Trojan horses in System Innovation; A dialectical perspective on the paradox of acceptable novelty

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Current and future sustainability challenges are increasingly acknowledged to be of a persistent and systemic nature. This gives rise to calls for likewise systemic solution strategies: Transformative system innovations instead of incremental system improvements, and societal transitions rather than procrastination on current locked-in trajectories. On these accounts, incremental change will not do. Still it proves difficult to achieve truly radical transformations. Insights from innovation theory, governance, sociology and critical theory help understand why radical transformation is unlikely to occur: Novelty, if it is to spread at all, should be acceptable to potential 'adopters', and should not be overly disruptive to existing practices. Initiatives should be radical enough to constitute transformative potential, but also shallow enough to be acceptable in current institutional constellations: This contradiction between transformation and non-disruption, the 'paradox of acceptable novelty', can be considered a key system innovation challenge. It is only paradoxical in its idealized form, however. System-innovative practices bring out various ways of dealing with the contradiction and its tradeoffs. This paper returns to the archetypical example of the more favorable case: The Trojan horse, the seemingly innocuous innovation with latent transformative force. Addressing its ambiguities, the concept's practical relevance is elicited. Clever levers to systemic change may be devised, but inversely they may become 'domesticated' and neutralized. Based on a comparative case study on innovation attempts in the Dutch traffic management field, it is shown how these two faces can even alternate. The 'incremental' turn towards 'network-oriented' traffic management and the 'radical' call for the social sharing of space display an intriguing mixture of transformative and non-disruptive faces. Analyzed as sequences of 'translations', these cases help understand and deal with the ambiguities of Trojan horses. A dialectical approach to 'acceptable novelty' helps combine system-innovative idealism with Machiavellian agility.

0 Introduction: The quest for system innovation and the paradox of acceptable novelty

Current and future sustainability challenges are increasingly acknowledged to be of a particularly persistent and systemic nature. This gives rise to calls for likewise systemic solution strategies: Transformative system innovations instead of incremental system improvements, and societal transitions rather than procrastination on current locked-in trajectories (Rotmans, 2006, Loorbach, 2007, Grin et al., 2010). The quest for system innovation starts from the assumption that current sustainability challenges require radical and multidimensional transformations, integrally addressing cultures, structures and modus operandi. Studies into historical transitions and system innovations have brought out that such radical changes can unfold through various patterns and pathways. Different combinations of quasi-autonomous 'landscape' pressures, endogenous 'regime' tensions and challenging

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novelties from ‘niches’ generate alternative evolutionary courses through which dominant ‘regimes’ are transformed or replaced (Geels (2005), Geels & Schot (2007)). The ‘default’ pattern, the normal course of affairs, is systemic reproduction, however: Entrenched beliefs, practices and regulations selecting upon novelty, dominant structures change only marginally. They thus remain locked-in within their developmental trajectories.

The calls for sustainable system innovation and transitions revive the (neo-)Marxist attention to structural, systemic pathologies (Horkheimer & Adorno (1981), de Vries (1993), Kelly (1994)). Similar to these accounts, incremental change is deemed insufficient. Reformism is rejected in favor of transformation, which is envisioned to take effect through co-evolutionary processes. Yet although the desired structural transformations have been noted to have occurred throughout history, and despite the work done to develop system-dynamic insight into management principles, in practice the quest for system innovation proves to run into considerable challenges. A growing literature into system innovation ‘in the making’ is helping to specify the difficulties of achieving truly radical transformations. Some of the striking phenomena reported are the ‘capture’, ‘domestication’ and ‘dilution’ of novelty by incumbent actors (Rotmans & Kemp (2009), Avelino (2009), Hendriks (2009), Voß et al., (2010)). These selective appropriations then lead to policy mixes in which novelty is intermingled with old policy ambitions. Hybridization is likely to occur (Heiskanen et al. (2009)), and system innovation champions are advised to anticipate ‘emergent incoherence’ (Kern & Howlett (2009)).

Insights from innovation theory, governance, sociology and critical theory help understand why radical transformation is unlikely to occur: Novelty, if it is to spread at all, should be acceptable to potential ‘adopters’, and should not be overly disruptive to existing practices (Abernathy & Clark (1985), Tushman & Anderson (1986), Ferlie et al. (2005)). Disruption can take place in the form of competences and competitive assets lost, but can also manifest through policy alienation on the side of professionals involved (Tummers (2012)). And even when policy innovations are initially accepted as meaningful contributions, their relevance to adopters all too often diminishes over time (Teisman (2005)), or they fail to become consolidated as more than incidental experiments (van Buuren & Loorbach (2009)).

