 2013, http://www.waze.com/wiki/index.php/FAQ.

Waze, 'Waze Company Fact Sheet.' *Waze*, 2013, accessed 25 October, 2016, https://assets.brandfolder.com/o4vb2e-fove2o-8o8m3r/original/Waze%20Company%20Fact%20Sheet.pdf.