With regard to system innovations, a class of innovations with particularly high transformation ambitions, the risk of excessive disruption is accordingly high, Grin (2010) indicates. The basic strategy is to nurture radical novelties in relatively secluded evolutionary ‘niches’, at a distance from hostile selection environments. Preparing their breakthrough through experimentation and network formation, the next step is to seize the windows of opportunity opened through the internal tensions within and the external pressures on dominant ‘regime’ structures (Schot & Geels (2008)). Depending on these circumstances, disruptive innovations could thus break through nevertheless. Still, reflecting upon empirical examples in eco-housing and organic food, Smith (2007) stresses that the problem of disruptive innovation cannot be circumvented altogether. The intended normalization or ‘mainstreaming’ of radical innovations by vanguard ‘frontrunners’ involves a manifold of sometimes subtle alterations: In the process of domesticating ‘wild’ innovations, rough edges have to be smoothened to have them ‘slot in’ with a formalized and regulated institutional environment. In other words, notwithstanding the stepwise and systemically informed approach to radical innovation, attempts at system innovation remain confronted with the *paradox of acceptable novelty*: Initiatives contributing to system innovations should be radical enough to constitute transformative potential, but also shallow enough to be acceptable in current institutional constellations.

The contradiction between transformation and non-disruption can be considered a key system innovation paradox. Yet in itself this is rather underwhelming news. First, the paradox has been formulated earlier in different but similar contexts. Second, as Meadowcroft (2009) expressed it tellingly, it is hardly counterintuitive that attempts at societal transformation[2] become subject to politics, negotiation, and tradeoff: *"When have policy directions—even those that officially espouse change, openness, and participation— entirely escaped the orbit of economic and political power? It is entirely understandable that transition-management-in-practice looks a bit more like policy-as-usual than would be recommended by transition-management-in-theory. What is surprising is that an idea that explicitly talks of system change ever got adopted into official circles in the first place."* (336) In other words, having established the paradox of acceptable novelty as a key challenge to system innovation endeavors, this is only an intermediate conclusion. The paradox should be considered as a stepping stone towards more specific questions and empirically informed answers. *How can this paradox be dealt with? And, considering that it is only paradoxical in its idealized form, how to strike a balance between non-disruption and transformation?*

These questions will be answered as follows: First the paradox is dismantled somewhat, restating the apparent logical contradiction as a practical dilemma. Addressing the *practice* of paradox, this paper invokes the archetypical example of the more favorable case: The Trojan horse, the seemingly innocuous innovation with latent transformative force. Of particular interest is the ambiguity inherent to Trojan horses: They may be clever levers to systemic change, but inversely they may become 'domesticated' and neutralized. Following methodological guidelines from the sociology of translations, empirical investigation focuses on the interpretive flexibility inherent to Trojan horses. Concrete system innovation practices are analyzed as sequences of 'translations' **(section 1)**. Next, the ambiguities of Trojan horses are shown as they occurred in system-innovative practices. Empirical analysis is based on comparative case study into innovation attempts in the Dutch traffic management field (Pel, 2012). Highlighted are the striking similarities between two otherwise different innovation attempts: The seemingly 'incremental' turn towards 'network-oriented' traffic management **(section 2)** and the apparently radical call for the social sharing of space **(section 3)** display an intriguing mixture of transformative and non-disruptive faces. Of particular interest to system innovation practice is the alternation between those faces. In the conclusion the cases are compared on key dimensions, thereby eliciting the ambiguities of Trojan horses. On this basis it is argued that the paradox of acceptable novelty should be handled with a dialectical approach. Such approach helps to combine system-innovative idealism with Machiavellian agility **(section 4)**.

1 The Trojan horse – between silent transformation and domestication

The 'paradox of acceptable novelty' is a nagging challenge to system-innovative endeavors. Formulated as a paradox the challenge is portrayed as insoluble, however. Instead, the paradox can be made productive by realizing that the apparent logical contradiction is rather a practical tension (Poole & van de Ven (1989)). Treating 'acceptable novelty' as an innovation *dilemma*, it becomes tractable as an empirical phenomenon. It then becomes apparent that more and less favorable balances can be struck between transformative innovation on the one hand, and the avoidance of disruption on the other: Not accidentally, the very quest for system innovation and transitions is underpinned and encouraged by systemic-historical analyses that show such transformations to be possible and retraceable.

[2] In the quotation Meadowcroft comments upon the introduction of the transition management approach, but his comments also apply to attempts at systemic transformation more generally.

A most inspiring example of purposive transformation is Edison's[3] legendary introduction of incandescent lighting. His efforts and ruses to conquer and transform a dominant constellation based on gas light have been exemplars for several innovation-theoretical insights. Amongst the various studies on this case, the analysis of Hargadon & Douglas (2001) is particularly insightful for present purposes. They elicit how the deeply entrenched gas light 'regime' could be invaded and supplanted through what they call 'robust design': *"..an innovation's design is robust when its arrangement of concrete details are immediately effective in locating the novel product or process within the familiar world, by invoking valued schemas and scripts, yet preserve the flexibility necessary for future evolution, by not constraining the potential evolution of understanding and action that follows use. To strike this balance, prospective innovators must carefully choose designs that couch some features in the familiar, present others as new, and keep still others hidden from view."* (479/480). Disregarding the details of Edison's design process and focusing on the above theoretical characterization, the 'robust design' concept indicates a particularly successful way of dealing with 'acceptable novelty'. On the one hand, the paradox can be dealt with successfully by invoking familiar schemas and scripts. This helps evade the trap of inviting resistance against apparent disruption. On the other hand, familiarity should not be built in to the extent that transformative novelty is sacrificed altogether. The authors nicely describe how Edison did not triumph over the gas industry by *"…clearly distinguishing his new system from, but, rather, by initially cloaking it in the mantle of these established institutions"* (479).

From the perspective of dealing with 'acceptable novelty', the most interesting element in Hargadon & Douglas' analysis is the strategic cunning involved. Apparently, Edison struck a most favorable balance between innovation and acceptability (non-disruption). It even seems as if he transcended the paradox, defying its logic. As indicated above, to clearly distinguish the revolutionary lighting system from its well-positioned competitor would have amounted to an unfavorable balance – such would only have increased mistrust against an already fragile innovation attempt (occasional flaws in the electrical wiring did cause several lethal accidents, for example). Instead, Edison 'cloaked his innovation in the mantle of the established institutions', affording it with a relatively innocuous, not overly revolutionary, appearance.

Edison's ruse poses a preliminary answer to the question of how to deal with 'acceptable novelty'. The concept of 'robust design' offers a crisp formulation of the 'working substance' in this process, but in this context such specification is somewhat premature – the concept indicates a favorable kind of dealing with 'acceptable novelty', but does not fully articulate the ambiguities involved. Instead of specifying Edison's ruse, it is therefore more useful to *generalize* it. This allows to describe and interrelate both the favorable and the less fortunate dealings with the innovation dilemma. Remembering the trick of 'cloaking' the innovation, it is not difficult to come up with such a general concept. The concept antedates Edison by far: The Trojan horse.

The Trojan horse is the archetypical strategic disguise of true intentions. The mythos stems from the Trojan war. On most accounts it was Odysseus who sought to forge a breakthrough in the thus far fruitless siege of Troy. The literal breakthrough through Trojan city walls was increasingly unlikely to come about by brute force however, the protagonists came to acknowledge. Instead, the Greeks came with their famous gift: The giant wooden horse. It was attractive for the Trojans to bring home, as this would gain the divine favor and protection of Pallas Athena. The horse did require the Trojans to bring down their city walls, however. The Greeks had made sure it did not fit through the fortress' main entrance. Finally,

[3] As has often been stressed, Edison did by no means work alone and relied on a network of innovators. For the present discussion this nuance is of no direct relevance, however.

once the horse had been eagerly hauled in by the Trojans, the Greeks played their biggest trump: In the night, soldiers came out of the horse in which they were hiding, and opened the city gates for their comrades.

The Trojan horse (or 'Greek gift') is a classical metaphor, invoked to symbolize a wide range of somehow deceitful strategies. With regard to the 'acceptable novelty' dilemma in system innovation, this rich metaphor offers a lens that is attractive for the following reasons:

1. The metaphor articulates how the quest for system innovation seeks to transform societal structures primarily through innovation rather than destruction. System innovation develops, and *offers*.
2. The metaphor articulates the system-innovative awareness that a straightforward siege of locked-in societal structures is bound to run up against fortified city walls, i.e. resistance to disruptive change on the side of vested interests, dominant beliefs and established routines. As indicated by Stirling (2011, 84), the quest for system innovation should even start from a more fundamental acknowledgement that many initiators of change hold subaltern positions. This increases the practical relevance of Trojan horses, i.e. of seemingly innocuous innovation with latent transformative force.
3. The metaphor is applicable to various dimensions of systemic innovation: Whereas Hargadon & Douglas' (2001) 'robust design' seems to refer primarily to new technologies and objects, the Trojan horse could refer to any of the innovations in products, processes, institutional arrangements, beliefs and infrastructures that the system innovation concept contains.
4. The metaphor helps organize and interrelate the various patterns distinguished in studies on 'system innovation in the making'. As briefly discussed in section 1, system-innovative ventures are frequently noted to be 'captured', 'domesticated', 'diluted', in the more favorable cases they break through, take off, or become scaled up, and then there are the intermediate cases and 'hybridizations'. Through the mythos' richness, these patterns can be reformulated as alternative 'Greek gift' scenarios.
5. Following up on 4), the metaphor contains a considerable ambiguity that is not obvious at first sight. As emphasized in the heroic story, the apparently non-disruptive horse yielded relatively silent transformation. Yet on a less heroic, more sober and more *strategic* interpretation, the Greek breakthrough attempt could also have taken an entirely different turn. There is also the inverse possibility of 'capture' and 'domestication', in which the system-innovation champions are outsmarted as it were: Their horse is accepted, but neutralized or assimilated thereafter[4]. In other words, the Trojan horse metaphor need not be taken to *dissolve* the innovation paradox by striking a particular balance. On this broader interpretation it rather embodies or *contains* it.

Emphasizing the ambiguity implied with the concept, the Trojan horse metaphor can cover the entire spectrum between silent transformation and domestication. As such it offers a lens through which to gain understanding of the 'acceptable novelty' paradox as it occurs in concrete system innovation processes. In order to deal with this paradox/dilemma effectively, a greater affinity with its ambiguities seems prerequisite. In the following sections two cases are briefly presented. They are cases of attempts at system innovation and their subsequent innovation processes. Particularly insightful about the cases is not only their display of both

[4] The Trojan horse is a theme that allows for diverse variations. A famous example is the parody in "Monty Python and the Holy Grail", in which the Trojan Rabbit is captured by the French – the rabbit turns out innocuous, however, as the soldiers forget the essential part of hiding inside it (Youtube, 2012). In this case, transformative force is not latent but absent.

'silent transformation' and 'domestication', but moreover, the apparent alternation between these two faces. That alternation is a key to answering the central questions on 'acceptable novelty'.

The two cases are lifted out from a quadruple-case study in the Dutch traffic management field, as contrasting examples. The underlying research, a four-year dissertation project, is documented extensively in Pel (2012). The research was concerned with 'system innovation in the making': Paying particular attention to the system understandings of involved actors, system innovation was studied from within, rather than from a transcendental, synoptic perspective. To paraphrase Yanow (1997), this involved investigating 'how an attempt at system innovation means' to diverse actors. Following methodological guidelines from the sociology of translation (Callon & Law (1982), Star & Griesemer (1989), Bijker & Law (1992), Akrich et al. (2002[a,b]), Latour (2005)), it was reconstructed[5] how system innovation achievements can emerge from the diverse translations of an innovation attempt. An innovation is waged by an actor with a particular system understanding and ambitions, then it is embraced, modified or resisted by various others, and in the end translation sequences can be carved out that display particular translation-dynamic patterns. Development of these patterns was aided by a sensitizing translation typology. These translation-dynamic patterns, developed through both 'intrinsic' case analysis and case comparison, formed the basis for a generalization of findings: The following two cases thus constitute exemplars, whilst the 'Trojan theme' itself emerged from a more encompassing analysis.

Originally analyzed as translation sequences, the following cases display particular sensitivity towards the 'interpretive flexibility' (Bijker & Law, 1992) of innovation attempts. In this constructivist approach, the question raised is not so much if, and to what extent, an innovation attempt possessed Trojan horse-properties. Attention does not go out only to the clever 'Greeks', but to the 'Trojans' as well – who may turn out to be no less clever in the particular case. Moreover, the cases involve multiple actors who are generally not at 'war' with each other. Building analysis on a metaphor, these differences from the original mythos must be kept in mind[6]. Yet whereas the multi-actor setting may confuse the similarity between the Greek-Trojan battle and the more complex negotiation processes at issue, it displays even stronger how Odysseus' ruse relied on *interpretation*: The horse had to *seem* non-disruptive and attractive, and this attractiveness[7] differs according to system understanding and time. In section 2 it is described how a seemingly 'incremental' innovation attempt held a latent revolutionary spark, and in section 3 an attempt is described that poses rather its mirror image: Apparent radicalism may have been deceiving in the latter case. After a brief description of the cases, their key characteristics are discussed. Following the 'Trojan theme', analysis concerns the following elements. First it is specified what transformation the initiators sought to bring about and, second, the disruption implied with this ambition. Next, the affirmative and negating translations show whether key actors found the innovation disruptive or not, and how they appropriated and modified it. Fifth, it is verified how the cases resemble or differ from the 'Greek gift' archetype of latent transformation. What was hidden from view by initiators? And, remembering that others may do their share in deceitfulness as well, what was hidden from view by *translators*?

[5] This reconstruction involved approximately 12 transcripted interviews per case, extensive analysis of reports, minutes, evaluations and traffic professionals' journals, as well as field observations.

[6] These differences also signal limitations and caveats on the use of the metaphor, which will be revisited in the concluding section.

[7] Or 'interessement', as Akrich et al. (2002a,b) would call it.

2 The revolutionary spark of network-oriented traffic management and transport policy

This case concerns an attempt, or in fact a cluster of attempts, to arrive at an integrated way of dealing with transport flows. In 2003 a ministerial commission delivered its advisory report 'Movement through cooperation'. This 'Luteijn' commission, named after its chairman, consisted of high-ranked officials from both public and private sectors. Its mission had been to address the accessibility problems on the A4 highway as they occurred especially in the Greater the Hague area. More specifically, the commission was to develop further the concept of a 'mobility market', addressing not only the supply of transport solutions but also the demand for travel. During the commission's deliberations the associated road pricing schemes perished in a heated political debate, however, which limited its scope somewhat. The report retained the initial ambition towards integration, however. Its key message read that the A4 highway issue should no longer be treated as a transport axis problem, but rather as a problem of network malfunctioning. A4 accessibility could be understood only through the commuting flows in the entire surrounding metropolitan area. This 'network problem' crucially required integral management, the report read. However, the network was noted to be fragmented into a large number of central and decentralized government agencies, various public transport operators, and a private sector that hardly acknowledged its role in the generation of traffic flows. The proposed solution strategy aimed to carefully build up the requisite integration, reminding the targeted actors that 'to the road user, administrative boundaries are irrelevant'. The commission established a growth model that specified several clusters of 'network-oriented' measures, the easy picks within which would create the trust for the more challenging ones. The model would be tested through a pilot in the Greater the Hague area.

The 'Luteijn approach' became a national benchmark for integrated transport policy and 'area-oriented' traffic management. The Greater the Hague pilot yielded a variety of effective collaborations and innovative transport solutions, which in turn inspired similar initiatives in other regions. All in all these initiatives can be summarized under the 'network turn', for their common rationale that 'to the road user, administrative boundaries are relevant'. The system-innovative importance of this 'network turn' resides in the shift towards an integrated, system-responsive approach to mobility problems, often involving the ever-contested application of demand management as well. The innovation attempt, or rather the family of network-oriented innovation attempts, was successful: The network-oriented way of thinking became a standard in Dutch transport and traffic management policies, and the integrated approach spurred various transport innovations in turn.

Typical for the translation sequence as a whole was the range of innovative projects that were undertaken as boundary-transgressing collaborations. This involved coordinated slippery road abatement, an experiment with the opening and closing regime of bridges, coordinated incident management, an open tendering procedure for private-sector traffic information services, area-oriented optimization of traffic light cycles, the development of a methodic for area-oriented traffic management and its multiple applications, an 'inverse pricing' experiment with Rush Hour Avoidance, the introduction of the 'mobility broker' and related initiatives to self-regulate traffic-generation, the 'traffic mariner' arrangement to coordinate the operational challenges of immediate traffic problem-solving, and schemes for joint infrastructure financing and the associated bids for national-level support.

Appreciated in terms of the 'acceptable novelty' dilemma, the 'network turn' process displays a striking similarity to the Trojan horse theme. A closer look at some key characteristics allows to substantiate this. First of all, it is good to specify the 'city walls under siege': *What was the transformative content of the attempted innovation, and what disruption*

was implied with this ambition? In this respect the 'Luteijn' commission can be seen to aim for a more integrated, boundary-crossing and system-oriented approach to traffic management and transport policy. The commission convincingly laid down the functional rationale for this, which was hard to object against. Still, the argued irrelevance of administrative boundaries implied a disruption of existing practices and discretions, of territorial logic. In that respect it can be said that the commission was in need for nothing less than a Trojan horse construction; they were facing particularly solid 'city walls'.

This prompts the question of how their plan for network-oriented action was received by key translators. *Did they find it disruptive? How did they appropriate it, and select upon it?* The translation process involved a myriad of actors, it needs to be emphasized: Administrators at municipal, metropolitan and provincial levels, traffic professionals, 'mobility managers' who were appointed to guide boundary-crossing action, and various private sector actors such as employers and entrepreneurs. Yet however large and diverse the group of translators, it is striking that fairly little disruption was experienced, and moreover, that the innovation was often hauled in eagerly: To some, the proposed 'network turn' was significant especially as an effective traffic solution. Especially the content-oriented traffic professionals saw it as an opportunity for 'serious', well-founded and integral management of traffic. They applied the 'network logic' in regional 'network analyses' and traffic scenarios, emphasizing the added value of this system-oriented line of reasoning. By contrast, administrators, managers and consultants were somewhat less impressed by the content-driven logic itself. To them the demarcation of a particular road network and the establishment of attendant network challenges remained a deeply political issue – let alone the implementation and financing. In this translation the 'network turn' revolved not so much around the diagnosis and resolution of road network problems. Instead, the network logic was rather a lever for fruitful cooperation and generation of trust, and a way of thinking through which to establish shared problem ownership. Furthermore, 'network action' was generally applauded by private sector actors. From their perspective, the initiative was welcome as an effort to reduce 'red tape', overcome fragmentation and arrive at a more forceful management of congestion problems. Moreover, the fresh approach offered opportunities for entrepreneurs to show their innovative capacities, and its deliberative set-up could be used for lobbying purposes. On the other hand, the gains from network-oriented actions were not equally clear to all translators, and their active endorsements changed over time: Conflicting interests resurfaced once network plans were elaborated, responsiveness to the own constituency remained important, the gains of coordination were not of equal relevance to all, conflicting interests were difficult to settle in the informal arrangements, and the election cycle made it difficult to sustain the trusting relationships on which network action rested.

Apparently, the 'network idea' was not received as particularly disruptive. This summary statement raises the crucial question of how the case resembled the 'Greek gift' archetype of latent transformation. *What was hidden from view by initiators? And what was hidden from view by* translators*?* Regarding the first, it can be said that the initiators of 'networked action' managed to present it as a fairly 'incremental', non-disruptive innovation. Intended network collaborators were primarily presented with effective solutions and quick wins to the shared problem of congestion. And whereas the advocated 'network action' could have been taken as a threat to discretions and administrative autonomy, this element of the innovation remained largely implicit in the informal network arrangements made. Indeed, one of the key trailblazers indicated this to be the trick behind their growth model: Any hint at the establishment of a new 'Transport Authority' was carefully avoided, yet this was where they were heading towards. As far as they successfully hid the 'revolutionary spark', the 'Luteijn'

protagonists can thus be said to have arrived at a system-innovative Trojan horse. On the other hand, the translation process reveals as well that the actors targeted for network action did not simply fall for the trick: The network logic was generally hauled in enthusiastically, but behind this endorsement there were also the subtle twists that deflected the revolutionary spark somewhat. Next to the network logic, the territorial logic continued to hold sway, and in fact the first could be mobilized to serve the latter – the definition of the network and its problems remained a deliberative practice, after all.

To conclude, the 'network turn' can be considered a contemporary example of the Trojan horse ploy. Yet beyond this assessment of favorable balancing between transformation and disruption, there is the more intricate story of mutual latencies: At times the intended Trojan horse was also domesticated, deflecting locally unwanted transformations. .

3 The domestication of Shared Space radicalism

This case concerns an attempt to reconfigure the road network towards a more 'humane' traffic order, also seeking to restore the balance between spatial quality and traffic concerns. Shared Space became internationally known as a daring and intriguing concept to roll back traffic management, in favor of a less regulated, more 'democratic' and more attractive public space. One of the earlier showcases for the emblem was the Haren town center reconstruction, involving a much-debated shift towards mixing of traffic modes. Together with similar schemes at other sites this led to a Shared Space approach. The approach was laid down in booklets, applied in an EU-Interreg project, further developed in a Shared Space institute, embedded in traffic-related curricula, discussed with traffic safety experts and applied at various sites in both the Netherlands and abroad. Meanwhile the intriguing concept of 'safety through chaos' was eagerly disseminated through various media, not in the least because of the missionary work by its late standard bearer Hans Monderman and his network of advocates. A series of inconspicuous road reconstructions was welded into a well-known 'brand'; in this respect the innovation attempt can be considered successful. On the other hand, in many cases the radical concept materialized in rather watered-down fashion.

The Shared Space translation sequence displays widely diverging translations that initially proved hard to reconcile. In this respect the Haren town center reconstruction acts as a pars pro toto: The officials from local government and their alderman enthusiastically embraced the plans to 'mix traffic', which had been developed in a series of participatory design sessions with citizens. To them it was an innovative way to deal with traffic, while simultaneously ensuring an upgraded town centre – the main road no longer divided the town center in two. On the other hand, the plan met with considerable resistance from various stakeholder groups: The large group of elderly citizens felt threatened by the plans to do away with the separate bicycle lanes and the suggestion to negotiate traffic order amongst road users. Similarly, parents felt insecure about the safety of their children, and the bicyclist's association deplored the removal of separate bicycle lanes; their hard-fought achievement in the struggle with car-dominated traffic. Also the police forces were less than enthusiastic, considering that the deregulating approach robbed of them the legal ground for enforcement. Similar translation dynamics can be seen more broadly; established traffic institutes warned that the 'safety through chaos' principle had yet to prove itself. According to them its application better be restricted to 'dwelling areas' with low traffic intensities, in line with existing guidelines. Others were less concerned about the questions about traffic safety, and emphasized that Shared Space's removal of traffic signs and insistence on the 'self-explaining road' made for more attractive places and empowered citizens.

Shared Space acquired fame and notoriety primarily for its 'safety through chaos' principle, the controversial idea that traffic order should rely more on the self-organizing capacities of citizens. This often led to unresolved battles from entrenched positions – some emphasized the vulnerability of non-motorized road users, others emphasized their resilience and capacity for improvisation. The Shared Space initiators found that an important aspect of their concept had become 'lost in translation', however. The concept had never been meant as recipe for management of traffic, they held. At least as important was their argument for shared spatial design: Shared Space was also a way of negotiating space, of participative and interdisciplinary design and of exploring ways to share space. The 'traffic solution' translations neglected that the concept involved more than traffic. The partners in the EU-Interreg Shared Space program, reflecting on their experiences and the compromises made, laid this down in a second official publication. In this 'from project to process' booklet they effectively argued for a 'process turn', asserting the primacy of the participative design process over the implementation of traffic solutions. The earlier iconoclasm against the dominant traffic safety doctrine was toned down, and instead Shared Space was presented more and more as a model for participative governance. They took to a synchronization strategy, seeking to attune different conceptions of sharing space. This can be seen in the deliberative processes started from the Shared Space institute, the research and education projects conducted with polytechnics, and also in the later discussions about future Shared Space application in Haren. Highly symbolic value is the research project undertaken in collaboration with an organization for the visually impaired: This group of particularly vulnerable road users, evidently less capable of negotiating traffic order through eye contact, had initially been overlooked by the enthusiastic innovators. The research project shows a shared scanning of the concrete challenges and opportunities. The 'safety through chaos' principle is subject to joint fact finding, which may bring forward new ways to share space. The 'process turn' made Shared Space into a more flexible concept, revolving around the shar*ing* of space.

Appreciated in terms of 'acceptable novelty', Shared Space displays hardly any resemblance to the Trojan horse, as the 'network turn' case did. Instead, it even appears to involve its inverse, the series of not that spectacular transformations being donned in a radical storyline. In order to develop this assessment further, the first question to answer is the following: *What was the transformative content of the attempted innovation, and what disruption was implied with this ambition?* In this respect it needs to be remembered that Shared Space is juxtaposed against divided space. The concept was aimed to roll back the partitioning of public space through traffic engineering measures, in favor of more 'humane', more democratic and more appealing public space. In order to bring this about, the concept implied an argument for road design that was more participative and political, and less guided by traffic safety doctrines. Especially as regarding the traffic safety doctrine Shared Space was overtly and purposively disruptive – the 'safety through chaos' principle implied a provocative stance towards a well-established sector and common beliefs about traffic safety.

The disruptiveness of Shared Space did not go unnoticed. As speaks from the receptions by traffic safety institutes, traffic professionals and the police, the 'safety through chaos' principle met with concerns, serious objections and sometimes even derision. And apart from disruption of professional practices and standards, various spokespersons of 'vulnerable road users' (the elderly, children and bicyclists) equally translated the concept as an erosion of achievements in traffic safety. In Haren Shared Space took away the separate bicycle lanes that secured bicyclists their protective space; other than the Greeks, the Shared Space protagonists seemed to take, rather than offer. Still, the anarchist storyline of 'safety through

chaos' and the appeal to common sense and decency gained considerable media coverage and public attention. So however great the resistance against the 'irresponsible' traffic concept, its iconoclasm did pay off in terms of attention and 'rumor around the brand'. To consider Shared Space as mere iconoclasm would only grasp the surface of the concept however, the initiators held. As also critics had pointed out, Shared Space never amounted to complete eradication of traffic ordering in practice: Traffic and livelihood ambitions were always rebalanced, rather than substituted, and the eventual designs were generally rather inconspicuous compared to the radicalism surrounding the guiding concept. Compromises were made to make Shared Space less disruptive to road users, and more acceptable. The 'process turn' clearly displays a further emphasis on the avoidance of disruption, refocusing on the negotiation of acceptable ways to share space.

Shared Space iconoclasm could not actually break through the 'city walls' of traffic safety doctrine, even when the concept managed to mobilize forces. When materializing, it always involved domestication of the rather 'wild' idea. In that respect the later 'process turn' towards *negotiation* of space can be considered more as a confirmation of ongoing practice than as a major change of direction: De facto domestication was acknowledged and anticipated upon. On the other hand, the 'process turn' was a strategic repositioning that explicitly seeks to strike a balance in the 'acceptable novelty' dilemma. Upfront, the case has been characterized as the inverse of the 'Greek gift': In this regard the following questions were raised beforehand: *What was hidden from view by initiators? And what was hidden from view by* translators*?* The main answer is then that, indeed, there was no latent transformation, but rather domestication of overt and even provocatively formulated transformative ambitions. Yet when taking account the later 'process turn', things are less clear: It can be said that the initiators took to a 'Greek gift' strategy after all, in the sense that they downplayed and hid Shared Space anarchism.

To conclude, the domestication of Shared Space radicalism indicates not just how a radical innovation attempt became diluted through translators – the case also shows that the iconoclasm was rather a surface dimension of the concept that was first exploited and later discarded. It can therefore be concluded that, first, the initial 'inversal' of the 'Greek gift' was not as strategically naïve as it may appear, and secondly, that a Trojan horse-strategy was adopted *over time*. In the next and concluding section the cases are briefly compared, also seeking to establish what lessons they convey for practical dealings with the 'acceptable novelty' paradox.

4 Conclusion and discussion of findings: A dialectical approach to the paradox of 'acceptable novelty'

As argued in the first section, the paradox of 'acceptable novelty' is a crucial challenge to system innovation practice. Stated as a paradox, the tension between the contradicting ambitions of non-disruption/acceptance and transformation is indicated to be inherent, and unavoidable, to some extent. On the other hand, the indicated logical contradiction needs to be acknowledged as a tractable issue, as a practical dilemma. Having described and analyzed two cases of system innovation processes, it has only become more clear that the dilemma can be dealt with in a variety of ways. Table 1 below summarizes the cases on the key dimensions of transformative content, disruptions implied, affirmative and negating translations, and patterns in latency. Comparison on these 'Greek gift' dimensions then allows to formulate answers to the practice-oriented questions on the 'acceptable novelty' paradox:

How can this paradox be dealt with? And, considering that it is only paradoxical in its idealized form, how to strike a balance between non-disruption and transformation?

Table 1 Case comparison on 'Trojan horse' dimensions

	'Network turn'	**Shared Space**
Transformative content (system-innovative ambition)	Towards integrated, network-oriented mobility policies; boundary-crossing action	Towards more 'humane', more democratic and self-organizing traffic order and spatial design; participative design.
Disruption implied (how is existing system affected?)	Break away from territorial logic; undermining administrative autonomy.	Against traffic safety code, jeopardizing traffic safety certainties
Affirmative translations (why/how was innovation attempt accepted?)	Quick wins and innovative transport solutions; sometimes in line with territorial logic	Appealing iconoclasm; acceptable traffic innovations
Negating translations (why/ how was innovation attempt experienced as disruptive?)	Network logic not always relevant/beneficial; interference with discretions	Iconoclasm 'irresponsible'/unfeasible; 'vulnerable road users' neglected
Patterns in latency (what was hidden from view by initiators? What was hidden from view by translators?)	Integrated Transport Authority hidden from translators; accommodation & domestication hidden from initiators	Overt iconoclasm downplayed at later stage; Translators domesticated the radical concept

Overlooking these case summaries and thinking through the cases' similarities and differences from the Trojan horse theme, the following conclusions can be drawn: First of all, the cases are very different in the nature of the transformation envisioned by the initiators. Whereas the first involves fairly incremental change, in the sense that primarily the means to congestion abatement were changed rather than this goal itself, the second involves a more fundamental reconsideration of traffic management practices. Accordingly, the first innovation attempt can be considered to imply relatively less disruption. The two cases' translation dynamics largely confirm this. The second conclusion, however, is that the two innovation attempts do not fit a clear-cut juxtaposition of incremental-radical innovation. On the one hand, the 'network turn' seemed not overly disruptive to most translators but did contain a revolutionary spark. On the other hand, Shared Space was quite radical in its iconoclastic storyline, but both initiators and translators domesticated the concept somewhat. Both 'network turn' and Shared Space initiatives functioned as 'boundary objects' (Star & Griesemer (1989): More than their differences, i.e. their presumed intrinsic radical or incremental nature, their common malleability stands out.

Having indicated the malleability of the respective innovative concepts, the Trojan horse theme comes to life. The third conclusion is then that the two cases do not so much constitute a contemporary Trojan horse and its apparent inverse of overt confrontation, but rather two cases in which non-disruptive and transformative *alternated*. The Trojan horse-construction of latent transformation was in-built in the 'network turn' case, but translators countered any overly transformative materializations of the concept. In the Shared Space case, the Trojan-horse strategy was only chosen later - after confrontational rhetoric had done its work for the

initiators. The general picture that arises is one of malleable innovation attempts that are constantly reinterpreted and slightly altered according to circumstances. Unlike the original mythos, both initiators and translators play tricks on each other. Both latent transformation and latent domestication are passing moments in translation[8].

The above observations and conclusions lead, as far as this can be done on the basis of a small number of cases, to the main contention of this paper: The paradox of 'acceptable novelty' needs to be appreciated as a practical contradiction between transformation and non-disruption, and, because of the interpretive flexibility of innovation attempts, this contradiction is of a highly dynamic nature. Once applied to system innovation processes, the Trojan horse metaphor instructively showed what is missing in the original mythos: Instead of a simple case of masterful deceit by the Greeks, there were rather mutual tricks and twists; and instead of a breakthrough that happened overnight, there were rather prolonged strategic games around the innovation attempt – the Trojan horse was offered, returned, and offered again, each time with new latent content. In other words, the Trojan horse metaphor has helped elicit that the paradox of 'acceptable novelty' should be appreciated through a *dialectical* perspective. This entails practically that system-innovative endeavors should not be blinded by transitory moments of acceptance or rejection, or by the 'incremental' or 'radical' nature of their innovative concept[9]. Instead, innovators should rather be attentive to the sometimes subtle 'idea mutations' in their innovative concept over time (Dudley (2003, 437)), and to the changes in circumstances under which Trojan horses can gain and lose in transformative force[10]. On this dialectical account, the completion of a Trojan horse is only the beginning of a process of system-innovative action, in which the latent ambitions of translators have to be anticipated (see also Luhmann (1997), Grin & van Staveren (2007)). Whether the process will eventually turn out as the intended latent transformation, or as neutralizing domestication instead (see for example de Coninck (2007) and Meadowcroft (2009) on the apparent Trojan horse of Carbon Capture & Storage), depends on sustained efforts to keep the innovation acceptable and to maintain latency – the 'Luteijn' growth model can be considered a good example of this. These co-steering adjustments 'from within' a clew of translators can be considered opportunistic or Machiavellian (Rip (2006)) – system-innovative idealism remains present however, in the form of latencies.

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[8] As has been pinpointed earlier by ANT scholars, the very concept of translation implies a degree of deceit. In Latin-French etymology, 'translation' ('traduction') and 'deceit' ('trahison') are closely related.

[9] Such functionalist radical-incremental dichotomy is frequently used in studies of system innovations and transitions, see for example Geels et al. (2012) on the automobility system transition.

[10] This oscillating pattern has also been described as the 'harmonica-movement' in system innovation (Jan Rotmans), see also Pel (2012) on 'oscillation'.

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